TECHNICAL BULLETIN

SOFTWARE USER'S MANUAL
(SUM)

DIGITAL TOPOGRAPHIC SUPPORT SYSTEM (DTSS)

VERSION 7.0/Windows NT Version

Distribution Statement C. Distribution authorized to U.S. Government agencies and their contractors only for official use or for administrative or operational purposes. This determination was made on 31 January 1994. Other requests for this document shall be referred to Commander, US Army Communications-Electronics and Fort Monmouth, ATTN: AMSEL-LC-LEO-E-ED, Fort Monmouth, NJ 07703-5006.

DESTRUCTION NOTICE

Destroy by any method that will prevent disclosure of contents or reconstruction of the document.

HEADQUARTERS, DEPARTMENT OF THE ARMY

1 February 2002

LIST OF EFFECTIVE PAGES

INSERT LATEST CHANGED PAGES, DESTROY SUPERSEDED PAGES

NOTE: The portion of the text affected by the changes is indicated by a vertical line in the outer margins of the page. Changes to illustrations are indicated by miniature pointing hands. Changes to wiring diagrams are indicated by shaded areas.

Dates of issue for original and changed pages are:

Original .....0 ..... 1 February 2002

TOTAL NUMBER OF PAGES IN THIS PUBLICATION IS 757 CONSISTING OF THE FOLLOWING:

Page No.	*Change No.
Cover	0
a -b	0
i - xxxiv	0
1-1 - 1-10	0
2-1 - 2-8	0
3-1 - 3-12	0
4-1 - 4-22	0
5-1 - 5-80	0
6-1 - 6-76	0
7-1 - 7-70	0
8-1 - 8-88	0
9-1 – 9-44	0
10-1 – 10-66	0
11-1 – 11-80	0
12-1 – 12-8	0
A-1 - A-78	0
B-1 - B-12	0
C-1 - C-6	0
D-1 - D-18	0
E-1 – E-4	0
F-1 – F-8	0
Index-1 – Index 10	0

TECHNICAL BULLETIN **HEADQUARTERS,**
DEPARTMENT OF THE ARMY
No. 11-6675-294-10 **WASHINGTON, D.C., 1 February 2002**

SOFTWARE USER'S MANUAL (SUM)

DIGITAL TOPOGRAPHIC SUPPORT SYSTEM (DTSS)

VERSION 7.0/Windows NT Version

REPORTING OF ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistakes, or if you know of a way to improve the procedures, please let us know. Mail your letter or DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028 located
in the back of this manual directly to:
U.S. Army Communications-Electronics Command and Fort Monmouth,
ATTN: AMSEL-LC-LEO-D-CS-CFO,
Fort Monmouth, New Jersey 07703-5006.

The FAX Number is 732 532-1413, DSN 992-1413
You may also e-mail your recommendations to:
AMSEL-LC-LEO-PUBS-CHG@mail1.monmouth.army.mil .
In either case, a reply will be furnished directly to you.

TABLE OF CONTENTS

1	**INTRODUCTION**	1-2
1.1	Document Overview	1-2
1.1.1	Style Conventions	1-3
1.2	System Overview	1-4
1.2.1	System Purpose	1-4
1.2.2	User Classes	1-6
1.2.3	Equipment	1-6
1.2.4	Software Overview	1-7
1.2.4.1	Workstation Software	1-7
1.2.4.1.1	COTS Software	1-7
1.2.4.1.2	GOTS Software	1-9
1.2.4.2	Laptop Software	1-9
1.2.4.2.1	COTS Software	1-9

1.2.4.2.2 GOTS Software 1-9
1.2.4.3 Help 1-10
1.2.4.4 Input and Storage Media 1-10
1.2.5 Laptop Operations 1-10
1.2.6 Software Maintenance and Problem Reporting 1-10

2 **ACCESS** 2-2
2.1 Workstation Startup and Shutdown 2-2
2.1.1 Power-On Procedures 2-2
2.1.2 Power-Down Procedures 2-2
2.2 Logon and Logoff Procedures 2-2
2.2.1 Obtaining a User Account 2-2
2.2.2 User Names and Passwords 2-2
2.2.3 Logging On for First Time 2-3
2.2.4 Logging On After First Time 2-5
2.2.5 Changing Password 2-6
2.2.6 Logoff Procedures 2-6
2.3 Reboot Procedures 2-6
2.4 Shutdown Procedures 2-7

3 **GRAPHICAL USER INTERFACE (GUI)** 3-2
3.1 Introduction to Windows NT 3-2
3.1.1 Desktop 3-2
3.1.2 Taskbar 3-2
3.1.2.1 Start Button and Start Menu 3-2
3.1.2.2 Window Icons 3-4
3.1.2.3 Utilities Shortcut Icons 3-4
3.1.3 Desktop Icons 3-4
3.1.4 Program Windows 3-4
3.1.4.1 Title Bar 3-5
3.1.4.1.1 Window Icon 3-6
3.1.4.1.2 Title 3-7
3.1.4.1.3 Window Control Buttons 3-7
3.1.4.2 Menu Bar 3-8
3.1.4.3 Display Area 3-8
3.1.4.4 Border 3-8
3.1.5 Window Operations 3-9

3.1.6 User Input Items 3-9
3.2 Wizard Interface 3-9
3.3 Default Settings for Screen Display 3-10

4 **SOFTWARE INTRODUCTION** 4-2
4.1 ArcInfo Overview 4-2
4.1.1 ArcMap 4-3
4.1.1.1 ArcMap Main Menu Bar 4-5
4.1.1.2 ArcMap Standard Toolbar 4-5
4.1.1.3 ArcMap Tools Toolbar 4-7
4.1.1.4 ArcMap Draw Toolbar 4-8
4.1.2 ArcCatalog 4-10
4.1.2.1 ArcCatalog Main Menu Bar 4-11
4.1.2.2 ArcCatalog Standard Toolbar 4-12
4.1.2.3 ArcCatalog Geography Toolbar 4-13
4.1.2.4 ArcCatalog Location Dropdown List 4-14
4.1.2.5 ArcCatalog Metadata Toolbar 4-14
4.1.3 ArcToolbox 4-15
4.1.4 ArcInfo Workstation 4-17
4.2 ERDAS Imagine 4-19
4.3 DTSS Menu 4-20
4.4 DTSS Directory Structure 4-20
4.4.1 Changing Permissions on Directories or Files 4-21

5 **DATA COLLECTION** 5-3
5.1 Data Models 5-3
5.1.1 Vector Models 5-4
5.1.1.1 Coverages 5-4
5.1.1.2 Shapefiles 5-4
5.1.1.3 Geodatabases 5-5
5.1.2 Raster Models 5-6
5.2 Importing Data 5-6
5.2.1 ITD Importer 5-7
5.2.1.1 Importing ITD Into a New Geodatabase 5-8
5.2.1.2 Importing ITD Into an Existing Geodatabase 5-13
5.2.2 VPF Importer 5-18
5.2.2.1 Importing VPF Data Into a New Geodatabase 5-19

5.2.2.2 Importing VPF Data Into an Existing Geodatabase 5-27
5.2.3 Importing Data With ArcInfo 5-36
5.2.4 Importing Data With Imagine 5-37
5.2.4.1 Importing ARC Digitized Raster Graphics (ADRG) Data 5-37
5.2.4.2 Importing Digital Terrain Elevation Data (DTED) 5-42
5.2.4.3 Importing Raster Product Format (RPF) Data 5-47
5.3 Scan 5-51
5.3.1 User Interface 5-52
5.3.1.1 Menu Bar 5-52
5.3.1.2 Main Toolbar 5-53
5.3.1.3 Scan Window 5-54
5.3.1.3.1 Scan Task Toolbar 5-55
5.3.1.3.2 Scan Panel 5-56
5.3.1.3.3 Overview and Detail Windows 5-56
5.3.1.4 View Window 5-56
5.3.1.4.1 View Task Toolbar 5-57
5.3.1.4.2 View Window Main Display Area 5-58
5.3.1.5 Feature Window 5-58
5.3.1.5.1 Feature Task Toolbar 5-59
5.3.1.5.2 Feature Window Main View 5-60
5.3.1.5.3 Color Wheel View 5-60
5.3.1.5.4 Histogram View 5-61
5.3.2 Scanner Setup 5-62
5.3.2.1 Paper Load Tab 5-62
5.3.2.2 Media Offsets Tab 5-63
5.3.2.3 Extended Thickness Tab 5-64
5.3.3 Scanner Calibration 5-64
5.3.4 Scanning an Image 5-66
5.3.4.1 Initializing Phase 5-67
5.3.4.1.1 Presets 5-67
5.3.4.1.1.1 Standard Scan Presets 5-68
5.3.4.1.1.2 Creating a Scan Preset 5-68
5.3.4.1.2 Scanning Modes 5-68
5.3.4.1.3 Resolution 5-69
5.3.4.1.3.1 Resolution Lists 5-70
5.3.4.1.4 Paper Size 5-70
5.3.4.2 Prescanning Phase 5-71

5.3.4.2.1 Prescan Control 5-71
5.3.4.2.2 Setting Black And White Point 5-71
5.3.4.2.3 Defining a Scan Window 5-72
5.3.4.3 Adjustments Phase 5-72
5.3.4.4 Final Scanning Phase 5-72
5.3.5 Feature Extraction Overview 5-73
5.3.5.1 Feature Extraction Process 5-73
5.3.6 Scanning to Printer 5-77

6 **DATA MANAGEMENT** 6-3
6.1 Data Conversion 6-3
6.1.1 Vector Data Conversion 6-3
6.1.1.1 ArcToolbox Data Conversions 6-3
6.1.1.1.1 Converting Coverage to Geodatabase 6-3
6.1.1.2 ArcCatalog Data Conversions 6-9
6.1.1.2.1 Converting Geodatabase to Coverage 6-9
6.1.2 Raster-to-Vector Conversion 6-13
6.1.2.1 Imagine Raster-to-Vector Conversion 6-13
6.1.2.2 ArcInfo Raster-to-Vector Conversion 6-16
6.1.3 Projections and Datums 6-16
6.1.3.1 Vector Data Projection 6-16
6.1.3.1.1 On-the-Fly Projection 6-16
6.1.3.1.2 Defining Projection for Geodatabases 6-17
6.1.3.1.3 Defining Projection for Shapefiles 6-18
6.1.3.1.4 ArcToolbox Data Management and Projection Conversion 6-22
6.1.3.1.4.1 Define Projection Wizard 6-22
6.1.3.1.4.1.1 Defining Projection Interactively 6-23
6.1.3.1.4.1.2 Matching Projection of Existing Dataset 6-28
6.1.3.1.4.2 Project Wizard 6-32
6.1.3.1.4.2.1 Selecting New Projection Interactively 6-33
6.1.3.1.4.2.2 Matching Coordinate Projection of Existing Data 6-39
6.1.3.1.4.3 Transform Tool 6-45
6.1.3.2 Raster Data Projection 6-46
6.1.3.2.1 Determining Projection Information 6-47
6.1.3.2.2 Assigning Projection to Raster Image 6-48
6.1.3.2.3 Polynomial Rectification 6-51
6.1.3.2.4 Reprojecting Images 6-58

6.1.4 Orthorectification 6-63
6.2 Data Organization and Access 6-63
6.2.1 Catalog Tree Structure 6-63
6.2.1.1 Folder Connection 6-64
6.2.1.2 Database Connections 6-67
6.2.1.3 Coordinate Systems 6-68
6.2.2 Connecting to Data 6-69
6.2.3 Organizing Data 6-71
6.2.4 Exploring Data 6-71
6.2.4.1 ArcCatalog Tabs 6-71
6.3 Using Unix DTSS Products on Windows NT 6-73
6.4 GEOTRANS Coordinate Conversion 6-74
6.5 NIMAMUSE 6-75

7 **DATA EDITING AND GENERATION** 7-3
7.1 Digital Feature Data 7-3
7.1.1 ArcMap Editor 7-3
7.1.1.1 Feature Geometry 7-4
7.1.1.1.1 Sketch Tool Context Menu 7-8
7.1.1.1.2 User Tolerances 7-8
7.1.1.1.3 Layer Coordinate System 7-9
7.1.1.2 Feature Selection 7-10
7.1.1.2.1 Selecting All Elements 7-10
7.1.1.3 Feature Attributes 7-11
7.1.1.3.1 Modifying Feature Attributes 7-11
7.1.1.3.2 Assigning Attributes to New Features 7-13
7.1.1.3.3 Adding and Deleting Records 7-16
7.1.1.3.4 Editing Records 7-18
7.1.2 Adding and Creating New Feature Classes 7-18
7.1.2.1 Adding New Feature Classes to Existing Geodatabase 7-18
7.1.2.2 Creating Data Using an Existing Geodatabase Template 7-19
7.1.2.2.1 Copying a Blank Geodatabase Template 7-19
7.1.2.2.2 Digitizing Features in Blank Geodatabase Template 7-21
7.1.2.2.3 Deleting Features 7-25
7.1.2.3 Creating a New Geodatabase 7-26
7.1.2.3.1 Creating a New Feature Dataset 7-28
7.1.2.3.2 Creating New Feature Classes 7-36

7.1.2.3.3 Creating New Attribute Fields for Feature Classes....7-40
7.1.3 Feature Extraction Using ERDAS Imagine....7-44
7.1.3.1 Terrain Categorization....7-44
7.1.3.2 Sub-Pixel Classifier....7-52
7.1.3.3 Expert Classifier....7-52
7.1.3.4 Using Imagine Feature Data in ArcMap....7-52
7.1.3.5 Stereo Analyst....7-53
7.2 Digital Elevation Data....7-55
7.2.1 IFSAR DEM....7-55
7.2.2 StereoSAR DEM....7-59
7.3 Metadata Editor....7-64
7.4 DTSS Contact Information Editor....7-67

8 **DATA EXPLOITATION–CUSTOM**....8-3
8.1 Mobility Overview....8-3
8.1.1 NRMM II Overview....8-3
8.1.1.1 Scenario Factors....8-5
8.1.2 NRMM II Products....8-5
8.1.2.1 Cross-Country Movement....8-5
8.1.2.2 On-Road Speed....8-6
8.1.2.3 Gap Crossing....8-6
8.1.3 User-Defined Parameters....8-7
8.1.4 Creating a Mobility TDA....8-8
8.1.5 NRMM II Output....8-14
8.1.5.1 Cross-Country Movement Factors....8-14
8.1.5.2 On-Road Speed Factors....8-15
8.1.5.3 Gap Crossing Factors....8-16
8.1.5.4 Accessing Original Data Values....8-17
8.1.5.5 Sample Output....8-18
8.2 Line of Sight Overview....8-20
8.2.1 Line of Sight Products....8-21
8.2.2 Line of Sight Parameters....8-21
8.2.2.1 Target Height....8-21
8.2.2.2 Target Altitude....8-22
8.2.2.3 Target Reference....8-22
8.2.2.4 Interpolation Method....8-22
8.2.2.5 Range Bands....8-23

8.2.2.6 Coordinate Reference 8-23
8.2.2.6.1 Latitude/Longitude (Lat/Lon) 8-23
8.2.2.6.2 Universal Transverse Mercator (UTM) 8-24
8.2.2.6.3 Military Grid Reference System (MGRS) 8-24
8.2.2.7 Observer Selection Method 8-25
8.2.2.8 Visibility Fan 8-25
8.2.2.9 Observer Height 8-25
8.2.2.10 LOS Mode 8-26
8.2.2.11 LOS Range 8-26
8.2.2.12 Observer Reference 8-26
8.2.2.13 Sample Spacing 8-26
8.2.3 Visibility Plot 8-27
8.2.3.1 Creating a Visibility Plot 8-27
8.2.3.2 Visibility Plot Output 8-38
8.2.3.2.1 Best and Worst Case Graph 8-38
8.2.3.2.2 Visible, Partially Visible, and Masked Areas 8-39
8.2.3.2.3 Fused and Combination Product 8-39
8.2.4 Target Profile 8-40
8.2.4.1 Creating a Target Profile 8-40
8.2.4.2 Target Profile Output 8-51
8.3 Data Query Overview 8-52
8.3.1 Data Query Structure 8-53
8.3.2 Data Query Wizard 8-55
8.3.2.1 Creating a New Query 8-55
8.3.2.2 Loading and Modifying Existing Queries 8-63
8.3.2.3 Reassigning Data When Loading Queries 8-69
8.3.2.4 Querying Existing Products 8-71
8.3.2.5 Data Query Output 8-72
8.3.3 Query Manager 8-72
8.3.3.1 Searching Queries 8-74
8.3.3.2 Exporting Queries 8-76
8.3.3.2.1 Exporting to Drive or Directory 8-76
8.3.3.2.2 Exporting to E-mail 8-77
8.3.3.3 Importing Queries 8-78
8.3.3.3.1 Importing From Drive or Directory 8-78
8.3.3.3.2 Importing From E-mail 8-79
8.3.4 Creating Queries From Multiple DTSS Products 8-80

8.4 Slope Generator 8-80

9 **DATA EXPLOITATION–COTS** 9-3
9.1 Feature Query and Selection 9-3
9.1.1 Identifying Features 9-3
9.1.1.1 Map Tips 9-3
9.1.2 Selecting Features 9-5
9.1.2.1 Feature Selection Color 9-5
9.1.2.1.1 Changing Selection Color for All Layers 9-6
9.1.2.1.2 Changing Selection Color for an Individual Layer 9-6
9.1.2.2 Setting Selectable Layers 9-7
9.1.2.3 Graphical Feature Selection 9-8
9.1.2.3.1 Selecting Individual Features 9-8
9.1.2.3.2 Selecting Multiple Features 9-9
9.1.2.4 Selecting From Attribute Table 9-10
9.1.2.5 Selecting by Location 9-11
9.1.2.6 Selecting by Attributes 9-13
9.1.2.7 Additional Feature Selection Operations 9-16
9.1.3 Deselecting Features 9-17
9.1.4 Exporting Selected Features 9-17
9.1.5 Finding Features 9-17
9.1.5.1 Finding Features and Attributes in NIMA Data Specifications 9-20
9.1.6 Spatial Bookmarks 9-21
9.1.6.1 Creating Spatial Bookmarks 9-22
9.1.6.2 Accessing Existing Spatial Bookmarks 9-22
9.1.6.3 Removing Existing Spatial Bookmarks 9-22
9.2 Geoprocessing Tools 9-23
9.2.1 ArcMap Tools 9-23
9.2.1.1 Buffer Wizard 9-23
9.2.1.2 Dissolve Wizard 9-27
9.2.2 ArcToolbox Analysis Tools 9-28
9.2.2.1 Extract 9-28
9.2.2.2 Overlay 9-28
9.2.2.2.1 Erase Tool 9-29
9.2.2.2.2 Overlay Wizard 9-31
9.2.2.3 Proximity Directory 9-35
9.2.2.3.1 Buffer Wizard 9-36

9.2.2.4 Statistics Directory 9-36
9.2.2.5 Surface Tools 9-37
9.2.3 ArcToolbox Data Management Tools 9-37
9.2.3.1 Append Wizard 9-37

10 **DATA PRESENTATION** 10-3
10.1 Displaying Data in ArcMap 10-3
10.1.1 Data Layers 10-4
10.1.1.1 Adding Layers 10-4
10.1.1.1.1 Adding a Single Geodatabase Feature Class 10-4
10.1.1.1.2 Adding an Entire Geodatabase Feature Dataset 10-6
10.1.1.2 Copying Layers 10-7
10.1.1.3 Working With Multiple Layers 10-8
10.1.1.4 Group Layers 10-8
10.1.1.4.1 Creating Group Layers 10-8
10.1.1.4.2 Adding Layers to a Group Layer 10-10
10.1.1.4.3 Changing the Layer Order in a Group Layer 10-12
10.1.1.4.4 Removing Layers 10-12
10.1.2 Symbology 10-13
10.1.2.1 Transparency 10-16
10.1.2.1.1 Adjusting Vector Layer Transparency 10-16
10.1.2.1.2 Adjusting Raster Layer Transparency 10-17
10.1.2.2 Saving Symbology 10-18
10.2 Map Composition 10-19
10.2.1 Map Documents and Map Templates 10-19
10.2.1.1 Choosing a Template 10-19
10.2.1.2 Saving a Map Template 10-21
10.2.1.3 Data Links 10-21
10.2.2 Layout View 10-21
10.2.2.1 Data Frames 10-22
10.2.2.1.1 Data Frame Scale 10-24
10.2.2.2 Page Setup 10-28
10.2.2.3 Scale Bar 10-29
10.2.2.4 Grids and Graticules 10-31
10.2.2.5 Legend 10-35
10.2.2.6 Text Fields 10-37
10.2.2.7 North Arrow 10-38

10.2.2.8 Align and Group Functions 10-40
10.2.3 Annotating Imagery 10-41
10.2.3.1 Dynamic Labeling....10-41
10.2.3.2 Converting Labels to Annotation 10-43
10.2.4 Saving a Map Composition 10-46
10.2.4.1 Exporting a Map Image 10-46
10.2.5 Printing a Map....10-46
10.2.6 DTSS Map Production Tool....10-46
10.2.6.1 DTSS Map Template....10-47
10.2.6.2 DTSS Map Elements 10-49
10.3 Terrain Visualization 10-51
10.3.1 3-D Perspective Views....10-51
10.3.2 3-D Anaglyph....10-59
10.3.3 Shaded Relief.... 10-61

11 **DATA OUTPUT AND DISSEMINATION**....11-4
11.1 Data Output....11-4
11.1.1 Exporting Data With ArcInfo....11-4
11.1.2 Exporting Data With Imagine....11-4
11.1.2.1 Exporting ARC Digitized Raster Graphics (ADRG) Data....11-5
11.1.2.2 Exporting Raster Product Format (RPF) Data 11-8
11.1.2.3 Exporting National Imagery Transmission Format (NITF) Data 11-15
11.1.2.3.1 Preparing Image for NITF Export 11-16
11.1.2.3.2 NITF Export....11-16
11.1.3 DOP Exporter....11-21
11.1.4 DTSS Geodatabase Exporter....11-24
11.2 Data Dissemination....11-27
11.2.1 DTSS Website Overview....11-27
11.2.1.1 DTSS Web Exporter....11-28
11.2.1.1.1 Add Product to Website....11-28
11.2.1.1.2 Updating Product Data on Website....11-31
11.2.1.1.3 Removing Product From Website....11-34
11.2.1.1.4 Managing Website Product Folders 11-36
11.2.1.2 Downloading Product From DTSS Website....11-40
11.2.2 Adaptec Easy CD Creator....11-44
11.2.2.1 CD Creator Main Window 11-45
11.2.2.1.1 Layout Tabs....11-46

11.2.2.1.2 Menu 11-46
11.2.2.1.3 Toolbar 11-50
11.2.2.2 Creating a Data CD 11-51
11.2.2.2.1 CD Layout 11-51
11.2.2.2.2 Define CD Layout Properties 11-53
11.2.2.2.2.1 General Tab 11-53
11.2.2.2.2.2 Data Settings Tab 11-53
11.2.2.2.2.3 File Types Tab 11-55
11.2.2.2.3 Creating the CD 11-55
11.2.3 DVD-RAM 11-58
11.2.4 Tape Archive 11-59
11.2.4.1 Backup Main Window 11-59
11.2.4.1.1 Menu 11-59
11.2.4.1.2 Toolbar 11-62
11.2.4.1.3 Backup Disk Files To Tape 11-63
11.2.4.1.3.1 Backing Up All Files 11-63
11.2.4.1.3.2 Backing Up Individual Files 11-63
11.2.4.1.3.3 Setting Tape Options 11-63
11.2.4.1.3.4 Setting Backup Set Options 11-64
11.2.4.1.3.5 Setting Log Options 11-64
11.2.4.1.3.6 Checking Backup Status 11-65
11.2.4.1.4 Restoring Tape Files to Disk 11-65
11.2.4.1.4.1 Loading Catalogs 11-66
11.2.4.1.4.2 Restoring Tapes Or Backup Sets 11-66
11.2.4.1.4.3 Restoring Individual Files 11-67
11.2.4.1.4.4 Setting Restore Options 11-67
11.2.4.1.4.5 Setting Log Options 11-67
11.2.4.1.4.6 Checking Restore Status 11-68
11.2.4.1.5 Maintain Tapes 11-68
11.2.4.1.5.1 Erasing Tapes 11-68
11.2.4.1.5.2 Retensioning Tapes 11-69
11.2.4.1.5.3 Formatting Tapes 11-69
11.2.5 Jaz Drive 11-69
11.2.6 LS-120 Floppy Drive 11-71
11.2.7 Printing 11-71
11.2.7.1 Printing in ArcMap 11-72
11.2.7.2 Printing in ERDAS Imagine 11-76

11.3 Common Message Processor (CMP) 11-79

12 **HELP**.....12-2
12.1 COTS Online Help.....12-2
12.1.1 ArcInfo Online Help 12-2
12.1.1.1 Contents Tab 12-2
12.1.1.2 Index Tab 12-3
12.1.1.3 Find Tab 12-5
12.1.2 Imagine Online Help Functionality 12-6
12.2 CTIS Online Help 12-7

APPENDIX A (System Administration)..... A-1

APPENDIX B (Security) B-1

APPENDIX C (References).....C-1

APPENDIX D (Glossary) D-1

APPENDIX E (Troubleshooting Guide) E-1

APPENDIX F (Frequently Asked Questions-FAQ) F-1

TABLE OF FIGURES

CHAPTER 1

Figure 1-1 DTSS Configurations 1-5
Figure 1-2 DTSS Software Layered Architecture 1-7

CHAPTER 3

Figure 3-1 Common Look and Feel (CLF) in Windows NT 3-3
Figure 3-2 Start Menu 3-3
Figure 3-3 Program Window 3-5
Figure 3-4 Window Control Pull-Down Menu 3-6
Figure 3-5 Window Without Maximize Button 3-7
Figure 3-6 Find Window Showing User Input Items 3-9
Figure 3-7 Sample Wizard Window 3-10

CHAPTER 4

Figure 4-1 ArcInfo Diagram 4-3
Figure 4-2 ArcMap Window 4-4
Figure 4-3 Standard Toolbar in ArcMap Window 4-6
Figure 4-4 Tools Toolbar From ArcMap Window 4-7
Figure 4-5 ArcMap Draw Toolbar 4-8
Figure 4-6 ArcCatalog Main Window 4-11
Figure 4-7 Standard Toolbar in ArcCatalog 4-12
Figure 4-8 Geography Toolbar in ArcCatalog 4-13
Figure 4-9 Location Toolbar in ArcCatalog 4-14
Figure 4-10 Metadata Toolbar in ArcCatalog 4-15
Figure 4-11 ArcToolbox Window 4-16
Figure 4-12 ArcTools Interface in ArcInfo Workstation 4-18
Figure 4-13 ERDAS Imagine 8.4 Main Window 4-19
Figure 4-14 DTSS Menu in ArcMap 4-20

CHAPTER 5

Figure 5-1 Data Model Structure 5-6
Figure 5-2 DTSS–ITD Importer Window 5-8
Figure 5-3 DTSS ITD Importer–Select Data Window 5-9

Figure 5-4 Choose Source Directory Window 5-9
Figure 5-5 DTSS ITD Importer–Select Data Window 5-10
Figure 5-6 DTSS ITD Importer–Select Data Window 5-10
Figure 5-7 DTSS ITD Importer–Select Data Window 5-11
Figure 5-8 DTSS ITD Importer–Choose Output Location Window 5-11
Figure 5-9 DTSS ITD Importer–Import Status 5-12
Figure 5-10 DTSS ITD Importer–Import Status Complete Window 5-12
Figure 5-11 ArcMap Main Window Showing ITD Layers Imported 5-13
Figure 5-12 DTSS–ITD Importer Window 5-14
Figure 5-13 DTSS ITD Importer–Select Data Window 5-14
Figure 5-14 Choose Source Directory Window 5-15
Figure 5-15 DTSS ITD Importer–Select Data Window 5-15
Figure 5-16 DTSS ITD Importer–Select Data Window 5-16
Figure 5-17 DTSS ITD Importer–Select Data Window 5-16
Figure 5-18 DTSS ITD Importer–Import Status Window 5-17
Figure 5-19 DTSS ITD Importer–Import Status Complete Window 5-17
Figure 5-20 ArcMap Main Window Showing ITD Layers Imported 5-18
Figure 5-21 DTSS VPF Importer–Import Options Window 5-19
Figure 5-22 VPF to Geodatabase Importer Window 5-20
Figure 5-23 Open VPF Library Window 5-20
Figure 5-24 VPF to Geodatabase Importer Window 5-21
Figure 5-25 VPF to Geodatabase Importer Window 5-21
Figure 5-26 Select Tiles to Import Window 5-22
Figure 5-27 Select Tiles to Import Window 5-23
Figure 5-28 Import Tab of VPF to Geodatabase Importer Window 5-23
Figure 5-29 Table View Tab of VPF to Geodatabase Importer Window 5-24
Figure 5-30 Map View Tab of VPF to Geodatabase Importer Window 5-24
Figure 5-31 DTSS VPF Importer–Choose Output Location Window 5-25
Figure 5-32 DTSS VPF Importer–Import Status Window 5-26
Figure 5-33 DTSS VPF Importer–Import Status Complete Window 5-26
Figure 5-34 ArcMap Main Window Showing Imported Tiled Data 5-27
Figure 5-35 DTSS VPF Importer–Import Options Window 5-28
Figure 5-36 VPF to Geodatabase Importer Window 5-29
Figure 5-37 Open VPF Library Window 5-29
Figure 5-38 VPF to Geodatabase Importer Window 5-30
Figure 5-39 VPF to Geodatabase Importer Window 5-30
Figure 5-40 Select Tiles to Import Window 5-31

Figure 5-41 Select Tiles to Import Window 5-32
Figure 5-42 VPF to Geodatabase Importer Window 5-33
Figure 5-43 Table View Tab of VPF to Geodatabase Importer Window 5-33
Figure 5-44 Map View Tab of VPF to Geodatabase Importer Window 5-34
Figure 5-45 DTSS VPF Importer–Import Status Window 5-35
Figure 5-46 DTSS VPF Importer–Import Status Complete Window 5-35
Figure 5-47 ArcMap Main Window Showing Import of Tiled Data 5-36
Figure 5-48 Import/Export Window 5-38
Figure 5-49 Import ADRG Window 5-39
Figure 5-50 Preview Options Window 5-40
Figure 5-51 ADRG Preview Image in Viewer Window 5-40
Figure 5-52 Import Options Window 5-41
Figure 5-53 Inquire Box Coordinates Window 5-41
Figure 5-54 Import/Export Window 5-43
Figure 5-55 Import DTED Data Window 5-44
Figure 5-56 Preview Options Window 5-45
Figure 5-57 DTED Preview Image in Viewer Window 5-45
Figure 5-58 Import Options Window 5-46
Figure 5-59 Data Preparation Window 5-47
Figure 5-60 Mosaic Tool Window 5-47
Figure 5-61 Add Images for Mosaic Window 5-48
Figure 5-62 Image Filename Window 5-48
Figure 5-63 Image Filename Window Showing File Selected 5-49
Figure 5-64 Add Images for Mosaic Window Showing Files Selected 5-49
Figure 5-65 Mosaic Tool Window Showing Selected File 5-50
Figure 5-66 Run Mosaic Window 5-51
Figure 5-67 Wide Image Window 5-52
Figure 5-68 Wide Image Main Toolbar 5-53
Figure 5-69 Scan Portion of Wide Image Window 5-54
Figure 5-70 Scan Task Toolbar 5-55
Figure 5-71 View Window in Wide Image Window 5-57
Figure 5-72 View Task Toolbar 5-57
Figure 5-73 Feature Task Toolbar 5-59
Figure 5-74 Feature Window Main View Window 5-60
Figure 5-75 Color Wheel View Window 5-61
Figure 5-76 Histogram View Window 5-62
Figure 5-77 Scanner Setup Window Showing Paper Load Tab 5-63

Figure 5-78 Scanner Setup Window Showing Media Offsets Tab 5-64
Figure 5-79 Scanner Setup Window Showing Extended Thickness Tab 5-64
Figure 5-80 Scanner Imagining Components 5-65
Figure 5-81 Image Scanning Phases 5-67
Figure 5-82 Resolution Examples 5-70
Figure 5-83 Black and White Point Setup Window 5-72
Figure 5-84 Feature Extraction Process 5-73
Figure 5-85 Scan Setup Panel 5-74
Figure 5-86 Create LUT Window 5-75
Figure 5-87 Adaptive Settings Window 5-75
Figure 5-88 Histogram View Window 5-76
Figure 5-89 Histogram View Window 5-76
Figure 5-90 Scan Setup Tab 5-77
Figure 5-91 Wide Image Main Window 5-78
Figure 5-92 Scan Setup Tab With Settings Entered 5-78
Figure 5-93 Print Window in Wide Image Scanning Utility 5-79
Figure 5-94 Printer Specific Tab in Printer Properties Window 5-79
Figure 5-95 Page Setup Tab in Printer Properties Window 5-80
Figure 5-96 Scan in Progress in Wide Image 5-80

CHAPTER 6

Figure 6-1 ArcToolbox Main Window 6-4
Figure 6-2 Input Coverage Window in Coverage to Geodatabase Wizard 6-5
Figure 6-3 Choose an Input Coverage Window 6-5
Figure 6-4 Input Coverage Window in Coverage to Geodatabase Wizard 6-6
Figure 6-5 Output Geodatabase Window in Coverage to Geodatabase Wizard 6-6
Figure 6-6 Output Geodatabase Window in Coverage to Geodatabase Wizard 6-7
Figure 6-7 Use Defaults Window in Coverage to Geodatabase Wizard 6-8
Figure 6-8 Summary Window in Coverage to Geodatabase Wizard 6-8
Figure 6-9 Converting Polygon Window for Coverage to Geodatabase Wizard 6-9
Figure 6-10 Selecting Geodatabase to Coverage Tool in ArcCatalog 6-10
Figure 6-11 Geodatabase to Coverage Window 6-11
Figure 6-12 Converting Feature Class Window 6-13
Figure 6-13 Vector Utilities Window 6-14
Figure 6-14 Raster to Vector Window 6-14
Figure 6-15 Raster to ARC/INFO Coverage Window 6-15
Figure 6-16 Convert Raster to ARC/INFO Coverage Processing Window 6-15

Figure 6-17 Coordinate System Tab in Data Frame Properties Window 6-18
Figure 6-18 Shapefile Context Menu 6-19
Figure 6-19 Shapefile Properties Window in ArcCatalog 6-19
Figure 6-20 Fields Tab in Shapefile Properties Window 6-20
Figure 6-21 Spatial Reference Properties Window for Shapefile 6-21
Figure 6-22 ArcToolbox Main Window 6-23
Figure 6-23 Define Projection Wizard First Window 6-24
Figure 6-24 Input Dataset Window of Define Projection Wizard 6-24
Figure 6-25 Choose an Input Dataset Window 6-25
Figure 6-26 Select Projection Window of Define Projection Wizard 6-26
Figure 6-27 Parameters Window of Define Projection Wizard 6-26
Figure 6-28 Datum/Spheroid Window of Define Projection Wizard 6-27
Figure 6-29 Summary Window of Define Projection Wizard 6-28
Figure 6-30 ArcToolbox Main Window 6-29
Figure 6-31 Define Projection Wizard First Window 6-29
Figure 6-32 Input Dataset Window of Define Projection Wizard 6-30
Figure 6-33 Choose an Input Dataset Window 6-30
Figure 6-34 Matching Dataset Window of Define Projection Wizard 6-31
Figure 6-35 Matching Data Summary Window of Define Projection Wizard 6-32
Figure 6-36 ArcToolbox Window 6-33
Figure 6-37 First Window of Project Wizard 6-34
Figure 6-38 Input Dataset Window of Project Wizard 6-34
Figure 6-39 Choose an Input Dataset Window 6-35
Figure 6-40 Path and Filename in Project Wizard 6-35
Figure 6-41 Projection Selection Window of Project Wizard 6-36
Figure 6-42 Projection Parameters Window of Project Wizard 6-37
Figure 6-43 Select Datum Window of Project Wizard 6-37
Figure 6-44 Output Dataset Prompt in Project Wizard 6-38
Figure 6-45 Summary Window of Project Wizard 6-39
Figure 6-46 ArcToolbox Window 6-40
Figure 6-47 First Window of Project Wizard 6-40
Figure 6-48 Input Dataset Window of Project Wizard 6-41
Figure 6-49 Choose an Input Dataset Window 6-41
Figure 6-50 Path and Filename in Project Wizard 6-42
Figure 6-51 Matching Dataset Window of Project Wizard 6-43
Figure 6-52 Output Dataset Prompt in Project Wizard 6-44
Figure 6-53 Specify an Output Dataset Window 6-44

Figure 6-54 Summary Window of Project Wizard 6-45
Figure 6-55 Transform Tool in ArcToolbox 6-46
Figure 6-56 Select Layer to Add Window 6-47
Figure 6-57 ImageInfo Window 6-48
Figure 6-58 ImageInfo Window Without Projection and Map Information 6-49
Figure 6-59 Change Map Info Window 6-49
Figure 6-60 ImageInfo Window With Map Information Added 6-50
Figure 6-61 Projection Chooser Window 6-50
Figure 6-62 ImageInfo Window With Projection Information Added 6-51
Figure 6-63 Set Geometric Model Window 6-52
Figure 6-64 Geo Correction Tools Window 6-52
Figure 6-65 Polynomial Model Properties Window 6-53
Figure 6-66 GCP Tool Reference Setup Window 6-53
Figure 6-67 Viewer Selection Instructions Window 6-54
Figure 6-68 Reference Map Information 6-54
Figure 6-69 Viewer And GCP Tool Windows 6-55
Figure 6-70 Viewer #3 Window Showing GCP 6-55
Figure 6-71 GCP Tool Window 6-56
Figure 6-72 GCP Matching Window 6-57
Figure 6-73 Resample Window 6-58
Figure 6-74 Set Geometric Model Window 6-59
Figure 6-75 Geo Correction Tools Window 6-59
Figure 6-76 Reproject Model Properties Window 6-60
Figure 6-77 Reproject Model Properties Window Showing Projection Tab 6-60
Figure 6-78 Projection Chooser Window 6-61
Figure 6-79 Reproject Model Properties Window 6-61
Figure 6-80 Resample Window 6-62
Figure 6-81 The Catalog and Connections to Data 6-64
Figure 6-82 Folder Connection Structure 6-65
Figure 6-83 Database Connections Structure 6-68
Figure 6-84 Coordinate Systems Folder Structure 6-68
Figure 6-85 ArcCatalog Window 6-69
Figure 6-86 Connect to Folder Button on ArcCatalog Standard Toolbar 6-69
Figure 6-87 Connect to Folder Window 6-70
Figure 6-88 Catalog Tree Showing New Connection 6-70
Figure 6-89 ArcCatalog Tabs 6-72
Figure 6-90 Metadata Toolbar Showing Stylesheet Dropdown Menu 6-73

Figure 6-91 GEOTRANS2 Window 6-74

CHAPTER 7

Figure 7-1 ArcMap Editor Toolbar..... 7-3
Figure 7-2 Editor Toolbar Settings for Digitizing New Polygon 7-5
Figure 7-3 Start Editing Window in ArcMap 7-6
Figure 7-4 New Polygon in ArcMap 7-7
Figure 7-5 ArcMap Editing Options Window 7-9
Figure 7-6 Selected Feature and Selection Anchor in ArcMap 7-10
Figure 7-7 Start Editing Window in ArcMap 7-12
Figure 7-8 Selected Road in ArcMap 7-12
Figure 7-9 Attributes Window in ArcMap 7-13
Figure 7-10 Selected Road in ArcMap 7-14
Figure 7-11 Attributes Window in ArcMap 7-14
Figure 7-12 Copying Feature Attributes in ArcMap..... 7-15
Figure 7-13 Pasting Feature Attributes to New Feature 7-16
Figure 7-14 Context Menu for Layer in ArcMap 7-17
Figure 7-15 Attributes Table in ArcMap 7-17
Figure 7-16 Copy Command on Context Menu in ArcCatalog..... 7-20
Figure 7-17 Paste Command on Context Menu in ArcCatalog..... 7-20
Figure 7-18 Rename Command on Context Menu in ArcCatalog 7-21
Figure 7-19 Add Data Window 7-22
Figure 7-20 Background Image Open in ArcMap 7-22
Figure 7-21 Add Data Window With VITD Dataset..... 7-23
Figure 7-22 Blank Geodatabase Loaded Over Image in ArcMap..... 7-23
Figure 7-23 New Road Feature Digitized in ArcMap 7-24
Figure 7-24 Attributes Window for New Feature..... 7-25
Figure 7-25 Selected Feature in ArcMap..... 7-26
Figure 7-26 ArcCatalog Context Menu for New Geodatabase..... 7-27
Figure 7-27 New Geodatabase on Contents Tab in ArcCatalog..... 7-27
Figure 7-28 ArcCatalog Context Menu for New Feature Dataset 7-28
Figure 7-29 Feature Dataset Window in ArcCatalog 7-29
Figure 7-30 Spatial Reference Properties Window for New Feature Dataset 7-30
Figure 7-31 Browse for Coordinate System Window in ArcCatalog 7-31
Figure 7-32 Coordinate System Tab in Spatial Reference Properties Window..... 7-32
Figure 7-33 Projected Coordinate System Properties Window 7-33
Figure 7-34 X/Y Domain Tab in Spatial Reference Properties Window 7-34

Figure 7-35 Feature Dataset Window Showing Spatial Reference Information 7-35
Figure 7-36 New Dataset on Contents Tab in ArcCatalog 7-35
Figure 7-37 Context Menu for New Feature Class 7-36
Figure 7-38 New Feature Class Window in ArcCatalog 7-37
Figure 7-39 New Feature Class Storage Configuration Window 7-38
Figure 7-40 New Feature Class Attribute Table Window 7-39
Figure 7-41 New Feature Class on Contents Tab in ArcCatalog 7-39
Figure 7-42 Feature Class Context Menu in ArcCatalog 7-40
Figure 7-43 Feature Class Properties Window in ArcCatalog 7-41
Figure 7-44 Feature Class Properties Window With New Field 7-42
Figure 7-45 Selected Bridge Line in ArcMap 7-43
Figure 7-46 Attributes Window in ArcMap With New Field 7-43
Figure 7-47 Viewer #1 Window Showing a Raster Image 7-45
Figure 7-48 Classification Window 7-46
Figure 7-49 Signature Editor Window 7-46
Figure 7-50 Region Growing Properties Window 7-47
Figure 7-51 AOI Window 7-47
Figure 7-52 Viewer #1 Window Showing Selected Boundary 7-48
Figure 7-53 Signature Editor Window 7-49
Figure 7-54 Signature Editor Window 7-49
Figure 7-55 Supervised Classification Window 7-50
Figure 7-56 Classify–Performing Classification Window 7-51
Figure 7-57 Viewer #2 Window Showing Image Classified 7-51
Figure 7-58 Radar Window 7-55
Figure 7-59 IFSAR Project Selector Window 7-56
Figure 7-60 Open New IFSAR Project Window 7-56
Figure 7-61 IFSAR–Input Window 7-57
Figure 7-62 IFSAR Options Window 7-57
Figure 7-63 IFSAR–Input Window 7-58
Figure 7-64 Radar Window 7-60
Figure 7-65 StereoSAR Project Selector Window 7-60
Figure 7-66 Open New StereoSAR Project Window 7-61
Figure 7-67 StereoSAR–Input Window 7-61
Figure 7-68 StereoSAR Options Window 7-62
Figure 7-69 StereoSAR–Input Window 7-63
Figure 7-70 Options Window Showing Metadata Tab in ArcCatalog 7-65
Figure 7-71 Metadata Tab and Toolbar in ArcCatalog 7-66

Figure 7-72 General Tab in DTSS Metadata Editor Window 7-66
Figure 7-73 Contact Tab in DTSS Metadata Editor Window 7-67
Figure 7-74 Contact Information Window 7-68

CHAPTER 8

Figure 8-1 Three Primary Modules of NRMM II Mobility Model..... 8-4
Figure 8-2 DTSS–NATO Reference Mobility Model II Window 8-9
Figure 8-3 DTSS–NATO Reference Mobility Model II–Select Data Window..... 8-10
Figure 8-4 Select an Existing Geodatabase Window 8-10
Figure 8-5 DTSS–NATO Reference Mobility Model II–Select Data Window..... 8-11
Figure 8-6 Select New Geodatabase Location Window..... 8-11
Figure 8-7 DTSS–NATO Reference Mobility Model II–Select Parameter..... 8-12
Figure 8-8 DTSS–NATO Reference Mobility Model II–Summary Window..... 8-12
Figure 8-9 DTSS Mobility Wizard Window 8-13
Figure 8-10 DTSS Mobility Engine Status Window..... 8-13
Figure 8-11 Information–Production Complete Window 8-14
Figure 8-12 Sample Mobility Product Displayed in ArcMap Window..... 8-14
Figure 8-13 Sample NRMM II Output in ArcMap..... 8-19
Figure 8-14 Symbol Selector Window 8-19
Figure 8-15 Symbology Tab in Properties Window..... 8-20
Figure 8-16 DTSS–LOS Visibility Plot TDA Wizard–Introduction Window 8-27
Figure 8-17 DTSS–LOS Visibility Plot TDA Wizard–Select Data Window..... 8-28
Figure 8-18 DTSS Visibility Plot–Select an Elevation Dataset Window 8-29
Figure 8-19 DTSS–LOS Visibility Plot TDA Wizard–Select Data Window..... 8-29
Figure 8-20 Select a Data Set Window From LOS Visibility Plot TDA Wizard..... 8-30
Figure 8-21 DTSS–LOS Visibility Plot TDA Wizard–Select Data Window..... 8-30
Figure 8-22 DTSS–Open Product Profile Window From Visibility Plot Wizard..... 8-31
Figure 8-23 DTSS–LOS Visibility Plot TDA Wizard–Select Data Window..... 8-31
Figure 8-24 DTSS Visibility Plot–Select New Geodatabase Location Window 8-32
Figure 8-25 DTSS–LOS Visibility Plot TDA Wizard–Select Data Window..... 8-32
Figure 8-26 DTSS–LOS Visibility Plot TDA Wizard–Visibility Plot Window..... 8-33
Figure 8-27 DTSS–Visibility Plot Observer Selection Window..... 8-33
Figure 8-28 DTSS–Observer Parameters Window 8-35
Figure 8-29 Context Menu From DTSS–Visibility Plot Observer Selection..... 8-35
Figure 8-30 DTSS–Observer Parameter Information Window..... 8-36
Figure 8-31 DTSS-LOS Visibility Plot TDA Wizard-Observer Parameters..... 8-37
Figure 8-32 Visibility Area Plot Window 8-38

Figure 8-33 Visibility Plot Displayed in ArcMap 8-38
Figure 8-34 LOS Target Profile–Introduction Window 8-40
Figure 8-35 LOS Target Profile–Select Data Window 8-41
Figure 8-36 Select an Elevation Dataset Window From Target Profile Wizard 8-42
Figure 8-37 LOS Target Profile–Select Data Window 8-42
Figure 8-38 Select a Data Set Window From LOS Target Profile Wizard 8-43
Figure 8-39 LOS Target Profile–Select Data Window 8-44
Figure 8-40 Open Target Profile Window From Target Profile Wizard 8-44
Figure 8-41 LOS Target Profile–Select Data Window 8-45
Figure 8-42 DTSS Target Profile–Select New Geodatabase Location Window 8-45
Figure 8-43 LOS Target Profile–Select Data Window 8-46
Figure 8-44 LOS Target Profile–Parameters Window 8-46
Figure 8-45 DTSS–Target Profile Observer Selection Window 8-47
Figure 8-46 DTSS–Observer Parameters Window 8-48
Figure 8-47 Context Menu in DTSS–Target Profile–Observer Selection Window . 8-49
Figure 8-48 DTSS–Observer Parameter Information Window 8-50
Figure 8-49 LOS Target Profile–Observer Parameters 8-50
Figure 8-50 Target Profile Line of Sight Window 8-51
Figure 8-51 Target Profile Product Displayed In ArcMap 8-51
Figure 8-52 Target Profile Graph 8-52
Figure 8-53 Simple Data Query 8-54
Figure 8-54 Data Query Logic (Logical 'AND') 8-54
Figure 8-55 Data Query Logic (Logical 'OR') 8-55
Figure 8-56 DTSS–Data Query–Introduction Window 8-56
Figure 8-57 DTSS–Data Query–Setup Window 8-56
Figure 8-58 DTSS–Data Query–Data Source Selection Window 8-57
Figure 8-59 Select a Data Source Window in DTSS Data Query Wizard 8-57
Figure 8-60 DTSS–Data Query–Data Source Selection Window 8-57
Figure 8-61 DTSS–Data Query–Data Source Selection Window 8-58
Figure 8-62 DTSS–Data Query–Query Builder Window 8-59
Figure 8-63 New Legend Window in Data Query Wizard 8-59
Figure 8-64 DTSS–Data Query–Query Builder Window 8-60
Figure 8-65 DTSS–Data Query–Query Builder Window 8-61
Figure 8-66 Context Menu From DTSS–Data Query–Query Builder Window 8-61
Figure 8-67 DTSS–Data Query–Edit Filter Fields 8-61
Figure 8-68 DTSS–Data Query–Run Options Window 8-62

Figure 8-69 Query Complete Window 8-63
Figure 8-70 DTSS–Data Query–Introduction Window 8-64
Figure 8-71 DTSS–Data Query–Setup Window 8-64
Figure 8-72 DTSS–Data Query–Data Source Selection Window 8-65
Figure 8-73 Select a Data Source Window 8-65
Figure 8-74 DTSS–Data Query–Query Builder Window 8-66
Figure 8-75 Legend Categories in Query Builder Window 8-66
Figure 8-76 Filters Displayed in Query Builder Window 8-67
Figure 8-77 DTSS–Data Query–Run Options Window 8-67
Figure 8-78 Query Complete Window 8-68
Figure 8-79 DTSS Data Query Results in ArcMap 8-69
Figure 8-80 DTSS–Data Query Error Message 8-69
Figure 8-81 DTSS–Data Query–Data Source Selection Window 8-70
Figure 8-82 Select a Data Source Window 8-70
Figure 8-83 DTSS–Data Query–Data Source Selection Window 8-71
Figure 8-84 DTSS–Data Query–Data Source Selection Window 8-71
Figure 8-85 Sample Data Query Output in ArcMap 8-72
Figure 8-86 DTSS–Query Manager Window 8-73
Figure 8-87 DTSS–Data Query Search Window 8-75
Figure 8-88 DTSS–Data Query Search Window With Results 8-76
Figure 8-89 Export Directory Window 8-77
Figure 8-90 DTSS EXPORT E-Mail Window 8-78
Figure 8-91 Import Common Window 8-79
Figure 8-92 DTSS–Data Query Import From E-mail Window 8-79
Figure 8-93 Generate Slope Product Window 8-82
Figure 8-94 Select ERDAS Elevation File Window 8-82
Figure 8-95 Generate Slope Product Window Showing Selected Elevation File 8-83
Figure 8-96 Save As Geodatabase Window 8-84
Figure 8-97 Generate Slope Product Window Showing Selected Geodatabase File 8-84
Figure 8-98 Generating Slope Window 8-85
Figure 8-99 Slope Generator Info Window 8-85
Figure 8-100 Slope Generation Data Displayed in ArcMap Window 8-85
Figure 8-101 Properties Window Showing Symbology Tab 8-86
Figure 8-102 Slope Generation Data With Added Symbology in ArcMap Window 8-87

CHAPTER 9

Figure 9-1 Identify Results Window 9-3

Figure 9-2 Context Menu Showing Properties Selected 9-4
Figure 9-3 Properties Window Showing Display Tab 9-4
Figure 9-4 Properties Window Showing Fields Tab 9-5
Figure 9-5 ArcMap Selection Options Window 9-6
Figure 9-6 ArcMap Layer Properties Window Showing Selection Tab 9-7
Figure 9-7 ArcMap Menu Bar Showing Set Selectable Layers 9-8
Figure 9-8 Selection Options Window in ArcMap 9-10
Figure 9-9 Selected Feature From Attributes Table in ArcMap 9-11
Figure 9-10 ArcMap Select by Location Window 9-12
Figure 9-11 ArcMap Select by Attribute Window 9-13
Figure 9-12 ArcMap Select by Attribute Window Showing Entered Expression 9-16
Figure 9-13 ArcMap Find Window 9-18
Figure 9-14 ArcMap Find Window 9-19
Figure 9-15 Option Menu for Find Results 9-19
Figure 9-16 Acrobat Reader Window 9-20
Figure 9-17 Find Window in Acrobat Reader 9-21
Figure 9-18 ArcMap Spatial Bookmark Window 9-22
Figure 9-19 ArcMap Spatial Bookmarks−Manage Window 9-22
Figure 9-20 ArcMap Buffering Wizard, Step 1 of 3 Window 9-24
Figure 9-21 ArcMap Buffering Wizard, Step 2 of 3 Window 9-25
Figure 9-22 ArcMap Buffering Wizard, Step 3 of 3 Window 9-26
Figure 9-23 Completed Feature Buffer Displayed in ArcMap 9-26
Figure 9-24 ArcToolbox Window Showing Erase Tool Selected 9-30
Figure 9-25 Erase Window in ArcToolbox 9-30
Figure 9-26 ArcToolbox Window Showing Overlay Wizard Selected 9-32
Figure 9-27 Overlay WizardWhat Type of Overlay Do You Want? Window 9-32
Figure 9-28 Overlay Wizard−Input Coverage Window 9-33
Figure 9-29 Overlay Wizard−Overlay Coverage Window 9-33
Figure 9-30 Overlay Wizard−Join Attributes Window 9-34
Figure 9-31 Overlay Wizard−Output Coverage Window 9-34
Figure 9-32 Overlay Wizard−Summary of Your Input Window 9-35
Figure 9-33 Processing Window From ArcToolbox Overlay Wizard 9-35
Figure 9-34 ArcToolbox Window Showing Append Wizard Selected 9-38
Figure 9-35 Append Wizard−Which Coverages to Append Window 9-39
Figure 9-36 Choose an Input Coverage Window 9-39
Figure 9-37 Append Wizard−Which Coverages to Append Window 9-40
Figure 9-38 Append Wizard−Select the Desired Feature Classes Window 9-40

Figure 9-39 Append Wizard–Select a Clip Coverage Window 9-41
Figure 9-40 Append Wizard–Select the Output Coverage Window 9-42
Figure 9-41 Append Wizard–Summary of Your Input Window 9-43
Figure 9-42 Processing Window From ArcToolbox Append Wizard 9-43

CHAPTER 10

Figure 10-1 Sample Data View in ArcMap Display Panel 10-3
Figure 10-2 Highlighted Feature Class in ArcCatalog 10-5
Figure 10-3 Added Feature Class Layer in ArcMap 10-5
Figure 10-4 Add Data Window 10-6
Figure 10-5 Added Feature Classes in ArcMap 10-6
Figure 10-6 Context Menu Showing Copy Selected 10-7
Figure 10-7 Context Menu Showing New Group Layer Selected 10-9
Figure 10-8 Layer Properties Window 10-9
Figure 10-9 Layer Properties Window 10-10
Figure 10-10 Add Data Window 10-11
Figure 10-11 Layer Properties Window 10-11
Figure 10-12 Group Layer With Added Layer 10-12
Figure 10-13 Context Menu for Layers 10-13
Figure 10-14 Symbology Tab in ArcMap Layer Properties Window 10-14
Figure 10-15 Symbol Selector Window in ArcMap 10-14
Figure 10-16 Context Menu in ArcMap 10-16
Figure 10-17 Display Tab in ArcMap Properties Window 10-17
Figure 10-18 Effects Toolbar in ArcMap 10-18
Figure 10-19 Transparency Sliding Scale in ArcMap 10-18
Figure 10-20 ArcMap New Map Document Window 10-20
Figure 10-21 New Map Template in ArcMap 10-20
Figure 10-22 Sample Layout View in ArcMap 10-22
Figure 10-23 Sample Data Frame From Layout View in ArcMap 10-23
Figure 10-24 Additional Data Frame From Layout View in ArcMap 10-24
Figure 10-25 Active Data Frame With Variable Scale in ArcMap 10-25
Figure 10-26 Layers Properties Window in ArcMap 10-26
Figure 10-27 Data Frame Settings in Layers Properties Window 10-27
Figure 10-28 Fixed-Scale Map in ArcMap 10-28
Figure 10-29 Page Setup Window 10-29
Figure 10-30 Scale Bar Selector Window 10-30
Figure 10-31 Scale Bar Properties Window 10-30

Figure 10-32 Layers Properties Window in ArcMap 10-32
Figure 10-33 Grids Tab in Layers Properties Window 10-33
Figure 10-34 Reference System Selector Window in ArcMap 10-33
Figure 10-35 Selected Grid on Grids Tab in ArcMap 10-34
Figure 10-36 Inserted Grid Displayed in ArcMap 10-35
Figure 10-37 ArcMap Insert Menu 10-36
Figure 10-38 Legend Properties Window 10-37
Figure 10-39 Text Properties Window 10-38
Figure 10-40 North Arrow Selector Window 10-39
Figure 10-41 North Arrow Properties Window 10-39
Figure 10-42 Align Function From Draw Toolbar in ArcMap 10-40
Figure 10-43 Draw Toolbar in ArcMap 10-41
Figure 10-44 Labels Tab in Layers Properties Window in ArcMap 10-42
Figure 10-45 Dynamic Labeling in ArcMap 10-43
Figure 10-46 Context Menu in ArcMap 10-44
Figure 10-47 Convert Labels to Annotation Window in ArcMap 10-44
Figure 10-48 Label Conversion Progress Window in ArcMap 10-45
Figure 10-49 Labels Overflow Window in ArcMap 10-45
Figure 10-50 DTSS Map Production Window 10-48
Figure 10-51 Creating DTSS Map Layout Window 10-48
Figure 10-52 ArcMap Window Showing DTSS Map Layout 10-49
Figure 10-53 VirtualGIS Window 10-51
Figure 10-54 VirtualGIS Viewer Window 10-52
Figure 10-55 Select Layer to Add Window 10-52
Figure 10-56 VirtualGIS Viewer Window 10-53
Figure 10-57 VirtualGIS Viewer Window 10-54
Figure 10-58 Scene Properties Window 10-54
Figure 10-59 VirtualGIS Viewer Window in Terrain Mode 10-55
Figure 10-60 Viewer Window 10-56
Figure 10-61 Flight Path Editor Window 10-56
Figure 10-62 Viewer Selection Instructions Window 10-57
Figure 10-63 Define Flight Path Window 10-57
Figure 10-64 Viewer Window Showing Digitized Flight Path 10-58
Figure 10-65 Flight Path Editor Window 10-58
Figure 10-66 Flight Path Elevation Window 10-59
Figure 10-67 Scene Properties Window Showing Stereo Tab 10-60
Figure 10-68 Scene Properties Window Showing Anaglyph Selected 10-61

Figure 10-69 Image Interpreter Window 10-62
Figure 10-70 Topo Analysis Window 10-62
Figure 10-71 Shaded Relief Window 10-63
Figure 10-72 Modeler Window 10-65

CHAPTER 11

Figure 11-1 Import/Export Window 11-5
Figure 11-2 Import/Export Window With Export Option Selected 11-6
Figure 11-3 Export ADRG Window 11-7
Figure 11-4 Import/Export Window 11-9
Figure 11-5 Import/Export Window With Export Option Selected 11-10
Figure 11-6 Export RPF Window 11-11
Figure 11-7 NITF Tab in Export RPF Window 11-12
Figure 11-8 Color Table Tab in Export RPF Window 11-13
Figure 11-9 Attributes Tab in Export RPF Window 11-14
Figure 11-10 Coverages Tab in Export RPF Window 11-15
Figure 11-11 Import/Export Window 11-17
Figure 11-12 Import/Export Window With Export Option Selected 11-17
Figure 11-13 Export NITF Data Window 11-19
Figure 11-14 NITF Export Options 11-19
Figure 11-15 NITF View Details Window Showing Main Header Info Tab 11-20
Figure 11-16 NITF View Details Window Showing Security Tab 11-20
Figure 11-17 DOP Exporter Will Export The Following Layers Window 11-22
Figure 11-18 Browse for Folder Window 11-22
Figure 11-19 Enter Metadata Window 11-23
Figure 11-20 DOP Exporter Status Window 11-23
Figure 11-21 DOP Export Process Complete Window 11-24
Figure 11-22 Error Message From DOP Exporter 11-24
Figure 11-23 DTSS Geodatabase Exporter Window 11-25
Figure 11-24 Select an Existing Geodatabase Window 11-25
Figure 11-25 DTSS Geodatabase Exporter Window With Geodatabase Selected 11-26
Figure 11-26 DTSS Geodatabase Exporter Window With Destination Path 11-26
Figure 11-27 DTSS Geodatabase Exporter–Export Status Window 11-27
Figure 11-28 DTSS Geodatabase Exporter–Export Complete Window 11-27
Figure 11-29 DTSS Web Exporter Window 11-28
Figure 11-30 Add Product to Website Window 11-29
Figure 11-31 Open Window 11-29

Figure 11-32 Add Product to Website Window Showing Selected Product 11-30
Figure 11-33 Web Metadata Editor Window 11-30
Figure 11-34 DTSS Web Exporter–Successful Update Window 11-31
Figure 11-35 DTSS Web Exporter Window 11-32
Figure 11-36 Update Product Data Window 11-32
Figure 11-37 Update Product Data Window Showing Product Selected 11-33
Figure 11-38 Web Metadata Editor Window 11-33
Figure 11-39 DTSS Web Exporter–Successful Update Window 11-34
Figure 11-40 DTSS Web Exporter Window 11-35
Figure 11-41 Remove a Product Window 11-35
Figure 11-42 Remove a Product Window Showing Product Selected 11-36
Figure 11-43 DTSS Web Exporter–Success Window 11-36
Figure 11-44 DTSS Web Exporter Window 11-37
Figure 11-45 Manage Product Folders Window 11-37
Figure 11-46 Manage Product Folders Window Showing New Folder Typed 11-38
Figure 11-47 Manage Product Folders Window Showing Added Folder 11-38
Figure 11-48 Manage Product Folders Window 11-39
Figure 11-49 Manage Product Folders Window 11-39
Figure 11-50 Manage Product Folders Window 11-40
Figure 11-51 DTSS Website Home Page in the Netscape Window 11-41
Figure 11-52 DTSS Website Showing DTSS Products Menu Tree 11-41
Figure 11-53 DTSS Website Showing Search Results 11-42
Figure 11-54 DTSS Website Showing DTSS Products Selected 11-42
Figure 11-55 DTSS Website Showing Product's Metadata 11-43
Figure 11-56 DTSS Website Showing Product Download 11-43
Figure 11-57 Save As Window 11-44
Figure 11-58 Adaptec Easy CD Creator Main Window 11-46
Figure 11-59 CD Layout Diagram 11-52
Figure 11-60 General Tab From CD Layout Properties Window 11-53
Figure 11-61 Data Settings Tab in CD Layout Properties Window 11-54
Figure 11-62 Examples of the File System Properties Windows 11-54
Figure 11-63 File Types Tab From CD Layout Properties Window 11-55
Figure 11-64 Adaptec Easy CD Creator Wizard–Welcome Window 11-56
Figure 11-65 Adaptec Easy CD Creator Wizard–Data Selection Window 11-56
Figure 11-66 Adaptec Easy CD Creator Wizard–Test Before Writing Window 11-57
Figure 11-67 Adaptec Easy CD Creator Wizard–Ready to Create CD Window 11-58
Figure 11-68 Backup Window 11-59

Figure 11-69 IomegaWare Window 11-70
Figure 11-70 Removable Disk (H:) Properties Window 11-71
Figure 11-71 Map Document Print Preview in ArcMap 11-72
Figure 11-72 Print Window in ArcMap..... 11-73
Figure 11-73 Page Setup Window in ArcMap 11-73
Figure 11-74 Page Setup Tab in Printer Properties Window 11-74
Figure 11-75 Paper Sizes Window 11-75
Figure 11-76 Advanced Tab in Printer Properties Window 11-76
Figure 11-77 Print Window in ERDAS Imagine..... 11-77
Figure 11-78 Print Map Composition Window in ERDAS Imagine..... 11-77
Figure 11-79 Print Map Composition Window Showing Preview Tab 11-78
Figure 11-80 MapMaker Rendering Window in ERDAS Imagine 11-78

CHAPTER 12

Figure 12-1 Help Topics: ArcMap Window Showing Contents Tab 12-3
Figure 12-2 Help Topics: ArcMap Window Showing Index Tab 12-4
Figure 12-3 Topics Found Window in ArcMap Online Help..... 12-5
Figure 12-4 Help Topics: ArcMap Window Showing Find Tab 12-6

TABLE OF TABLES

CHAPTER 3

Table 3-1 Start Menu Functions 3-4
Table 3-2 Window Control Pull-Down Menu Options 3-6
Table 3-3 Window Control Button Functions 3-7
Table 3-4 User Input Item Descriptions 3-9
Table 3-5 Wizard Button Functions 3-10

CHAPTER 4

Table 4-1 ArcMap Menu Bar Functions 4-5
Table 4-2 ArcMap Standard Toolbar Functions 4-6
Table 4-3 ArcMap Tools Toolbar Functions 4-7
Table 4-4 ArcMap Draw Toolbar Functions 4-9
Table 4-5 ArcCatalog Menu Bar Functions 4-11
Table 4-6 ArcCatalog Standard Toolbar Functions 4-12
Table 4-7 ArcCatalog Geography Toolbar Functions 4-14
Table 4-8 ArcCatalog Metadata Toolbar Functions 4-15
Table 4-9 ArcToolbox's Main Toolsets 4-16
Table 4-10 ArcTools Functionalities 4-18

CHAPTER 5

Table 5-1 Wide Image Menus and Commands 5-53
Table 5-2 Main Toolbar Functions 5-53
Table 5-3 Scan Task Toolbar Functions 5-55
Table 5-4 View Task Toolbar Functions 5-57
Table 5-5 Feature Task Toolbar Functions 5-59

CHAPTER 6

Table 6-1 Output Feature Class Description 6-12
Table 6-2 Functionality of Fields in Transform Tool 6-46
Table 6-3 Description of Catalog Icons 6-64
Table 6-4 Description of Folder Connection Catalog Icons 6-65
Table 6-5 Description of Database Connection Folder Icons 6-68
Table 6-6 Coordinate System File Icon 6-69
Table 6-7 Contents View Icons in ArcCatalog 6-72

CHAPTER 7

Table 7-1 ArcMap Editor Toolbar Button Functions 7-4
Table 7-2 Tab Functions for the ArcMap Editing Options Window 7-9
Table 7-3 IFSAR DEM Process Step Descriptions 7-58
Table 7-4 StereoSAR DEM Process Step Descriptions 7-63
Table 7-5 DTSS Contact Information Editor Field Requirements 7-68

CHAPTER 8

Table 8-1 DTSS Mobility Wizard Vehicle Descriptions 8-7
Table 8-2 CCM and On-Road Reason Codes and Descriptions 8-16
Table 8-3 Gap Crossing Reason Codes and Descriptions 8-17
Table 8-4 Graphical Observer Selection Window Toolbar Descriptions 8-34
Table 8-5 Observer Parameter Profile Button Descriptions: LOS Visibility Plot .. 8-37
Table 8-6 Graphical Observer Selection Window Toolbar Descriptions 8-47
Table 8-7 Data Query Logical Operators and Definitions 8-62
Table 8-8 Query Manager Functions 8-73
Table 8-9 Internal Codes for Slope Generator Ranges 8-81

CHAPTER 9

Table 9-1 Logical Operator Descriptions 9-14
Table 9-2 Erase Tool Window Functions 9-30

CHAPTER 10

Table 10-1 Scale Bar Properties Tab Descriptions 10-31
Table 10-2 Legend Properties Tab Descriptions 10-37
Table 10-3 Text Properties Tab Descriptions 10-38
Table 10-4 North Arrow Properties Tab Descriptions 10-40
Table 10-5 DTSS Map Element Descriptions 10-49

CHAPTER 11

Table 11-1 Easy CD Creator Supported CD Formats 11-44
Table 11-2 Comparison of CD Media Types 11-45
Table 11-3 Easy CD Creator File Menu Command Descriptions 11-47
Table 11-4 Easy CD Creator Edit Menu Command Descriptions 11-48
Table 11-5 Easy CD Creator View Menu Command Descriptions 11-48

Table 11-6 Easy CD Creator Disc Menu Command Descriptions 11-49
Table 11-7 Easy CD Creator Tools Menu Command Descriptions 11-49
Table 11-8 Easy CD Creator Help Menu Command Descriptions 11-50
Table 11-9 Easy CD Creator Toolbar Functions 11-50
Table 11-10 Operations Menu Command Functions 11-60
Table 11-11 Tree Menu Command Functions 11-60
Table 11-12 View Menu Command Functions 11-60
Table 11-13 Select Menu Command Functions 11-61
Table 11-14 Window Menu Command Functions 11-61
Table 11-15 Toolbar Functions 11-62

CHAPTER 12

Table 12-1 ArcInfo Help Functions 12-2
Table 12-2 Imagine Help Functions 12-6
Table 12-3 DTSS Help and Reference Functions 12-7

THIS PAGE INTENTIONALLY LEFT BLANK

Chapter 1

INTRODUCTION

1	**INTRODUCTION**	1-2
1.1	Document Overview	1-2
1.1.1	Style Conventions	1-3
1.2	System Overview	1-4
1.2.1	System Purpose	1-4
1.2.2	User Classes	1-6
1.2.3	Equipment	1-6
1.2.4	Software Overview	1-7
1.2.4.1	Workstation Software	1-7
1.2.4.1.1	COTS Software	1-7
1.2.4.1.2	GOTS Software	1-9
1.2.4.2	Laptop Software	1-9
1.2.4.2.1	COTS Software	1-9
1.2.4.2.2	GOTS Software	1-9
1.2.4.3	Help	1-10
1.2.4.4	Input and Storage Media	1-10
1.2.5	Laptop Operations	1-10
1.2.6	Software Maintenance and Problem Reporting	1-10

1 INTRODUCTION

This Technical Bulletin (TB) contains software operating instructions for the Digital Topographic Support System (DTSS). This TB is to be used in conjunction with the commercial software manuals and hardware operating procedures provided in the DTSS Operator's Manuals TM 11-6675-291-10, TM 11-6675-292-10, and TM 11-6675-294-10. This chapter describes the scope of the DTSS version 7.0 Software User's Manual (SUM) and provides an overview of the DTSS.

1.1 Document Overview

The SUM is organized as follows: Chapters 1 through 4 provide the initial introduction needed to access and use the DTSS software. Chapters 5 through 11 cover the functions and capabilities of the DTSS software. Chapter 12 contains help procedures for the DTSS analyst. An overview of each chapter and appendix is listed below.

Chapter 1, *Introduction*, contains an overview of the SUM and the DTSS. This chapter also includes a software inventory and discusses other topics, such as portable workstation operations, software maintenance, problem reporting, and online Help.

Chapter 2, *Access*, contains procedures for obtaining a user account, logging into and out of the system, changing passwords, and rebooting the system. References are included for workstation power-up and power-down procedures.

Chapter 3, *Graphical User Interface*, covers the Graphical User Interface (GUI). It gives an overview of the Windows NT environment, followed by information on how to navigate through the operating system and run programs.

Chapter 4, *Software Introduction*, introduces the commercial-off-the-shelf (COTS) software products ArcInfo version 8.0 and ERDAS Imagine version 8.4. It also covers the DTSS menu and directory structure.

Chapter 5, *Data Collection*, contains an overview on data models and briefly explains how to import and scan data to make it usable to the DTSS software.

Chapter 6, *Data Management*, provides procedures on how to open existing DTSS data, access data properties, perform data conversions, and define projection information.

Chapter 7, *Data Editing and Generation*, provides procedures for many common editing and data creation functions.

Chapter 8, *Data Exploitation—Custom*, provides procedures to run the custom DTSS software, including Mobility, Line of Sight, and Data Query analysis.

Chapter 9, *Data Exploitation—COTS*, overviews various COTS software functions for performing geoprocessing tasks.

Chapter 10, *Data Presentation*, overviews data display, map composition, and terrain visualization functions.

Chapter 11, *Data Output and Dissemination*, provides procedures on various ways to export data to various formats, as well as output analysis information and methods for sharing and distributing DTSS products.

Chapter 12, *Help*, provides instructions for accessing DTSS and COTS software online Help functions.

Appendix A, *System Administration*, contains procedures that the system administrator performs to install and configure both the DTSS software and the disk array, in addition to completing routine administrative tasks.

Appendix B, *Security*, contains security procedures.

Appendix C, *References*, lists government and non-government documents referenced within the SUM.

Appendix D, *Glossary*, contains a list of all abbreviations and acronyms found in the SUM.

Appendix E, *Troubleshooting Guide*, contains a list of solutions to common system questions.

Appendix F, *Frequently Asked Questions*, contains a list of frequently asked questions and their answers.

1.1.1 Style Conventions

The following style conventions are used in this manual:

- All menu options, window names, window buttons, and computer commands are shown in **bold** print.
- System-generated text is shown in “quotation marks.”
- Names of panels, radio button options, fields, and portions of informational windows appear in “quotation marks.”
- Information of critical importance, as in *NOTES*, is shown in *italics*.
- Information that the user is expected to enter, including menu command sequences, is shown in ***bold italics***.
- Keys on the workstation keyboard are in ***bold italics*** and enclosed in brackets; for example, ***[Return]***.

- A forward slash, /, is used to identify selected nested commands; e.g, "Select ***File/New***."

1.2 System Overview

"Terrain Visualization is the responsibility of Commanders and staffs across the spectrum of today's Army. To effectively see the impact that terrain has on units conducting and supporting military operations, all Commanders and staffs must be aware of the effects of terrain. The terrain expert is the Engineer."

MG Robert Flowers
Commandant
US Army Engineer School

The statement from the current Chief of Engineers, LTG Robert Flowers, supports the idea that the U.S. Army requires an integrated, independently deployed, self-contained terrain graphics, data manipulation/analysis, and output capability to support commanders and staff at Brigade, Division, Corps, and Theater. This requirement is based on the DTSS Operational Requirements Document (ORD), which states the need for a system that will support the collection, extraction, and exploitation of information about the physical characteristics of the earth's surface. The DTSS is the topographic engineering component that is being developed and fielded to provide this capability.

The DTSS provides critical, timely, and accurate digital and hardcopy geospatial information to support mission planning and execution. The DTSS missions include the generation and collection of geospatial information, the development and management of a geospatial database (commonly referred to as the Terrain Analysis Database), and a suite of geospatial information and capabilities that provide the warfighter with terrain analysis products, special map reproduction, and geodetic survey support.

The U.S. Army Program Executive Office for Command, Control, and Communications Systems (PEO C3S) provides DTSS program management. Project management is being provided by the Materiel Developer, the Project Director for Combat Terrain Information Systems (PD CTIS), and the U.S. Army Topographic Engineering Center (TEC). The Maneuver Support Center (MANSCEN, formerly USAES) is the Combat and Training Developer, with institutional training provided by the Defense Mapping School (DMS).

1.2.1 System Purpose

The DTSS will provide topographic engineering support to the commander and staff. The DTSS at Brigade, Division, Corps, and Theater will provide timely, accurate, and analyzed digital and hardcopy geospatial information to meet commander and staff real-time requirements for topographic support. The DTSS contains all aspects of

topographic engineering support and services, combining modernized versions of the capabilities resident in the existing Topographic Support System (TSS) with the DTSS terrain analysis support packages found at Division and above. This comprehensive topographic support package merges terrain analysis, image processing, data generation (feature/elevation data extraction), digital cartographic revision and reproduction, and geodetic surveying under a single, streamlined digital topographic package. Although the DTSS capabilities will continue to focus on support to the commander's mission planning and execution, system capabilities are expanded to improve data collection, data management, and data dissemination and output. The DTSS will now provide capabilities that improve the performance and increase the depth of the traditional topographic support of past decades. The DTSS will provide direct access to data holdings, significantly enhance the ability to produce digital geospatial data essential to all tactical decision aid software, provide improved image processing tools, and add the capability for high-volume hardcopy output to support the production of image/special purpose maps.

The DTSS consists of six distinct configurations that are capable of providing direct topographic support to the Army commanders and staff deployed at key maneuver echelons from Theater down to Brigade. These configurations, illustrated in Figure 1-1, include the DTSS-Base (DTSS-B), the DTSS-Heavy (DTSS-H), the DTSS-Light (DTSS-L), the DTSS-Deployable (DTSS-D), the DTSS-High-Volume Map Production (DTSS-HVMP), and the DTSS-Survey (DTSS-S).

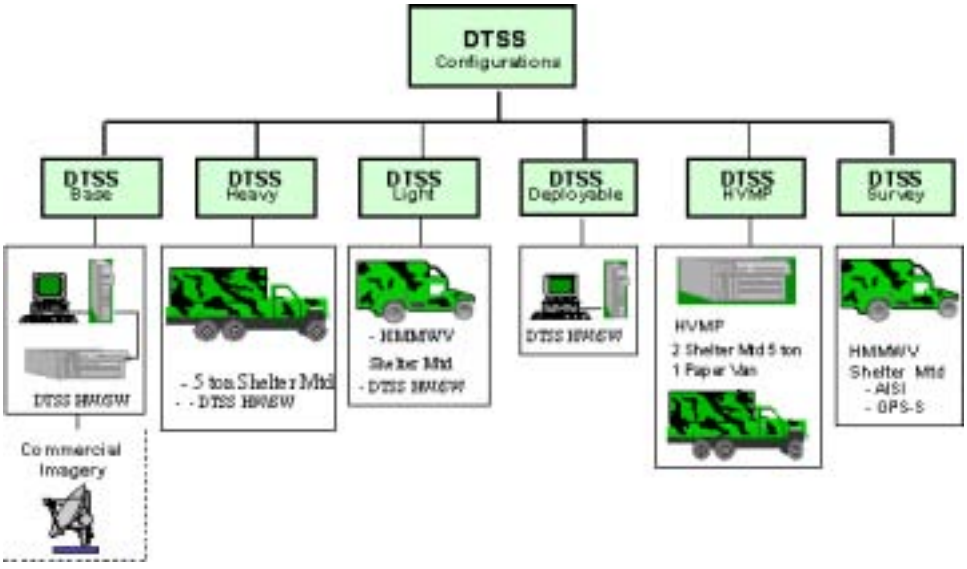


Figure 1-1 DTSS Configurations

These configurations will use a combination of government and commercial software, operating within the Army Common Hardware/Software (CHS) environment. The DTSS-B, H, L, and D configurations have similar capabilities in that they will use compatible hardware, software, and operating procedures to provide terrain analysis and related topographic support to the warfighters at Theater through Brigade. The DTSS-HVMP will provide high-volume, large-format digital printing capabilities to support hardcopy reproduction of topographic products. The DTSS-S will provide geodetic survey support across the battlefield. Major functions of the DTSS include the following:

- Accepting data from the National Imagery & Mapping Agency (NIMA) and other sources in a variety of formats; for example, hardcopy and digitized maps, charts, weather forecasts or reports, climate summaries, terrain studies, and photographs.
- Processing data into Tactical Decision Aids (TDAs) and usable terrain products in categories such as the following: mobility, line of sight, landing zones, and concealment.
- Providing low-volume reproduction of large-format, multicolor terrain products of graphic and non-graphic battlefield terrain data, including images derived from satellite data, maps, charts, and other sources.
- Providing image processing, geographic information system (GIS), and related functions to answer questions of a specific or general nature regarding terrain: mobility, bridges, and other data using tables, maps, images, files, and other products.

1.2.2 User Classes

There are three classes of CTIS users. Each class is designed to allow the user to perform specific system or application functions.

- **Administrator**—This is used during the installation of application segments and to set up user accounts. The user of the DII COE installer software is required to be Administrator.
- **Secman**—This is used to change security permissions and perform other security-related tasks.
- **Dtssuser**—This is a default class that represents the terrain analyst. User accounts must be set up by the Administrator.

1.2.3 Equipment

For detailed information on system equipment, refer to the DTSS Operator's Manuals, TM 11-6675-292-10 (Heavy), TM 11-6675-291-10 (Light), and TM 11-6675-294-10 (Deployable). See Chapter 1, Section II, in each Operator's Manual for equipment

location, characteristics, and capabilities. See Chapter 2, Section I, in each manual for an explanation of equipment controls and indicators.

1.2.4 Software Overview

The DTSS software is composed of COTS, government-off-the-shelf (GOTS), and custom software. The operating system is Windows NT 4.0 Service Pack 6A with DII COE Kernel 4.2 installed. The primary types of software are as shown below in the DTSS Software Layered Architecture diagram (Figure 1-2).

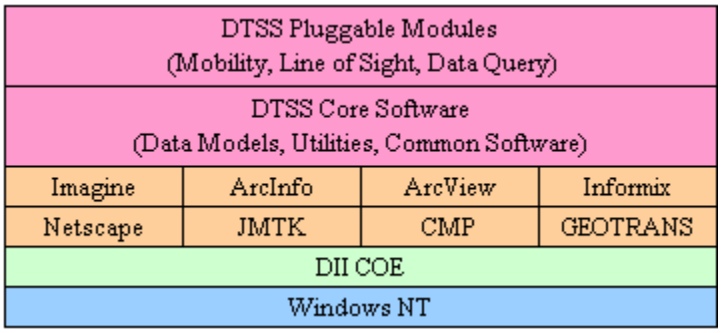


Figure 1-2 DTSS Software Layered Architecture

1.2.4.1 Workstation Software

The following sections list the software used for the DTSS workstation.

1.2.4.1.1 COTS Software

The COTS software versions include the following:

- Adaptec Easy CD Creator, v. 2.0.0.4
- Adobe Acrobat Reader, v. 3.0
- Adobe Photoshop, v. 5.5
- ERDAS Imagine, v. 8.4

  -Professional
  -NITF
  -Stereo Analyst
  -Sub-Pixel Classifier
  -ADRG Exporter
  -RPF Exporter
  -Anaglyph

- ESRI ArcInfo, v. 8.0.2

  -Workstation
  -Desktop
  -Patch

- ESRI ArcView, v. 3.2
- ESRI License Manager, v. 2.0.0.5
- ESRI ODBC Drivers, v. 1.0
- EZ-SCSI, v.2.2
- Ideal Wide Scan Software, v. 2.0
- Informix IIF 2000, v. 1.0.4.0
- Informix Data Director, v. 2.0
- Integrated Foundation Library, v. 4.2
- iPlanet Netscape Server, v. 4.0.1.0
- Java Platform2, v. 4.0.1.0
- Java Plug-In, v. 2.0
- Microsoft Front Page 2000
- Microsoft Office 2000
- Microsoft Security Editor, v. 4.1.2.1
- Microsoft Security Templates, v. 4.1.2.0
- Netscape, v. 4.0.9.0
- Norton Antivirus, v. 4.0
- Perl, v.1.0
- Security Banner, v. 4.1
- TeraTerm, v. 2.0.0.1
- TFTP, v. 2.0
- TripWire, v. 4.0
- Universal Message Processor, v. 4.3.0.0
- Update Security System Level, v. 4.1.0.1
- Windows NT (Workstation) 4
- Winzip, v. 2.0
- Wintar, v. 2.0
- Write DVD, v. 2.0
- WSFTP Client, v. 1.0

1.2.4.1.2 GOTS Software

The GOTS software versions include the following:

- Common Message Processor (CMP), v. 4.1.0.1
- DII COE Kernel, v. 4.2
- JMTK-Visualization, v. 4.2
- GEOTRANS, v. 2.0
- NATO Reference Mobility Model II (NRMM II)

1.2.4.2 Laptop Software

The following sections list the software used on the DTSS laptop.

1.2.4.2.1 COTS Software

- Adobe Photoshop, v. 5.5
- ERDAS Advantage Bundle, v. 8.4
- ESRI ArcView, v. 3.2
  - Spatial Analyst
- Integrated Foundation Library, v. 4.2
- Java Platform2, v. 4.0.1.0
- Microsoft Front Page 2000
- Microsoft Office 2000
- Microsoft Security Editor, v. 4.1.2.1
- Microsoft Security Templates, v. 4.1.2.0
- Netscape, v. 4.0.9.0
- Norton Antivirus, v. 4.0
- Security Banner, v. 4.1
- Update Security System Level, v. 4.1.0.1
- Windows NT (Workstation) 4
- WSFTP Client, v. 1.0

1.2.4.2.2 GOTS Software

- Common Message Processor (CMP), v. 4.1.0.1
- DII COE Kernel, v. 4.2

- JMTK-Visualization, v. 4.2

1.2.4.3 Help

Online Help for custom software in the DTSS is provided via the **Help** button on the ArcMap main menu. COTS software packages also include online Help. Refer to the specific section describing each software segment for more information on the help available for that segment.

1.2.4.4 Input and Storage Media

The DTSS can handle data on several different transportable media. The Versatile Computer Unit (VCU) has a 25-GB removable hard disk drive, and the portable workstations have 18-GB removable hard disk drives for storing all operating system and application software. Laptops are included, with hard drives configurable to 32-GB. A large peripheral disk array provides primary storage for operational data. It contains eight hard drives in a configuration known as Redundant Array of Independent Disks (RAID). The RAID is configured using five “hot” spares and has storage capacity of 480-GB, after configuration. With the exception of the original DTSS-L, equipment comes with LS-120 Superdisk floppy disk drives and can connect to the CD-RW to write data to recordable CDs. The system also includes a 2-GB Jaz drive and an 8-mm cartridge tape drive for reading and writing data.

See Appendix B, *Security*, for instructions on storing classified media. For more information on the DTSS models and hardware, refer to the appropriate technical manual.

1.2.5 Laptop Operations

When networked to the switch, the laptop can provide access from computers to peripherals and computers to communications equipment. If the VCU becomes inoperable, the laptop can be used in its place by reconfiguring the disk array. The laptop can be connected to the RAID via a SCSI cable adapter to an Adaptec Slim SCSI Card 1480A. The user will need to install an ArcInfo license, and the COTS software with Build 7 on it, if the VCU goes down. See Appendix A for laptop installation procedures. The operator can then call up the DTSS software locally from its own hard disk drive.

1.2.6 Software Maintenance and Problem Reporting

The CTIS software contractor, TASC, is providing support for the DTSS Build 7.0. The toll free hotline number for the DTSS Help desk is 1-866-ASK-CTIS (275-2847). The Web address for DTSS information from TASC is http://www.gsd.tasc.com/ctis/. E-mail for support is ctissupport@tasc.com.

Chapter 2

ACCESS

2	**ACCESS**	2-2
2.1	Workstation Startup and Shutdown	2-2
2.1.1	Power-On Procedures	2-2
2.1.2	Power-Down Procedures	2-2
2.2	Logon and Logoff Procedures	2-2
2.2.1	Obtaining a User Account	2-2
2.2.2	User Names and Passwords	2-2
2.2.3	Logging On for First Time	2-3
2.2.4	Logging On After First Time	2-5
2.2.5	Changing Password	2-6
2.2.6	Logoff Procedures	2-6
2.3	Reboot Procedures	2-6
2.4	Shutdown Procedures	2-7

2 ACCESS

This chapter covers getting access to the Combat Terrain Information System (CTIS) software.

2.1 Workstation Startup and Shutdown

The following sections relate to Power-On and Power-Down procedures.

2.1.1 Power-On Procedures

Instructions for powering on the Central Processing Unit (CPU) of the workstation are provided in Chapter 2, Section III, of the DTSS-L AN/TYQ-67 (V) 1 Operator's Manual, TM 11-6675-291-10, and the DTSS-H AN/TYQ-48A Operator's Manual, TM 11-6675-292-10.

2.1.2 Power-Down Procedures

Instructions for powering down the CPU under normal and emergency conditions are provided in Chapter 2, Sections III and IV, of the DTSS-L Operator's Manual, TM 11-6675-291-10, and the DTSS-H Operator's Manual, TM 11-6675-292-10.

2.2 Logon and Logoff Procedures

The following sections relate to Logon and Logoff procedures. Further information on security issues related to user access can be found in the User's Security Manual (DCN: DTSS-USM/SOP-6-00).

2.2.1 Obtaining a User Account

In order to access the system, a user account is needed for the DTSS software. To obtain a user account, a SECRET clearance and a need-to-know is required. With these requirements met, the system administrator will assign a user name. The user must log in to the system with the assigned user name.

If in the future a user leaves the unit or is removed from the system access list, the user name and password will be deactivated or completely removed for security purposes.

2.2.2 User Names and Passwords

Users are required to identify themselves to the computer using their unique user name and password prior to gaining access to the CTIS software. When a user enters their user name and password, the system determines from the user name what functions that user is permitted to access.

Although passwords are not reflected on the screen when logging in, it is important to take extra precaution to ensure that others do not observe the password. Passwords must always be protected and safeguarded as SECRET information. Do not share password information with anyone. Immediately notify the Security Officer if it is suspected a password has been compromised.

2.2.3 Logging On for First Time

Prior to logging on for the first time, the user must see the System Administrator to obtain the initial user name and password. This provides the user with access to the system.

Use the following steps to log on.

1. After powering on the workstation, the **Logon Information** window appears, where the user enters the user account information provided by the System Administrator. Click the **Help** button in the **Login** window to display login instructions on the screen.

2. Type the user name assigned by the System Administrator in the “User name” field. Use the ***[Backspace]*** key to erase any mistakes.

3. Type the password given by the System Administrator in the “Password” field. To protect the password, only asterisks are displayed when typed. The password must be entered in the correct case, as Windows NT distinguishes between upper and lower case. Use the ***[Backspace]*** key to erase any mistakes.

4. If appropriate, select the domain where the account is located in the “Domain” field.

5. Click the **OK** button, or press ***[Enter]***.

6. A message window will appear, stating, “You are required to change your password at first logon.” On the message window select the **OK** button. The **Change Password** window will appear.

7. Type in the password given by the System Administrator in the “Old Password” field.

8. Type the new password in the “New Password” field. The password must be at least eight characters long, or the system will not accept it. The system will accept passwords longer than eight characters, but only the first eight characters are used by the system. The rest of the characters are ignored. The following list of password rules is required:

- Passwords must be changed every 90 days.
- The password must be at least eight (8) characters long and include at least two alphabetic and one numeric or special character.
- The new password must contain at least four (4) characters that are different from the old existing password, and must not repeat more than four (4) characters from the old password.
- The new password cannot be the same as the user name.
- The new password cannot be a reversal of the existing password.

9. Type the new password again in the "Confirm New Password" field to be sure there are no typing errors.

10. Click the **OK** button.

11. A message will appear, stating, "Your password has been changed." Click ***OK*** to proceed. If the passwords typed in the "New Password" and "Confirm New Password" fields do not match, an error message will pop up instead. Click ***OK*** and reenter the new password in the appropriate fields of the **Change Password** window.

NOTE

If the user enters the incorrect password three (3) times consecutively, the account will become locked and must be unlocked by the System Administrator. For more information on login procedures, refer to Appendix B of this document.

12. Once the new password is successfully entered in the system, the system will log off automatically, and the user will need to log back on using the new password.

13. Type in the new password. If an invalid password is entered, a message appears stating that the login is incorrect and to try again. Click the **OK** button in the message window to acknowledge the message and close the window. The initial **Logon Information** window returns for the user to reenter the user name.

NOTE

For continued problems logging in, contact the System Administrator.

14. After having correctly entered the user name and password, the user will be logged into the Common Look and Feel (CLF) desktop environment. See Chapter 3, *Graphical User Interface*, for more information.

15. A blue window appears on the desktop, with the seal of the Defense Information Systems Agency (DISA) and a message about usage and monitoring on the system. After successful logon, the **United States Department of Defense Warning Statement** window appears, with more information on usage guidelines and monitoring of the system. Click ***OK***.

16. After several moments, a message appears, stating that the CLF is starting, and an **Informational Message** window, stating, "COE login processing is complete" appears. On the **Informational Message** window, select the **OK** button. The user is now successfully logged on and can begin running programs on the CLF. Notice the classification banner on the desktop, indicating the level of classification of the data being processed.

2.2.4 Logging On After First Time

When the desktop appears for log in, the user will see a blue banner security message from the Defense Information Systems Agency (DISA) in the background and a prompt to press ***[Alt]*** + ***[Ctrl]*** + ***[Del]*** to log in. Use this keyboard shortcut. The **United States Department of Defense Warning Statement** window appears, with more information on usage guidelines and monitoring of the system. Click ***OK***, and then enter the current password in the "Password" field of the **Logon Information** window. Click the **OK** button. If necessary, click the **Help** button in the **Logon Information** window to display logon instructions on the screen.

Should the user name or password be entered incorrectly, the system will notify the user that the logon was incorrect. Click the **OK** button, check to see if ***[Caps Lock]*** has been left on, and try again. If the system continues to refuse to log on, contact the System Administrator.

After having correctly entered the user name and password, the user will be logged into the Common Look and Feel (CLF) desktop environment. Notice the classification banner on the desktop, indicating the level of classification of the data being processed.

After several moments, a system message states that the CLF is starting, and an **Informational Message** window appears, stating, "COE login processing is complete." On the **Informational Message** window, select the **OK** button. The user is now successfully logged on and can begin running programs on the CLF.

2.2.5 Changing Password

The operating system requires changing the password every 90 days. Five days prior to the password expiring, the system will alert the user that the password is about to expire. If this alert is ignored, the password will become inactive. The user will be forced to change the password when logging in after the five-day warning period. Contact the System Administrator, or refer to Appendix A if there are any problems.

For password changing procedures during the initial logon, see Section 2.2.3. To change the password after the initial logon, log in, press ***[Ctrl]*** + ***[Alt]*** + ***[Delete]***, and click the **Change Password** button from the **Windows NT Security** window. The **Change Password** window appears, where the user can enter the new password information.

2.2.6 Logoff Procedures

Do not turn off power to the workstation until properly shutting down the system using the procedures in Chapter 2, Section III, of the applicable DTSS Operator's Manual, TM 11-6675-291-10 or TM 11-6675-292-10. If the system is not shut down properly, programs and data on the disk may be damaged. Use the following steps to log off.

1. If there are any applications running, exit from those applications before starting the logoff process.

2. Press ***[Ctrl]*** + ***[Alt]*** + ***[Delete]***, and click the **Logoff** button in the **Windows NT Security** window. This will bring up a **Logoff Windows NT** window, stating, "This will end your Windows NT session." Select the **Cancel** button to quit the logoff. Otherwise, select the ***OK*** button to complete the logoff process. When the logoff process is complete, the **Begin Logon** window will appear.

2.3 Reboot Procedures

Rebooting is used to restart the operating system without powering off the workstation. It may be necessary to reboot when experiencing system problems. Rebooting is accomplished by selecting **Shut Down** from the **Start** menu located in the bottom left corner of the Windows NT desktop. The **Shut Down Windows** dialog will appear. Click the radio button next to "Restart the computer?" and click **Yes**. The system will then close any open applications, terminate normal operation, and reboot back to the **Logon Information** window. The blue DISA security banner appears in the background.

2.4 Shut Down Procedures

System shut down requires that the operating system on the computer be halted prior to turning off power. Shut down is accomplished by selecting **Shut Down** from the **Start** menu. The **Shut Down Windows** dialog will appear. Click the radio button next to “Shut down the computer?” and click **Yes**. The system will then close any open applications, terminate normal operation, and prepare the computer to be turned off.

The blue DISA consent statement appears again as the system starts to shut down. After several moments, the **Shut Down Computer** window prompt appears. The user may then turn off the power to the machine, or click the **Restart** button to reboot the machine.

THIS PAGE INTENTIONALLY LEFT BLANK

Chapter 3

GRAPHICAL USER INTERFACE (GUI)

3	**GRAPHICAL USER INTERFACE (GUI)**	3-2
3.1	Introduction to Windows NT	3-2
3.1.1	Desktop	3-2
3.1.2	Taskbar	3-2
3.1.2.1	Start Button and Start Menu	3-2
3.1.2.2	Window Icons	3-4
3.1.2.3	Utilities Shortcut Icons	3-4
3.1.3	Desktop Icons	3-4
3.1.4	Program Windows	3-4
3.1.4.1	Title Bar	3-5
3.1.4.1.1	Window Icon	3-6
3.1.4.1.2	Title	3-7
3.1.4.1.3	Window Control Buttons	3-7
3.1.4.2	Menu Bar	3-8
3.1.4.3	Display Area	3-8
3.1.4.4	Border	3-8
3.1.5	User Input Items	3-9
3.2	Wizard Interface	3-9
3.3	Default Settings for Screen Display	3-10

3 GRAPHICAL USER INTERFACE (GUI)

This chapter discusses the Graphical User Interface (GUI) for the DTSS software. It gives an overview of the Windows NT environment, followed by information on how to navigate through the operating system and run programs.

3.1 Introduction to Windows NT

The Windows NT environment serves as the platform for running DTSS Version 7.0. The GUI in Windows NT, also called the Common Look and Feel (CLF), shown and labeled in Figure 3-1, includes the following features:

- Desktop (Item 1)
- Taskbar (Item 2)
- Desktop Icons (Item 3)
- Program Windows (Item 4)

These features are described briefly in the following sections.

3.1.1 Desktop

When the user starts Windows NT, a large area called the **Desktop** appears (Item 1 in Figure 3-1). The **Desktop** serves as background for the programs and icons seen on the monitor.

3.1.2 Taskbar

The **Taskbar** (Item 2 in Figure 3-1) appears at the bottom of the screen. It has three features: the **Start** button with the pop-up **Start** menu, the **Window Icon** buttons, and the **Utilities Shortcut** icons. Those features are discussed in the following subsections.

3.1.2.1 Start Button and Start Menu

The **Start** button in the lower left corner of the **Taskbar** accesses the pop-up **Start** menu (Figure 3-2). Click the left mouse button to bring up this **Start** menu. As described in Table 3-1, the **Start** menu includes the submenus **Programs**, **Documents**, **Settings**, **Find**, **Help**, **Run**, and **Shut Down**. The **Start** menu may also include other options.



Figure 3-1 Common Look and Feel (CLF) in Windows NT



Figure 3-2 Start Menu

Table 3-1 Start Menu Functions

Menu Item	Function
Programs	Displays the Programs submenus.
Documents	Displays the Documents submenu.
Settings	Displays the Settings submenu.
Find	Displays the Find submenu.
Help	Displays the Help window.
Run	Displays the Run window.
Shut Down	Displays the Shut Down window.

3.1.2.2 Window Icons

On the **Taskbar** to the immediate right of the **Start** button are the **Window Icon** buttons**.** For each open window, there will be a **Window Icon** button on the **Taskbar**. Closing a **Desktop** application window will remove the associated **Window Icon** button from the **Taskbar**.

If the user left clicks on a **Window Icon** button, the associated **Desktop** window will be raised to the top of the window stack.

If the user right clicks on a **Window Icon** button, a pop-up menu will appear. This menu gives options to **Restore**, **Move**, **Size**, **Minimize**, **Maximize**, or **Close**. These options are discussed in Section 3.1.4.1.1

3.1.2.3 Utilities Shortcut Icons

At the far right of the **Taskbar** are the **Utilities Shortcut** icons. Double click on any **Utilities Shortcut** icon to open its associated application. Right click the mouse button on the **Utilities Shortcut** icon to access a pop-up menu with other options.

3.1.3 Desktop Icons

The **Desktop Icons** (Item 3 in Figure 3-1) give quick access to frequently used programs and system utilities.

3.1.4 Program Windows

A bordered area on the **Desktop** called a **Program Window** appears when the user opens an application (Item 4 in Figure 3-1). More than one **Program Window** may be open at a time. These windows may partially or even totally obscure other windows.

To interact with a **Program Window** (entering text in a field, for example), the window must be made active. To do this, left click the mouse on any portion of the **Program Window**. The user can also select the **Program Window** associated icon on the **Taskbar** (Item 2 in Figure 3-1) and left click the mouse to activate the window. (See Section 3.1.2 for a discussion of the **Taskbar** features.)

Program Windows have several common features, as illustrated in Figure 3-3. These features include a **Title Bar**, **Menu Bar**, **Display Area**, and **Border**.

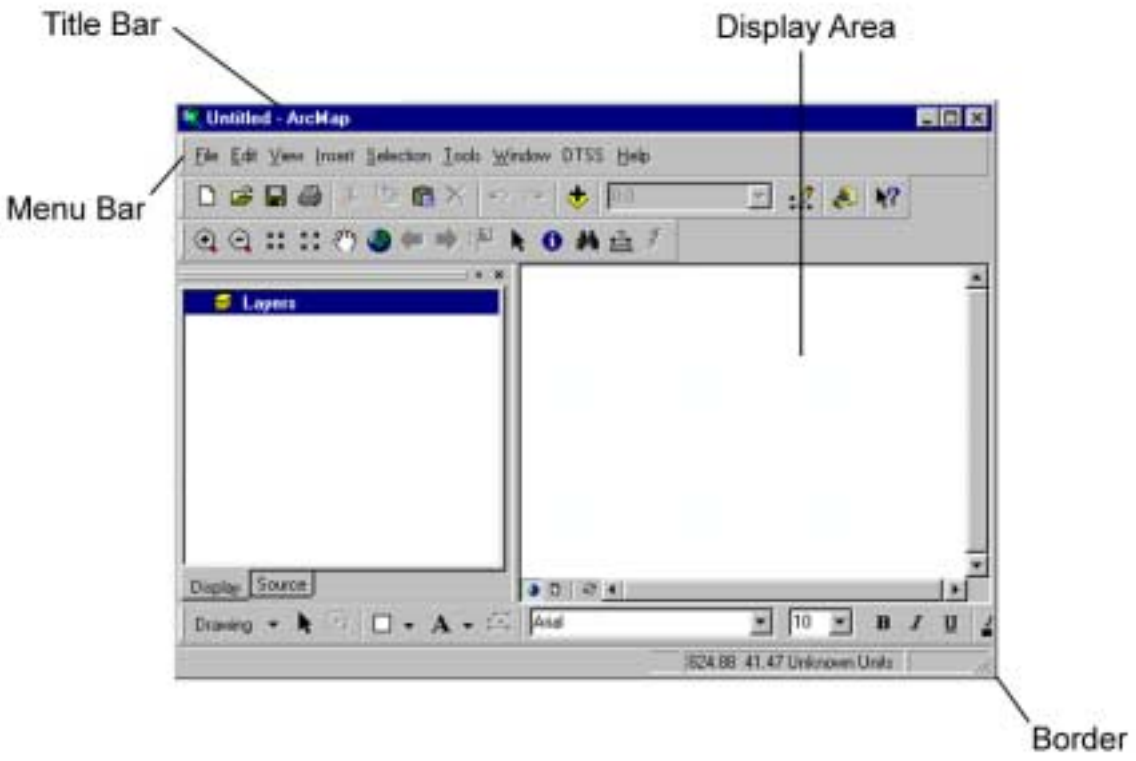


Figure 3-3 Program Window

3.1.4.1 Title Bar

In Figure 3-3, the **Title Bar** is the blue stripe across the top of the **Program Window**. Only the active window has a blue **Title Bar**. Inactive windows have a gray **Title Bar**. The **Title Bar** usually has three main features: the **Window Icon**, the **Title**, and the **Window Control** buttons.

3.1.4.1.1 Window Icon

The **Window Icon** is on the left end of the **Title Bar**. Click on the **Window Icon** to see the **Window Control** pull-down menu (Figure 3-4), which contains selectable options for controlling the window display. These are similar options to those that appear when right clicking the **Window Icon** button on the **Taskbar** (as discussed in Section 3.1.2.2).

These options—**Restore**, **Move**, **Size**, **Minimize**, **Maximize**, and **Close**—are described in Table 3-2. Some windows may not allow the use of all **Window Control** options on the pull-down menu. In this case, unavailable options appear in gray.

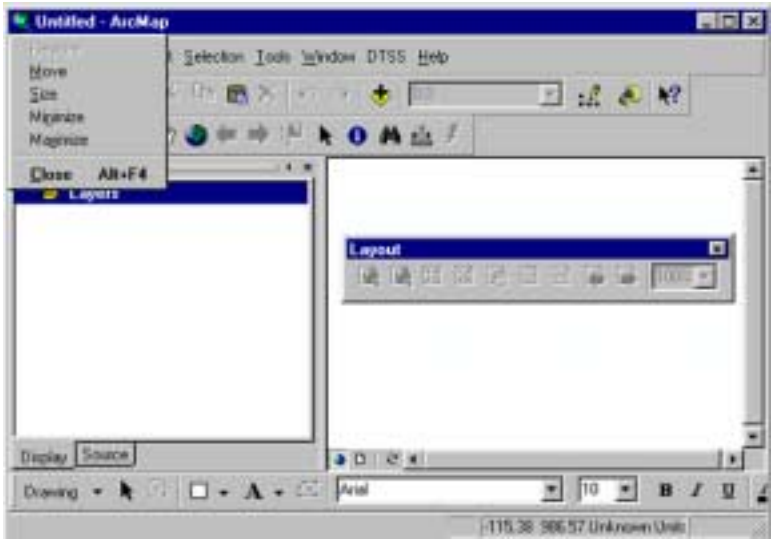


Figure 3-4 Window Control Pull-Down Menu

Table 3-2 Window Control Pull-Down Menu Options

Option	Description
Restore	Restores the window to full size when the window has been minimized.
Move	Grabs the window and moves it to a new location with the mouse. Click the left mouse button to drop the window in the new location.
Size	Allows user to resize the window.
Minimize	Minimizes the window into a Taskbar icon.
Maximize	Maximizes the window to fill the entire workspace.
Close	Closes the window and its associated application.

3.1.4.1.2 Title

The window **Title** is displayed on the **Title Bar** between the **Window Icon** on the left and the **Window Control** buttons on the right. This **Title** indicates the program or document file name.

3.1.4.1.3 Window Control Buttons

On the far right of the **Title Bar** are three **Window Control** buttons that may appear: **Minimize**, **Maximize**, and **Close**. In most windows, the **Minimize** button ( ) is the leftmost of the three **Window Control** buttons. The **Maximize** button ( ) is in the middle, and the **Close** button ( ) is on the far right. Table 3-3 shows the three **Window Control** buttons and describes their functions.

Table 3-3 Window Control Button Functions

Button	Name	Function
	Minimize Button	Minimizes the window to a Taskbar icon.
	Maximize Button	Maximizes the window to fill the entire workspace. If the window is already maximized, the button changes to Restore mode, and you can return the window to its default size.
	Close Button	Closes the window and its associated application.

Not all windows will have all three **Window Control** buttons. If the associated option is grayed out on the **Window Control** menu, that **Window Control** button will not appear. Figure 3-5 shows an example of a window without a **Maximize** button on the right. Note that the words **Size** and **Maximize** are grayed out on the **Window Contro**l menu on the left of the **Title Bar** in Figure 3-5.

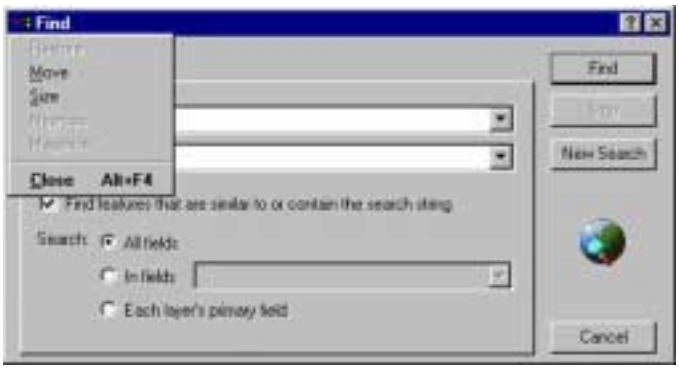


Figure 3-5 Window Without Maximize Button

3.1.4.2 Menu Bar

Most **Program Windows** will have a **Menu Bar**, located directly under the **Title Bar** (see Figure 3-3). There is no standard configuration for a **Menu Bar**, but most windows offer at least **File** and **Help** menus.

3.1.4.3 Display Area

The **Program Window Display Area** appears below the **Menu Bar** and features the most important information for the user.

If the information in the **Display Area** exceeds the size of the window, use **Scroll Bars** to see the rest of the window. **Scroll Bars** may appear on the right and bottom of the window, with directional arrows to move the view up, down, left, and right. Left-click on one of these arrows to scroll in the desired direction.

3.1.4.4 Border

The window **Border** controls the displayed size of the window. The user can change the size of some windows by adjusting the **Border**. In some cases, however, the size of the window is fixed. On a fixed-size window, the **Size** option will be grayed out on the **Window Control** menu.

There are two ways to change the size of a window. The first method is to position the mouse pointer on any window **Border**. The mouse pointer will change shape and become a double-sided arrow when it is directly over the **Border**. Once the pointer is in this position, hold down the left mouse button and drag the mouse to change the size of the window. By clicking-and-dragging on one of the side **Borders** of the window, the user will only be able to resize the window in one direction. By clicking and dragging the window **Border** in a corner, however, the user can change the window size in two directions. To release a window **Border** after dragging it, release the left mouse button.

The second method for changing the size of a window is to select the **Size** option from the pull-down **Window Control** menu. By selecting the **Size** option, the mouse pointer is changed into a cross symbol (✥). The cross symbol becomes a two-directional arrow when placed over the window **Border**, and allows the user to click and drag the window **Border**. When the window **Border** is the desired size, the user can click the left mouse button to release the **Border**.

3.1.5 User Input Items

Many windows have different user input items that need to be selected or entered in order to perform a certain function or task. See Figure 3-6 for an example of the **Tab**, **Check Box**, **Radio Button**, **Text Field**, and **Dropdown Menu** user input items. A description of each item appears in Table 3-4.

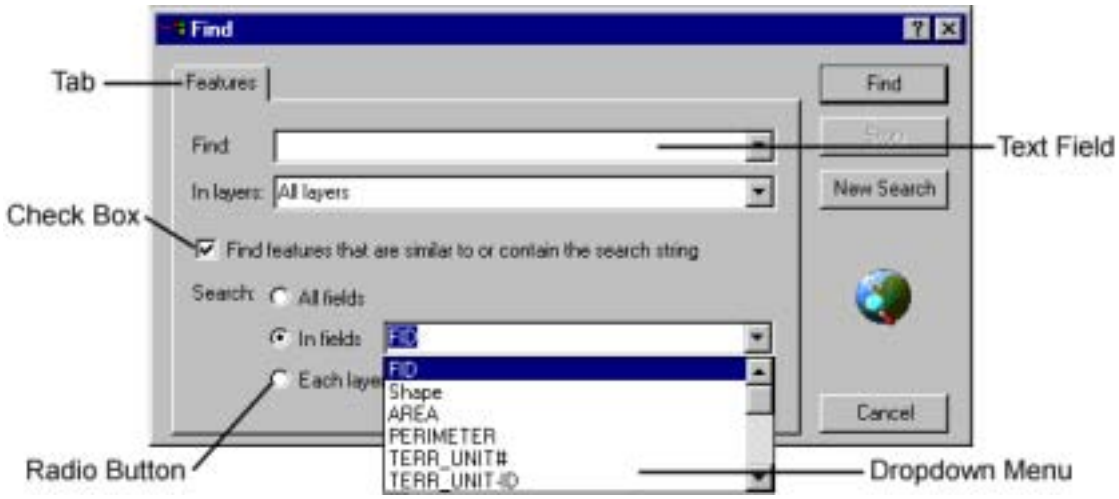


Figure 3-6 Find Window Showing User Input Items

Table 3-4 User Input Item Descriptions

Item	Description
Tab	Shows the topic of information for that portion of the window.
Check Box	Switches the information next to the box by clicking a check mark for on and a blank box for off.
Radio Button	Allows user to select or unselect the instruction by clicking in the circle next to the text.
Text Field	Allows user to input text into the window.
Dropdown Menu	Provides user with a list of options to choose from.

3.2 Wizard Interface

Many TDAs in DTSS Version 7.0 are carried out using wizards, which are series of windows that lead a user step by step through the process of creating products. If someone has ever used an Install program in the Windows NT environment, they are probably familiar with the wizard interface. See Figure 3-7 for an example.

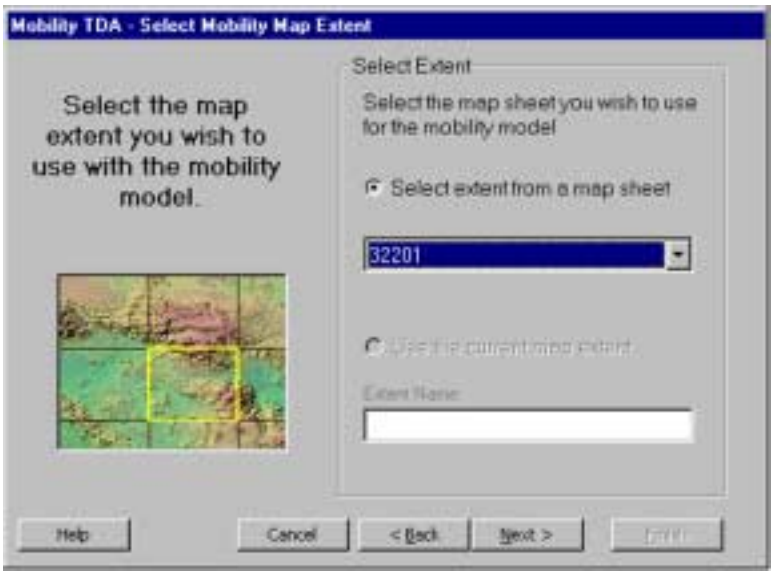


Figure 3-7 Sample Wizard Window

The wizard interface allows the user to enter data within fields or choose from available lists of data. As each step is completed, the **Next** button is selected. The wizard will go to the next step of the process. The user can move to previous steps by selecting the **Back** button. When the wizard process has been completed, selecting **Finish** closes the wizard dialog box and processes the data. The **Cancel** button, available on all wizard windows, closes the window and goes back to the previous screen. Selecting **Help** accesses the online Help documentation. Table 3-5 outlines the functions for each wizard button. Any buttons that are grayed out in a particular window are not available options for that step.

Table 3-5 Wizard Button Functions

Button	Function
Help	Accesses the online Help documentation.
Cancel	Closes the dialog box and exits the wizard.
Back	Returns to the previous step in process.
Next	Accepts the settings for the current dialog and moves to the next step.
Finish	Accepts all settings and generates the product.

3.3 Default Settings for Screen Display

If the screen display settings are changed, there may be unexpected effects with the GUIs, like not being able to see all of the buttons, etc. The screen display default settings are set under ***Start/Settings/Control Panel/Display***. The default settings are as follows:

- Screen Size: 1280 x 1024

- Font: Small Font
- Color Palette: True Color

THIS PAGE INTENTIONALLY LEFT BLANK

Chapter 4

SOFTWARE INTRODUCTION

4	**SOFTWARE INTRODUCTION**	4-2
4.1	ArcInfo Overview	4-2
4.1.1	ArcMap	4-3
4.1.1.1	ArcMap Main Menu Bar	4-5
4.1.1.2	ArcMap Standard Toolbar	4-5
4.1.1.3	ArcMap Tools Toolbar	4-7
4.1.1.4	ArcMap Draw Toolbar	4-8
4.1.2	ArcCatalog	4-10
4.1.2.1	ArcCatalog Main Menu Bar	4-11
4.1.2.2	ArcCatalog Standard Toolbar	4-12
4.1.2.3	ArcCatalog Geography Toolbar	4-13
4.1.2.4	ArcCatalog Location Dropdown List	4-14
4.1.2.5	ArcCatalog Metadata Toolbar	4-14
4.1.3	ArcToolbox	4-15
4.1.4	ArcInfo Workstation	4-17
4.2	ERDAS Imagine	4-19
4.3	DTSS Menu	4-20
4.4	DTSS Directory Structure	4-20
4.4.1	Changing Permissions on Directories or Files	4-21

4 SOFTWARE INTRODUCTION

This chapter covers an introduction to the DTSS software including ArcInfo and ERDAS Imagine. It begins with a brief overview of each of these products, including basic information about how these programs relate to the DTSS software. Following these overviews, the chapter goes into more detail about the DTSS menu itself, its structure, and its menu command functions.

4.1 ArcInfo Overview

ArcInfo is COTS geographic information system (GIS) software package designed for the analysis, display, and management of geographic data. ArcInfo functions include database management and query, table management, and vector and raster analyses, which are covered in this document. ArcInfo has a layered architecture with the database and engine as its foundation. Functions are divided and grouped into a number of programs, or modules, for editing, mapping, analysis, table operations, and data management.

ArcInfo provides three desktop applications, ArcMap, ArcCatalog, and ArcToolbox, as well as access to ArcInfo Workstation, which is similar to the ArcInfo found on Unix platforms. The desktop applications are designed to work together to perform a variety of tasks. An analyst can browse, organize, and document data holdings in ArcCatalog; send coverages from ArcCatalog to tools in ArcToolbox for sophisticated geoprocessing; and then drag and drop the results into an existing map in ArcMap for display, analysis, and publication. Figure 4-1 shows an illustration of the desktop ArcInfo applications and their functions.

User interfaces to ArcInfo are built using Visual Basic (VB) for the desktop applications and Arc Macro Language (AML) for ArcInfo Workstation. The DTSS software is an extension of the ArcInfo system, allowing the DTSS analyst to perform required tasks within the ArcInfo window. For more detailed information on ArcInfo, refer to the online Help and the vendor documentation listed in Appendix C, *References*.

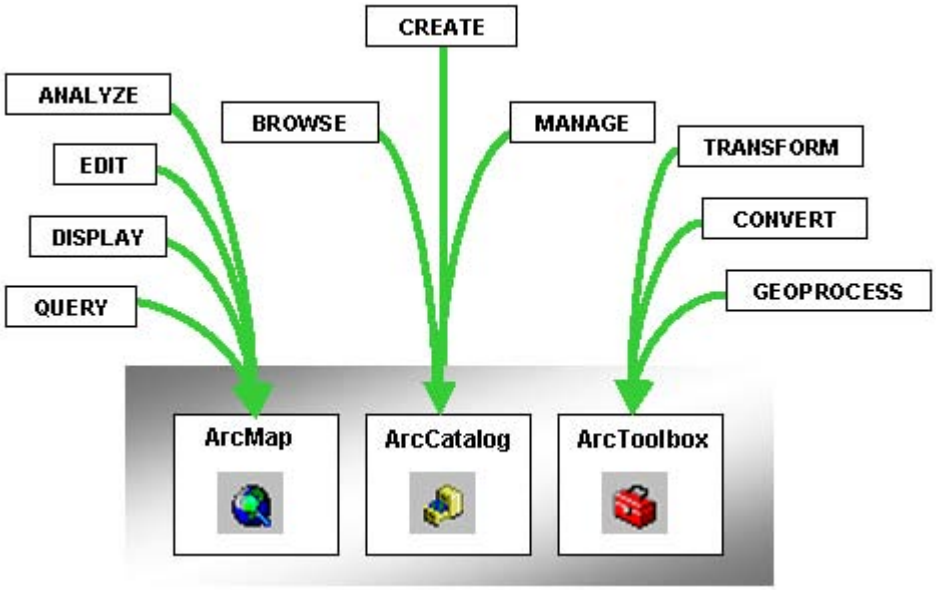


Figure 4-1 ArcInfo Diagram

4.1.1 ArcMap

ArcMap provides a visual environment with which to view and manipulate geographic data. ArcMap allows the DTSS analyst to edit geographic data, change the scale, and query feature attributes, among other tasks. ArcMap is also used to prepare maps for printing and saving.

Use the following steps to open ArcMap:

1. Click the ***Start*** button on the Windows taskbar.
2. Point to ***Programs***.
3. Point to ***ArcInfo***.
4. Click ***ArcMap***. When the **ArcMap** window opens, the analyst sees a standard Windows program interface like the one shown in Figure 4-2.

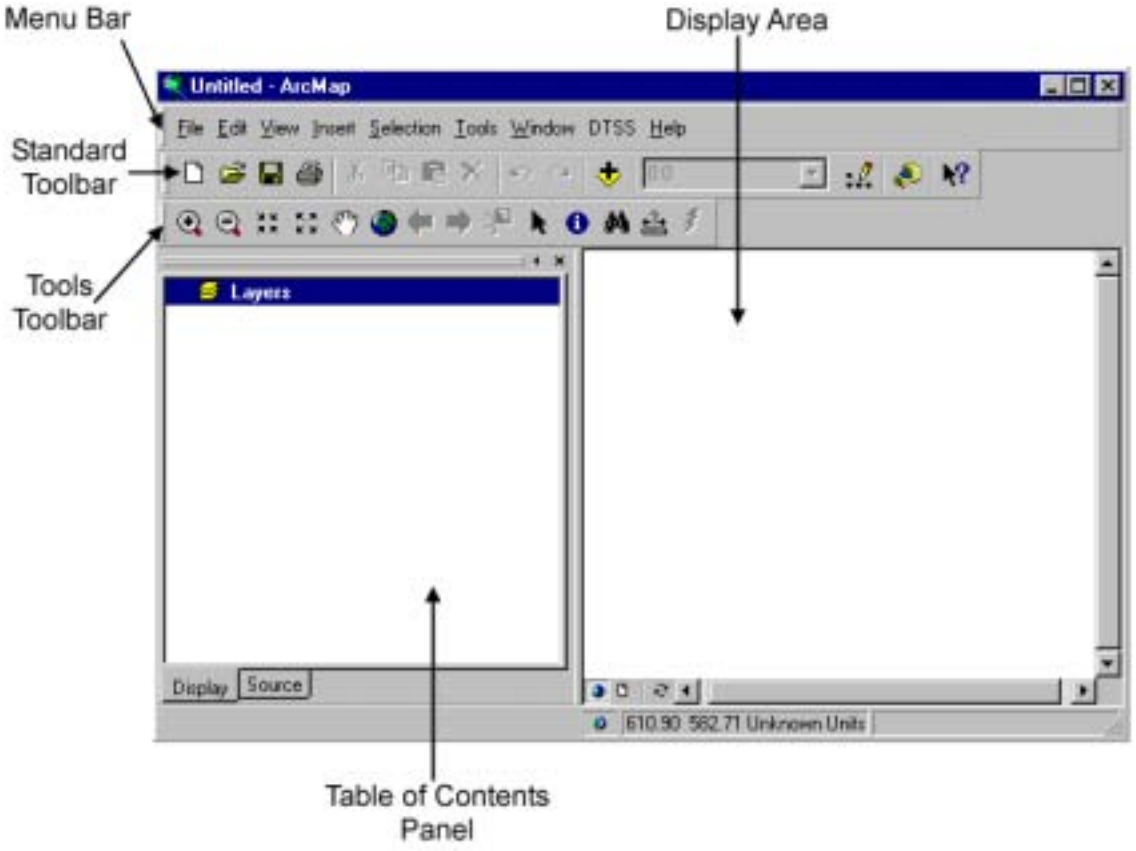


Figure 4-2 ArcMap Window

The **Main Menu** bar and **Standard** toolbar appear by default on all ArcInfo applications. Other toolbars are available to use when performing particular tasks. These toolbars contain dropdown menus, buttons, and tools. Both ArcCatalog and ArcMap hide or show toolbars from the **View/Toolbars** submenu. A check mark next to the toolbar name on the submenu indicates that the toolbar is currently displayed. All toolbars can be unchecked, or hidden, except for the **Main Menu** bar. After checking a toolbar, the application displays it as a floating toolbar on the desktop.

Any toolbar can be moved or "docked" at the top, bottom, or either side of the **ArcMap** and **ArcCatalog** windows by clicking and dragging it by the handle into the space beneath the **Main Menu** bar. Alternatively, toolbars can float on the desktop while functioning as part of the application. When a toolbar is docked, it is moved and resized to fit the application's window. To prevent a toolbar from docking, hold down the ***[Ctrl]*** key while dragging it. If the toolbar was previously turned on, it returns to its last position.

The ArcMap menu, toolbars, and display areas are discussed in the following sections. For more detailed information about any menu command or toolbar icon in ArcMap,

refer to the program's online Help, use the **What's This?** button () on the **Standard** toolbar, or see the printed user documentation.

4.1.1.1 ArcMap Main Menu Bar

The ArcMap **Main Menu** bar arranges commands into related lists of tasks. Table 4-1 shows each menu item and its corresponding list of commands.

Table 4-1 ArcMap Menu Bar Functions

Menu Item	Function
File	Allows the analyst to access the following commands in ArcMap: **New**, **Open**, **Save**, **Save As**, **Add Data**, **Page Setup**, **Print Preview**, **Print**, **Map Properties**, **Export Map**, **Copy Map to Clipboard**, and **Exit**.
Edit	Provides the following commands: **Undo**, **Redo**, **Cut**, **Copy**, **Paste**, **Paste Special**, **Delete**, **Find**, and **Select All Elements**.
View	Allows access to the following commands (in **boldface**) and commands with submenus (in ***italic boldface***): **Data View**, **Layout View**, ***Zoom Data***, ***Zoom Layout***, ***Bookmarks***, ***Toolbars***, **Table of Contents**, **Status Bar**, **Overflow Labels**, **Scrollbars**, **Rulers**, **Guides**, and **Grid**.
Insert	Allows the analyst to place the following items on a map: **Data Frame**, **Title**, **Text**, **Legend**, **North Arrow**, **Scale Bar**, **Scale Text**, and **Picture**.
Selection	Displays the following commands (in **boldface**) and commands with submenus (in ***italic boldface***): **Select By Attributes**, **Select By Location**, **Select By Graphics**, **Zoom To Selected Features**, **Statistics**, ***Set Selectable Layers***, **Clear Selected Features**, ***Interactive Selection Method***, and **Options**.
Tools	Allows access to the following commands (in **boldface**) and commands with submenus (in ***italic boldface***): **Editor Toolbar**, **Make Graph**, **Make Report**, **Buffer Wizard**, **Dissolve Wizard**, **ArcCatalog**, ***Macros***, **Customize**, ***Styles***, and **Options**.
Window	Allows access to the following commands: **Overview**, **Magnifier**, and **Windows**.
DTSS	Allows access to the following DTSS functions (in **boldface**) and commands with submenus (in ***italic boldface***): ***Export***, ***Data Query***, ***Import***, ***Utilities***, ***Mobility***, ***Line of Sight***, and **About DTSS**.
Help	Displays the following commands: **ArcMap Help**, **What's This?**, and **About ArcMap**.

4.1.1.2 ArcMap Standard Toolbar

The ArcMap **Standard** toolbar (Figure 4-3) displays a set of commonly used commands that carry out related tasks. Toolbars can float on the desktop in their own window, or can be docked at the top, bottom, or sides of the **ArcMap** window.



Figure 4-3 Standard Toolbar in ArcMap Window

Table 4-2 shows each ArcMap **Standard** toolbar button and a description of its functions. For more information, refer to ArcMap's online Help or printed documentation.

Table 4-2 ArcMap Standard Toolbar Functions

Button	Name	Function
	New Map File	Creates a new map. User will be prompted to choose a template for the new map.
	Open	Opens an existing map. User will be prompted to save unsaved changes to the current map if one is already open.
	Save	Saves the current map. If the map has not been named, the user will be prompted for a name and location to be saved.
	Print	Prints the map. User will be prompted to choose the printer, which pages to print, how many copies, and other printing options.
	Cut	Cuts selected text, graphics, and objects on the map and places them onto the clipboard.
	Copy	Copies selected text, graphics, and objects on the map and places them onto the clipboard.
	Paste	Pastes the contents of the clipboard into the map.
	Delete	Deletes selected text, graphics, and objects on the map.
	Undo	Reverses the user's last command or function.
	Redo	Repeats the user's last command or function.
	Add Data	Adds geographic data to the map. User will be prompted to navigate for appropriate data.
	Scale	Displays the scale of the map. User can type in a scale or choose a scale from the dropdown list in order to set.
	Editor Toolbar	Displays the **Editor** toolbar so user can edit the map's data.

Table 4-2 ArcMap Standard Toolbar Functions (Cont'd)

Button	Name	Function
	ArcCatalog	Launches the ArcCatalog application. User can use ArcCatalog to access, browse, review, and manage geographic data.
	What's This?	Displays a description of a button or menu item when the user clicks the **What's This?** button on the toolbar, then on the item of interest.

4.1.1.3 ArcMap Tools Toolbar

The ArcMap **Tools** toolbar (Figure 4-4) displays a set of commonly used tools that carry out related tasks. The **Tools** toolbar is not an ArcMap default toolbar, so it must be activated by selecting **View/Toolbars/Tools** from the ArcMap menu. A check mark next to the toolbar name indicates that the toolbar is currently displayed. If the toolbar name appears in the **View/Toolbars** submenu without a check mark, the toolbar will be hidden.



Figure 4-4 Tools Toolbar From ArcMap Window

Table 4-3 shows each **Tools** toolbar button and a description of its functions. For more information, refer to ArcMap's online Help or printed documentation.

Table 4-3 ArcMap Tools Toolbar Functions

Button	Function	Description
	Zoom In	Zooms in on the data in the map. User can click on a location to zoom in on, or can click and drag with the mouse to define a particular area to zoom in on.
	Zoom Out	Zooms out the data in the map. User can click on a location to zoom out from, or can click and drag a box with the mouse to define a particular area to display after zooming out.
	Fixed Zoom In	Zooms in on the center of the data in the map by a fixed ratio.
	Fixed Zoom Out	Zooms out from the center of the data in the map by a fixed ratio.
	Pan	Pans the view of data in the map. The user can move the cursor anywhere, hold down the left mouse button, and drag the display in any direction.

Table 4-3 ArcMap Tools Toolbar Functions (Cont'd)

Button	Function	Description
	Full Extent	Zooms to the full extent of the data in the map.
	Go Back To Previous Extent	Goes back to the previous extent of data that the user was viewing.
	Go To Next Extent	Goes forward through the sequence of extents of data that the user has been browsing. User will eventually reach the most recent extent viewed.
	Select Features	Selects geographic features on the map. User can click on a feature to select.
	Select Graphics	Lets user select, resize, and move graphics, such as lines, boxes, text, labels, north arrows, scale bars, and pictures on the map.
	Identify Features	Allows user to view attributes of geographic features. If several features at the location are clicked, attributes for all features appear, with the attributes of the uppermost layer displayed first.
	Find	Finds a particular geographic feature in the map based on one of its attributes. Opens a window where user enters the desired attribute to search for.
	Measure	Measures distances on the map. User draws a line with this tool, and the length of the line displays in the status bar, shown in the Distance Units specified in the **Data Frame Properties** window.
	Hyperlink	Allows user to insert a hyperlink to a file or a URL by clicking on a feature. The cursor will turn into a pointing hand when it is on a feature for which a hyperlink exists.

4.1.1.4 ArcMap Draw Toolbar

The ArcMap **Draw** toolbar (Figure 4-5) displays a set of commonly used annotation tools that carry out related tasks. The **Draw** toolbar is not an ArcMap default toolbar, so it must be activated by selecting **View/Toolbars/Draw** from the ArcMap menu. A check mark next to the toolbar name indicates that the toolbar is currently displayed. If the toolbar name appears on the **View/Toolbars** submenu without a check mark, the toolbar will be hidden.



Figure 4-5 ArcMap Draw Toolbar

Table 4-4 shows each **Draw** toolbar button and a description of its functions. For more information, refer to ArcMap's online Help or printed documentation.

Table 4-4 ArcMap Draw Toolbar Functions

Button	Function	Description
	Drawing Pull-Down Menu	Accesses commands (in **boldface**) and commands with submenus (in ***italic boldface***) for annotation and graphics manipulation: **New Annotation Target**, ***Active Annotation Target***, **Group**, **Ungroup**, ***Order***, ***Nudge***, ***Align***, ***Distribute***, ***Rotate or Flip***.
	Select Graphics	Lets user select, resize, and move graphics such as lines, boxes, text, labels, north arrows, scale bars, and pictures drawn on the map.
	Rotate	Rotates the selected text or object.
	New Rectangle	Draws a rectangle on the map. User clicks one corner of the rectangle and then drags the box to the desired size.
	New Text	Adds text to the map. User clicks where the text is to start, then types in the text box. Once text has been added, click and drag to move it. Double click on the text to edit or change properties.
	Edit Vertices	Edits the vertices of the selected line, polygon, or curve.
	Font	Changes the font of the selected text. If no text is currently selected, this sets the default font for new text.
	Font Size	Changes the font size of the selected text. If no text is currently selected, this sets the default font size for new text, specified in points.
	Bold	Makes the selected text bold or not bold. If no text is currently selected, this sets the default.
	Italic	Makes the selected text italic or not italic. If no text is currently selected, this sets the default.
	Underline	Makes the selected text underlined or not underlined. If no text is currently selected, this sets the default.
	Font Color	Changes the color of the selected text. If no text is currently selected, this sets the default color for new text.

Table 4-4 ArcMap Draw Toolbar Functions (Cont'd)

Button	Function	Description
	Fill Color	Changes the fill color of the selected graphics. If no graphics are currently selected, this sets the default fill color for new graphics.
	Line Color	Changes the line color of the selected graphics. If no graphics are currently selected, this sets the default line color for new graphics.
	Marker Color	Changes the color of the selected marker (point) graphics. If no graphics are currently selected, this sets the default color for new markers.

4.1.2 ArcCatalog

ArcCatalog allows the DTSS analyst to access, browse, organize, and manage geographic data. ArcCatalog is very similar, in look and feel, to the Windows Explorer software. The analyst can easily add folders and/or remote geodatabases containing geographic data using ArcCatalog.

Drag and drop techniques, where an item is selected in ArcCatalog by clicking on it with the mouse and then dragging it to another screen or folder, can be used to manage data. Data from ArcCatalog can be dragged and dropped directly into the ArcMap window or into ArcToolbox data input fields. To view changes made to data, select ***View/Refresh***.

Use the following steps to open ArcCatalog:

1. Click the ***Start*** button on the Windows taskbar.
2. Point to ***Programs***.
3. Point to ***ArcInfo***.
4. Click ***ArcCatalog***. The **ArcCatalog** window opens to show a standard Windows program interface like the one in Figure 4-6.

ArcCatalog can also be started from ArcMap by clicking the **Launch ArcCatalog** button () on the ArcMap **Standard** toolbar (Figure 4-3). For more detailed information about any menu command or toolbar icon in ArcCatalog, refer to the program's online Help, use the **What's This?** button () on the **Standard** toolbar, or see the printed user documentation.

ArcCatalog has three tabs used to view data: **Contents**, **Preview**, and **Metadata** (shown in Figure 4-6). The **Contents** tab allows the analyst to browse folders and databases, as in Windows NT Explorer. The **Preview** tab allows quick access to the layered geometry or attributes. Using the Preview selection at the bottom of the display, set to "Table" to see attributes or to "Geography" to see features. The **Metadata** tab shows the catalog's metadata, which gives summary information about each data source, such as data type, author, and date of origin.

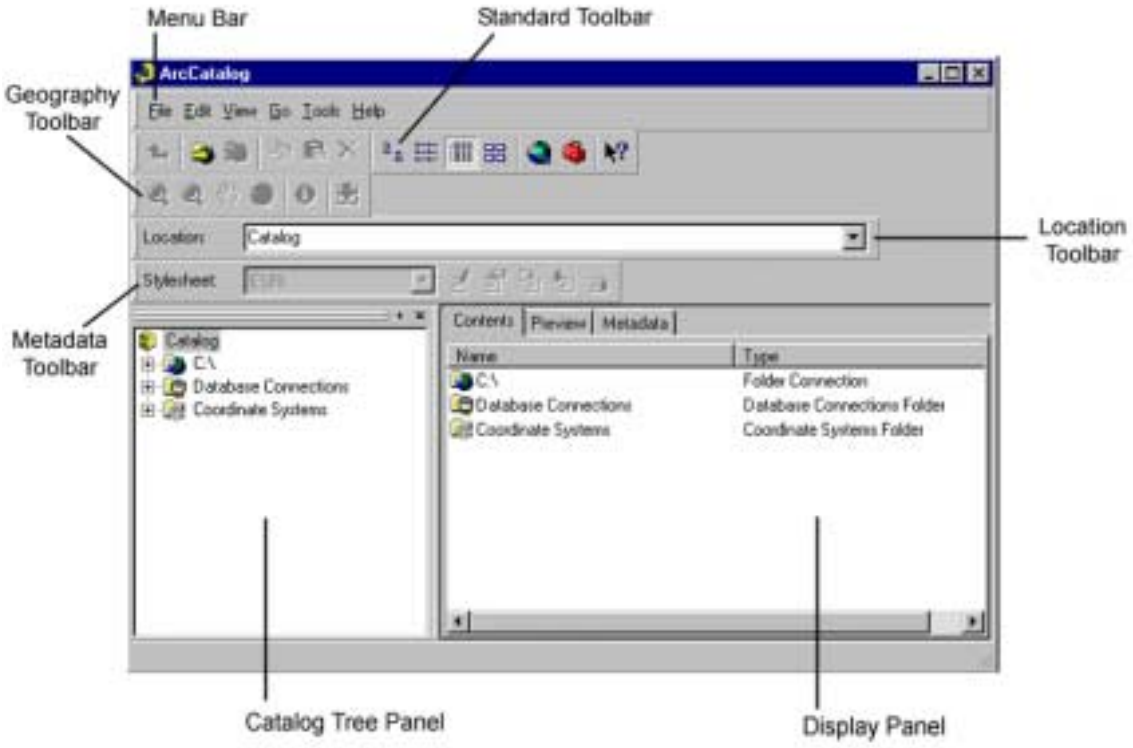


Figure 4-6 ArcCatalog Main Window

4.1.2.1 ArcCatalog Main Menu Bar

The ArcCatalog **Main Menu** bar arranges commands into related lists of tasks. Table 4-5 shows each menu item and its corresponding list of commands.

Table 4-5 ArcCatalog Menu Bar Functions

Menu Item	Function
File	Allows the analyst to access the following commands (in **boldface**) and commands with submenus (in ***italic boldface***) in ArcCatalog: ***New***, **Connect Folder…**, **Disconnect Folder**, **Delete**, **Rename**, **Properties**, and **Exit**.

Table 4-5 ArcCatalog Menu Bar Functions (Cont'd)

Menu Item	Function
Edit	Accesses the **Copy** and **Paste** commands.
View	Allows access to the following commands (in **boldface**) and commands with submenus (in ***italic boldface***): ***Toolbars***, **Status Bar**, **Catalog Tree**, and **Refresh**.
Go	Allows access to the **Up One Level** command.
Tools	Allows access to the following commands (in **boldface**) and commands with submenus (in ***italic boldface***): **ArcToolbox**, **ArcMap**, ***Macros***, **Customize**, and **Options**.
Help	Displays the following commands: **ArcCatalog Help**, **What's This?**, and **About ArcCatalog**.
DTSS	Allows access to the following command (in boldface) and commands with submenus (in italic boldface): **About DTSS**, ***Export***, ***Import***, and ***Utilities***.

4.1.2.2 ArcCatalog Standard Toolbar

The ArcCatalog **Standard** toolbar (Figure 4-7) displays a set of commonly used commands that carry out related tasks. Toolbars can float on the desktop in their own window, or can be docked at the top, bottom, or sides of the main window.

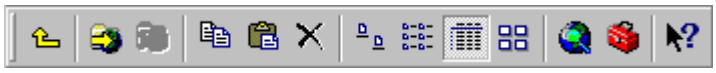


Figure 4-7 Standard Toolbar in ArcCatalog

Table 4-6 shows each ArcCatalog **Standard** toolbar button and a description of its functions. For more information, refer to ArcCatalog's online Help or printed documentation.

Table 4-6 ArcCatalog Standard Toolbar Functions

Button	Function	Description
	Up One Level	Goes to the next level up in the Catalog Tree panel.
	Connect To Folder	Connects to a folder and brings it into ArcCatalog as a folder connection, which is listed in the Catalog Tree panel.
	Disconnect From Folder	Disconnects the currently selected folder connection.
	Copy	Copies the selected items to the clipboard.

Table 4-6 ArcCatalog Standard Toolbar Functions (Cont'd)

Button	Function	Description
	Paste	Pastes the contents of the clipboard into ArcCatalog at the current location.
	Delete	Deletes the current selection. *NOTE*: Take care using this command, as **Delete** cannot be undone in ArcCatalog.
	Large Icons	Displays the contents of the current catalog location as large icons.
	List	Displays the contents of the current catalog location as a file list. This icon is useful for viewing a large number of items at once.
	Details	Displays the contents of the current catalog location as a detailed list, including the name and type of file.
	Thumbnails	Displays the contents of the current catalog location as thumbnail images, if available.
	Launch ArcMap	Launches the ArcMap application.
	Launch ArcToolbox	Launches the ArcToolbox application.
	What's This?	Displays a description of a button or menu item when the user clicks the **What's This?** button on the toolbar, then on the item of interest.

4.1.2.3 ArcCatalog Geography Toolbar

The ArcCatalog **Geography** toolbar (Figure 4-8) displays a set of commonly used geographic tools that carry out related tasks. The **Geography** toolbar becomes enabled when an item containing geographic information is selected from the Catalog Tree panel and the **Preview** tab is selected and set to **Geography** view.



Figure 4-8 Geography Toolbar in ArcCatalog

Table 4-7 shows each **Geography** toolbar button and a description of its functions. For more information, refer to ArcCatalog's online Help or printed documentation.

Table 4-7 ArcCatalog Geography Toolbar Functions

Button	Function	Description
	Zoom In	Zooms in on the data in the geographic preview. User can click on a location to zoom in on, or use the tool to click and drag a box around a particular area to zoom.
	Zoom Out	Zooms out from the data in the geographic preview by a set ratio. User can click the location from which to zoom out, and view zooms out accordingly.
	Pan	Pans the data in the geographic preview by dragging the display in any direction with the mouse.
	Full Extent	Zooms to the full extent of the data in the geographic preview.
	Identify	Identifies features clicked on in the geographic preview (shown on the Preview tab). Opens **Identify Results** window, with attributes and values for selected feature(s).
	Create Thumbnail	Creates a thumbnail graphic for the currently selected spatial data being previewed. (Thumbnails are small images that make it easy to see what a particular dataset, layer, or map looks like without having to draw it.)

4.1.2.4 ArcCatalog Location Dropdown List

The **Location** dropdown list in ArcCatalog (Figure 4-9) allows quick access to frequently used file locations. This field shows the full path for the currently selected location. The user can type in a path to go directly to a certain location. ArcCatalog will automatically create a connection to the folder if one does not already exist. The path is saved as an item on the dropdown list for future reference.



Figure 4-9 Location Toolbar in ArcCatalog

4.1.2.5 ArcCatalog Metadata Toolbar

The **Metadata** toolbar in ArcCatalog (Figure 4-10) allows the user to format and manipulate metadata using stylesheets and other functionalities discussed in Table 4-8. The **Metadata** toolbar becomes enabled when the **Metadata** tab is selected in ArcCatalog.



Figure 4-10 Metadata Toolbar in ArcCatalog

Table 4-8 shows each **Metadata** toolbar button and a description of its functions. For more information, refer to ArcCatalog's online Help or printed documentation.

Table 4-8 ArcCatalog Metadata Toolbar Functions

Button	Function	Description
	Stylesheet Dropdown List	Allows user to choose a stylesheet for the current session in ArcCatalog.
	Edit Metadata	Launches the metadata editor, where user can edit the metadata for the selected item.
	Metadata Properties	Sets the properties of the metadata for the selected item and adds enclosures (any file to be used as metadata) to the metadata.
	Create/Update Metadata	Automatically creates metadata for the selected item if it hasn't already been created; updates the metadata if it already exists.
	Import Metadata	Imports existing metadata into ArcCatalog, which uses XML as its storage format for metadata.
	Export Metadata	Opens **Export Metadata** window, where user can specify file format and location for metadata.

4.1.3 ArcToolbox

ArcToolbox provides wizards and tools to import, process, and analyze ArcInfo coverages. With ArcToolbox, virtually all major spatial data formats can be converted to and from ArcInfo coverages, grids, and Triangulated Irregular Networks (TINs). Topology can be generated and maintained; mapsheets can be joined, clipped, and split; and advanced coverage-based modeling tools can be used.

Use the following steps to open ArcToolbox:

1. Click the ***Start*** button on the Windows taskbar.
2. Point to ***Programs***.
3. Point to ***ArcInfo***.

4. Click ***ArcToolbox***. The **ArcToolbox** window shown in Figure 4-11 will appear.

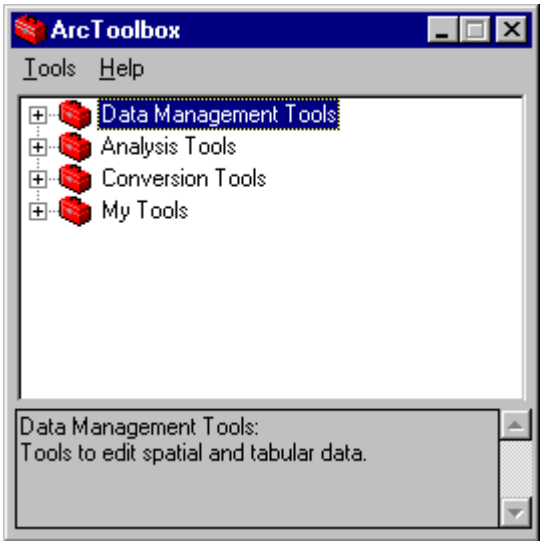


Figure 4-11 ArcToolbox Window

When the **ArcToolbox** window opens, a list of tool categories will appear in the main panel. Highlight any category to see a brief description in the status box at the bottom of the window. Click on the plus sign to the left of any category to see a list of the tools it contains. ArcToolbox can also be started from ArcCatalog by clicking the **Launch ArcToolbox** button ( ) on the **Standard** toolbar (Figure 4-7).

ArcToolbox tools are organized into the four main toolsets shown in Table 4-9. When an item in the **ArcToolbox** window is selected, a description appears at the bottom of the window.

Table 4-9 ArcToolbox's Main Toolsets

Toolset	Description
Data Management Tools	Used to modify the characteristics of a coverage or image.
Analysis Tools	Used to solve a spatial or statistical problem.
Conversion Tools	Used to convert coverages, grids, and TINs to other supported data formats.
My Tools	Used to store frequently used tools.

NOTE

ArcToolbox also provides wizards to assist with more complex conversions.

4.1.4 ArcInfo Workstation

In addition to the ArcInfo desktop applications, ESRI also provides ArcInfo Workstation 8.0.2, which contains modules for working with GIS data on a UNIX or Windows platform. To access ArcInfo Workstation functionality, follow these steps:

1. From the **Start** menu in Windows NT, select ***Programs/ArcInfo***, and point to **ArcWorkstation**.
2. Notice that the following options appear as options: **Arc**, **ArcDoc**, **ArcEdit**, **ArcGrid**, **ArcPlot**, and **ArcTools**. Select the desired option to work.

ArcInfo Workstation provides the same applications and extensions as previous ArcInfo releases, listed below, with added capabilities in a number of areas. For a very thorough description of the latest capabilities in ArcInfo Workstation 8.0.2, refer to ArcDoc, the online Help system for ArcInfo Workstation.

- Arc (application)
- ArcEdit (application)
- ArcPlot (application)
- ArcGrid (extension)
- ArcStorm (extension)
- ArcTools

Accessing any of these modules will open an MS-DOS command prompt window where the user enters ArcInfo commands to perform different operations on the data.

NOTE

Geodatabases cannot be used in ArcInfo Workstation

It is important to note that operating system commands are different between Unix and NT. Workstation ArcInfo on NT uses DOS operating system commands to change directories and list files. Unlike Unix, which uses a forward slash (/) to change directories, DOS requires a backward slash (\). The following is an example to help navigate ArcInfo Workstation directories and list files.

To navigate directories and list files, use the “workstation” command in ArcInfo, or just “w,” instead of the Unix “cd” command to change directories. For example, to get from **\data\geodatabase** to **\data\coverage**, type the following at the Arc prompt:

Arc: ***w \data\coverage***

To list the files in \data\coverage type the following:

Arc: ***&sys dir /p***

The ArcTools option within ArcInfo Workstation provides the ArcTools interface (Figure 4-12), which allows the user to access commands to manipulate current data.



Figure 4-12 ArcTools Interface in ArcInfo Workstation

See Table 4-10 below for a brief description of the functionality of each tool group listed. For more information on the functionality of ArcTools, use the **Help** button in the ArcTools window to access ArcTools’ online Help system.

Table 4-10 ArcTools Functionalities

Tool Set	Functionality
Map Tools	Runs from inside the ArcPlot application. Allows user to display, query, and analyze spatial data.
Edit Tools	Runs from inside the ArcEdit application. Allows user to create new coverages, digitize features, correct errors, edit attributes, and generate topology.
Grid Tools	Runs an ArcGrid session. Allows user to perform raster analysis using this extension (license required).
Command Tools	Runs from “Arc:” prompt. Allows user to perform batch-oriented commands on ArcInfo data, including data conversion, overlay, update, and tabular operations.

Table 4-10 ArcTools Functionalities (Cont'd)

Tool Set	Functionality
Land Records	Runs as an extension (license required). Allows user to edit and manage land record themes.

4.2 ERDAS Imagine

The ERDAS Imagine software system provides a complete suite of image processing functions, along with selected functions for working with vector data. These functions include importing, viewing, altering, and analyzing raster and vector data sets.

Use the following steps to open ERDAS Imagine:

1. Click the ***Start*** button on the Windows taskbar.
2. Point to ***Programs***.
3. Point to ***ERDAS IMAGINE 8.4***.
4. Click ***ERDAS IMAGINE 8.4***. The **Imagine** program opens, showing a program interface like the one shown in Figure 4-13.

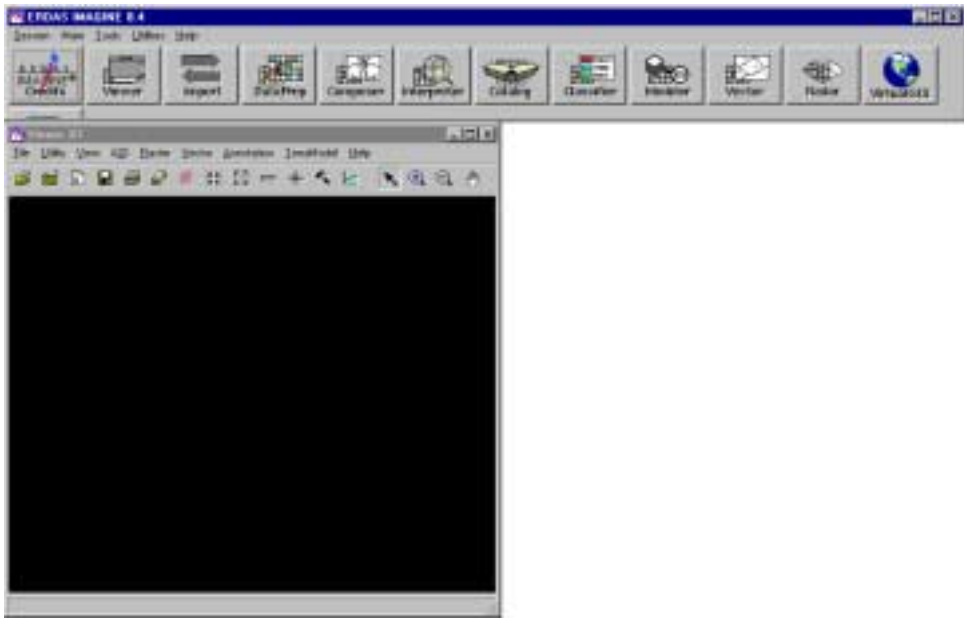


Figure 4-13 ERDAS Imagine 8.4 Main Window

The **ERDAS Imagine** icon panel appears at the top of the screen with the **Viewer** window appearing directly below. The **ERDAS Imagine** icon panel contains icons and

menus for accessing Imagine geoprocessing functions. The **Viewer** window contains toolbars and menus for accessing Imagine display functions.

ERDAS Imagine offers thorough online documentation to describe system capabilities and menu and toolbar functions. See Section 12.1.2 for ways to access Imagine Help information.

4.3 DTSS Menu

The **DTSS** menu is an extension of the ArcMap program. Figure 4-14 shows the ArcMap **Main Menu** bar with the **DTSS** menu selected.

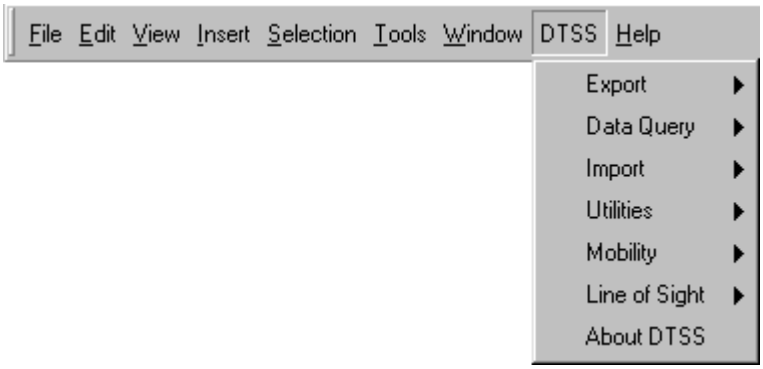


Figure 4-14 DTSS Menu in ArcMap

The dropdown **DTSS** menu shows the different custom products available for the DTSS analyst to use. The DTSS software provides tools for generating and distributing products for review and analysis. Selecting any item or TDA will display the wizard or window for that particular item. The functions for each DTSS menu item are described throughout this manual. See Chapter 8, *Data Exploitation—Custom*, for detailed information on DTSS products.

4.4 DTSS Directory Structure

DII COE directory structure requirements specify that each segment is assigned its own unique, self contained sub-directory in order to maintain a standardized structure. The DTSS directory structure follows the DII COE requirements by storing segments under a path similar to **\H\data\local\dtss\data**. The following represent default directories created upon software installation. These are available to help the analyst manage data and queries.

E:\Ifmxdata—stores database with Website pages and data. DO NOT REMOVE.

E:\H\data\local\dtss\data—DTSS TDAs will default users to this directory for input and output. Users can create their own project workspaces under **\H\data\local\dtss\data** to store input data, output data, source data, raw data, or imagery.

E:\H\data\local\dtss\data\dataquery—Common Queries are stored in this directory.

E:\H\data\local\dtss\data\elevation—default directory provided to store elevation data.

E:\H\data\local\dtss\data_templates—stores custom geodatabase templates. DO NOT REMOVE.

D:\Netscape\Server4\docs—contains all of the data needed by the Web Server software to service Web clients. This directory is at the root level of the file system and is stored on the RAID device (if the host configuration supports a RAID device).

Users may wish to add additional subdirectories such as ITD, VITD, etc., under DTSS provided directories. Use the Windows NT Explorer or ArcCatalog to create new directories. If the analyst does not have permission to create directories, the System Administrator will have to either make the directories and/or change the permissions on parent directories. See Appendix A for further information on system administration functions.

4.4.1 Changing Permissions on Directories or Files

The following procedures outline steps for changing permissions on directories and files within the Windows NT environment. Any directory or file to which the user has access can be changed in this manner.

To change a directory or file to a read-only status, do the following:

1. Open Windows Explorer.
2. Right click on the desired file or directory to make read-only.
3. Select ***Properties***.
4. Check the box next to “Read-only” on the **General** tab.

To change the permissions on a directory or file, do the following:

1. Open Windows Explorer.
2. Right click on the desired file or directory to change the permissions for.

3. Select ***Properties*** from the context menu.
4. Select the **Security** tab.
5. Notice the Permission panel in the middle of the window. In this panel, set appropriate Allow and Deny permission for users.
6. The user can now add or remove permissions.

To add permissions, follow these steps:

1. Select the ***Add*** button (An Add Users and Groups window appears).
2. Double click on the "Name(s)" to add (Name will be moved to the "Add Names" box).
3. Click ***OK*** to return to the previous window.
4. Select the type of access for the user(s) to have.
5. Click the ***OK*** button.

To remove permissions, do the following:

1. Highlight the "Name" to remove.
2. Click the ***Remove*** button.

Chapter 5

DATA COLLECTION

5	**DATA COLLECTION**	5-3
5.1	Data Models	5-3
5.1.1	Vector Models	5-4
5.1.1.1	Coverages	5-4
5.1.1.2	Shapefiles	5-4
5.1.1.3	Geodatabases	5-5
5.1.2	Raster Models	5-6
5.2	Importing Data	5-6
5.2.1	ITD Importer	5-7
5.2.1.1	Importing ITD Into a New Geodatabase	5-8
5.2.1.2	Importing ITD Into an Existing Geodatabase	5-13
5.2.2	VPF Importer	5-18
5.2.2.1	Importing VPF Data Into a New Geodatabase	5-19
5.2.2.2	Importing VPF Data Into an Existing Geodatabase	5-27
5.2.3	Importing Data With ArcInfo	5-36
5.2.4	Importing Data With Imagine	5-37
5.2.4.1	Importing ARC Digitized Raster Graphics (ADRG) Data	5-37
5.2.4.2	Importing Digital Terrain Elevation Data (DTED)	5-42
5.2.4.3	Importing Raster Product Format (RPF) Data	5-47
5.3	Scan	5-51
5.3.1	User Interface	5-52
5.3.1.1	Menu Bar	5-52
5.3.1.2	Main Toolbar	5-53
5.3.1.3	Scan Window	5-54
5.3.1.3.1	Scan Task Toolbar	5-55
5.3.1.3.2	Scan Panel	5-56

5.3.1.3.3 Overview and Detail Windows 5-56
5.3.1.4 View Window 5-56
5.3.1.4.1 View Task Toolbar 5-57
5.3.1.4.2 View Window Main Display Area 5-58
5.3.1.5 Feature Window 5-58
5.3.1.5.1 Feature Task Toolbar 5-59
5.3.1.5.2 Feature Window Main View 5-60
5.3.1.5.3 Color Wheel View 5-60
5.3.1.5.4 Histogram View 5-61
5.3.2 Scanner Setup 5-62
5.3.2.1 Paper Load Tab 5-62
5.3.2.2 Media Offsets Tab 5-63
5.3.2.3 Extended Thickness Tab 5-64
5.3.3 Scanner Calibration 5-64
5.3.4 Scanning an Image 5-66
5.3.4.1 Initializing Phase 5-67
5.3.4.1.1 Presets 5-67
5.3.4.1.1.1 Standard Scan Presets 5-68
5.3.4.1.1.2 Creating a Scan Preset 5-68
5.3.4.1.2 Scanning Modes 5-68
5.3.4.1.3 Resolution 5-69
5.3.4.1.3.1 Resolution Lists 5-70
5.3.4.1.4 Paper Size 5-70
5.3.4.2 Prescanning Phase 5-71
5.3.4.2.1 Prescan Control 5-71
5.3.4.2.2 Setting Black And White Point 5-71
5.3.4.2.3 Defining a Scan Window 5-72
5.3.4.3 Adjustments Phase 5-72
5.3.4.4 Final Scanning Phase 5-72
5.3.5 Feature Extraction Overview 5-73
5.3.5.1 Feature Extraction Process 5-73
5.3.6 Scanning to Printer 5-77

5 DATA COLLECTION

The DTSS provides the analyst with software to view, exploit, and print geographic data. However, in order to use many of the functions provided by DTSS, the analyst must first get the data in a format that can be used by the DTSS software. The DTSS software uses digital data in a variety of vector and raster formats. The DTSS also provides software to scan hardcopy products into a digital format usable by the DTSS software.

This chapter will briefly explain the following:

- Data models
- Importing data
- Scanning

For more detailed information on these topics, use the COTS online Help tools (discussed in Chapter 12), or refer to the COTS printed documentation.

5.1 Data Models

Various geographic data models exist to represent real world information. The two most common data models are vector and raster. Vector data models use points, lines, and areas (polygons) to represent real world features. These models are most commonly used to represent discrete features such as rivers, roads, and building. A raster model represents data using a regular grid of cells. Raster models are most commonly used to store data that varies continuously across a surface such as elevation values. Each cell in a raster data model has a single value to represent the information across the entire cells area. Thus, variability within the cells area may not be captured. Another type of data that is commonly used for geographic analysis is tabular data. It is possible to link tabular information about geographic features by linking their location to the information stored in a database.

ArcInfo and Imagine provide their own internal formats for storing raster, vector, and tabular data. ArcInfo uses the grid format to store raster data. However, several different formats are available in ArcInfo for storing vector feature data. These include coverages, shapefiles, and geodatabases. Imagine uses a hierarchical file architecture (HFA) format to store raster data, the most common of these is the *.img* format, and it uses ArcInfo coverages and shapefiles for vector data.

5.1.1 Vector Models

The vector model represents geographical areas with points, lines, and areas. ArcInfo uses three main formats for feature data: coverages, shapefiles, and geodatabases. Both coverages and shapefiles employ a georelational data model. They store vector data for features and use unique identifiers to link the features to attributes stored in feature attribute tables. Geodatabases employ a geodatabase data model where features are stored as rows in a relational database table.

5.1.1.1 Coverages

A coverage is a file-based vector data format for storing the location, shape, and attributes of geographic features. A coverage usually represents a single theme such as soils, streams, roads, or land use. All vector data imported with custom importers in DTSS Build 6.x and earlier is stored in coverage format.

The coverage format stores geographic features as primary, secondary, and composite features. Primary features include arcs, nodes, polygons, and label points. Secondary features include tics, map extents, links, and annotations. Composite features are built from primary features and include routes/sections and regions. Feature attribute tables describe and store the attributes of the geographic features using an INFO database. Topology, related to the connectivity of features, is also stored with ArcInfo coverages.

Simple coverages have their attributes stored in the coverage's INFO table and can be easily accessed. Complex coverages have attributes stored in related tables (Unix ITD) or have composite features, such as regions and routes (Unix VPF).

Coverages are stored in workspaces. A workspace is a folder in the file system that contains another folder called info and folders for each coverage in the workspace.

5.1.1.2 Shapefiles

Shapefiles are a vector data format for storing the location, shape, and attributes of geographic features. A shapefile is stored in a set of related files that contains a single feature class. Shapefiles are simpler than coverages because they do not store topological associates among different features belonging to a single feature class.

Shapefiles can contain points, multipoints, lines, and polygons. Shapefiles are stored in folders. A shapefile consists of a set of files of vector data in the shapefile and a dBASE *.dbf* file of the attributes.

5.1.1.3 Geodatabases

The ArcInfo geodatabase implements an object-oriented data model. One advantage of this data model is the ability to have “built-in” behavior for features, such as a bridge must be used to connect a road across a stream. Geodatabases also allow large databases to be stored seamlessly without tiling.

The geodatabase is a store of geographical information inside a relational database. Geodatabases allow the user to define advance properties for features such as relationships between features and default symbology for feature rendering. Geodatabases may be implemented as multi-user, or as single-user, personal databases. Within a geodatabase, geographic data is organized into a hierarchy of data objects as follows:

- **Geodatabase**—the top-level unit of geographic data; a collection of datasets, feature classes, object classes, and relationship classes.
- **Feature dataset**—a collection of feature classes that contain a common coordinate system.
- **Feature class**—a collection of features with the same type of geometry: point, line or polygon.
- **Object class**—a table that contains descriptive information about objects that are related to geographic features.
- **Relationship class**—a table that stores relationships between features or objects in two feature classes or tables.

DTSS Build 7 provides custom geodatabase templates defined for ITD, VITD, FFD, and DTOP, as described in Section 5.2. These templates contain only valid feature classes and attribute values for the selected data type. See Figure 5-1 for an example of the VITD geodatabase structure within ArcInfo.

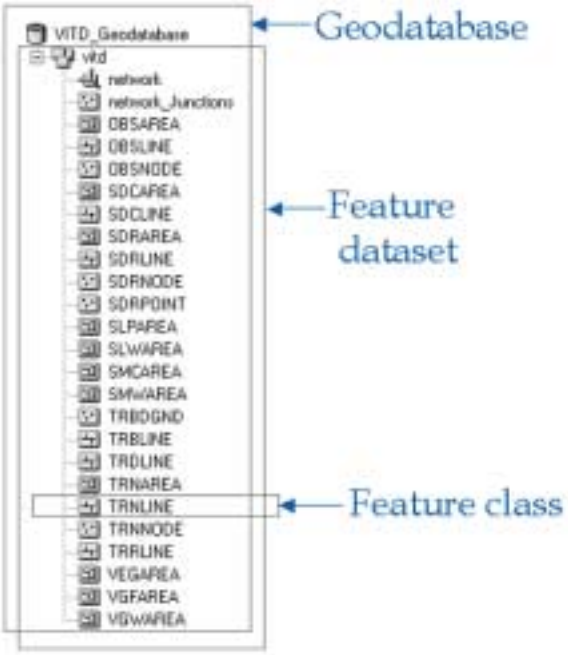


Figure 5-1 Data Model Structure

5.1.2 Raster Models

A raster model represents the world as a surface divided into a regular grid of cells. Raster models are useful to depict features without discrete boundaries, such as an aerial photograph, a satellite image, or an elevation surface. Imagine uses a hierarchical file architecture (HFA) format to store raster data, the most common of these is the *.img* format, and ArcInfo uses the Grid data format for raster data.

5.2 Importing Data

Both ArcInfo and ERDAS Imagine provide off-the-shelf software to import data from many different formats into their own internally supported formats. DTSS software has also been developed that will import NIMA data into ArcInfo geodatabases. Custom geodatabases, which provide default symbology and advanced attribute editing capabilities, are provided for the following NIMA data types:

- Standard Linear Format (SLF) :
    - Interim Terrain Data (ITD)
    - Planning ITD (PITD)
- Vector Product Format (VPF):
    - Vector Product Format ITD (VITD)

- Foundation Feature Data (FFD)
- Digital Topographic Data (DTOP)

5.2.1 ITD Importer

The DTSS ITD Importer wizard will import NIMA data in Standard Linear Format (SLF). SLF data uses Defense Mapping Agency Feature File (DMAFF) standard for feature and attribute codes. The ITD Importer will import the following NIMA data in Standard Linear Format (SLF):

- Interim Terrain Data (ITD) – this is a digital representation of information found on hardcopy Tactical Terrain Analysis Databases (TTADBs). Data consists of six thematic layers including surface drainage, surface materials, obstacles, slope/surface configuration, transportation, and vegetation. SLF ITD represents features at a data density commensurate with a 1:50,000-scale map.
- Planning ITD (PITD) – this contains the same six thematic layers as ITD but represents features at a data density commensurate with a 1:250,000-scale map.

ITD has a standard naming convention that provides consistency for understanding the content of a given data set. DTSS ITD import functions use this naming convention to provide the ability to load an entire data set in one process. Any of the six ITD layers can be selected, and an output directory can be designated to contain the selected layer(s).

Besides providing an automated way to import all layers of a dataset, the ITD import functions also provide the flexibility to import layers with non-standard names and unique pathnames or to import single or multiple data files within a directory containing ITD layer data.

NOTE

Because the importer checks for both standard and non-standard filenames, import from CD may take a very long time. It is recommended that users copy required data from CD to disk prior to import.

The ITD Importer wizard can import data from disk or CD. The importer applies custom geodatabase templates to the imported data. Once the data is imported and a geodatabase is generated, the analyst can run DTSS products and edit data to review information.

The ITD Importer wizard offers two import options: “Create new geodatabase” or “Add to existing.” Section 5.2.1.1, *Importing ITD into a New Geodatabase*, goes through the steps of importing ITD data to a new geodatabase. Section 5.2.1.2, *Importing ITD into an Existing Geodatabase*, goes through the steps of importing ITD data to a geodatabase that already exists.

5.2.1.1 Importing ITD Into a New Geodatabase

To import ITD into a new geodatabase, follow the procedure below.

1. To access the DTSS ITD Importer wizard in ArcMap, select ***Import/ITD Importer*** from ArcMap’s **DTSS** menu. The **DTSS—ITD Importer** window will appear (Figure 5-2).

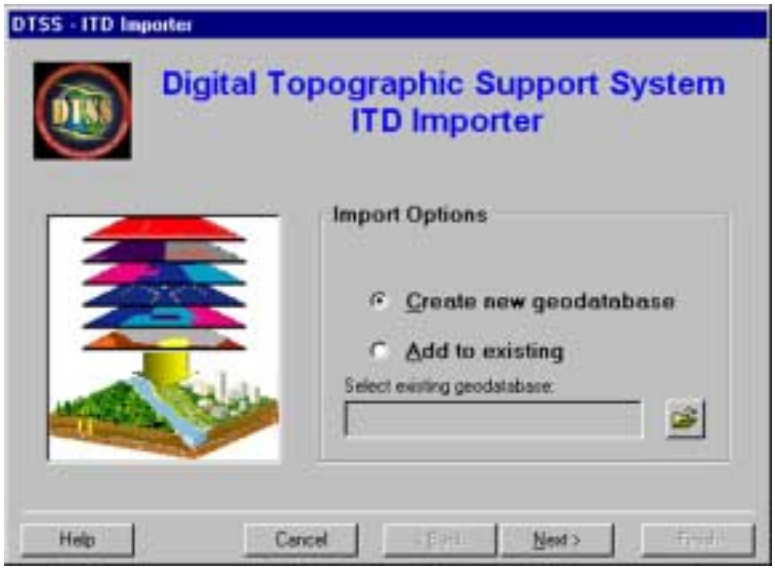


Figure 5-2 DTSS—ITD Importer Window

2. Select the “Create new geodatabase” option and click ***Next.*** The **DTSS ITD Importer—Select data** window shown in Figure 5-3 appears.

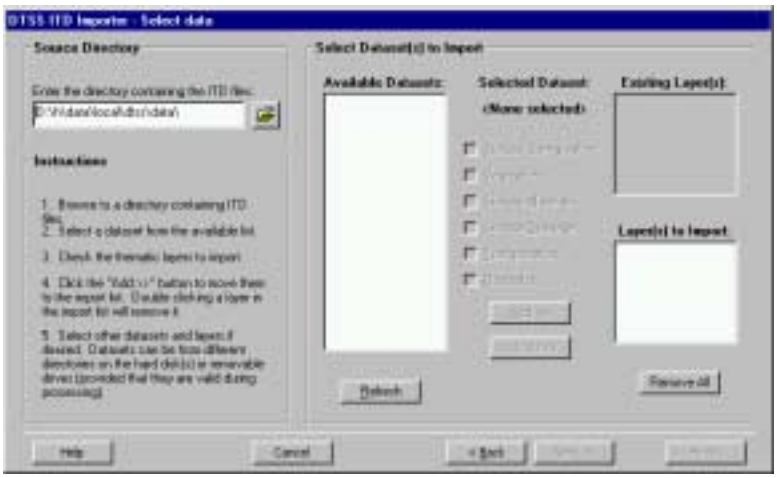


Figure 5-3 DTSS ITD Importer—Select Data Window

3. Click the ***Open Folder*** button ( ) located in the top left portion of the window to navigate to the appropriate ITD database. The **Choose source directory** window shown in Figure 5-4 appears.



Figure 5-4 Choose Source Directory Window

4. In this window, navigate to the appropriate ITD file and click ***OK***. The window closes, returning to the **DTSS ITD Importer—Select Data** window (Figure 5-5). Notice a listing of available datasets appears in the "Available Datasets" panel.

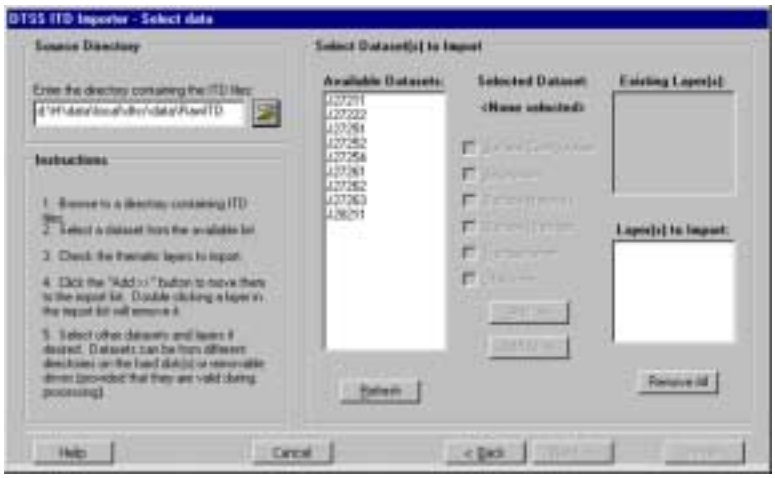


Figure 5-5 DTSS ITD Importer—Select Data Window

5. Select a dataset from the "Available Datasets" panel by single clicking it with the mouse. The selected dataset will be listed under the "Selected Dataset" heading, and the thematic layers to import become enabled (Figure 5-6).

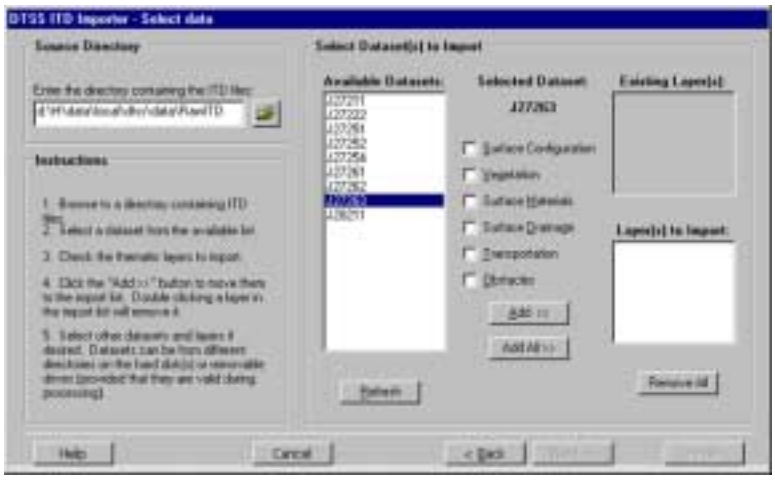


Figure 5-6 DTSS ITD Importer—Select Data Window

6. Select the thematic layers to import by clicking the mouse in the box next to the layer name(s).

   a. Click the ***Add*** >> button to move the selected layers to the "Layer(s) to Import" list to the right (Figure 5-7).

   b. Click the ***Add All*** >> button to add all layers to the list.

   c. To remove a layer from the "Layer(s) to Import" list, double click on the desired layer.

d. To remove all layers from the list, click the ***Remove All*** button below the panel.

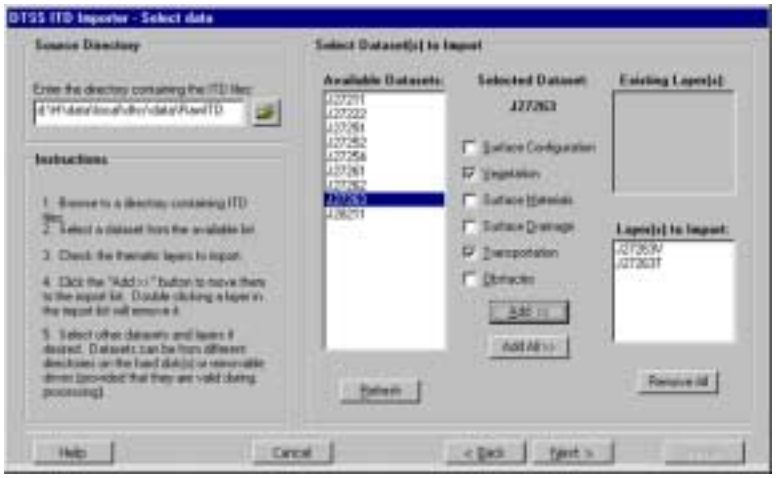


Figure 5-7 DTSS ITD Importer—Select Data Window

7. Select other datasets and layers if desired. Datasets can be from different directories or removable drives. When finished selecting the appropriate layers to import, click ***Next***. The **DTSS ITD Importer—Choose output location** window will appear (Figure 5-8).

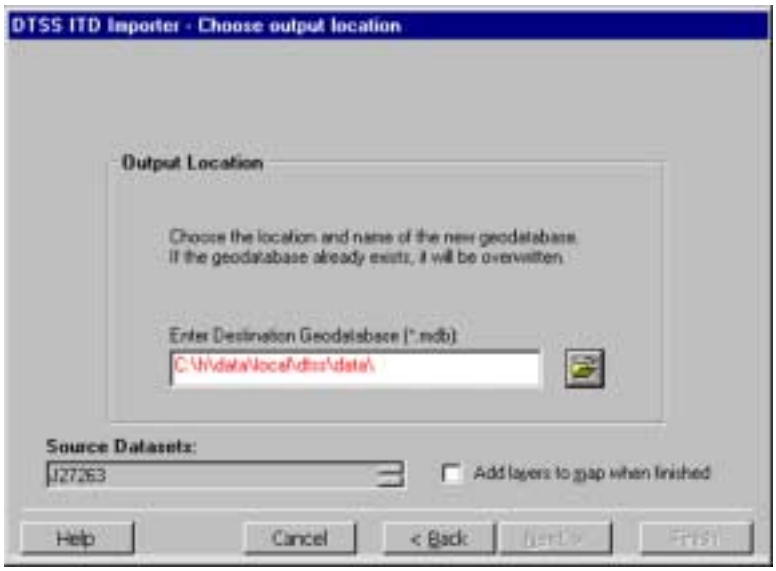


Figure 5-8 DTSS ITD Importer—Choose Output Location Window

8. The DTSS ITD Importer automatically provides a default path and filename in the “Enter Destination Geodatabase (*.mdb)” field. If this path and filename are acceptable, press ***[Enter]*** to enable the **Finish** button.

9. If a different path or filename is desired, type the name and location of the new geodatabase, or click the ***Open File*** button ( ) and navigate to the appropriate geodatabase. The file will be saved with an *.mdb* extension.

10. Once the filename is entered, the analyst must add an *.mdb* extension and press the ***[Enter]*** key. If the geodatabase already exists, it will be overwritten, and a message will appear to that effect.

11. Click the box next to "Add layers to map when finished" to have the layers display in ArcMap when the import process is complete.

12. When complete, click the ***Finish*** button. The **DTSS ITD Importer—Import Status** window (Figure 5-9) will appear. During import, a status bar appears in the window, indicating progress in data processing. Importing a database will take several minutes.

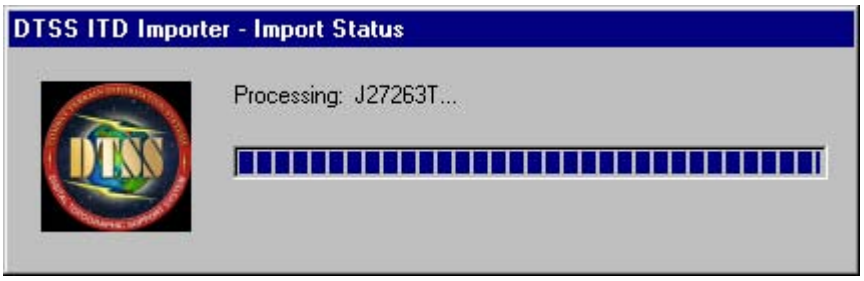


Figure 5-9 DTSS ITD Importer—Import Status

13. When the import process is completed, the **DTSS ITD Importer—Import Status Complete** window will appear (Figure 5-10). Click ***OK*** to end the import session.



Figure 5-10 DTSS ITD Importer—Import Status Complete Window

14. If the option to add layers to a map was selected, the imported layers appear in the Table of Contents panel in ArcMap. The boxes beside the layers are unchecked, so nothing is yet displayed in the Display panel. Check the layers to display, and then edit and display data as desired using ArcMap functionality (Figure 5-11).

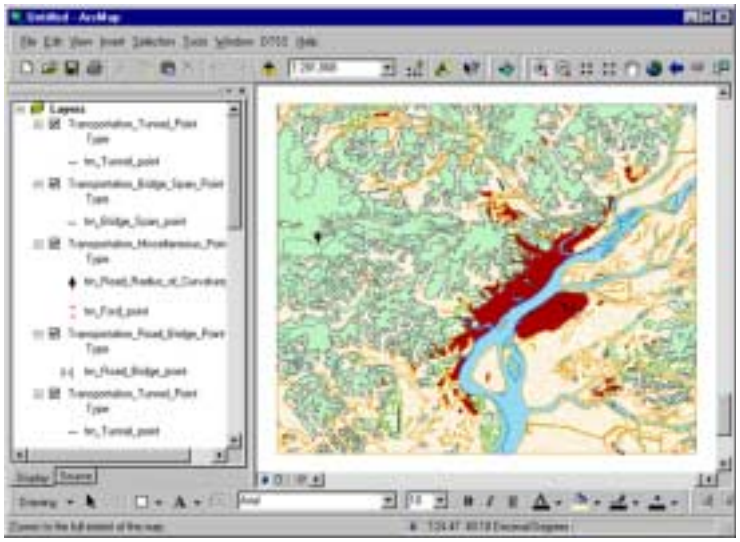


Figure 5-11 ArcMap Main Window Showing ITD Layers Imported

5.2.1.2 Importing ITD Into an Existing Geodatabase

In order to properly import data into the existing geodatabase, the network file needs to be deleted from the desired existing geodatabase before running the importer wizard. To do this, follow the brief procedure below.

1. Close ArcMap and open ArcCatalog.
2. Navigate to and select the desired existing geodatabase. Double click the geodatabase to access the dataset.
3. Double click the dataset, select the “network” file, and right click on it.
4. Select ***Delete*** from the context menu to remove the “network” file. When the “network” file has been deleted, close ArcCatalog.

NOTE

If ArcMap is still open when the analyst deletes the “network” file in ArcCatalog, he/she will receive a message that the database is currently in use. Close ArcMap and proceed.

Once the “network” file has been successfully deleted from the geodatabase, import ITD into an existing geodatabase by following the procedure below.

1. To access the DTSS VPF Importer Wizard in ArcMap, select ***Import/ITD Importer*** from the **DTSS** menu. The **DTSS—ITD Importer** window will appear.

2. Select the "Add to existing" option under **Import Options**. (Figure 5-12).



Figure 5-12 DTSS—ITD Importer Window

3. Click the ***File Open*** button ( ) to navigate to the desired existing geodatabase**.** Typing the path and name of the existing geodatabase, or dragging and dropping the geodatabase file from Windows Explorer, can also be done to enter the desired existing geodatabase in the "Select existing geodatabase" field.

4. Click ***Next***. The **DTSS ITD Importer—Select Data** window shown in Figure 5-13 appears. Notice the "Existing Layer(s)" panel displays the layers from the selected geodatabase.



Figure 5-13 DTSS ITD Importer—Select Data Window

5. Click the ***Open Folder*** button ( ) located in the top left portion of the window to navigate to the appropriate ITD file. The **Choose source directory** window shown in Figure 5-14 appears.

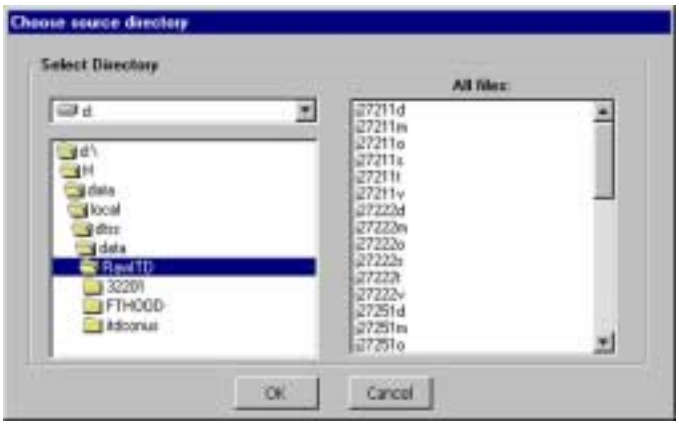


Figure 5-14 Choose Source Directory Window

6. In this window, navigate to the appropriate ITD file and click ***OK***. The window closes, returning to the **DTSS ITD Importer—Select data** window (Figure 5-15).

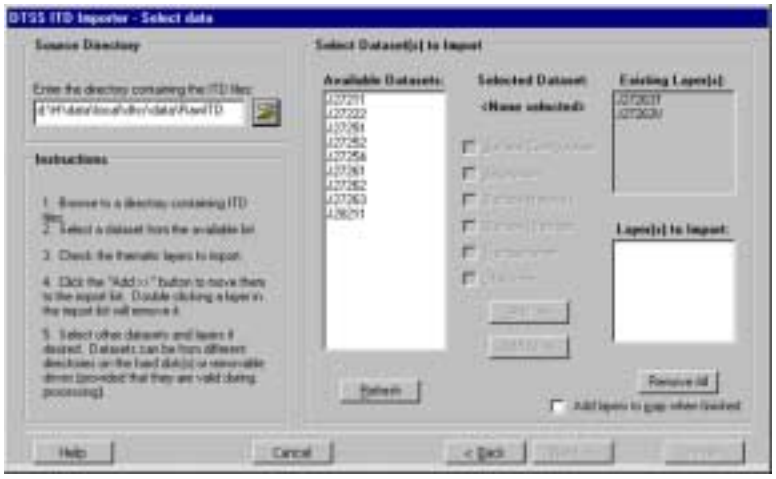


Figure 5-15 DTSS ITD Importer—Select Data Window

7. Select a dataset from the “Available Datasets” panel in the center of the window by clicking it with the mouse. The selected dataset will be listed under the “Selected Dataset” heading, and the thematic layers to import become enabled (Figure 5-16).

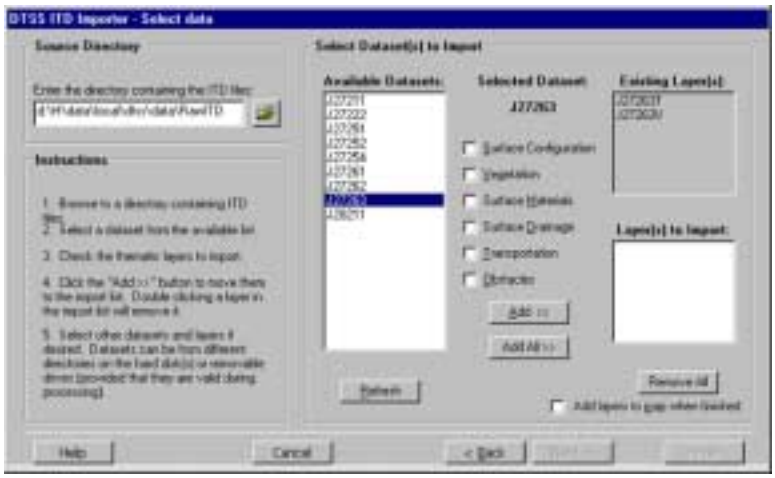


Figure 5-16 DTSS ITD Importer—Select Data Window

8. Select the thematic layers to import by clicking the mouse in the box next to the layer name(s).

   a. Click the ***Add*** >> button to move the selected layers to the "Layer(s) to Import" list to the right (Figure 5-17).

   b. Click the ***Add All*** >> button to add all layers to the list.

   c. To remove a layer from the "Layer(s) to Import" list, double click on the desired layer.

   d. To remove all layers from the list, click the ***Remove All*** button.

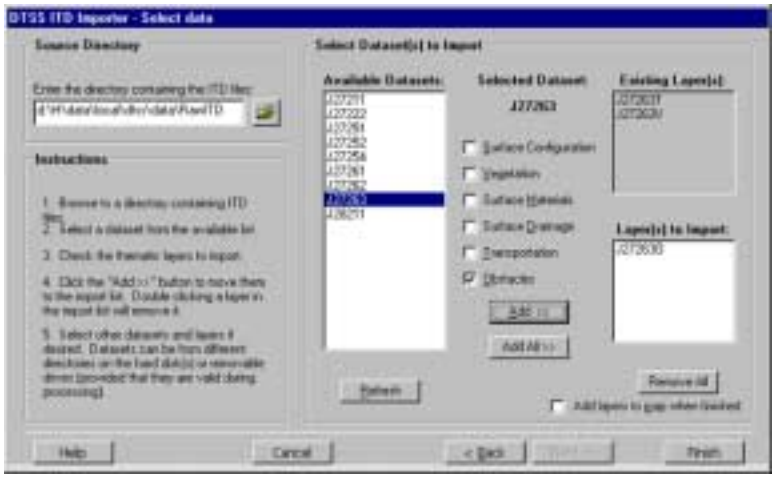


Figure 5-17 DTSS ITD Importer—Select Data Window

9. Select other datasets and layers if desired. Datasets can be from different directories or removable drives.

10. Click the box next to "Add layers to map when finished" in the lower right corner of the window to have the layers display in ArcMap when the import process is complete.

11. When finished selecting the appropriate layers to import, click ***Finish***. The **DTSS ITD Importer—Import Status** window (Figure 5-18) will appear. During import, a status bar appears in the window, indicating progress in data processing. Importing a database will take several minutes.

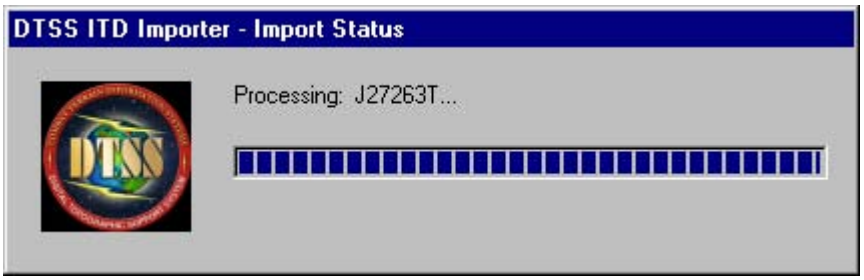


Figure 5-18 DTSS ITD Importer—Import Status Window

12. When the import process is completed, the **DTSS ITD Importer—Import Status Complete** window will appear (Figure 5-19). Click ***OK*** to end the import session.

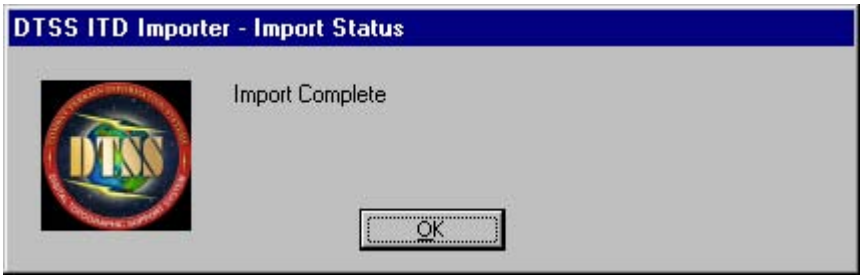


Figure 5-19 DTSS ITD Importer—Import Status Complete Window

13. If the option to add layers to a map was selected, the imported layers appear in the Table of Contents panel in ArcMap. By default, the boxes beside the layers are unchecked. Check the layers to display, and then edit and display data as desired using ArcMap functionality (Figure 5-20).

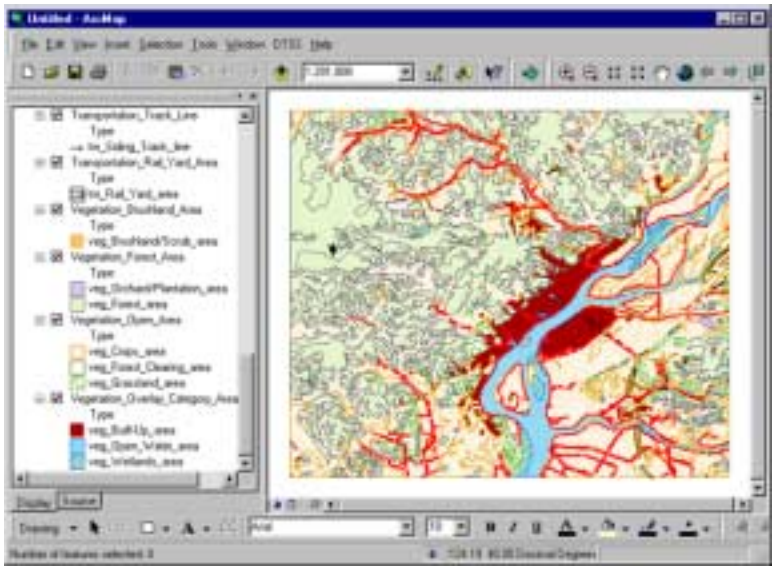


Figure 5-20 ArcMap Main Window Showing ITD Layers Imported

5.2.2 VPF Importer

Vector Product Format (VPF) is a newer data format that is more versatile and complex than SLF. VPF consists of three primary directory levels: the database, the library, and the coverage or terrain layer. Typically, a database contains one or more libraries. Each library contains one or more terrain layers. VPF products use the Feature Attribute Coding Catalog (FACC) standard to define the data features and attributes. DTSS provides custom geodatabase templates for the following NIMA VPF products:

- VPF Interim Terrain Data (VITD)—like ITD, this data is a digital representation of information found on hardcopy Tactical Terrain Analysis Databases (TTADBs). Data consists of six thematic layers including surface drainage, surface materials, obstacles, slope/surface configuration, transportation, and vegetation. VITD represents features at a data density commensurate with a 1:50,000-scale map. However, unlike ITD, VITD contains several directories and metadata files for each terrain layer.

- Foundation Feature Data (FFD)—this is a planning dataset with the density of a 1:250,000-scale map and the accuracy of a 1:50,000-scale map. Limited number of layers, features, and attributes.

- Digital Topographic Data (DTOP)—this represents various levels of feature data ranging from datasets with few features and attributes to the highest level that contains many features and attributes. Several of the levels within DTOP can be used to support terrain analysis, while other levels can be used to generate map products. DTOP Level 3 is roughly equivalent to the feature and

attribute content in ITD/VITD. DTOP supports the generation of Mission Specific Data Sets (MSDS).

Other NIMA VPF products, such as Digital Nautical Chart (DNC), Digital Chart of the World (DCW), and Vector Map (Vmap) can also be imported into a "generic" geodatabase in DTSS. A "generic" geodatabase does not contain pre-defined data models. Therefore, it only shows the information provided with the data, and default symbology for feature rendering is not available.

The DTSS VPF Importer wizard imports data from disk or CD. Once the data is imported and a geodatabase is generated, the analyst can run DTSS products and edit data to review information.

The VPF Importer wizard offers two import options: "Create new geodatabase" and "Add to existing." Section 5.2.2.1, *Importing VPF Data into a New Geodatabase*, goes through the steps of importing VPF data to a new geodatabase. Section 5.2.2.2, *Importing VPF Data into an Existing Geodatabase*, goes through the steps of importing VPF data to a geodatabase that already exists.

5.2.2.1 Importing VPF Data Into a New Geodatabase

To import VPF data into a new geodatabase, follow the procedure below.

1. To access the DTSS VPF Importer Wizard in ArcMap, select ***Import/VPF Importer*** from the **DTSS** menu. The **DTSS VPF Importer—Import Options** window will appear (Figure 5-21).

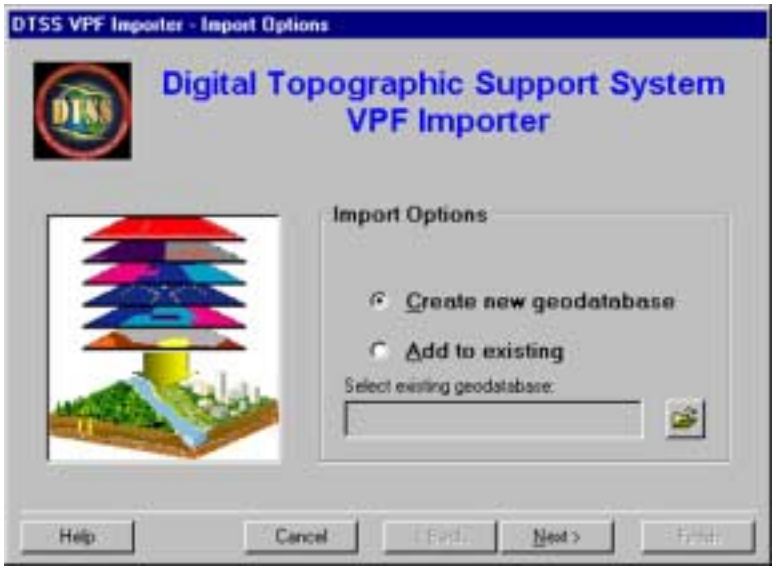


Figure 5-21 DTSS VPF Importer—Import Options Window

2. Select the "Create new geodatabase" option and click ***Next.*** The **VPF to Geodatabase Importer** window shown in Figure 5-22 appears.

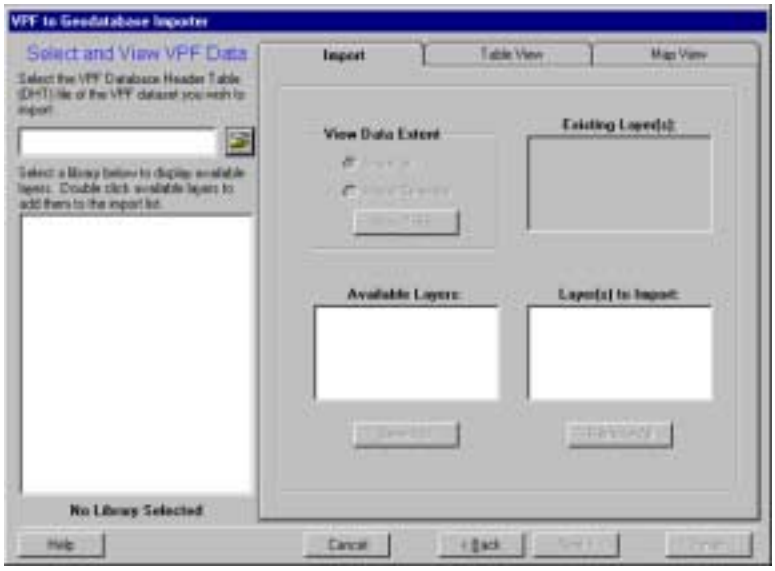


Figure 5-22 VPF to Geodatabase Importer Window

3. No database information appears in the window, but the analyst will see three data preview tabs, with the **Import** tab showing as the default. Click the ***Open File*** button (📂) located in the top left portion of the window to navigate to the appropriate VPF database. The **Open VPF library** window shown in Figure 5-23 appears.



Figure 5-23 Open VPF Library Window

4. In this window, highlight the appropriate VPF Database Header Table (dht) file, and click ***Open***. The window closes, returning to the **VPF to Geodatabase Importer** window (Figure 5-24). Notice that the selected

geodatabase and one or more library icons ( ) appear in the left panel of the **VPF to Geodatabase Importer** window.

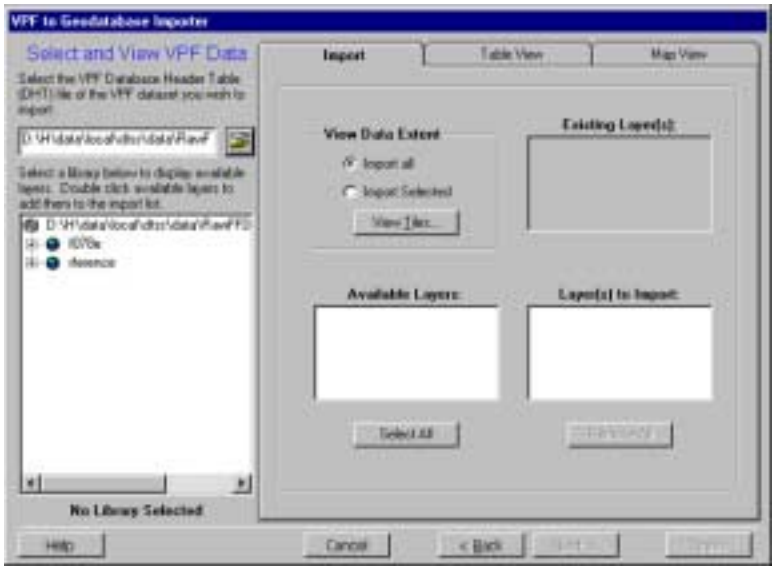


Figure 5-24 VPF to Geodatabase Importer Window

5. Double click on the database to hide or show the available libraries. Double click a library (or click the plus sign beside it) to show the available layer folders, which contain the available layer subtypes.

6. Clicking on the desired library icon ( ), or on any of the layer folders within it, will list the layers in the "Available Layers" panel to the right (Figure 5-25).



Figure 5-25 VPF to Geodatabase Importer Window

7. If the selected library contains data that is tiled, the "View Data Extent" area in the middle of the window will become enabled. Tiled data is used to break down a larger area and decrease the size of the resultant geodatabase, though importing may take longer for tiled data. If the selected library contains tiled data, use the substeps below.

    a. To view the tiles, click the ***View Tiles*** button. The **Select Tiles to Import** window will appear, showing the available tiles (Figure 5-26).

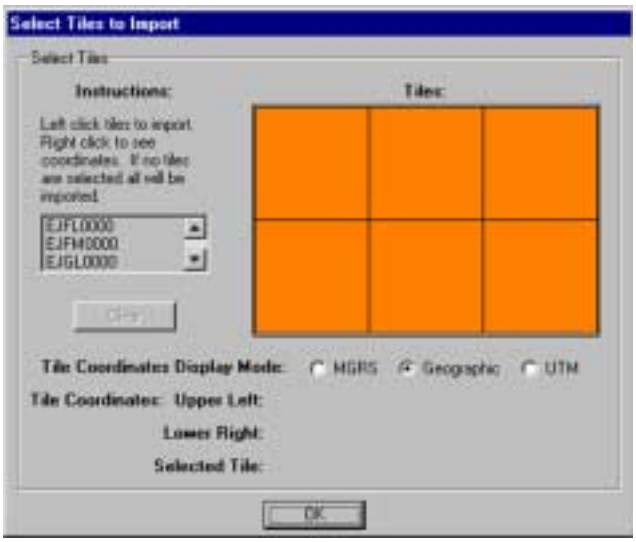


Figure 5-26 Select Tiles to Import Window

    b. Click on the different tiles to view the coordinate information at the bottom of the window. Click ***OK*** when finished viewing the tiles to return to the **VPF to Geodatabase Importer** window.

    c. To import all tiles, click the radio button next to "Import all."

    d. To import only selected tiles, click the radio button next to "Import Selected," then click the ***Select Tiles*** button. The **View Tiles to Import** window will appear again, allowing the user to select the desired tiles to import by left clicking the mouse on the tile (Figure 5-27). To view the coordinates of the tile without selecting it for import, right click the tile.

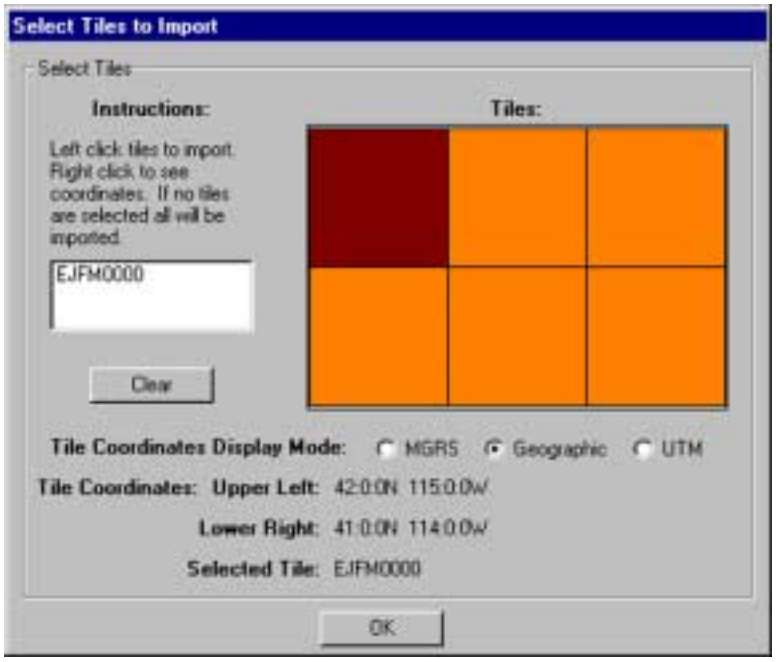


Figure 5-27 Select Tiles to Import Window

e. The selected tiles will appear in the box located on the left side of the window. Click the **Clear** button to remove the selections. When finished selecting the tiles to import, click ***OK*** to return to the **VPF to Geodatabase Importer** window. Only the selected tiles will be imported.

8. In the "Available Layers" panel, double click on any layer to move it to the "Layers to Import" panel (Figure 5-28). It is also possible to move all layers at once using the **Select All** and **Remove All** buttons below the panels.

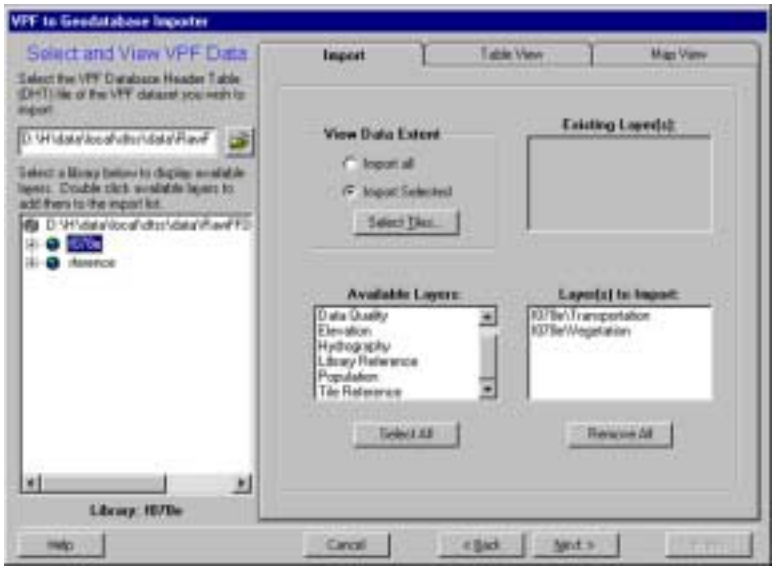


Figure 5-28 Import Tab of VPF to Geodatabase Importer Window

9. After selecting the appropriate layers, data can be previewed using the **Table View** (Figure 5-29) and **Map View** (Figure 5-30) tabs. These tabs display data when one of the layer subtypes is highlighted from the far left panel. Access layer subtypes by double clicking a layer folder.

NOTE

*Neither the **Table View** nor the **Map View** tab enables the **Next** button in the **VPF to Geodatabase Importer** window.*

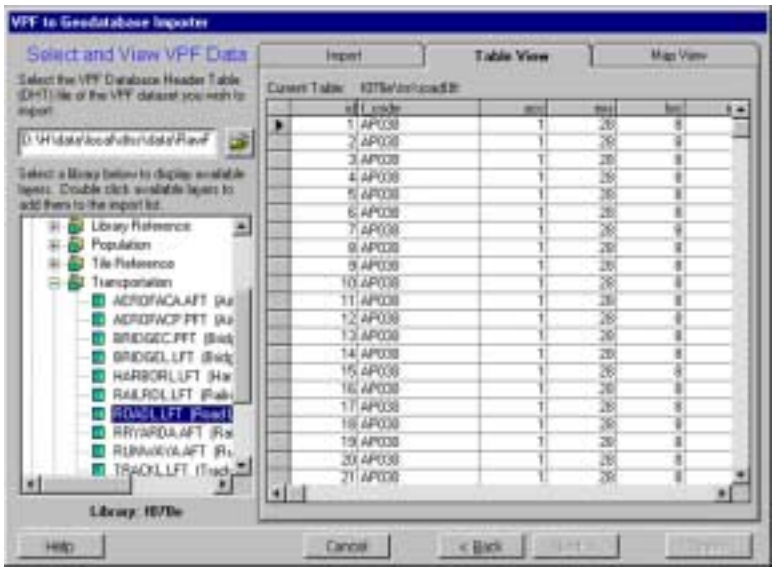


Figure 5-29 Table View Tab of VPF to Geodatabase Importer Window

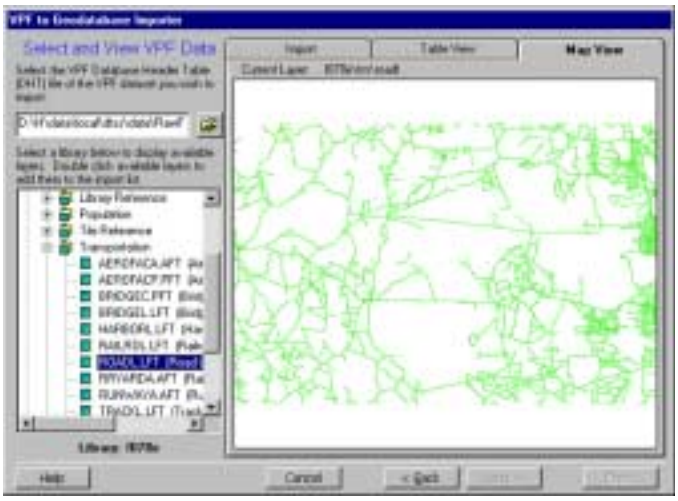


Figure 5-30 Map View Tab of VPF to Geodatabase Importer Window

10. Select other datasets and layers if desired. Datasets can be from different directories or removable drives.

NOTE

If importing a tile selection, multiple datasets cannot be selected, because the other dataset would not match up with the tiled selection.

11. After previewing the data, go back to the **Import** tab and click the ***Next*** button. The **DTSS VPF Importer—Choose output location** window shown in Figure 5-31 will appear.

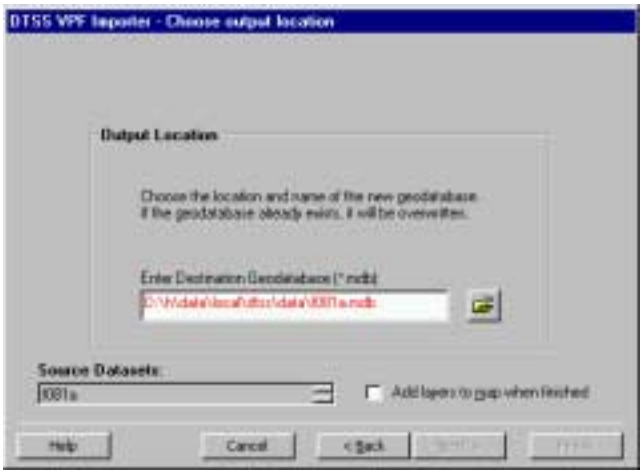


Figure 5-31 DTSS VPF Importer—Choose Output Location Window

12. The DTSS VPF Importer automatically provides a default path and filename in the "Enter Destination Geodatabase (*.mdb)" field. If this path and filename are acceptable, press ***[Enter]*** to enable the **Finish** button.

13. If a different path or filename is desired, type the name and location of the new geodatabase, or click the ***Open File*** button ( ) and navigate to the appropriate geodatabase. The file will be saved with an *.mdb* extension.

14. Once the filename is entered, the analyst must add an *.mdb* extension and press the ***[Enter]*** key. If the geodatabase already exists, it will be overwritten, and a message appears to this effect.

15. Click the mouse in the box next to "Add layers to map when finished" to have the layers display in ArcMap when the import process is complete.

16. When complete, click the ***Finish*** button. The **DTSS VPF Importer—Import Status** window (Figure 5-32) will appear. During import, a status bar appears

in the window, indicating progress in data processing. Importing a database will take several minutes.

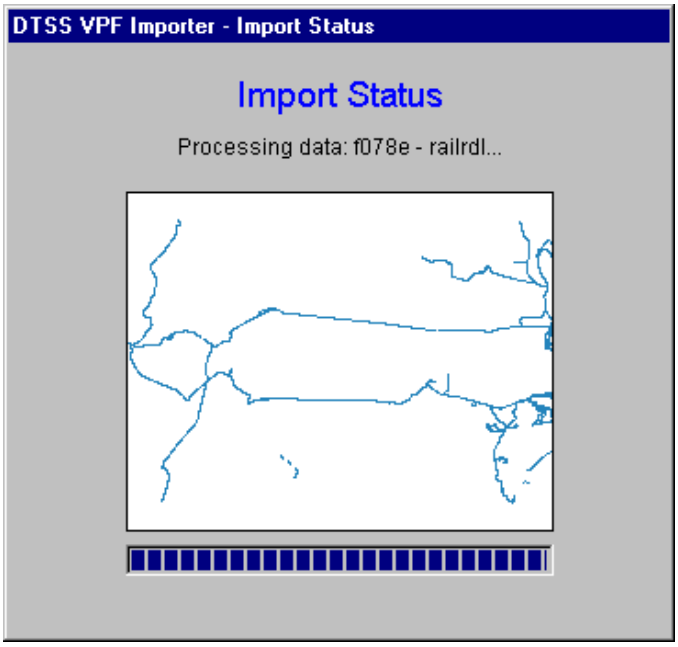


Figure 5-32 DTSS VPF Importer—Import Status Window

17. When the import process is complete, the **DTSS VPF Importer—Import Status Complete** window shown in Figure 5-33 will appear. Click ***Close*** to end the import session.

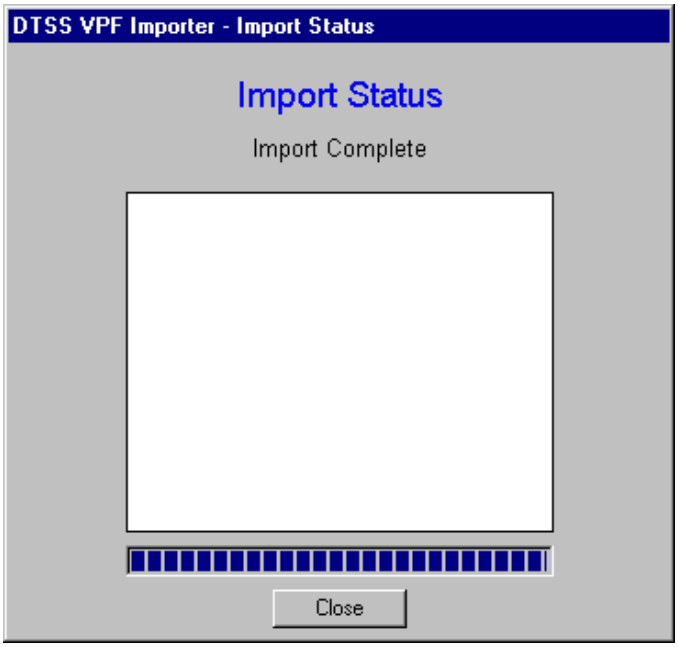


Figure 5-33 DTSS VPF Importer—Import Status Complete Window

18. If the option to add layers to a map was selected, the imported layers appear in the Table of Contents panel in ArcMap. The boxes beside the layers are unchecked by default, so no data is displayed in the Display panel. Check the layers to display, and then edit and display data as desired using ArcMap functionality (Figure 5-34).

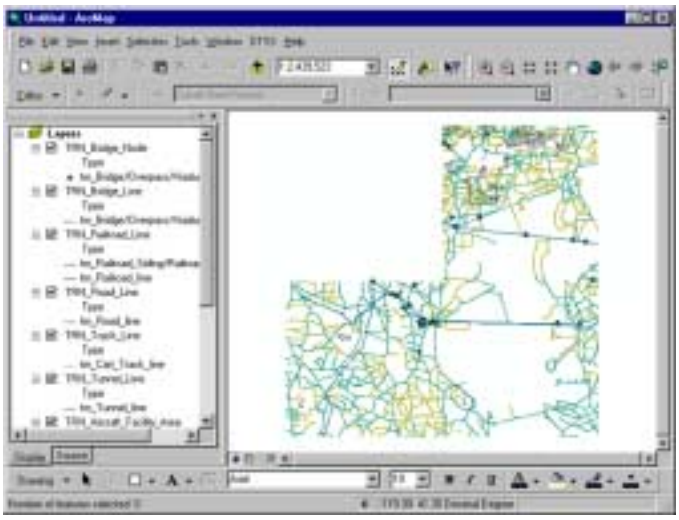


Figure 5-34 ArcMap Main Window Showing Imported Tiled Data

5.2.2.2 Importing VPF Data Into an Existing Geodatabase

In order to properly import data into the existing geodatabase, the file called "network" must be deleted from the desired existing geodatabase before running the importer wizard. To do this, follow the brief procedure below.

1. Close ArcMap and open ArcCatalog.
2. Navigate to and select the desired existing geodatabase. Double click the geodatabase to access the dataset.
3. Double click the dataset, select the "network" file, and right click on it.
4. Select ***Delete*** from the context menu to remove the "network" file. When the "network" file has been deleted, close ArcCatalog.

NOTE

If ArcMap is still open when the analyst deletes the "network" file in ArcCatalog, he/she will receive a message that the database is currently in use. Close ArcMap and proceed.

Once the "network" file has been successfully deleted from the geodatabase, import VPF into an existing geodatabase by following the procedure below.

1. To access the DTSS VPF Importer Wizard in ArcMap, select ***Import/VPF Importer*** from the **DTSS** menu. The **DTSS VPF Importer—Import Options** window will appear.

2. Select the "Add to existing" option under **Import Options** (Figure 5-35).



Figure 5-35 DTSS VPF Importer—Import Options Window

3. Click the ***Open File*** button ( ) to navigate to the desired existing geodatabase. Typing the path and name of the existing geodatabase, or dragging and dropping the geodatabase file from Windows Explorer, can also be done to enter the desired existing geodatabase in the "Select existing geodatabase" field.

4. Click ***Next***. The **VPF to Geodatabase Importer** window shown in Figure 5-36 appears. Notice the "Existing Layer(s)" panel displays the layers from the selected geodatabase.



Figure 5-36 VPF to Geodatabase Importer Window

5. No database information appears in the left panel of the window, but the analyst will see three data preview tabs, with the **Import** tab showing as the default. Click the ***Open Folder*** button ( ) located at the top left part of the window to navigate to the appropriate VPF database. The **Open VPF library** window shown in Figure 5-37 appears.

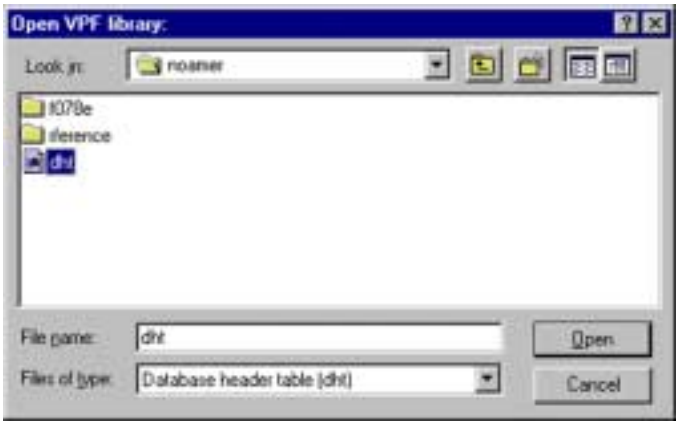


Figure 5-37 Open VPF Library Window

6. In this window, highlight the appropriate VPF Database Header Table (dht) file and click ***Open***. The window closes, returning to the **VPF to Geodatabase Importer** window.

7. The geodatabase and one or more library icons ( ) appear in the left panel of the **VPF to Geodatabase Importer** window (Figure 5-38). Double click on the geodatabase to hide or show the available libraries. Double click a library (or click the plus sign beside it) to show the available layer folders, which contain the available layer subtypes.



Figure 5-38 VPF to Geodatabase Importer Window

8. Click on the desired library icon (), or any of its layer folders to list the layers in the "Available Layers" panel to the right (Figure 5-39).

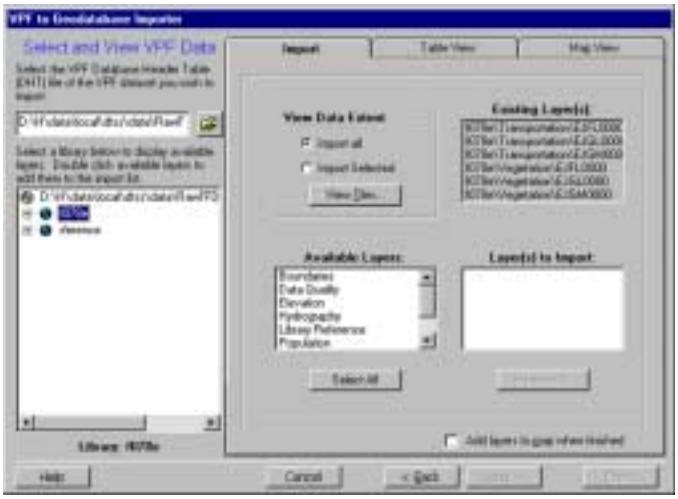


Figure 5-39 VPF to Geodatabase Importer Window

9. If the selected library contains data that is tiled, the "View Data Extent" area will become enabled. Tiled data is used to break down a larger area and decrease the size of the resultant geodatabase, though importing tiled data may take longer than with other data. If the selected library contains tiled data, use the substeps below.

    a. To view the tiles, click the ***View Tiles*** button. The **Select Tiles to Import** window will appear showing the available tiles (Figure 5-40).

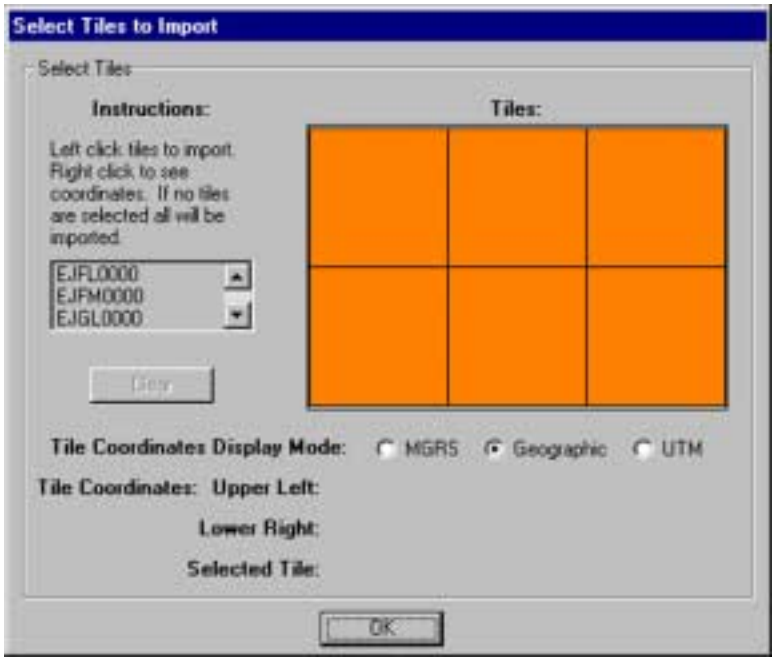


Figure 5-40 Select Tiles to Import Window

b. Click on the different tiles to view the coordinate information at the bottom of the window. Click ***OK*** when finished viewing the tiles to return to the **VPF to Geodatabase Importer** window.

c. To import all tiles, click the radio button next to "Import all."

d. To import only selected tiles, click the radio button next to "Import Selected," and then click the ***Select Tiles*** button. The **View Tiles to Import** window will appear again, allowing the user to select the desired tiles to import by left clicking the mouse on the tile (Figure 5-41). To view the coordinates of the tile without selecting it for import, right click the tile.

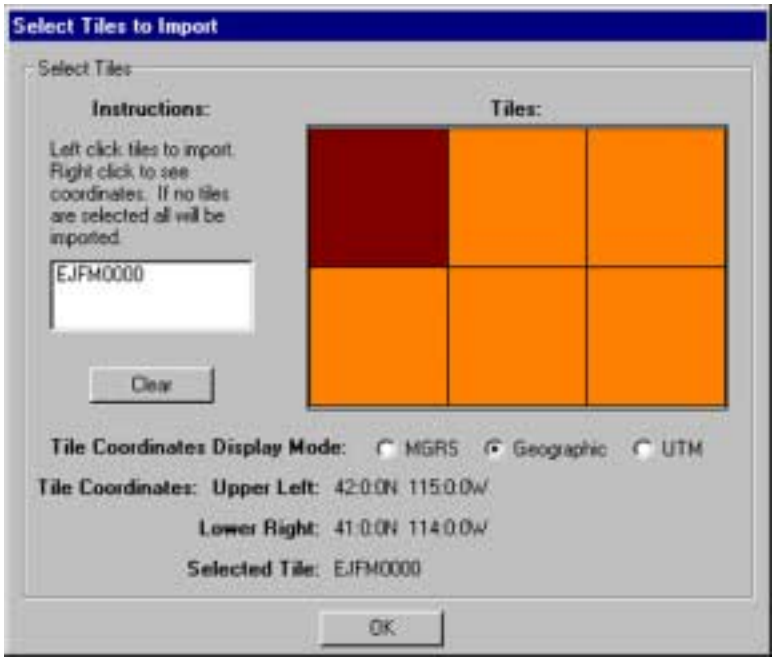


Figure 5-41 Select Tiles to Import Window

e. The selected tiles will appear in the box located on the left side of the window. Click the **Clear** button to remove the selections. When finished selecting the tiles to import, click ***OK*** to return to the **VPF to Geodatabase Importer** window. Only the selected tiles will be imported.

NOTE

*When adding tiles to an existing geodatabase, the selected tiles to import must cover the same geographical area as the tiles in the existing geodatabase. If different tiles are chosen, an error message will appear when the user clicks the **Finish** button.*

10. In the "Available Layers" panel, double click on any layer to move it to the "Layers to Import" panel (Figure 5-42). It is also possible to move all layers at once using the **Select All** and **Remove All** buttons below the panels.

NOTE

The layers in the "Existing Layer(s)" panel at the top right of the window will be imported along with the new layers selected in the "Layer(s) to Import" panel.

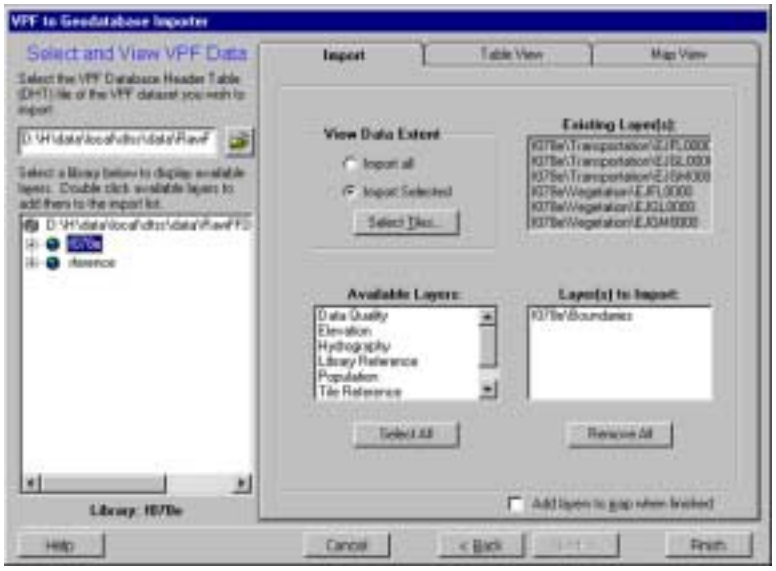


Figure 5-42 VPF to Geodatabase Importer Window

11. After selecting appropriate layers, data can be previewed using the **Table View** (Figure 5-43) and **Map View** (Figure 5-44) tabs. These tabs display data when one of the layer subtypes is highlighted in the left panel.

NOTE

*Neither the **Table View** nor the **Map View** tab enables the **Finish** button in the **VPF to Geodatabase Importer** window.*

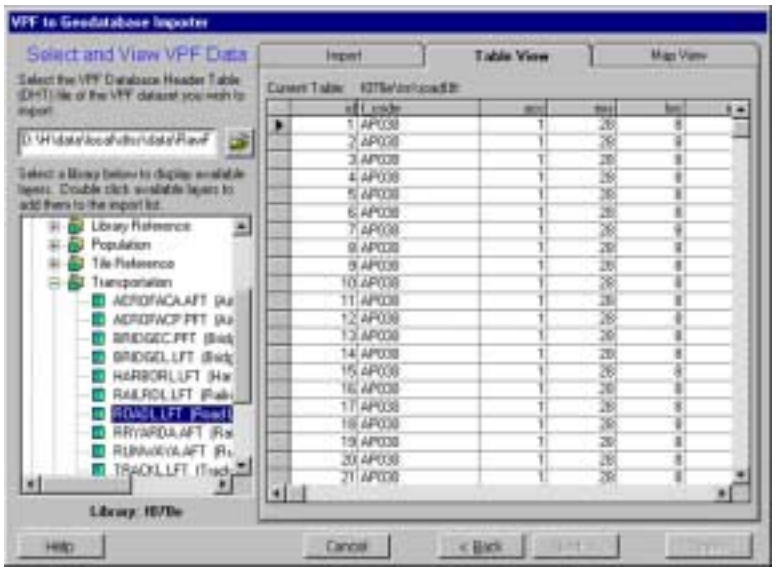


Figure 5-43 Table View Tab of VPF to Geodatabase Importer Window

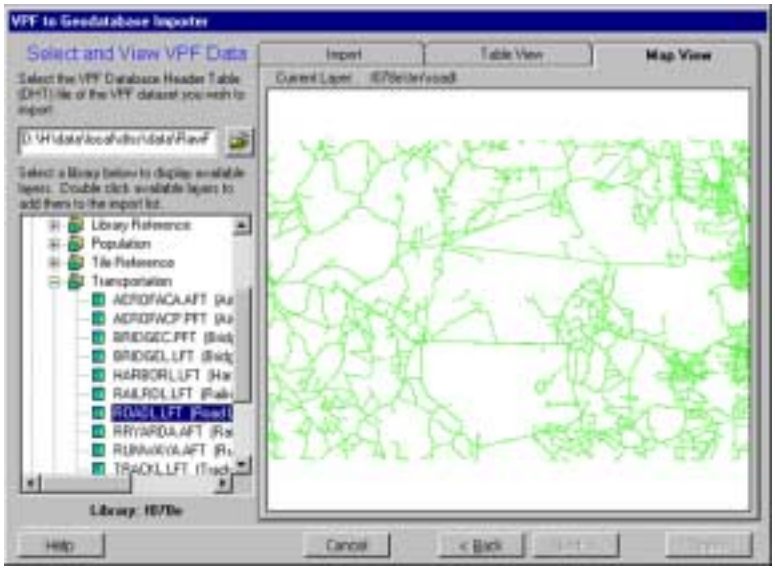


Figure 5-44 Map View Tab of VPF to Geodatabase Importer Window

12. Select other datasets and layers if desired. Datasets can be from different directories or removable drives.

NOTE

If importing a tile selection, multiple datasets cannot be selected because the other dataset would not match up with the tiled selection.

13. After previewing the data, go back to the **Import** tab. Click the mouse in the box next to "Add layers to map when finished" to have the layers display in ArcMap when the import process is complete.

14. Review the information in this window, and click the ***Back*** button to change any previous settings. When complete, click ***Finish***. The **DTSS VPF Importer—Import Status** window (Figure 5-45) will appear. During import, a status bar appears in the window, indicating progress in data processing. Importing a database will take several minutes.

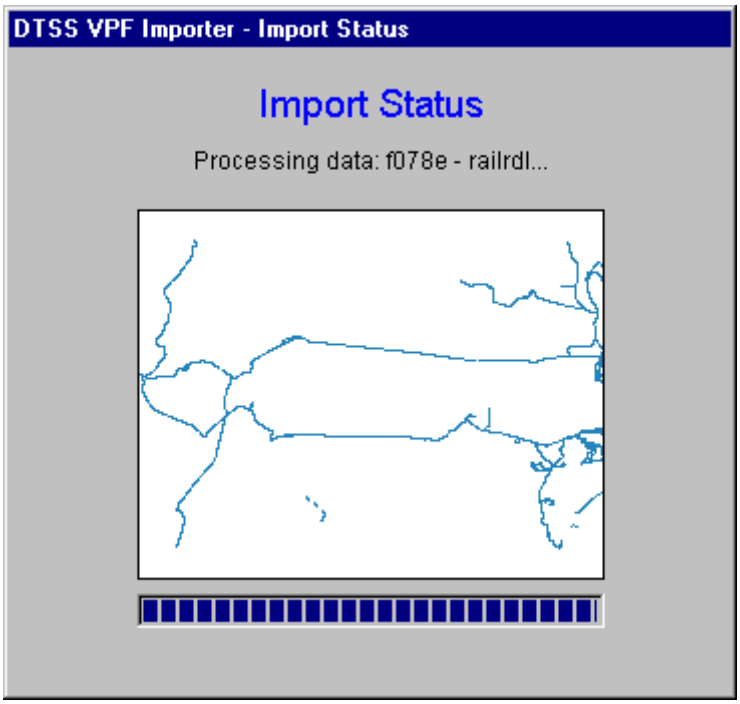


Figure 5-45 DTSS VPF Importer—Import Status Window

15. When the import process is complete, the **DTSS VPF Importer—Import Status Complete** window shown in Figure 5-46 will appear. Click ***Close*** to end the import session.

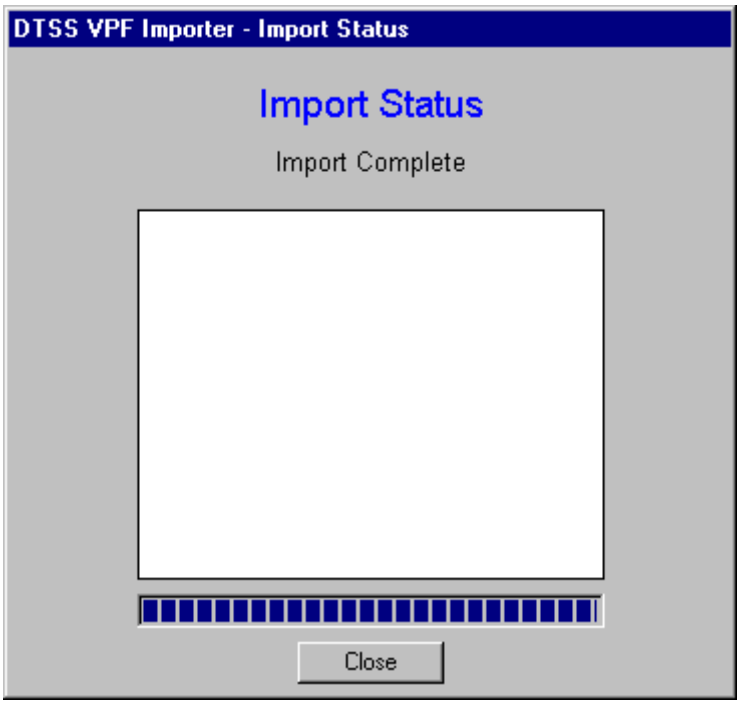


Figure 5-46 DTSS VPF Importer—Import Status Complete Window

16. If the option to add layers to a map was selected, the imported layers appear in the Table of Contents panel in ArcMap. The boxes beside the layers are unchecked by default, so no data appears in the Display panel. Check the layers to display, and then edit and display data as desired using ArcMap functionality (Figure 5-47).

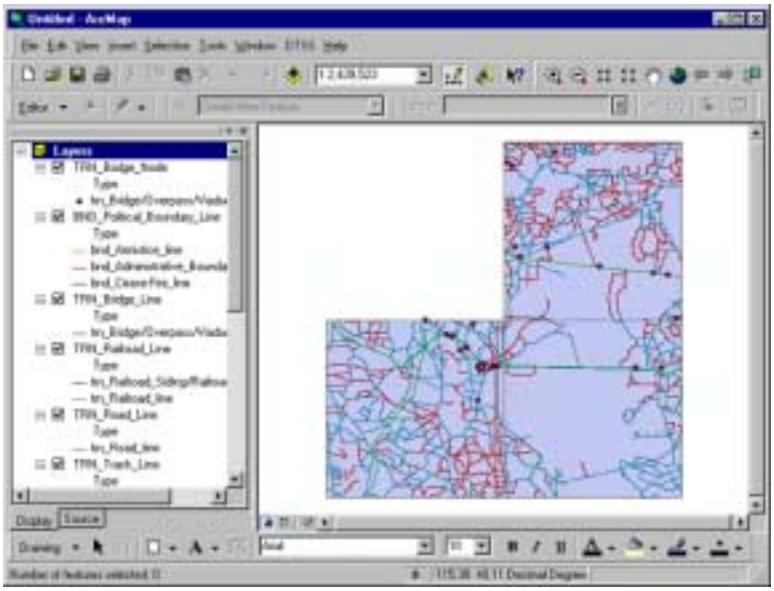


Figure 5-47 ArcMap Main Window Showing Import of Tiled Data

5.2.3 Importing Data With ArcInfo

ArcCatalog and ArcToolbox each contain tools to import spatial data to coverages, shapefiles, and geodatabases and from coverages and shapefiles into a geodatabase. They also contain tools for importing nonspatial data from INFO and dBASE tables. Tables, coverages, and shapefiles can also be imported in other ways.

When importing data into a geodatabase, it is recommended to use the tools provided by ArcCatalog or ArcToolbox, or a custom application written with the ArcInfo COM components. When a shapefile or coverage is imported using an ArcCatalog or ArcToolbox tool, a geodatabase feature class is created to store the features. This feature class stores both the geometry and attributes from the input data. The feature class is automatically registered with the geodatabase system tables so that it can participate in relationships and geometric networks, have validation rules, and so on. Similarly, when a table is imported, a table is created in the geodatabase and automatically registered with the geodatabase system tables. Coverages and shapefiles are imported into ESRI simple feature classes. INFO and dBASE tables are imported into ESRI simple row tables.

Any table, shapefile, or coverage that is imported by some other mechanism will not be registered with the geodatabase system tables and will therefore not be a true geodatabase feature class or table. ArcInfo has tools to automatically register these feature classes and tables with the geodatabase.

For more information on importing spatial data in ArcInfo, refer to ArcCatalog and ArcToolbox online Help or printed documentation.

5.2.4 Importing Data With Imagine

Imagine supports the import and export of many different data types and formats. The **Import/Export** window enables the user to import or export all data types supported. The supported data types in the **Import/Export** window change according to whether **Import** or **Export** is chosen. Some data types may not be supported, depending upon the platform and the modules installed. The media type selected is dependent upon the data type being imported. Certain media types can only import certain data types. Once the user selects the desired data type, media, and output file name, the **OK** button will be enabled. Clicking on the ***OK*** button will initiate the specific import or export window for the selected data type.

The import processes for the following commonly used raster data types are covered in the sections below.

- ADRG - Imports ARC Digitized Raster Graphics data from CD-ROM only.
- DTED - Imports Digital Terrain Elevation Data from tape, file, or CD-ROM.
- RPF - Imports Raster Product Format frames that are distributed by the Defense Mapping Agency (DMA).

5.2.4.1 Importing ARC Digitized Raster Graphics (ADRG) Data

Use the steps below to import ADRG in Imagine.

1. With Imagine open on the desktop, click the **Import/Export** icon () from the Imagine icon panel. The **Import/Export** window will appear (Figure 5-48).

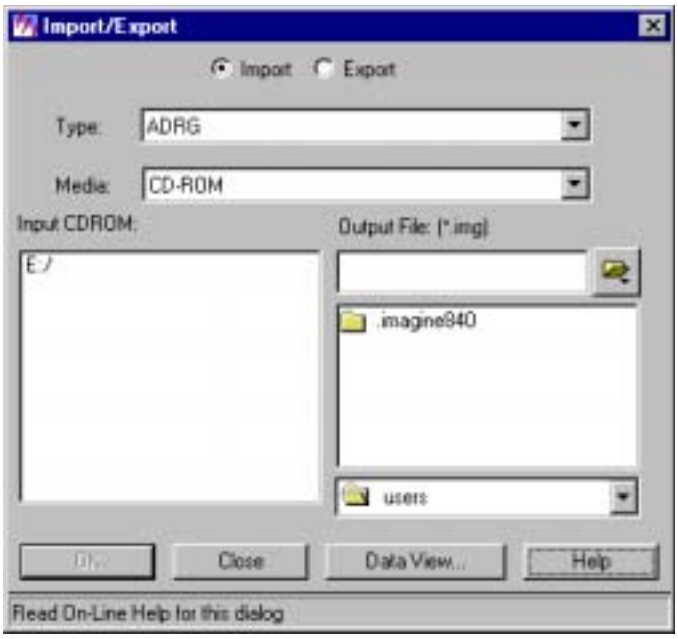


Figure 5-48 Import/Export Window

2. Click the radio button next to “Import” to import data into Imagine.

3. Select **ADRG** from the “Type” dropdown menu. For more information on the different data types, click the **Help** button to view Imagine’s online Help, or refer to the *Imagine 8.4 Field Guide.*

4. Click the “Media” dropdown menu to select the media from which the data is being imported: CD-ROM, Tape, or File. Not all data types can be imported from all media types. If the selected data type cannot be imported from a particular media type, an error message will appear informing the user the media type is not supported. ADRG imports from CD-ROM only, so select **CD-ROM**.

5. Select the appropriate name for the input file. The CD device name must be selected from the list that is opened (example: E:/). Click on the device name to select it.

6. In the “Output File” field, enter the name for the output file (the name of the file as it will appear in Imagine). Type the name manually or select the name from the **Open File** icon ( ) or the file navigation panels located below the “Output File” field on the right-hand side of the window. The appropriate Imagine default file extension will be appended to raster output files.

7. Input data can be analyzed before importing, using the **Data Viewer** button. This function allows the user to view the raw data on the source file or tape, including any header information. For more information on using the Data

Viewer, click the **Help** button to view Imagine's online Help, or refer to the *Imagine 8.4 Field Guide*.

8. Click ***OK*** to use the options selected and open the file-specific **Import ADRG** window (Figure 5-49)



Figure 5-49 Import ADRG Window

9. The **Import ADRG** window contains information about the selected image. Select the Distribution Rectangle and/or Zone Distribution Rectangle (ZDR) to import from by clicking the mouse on the desired item in the "Distribution Rectangles" and "ZDRs" fields.

10. Click the appropriate radio button to indicate what type of ADRG image to import. The **Import ADRG** window will change to show the appropriate information based on which radio button is selected. Each import item is listed below.

    - ZDR Image—Imports Zone Distribution Rectangles.
    - Legend Image—Imports descriptive data from the source image (legends, map scales, etc.).
    - Overview Image—Imports a 16:1 reduced overview of the entire scene.

11. The **Import ADRG** window also offers preview and import options that the user can select. If desired, click ***Preview Options*** to view settings in the **Preview Options** window (Figure 5-50).



Figure 5-50 Preview Options Window

12. The **Preview Options** window allows the user to import a reduced version of the image file. The image can be viewed before importing to be sure that it is the desired image, or to define a subset area of the image to import. This window is the same for all Imagine importers. When finished, click ***OK*** to close the window and return to the **Import ADRG Data** window.

13. To preview the image, select ***Preview*** from the **Import ADRG Data** window. A job status window opens, indicating the progress of the function. When complete, the job status window automatically closes. A **Viewer** window similar to the one shown in Figure 5-51 appears and displays the preview image.



Figure 5-51 ADRG Preview Image in Viewer Window

14. If desired, click ***Import Options*** from the **Import ADRG Data** window to view settings in the **Import Options** window (Figure 5-52).

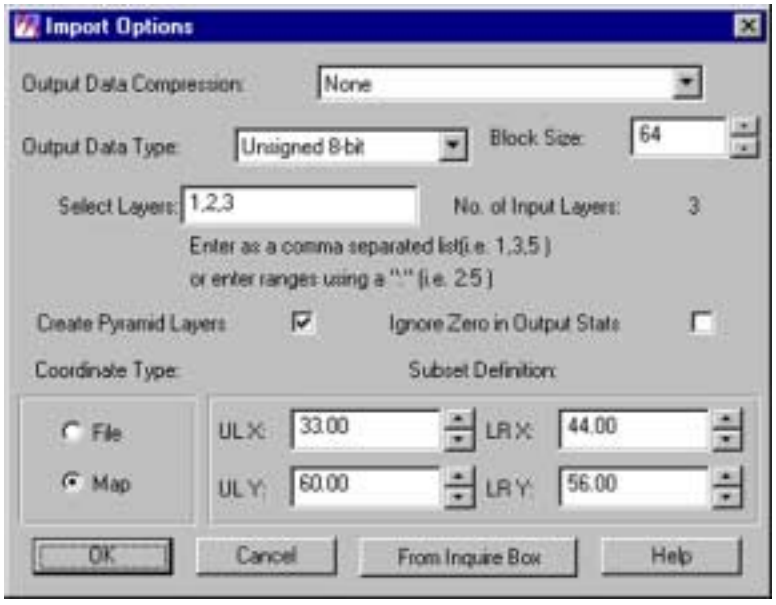


Figure 5-52 Import Options Window

15. The **Import Options** window allows the user to select options for importing *.img* files. This window is the same for all Imagine importers. For information on any field in this window, click the **Help** button or refer to *Imagine 8.4 Tour Guide*.

16. Select ***Utility/Inquire Box*** from the Viewer menu bar. The **Inquire Box Coordinates** window opens (Figure 5-53) and a rectangular box is displayed in the center of the Viewer.

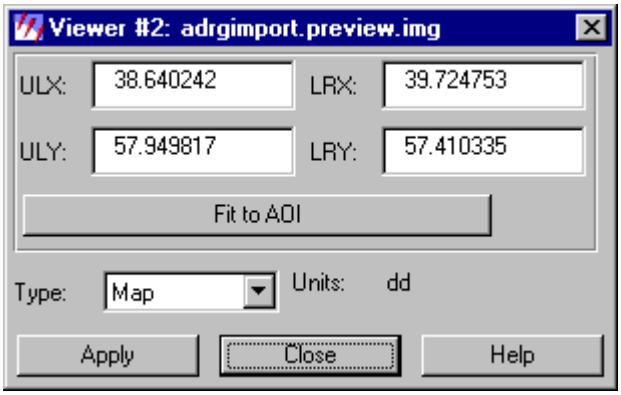


Figure 5-53 Inquire Box Coordinates Window

17. To select a subset area to be imported, move and resize the rectangular Inquire Box in the Viewer. To resize the Inquire Box, hold and drag on the sides or

corners of the box. To move the Inquire Box, hold and drag in the center of the box. The coordinates update in the **Inquire Box Coordinates** window.

18. When the subset area has been selected, click the ***From Inquire Box*** button at the bottom of the **Import Options** window. The "Subset Definition" coordinates located in the bottom right portion of the window will update with the selected subset coordinate information.

NOTE

The image in the Viewer window with the Inquire Box must display the same geographical area as the data being imported. If not, an error message will appear.

19. Click ***OK*** in the **Import Options** window.

20. Click ***OK*** in the **Import ADRG** window to import the data. The **Job Status** window appears indicating progress of the import process.

21. When the **Job Status** window indicates that import has completed, click ***OK***. The output file can be opened and displayed in a Viewer window.

For more information on importing data in Imagine, refer to Imagine's online Help or printed documentation.

5.2.4.2 Importing Digital Terrain Elevation Data (DTED)

Any standard DTED format can be imported using the steps below.

1. With Imagine open on the desktop, click the **Import/Export** icon () from the Imagine icon panel. The **Import/Export** window will appear (Figure 5-54).

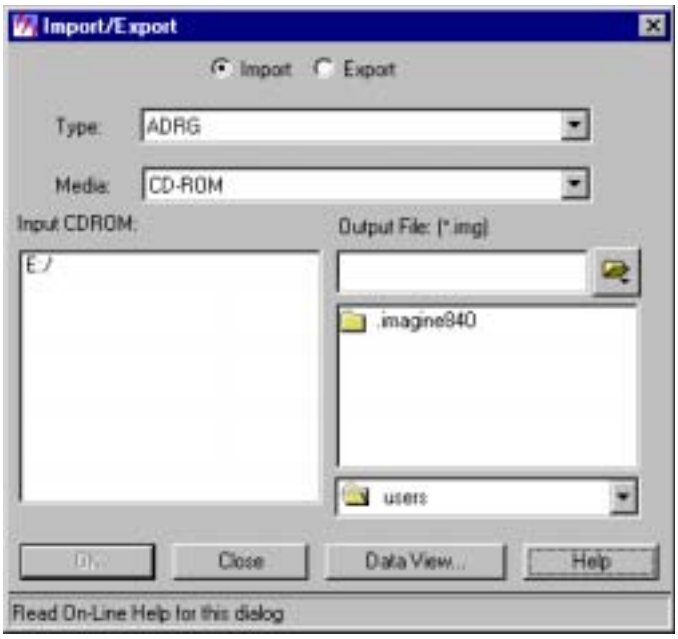


Figure 5-54 Import/Export Window

2. Click the radio button next to “Import” to import data into Imagine.

3. Select **DTED** from the “Type” dropdown menu. For more information on the different data types, click the **Help** button to view Imagine’s online Help, or refer to the *Imagine 8.4 Field Guide*.

4. Click the “Media” dropdown menu to select the media from which the data is being imported: CD-ROM, Tape, or File. Not all data types can be imported from all media types. If the selected data type cannot be imported from a particular media type, an error message will appear informing the user the media type is not supported.

5. Select the appropriate name for the input file. Depending on the selection, one of the following would apply.

   - Input File: Enter the name of the input file. Type the name manually or select the name from the file name part.

   - Input Device: When importing data, if Tape was selected as the media source, the name of the input device tape drive must be selected from the list that is opened. Click on the device name.

   - Input CD-ROM: If CD-ROM was selected as the media source, the CD device name must be selected from the list that is opened (example: E:/). Click on the device name to select it.

6. In the "Output File" field, enter the name for the output file (the name of the file as it will appear in Imagine). Type the name manually or select the name from the **File Open** icon ( ) or the file navigation panels located below the "Output File" field on the right-hand side of the window. The appropriate Imagine default file extension will be appended to raster output files.

7. Input data can be analyzed before importing, using the **Data Viewer** button. This function allows the user to view the raw data on the source file or tape, including any header information. For more information on using the Data Viewer, click the **Help** button to view Imagine's online Help, or refer to the *Imagine 8.4 Field Guide*.

8. Click ***OK*** to use the options selected and open the file-specific **Import DTED Data** window (Figure 5-55). The window may appear different, depending on the data selected.



Figure 5-55 Import DTED Data Window

9. The **Import DTED Data** window contains information about the selected image. It also offers preview and import options that the user can select. If desired, click ***Preview Options*** to view settings in the **Preview Options** window (Figure 5-56).

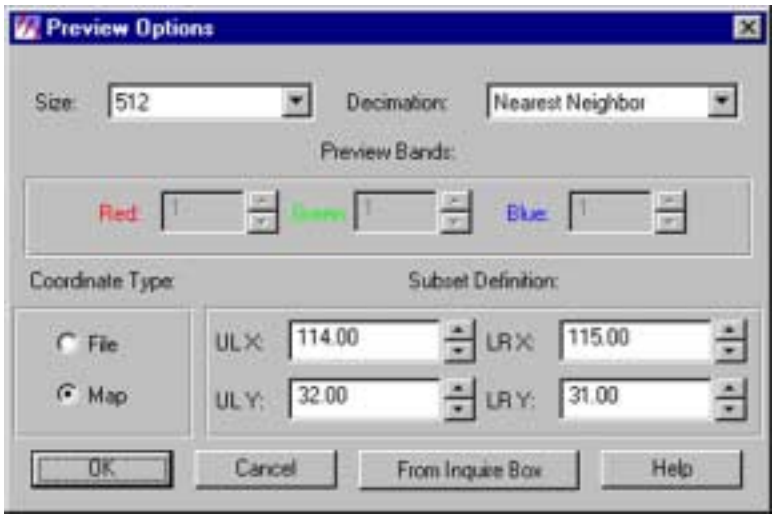


Figure 5-56 Preview Options Window

10. The **Preview Options** window allows the user to import a reduced version of the image file. The image can be viewed before importing to be sure that it is the desired image, or to define a subset area of the image to import. This window is the same for all Imagine importers. When finished, click ***OK*** to close the window and return to the **Import DTED Data** window.

11. To preview the image, select ***Preview*** from the **Import DTED Data** window. A job status window opens, indicating the progress of the function. When complete, the job status window automatically closes. A **Viewer** window similar to the one shown in Figure 5-57 appears and displays the preview image.



Figure 5-57 DTED Preview Image in Viewer Window

12. If desired, click ***Import Options*** from the **Import DTED Data** window to view settings in the **Import Options** window (Figure 5-58).

NOTE

The image in the Viewer window with the Inquire Box must display the same geographical area as the data being imported. If not, an error message will appear.

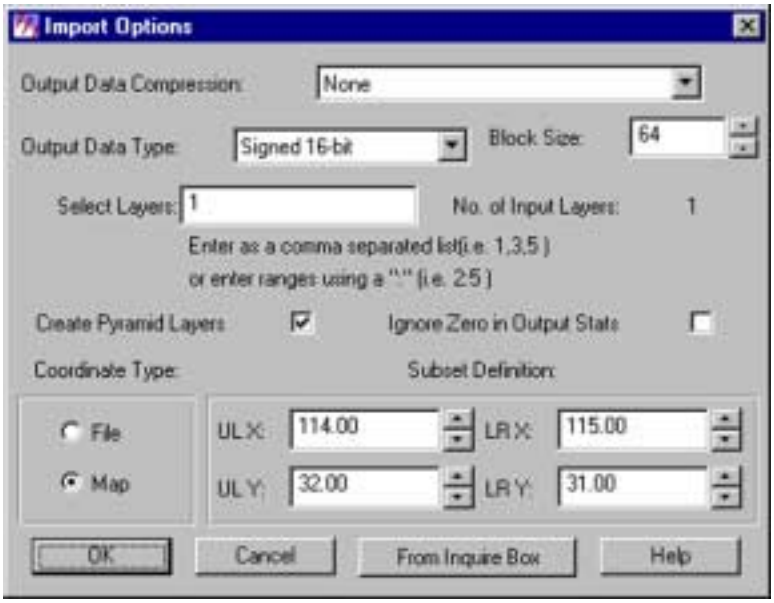


Figure 5-58 Import Options Window

13. The **Import Options** window allows the user to select options for importing *.img* files. This window is the same for all importers. For information on any field in this window, click the **Help** button or refer to *Imagine 8.4 Tour Guide*. When finished, click ***OK*** to close the window and return to the **Import DTED Data** window.

14. Click ***OK*** to import the data. The **Job Status** window appears indicating progress of the import process.

15. When the **Job Status** window indicates that import has completed, click ***OK***. The output file can be opened and displayed in a Viewer window.

For more information on importing data in Imagine, refer to Imagine's online Help or printed documentation.

5.2.4.3 Importing Raster Product Format (RPF) Data

NOTE

Imagine can view RPF data natively. In the Viewer window, select RPF as "Files of Type," and do NOT have "Fit to Frame" checked.

Use the steps below to import RPF in Imagine.

1. With Imagine open on the desktop, go to Session/Preferences/RPF Image Files. Make sure that the "Use Geographic coordinates (Lat/Long)" option is checked.

2. Click the **Data Prep** icon () from the Imagine icon panel. The **Data Preparation** window will appear (Figure 5-59).



Figure 5-59 Data Preparation Window

3. Select ***Mosaic Images***. The **Mosaic Tool** window will appear (Figure 5-60).

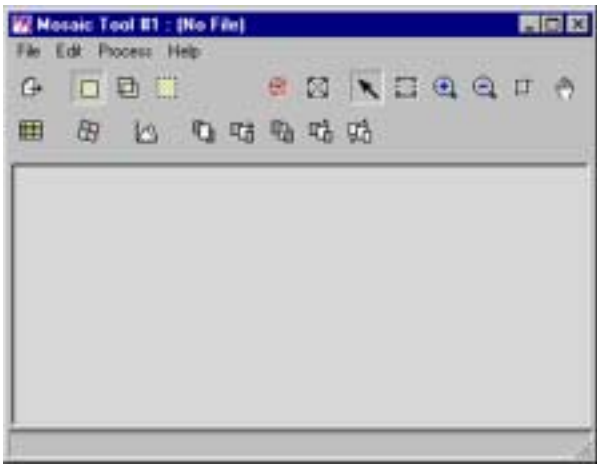


Figure 5-60 Mosaic Tool Window

4. Select ***Edit/Add Images*** from the **Mosaic Tool** menu bar. The **Add Images for Mosaic** window will appear (Figure 5-61).

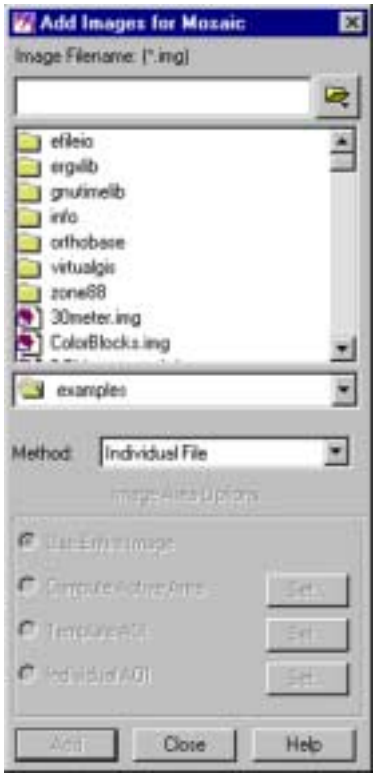


Figure 5-61 Add Images for Mosaic Window

5. Click the **File Open** icon ( ) to the right of the "Image Filename" field, located at the top of the window, to open the **Image Filename** window (Figure 5-62).

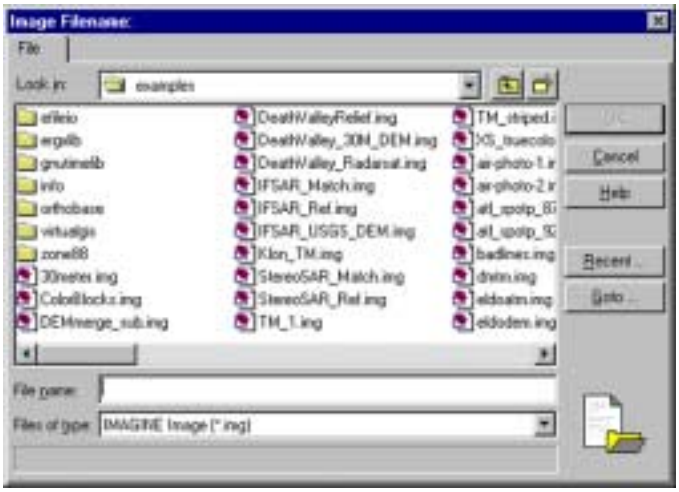


Figure 5-62 Image Filename Window

6. Select **RPF Cell** in the "Files of type" dropdown menu at the bottom of the window.

7. Navigate to the appropriate file to import, and click on the file. The file name will appear in the "File name" field, as shown in Figure 5-63.

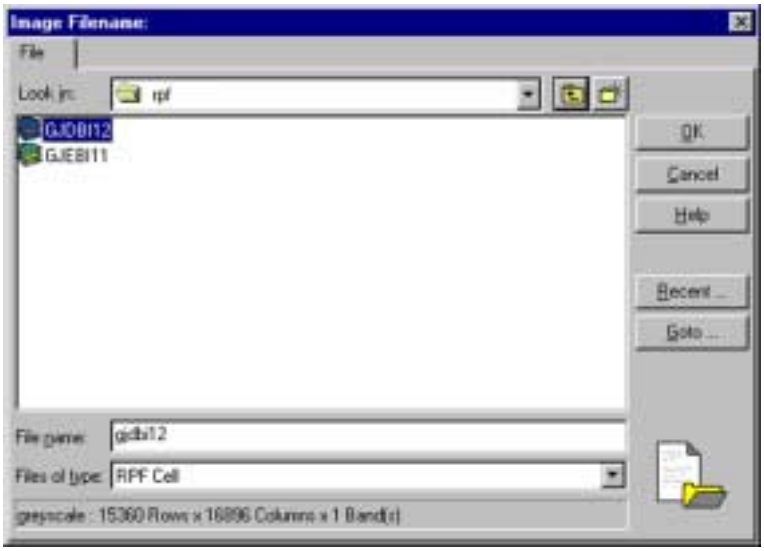


Figure 5-63 Image Filename Window Showing File Selected

8. Click ***OK***. The selected file(s) will appear in the **Add Images for Mosaic** window (Figure 5-64).



Figure 5-64 Add Images for Mosaic Window Showing Files Selected

9. Select the appropriate options. For information on any field in this window, click the **Help** button or refer to *Imagine 8.4 Tour Guide*.

10. When finished, click ***Add***. The selected image file will appear in the **Mosaic Tool** window (Figure 5-65).

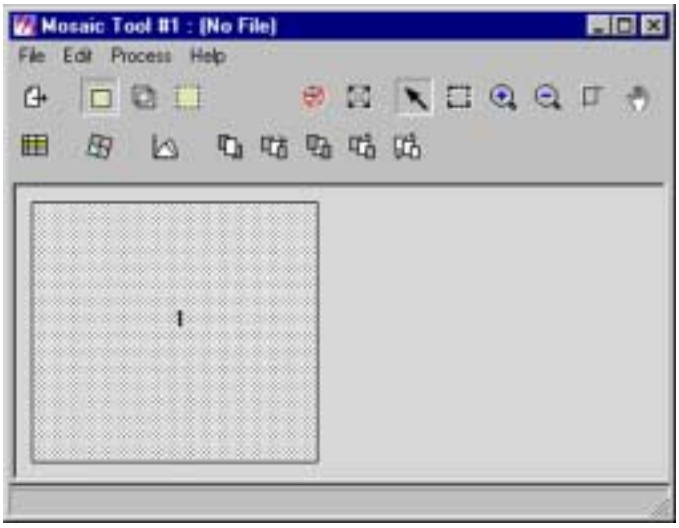


Figure 5-65 Mosaic Tool Window Showing Selected File

11. The **Add Images for Mosaic** window remains open. To add another file to the **Mosaic Tool** window, select the filename and click ***Add***. When finished adding files, click ***Close*** to close the **Add Images for Mosaic** window.

12. Check ***Edit/Output Options***. Make sure that WGS84 is set as the spheroid and datum on the **Custom** tab.

13. Click ***Process/Run Mosaic*** from the **Mosaic Tool** menu bar. The **Run Mosaic** window will appear (Figure 5-66).

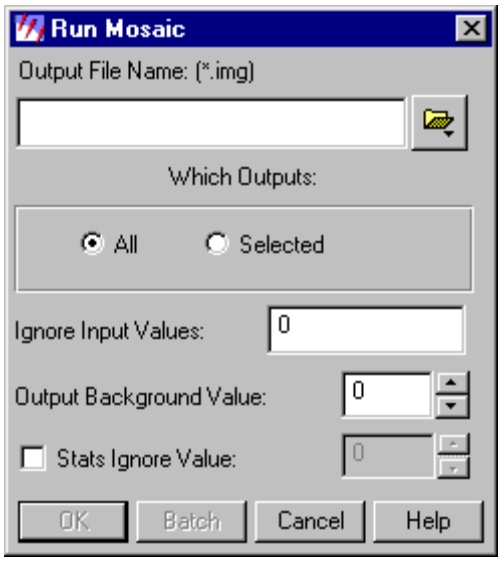


Figure 5-66 Run Mosaic Window

14. Enter the new name for the output file in the "Output File Name" field. Type the name manually, or navigate to the appropriate name and directory using the **File Open** icon ( ). Imagine will automatically append the appropriate file extension to the file.

15. Select the appropriate options. For information on any field in this window, click the **Help** button or refer to *Imagine 8.4 Tour Guide*.

16. When finished, click ***OK***. The **Job Status** window appears.

17. When the Job Status window indicates that the process has completed, click ***OK***. The file will reside in the selected directory.

For more information on importing data in Imagine, refer to Imagine's online Help or printed documentation.

5.3 Scan

Wide Image is a full-featured scanning software package with image enhancement, editing, and conversion capabilities. Images may be scanned in many different file formats and data types. The software is capable of scanning the full range of hardcopy products from black-and-white overlays to topographic maps and full-color aerial photography.

5.3.1 User Interface

The Wide Image user interface is designed with the typical workflow in mind. To open Wide Image, click the **Start** button from the Windows taskbar, and select ***Programs/ WIDEimage/WIDEimage***. The **Wide Image** window will appear. Tasks are divided into scanning, viewing, and feature extraction. Each of these functional areas is available on a separate tab in the main window. An image may be scanned, manipulated, and saved in different formats with a combination of the features from each of these tabs.

The Wide Image interface may be divided into the six basic functional areas shown in Figure 5-67.

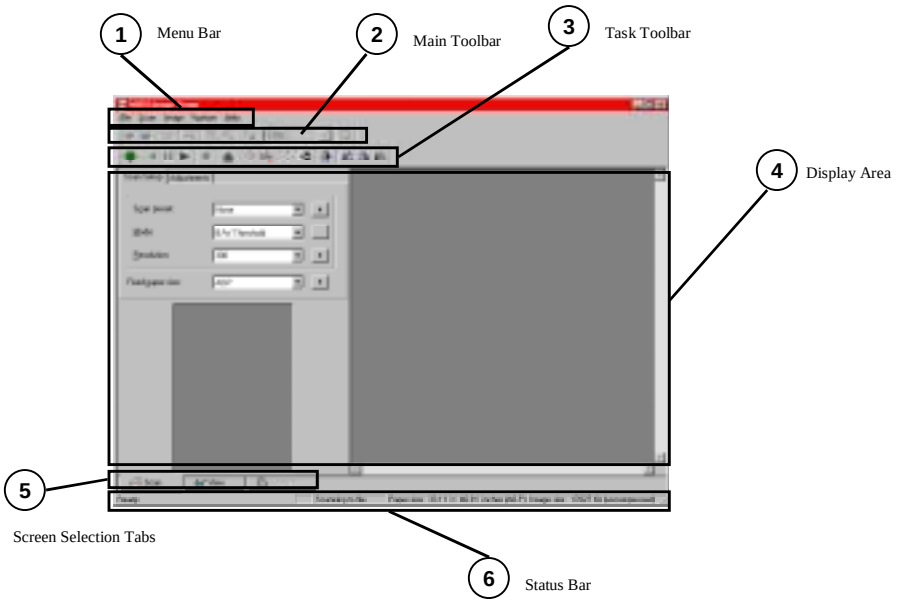


Figure 5-67 Wide Image Window

5.3.1.1 Menu Bar

The **Menu** bar (Item 1 in Figure 5-67) contains a standard Windows menu system, with access to most of the functions available in the Wide Image software. Table 5-1 briefly describes the menus of the program and their associated commands.

Table 5-1 Wide Image Menus and Commands

Menu	Associated Commands
File	Accesses the following commands: **Open**, **Close**, **Save**, **Save As**, **Properties**, **Print**, **Batch Print**, **Batch Convert**, **Preferences**, and **Exit**.
Scan	Accesses the following commands: **Scanner Setup**, **Scan To File**, **Scan to Viewer**, **Scan to Printer**, **Batch Scan**, **Calibrate Scanner**, and **Aperture Card Setup**.
Image	Accesses the following commands: **Brightness/Contrast**, **Histogram Stretch**, **Hue/Saturation/Value**, **Red/Green/Blue**, **Grayscale**, **Classify**, **Decrease Colors/Graytones**, **Count Colors**, and **Scale**.
Feature	Accesses the following commands: **Create LUT**, **Load LUT**, **Close LUT**, **Save LUT**, **Import Colors**, **Histogram Sorting**, and **Color Space**.
Help	Accesses the following commands: **Contents**, **Scanning Tasks**, and **About**.

For more information on any command or menu item in the Wide Image software, refer to the program's online Help or printed user documentation.

5.3.1.2 Main Toolbar

The **Main** toolbar (Figure 5-68) is constant throughout the different windows of the Wide Image interface. It provides file operations and tools to alter the image display scale.



Figure 5-68 Wide Image Main Toolbar

Table 5-2 lists the buttons found in the **Main** toolbar and the associated functions for each. For more information on toolbar functionalities, refer to Wide Image's online Help or printed user documentation.

Table 5-2 Main Toolbar Functions

Button	Name	Function
	Open	Opens image for editing.
	Save	Saves current image.
	Print	Prints current image.
	Zoom Area	Zooms in to user-defined box.
	Zoom In	Zooms in on image by fixed ratio.

Table 5-2 Main Toolbar Functions (Cont'd)

Button	Name	Function
	Zoom Out	Zooms out on image by fixed ratio.
	Birdseye	Interacts with zoom box while displaying entire image.
	Zoom Factor	Allows user to zoom in by defined zoom factor.
	Zoom Grid	Places grid in viewer when zoomed in closely, to aid in differentiating pixels.

5.3.1.3 Scan Window

The **Scan** window is the control center for prescanning and scanning tasks. The **Scan** window is displayed in the **Wide Image** main window when the **Scan** tab is selected at the bottom left of the main window. Aside from the common interface elements, the **Scan** window can be divided into the functional areas shown in Figure 5-69.

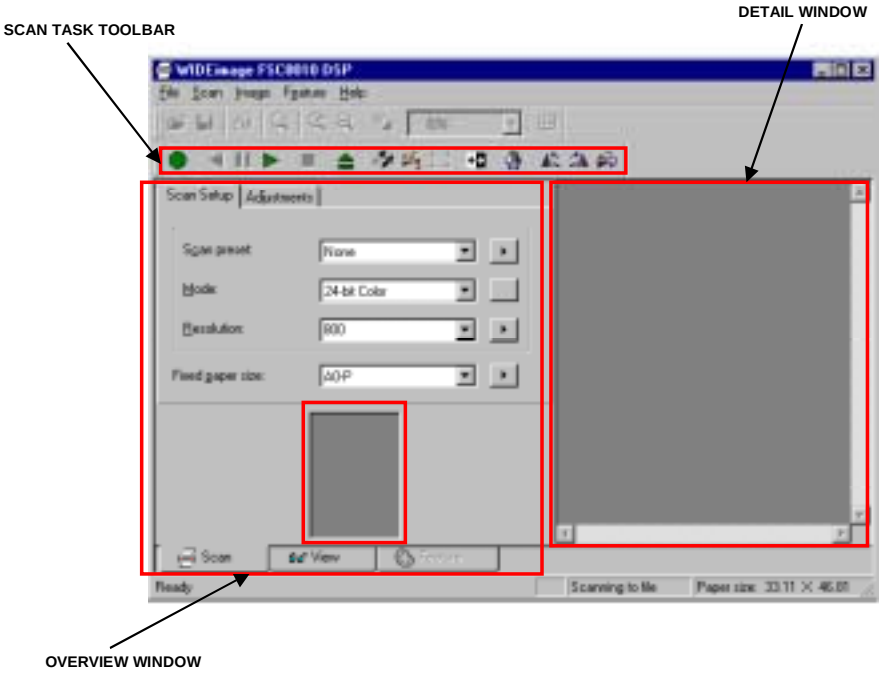


Figure 5-69 Scan Portion of Wide Image Window

5.3.1.3.1 Scan Task Toolbar

The **Scan Task** toolbar (Figure 5-70) is displayed only when using the **Scan** window. This toolbar contains the tools needed during prescanning and final scanning. These tools are discussed in Section 5.3.4, *Scanning an Image*.



Figure 5-70 Scan Task Toolbar

Table 5-3 lists the buttons found in the **Scan Task** toolbar and the associated functions for each. For more information on toolbar functionalities, refer to Wide Image's online Help or printed user documentation.

Table 5-3 Scan Task Toolbar Functions

Button	Name	Function
	Scan	Scans the image to the current target (viewer, file, or printer).
	Backward	Pulls the original backward across the scanning surface.
	Halt	Pauses the movement of the original in the scanner.
	Forward	Pulls the original forward across the scanning surface.
	Stop	Stops scanning.
	Eject	Unloads the original from the scanner.
	B/W Point	Sets black and white points for the current image.
	Align Image	Interactively aligns the image.
	Area Scan	Defines a bounding box to limit the scan area.
	Invert	Inverts the colors or grayscale values of the image.
	Mirror	Mirrors or flips the image horizontally.
	Flip	Flips image vertically.
	Rotate Left	Rotates image 90 degrees to the left.
	Rotate Right	Rotates image 90 degrees to the right.

Table 5-3 Scan Task Toolbar Functions (Cont'd)

Button	Name	Function
	Upside Down	Rotates image 180 degrees.

5.3.1.3.2 Scan Panel

The Scan panel is found at the upper left side of the **Scan** window, under the **Scan Task** toolbar. This panel is used to set options for scanning and prescanning. The scanning mode, resolution, and scan presets are all set in the Scan panel.

5.3.1.3.3 Overview and Detail Windows

During prescanning and scanning, the **Scan** window displays the full image being scanned. A movable position indicator in the **Overview** window is linked to the **Detail** window, which shows a magnified view of the image. Moving the position indicator in the **Overview** window automatically updates the **Detail** window.

5.3.1.4 View Window

Once an image has been scanned, it is loaded into the **View** window. The **View** window is displayed in the **Wide Image** main window when the **View** tab is selected. From this point, all post-scan image manipulation functions take place. Images that have been previously scanned or obtained in some other way may be loaded into the software from the **View** window. The **View** window can be divided into the functional areas shown in Figure 5-71.

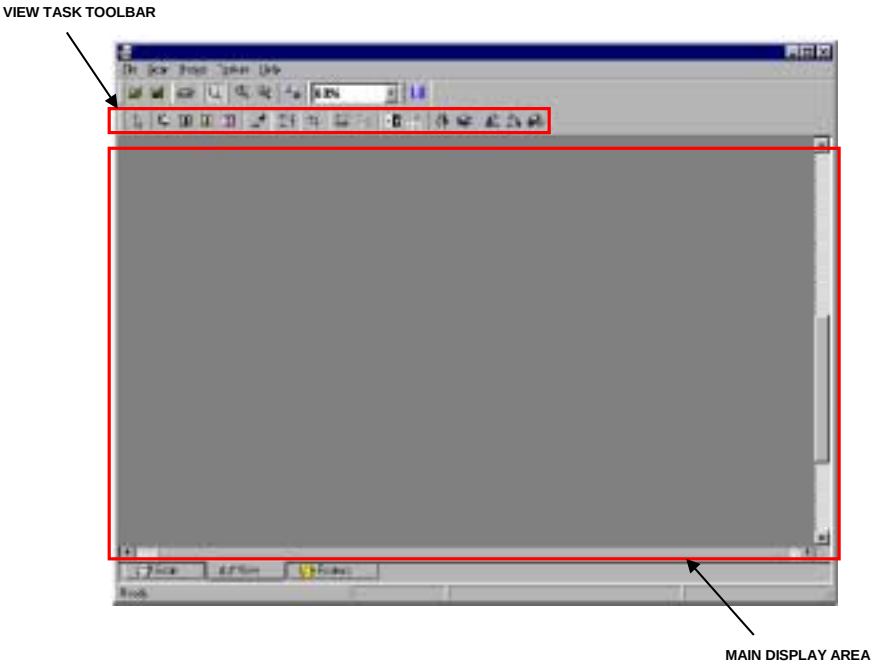


Figure 5-71 View Window in Wide Image Window

5.3.1.4.1 View Task Toolbar

The **View Task** toolbar is displayed only when using the **View** window. This toolbar contains tools for manipulation, measurement, and image enhancement. The buttons shown as grayed out in Figure 5-72 are only available when an image is loaded into the viewer.



Figure 5-72 View Task Toolbar

Table 5-4 lists the buttons found in the **View Task** toolbar and the associated functions for each. For more information on toolbar functionalities, refer to Wide Image's online Help or printed user documentation.

Table 5-4 View Task Toolbar Functions

Button	Name	Function
	Standard Cursor	Toggles off any tools and returns to standard cursor.

Table 5-4 View Task Toolbar Functions (Cont'd)

Button	Name	Function
	Main View	Switches to **Main** (image display) view.
	Viewboard 1, 2, 3	Switches to different viewboards.
	Pick Color	Picks a color from **Main**, **Histogram** or **Color Wheel** view.
	Rectangle Select	Defines bounding box to limit current action.
	Crop	Crops image to user-defined box.
	Measure	Performs interactive measurements on the window.
	Align	Interactively aligns image.
	Invert Colors	Inverts colors or grayscale values of an image.
	Despeckle	Performs Despeckle filter.
	Mirror	Mirrors or flips image horizontally.
	Flip	Flips image vertically.
	Rotate Left	Rotates image 90 degrees to the left.
	Rotate Right	Rotates image 90 degrees to the right.
	Upside Down	Rotates image 180 degrees.

5.3.1.4.2 View Window Main Display Area

The **View** window main display area displays the current image and provides an environment for performing the functions contained in the **View Task** toolbar. The standard image navigation tools from the **Main** toolbar are used in this window.

5.3.1.5 Feature Window

The **Feature** window is actually a collection of three separate views that are accessible from the **Feature Task** toolbar. The **Feature** window is displayed in the **Wide Image** main window when the **Feature** tab is selected at the bottom left of the main window. This window is designed to facilitate Lookup Table (LUT) editing. Most serious LUT editing tasks require the user to switch between the three views. The **Feature Task** toolbar grants access to the three different views.

5.3.1.5.1 Feature Task Toolbar

The **Feature Task** toolbar (Figure 5-73) is displayed only when using the **Feature** window. The tools contained in this toolbar are used to manipulate color LUTs for use in feature extraction. These tools are discussed in detail in Section 5.3.5, *Feature Extraction*.



Figure 5-73 Feature Task Toolbar

Table 5-5 lists the buttons found in the **Feature Task** toolbar and the associated functions for each. For more information on toolbar functionalities, refer to Wide Image's online Help or printed user documentation.

Table 5-5 Feature Task Toolbar Functions

Button	Name	Function
	Standard Cursor	Toggles off all other tools.
	Main View	Switches to **Main** view.
	Viewboard 1, 2, 3	Switches between Viewboards.
	Rectangle Select	Defines bounding box to limit current action.
	Color Wheel	Switches to **Color Wheel** view.
	Histogram	Displays histogram graph, showing color values and pixel counts for each color in LUT.
RGB LUT	RGB/LUT	Displays image using current LUT.
	Protect Color	Protects color from all actions.
	Pick Color	Selects color.
	Current Color	Displays most recently picked color.
	Merge Marked	Begins marking color to be merged.
	Merge Similar	Merges colors similar to selected color.
	Insert Color	Picks color from image for inclusion in LUT.
	Explode Color	Generates multiple colors from one color selection.

Table 5-5 Feature Task Toolbar Functions (Cont'd)

Button	Name	Function
	Remove Marked	Marks color(s) for removal.
	Remove Similar	Removes colors similar to the selected color.
	Remove Minor	Removes colors that have minor occurrences in image.
	Apply	Applies current edits to LUT.
	Undo	Undoes last edit to LUT.

5.3.1.5.2 Feature Window Main View

When the **Feature** tab is first accessed, the default view is the **Main** view. The **Main** view (Figure 5-74) displays the current true color image, or the LUT filtered output image.

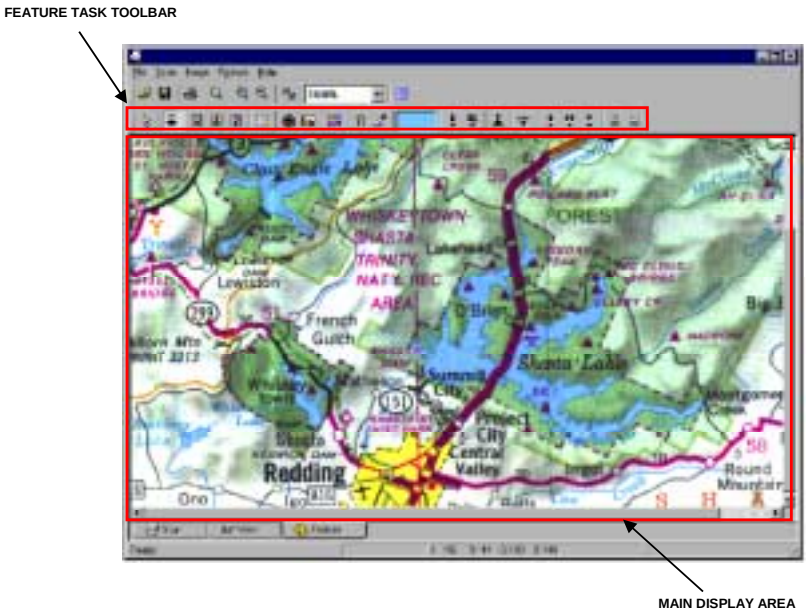


Figure 5-74 Feature Window Main View Window

5.3.1.5.3 Color Wheel View

Access the **Color Wheel** view by clicking the **Color Wheel** button () from the **Feature Task** toolbar. The **Color Wheel** view depicts the current LUT graphically in

two windows, as shown in Figure 5-75. Notice that hue and saturation are represented on the right of this view. Saturation increases with the distance from the center of the hexagon. The relative sizes of the symbols represent the number of image pixels that fall within each color category. The left side of the view depicts pixel brightness values with the brightest values at the top of the inverted pyramid.

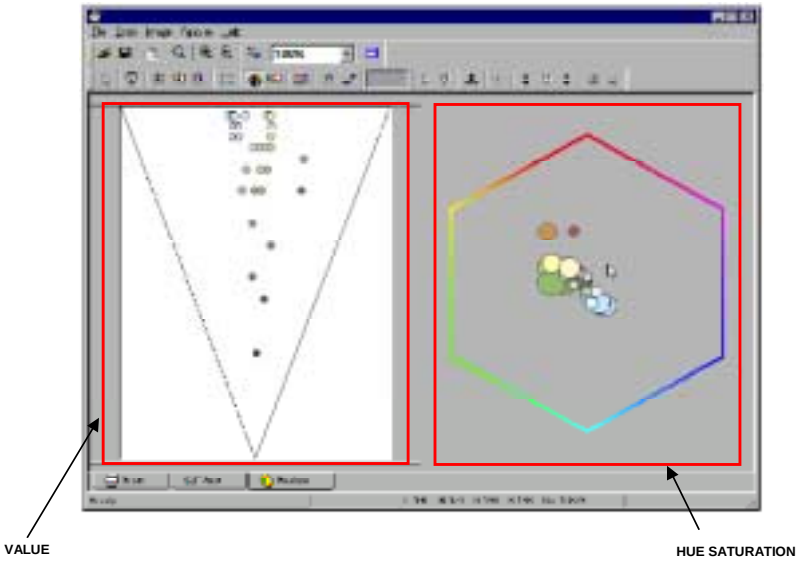


Figure 5-75 Color Wheel View Window

5.3.1.5.4 Histogram View

Access the **Histogram** view by clicking the **Histogram** button ( ) from the **Feature Task** toolbar. The **Histogram** view (Figure 5-76) displays a histogram graph, showing the color values and pixel counts for each color in the LUT. The graph may be sorted by pixel count, palette order, Hue-Saturation-Value (HSV) color values, or Red-Green-Blue (RGB) color values.

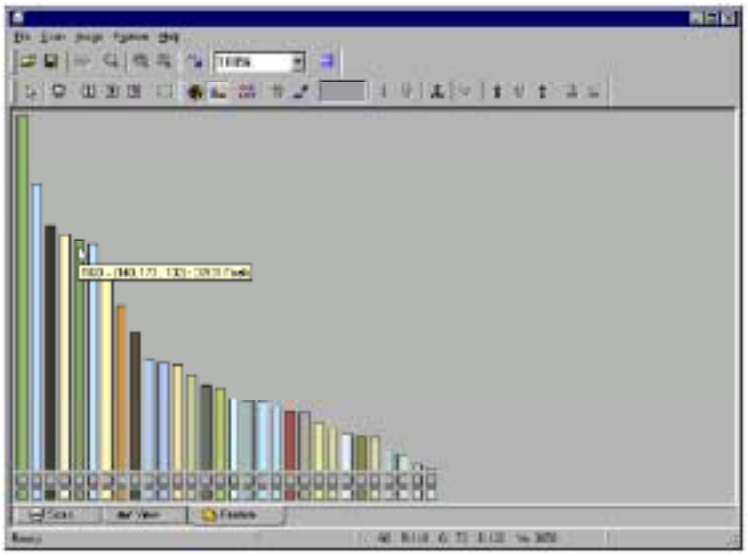


Figure 5-76 Histogram View Window

5.3.2 Scanner Setup

The **Scanner Setup** window, accessed by selecting **Scan|Scanner Setup** from the main menu bar, is used to set preferences with regard to the mechanical function of the scanner prior to scanning. Since commercial users may have more than one scanner available, there is a dropdown box for scanner selection. The DTSS uses only one scanner, so make sure that "FSC8010 DSP" is the scanner listed in this field. Once the scanner has been identified, there are three areas represented by tabs in the **Scanner Setup** window for controlling the way that media is handled in the scanner: Paper Load, Media Offsets, and Extended Thickness.

NOTE

Scanner Setup is not needed at the beginning of each scanning session. When scanning thick originals or media requiring special handling, Scanner Setup may need to be altered.

5.3.2.1 Paper Load Tab

The **Paper Load** tab (Figure 5-77) controls the method by which the paper is loaded into the scanner. Two selections are available:

- "Manual load"—User positions the original in the slot and presses the down button on the scanner. The original is then pulled into the scanner.

- "Automatic load"—User positions the original in the slot, and the scanner detects and loads the original. There is a user-configurable delay that allows the user additional time after detection before the original is loaded into the scanner. This delay is set in deciseconds (tenths of a second).

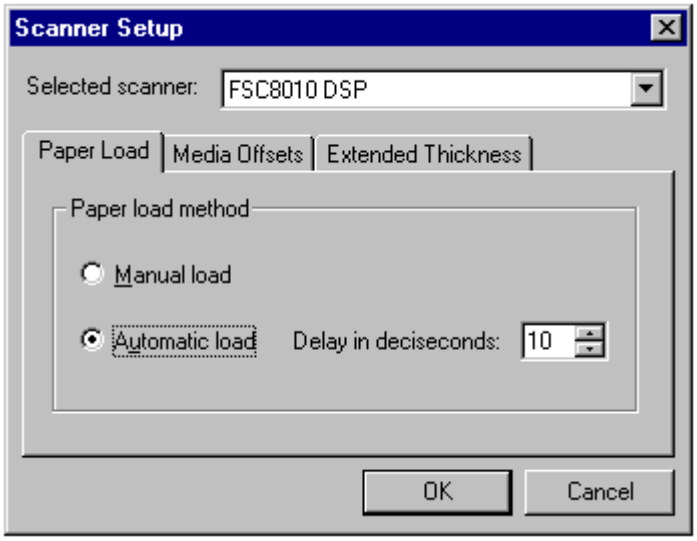


Figure 5-77 Scanner Setup Window Showing Paper Load Tab

5.3.2.2 Media Offsets Tab

The **Media Offsets** tab (Figure 5-78) controls scanning field offsets and vertical accuracy settings. The following settings are available.

- "Correction factor in scanning direction"—Affects the fine adjustments of the speed at which the original is moved across the imaging area. This is normally set to zero and is recommended to remain so.

- "Media offsets in inches"—Alters offset of the entire scanning field.

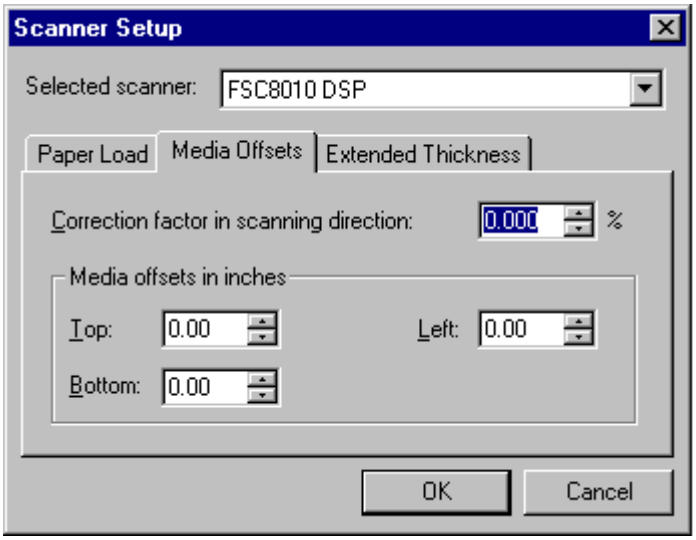


Figure 5-78 Scanner Setup Window Showing Media Offsets Tab

5.3.2.3 Extended Thickness Tab

The **Extended Thickness** tab (Figure 5-79) adjusts the cameras to compensate for originals up to 2mm thick. See the Wide Image user guide or online Help for details about scanning extended thickness originals.

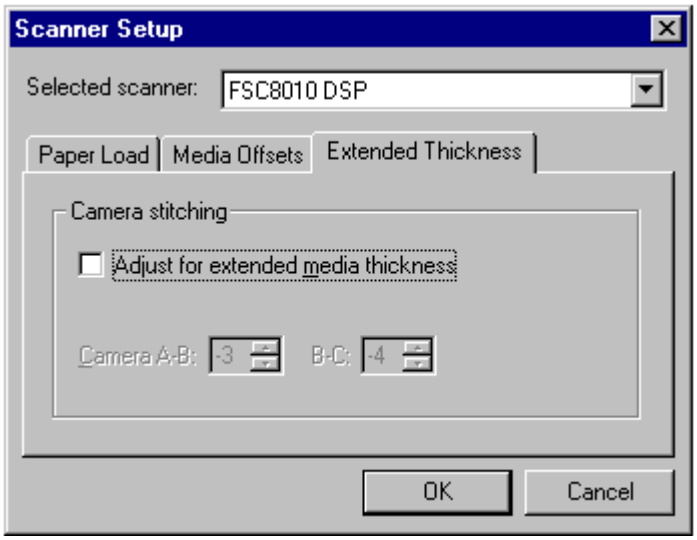


Figure 5-79 Scanner Setup Window Showing Extended Thickness Tab

5.3.3 Scanner Calibration

The FSC scanner captures images by projecting fluorescent light at an original and collecting the reflected light in four cameras. The reflected light is passed from the cameras as an analog electrical system signal to a signal processor. The signal processor

converts the analog signal to digital and passes the digital signal to the scanning software. The scanning software decodes the digital signal into the values that make up an image. As the operating environment (i.e., temperature, humidity) changes, the signals will vary slightly over time. It may be necessary to calibrate the signal processor to compensate for small fluctuations in the analog signals from the cameras. Figure 5-80 illustrates the basic imaging components of the scanner.

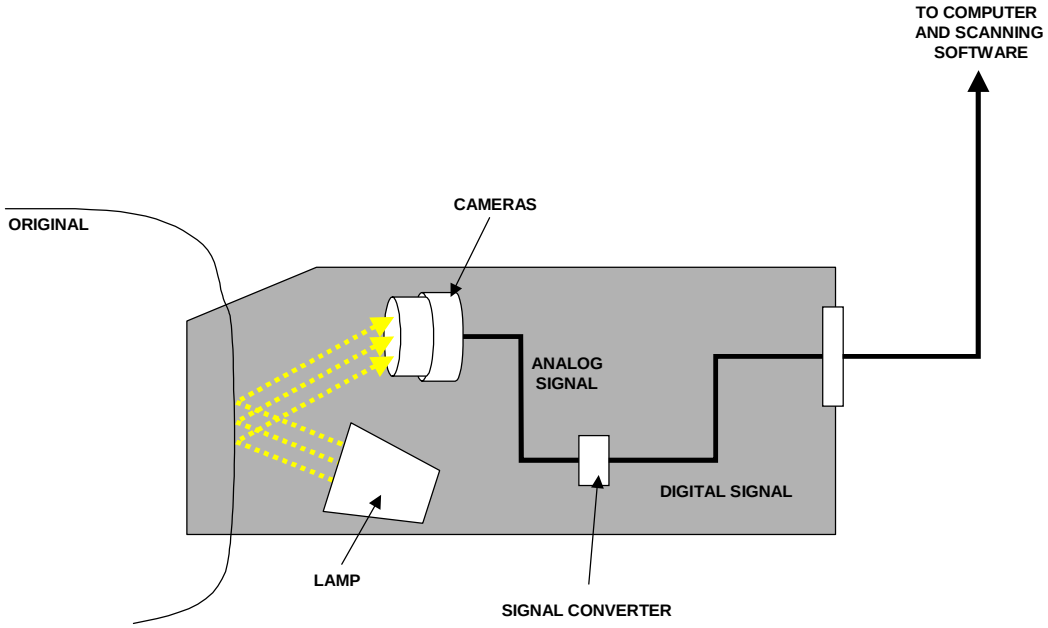


Figure 5-80 Scanner Imagining Components

The **Scanner Calibration Wizard**, accessed by selecting **Scan|Calibrate Scanner** from the menu bar, guides the user through the entire calibration process. Once started, it will prompt the user to complete the following calibration steps.

1. **Basic Calibration**. Basic Calibration is the process by which the "White Point" of the scanner is set. The Basic Calibration sheet is a specially

manufactured sheet designed to reflect light into the cameras at a set level of brightness. This brightness level is recognized as absolute white and is used as the basis from which all other shades are derived.

2. **Graytone Calibration and Color Balance Calibration**. After Basic Calibration is complete, graytone and color balance calibration are conducted. The IT8 Calibration Sheet contains ANSI IT8 color reference patches. These patches are specially printed to correspond to known standard color concentrations and values. These patches are scanned, and the scanner is calibrated to scan them as accurately as possible.

To calibrate the scanner, follow the steps below.

1. Let the scanner warm up for one hour before calibrating. This will ensure proper calibration.
2. Select ***Calibrate Scanner*** from the **Scan** menu.
3. The **Color Calibration Wizard** will guide the user through the calibration process.

NOTE

The IT8 Calibration Sheet lists cameras as 1 through 3, while the Calibration Wizard lists them as A through C. Cameras A, B, and C correspond to cameras 1, 2, and 3, respectively.

5.3.4 Scanning an Image

To scan any image, the user must complete the following four phases.

1. Initializing Phase—Initial central settings and image correction settings.
2. Prescanning Phase—Scan alignment and Black/White point adjustments.
3. Adjustment Phase—Detailed image adjustment and manipulation.
4. Scan Phase—Scan to viewer, file, or printer.

Each phase involves a different set of tools needed when scanning an image. Figure 5-81 illustrates the four phases and the tasks that are performed in each phase.

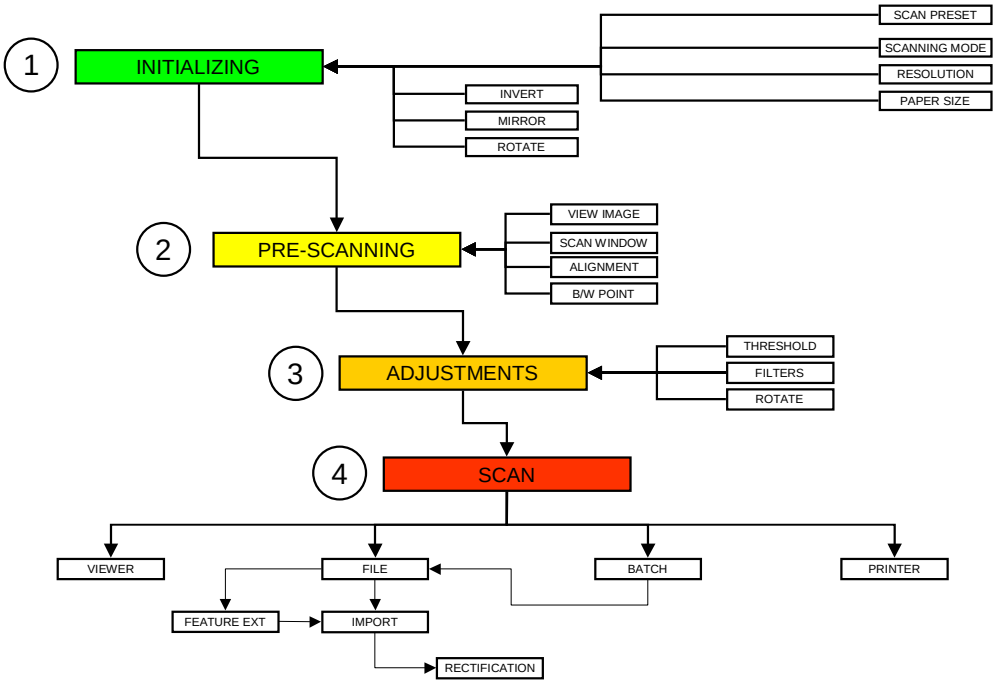


Figure 5-81 Image Scanning Phases

5.3.4.1 Initializing Phase

This phase begins the scanning process by setting parameters that are central to the scanning operation.

5.3.4.1.1 Presets

A scan preset is a combination of **Scan Setup** tab and **Adjustments** tab settings that have been defined and stored for later use. These settings will differ based on the characteristics of the individual job. For example, vastly different settings are used to scan a black-and-white overlay than a color map. The only real way to define the perfect settings for a scanning job is to experiment until the desired result is achieved. It is good practice to develop a preset for each type of job and then tailor the preset to the map series. Scan presets may be selected from the dropdown list, and then they can be amended, renamed, or deleted.

NOTE

Paper size settings cannot be saved in a scan preset.

5.3.4.1.1.1 Standard Scan Presets

Wide Image is installed with standard scan presets available for use. These presets combine scanning settings that are tested with different types of originals such as Light Paper, Light/Dark Blueprint, Light/Dark Brown Sepia, Gray Transparency, Pencil, and more. Standard scan presets cannot be deleted or amended, but they can be hidden from the dropdown selection list by clicking the arrow button next to the "Scan preset" dropdown menu in the **Scan Setup** tab and checking the "Hide Standard scan presets" option. Then only user-defined scan presets are displayed.

5.3.4.1.1.2 Creating a Scan Preset

Set the "Mode" and "Resolution" settings in the **Scan Setup** tab. Then set the appropriate **Adjustments** tab settings. Scan the original and make any necessary changes until the scanned image is satisfactory. After a successful scan, select the arrow next to "Scan preset" in the **Scan Setup** tab, and select ***Create***. Enter an appropriate filename for the preset. Click ***OK*** to save the settings and add the scan preset to the list.

5.3.4.1.2 Scanning Modes

The scanner is capable of capturing images in a wide range of formats, and each has its benefits and drawbacks. Photographic quality images may require thousands of colors to be accurately displayed, while a map may require only hundreds. The available scanning modes listed in the "Mode" dropdown menu of the **Scan Setup** tab are described below.

B/W Threshold—This mode uses a user-defined global threshold to determine whether a pixel is black or white. Use this mode for clean drawings and overlays. The threshold value is set on the **Adjustments** tab.

B/W Adaptive—In this mode the threshold adapts to darker or lighter areas in the original, as opposed to the B/W threshold mode that uses a singular global threshold. The B/W Adaptive mode is effective for stained or faded originals.

B/W Gray—This mode is suitable for displaying or printing files scanned from light to medium dark drawings.

B/W Adaptive Photo—This mode creates very large files and is not suited for digitizing.

B/W Photo—This mode scans gray images and converts them to a dithered black and white image. (Dithering is the process of simulating colors or grayscale values with discreet dots.) The "Contrast/Brightness" and "Lightness" settings are adjusted on the **Adjustments** tab.

Graytone—This mode records each pixel as one of 256 gray levels from black to white. Use this mode for black-and-white photos. The “Contrast/Brightness” and “Lightness” settings are adjusted on the **Adjustments** tab.

24-bit Color—This mode is used for images that are scanned in full color. Each pixel may be any of 16.8 million colors. Use this mode for color imagery and maps that require full-color reproduction. The “Contrast/Brightness” and “Lightness” settings are adjusted on the **Adjustments** tab.

Indexed Color—This mode allows the user to compress the file size by reducing the colors produced to a number between 2 and 256. The “Contrast/Brightness” settings are adjusted on the **Adjustments** tab. Clicking the setup button in this mode displays a window for selecting the number of colors and a method for computing the index color values based on a prescan analysis of the image. Available methods include the following:

- **Linear**—Index colors linearly distributed without a prescan.
- **Adaptive Photo**—Index colors optimized for photos with prescan and image adaptation.
- **Adaptive Map**—Index colors optimized for maps with prescan and image adaptation.

Classified Color—This mode is for scanning with an LUT filter created in the **Feature** window. Click on the **Setup** button ( ) to open a standard open file window, where the user can select and load the appropriate feature extraction LUT file (*.lut*).

5.3.4.1.3 Resolution

Image resolution may be thought of as the level of granularity with which an image is scanned and stored. High resolutions describe an image in more detail. Figure 5-82 illustrates the impact that resolution can have on image quality. The quality associated with higher resolutions comes at the expense of storage space. Higher resolutions require much more storage space than the lower resolution alternatives.

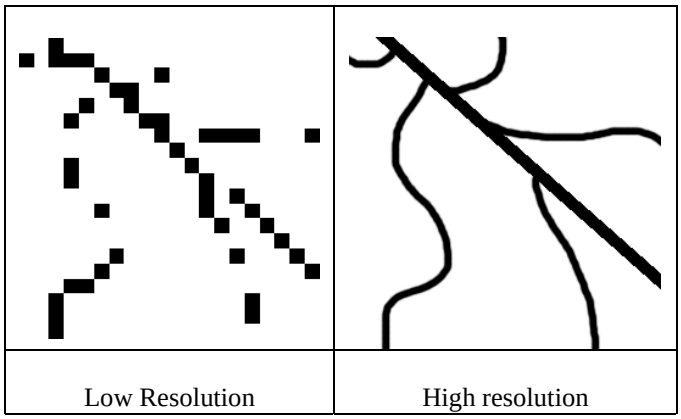


Figure 5-82 Resolution Examples

5.3.4.1.3.1 Resolution Lists

Resolution is selected from the "Resolution" dropdown box on the **Scan Setup** tab. Depending on the scanner model, the dropdown box shows either predefined normal resolutions, predefined turbo-resolutions, or the physical resolution.

Click the **Setup** button ( ) to display a window for selecting between different resolution lists. Wide Image automatically detects the resolutions supported by the attached scanner and displays only those applicable. The available resolution selections are listed below.

- **Normal**—Allows the user to set the scanning resolution in one dot-per-inch (DPI) increments.
- **Turbo**—Sets the scanner in vertical interlaced mode and speeds up the scan process by up to two times. Turbo mode has no effect on resolutions below 300 DPI and is not available in Classified and Index modes.
- **Physical**—Sets resolution to the actual unscaled physical resolution of the attached scanner.

5.3.4.1.4 Paper Size

Scanning may normally be accomplished with standard paper sizes, but occasionally different settings may be needed. Setting paper size is a two-step process:

1. Select the **Setup** button ( ) next to the "Fixed paper size" dropdown menu in the **Scan Setup** tab to choose one of the following methods for paper size calculation.

- **Fixed Paper Size**—Available standard sizes including common US, European and DIN drawing sizes and predefined custom sizes for the scanner.

- **Auto Paper Size**—Automatic detection of the paper size.

- **Paper Width Only**—Paper width values set directly in the "Paper Size" edit box. The values will be interpreted as inches or millimeters, depending on the "Unit" setting in the **File** menu **Unit Preferences** window, or as scanner units if the "Use Scanner Units" option is selected from the menu that appears by clicking the **Setup** button ( ) next to the "Fixed paper size" dropdown menu.

2. Select the actual size that relates to the chosen method from the "Fixed paper size" dropdown menu.

The list of standard paper sizes may be amended from the **Paper Setup** window, which is accessed by clicking the **Setup** button ( ) next to the "Fixed paper size" dropdown menu and selecting **Paper Setup | Paper Size**. See the Wide Image user manual for details on changing paper sizes.

5.3.4.2 Prescanning Phase

Once the Initializing phase is complete, prescanning may begin. Prescanning affords the user an opportunity to review the original as it is scanned.

5.3.4.2.1 Prescan Control

The **Forward** ( ), **Halt** ( ), and **Reverse** ( ) buttons on the **Scan Task** toolbar are used to scan and display the original image in both the **Overview** and **Detail** windows. The **Reverse** function is available only in black-and-white scanning modes. Clicking in the **Overview** window will reposition the area depicted in the **Detail** window.

5.3.4.2.2 Setting Black And White Point

Setting the black and white point is the process by which the user takes two samples representing the lightest and darkest portions of the scanned images. From these two values the scanner can adjust the resulting scan on the fly. Clicking the **B/W Point** button ( ) on the **Scan Task** toolbar displays the **Black and White Point Setup** window (Figure 5-83).

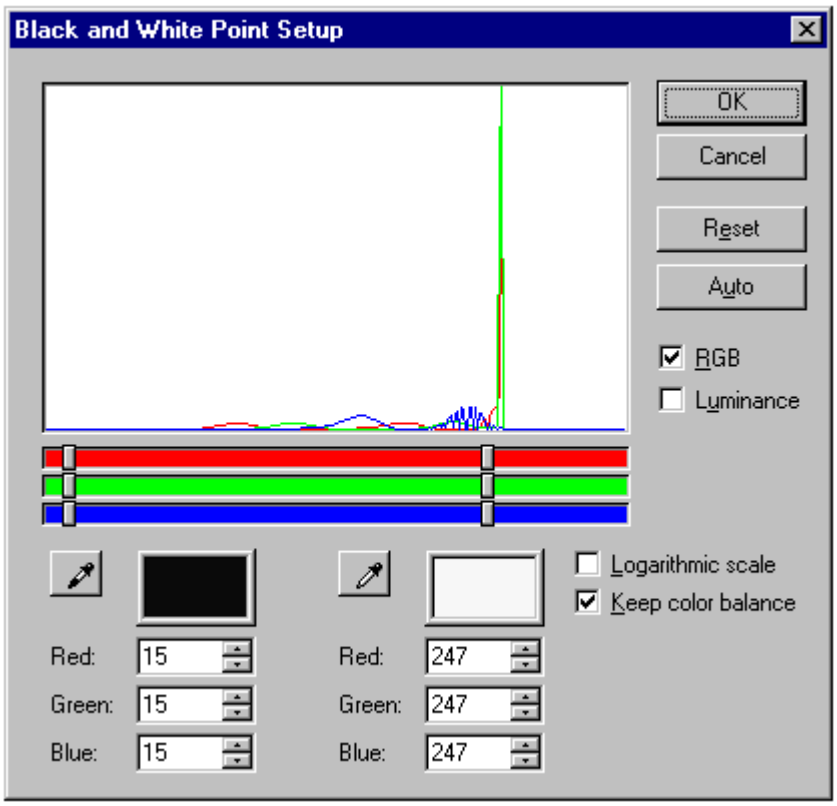


Figure 5-83 Black and White Point Setup Window

To set the black and white point, click on the **Black Eyedropper** button ( ) in the **Black and White Point Setup** window, and then click on a black pixel in the image. Next, click on the **White Eyedropper** button ( ), and then click a white pixel in the image. Clicking ***OK*** on the **Black and White Point Setup** window will set these changes.

5.3.4.2.3 Defining a Scan Window

During prescanning and in Halt mode, click the **Area Scan** button ( ) on the **Scan Task** toolbar. The cursor will change to the rectangle draw pointer. Define a scan window by dragging a rectangle in the **Overview** window.

5.3.4.3 Adjustments Phase

Wide Image offers a long list of filters and image adjustment options. Please refer to the Wide Image user guide for details on these options and the conditions of use for each.

5.3.4.4 Final Scanning Phase

Images may be scanned to several different targets. These targets are determined in the **Scan** menu. To perform a final scan to the target of choice, simply click the **Scan** button

( ) after prescanning is complete. Once an image is scanned, it may be further enhanced or used as a basis for color LUT generation.

5.3.5 Feature Extraction Overview

The DTSS has the capability to scan and store images with millions of colors. The human eye, however, cannot distinguish the full range of colors that a scanner is capable of capturing. Feature extraction is the process by which an image is scanned using a reduced color palette.

Topographic maps, for example, may be adequately displayed with a 4-bit (16-color) palette. These reduced palette images take up much less space than their full-color counterparts. Images are often displayed adjacent to each other. To ensure smooth display across multiple maps or images, a standard palette may be created and applied to all images. This technique is used when scanning a series of visually similar maps or images. Using this technique greatly reduces file size and improves display speed.

5.3.5.1 Feature Extraction Process

Figure 5-84 provides an overview of the process of creating an LUT for color reduction only. Please refer to the Wide Image user guide to create LUTs for other purposes.

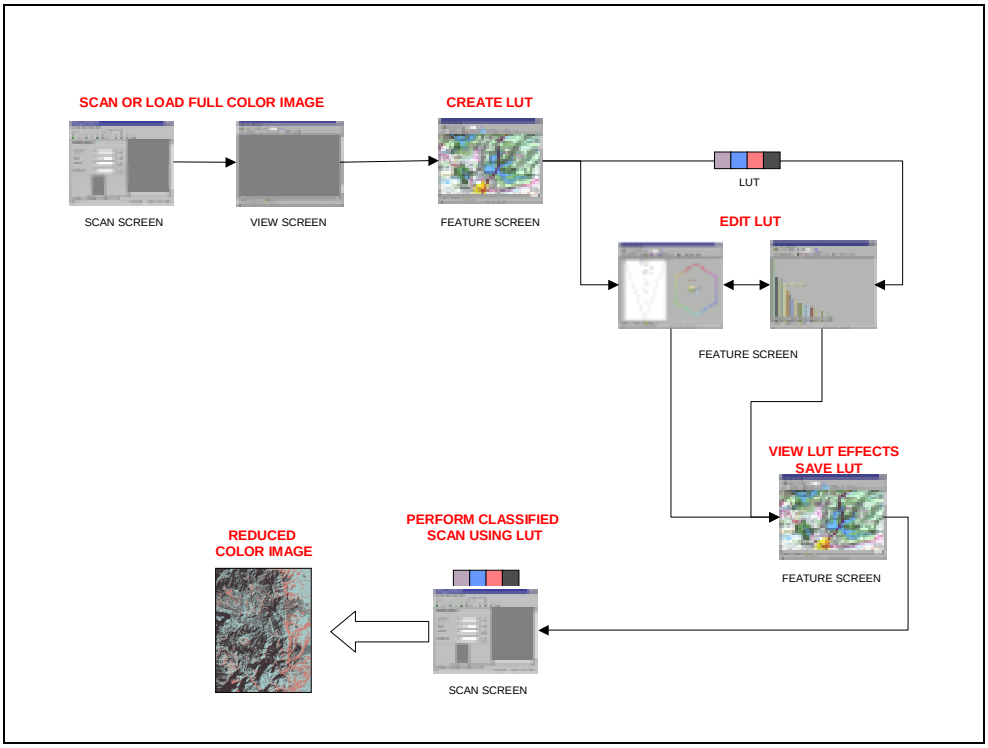


Figure 5-84 Feature Extraction Process

The actual steps for LUT generation are covered in the workflow example below.

1. To start the WIDEimage software, click the **Start** button from the Windows NT taskbar, and select ***Programs/WIDEimage/WIDEimage***. The **Wide Image** main window will appear.

2. Load the original map into the scanner.

3. From the **Scan** menu, select ***Scan to File***.

4. Enter the appropriate information in the **Scan Setup** tab shown in Figure 5-85.

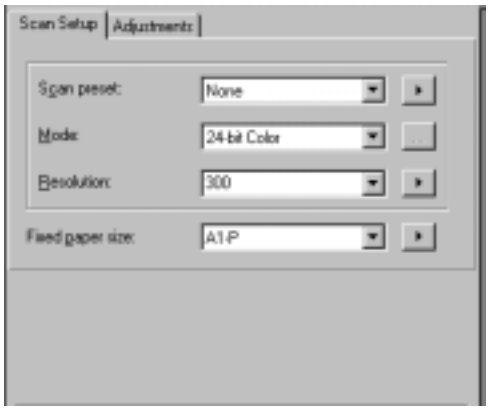


Figure 5-85 Scan Setup Panel

5. Prescan the image and inspect it. The B/W point may need to be set. If so, complete and prescan again.

6. Scan the image.

7. Switch to the **View** window by clicking on the **View** tab, and inspect the image quality.

8. Switch to the **Feature** window by clicking on the **Feature** tab.

9. From the **Feature** menu select ***Create LUT***. The **Create LUT** window will appear (Figure 5-86).

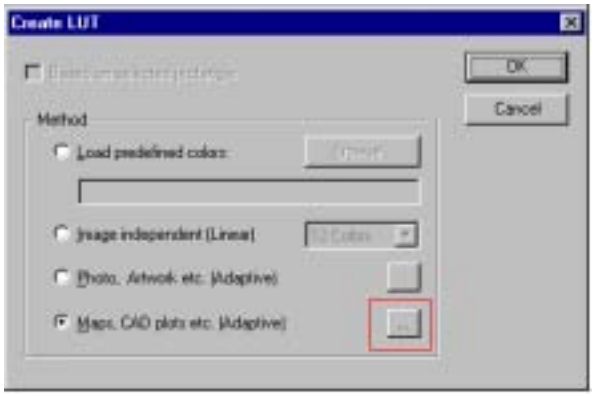


Figure 5-86 Create LUT Window

10. Click on the radio button next to "Maps, CAD plots etc. (Adaptive)" and select the **Adaptive Settings Setup** button (...). The **Adaptive Settings** window will appear (Figure 5-87).

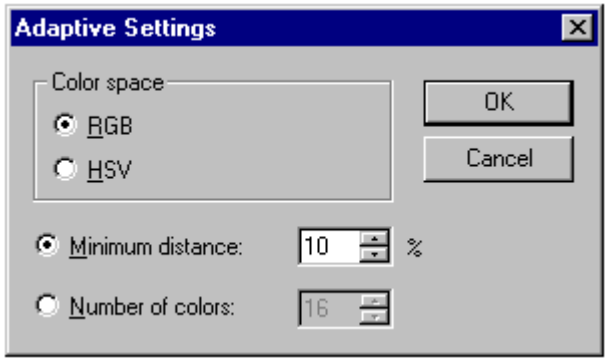


Figure 5-87 Adaptive Settings Window

11. Choose the appropriate adaptive settings, and click ***OK*** to return to the **Create LUT** window.

12. Click ***OK*** to close the **Create LUT** window and return to the **Feature** window.

13. From the **Feature** menu select ***Save LUT***. The LUT will be saved with an *.lut* file extension.

14. In the **Feature** window **Main** view, select the **Protect Color** button ( ) from the **Feature Task** toolbar, and click on prominent features (roads, water, etc.).

15. Switch to the **Histogram** view by clicking the **Histogram** button ( ) on the **Feature Task** toolbar. The **Histogram View** window will appear (Figure 5-88).

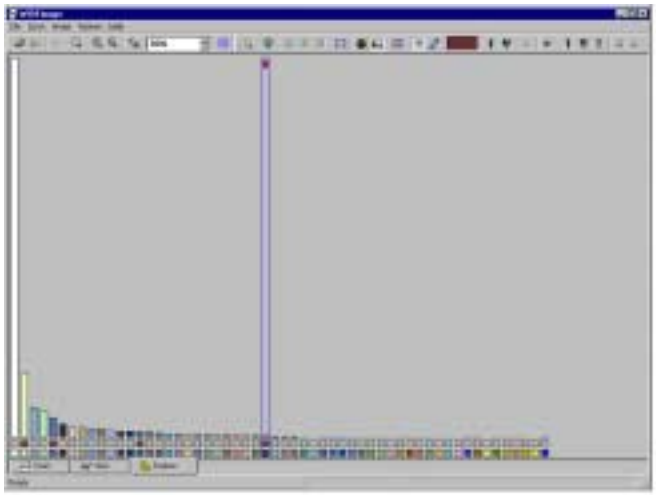


Figure 5-88 Histogram View Window

16. Click the **Remove Minor** button ( ) on the **Feature Task** toolbar. The **Set Mirror Percentage** window appears. The **Histogram View** window's appearance will change as seen in Figure 5-89. Note the reduced palette size.

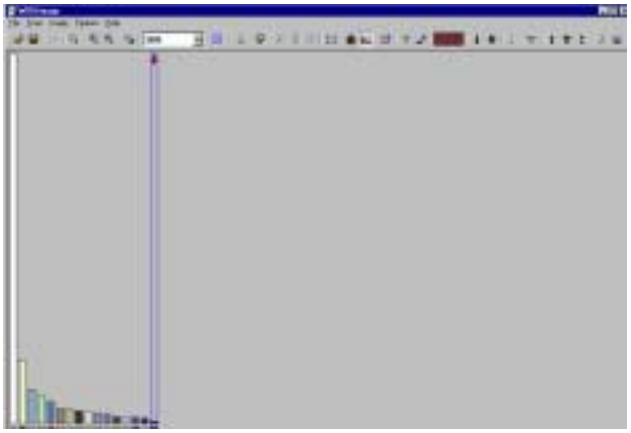


Figure 5-89 Histogram View Window

17. Set the percentage appropriately and click **OK**.

18. Switch back to the **Main** view by clicking the **Main View** button ( ) on the **Feature Task** toolbar.

19. Display the image using the LUT by clicking the **RGB LUT** button ( ) on the **Feature Task** toolbar.

20. Inspect the image. When finished, close the LUT.

21. Switch to the **Scan** window by clicking on the **Scan** tab.

22. Enter the appropriate information in the **Scan Setup** tab shown in Figure 5-90. The "Mode" dropdown menu should be set to ***Classified Color***.

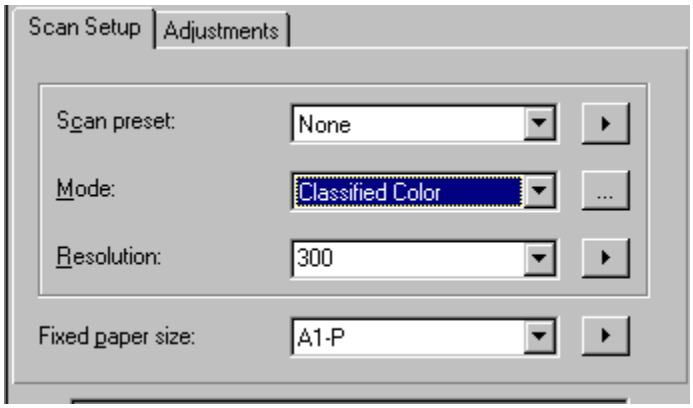


Figure 5-90 Scan Setup Tab

23. Click the **Setup** button (...) located to the right of the "Mode" dropdown menu, and choose the previously saved LUT.

24. Proceed with scanning, and the resulting image will be a reduced-color image using the colors in the new LUT.

For more information on any scanning procedures or features, refer to Wide Image online Help or printed user documentation.

5.3.6 Scanning to Printer

The following procedure briefly outlines the steps for scanning an image directly to the printer. It is recommended to perform the four phases discussed earlier for best results.

1. Place the image in the FSC8010 DSP scanner feed. The scanner will pick up the fed sheet and draw it in.

2. Go to the **Start** menu, and select ***Programs/WIDEimage/WIDEimage***. The **WIDEimage** window will appear (Figure 5-91).

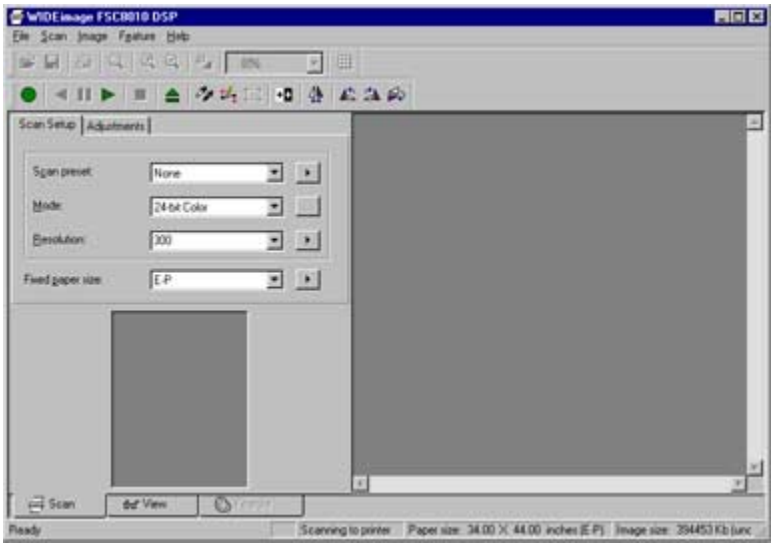


Figure 5-91 Wide Image Main Window

3. From the main menu, select ***Scan/Scan to Printer***. A marker appears beside this option on the menu.

4. On the **Scan** tab, select the appropriate settings for the scan. For this example, choose **24-bit Color** in the "Mode" field, **300** for "Resolution," and **E-P** for "Paper Size" (Figure 5-92). **E** refers to a standard paper size of 34" x 44", and **P** stands for "Portrait" orientation.

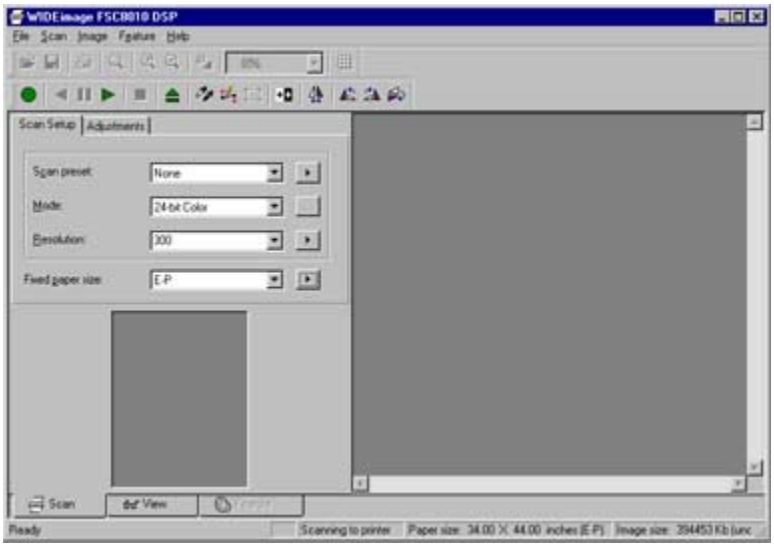


Figure 5-92 Scan Setup Tab With Settings Entered

5. Once these values are set, click the **Scan** button ( ) to start the scan. The **Print** window opens (Figure 5-93).

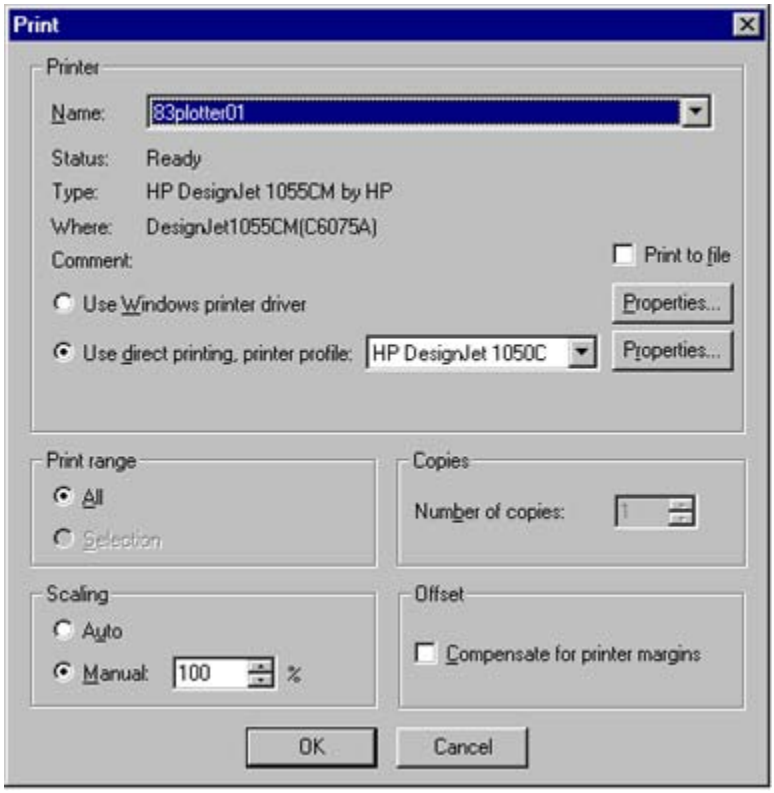


Figure 5-93 Print Window in Wide Image Scanning Utility

6. Click the radio button beside the option "Use direct printing, printer profile," and click the dropdown arrow to select the appropriate printer (HP DesignJet 1050C). Leave the "Scaling" setting, located in the lower left corner of the window, at **100%**.

7. Now click the **Properties** button to the right of the printer field to access the **HP DesignJet 1050C Properties** window (Figure 5-94).



Figure 5-94 Printer Specific Tab in Printer Properties Window

8. Accept the default settings on the **Printer Specific** tab, and click the **Page Setup** tab to make sure printer settings are accurate (Figure 5-95).

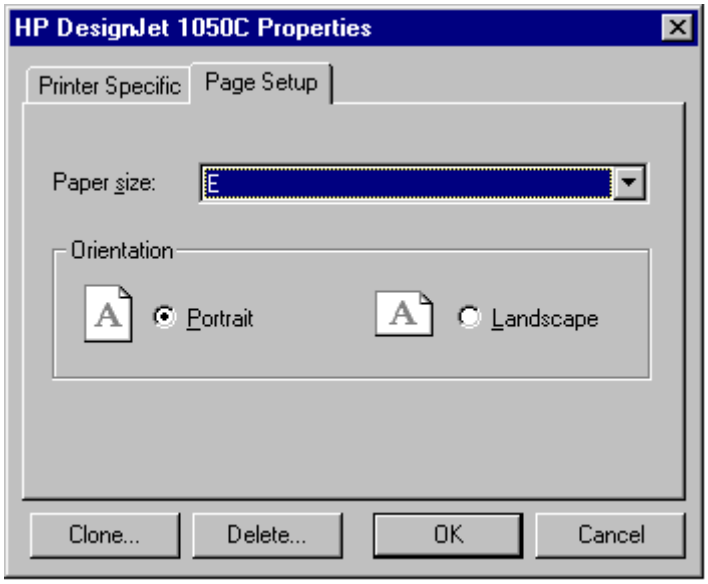


Figure 5-95 Page Setup Tab in Printer Properties Window

9. Click ***OK*** to accept any changes and return to the **Print** window.

10. Click ***OK*** in the **Print** window. The **Wide Image** window changes as the scan progresses (Figure 5-96). Click the **Halt** button ( ) to stop the scan at any point. The printer will begin printing as the image scans in.

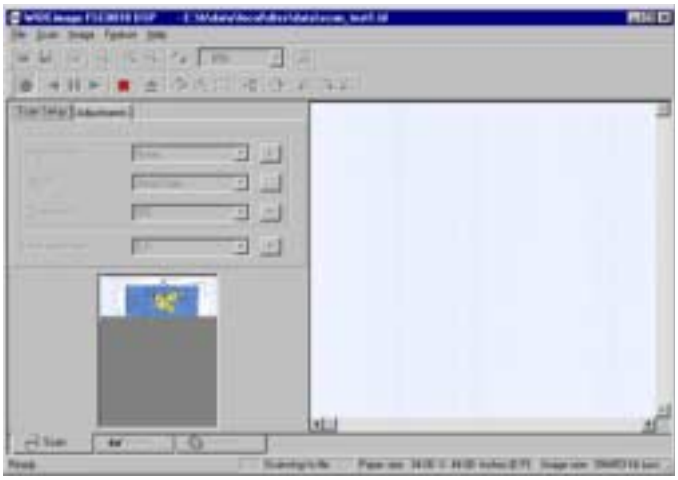


Figure 5-96 Scan in Progress in Wide Image

11. When scanning and printing are complete, click the **Eject** button ( ) to eject the original from the scanner.

Chapter 6

DATA MANAGEMENT

6	**DATA MANAGEMENT**	6-3
6.1	Data Conversion	6-3
6.1.1	Vector Data Conversion	6-3
6.1.1.1	ArcToolbox Data Conversions	6-3
6.1.1.1.1	Converting Coverage to Geodatabase	6-3
6.1.1.2	ArcCatalog Data Conversions	6-9
6.1.1.2.1	Converting Geodatabase to Coverage	6-9
6.1.2	Raster-to-Vector Conversion	6-13
6.1.2.1	Imagine Raster-to-Vector Conversion	6-13
6.1.2.2	ArcInfo Raster-to-Vector Conversion	6-16
6.1.3	Projections and Datums	6-16
6.1.3.1	Vector Data Projection	6-16
6.1.3.1.1	On-the-Fly Projection	6-16
6.1.3.1.2	Defining Projection for Geodatabases	6-17
6.1.3.1.3	Defining Projection for Shapefiles	6-18
6.1.3.1.4	ArcToolbox Data Management and Projection Conversion	6-22
6.1.3.1.4.1	Define Projection Wizard	6-22
6.1.3.1.4.1.1	Defining Projection Interactively	6-23
6.1.3.1.4.1.2	Matching Projection of Existing Dataset	6-28
6.1.3.1.4.2	Project Wizard	6-32
6.1.3.1.4.2.1	Selecting New Projection Interactively	6-33
6.1.3.1.4.2.2	Matching Coordinate Projection of Existing Data	6-39
6.1.3.1.4.3	Transform Tool	6-45
6.1.3.2	Raster Data Projection	6-46
6.1.3.2.1	Determining Projection Information	6-47
6.1.3.2.2	Assigning Projection to Raster Image	6-48

6.1.3.2.3 Polynomial Rectification 6-51
6.1.3.2.4 Reprojecting Images 6-58
6.1.4 Orthorectification 6-63
6.2 Data Organization and Access 6-63
6.2.1 Catalog Tree Structure 6-63
6.2.1.1 Folder Connection 6-64
6.2.1.2 Database Connections 6-67
6.2.1.3 Coordinate Systems 6-68
6.2.2 Connecting to Data 6-69
6.2.3 Organizing Data 6-71
6.2.4 Exploring Data 6-71
6.2.4.1 ArcCatalog Tabs 6-71
6.3 Using Unix DTSS Products on Windows NT 6-73
6.4 GEOTRANS – Coordinate Conversion 6-74
6.5 NIMAMUSE 6-75

6 DATA MANAGEMENT

DTSS provides both COTS and GOTS software packages to facilitate data management. ArcInfo and ERDAS Imagine provide many tools and commands that facilitate data conversion, access, and organization. GEOTRANS is a GOTS software package that can be used to perform coordinate conversion. This chapter gives an overview of the available functionality in these programs. It also describes how to use products created on the Unix-based DTSS in the Windows NT environment, and the GOTS package GEOTRANS provided for coordinate conversion. A brief introduction to the NIMAMUSE software is also provided.

6.1 Data Conversion

Geographic data is available in a variety of formats, as presented in Section 5.2, *Importing Data*. ArcInfo and Imagine provide a variety of tools that allow the DTSS user to convert data between formats. These data conversion tools can be used to convert data between internal ArcInfo and Imagine formats. For instance, it may be desirable to convert an Imagine *.img* file to an ArcInfo grid, or to convert an ArcInfo coverage to an ArcInfo geodatabase. Tools are also provided to convert ArcInfo and Imagine data formats into other data formats such those used by the U.S. Geological Survey (USGS) and the National Imagery and Mapping Agency (NIMA). It is also common to convert data from one spatial projection to another, based on how the data is to be used.

6.1.1 Vector Data Conversion

ArcToolbox and ArcCatalog provide many tools and wizards to convert between internal ArcInfo vector data formats: coverages, shapefiles, and geodatabases. These functions facilitate topology generation and maintenance. As stated in Section 4.1, simple ArcInfo commands are carried out by tools, while more complicated processes are performed using wizards.

6.1.1.1 ArcToolbox Data Conversions

ArcToolbox provides Conversion Tools for data format conversion. In addition to having tools and wizards for converting between various ArcInfo data formats, these tools facilitate data conversion to other formats as well.

6.1.1.1.1 Converting Coverage to Geodatabase

To convert an ArcInfo coverage to a geodatabase, use the ArcToolbox wizard described below. An example of a data conversion tool is shown in Section 6.1.1.2.1.

1. Open ArcToolbox using the desktop icon, or through the **Start** menu.

2. In the **ArcToolbox** window, click the plus sign (+) beside **Conversion Tools**, click the plus sign beside **Export from Coverage**, and then select **Coverage to Geodatabase Wizard** (Figure 6-1).

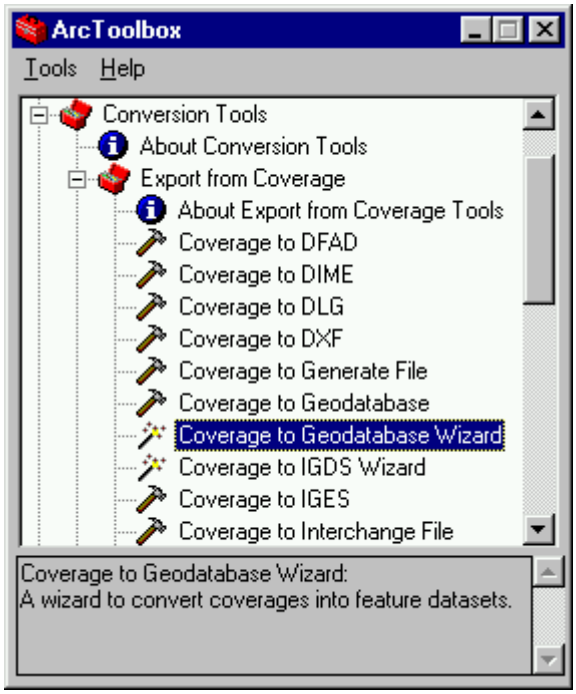


Figure 6-1 ArcToolbox Main Window

3. Double click ***Coverage to Geodatabase Wizard*** to access the first window of the wizard (Figure 6-2), which asks for an input coverage.

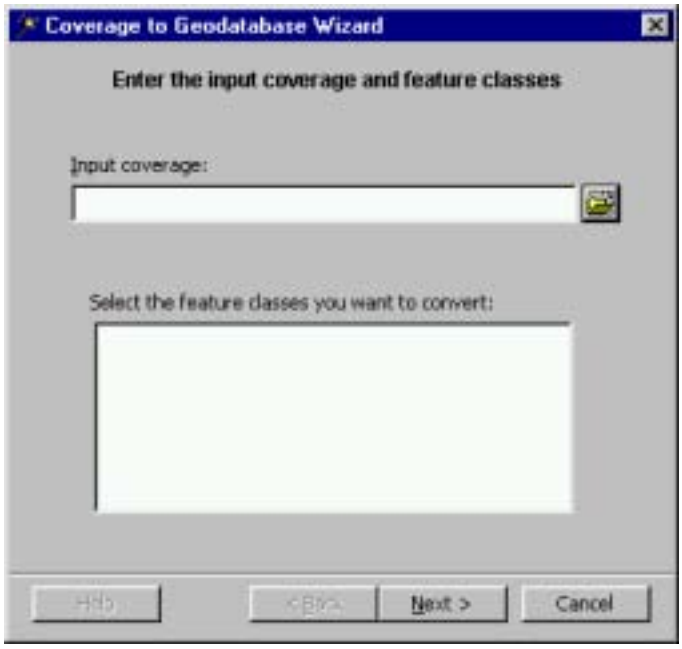


Figure 6-2 Input Coverage Window in Coverage to Geodatabase Wizard

4. Click the ***Open File*** icon ( ) to open the **Choose an input coverage** window (Figure 6-3). Navigate to the appropriate coverage, and click ***Open*** to add it to the wizard window. (The user could also drag a coverage from the ArcCatalog Tree View panel and drop it into the "Input Coverage" field of the **Coverage to Geodatabase Wizard** window.)

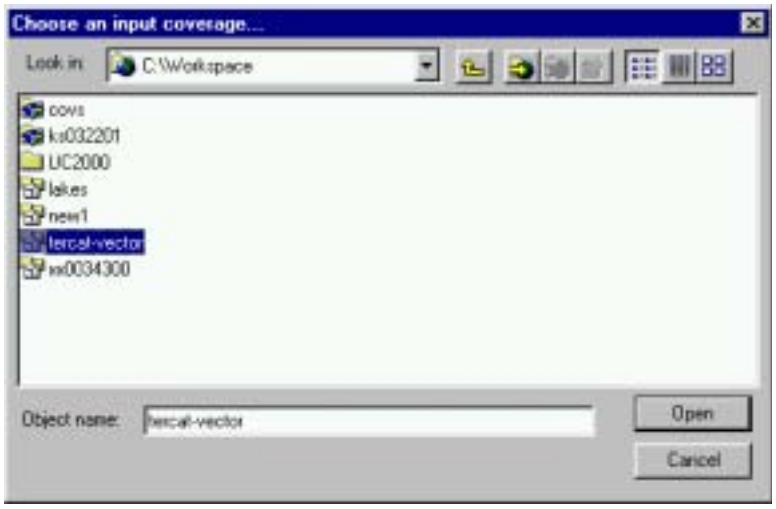


Figure 6-3 Choose an Input Coverage Window

5. When the coverage path and filename appear in the wizard window, select which type of feature class to convert (Figure 6-4), and click ***Next***.

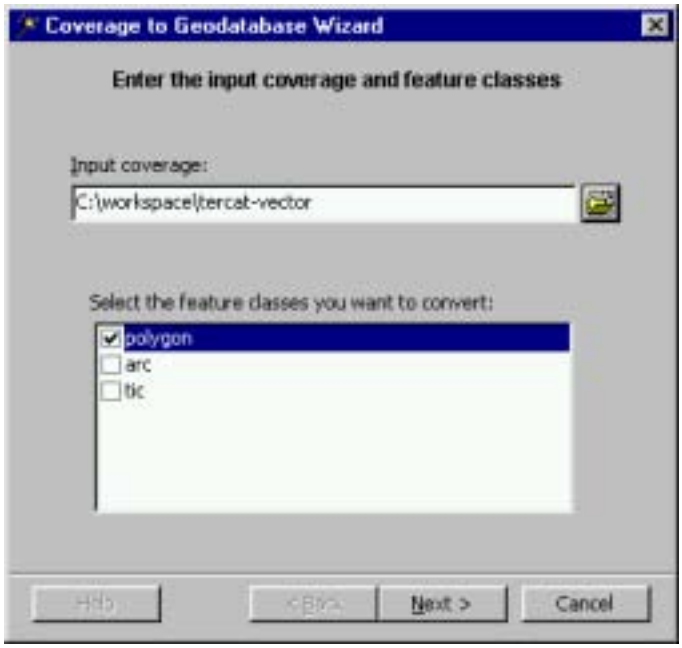


Figure 6-4 Input Coverage Window in Coverage to Geodatabase Wizard

6. The wizard advances to the next window, which asks for an output geodatabase (Figure 6-5). Click the ***Open Folder*** icon ( ) to navigate to the appropriate geodatabase for the new feature class.



Figure 6-5 Output Geodatabase Window in Coverage to Geodatabase Wizard

NOTE

The user must have an existing geodatabase in which to place the converted feature class. If no geodatabase exists, the user will receive an error message. To avoid such a message, the user can create a new geodatabase. See Section 7.1.2.3, Creating a New Geodatabase, *for more information.*

7. Once selected, the geodatabase path and filename appear in the wizard window (Figure 6-6), and the options below the filename are activated. Select the desired option. This example uses the "Create a stand-alone feature class" option. Then click ***Next***.



Figure 6-6 Output Geodatabase Window in Coverage to Geodatabase Wizard

8. The wizard advances to the next window, which asks whether to accept default parameters or to define parameters (Figure 6-7). This example accepts defaults. If the user decides to specify parameters, another window will open, allowing for changes.



Figure 6-7 Use Defaults Window in Coverage to Geodatabase Wizard

9. Once parameters are set, the wizard presents a **Summary** window (Figure 6-8). Review the information in this window, and click ***Back*** to make any needed changes to previous settings. Otherwise, click ***Finish***.



Figure 6-8 Summary Window in Coverage to Geodatabase Wizard

10. The **Converting Polygon** window appears (Figure 6-9), indicating progress in converting the coverage to a feature class within the specified geodatabase.

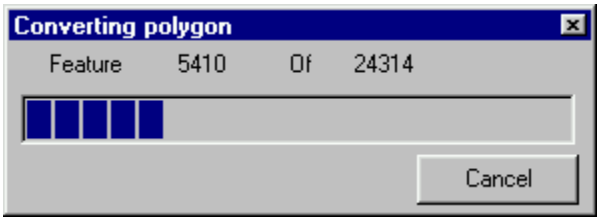


Figure 6-9 Converting Polygon Window for Coverage to Geodatabase Wizard

11. The window closes when processing is complete. Navigate to and display the output file in ArcMap.

Other data conversion tools and wizards are available to help the analyst convert from coverage to shapefile, shapefile to coverage, and shapefile to geodatabase, and they operate in a similar manner to that described above. For more information on using the tools and wizards available in ArcToolbox, refer to the section of this manual addressing the appropriate tool, or use ArcToolbox's online Help or printed user documentation.

6.1.1.2 ArcCatalog Data Conversions

Many of the data conversion tools and wizards available in ArcToolbox are also available in ArcCatalog. However, ArcCatalog also provides tools to convert geodatabases to coverages and shapefiles that are not available in ArcToolbox.

The ArcCatalog data conversion tools can be accessed by right clicking on the appropriate filename in the Catalog Tree View panel and selecting ***Export*** from the context menu. Some of these are the same tools used in ArcToolbox.

6.1.1.2.1 Converting Geodatabase to Coverage

ArcCatalog enables the DTSS analyst to perform a geodatabase-to-coverage conversion using the **Export** command. The analyst can export several feature classes at one time using the Batch functionality available in ArcCatalog.

When converting data from one type of file to another, such as a geodatabase to a coverage, the analyst will face some issues involved in the conversion. Different data formats will treat data differently; therefore, a line in a geodatabase may appear different from a line in a coverage. Some changes may occur during the conversion. Specific information on the use and conversion of different features is discussed in Table 6-1 below, as part of Step 6 in the procedure that follows.

1. With ArcCatalog open on the desktop, navigate to the desired geodatabase to convert to a coverage. Then preview the feature class for export using the **Preview** tab.

2. Right click the feature class to export in the Contents list or in the Catalog Tree View panel, and select ***Export/Geodatabase to Coverage*** from the context menu that appears (Figure 6-10).

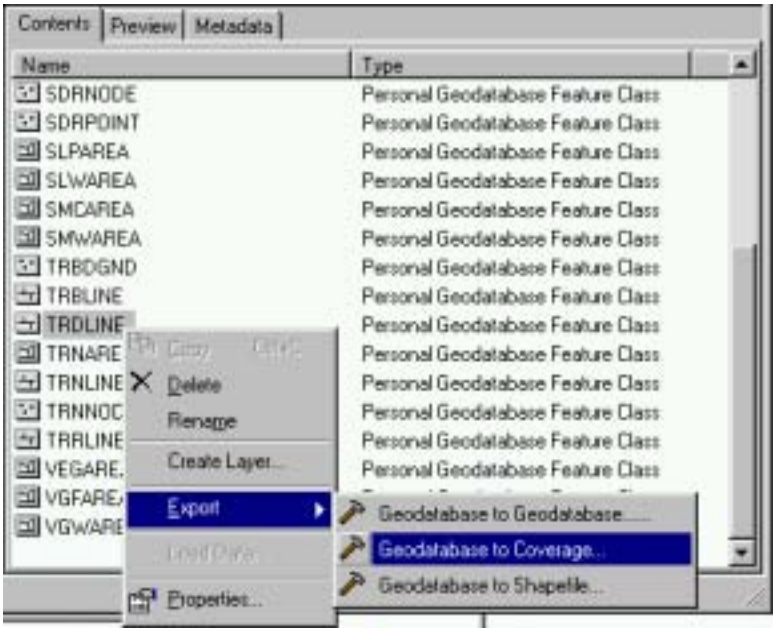


Figure 6-10 Selecting Geodatabase to Coverage Tool in ArcCatalog

3. The **Geodatabase to Coverage** window will appear (Figure 6-11). To place the coverage in a different location or provide a different name, type a new name or path in the "Output coverage" field. Or, click the **Open File** icon (), navigate to the desired location for the coverage, type a new filename, and then click ***Save***.

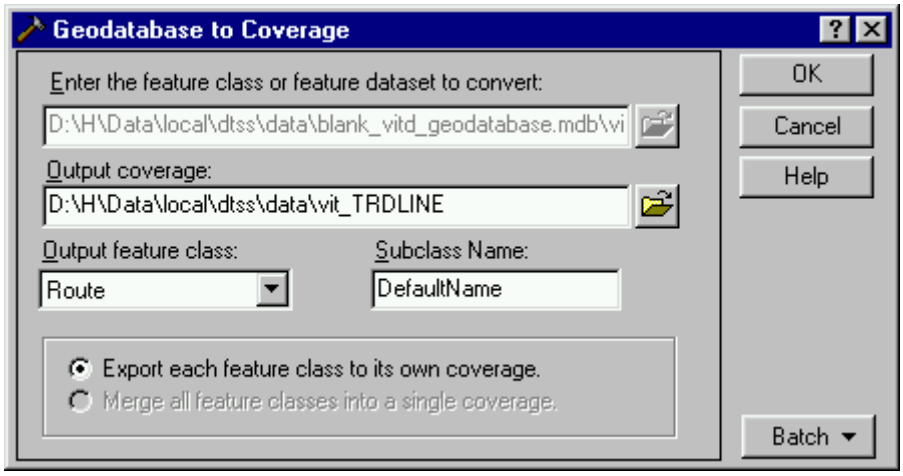


Figure 6-11 Geodatabase to Coverage Window

4. Click the **Batch** button in the lower right corner to open the batch table. To switch the tool back to single mode, where only one feature class is converted at a time, click the one row to use, then click the **Single** button. The batch table will disappear, and the **Single** button will change to the **Batch** button. To reopen the batch table, click the **Batch** button. The following icons assist in performing batch table functions:

   - Click the **Add Row** icon ( ) to add a row to the batch table. Then click and drag a feature class from ArcCatalog to the top field in the **Geodatabase to Coverage** window. The next row of the batch table fills in automatically.

   - Click the **Delete Row** icon ( ) to remove a row from the table.

   - Click the **Open File** button ( ), and click a script that already exists for that tool. The batch table is populated with the script's parameters.

   - Click the **Save File** button ( ) to save the contents of the batch table to a script.

5. The first item in the batch table is selected by default. If there are many feature classes, the user may have to scroll up to the first item in the batch table. Click on the item number to the left of the "In feature class" column, and the conversion tool automatically chooses an output feature class and subclass name, placing them in the "Cov feature class" column on the right end of the table.

NOTE

The user can also click any field of any item in the batch table to automatically populate the "Cov feature class"

column. This choice, however, does not allow the user to access different choices from the appropriate dropdown menu. The "Output feature class" and "Subclass name" fields become read-only.

6. If a different output feature class or subclass name is desired, click the appropriate dropdown arrow and click the type of feature class for which topology will be created in the output coverage. Subclasses are used only with regions and routes. Each output feature class is described briefly in Table 6-1 below.

Table 6-1 Output Feature Class Description

Feature Class	Description	Notes/Implications
Polygon	Geographic features that span a discrete area, represented by a set of arcs that exactly define its perimeter, and a single label point to associate all descriptive information for that polygon.	User may wish to combine polygons into single region. For example, Hawaii is made of more than one polygon that would represent a single region.
Regions	Compound polygons.	User may wish to combine polygons into single region.
Line	Simple arc features, without complex connectivity capability.	User may wish to convert linear feature class into a coverage with connectivity capability, such as a route.
Route	Complex linear features built on arcs, used primarily for transportation analysis.	Routes are made of sections or lines. User may wish to convert linear feature class into a route for connectivity capability.
Point	Simple point feature.	User may wish to convert point into a node, as part of a larger feature (line or polygon).
Node	Point feature included as part of larger object.	User may wish to convert point into a node, as part of a larger feature (line or polygon).

7. The next section of the window gives the option to export each feature class to its own separate coverage (in Single mode), or to merge classes into a single coverage (in Batch mode). Select the appropriate radio button, depending on the needs at the time. If merging feature classes to a single coverage, ensure that all feature types are the same (i.e., line, area, point).

NOTE

If the option to export classes to separate coverages is chosen, the user must define unique filenames for the output coverages.

8. When finished, click ***OK***. If any values are missing in the "Cov feature class column," an error message will appear indicating such. Otherwise, the **Converting Feature Class** window shown in Figure 6-12 appears, showing progress of the geodatabase-to-coverage conversion. The conversion process may take several minutes.

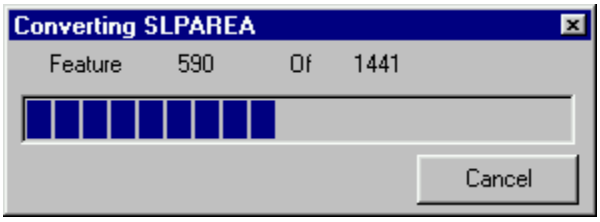


Figure 6-12 Converting Feature Class Window

9. When the conversion process is complete, the **Converting Feature Class** window will close, returning to the **ArcCatalog** main window, where the output coverage can be located in the Catalog Tree View panel.

For more information on converting geodatabases to coverages, refer to ArcCatalog's online Help or printed user documentation.

6.1.2 Raster-to-Vector Conversion

Both ArcInfo and Imagine provide functions to convert between raster and vector formatted data. ArcInfo provides tools to convert ArcInfo grids to coverages, shapefiles, and geodatabases, as well as a large number of external formats. Tools provided by ArcToolbox and ArcCatalog can be used to convert ArcInfo raster data to ArcInfo vector files. For more information on this, refer to ArcInfo's online Help or printed documentation.

6.1.2.1 Imagine Raster-to-Vector Conversion

Imagine's Raster to Vector function converts an Imagine *.img* raster file to an ArcInfo vector coverage. This functionality is useful to convert the output from an Imagine image classification to a vector feature file. Use the following steps to perform a raster-to-vector conversion.

1. With Imagine open on the desktop, click the ***Vector*** icon () on the Imagine icon panel. The **Vector Utilities** window will appear (Figure 6-13).

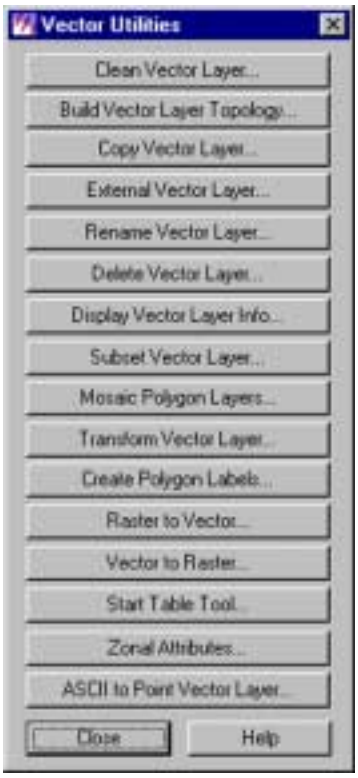


Figure 6-13 Vector Utilities Window

2. Click on the ***Raster to Vector*** button. The **Raster to Vector** window will appear (Figure 6-14).

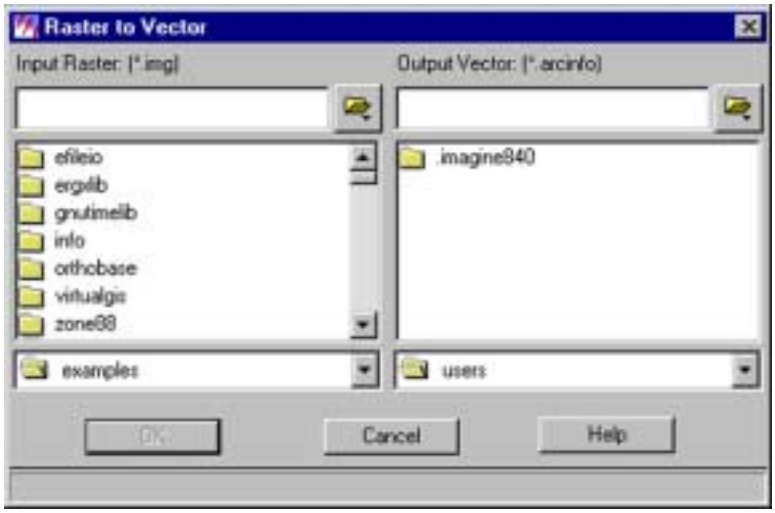


Figure 6-14 Raster to Vector Window

3. Enter the name of the "Input Raster" file, or click on the ***File Selector*** ( ) button to navigate to the appropriate file. The default file extension is *.img*.

4. In the "Output Vector" field, enter the name and directory of the new output vector layer, or navigate to it using the ***File Selector*** ( ) button.

5. Click ***OK***. The **Raster to ARC/INFO Coverage** window will appear (Figure 6-15).

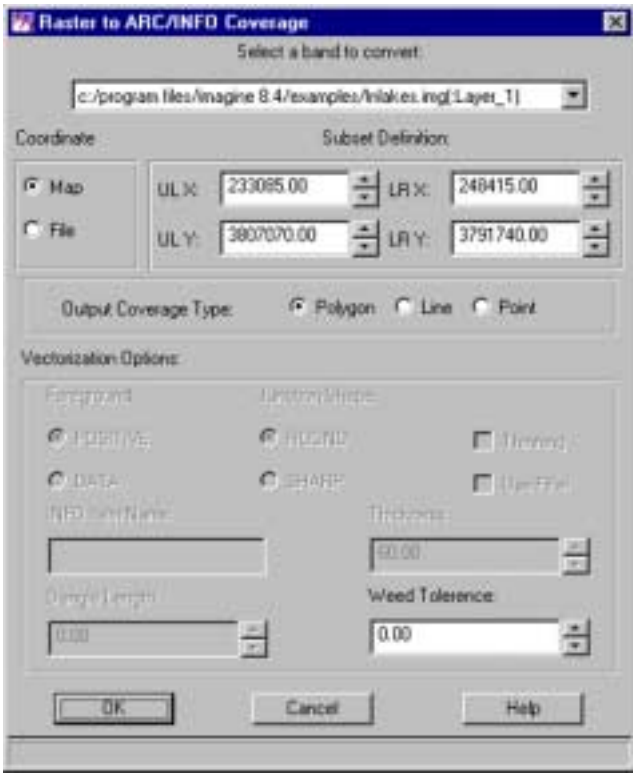


Figure 6-15 Raster to ARC/INFO Coverage Window

6. Accept the default values, or make appropriate changes as needed. For more information about items or fields in this window, click the ***Help*** button located in the bottom right corner of the window. Then click ***OK*** to process the conversion. The **Convert Raster to ARC/INFO Coverage** processing window will appear (Figure 6-16).

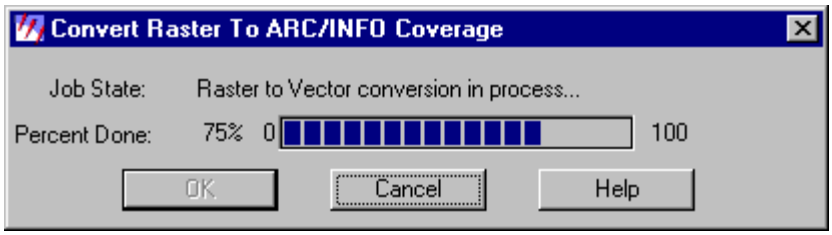


Figure 6-16 Convert Raster to ARC/INFO Coverage Processing Window

7. The conversion process will take a few moments. Click ***OK*** when finished. The raster-to-vector conversion is complete.

8. To compare the input raster image with the newly created vector output image, open the input raster image in the **Viewer #1** window, and then open the vector output image in **Viewer #2**.

For more information on Imagine raster-to-vector conversions, refer to Imagine's online Help or the *ERDAS Imagine 8.4 Tour Guides*.

6.1.2.2 ArcInfo Raster-to-Vector Conversion

ArcToolbox tools are provided to convert ArcInfo grids to various other raster data formats or to ArcInfo coverages. These tools operate in the same manner as the vector conversion tools. For more information on this type of conversion in ArcInfo, refer to ArcToolbox online Help or printed user documentation.

6.1.3 Projections and Datums

The projection and datum of a dataset defines that data's coordinate system. The coordinate system links x,y locations on a map to real-world locations. A datum is a mathematical representation of the shape of the earth's surface. Map projections are transformations that allow a three-dimensional earth to be represented in two dimensions, as x,y coordinates. Many map projections exist. Selection of a map projection for any given application depends largely on how the map is to be used.

6.1.3.1 Vector Data Projection

ArcMap offers on-the-fly projection and reprojection capability to the DTSS analyst, facilitating display and editing of data with formerly different coordinate systems. Vector data stored in geodatabases and shapefiles can be permanently projected using wizards and tools provided in ArcCatalog. Projection for coverages and grids can be accomplished within ArcToolbox using the Projections toolset.

6.1.3.1.1 On-the-Fly Projection

If the analyst brings a layer into an empty data frame in ArcMap, that layer's coordinate system and projection information is used as the default system, which the analyst can change later if desired. ArcMap will then automatically update the coordinate system of any subsequent layers added to this data frame to match the existing coordinate system, if sufficient information is available to determine the coordinate system of the data source.

If this information is not available, the analyst will have to provide such information, or ArcMap will not be able to align or display the data. Coverages, shapefiles, and raster files may have *.prj* files associated with them that provide coordinate projection information (and which the user can create using ArcToolbox or ArcCatalog). Geodatabases have coordinate information included in their metadata.

NOTE

Changing the coordinate system of a layer displayed in ArcMap does not change the defined coordinate system for the layer's data source.

6.1.3.1.2 Defining Projection for Geodatabases

When creating a new geodatabase with a feature dataset, the analyst must define a coordinate system and parameters in ArcCatalog. For more information on defining a geodatabase's projection in this manner, refer to Section 7.1.2.3.1, *Creating a New Feature Dataset*. For more information on determining the appropriate parameters for different projections, refer to ESRI's printed documentation, *Understanding Map Projections.*

To change projection information for a data frame in ArcMap, highlight the data frame and right click on it. Select ***Properties*** from the context menu that appears. In the **Data Frame Properties** window, click the **Coordinate System** tab, and then use the panel at the bottom of this tab to navigate to an appropriate coordinate system (Figure 6-17). Click **OK** to accept changes and close the window. See section 10.2.2.1, Data Frames, for more information.

NOTE

*Once a geodatabase has been reprojected in this manner, the only way to restore Geographical (Lat/Long) coordinates is to click the **Clear** button at the top of the **Coordinate System** tab.*

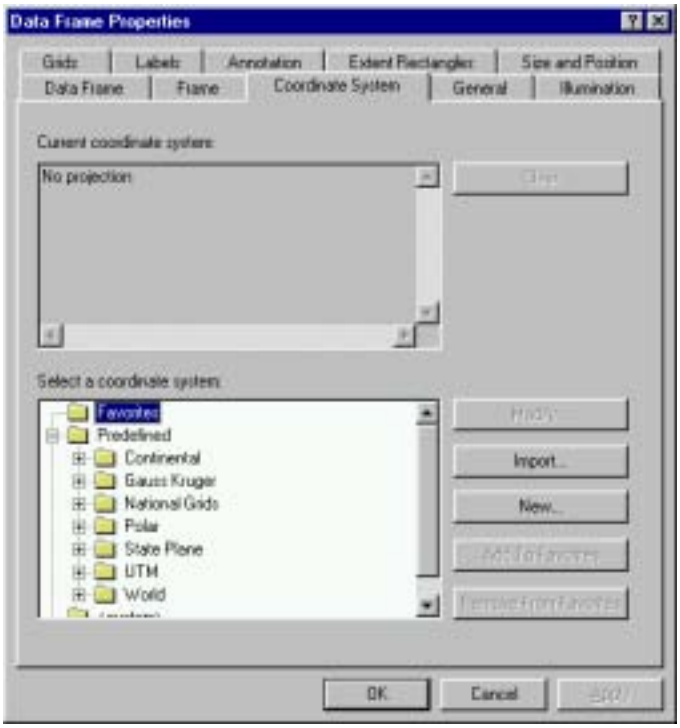


Figure 6-17 Coordinate System Tab in Data Frame Properties Window

For more information on defining and changing coordinate projections in ArcMap, refer to the program's online Help or the printed document, *Understanding Map Projections*.

6.1.3.1.3 Defining Projection for Shapefiles

The DTSS analyst can define or change the projection for a shapefile in ArcCatalog before bringing it into ArcMap as a new layer. This procedure is helpful to ensure that the new layer has compatible coordinate system information to facilitate display and editing in ArcMap. To define or change the projection for a shapefile in ArcCatalog, follow the procedure below.

1. With ArcCatalog open on the desktop, navigate to the appropriate shapefile in the Catalog Tree View panel on the left side of the **ArcCatalog** window.

2. Right click the shapefile, and select ***Properties*** from the context menu that appears (Figure 6-18).

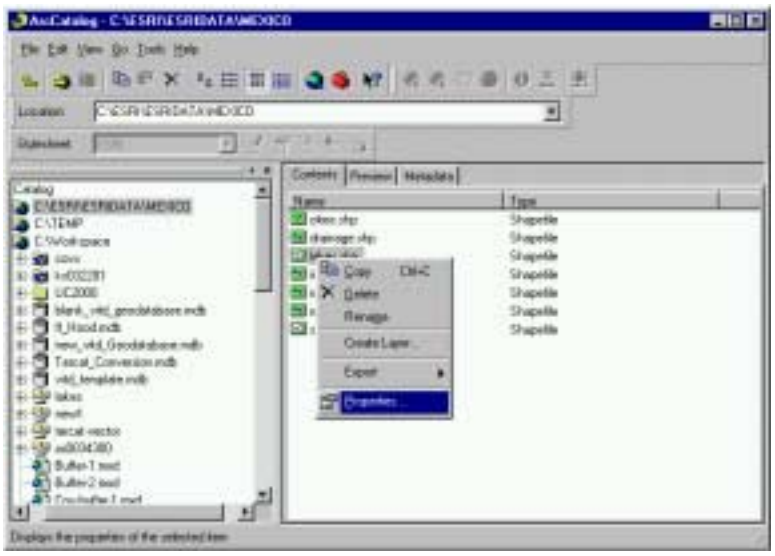


Figure 6-18 Shapefile Context Menu

3. The **Shapefile Properties** window opens (Figure 6-19), containing three tabs of information on the file.

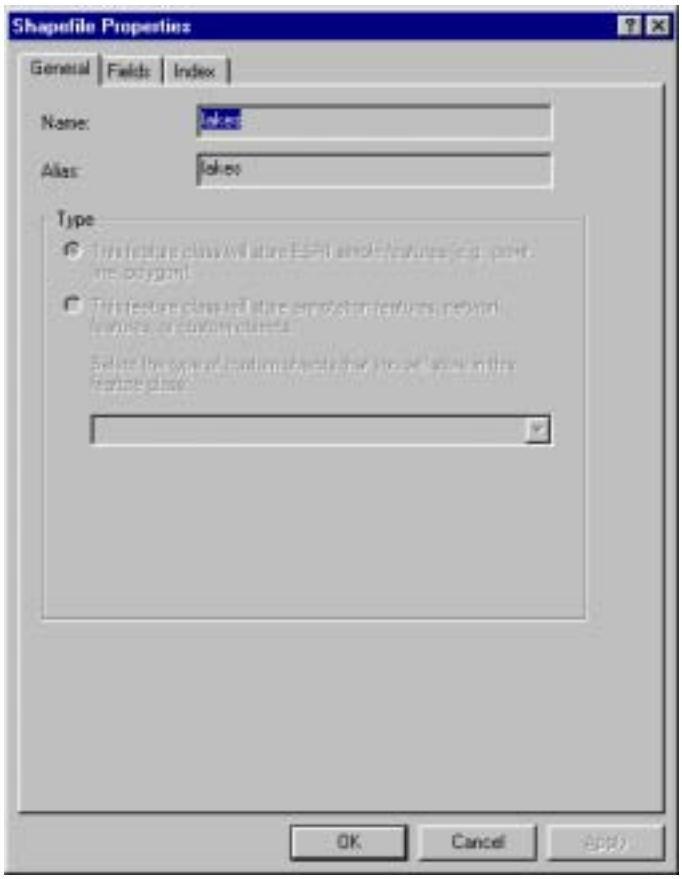


Figure 6-19 Shapefile Properties Window in ArcCatalog

4. Click the **Fields** tab to access a table displaying various fields available in this shapefile.

5. Click the table cell that reads “Shape,” in the “Field Name” column, to display a properties list that appears in the “Field Properties” area (Figure 6-20).

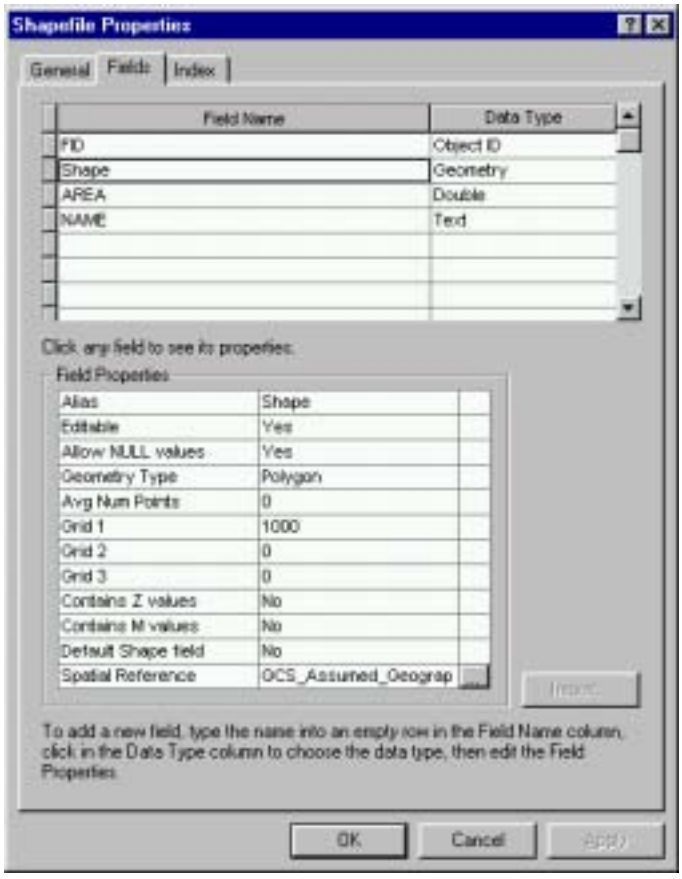


Figure 6-20 Fields Tab in Shapefile Properties Window

6. At the bottom right corner of the field properties list, click the “**…**” button (…) that appears in the row labeled “Spatial Reference.” The **Spatial Reference Properties** window will open (Figure 6-21).



Figure 6-21 Spatial Reference Properties Window for Shapefile

7. Depending on the need at the time, select one of the appropriate buttons:
   - Select—Allows user to choose a predefined coordinate system.
   - Import—Allows user to match the coordinate system of existing data.
   - New—Defines a new custom coordinate system.
   - Modify—Changes the properties of the current coordinate system.
   - Clear—Sets the coordinate system to "Unknown."
   - Save As—Saves this information to a *.prj* file.
8. Navigate to the appropriate coordinate system and make changes as needed in the desired window. When finished, click ***OK*** to return to the **Spatial Reference Properties** window.

9. When finished, click ***OK***. The window closes, returning to the **Shapefile Properties** window.

10. Click ***OK*** to accept changes and close the window.

For more information on projections in ArcInfo, refer to ESRI's printed document, *Understanding Map Projections.*

6.1.3.1.4 ArcToolbox Data Management and Projection Conversion

Within the ArcToolbox Data Management Tools are wizards and a transformation tool to help the user define or change the coordinate projection of a given dataset. To access this toolset, double click the **Data Management** toolbox in ArcToolbox's main window, then double click the icon next to **Projections**. This toolset includes the **Define Projection** wizard, the **Project** wizard, and the **Transform** tool, all covered in the following sections.

NOTE

Aside from the available functionality in ArcToolbox, data projection conversion can also be accomplished using ArcCatalog and ArcMap. For more information on defining coordinate projections in these programs, refer to Section 6.1.3.1.2, Defining Projection for Geodatabases.

6.1.3.1.4.1 Define Projection Wizard

The **Define Projection** wizard in ArcToolbox enables the DTSS analyst to define or modify a dataset's projection, associated projection parameters, and datum or spheroid information. It is useful when the analyst has a dataset without a defined projection or a projection definition (*.prj*) file. The analyst can choose to define the coordinate projection interactively or to match the projection of another dataset.

NOTE

*If the given dataset already has a coordinate projection defined, the **Define Projection** wizard will override any previous settings. The user will receive a warning message to that effect if a pre-defined dataset is chosen.*

6.1.3.1.4.1.1 Defining Projection Interactively

To define a dataset's coordinate projection interactively, follow the procedure below.

1. From the **ArcToolbox** window, click the plus sign (+) next to **Data Management Tools** to access the **Projections** toolset. Then click the plus sign next to **Projections** (Figure 6-22).



Figure 6-22 ArcToolbox Main Window

2. Double click ***Define Projection Wizard***. The wizard's first window appears (Figure 6-23), asking which action to follow. By default, the radio button beside "Define the coordinate system interactively" is selected.

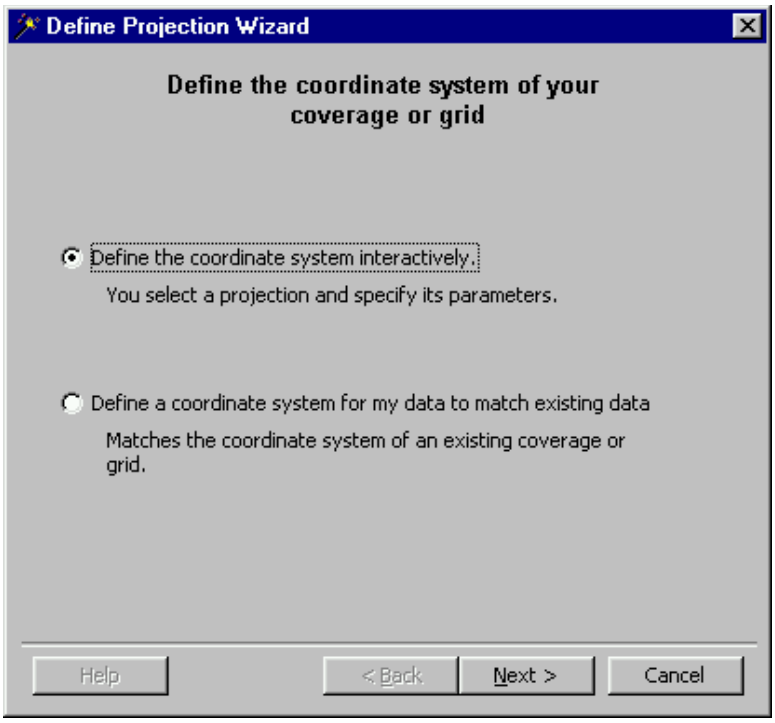


Figure 6-23 Define Projection Wizard First Window

3. Leave this setting as it is and click ***Next***. The second wizard window opens (Figure 6-24), prompting for a filename.

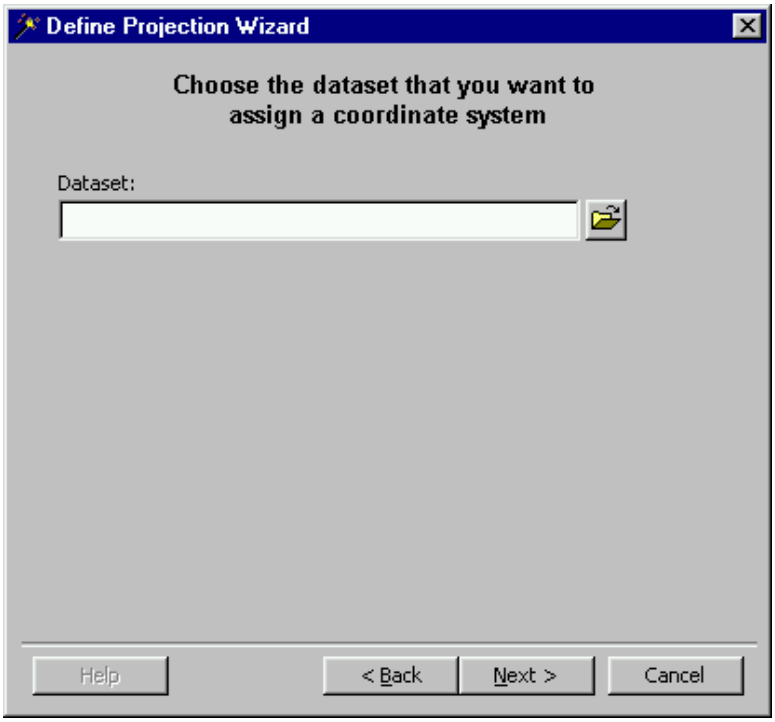


Figure 6-24 Input Dataset Window of Define Projection Wizard

4. Click the ***Open File*** icon ( ) to the right of the text field. The **Choose an Input Dataset** window opens (Figure 6-25).

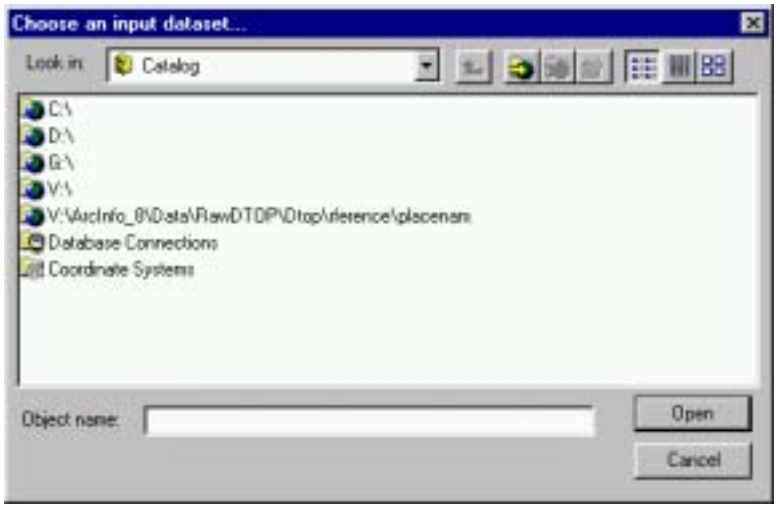


Figure 6-25 Choose an Input Dataset Window

5. Navigate to the appropriate folder, highlight the desired dataset, and click ***Open***.

6. When the filename appears in the wizard's text field, click ***Next***. The wizard advances to the window shown in Figure 6-26, which asks for the desired projection. Select the appropriate projection from the list on the left. Notice that the highlighted projection is described in the window's right panel.

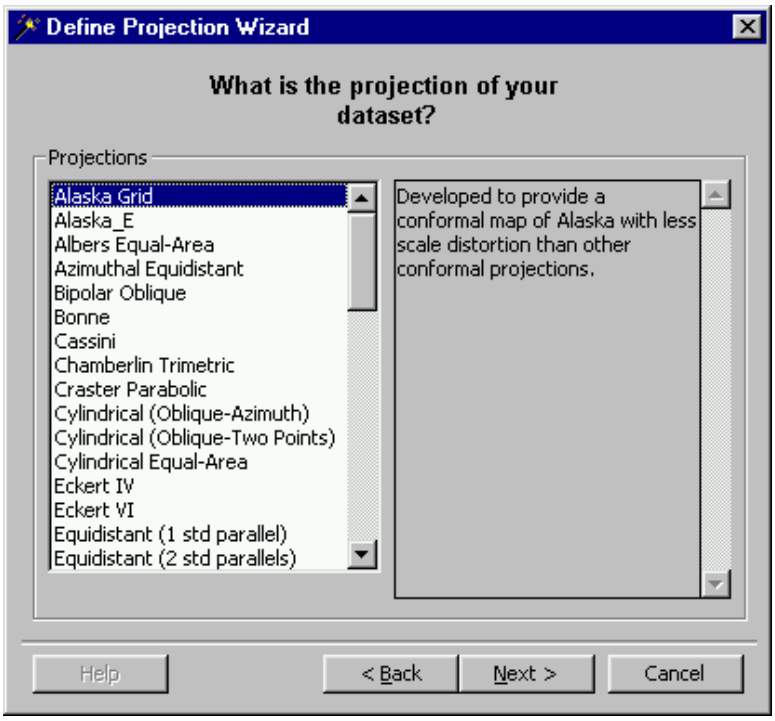


Figure 6-26 Select Projection Window of Define Projection Wizard

7. When finished, click ***Next***. The wizard advances to the window shown in Figure 6-27, where projection parameters are listed.

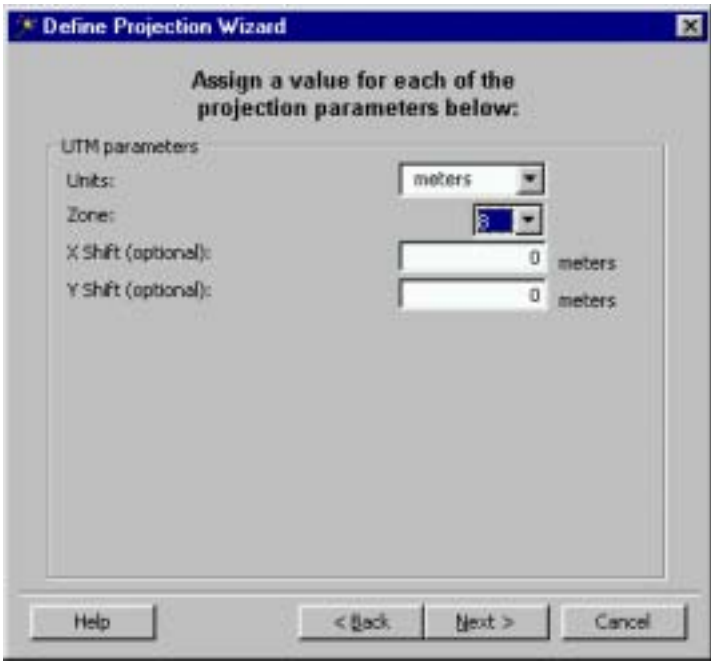


Figure 6-27 Parameters Window of Define Projection Wizard

8. Enter the desired parameters and click ***Next***. The following window asks for either datum or spheroid information (Figure 6-28). Select the appropriate radio button, and then select or enter the desired information.

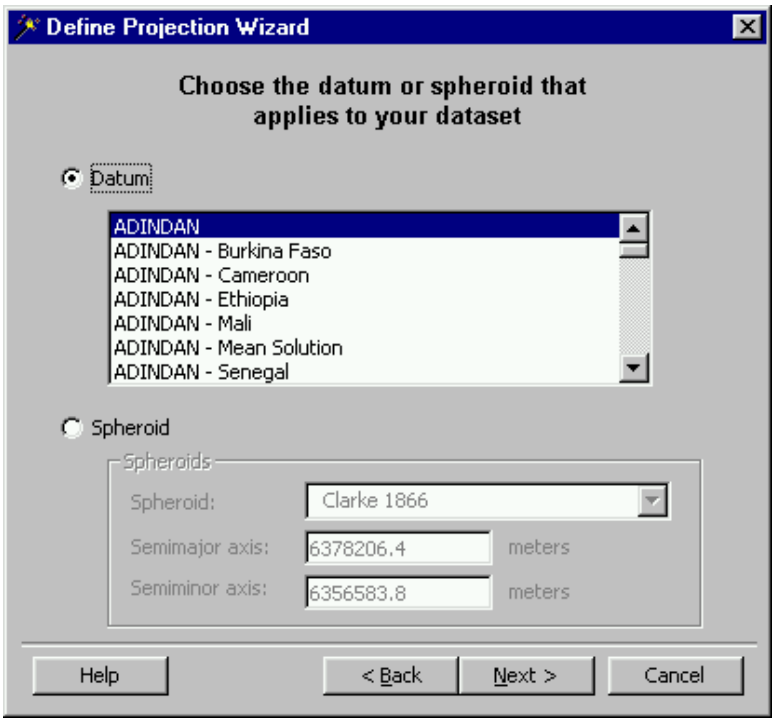


Figure 6-28 Datum/Spheroid Window of Define Projection Wizard

9. When finished entering the desired values, click ***Next***. The wizard's summary window appears (Figure 6-29), displaying the information entered in this session.

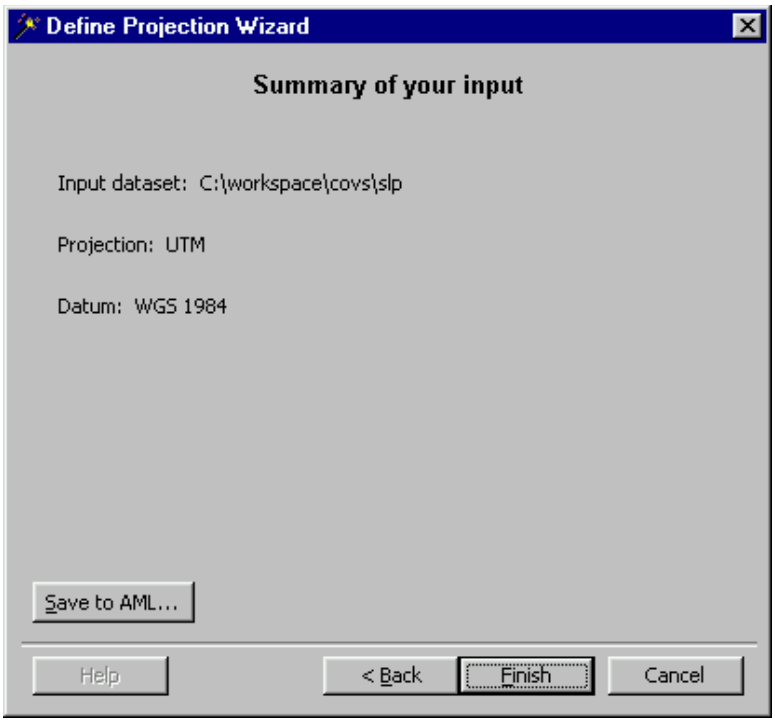


Figure 6-29 Summary Window of Define Projection Wizard

10. If this information is incorrect, click ***Back*** to modify earlier choices. Otherwise, click ***Finish*** to complete the projection definition.

The **Define Projection** wizard defines the dataset's projection and creates (or modifies) a *.prj* file that stores projection parameters for the dataset. Once this wizard is complete, the user must use the **Project** wizard (Section 6.1.3.1.4.2) to actually project the dataset or transform the datum or spheroid.

6.1.3.1.4.1.2 Matching Projection of Existing Dataset

To define the coordinate projection of a dataset using that of an existing dataset, follow the procedure below.

1. From the **ArcToolbox** window, double click ***Data Management Tools*** to access the **Projections** toolset. Then double click ***Projections*** to access the **Define Projection Wizard** (Figure 6-30).



Figure 6-30 ArcToolbox Main Window

2. Double click ***Define Projection Wizard***. The wizard's first window appears (Figure 6-31), asking which action to follow. By default, the radio button beside "Define the coordinate system interactively" is selected.

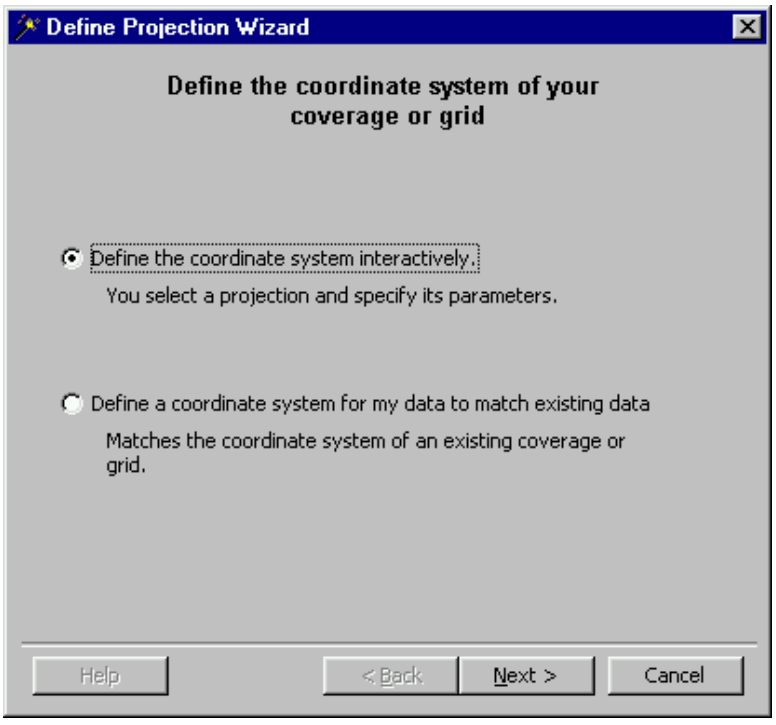


Figure 6-31 Define Projection Wizard First Window

3. Click the other option, "Define a coordinate system for my data to match existing data," and then click ***Next***. The next wizard window opens (Figure 6-32), asking for a filename for the input dataset.

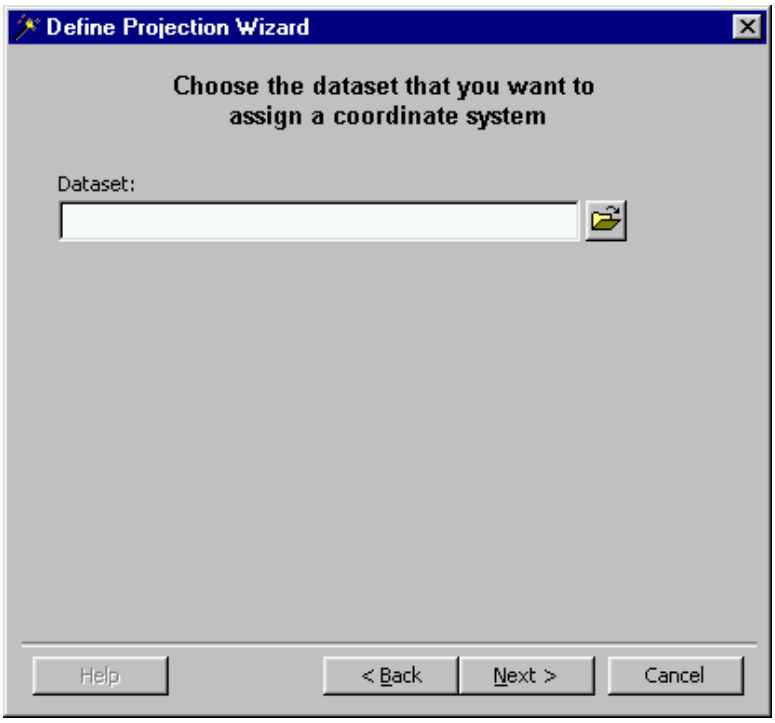


Figure 6-32 Input Dataset Window of Define Projection Wizard

4. Click the ***Open File*** icon ( ) to the right of the text field. The **Choose an Input Dataset** window opens (Figure 6-33).

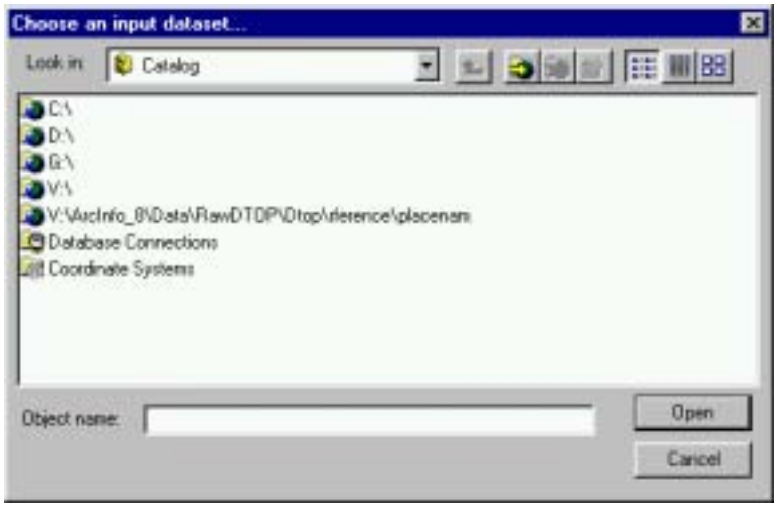


Figure 6-33 Choose an Input Dataset Window

5. Navigate to the appropriate folder, highlight the desired dataset, and click ***Open***.

6. The filename appears in the "Dataset" field of the **Define Projection Wizard**. Click ***Next***. The wizard advances to the window shown in Figure 6-34, which asks for a dataset whose projection the input will match.

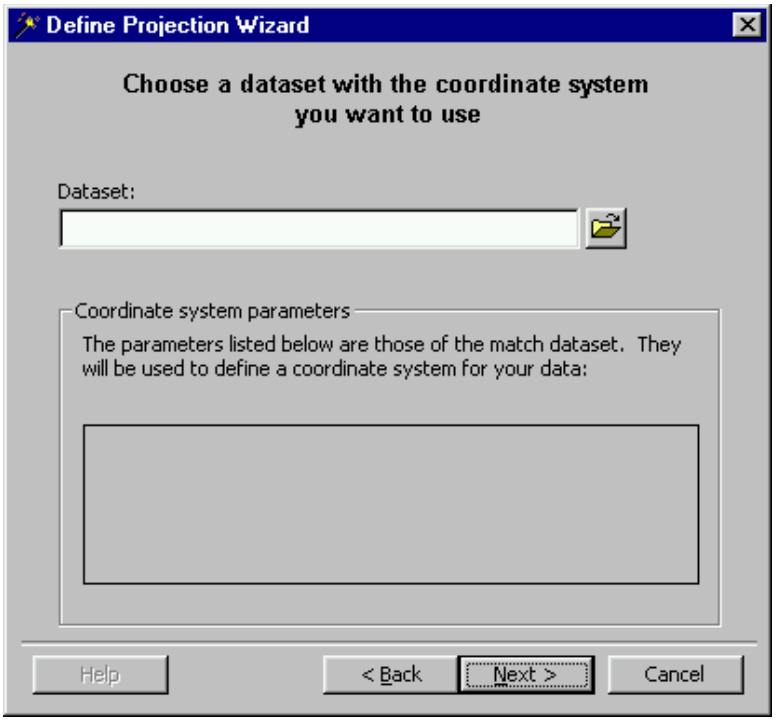


Figure 6-34 Matching Dataset Window of Define Projection Wizard

7. Navigate to the appropriate file using the **Open File** icon ( ), and then click ***Next***. The wizard's summary window appears (Figure 6-35), displaying information entered during the session.

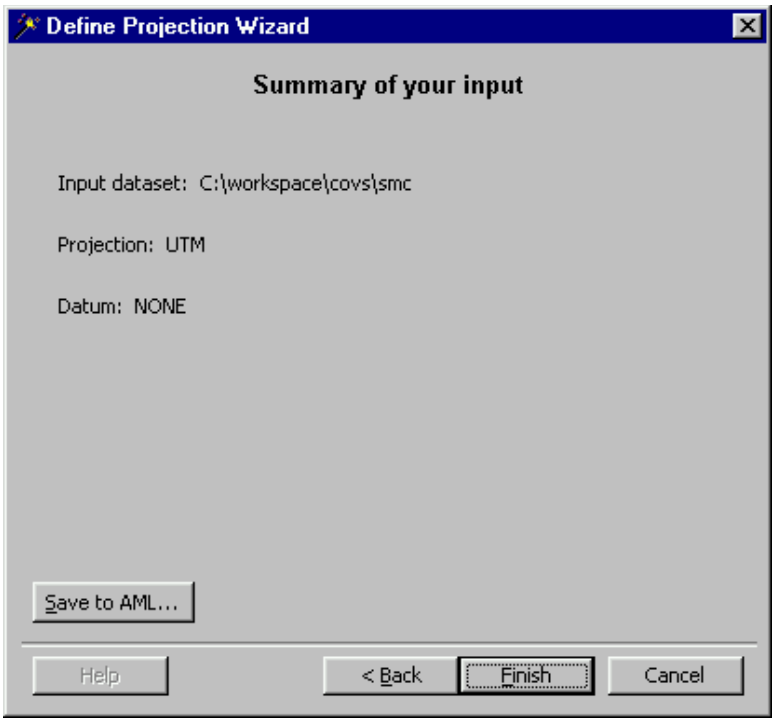


Figure 6-35 Matching Data Summary Window of Define Projection Wizard

8. If any information is incorrect, click ***Back*** to change earlier entries. Otherwise, click ***Finish***.

The **Define Projection** wizard defines the dataset's projection and creates (or modifies) a *.prj* file that stores projection parameters for the dataset. Once this wizard is complete, the user must use the **Project** wizard (Section 6.1.3.1.4.2) to actually project the dataset or transform the datum or spheroid.

6.1.3.1.4.2 Project Wizard

The **Project** wizard in ArcToolbox uses a dataset's *.prj* file to actually transform coordinates from one projection to another. The user can access the **Project** wizard to convert a dataset from one coordinate system to another, or to copy the projection information from one dataset to another. This conversion is useful when the analyst begins with a dataset with angular units (such as geographic degrees for longitude and latitude), because most tools in ArcToolbox assume the dataset has planar units (such as two-dimensional meters and feet). The user can change the projection to work more effectively with the given dataset, or to work with multiple datasets whose coordinate projections need to be the same. Like the **Define Projection** wizard, the **Project** wizard offers two options for the user: either to designate a specific projection, or to match the projection of another dataset.

NOTE

*Before using the **Project** wizard, the dataset must have a projection file (.prj) that records its projection, projection parameters, and datum and spheroid. Use the **Define Projection** wizard to create a projection file if the dataset does not have one.*

6.1.3.1.4.2.1 Selecting New Projection Interactively

To designate a specific projection for transforming coordinates, follow the procedure below.

1. In the **ArcToolbox** window, click the plus sign (+) next to ***Data Management***, and then ***Projections*** (Figure 6-36).

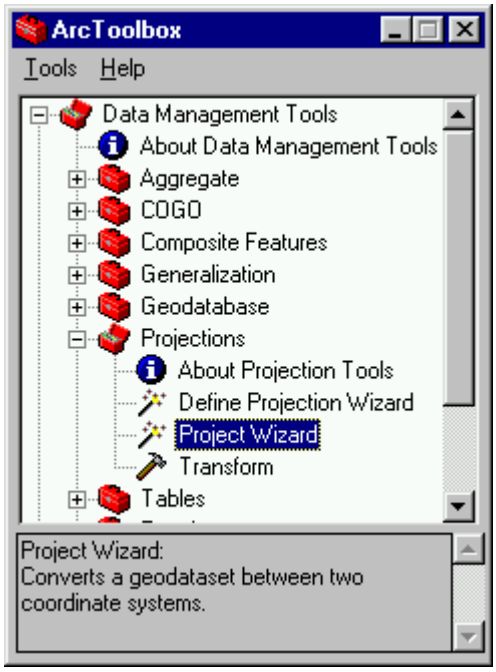


Figure 6-36 ArcToolbox Window

2. Double click ***Project Wizard*** to open the wizard's first window (Figure 6-37). The default setting is to "Project my data to a specified coordinate system."

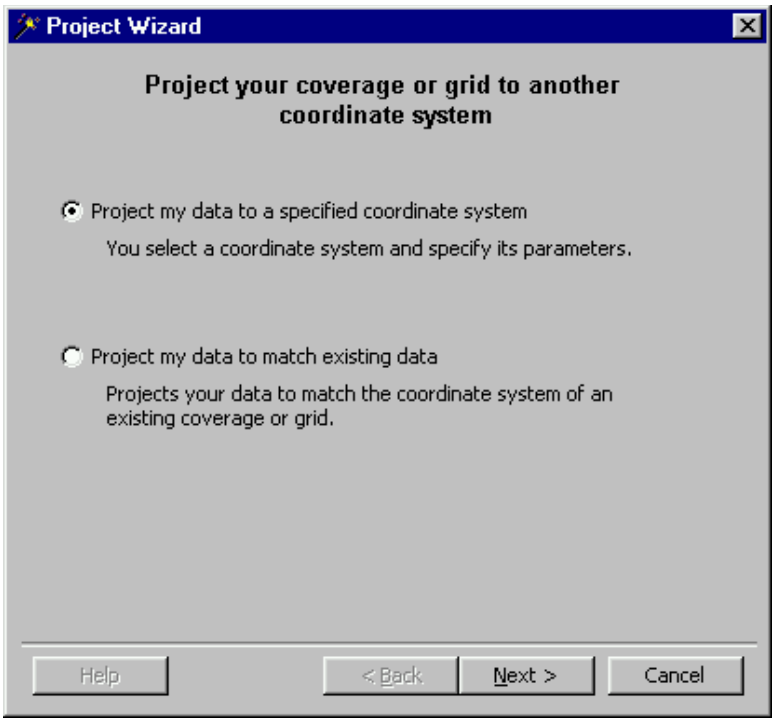


Figure 6-37 First Window of Project Wizard

3. Leave the setting as it is, and click ***Next***. The wizard's second window opens (Figure 6-38), asking for an input dataset.



Figure 6-38 Input Dataset Window of Project Wizard

4. Click the ***Open Folder*** icon ( ) to navigate to the appropriate file. The **Choose an Input Dataset** window opens (Figure 6-39).

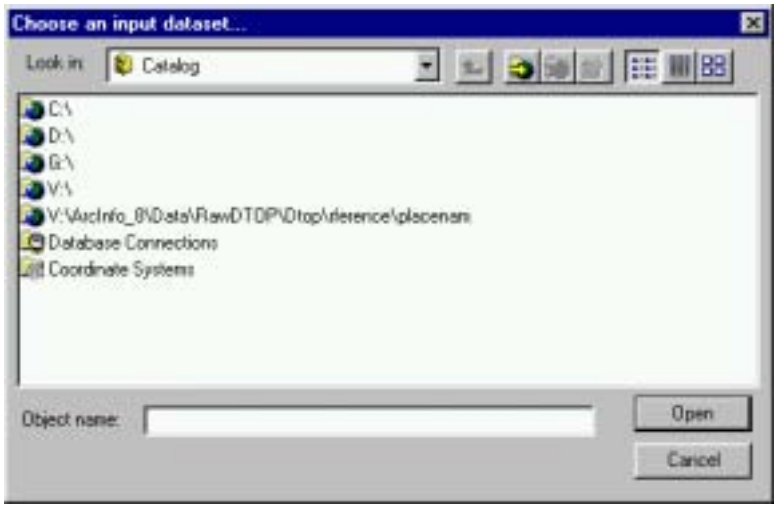


Figure 6-39 Choose an Input Dataset Window

5. Now highlight the desired dataset with the mouse and click ***Open***. The path and filename appear in the text field of the second wizard window (Figure 6-40). Notice that text appears in the "Coordinate system parameters" box at the bottom of the window.

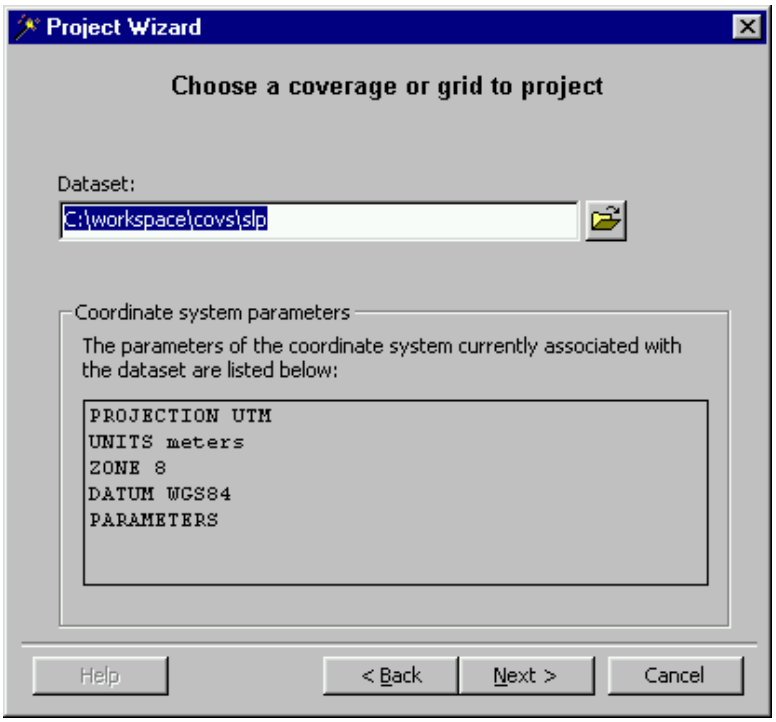


Figure 6-40 Path and Filename in Project Wizard

6. Click ***Next*** to continue. The window shown in Figure 6-41 appears, asking for a desired projection.

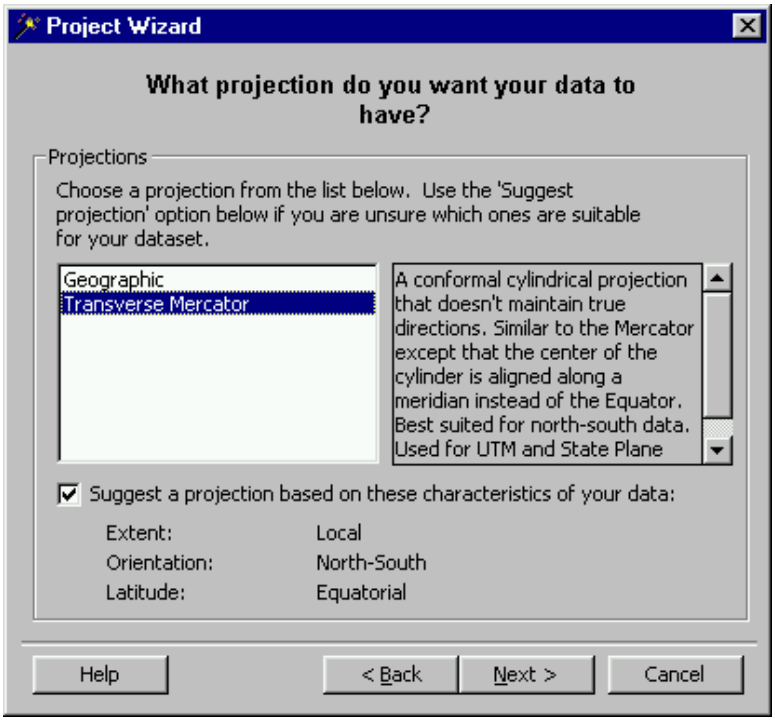


Figure 6-41 Projection Selection Window of Project Wizard

7. Notice the text at the top of the window, indicating that guidance is available. Click the "Suggest a projection" checkbox near the bottom of the window.

8. Highlight the desired projection and click ***Next***. The window shown in Figure 6-42 opens, asking for parameter values.

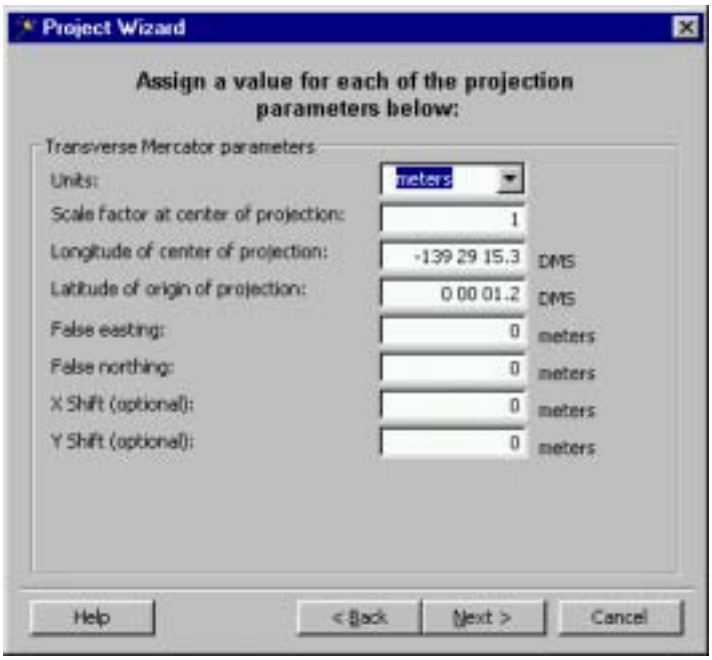


Figure 6-42 Projection Parameters Window of Project Wizard

9. Make the desired changes, if any, and click ***Next***. The next window (Figure 6-43) prompts for a datum. Notice that the "Suggest appropriate datums" checkbox is checked.

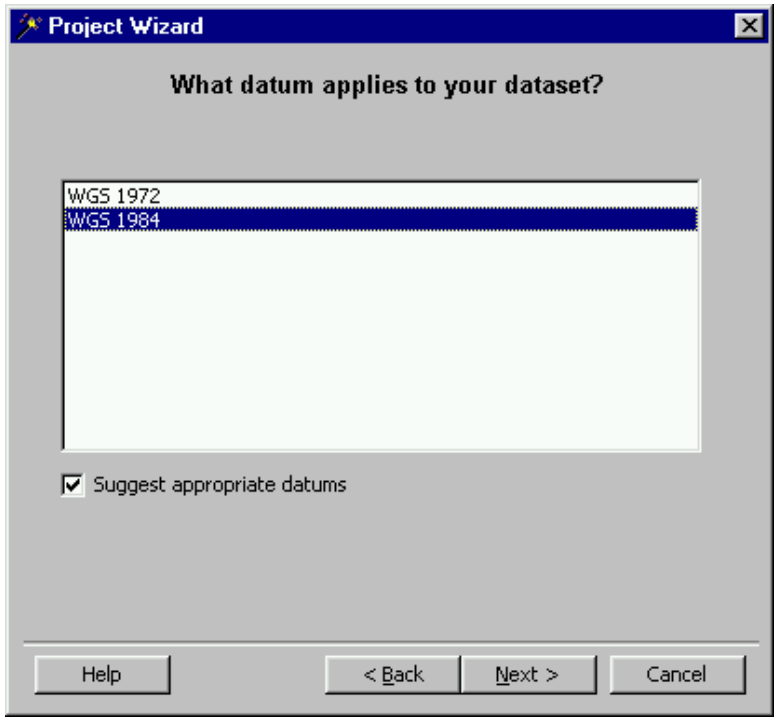


Figure 6-43 Select Datum Window of Project Wizard

10. Select the appropriate datum for the dataset, and click ***Next***. The window shown in Figure 6-44 asks for a path and filename for an output dataset.



Figure 6-44 Output Dataset Prompt in Project Wizard

11. Navigate to the appropriate folder, and then type in the filename for the dataset. When the correct path and filename appear in the text field, click ***Next***.

12. The wizard's **Summary** window opens (Figure 6-45), displaying the entries from this session. Review this information, and click ***Back*** to make any changes to previous settings. Otherwise, click ***Finish*** to accept these entries and process the projection changes.

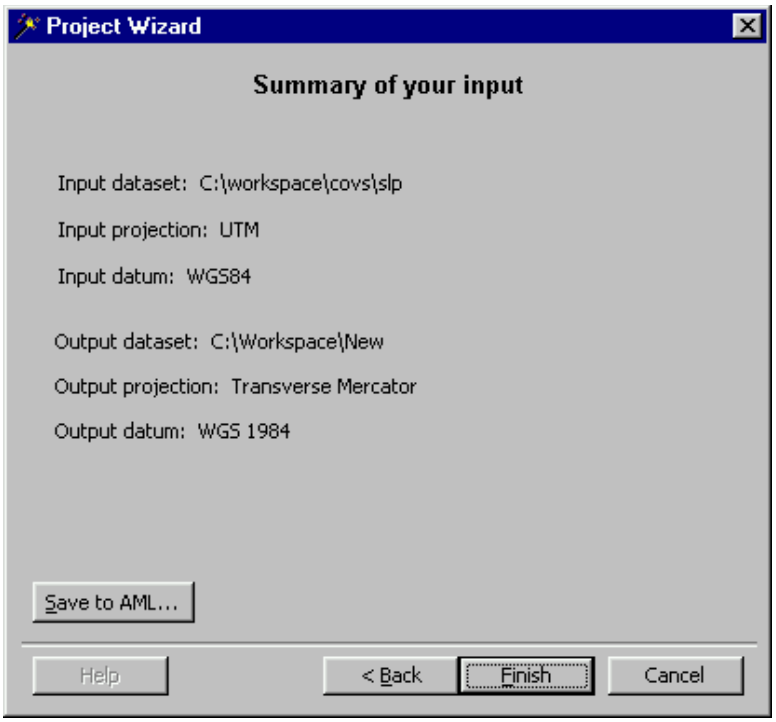


Figure 6-45 Summary Window of Project Wizard

NOTE

*At any point in the wizard's progression before clicking **Finish**, the user may select the **Back** button to change any previous entries. Once the **Finish** button is clicked, however, the changes are accepted, and changes to the dataset's projection are saved.*

ArcToolbox' online Help outlines specific recommendations for post-processing of datasets with newly defined projections. For more information, refer to the online Help topic "Project Wizard."

6.1.3.1.4.2.2 Matching Coordinate Projection of Existing Data

To transform a dataset's projection by matching the coordinate projection of existing data, follow the procedure below.

1. In the **ArcToolbox** window, click the plus sign (+) next to **Data Management**, and then **Projections** (Figure 6-46).

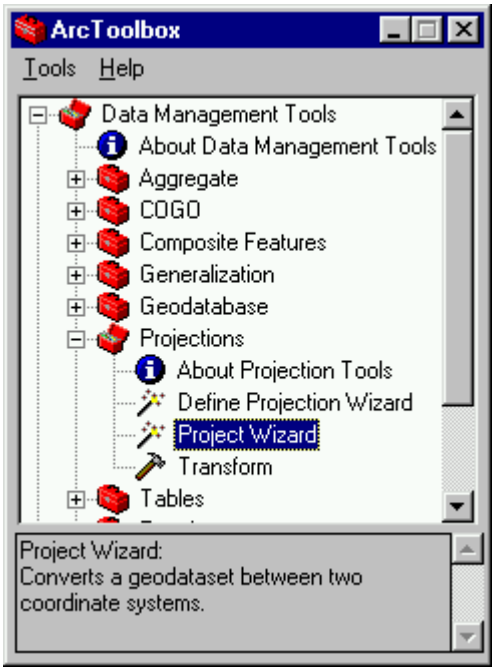


Figure 6-46 ArcToolbox Window

2. Double click ***Project Wizard*** to open the wizard's first window (Figure 6-47). The default setting is to "Project my data to a specified coordinate system."

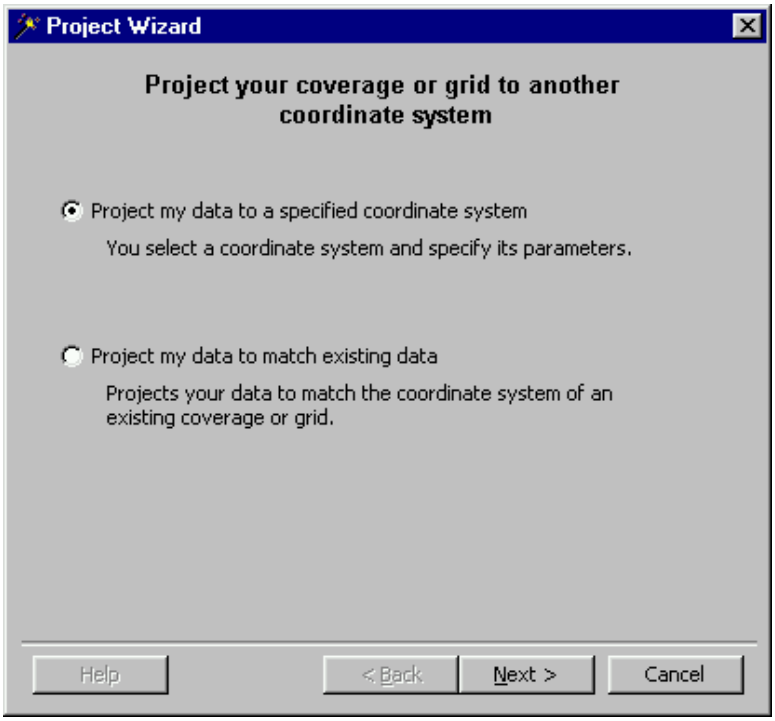


Figure 6-47 First Window of Project Wizard

3. Click the other option, “Project my data to match existing data,” and then click ***Next***. The wizard proceeds to the next window (Figure 6-48), which prompts for an input dataset filename.



Figure 6-48 Input Dataset Window of Project Wizard

4. Click the ***Open Folder*** icon ( ) to navigate to the appropriate file. The **Choose an Input Dataset** window opens (Figure 6-49).

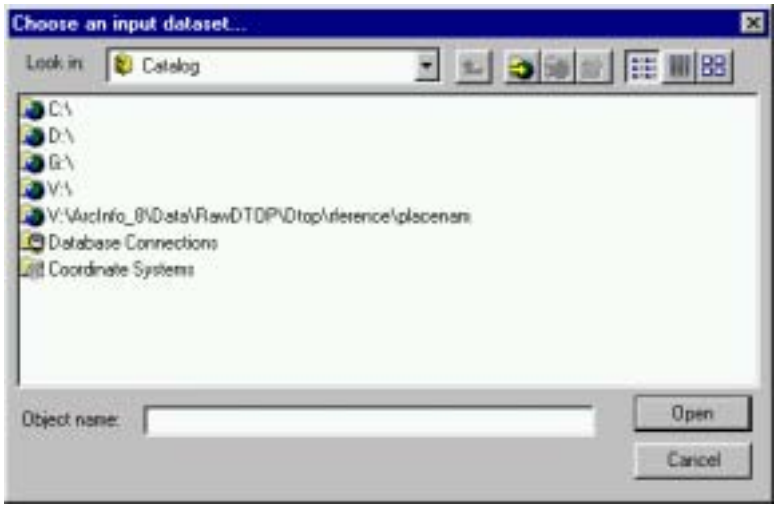


Figure 6-49 Choose an Input Dataset Window

5. Now highlight the desired dataset with the mouse and click ***Open***. The path and filename appear in the text field of the second wizard window (Figure 6-50). Notice that text appears in the "Coordinate system parameters" box at the bottom of the window.

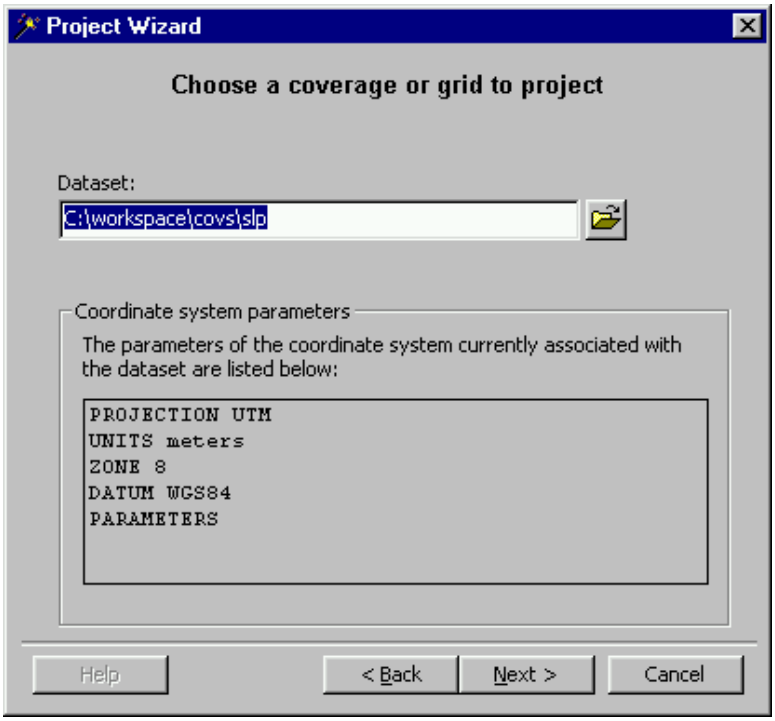


Figure 6-50 Path and Filename in Project Wizard

6. Click ***Next*** to continue. The window shown in Figure 6-51 opens, asking for a matching dataset.

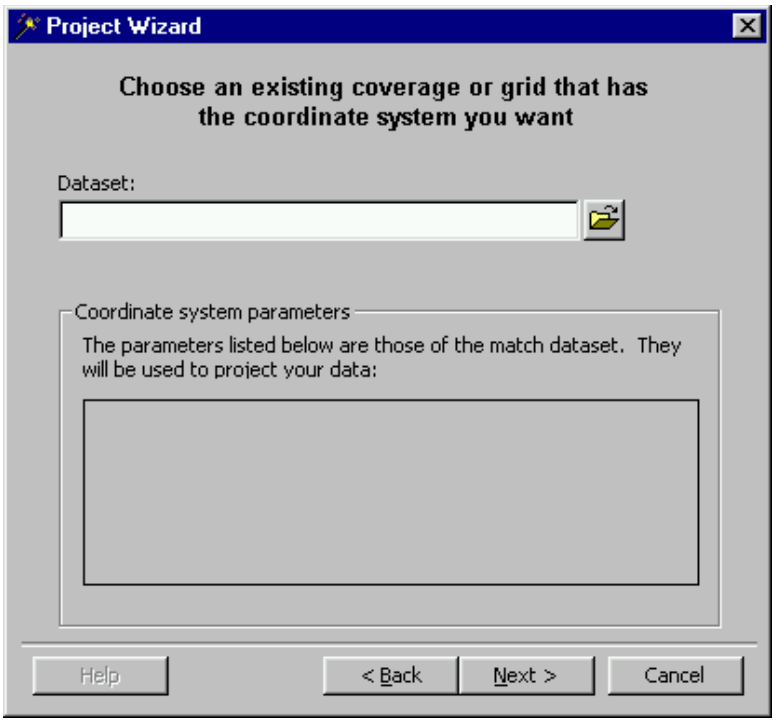


Figure 6-51 Matching Dataset Window of Project Wizard

7. Click the ***Open Folder*** icon ( ) to navigate to an appropriate dataset.

8. Select that dataset, click ***Open***, and view the filename and parameters in the window. Click ***Next***. The window shown in Figure 6-52 appears, asking for a designated output dataset.

NOTE

Either both or neither of the datasets must have a datum assigned. If one dataset has been assigned a datum and the other has not, an error message will appear, informing the analyst that an invalid dataset was chosen. In that case, click ***OK*** *to close the error message and return to the wizard to choose different datasets.*



Figure 6-52 Output Dataset Prompt in Project Wizard

9. Click the **Open Folder** icon ( ) to navigate to the appropriate folder, and then type in a name for the new dataset, as shown in Figure 6-53.

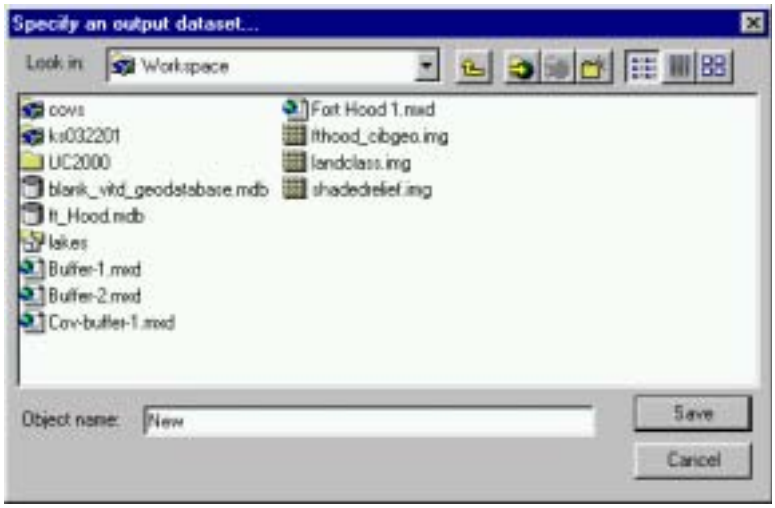


Figure 6-53 Specify an Output Dataset Window

10. Click ***Save*** to bring the path and new filename into the text field of the wizard, and then click ***Next***. The wizard's **Summary** window opens (Figure 6-54), showing the selections from this session.

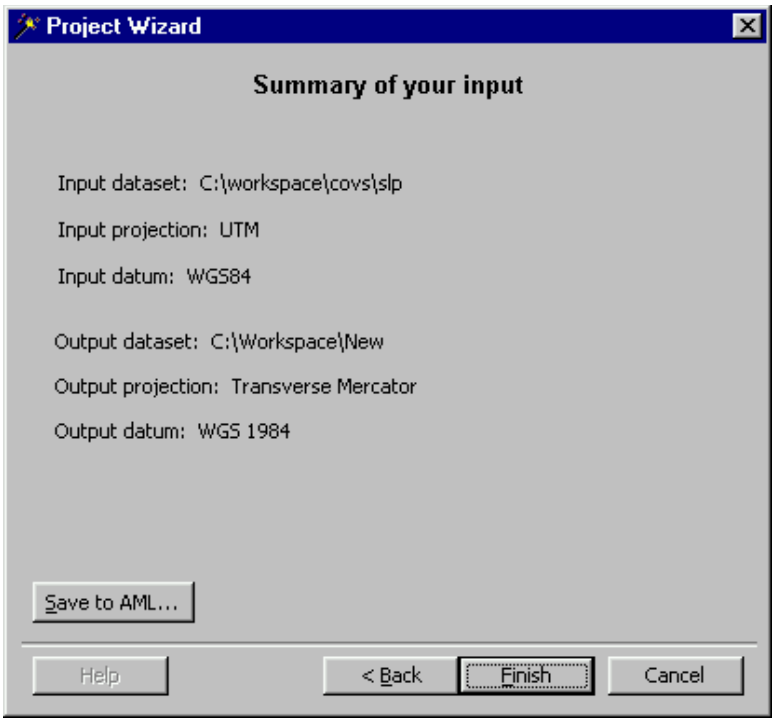


Figure 6-54 Summary Window of Project Wizard

11. Review this information, and click ***Back*** to change any previous settings. Otherwise, click ***Finish*** to accept these entries and process the projection changes.

NOTE

*At any point in the wizard's progression before clicking **Finish**, the user may select the **Back** button to change any previous entries. Once the **Finish** button is clicked, however, the changes are accepted, and changes to the dataset's projection are saved.*

ArcToolbox' online Help outlines specific recommendations for post-processing of datasets with newly defined projections. For more information, refer to the online Help topic "Project Wizard."

6.1.3.1.4.3 Transform Tool

The **Transform** tool in ArcToolbox allows the user to skew, rotate, and adjust the coordinates of a coverage, using one of three transformation methods: Affine, Projective, or Similarity. To access the **Transform** tool from the ArcToolbox main window, click the plus sign (+) beside ***Data Management Tools***, and then beside ***Projections***. Then

double click on ***Transform***. The user indicates an input and an output coverage using the **Open File** icons ( ) in the window (Figure 6-55). All transformation methods use control points, or "tics," to perform the coordinate transformation.

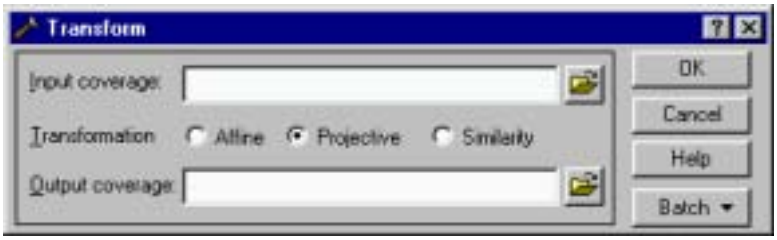


Figure 6-55 Transform Tool in ArcToolbox

Table 6-2 below gives a brief description of each item's function.

Table 6-2 Functionality of Fields in Transform Tool

Item	Functionality
Input Coverage	Indicates coverage whose coordinates user wishes to transform. User enters filename or navigates to appropriate coverage which populates field.
Transformation	Indicates type of coordinate transformation to perform, in decreasing order of accuracy.
Output Coverage	Indicates existing coverage whose tics user wishes to use to perform the transformation.
OK	Accepts tool's settings and proceeds with transformation.
Cancel	Cancels tool's operation.
Help	Accesses thorough description of items in window.
Batch	Opens table where user can input multiple coverages for coordinate transformation.

For a full description of the functionality and terminology connected to the **Transform** tool, click ***Help*** in the **Transform** window to access ArcToolbox's online Help.

6.1.3.2 Raster Data Projection

Raster data projection conversion can be accomplished within ERDAS Imagine using several possible options. First, the analyst needs to determine if the raster image has projection information. This process is discussed in Section 6.1.3.2.1, *Determining Projection Information*. Based on whether or not the raster image contains projection information, the user can reproject the image using the following scenarios:

- The raster image is projected, but the projection and map information is not assigned to image, and this information can be provided from another source.
- The raster image is not projected, but another image of the same area is projected.
- The raster image has a projection, and the user wants to reproject the image.

Each of these options is covered in the following sections.

6.1.3.2.1 Determining Projection Information

To determine whether the raster image has projection information, use the following steps.

1. With Imagine open on the desktop, open up a raster image in the **Viewer #1** window by clicking the ***Open Layer*** button ( ) from the toolbar. The **Select Layer To Add** window will appear. (Figure 6-56).

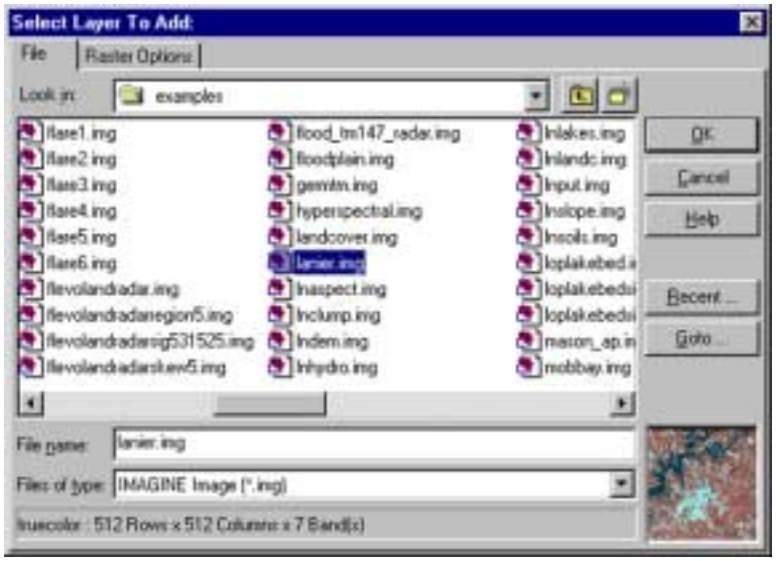


Figure 6-56 Select Layer to Add Window

2. Navigate to the desired raster image (*.img*) file and click ***OK***. The window closes and displays the selected raster image in the **Viewer #1** window.
3. Click the ***Show Information*** button ( ) from the Viewer #1 toolbar. The **ImageInfo** window will appear (Figure 6-57).

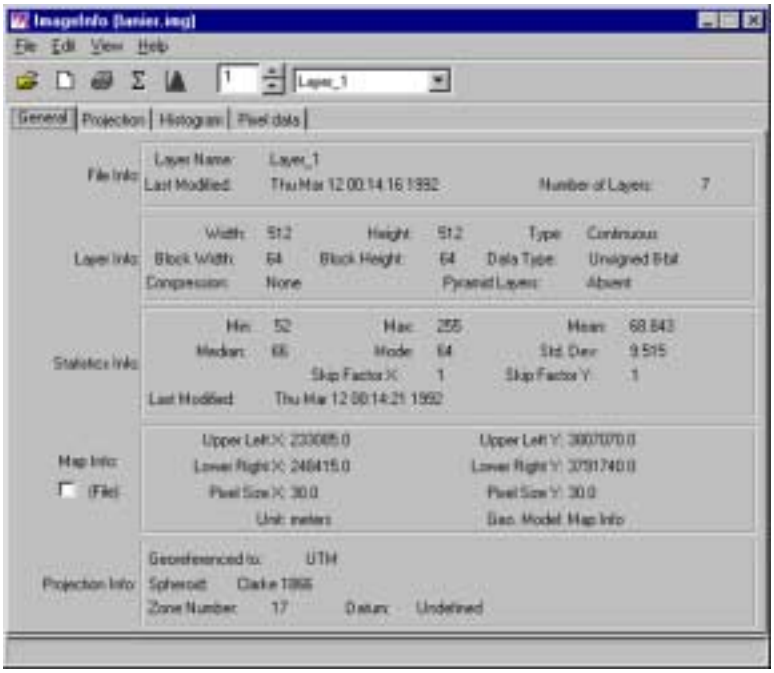


Figure 6-57 ImageInfo Window

4. The raster image's projection information appears in the "Projection Info" area located at the bottom of the screen on the General tab. If the raster image does not have projection information, the "Projection Info" area will be blank.

6.1.3.2.2 Assigning Projection to Raster Image

If the raster image does not have projection information, but it can be obtained from another source, follow the steps below to project the image. This process of projecting an image in not recommended unless the user knows the exact projection information to add.

NOTE

This process does not reproject the image. It only assigns projection information to an image that is already projected.

1. With Imagine open on the desktop, open the raster image that contains no projection information in the **Viewer #1** window.

2. Click the ***Show Information*** button ( ) from the **Viewer #1** toolbar. The **ImageInfo** window will appear (Figure 6-58). Notice the selected image does not have information displayed in the "Map Info" and "Projection Info" areas of the screen.

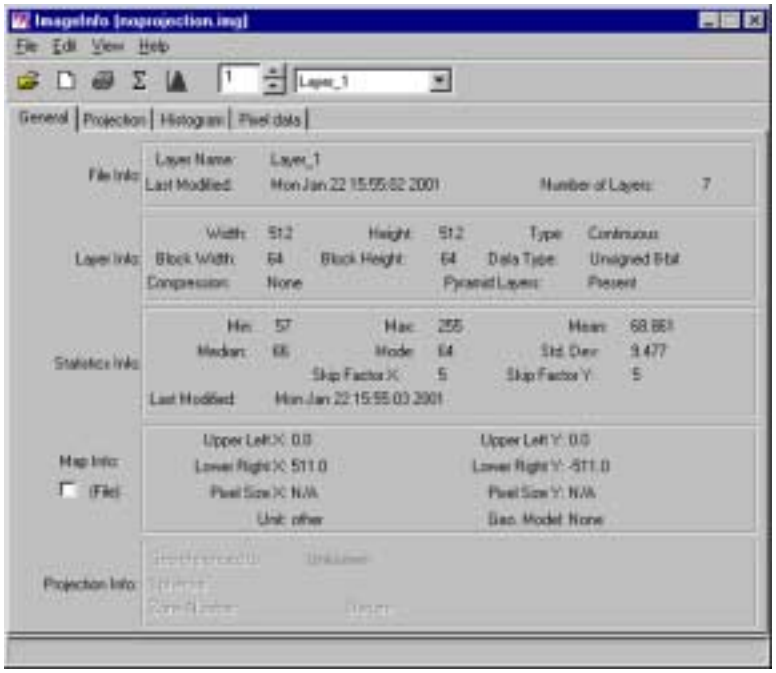


Figure 6-58 ImageInfo Window Without Projection and Map Information

3. Select ***Edit/Change Map Model*** from the menu bar. The **Change Map Info** window will appear (Figure 6-59).

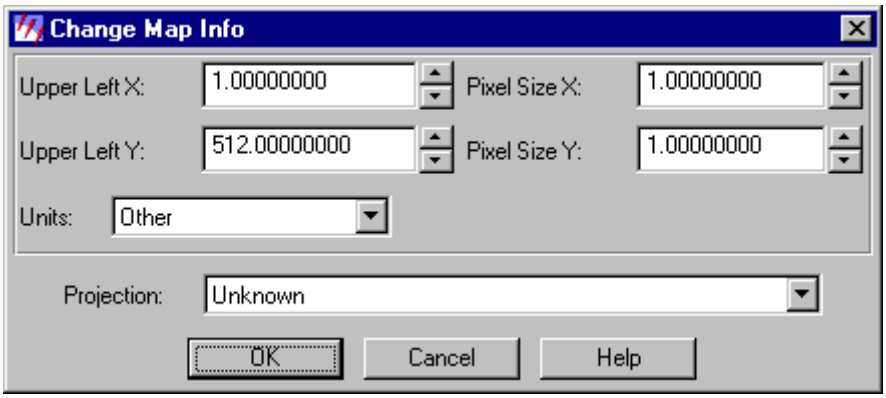


Figure 6-59 Change Map Info Window

4. Enter the exact map information into each field. When finished, click ***OK***. The window closes, and the entered information appears in the "Map Info" field of the **ImageInfo** window (Figure 6-60).

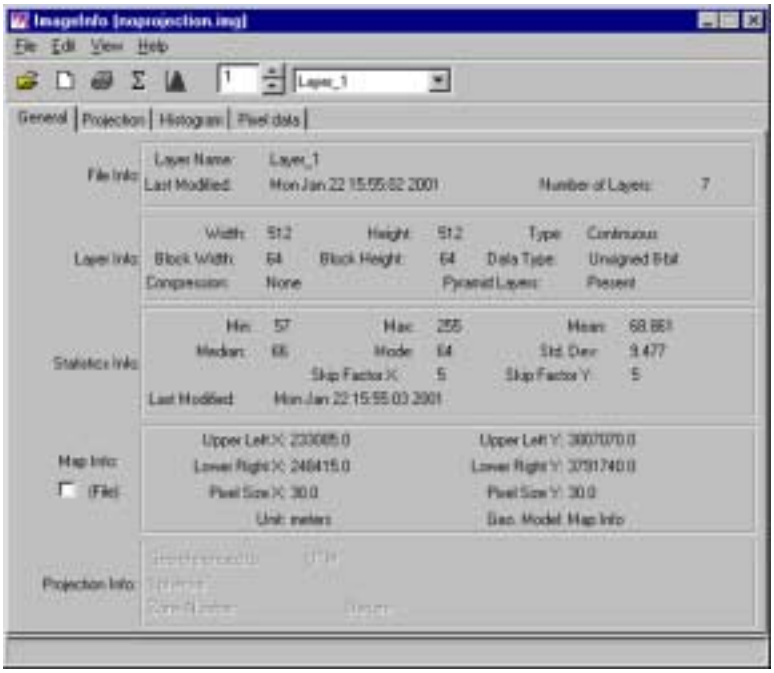


Figure 6-60 ImageInfo Window With Map Information Added

5. Select ***Add/Change Projection*** from the **Edit** menu. The **Projection Chooser** window will appear (Figure 6-61).

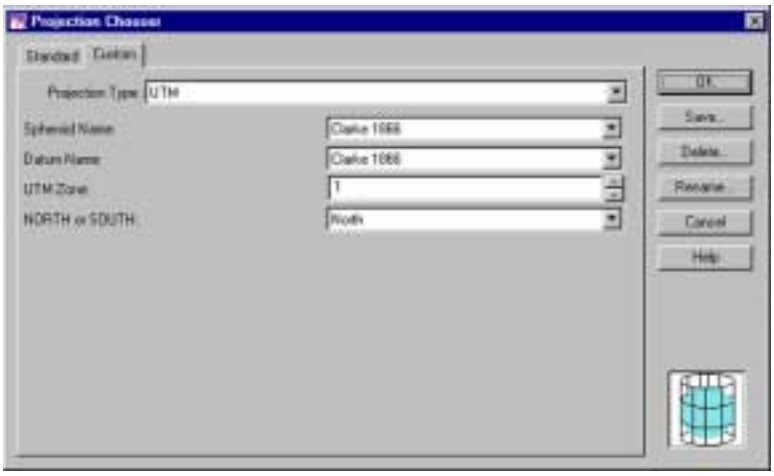


Figure 6-61 Projection Chooser Window

6. Enter the exact projection information into each field on the **Custom** tab. When finished, click ***OK***. The window closes and the entered information appears in the "Projection Info" field of the **ImageInfo** window (Figure 6-62), showing that the raster image now has projection information.

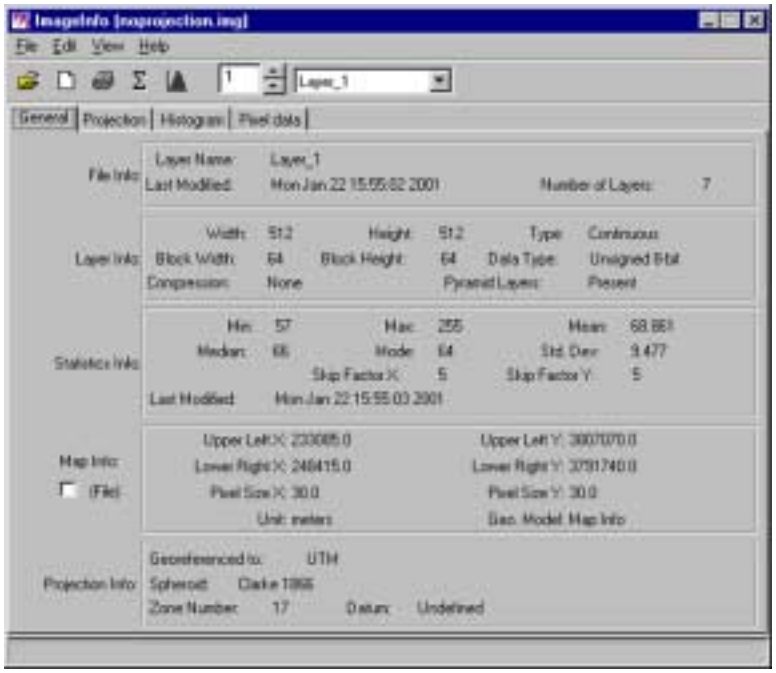


Figure 6-62 ImageInfo Window With Projection Information Added

6.1.3.2.3 Polynomial Rectification

If the raster image does not provide projection information, but another image of the same area does, image-to-image rectification can be performed using functionality in Imagine that utilizes ground control points (GCPs). Rectification is the process of projecting the data onto a plane and making it conform to a map projection system. In the following example, a raster image without projection information will be rectified using a georeferenced image of the same area. A georeferenced image has map coordinates assigned to the image data.

1. With Imagine open on the desktop, open the raster image that contains no projection information in the **Viewer #1** window.

2. Click the **Viewer** icon ( ) on the Imagine icon panel to open the second Viewer. The **Viewer #2** window will appear.

3. Open the georeferenced raster image in the **Viewer #2** window.

4. Select ***Raster/Geometric Correction*** from the **Viewer #1** window. The **Set Geometric Model** window appears (Figure 6-63).

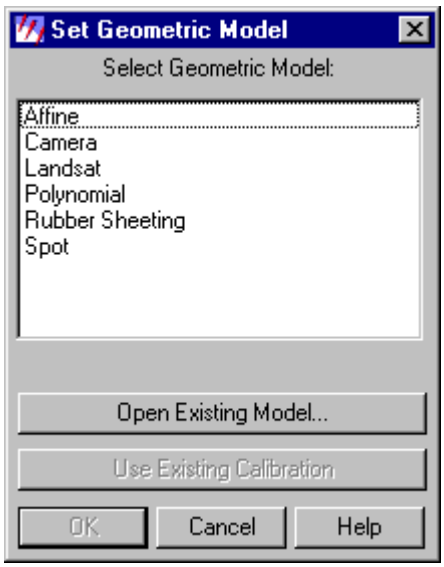


Figure 6-63 Set Geometric Model Window

5. Select ***Polynomial*** and click ***OK***. The **Geo Correction Tools** window will appear (Figure 6-64), along with the **Polynomial Model Properties** window (Figure 6-65).

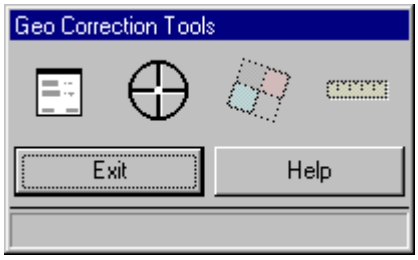


Figure 6-64 Geo Correction Tools Window

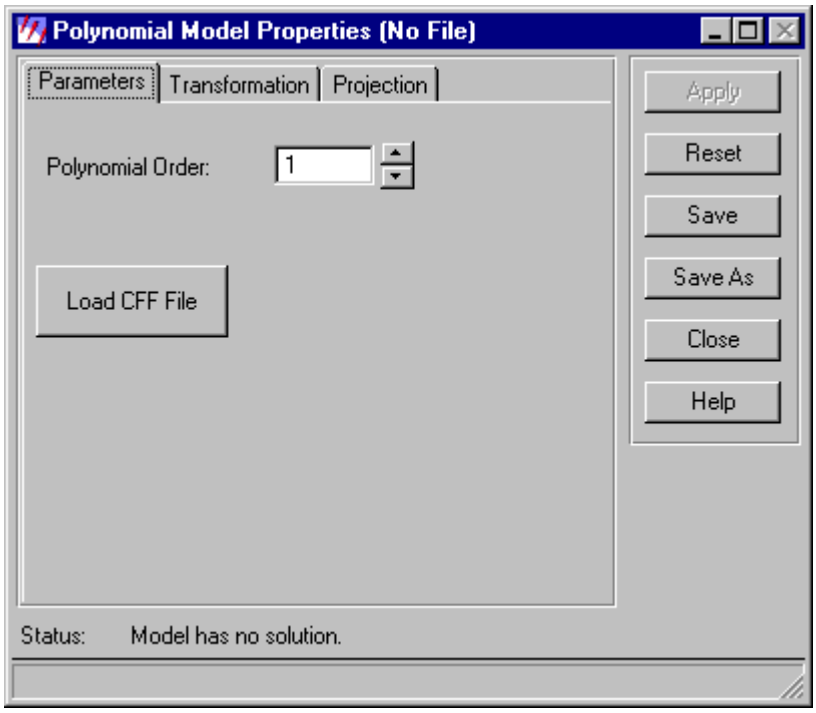


Figure 6-65 Polynomial Model Properties Window

6. Click the ***Close*** button in the **Polynomial Model Properties** window. These parameters will be selected later. The **GCP Tool Reference Setup** window appears (Figure 6-66).

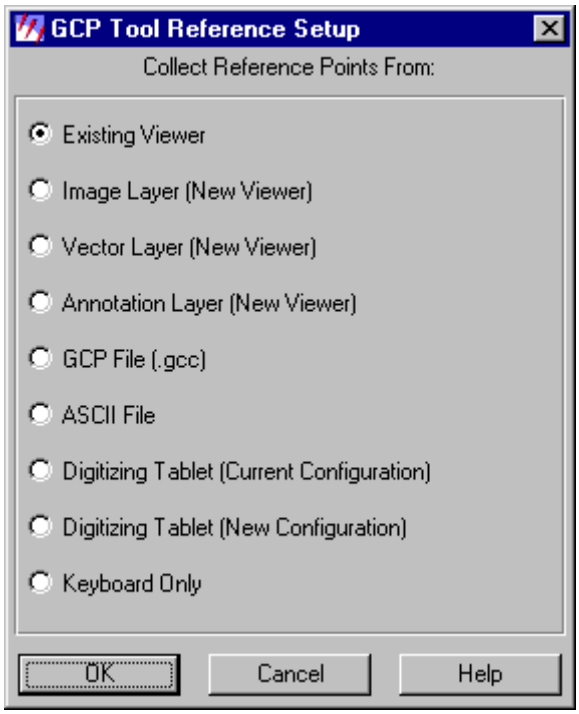


Figure 6-66 GCP Tool Reference Setup Window

7. Select “Existing Viewer” and click ***OK***. The window closes and a **Viewer Selection Instructions** window opens, directing the user to click in a Viewer to select for reference coordinates (Figure 6-67).

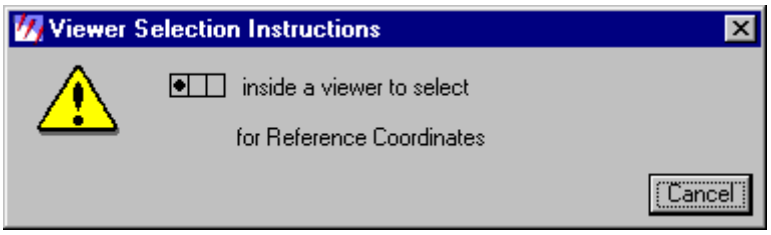


Figure 6-67 Viewer Selection Instructions Window

8. Click in the **Viewer #2** window, which displays the georeferenced image. The **Reference Map Information** window opens, showing the map information for the georeferenced image (Figure 6-68).

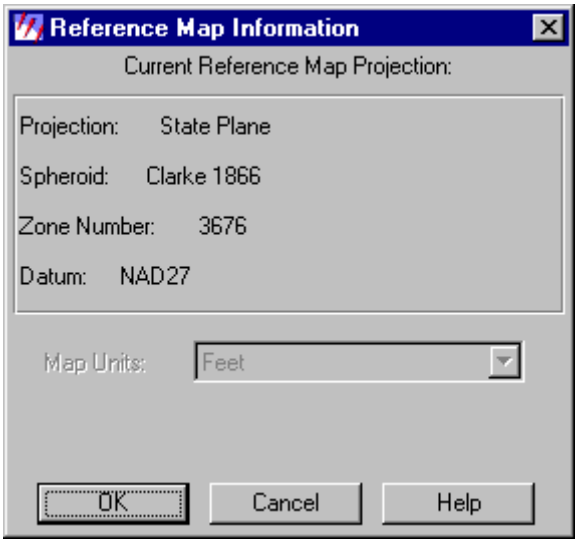


Figure 6-68 Reference Map Information

9. Review the information and click ***OK***. The chip extraction **Viewer #3** and **Viewer #4** windows open. The **GCP Tool** window also opens. The windows will appear similar to Figure 6-69.

NOTE

Chip extraction viewers give an inset view of Viewers #1 and #2, allowing the user to fine-tune placement of the GCPs. The user can change this view by clicking and dragging the bounding box within Viewer #1 or #2. To enlarge the zoom of Viewers #3 and #4, drag the corner of the bounding box to enclose a smaller area.

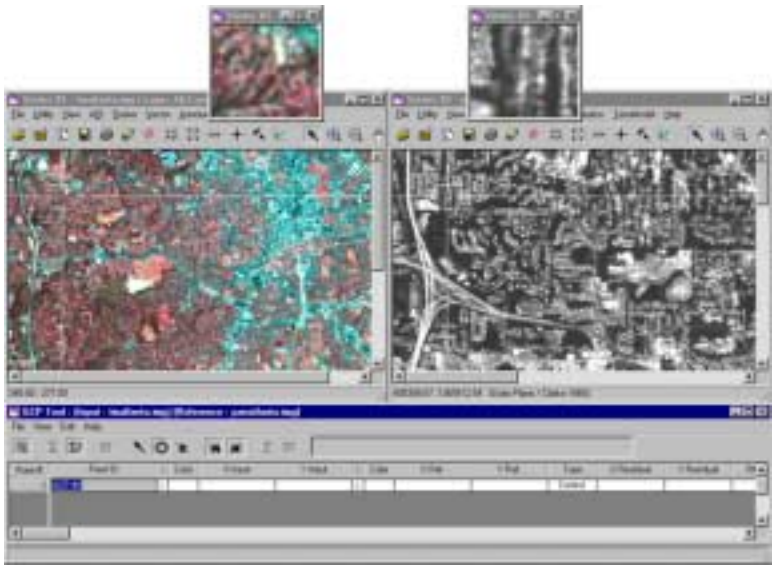


Figure 6-69 Viewer And GCP Tool Windows

10. The **GCP Tool** window opens. To begin collecting GCPs, go tot the CCP Tool window, and click on the ***Create GCP*** icon ( ). Then select a point in the **Viewer #1** window that is easily identifiable in both images, such as a road intersection or landmark.

11. The selected point is marked as "GCP #1" in the **Viewer #1** window, and its X and Y inputs are listed in the **GCP Tool** window.

12. In the **Viewer #3** window, drag the GCP to the exact desired location (Figure 6-70).



Figure 6-70 Viewer #3 Window Showing GCP

13. In the **GCP Tool** window, click on the ***Create GCP*** icon ( ).

14. In the **Viewer #2** window, click in the same area that is covered in the **Viewer #3** window. The selected point is marked as "GCP #1" in the **Viewer #3** window, and its X and Y coordinates are listed in the **GCP Tool** window.

15. The **GCP Tool** window should now look similar to the one pictured in Figure 6-71.

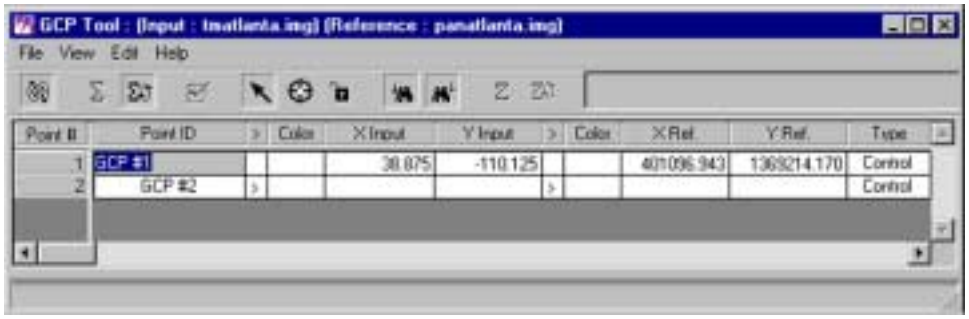


Figure 6-71 GCP Tool Window

16. In the **Viewer #4** window, drag the GCP to the same location it was moved to in the **Viewer #3** window.

17. Click the ***Create GCP*** icon ( ) from the **GCP** toolbar.

18. Return to the **Viewer #1** window and click to digitize another GCP.

19. Repeat this process until there are at least four GCPs in each **Viewer** window. The GCPs being digitized should be spread out across the image to form a large triangle. The more GCPs created, the more accurate the results.

20. In the **GCP Tool** window, select the last row in the window by clicking in the "Point #" column of the last row.

21. Select ***Edit/Set Point Type/Check*** from the **GCP Tool** menu bar. All of the points added in the next steps are classified as check points.

22. Select ***Edit/Point Matching*** from the **GCP Tool** menu bar. The **GCP Matching** window opens (Figure 6-72).



Figure 6-72 GCP Matching Window

23. In the "Threshold Parameters" area of the window, click in the "Correlation Threshold" field, type ***0.8***, and press ***[Enter]***.

24. Click the checkbox next to "Discard Unmatched Point" to activate the threshold.

25. Click ***Close***.

26. In the **GCP Tool** window, click the ***Create GCP*** icon ( ) and then the ***Lock*** icon ( ).

27. Create as many check points in each of the two **Viewer** windows as there were GCPs. If the previously input points were not accurate, the designated checkpoints may go unmatched and be automatically discarded.

28. When the checkpoints have been created, click the ***Lock*** icon ( ) in the **GCP Tool** window to unlock the Create GCP function.

29. Click the ***Compute Error*** icon ( ) in the **GCP Tool** window to compute the error for the checkpoints. The "Check Point Error" displays at the top of the **GCP Tool** window. See the *ERDAS Imagine 8.4 Field Guide* for information on what would make a reasonable resampling.

30. Click the ***Resample*** icon ( ) in the **Geo Correction Tools** window. The **Resample** window appears (Figure 6-73).

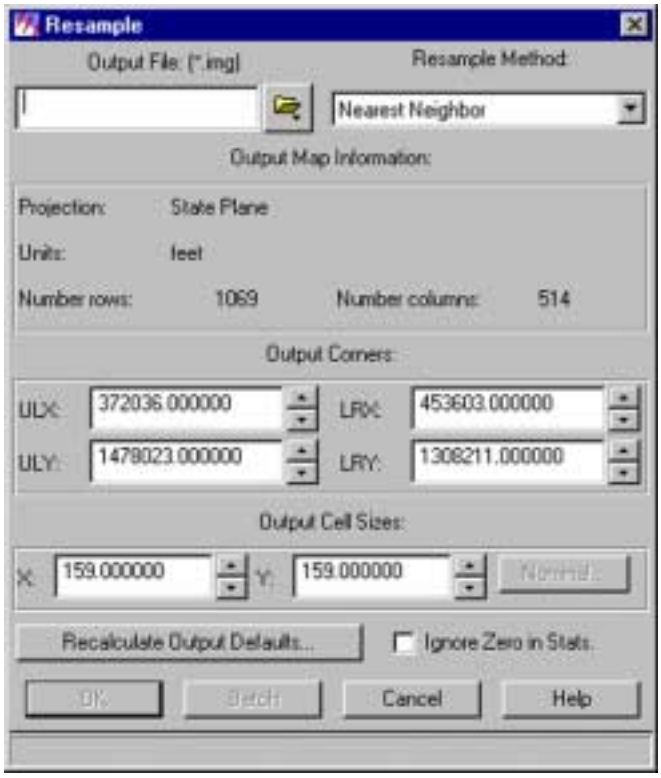


Figure 6-73 Resample Window

31. Enter the name for the new resampled data file in the "Output File" field.

32. Select ***Bilinear Interpolation*** from the "Resample Method" dropdown menu.

33. Click in the checkbox next to "Ignore Zero in Stats" so that pixels with zero file values are excluded when statistics are calculated for the output file.

34. Click ***OK*** to start the resampling process. The **Job Status** window appears to let the user know when the processes is complete.

35. Click ***OK*** in the **Job Status** window when the job is 100% complete.

36. Open the output image in a new Viewer window, and verify the newly resampled image with the georeferenced image from the **Viewer #2** window, visually comparing the two images.

6.1.3.2.4 Reprojecting Images

Reprojecting an image transforms raster image data from one map projection to another. Use the following steps to perform projection and datum transformations in Imagine.

1. With Imagine open on the desktop, open a raster image that contains projection information in the **Viewer #1** window.

2. Select ***Raster/Geometric Correction*** from the menu bar. The **Set Geometric Model** window will appear (Figure 6-74).

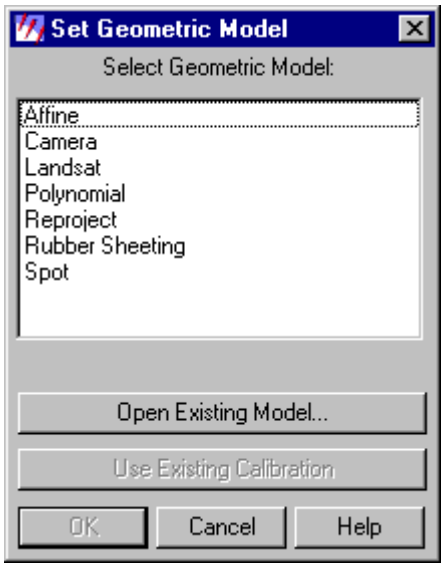


Figure 6-74 Set Geometric Model Window

3. Select ***Reproject*** and click ***OK***. The **Geo Correction Tools** window (Figure 6-75) and **Reproject Model Properties** window (Figure 6-76) will appear.

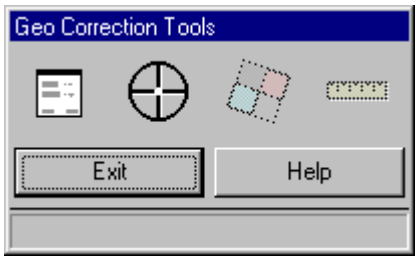


Figure 6-75 Geo Correction Tools Window

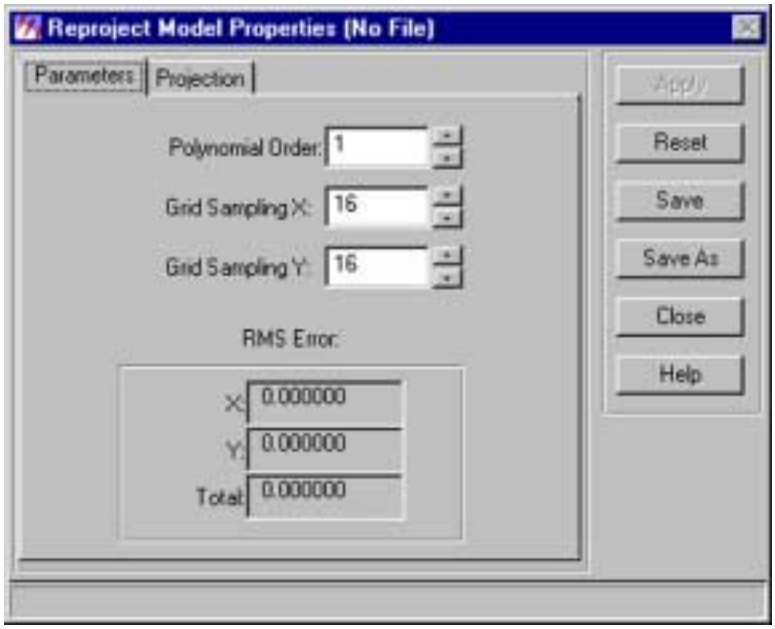


Figure 6-76 Reproject Model Properties Window

4. Click the **Projection** tab in the **Reproject Model Properties** window. The current image map projection is displayed (Figure 6-77).

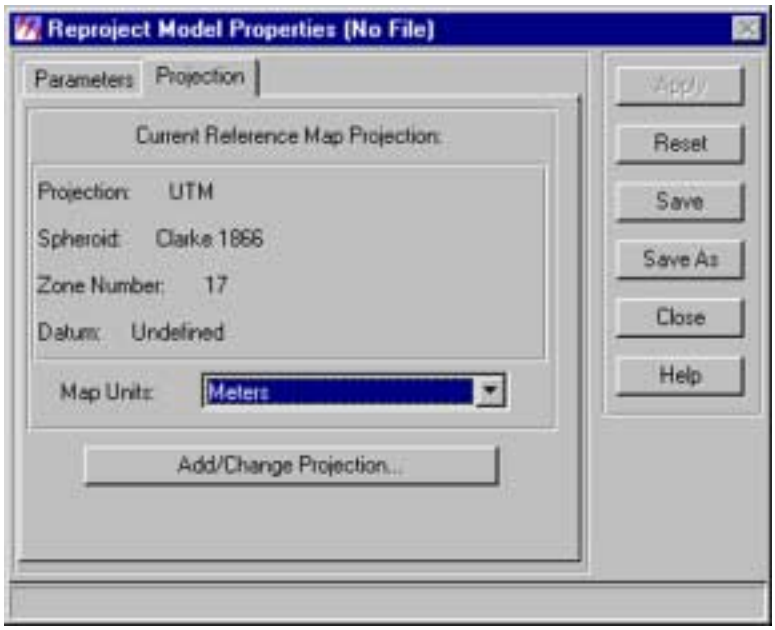


Figure 6-77 Reproject Model Properties Window Showing Projection Tab

5. Click the ***Add/Change Projection*** button. The **Projection Chooser** window will appear (Figure 6-78).

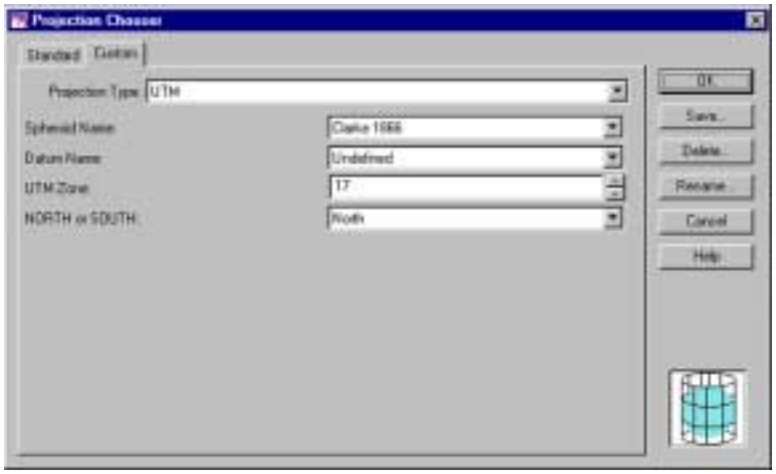


Figure 6-78 Projection Chooser Window

6. Select the new projection in the "Projection Type" field on the **Custom** tab and click ***OK***. The window closes and the selected projection information is displayed in the **Reproject Model Properties** window (Figure 6-79).

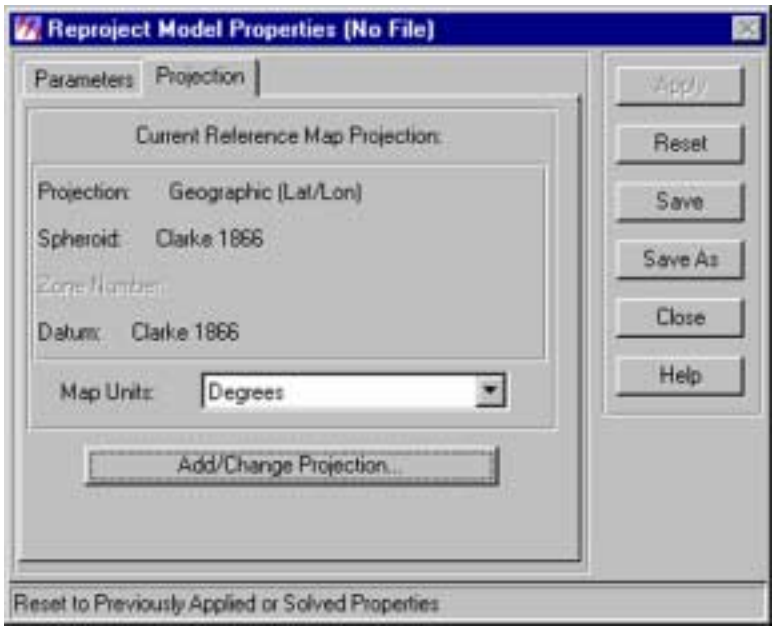


Figure 6-79 Reproject Model Properties Window

7. Click the ***Resample*** icon ( ) in the **Geo Correction Tools** window. The **Resample** window appears (Figure 6-80).

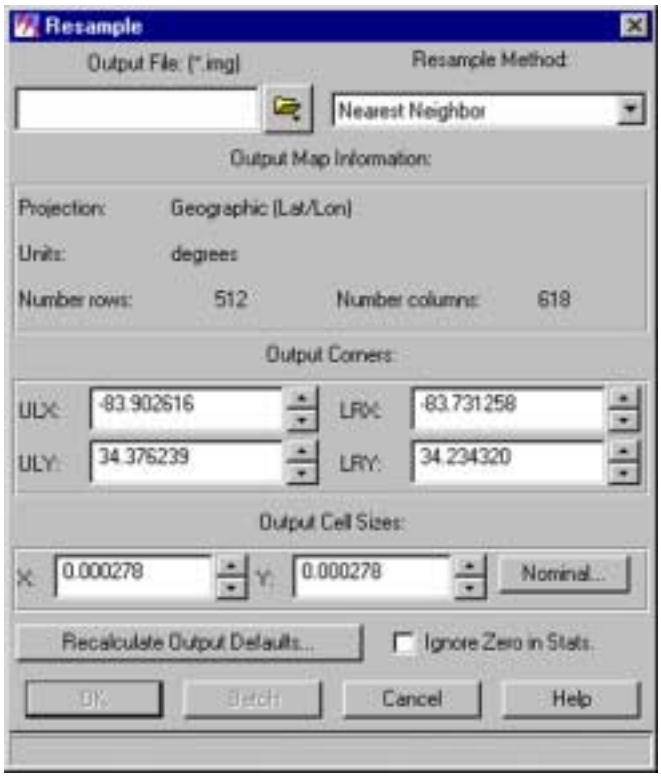


Figure 6-80 Resample Window

8. Enter the name for the new resampled data file in the "Output File" field. Imagine automatically appends the appropriate file extension.

9. Select the appropriate resample method from the "Resample Method" dropdown menu.

10. Click in the checkbox next to "Ignore Zero in Stats" in the bottom portion of the window, so that pixels with zero file values are excluded when statistics are calculated for the output file.

11. Click ***OK*** to start the resampling process. The **Job Status** window appears to let the user know when the processes is complete.

12. Click ***OK*** in the **Job Status** window when the job is 100% complete.

13. Open the output file in a Viewer window, and compare it to the original image.

For more information on projection and datum transformations using Imagine, refer to Imagine's online Help or the *ERDAS Imagine 8.4 Tour Guides*.

6.1.4 Orthorectification

Orthorectification is the process of rectifying an image with high relief, where the image shows a significant degree of distortion because of the terrain. An *.img* file and a DEM file of the study area are needed to complete this process. To orthorectify images, refer to Chapter 12, "Orthorectification," in the *ERDAS Imagine Tour Guides*, or Imagine's online Help.

ERDAS also offers a separately licensed add-on module called OrthoBASE. OrthoBASE is a digital photogrammetry package that allows for the fast and accurate triangulation and orthorectification of images collected from various types of cameras and satellite sensors. For more information on OrthoBASE, refer to the OrthoBASE printed documentation or online Help.

6.2 Data Organization and Access

ArcCatalog is a Windows Explorer-like environment for organizing data and accessing information about various geographic data sources. ArcCatalog provides the ability to connect to a variety of data sources, including internal computer disks, CDs, and map servers. This section briefly describes the connections, data sources, and related items that are available with ArcCatalog.

6.2.1 Catalog Tree Structure

ArcCatalog provides a collection of connections to geographic data called a **Catalog**. Files of data are located in a tree view hierarchy, shown in ArcCatalog's Tree View panel on the left side of the window. The **Catalog** shows the structure of geographic data through a variety of folders, icons, and titles. Some **Catalog** items represent folders and files in the Windows file system. Others represent collections of geographic data stored in various ArcInfo data types such as coverages, shapefiles, and geodatabases.

When browsing folder connections, the user sees the folders and data sources they contain. Unlike Windows Explorer, the **Catalog** does not list all files stored on disk, only files containing geographic data. Therefore, a folder without geographic data might appear empty in ArcCatalog. Folders containing geographic data sources have different icons to make data easier to find. Figure 6-81 shows the different types of folders that can be directly connected to the **Catalog**. The types of folders and files that are displayed in the Catalog can be set using **Tools|Options.** For more information on these options see the ArcCatalog's online Help or printed documentation.

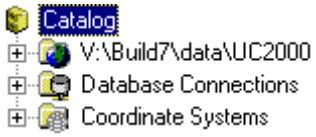


Figure 6-81 The Catalog and Connections to Data

See Table 6-3 for a description of the **Catalog** and the folders directly connected to it.

Table 6-3 Description of Catalog Icons

Icon	Name	Description
	Catalog	Represents the collection of maps with geographic data, available on local and network disks.
	Folder Connection Folder	Points to a root folder on a local disk or a selected folder on a disk accessed through a network.
	Database Connection Folder	Contains connections to relational databases and geographic data hosted in multi-user relational databases.
	Coordinate System Folder	Contains a number of coordinate system files.

6.2.1.1 Folder Connection

The **Folder Connection** folder () holds additional folders that contain geographical data or other folders that are similar to those seen when using Windows Explorer. Figure 6-82 shows examples of many different types of data objects stored in the **Folder Connection** folders.

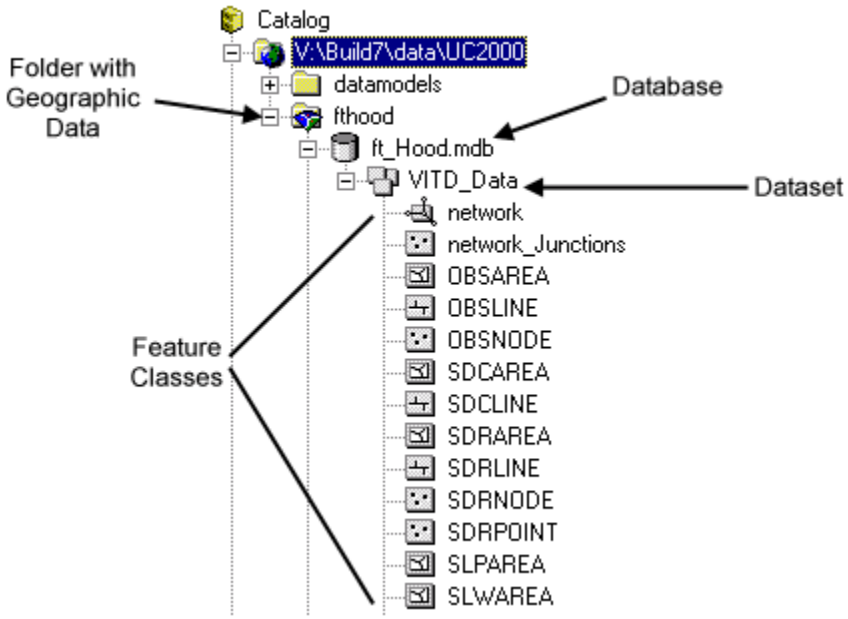


Figure 6-82 Folder Connection Structure

See Table 6-4 for a description of many types of folders and icons contained within the **Folder Connection** folder.

Table 6-4 Description of Folder Connection Catalog Icons

Icon	Name	Description
	Folder	Represents folders that do not contain geographic data.
	Catalog File	Stores the connections made to local or networked locations that contain geographic data.
	Catalog File Template	Contains preset connections and settings for generating new catalog files.
	Documentation Files	Contains information about geographic data in XML format. Also called metadata
	Styles	Contains standard and custom definitions of symbols for drawing points lines, areas, annotation, and other graphics.
	Folder with Geographic Data	Represents folders containing geographic data, including geodatabases, coverages, shapefiles, CAD files, and related files.
	Geodatabase	Represents a store of geographic data organized into geographic datasets and feature classes.
	Feature Dataset	Represents a collection of feature classes, graphs, and relationship classes that share a common spatial reference.

Table 6-4 Description of Folder Connection Catalog Icons (Cont'd)

Icon	Name	Description
	Point Feature Class	Indicates a collection of features with point geometries.
	Polygon Feature Class	Indicates a collection of features with polygon geometries.
	Line Feature Class	Indicates a collection of features with line geometries.
	Raster Dataset	Represents imaged or sampled data on a rectangular grid. It can have one or many raster bands.
	Object Class	Represents a feature class type that is a matrix of rows (representing objects) and columns (representing attributes).
	Relationship Class	Represents a feature class type that is a collection of relationships between features in two feature classes.
	Point Coverage	Represents an integrated set of feature classes that contain point topology.
	Line Coverage	Represents an integrated set of feature classes that contain line (or arc) topology.
	Polygon Coverage	Represents an integrated set of feature classes that contain polygon topology.
	Coverage Label Feature	Contains label points that mark polygons.
	Coverage Node Feature Class	Contains node features at the ends of arcs.
	Coverage Annotation Feature Class	Contains text on a map.
	Coverage Link Feature Class	Contains vectors used for adjusting local areas to known reference points.
	Coverage Tic Feature Class	Contains points used for registering maps that are digitized.
	TIN	Composed of points with *z* values organized into a set of triangles to represent a surface.
	INFO Table	Indicates a relational database table.
	CAD Drawing	Represents an entire CAD dataset.

Table 6-4 Description of Folder Connection Catalog Icons (Cont'd)

Icon	Name	Description
	Map Document	Stores the cartographic elements that make up a map; title, north arrow, legend, scale bar, data frames and layers.
	Map Document Template	Contains preset cartographic elements to set mapping standards.
	Group Layer	Represents a collection of layers that are grouped for convenient placement on a map.
	Point Layer	References a feature class with single-coordinate features from geodatabases, coverages, shapefiles, CAD files, or other datasets.
	Line Layer	References a two-dimensional feature class such as a line or edge feature class in a geodatabase, a coverage, or a shapefile.
	Polygon Layer	References a two-dimensional feature class such as a polygon feature class in a geodatabase, a coverage, or a polygon shapefile.
	Annotation Layer	References an annotation feature class in a geodatabase, coverage, or CAD dataset.
	TIN Layer	References a TIN dataset in a geodatabase or ArcInfo workspace.
	Raster Layer	References a raster file in a geodatabase, a grid in an ArcInfo workspace, or an image file in a folder.
	CAD Layer	References a CAD drawing in several common formats.
	Graphics Layer	Contains simple cartographic elements such as points, lines, and annotation to finish a map.

6.2.1.2 Database Connections

A database connection contains the specifications for accessing a database. The user can add folder connections that access specific folders, or directories, on a local disk, shared folders on the network, or the contents of a floppy or CD-ROM drive, as appropriate. Figure 6-83 shows items connected to the **Database Connections** folder ( ).



Figure 6-83 Database Connections Structure

See Table 6-5 for a description of the icons contained within the **Database Connections** folder.

Table 6-5 Description of Database Connection Folder Icons

Icon	Name	Description
	Database Connection	References a geodatabase stored in a multi-user database management system.
	Database Connection Wizard	Walks through the steps of the wizard to establish and test a connection to a database.

6.2.1.3 Coordinate Systems

The **Coordinate Systems** folder () provides a location where the user can organize coordinate system files. It contains many commonly used coordinate systems that are provided with ArcCatalog. Figure 6-84 shows items connected to the **Coordinate Systems** folder.

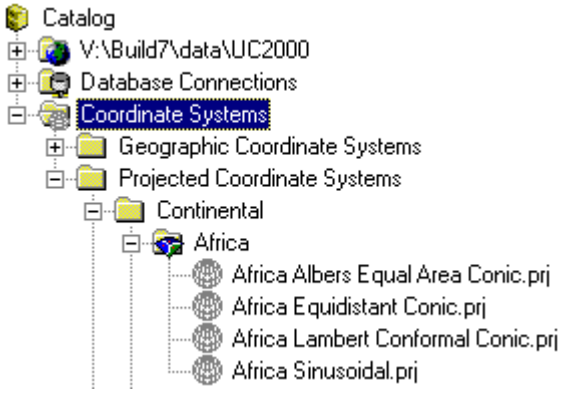


Figure 6-84 Coordinate Systems Folder Structure

Table 6-6 gives a description of the coordinate system file icon. For more information on any item located in the Catalog Tree, refer to ArcCatalog's online Help or ArcInfo's printed documentation.

Table 6-6 Coordinate System File Icon

Icon	Name	Description
	Coordinate System File	Represents a file containing mathematical specification for how geographical areas are converted from spheroid to planar coordinates.

6.2.2 Connecting to Data

When ArcCatalog is opened (see Section 4.1.2, *ArcCatalog*), two panels appear in the **ArcCatalog** window (Figure 6-85). The Catalog Tree View panel on the left allows the analyst to browse and organize data. This panel has a branch for each local hard drive and a branch for database connections. The contents of the selected branch are displayed in the right panel of the **ArcCatalog** window.

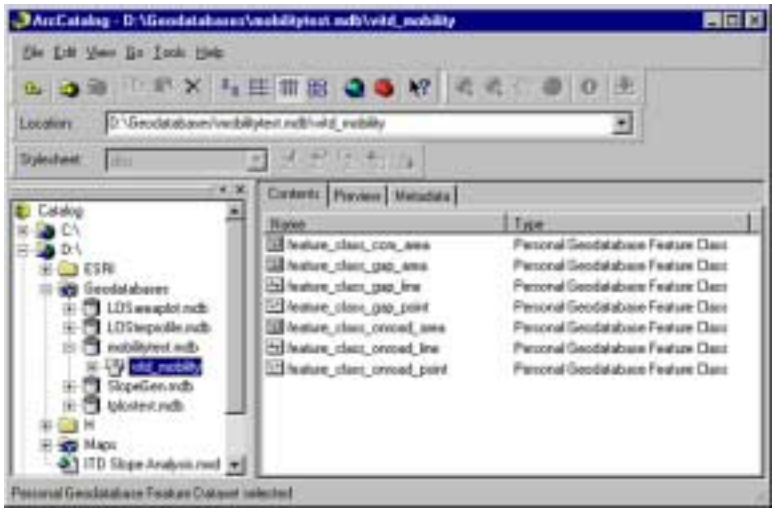


Figure 6-85 ArcCatalog Window

New branches, called connections, can be created to make it easier to access specific folders on a local disk, shared folders on the network, or the contents of a floppy or CD drive. The following steps show how to add a connection to a folder.

1. From the ArcCatalog **Standard** toolbar, click the ***Connect to Folder*** button () shown in Figure 6-86.

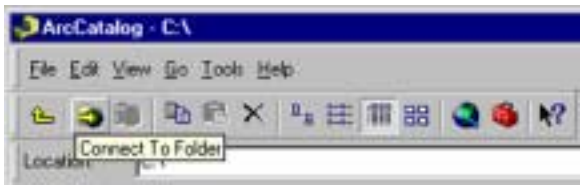


Figure 6-86 Connect to Folder Button on ArcCatalog Standard Toolbar

2. The **Connect to Folder** window shown in Figure 6-87 will appear. Navigate to the desired folder from the computer or network and click ***OK***.

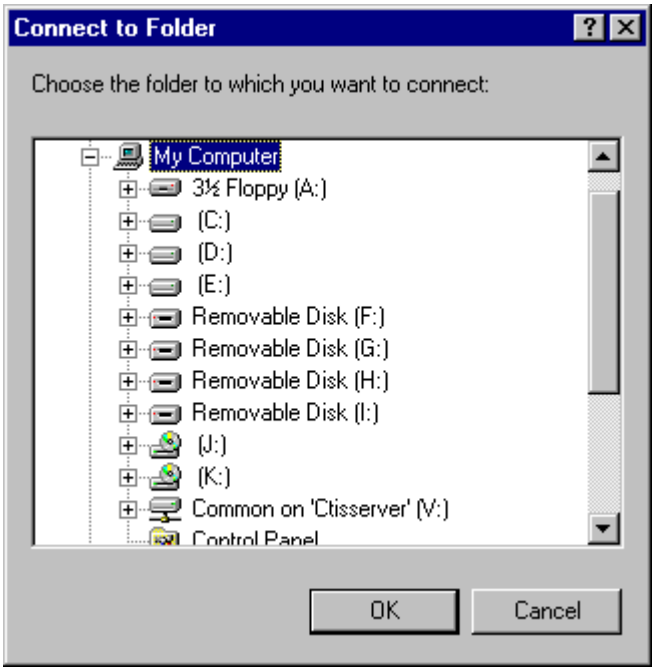


Figure 6-87 Connect to Folder Window

3. The new connection shows up as a branch in the Catalog Tree View panel (Figure 6-88). This new branch will remain until disconnected. Double click on the connection folder to display its contents in the **Contents** tab in the right panel of the **ArcCatalog** window.



Figure 6-88 Catalog Tree Showing New Connection

4. In the right panel, click on any tab to view the data in ArcCatalog. When finished, disconnect the folder by selecting it and clicking the ***Disconnect From Folder*** icon () on the **Standard** toolbar, or by right clicking on the connection and selecting ***Disconnect Folder***.

6.2.3 Organizing Data

The DTSS analyst manages data sources within ArcCatalog the same way folders and files are managed in the Windows NT environment. All standard Windows shortcuts can be used when copying, moving, renaming, or deleting items in ArcCatalog, including the ability to drag and drop items from one directory to another. For example, shapefiles and coverages can be moved by dragging and dropping them into a new folder. Geodatabases or feature datasets can be copied and pasted into shared folders on the network where other analysts can access them. When any data source is copied, moved, or deleted, its metadata is automatically copied, moved, or deleted with it. To perform these operations, right click the data and select **Copy**, **Paste**, **Delete**, or **Rename** from the context menu.

NOTE

For more information on copying geodatabases, coverages, and shapefiles, refer to Section 7.1.2.2.1, Copying a Blank Geodatabase Template.

NOTE

Do not change the name of DTSS generated datasets and feature classes in ArcCatalog. The DTSS code references these specific name titles to run the DTSS products. If the name is changed, the DTSS code will not be able to read the data, and the product will be incorrect. Names of layers can be changed in ArcMap, however.

6.2.4 Exploring Data

The DTSS analyst may need to gain a better understanding of an item's contents before working with the data to gather information or create a product. ArcCatalog provides a variety of ways to view the contents of folders and databases. This section briefly covers ways to explore the contents of the data by using ArcCatalog's **Contents**, **Preview**, and **Metadata** tabs.

6.2.4.1 ArcCatalog Tabs

ArcCatalog has three tabs that provide different ways to view the contents of the selected item in the Catalog Tree View panel. These are accessed using the **Contents** tab, the **Preview** tab, and the **Metadata** tab in the ArcCatalog viewer (Figure 6-89).

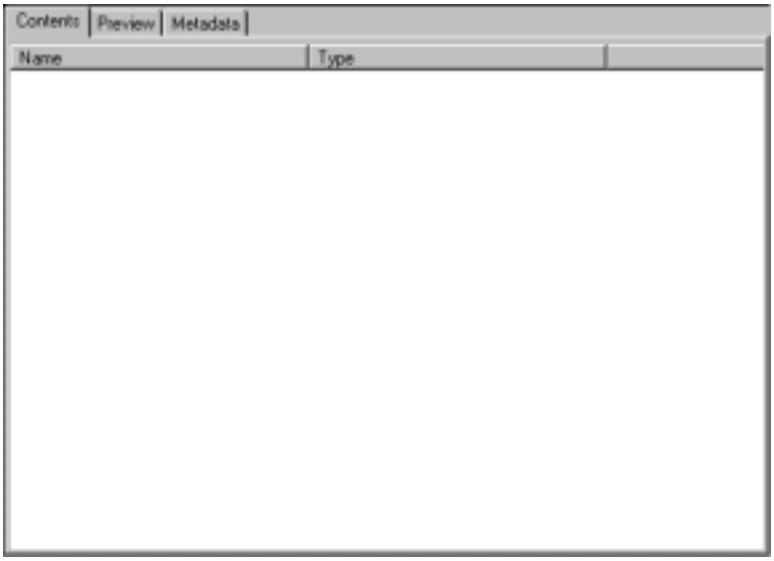


Figure 6-89 ArcCatalog Tabs

The **Contents** tab lists the contents of selected items, such as folders, databases, or feature datasets, in the Catalog Tree. The analyst can view the selected item's contents in several different ways by selecting the Large Icon, List, Details, and Thumbnail icons from the ArcCatalog **Standard** toolbar, described briefly in Table 6-7 below.

Table 6-7 Contents View Icons in ArcCatalog

Icon	Names	Description
	Large Icons	Shows the contents of selected item as large icons.
	List	Shows the contents of selected item as a list.
	Details	Shows the contents of selected item as a detailed list.
	Thumbnails	Shows the contents of selected item as thumbnails. For maps, a thumbnail sketch appears. If no thumbnail is available, the item's icon is used.

The **Preview** tab explores the selected item's data in either **Geography** (map) or **Table** view, by selecting the method at the bottom of the screen. The **Table** view provides a very useful tool to investigate the attributes associated with a dataset.

The **Metadata** tab shows information about geographic data, designed to help the analyst find data, determine its particular purpose, and use it. ArcCatalog creates metadata automatically by default, giving information about the data source's properties. Specific information can also be manually added to the metadata (for example, author and date information).

ArcCatalog automatically creates and updates metadata, which is stored in XML (eXtensible Markup Language) format. Group headings can be expanded to see more detailed information by clicking on the heading item.

Customized DTSS Metadata is available for many of the DTSS products. This metadata can be viewed using the Metadata tab and selecting the DTSS stylesheet from the dropdown list on the **Metadata** toolbar in ArcCatalog (Figure 6-90). Metadata shown on the DTSS stylesheet can be edited using the DTSS Metadata Editor. See Section 7.3, *Metadata Editor*, for more information on editing metadata with this tool.

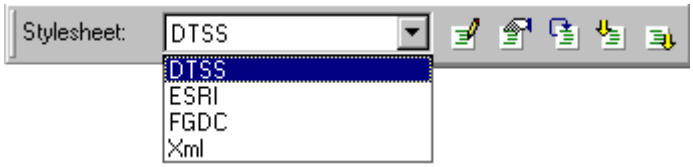


Figure 6-90 Metadata Toolbar Showing Stylesheet Dropdown Menu

For more information on using these tabs in ArcCatalog, use online Help or refer to ArcInfo's printed documentation.

6.3 Using Unix DTSS Products on Windows NT

Unix-based DTSS products can be displayed in Imagine on Windows NT. All Unix products are stored in the subdirectory: /work/wk1/prj/<project name>_dir/<product type>/<product name>. See Table 6-5 in Build 6.1 SUM for product types. The products consist of ArcInfo coverages, ERDAS Imagine map compositions, and annotation layers. Each can be transferred to the NT platform.

Use the following steps to transfer a DTSS product from a Unix platform to a Windows NT platform.

1. From Windows NT, FTP to the Unix system with the desired product to transfer.

2. In FTP, navigate to the directory on the Unix system that has the same name as the product being transferred.

3. Transfer the directory and all of its contents to the NT machine. This will bring all of the required coverages and files necessary to display the map composition.

In Windows NT, select **Map Composition** from the Imagine main menu. Select **Open Map Composition** and open the *.map* file in the Unix-based product directory. If the data

file links are corrupted, select **Substitute All**. The product should look the same as it did on the Unix system.

6.4 GEOTRANS – Coordinate Conversion

GEOTRANS (Geographic Translator) is an application program that converts geographic coordinates among a wide variety of coordinate systems, map projections, and datums. To access the GEOTRANS application, select ***Programs/Dtss/Utilities/Geotrans*** from the **Start** menu. The **GEOTRANS2** window will appear (Figure 6-91).



Figure 6-91 GEOTRANS2 Window

The user interface of GEOTRANS is similar to that of a calculator. To convert a set of coordinates, select the coordinate system or map projection and the datum in which the coordinates are defined. Then enter the source coordinates, select the coordinate system or map projection, and the datum to which the desired coordinates are to be converted, and click on the **Convert** button. The resulting coordinates will be displayed.

Because the GEOTRANS application stores previous selections, additional coordinate sets can be converted from the same source by just entering the new coordinates and clicking the **Convert** button. Any of the coordinate system, map projection, or datum

selections can be changed at any time. Currently, 25 different coordinate systems, map projections, grids, and coding schemes, and over 200 different datums, are supported.

For more information on using the GEOTRANS application, refer to the online Help.

6.5 NIMAMUSE

NIMAMUSE is a set of computer programs and utilities designed to work with National Imagery and Mapping Agency (NIMA) Mapping, Charting, and Geodesy (MC&G) data and information. The purposes of the NIMAMUSE program are to: 1) provide Digital Topographic Data (DTD) demonstration capability available on common "low-end" computer platforms throughout the DOD, and 2) provide developers with algorithms and source code as guides to developing software to exploit NIMA data. NIMAMUSE 2.1 supports the Windows, Sun, Hewlett-Packard and Silicon Graphics platforms.

NIMAMUSE 2.1 can be used to import the following NIMA raster products and prototypes.

- ARC Digitized Raster Graphic (ADRG)
- Compressed ADRG (CADRG)
- Compressed Aeronautical Chart (CAC)
- Controlled Image Base (CIB)
- Vector Product Format (VPF)
- Digital Terrain Elevation Data (DTED)

NIMAMUSE can export data in *.bmp*, *.tif*, or NIMAMUSE raster file format. Additional capabilities provided by NIMAMUSE 2.1 include the ability to read locations from a Global Positioning System (GPS) receiver in real time; display raster, DTED, or VPF data; display image products draped over elevation products from a given perspective; display Line of Sight or Intervisibility graphics; and extract vector coordinate strings from available thematic layers of VPF products.

For more information, or to download NIMAMUSE, visit one of the Websites listed below.

NOTE

For login and password information for the Website, send e-mail to ***muse@nima.mil****.*

- **Internet**: http://www.nima.mil/geospatial/SW_TOOLS/NIMAMUSE
- **OSIS**: http://osis.nima.mil/geospatial/SW_TOOLS/NIMAMUSE
- **SIPRnet**: http://sps.stl.nima.smil.mil/sw-tools/NIMAMUSE
- **JWICS**: http://jws.stl.nima.ic.gov/SW_TOOLS/NIMAMUSE

Chapter 7

DATA EDITING AND GENERATION

7	**DATA EDITING AND GENERATION**	7-3
7.1	Digital Feature Data	7-3
7.1.1	ArcMap Editor	7-3
7.1.1.1	Feature Geometry	7-4
7.1.1.1.1	Sketch Tool Context Menu	7-8
7.1.1.1.2	User Tolerances	7-8
7.1.1.1.3	Layer Coordinate System	7-9
7.1.1.2	Feature Selection	7-10
7.1.1.2.1	Selecting All Elements	7-10
7.1.1.3	Feature Attributes	7-11
7.1.1.3.1	Modifying Feature Attributes	7-11
7.1.1.3.2	Assigning Attributes to New Features	7-13
7.1.1.3.3	Adding and Deleting Records	7-16
7.1.1.3.4	Editing Records	7-18
7.1.2	Adding and Creating New Feature Classes	7-18
7.1.2.1	Adding New Feature Classes to Existing Geodatabase	7-18
7.1.2.2	Creating Data Using an Existing Geodatabase Template	7-19
7.1.2.2.1	Copying a Blank Geodatabase Template	7-19
7.1.2.2.2	Digitizing Features in Blank Geodatabase Template	7-21
7.1.2.2.3	Deleting Features	7-25
7.1.2.3	Creating a New Geodatabase	7-26
7.1.2.3.1	Creating a New Feature Dataset	7-28
7.1.2.3.2	Creating New Feature Classes	7-36
7.1.2.3.3	Creating New Attribute Fields for Feature Classes	7-40
7.1.3	Feature Extraction Using ERDAS Imagine	7-44
7.1.3.1	Terrain Categorization	7-44
7.1.3.2	Sub-Pixel Classifier	7-52
7.1.3.3	Expert Classifier	7-52
7.1.3.4	Using Imagine Feature Data in ArcMap	7-52
7.1.3.5	Stereo Analyst	7-53
7.2	Digital Elevation Data	7-55

7.2.1 IFSAR DEM 7-55
7.2.2 StereoSAR DEM..... 7-59
7.3 Metadata Editor..... 7-64
7.4 DTSS Contact Information Editor 7-67

7 DATA EDITING AND GENERATION

ArcInfo and ERDAS Imagine provide many out-of-the-box tools for editing and creating digital spatial data. This chapter covers much of the built-in functionality of the COTS software packages, as well as that of the DTSS custom Metadata Editor and Contact Information Editor.

NOTE

Prior to editing, it is a good idea to make a copy, edit the copy, and replace the original when satisfied with the edits.

7.1 Digital Feature Data

Digital feature data can be edited and created using both ArcInfo and ERDAS Imagine. Feature data is most often derived from source material such as maps and/or imagery. The analyst uses his or her experience to extract and attribute identifiable features in the source material. It is possible to have feature data in vector or raster formats, but vector format is preferred for use in GIS software such as ArcInfo. The following sections describe how to edit and create digital feature data.

NOTE

Background imagery used for editing MUST have geographic (Lat/Long) coordinates.

7.1.1 ArcMap Editor

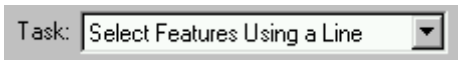
The ArcMap **Editor** toolbar provides a common editing environment for features stored in various ArcInfo data formats: geodatabases, coverages, and shapefiles. It provides many tools, commands, and tasks for editing and creating vector data. To view the **Editor** toolbar in ArcMap (Figure 7-1), click the ***Editor Toolbar*** button ( ) on ArcMap's **Standard** toolbar.



Figure 7-1 ArcMap Editor Toolbar

Some of the ArcMap **Editor** toolbar functions are discussed in Table 7-1. For more information on editing data in ArcMap, or on any toolbar item mentioned below, refer to the program's online Help or printed user documentation.

Table 7-1 ArcMap Editor Toolbar Button Functions

Button	Name	Function
	Editor Dropdown Menu	Opens edit session for editing all map layers. Accesses these commands: **Start Editing**, **Stop Editing**, **Save Edits**, **Build Edit Cache**, **Move**, **Split**, **Divide**, **Buffer**, **Copy Parallel**, **Merge**, **Union**, **Intersect**, **Integrate**, **Validate Selection**, **Snapping**, and **Options**.
	Edit	Selects geographic features for the purpose of editing.
	Create New Feature	Adds points, vertices, and segments to sketch.
	Task Control Dropdown	Sets current editing task. Available tasks include the following: **Create New Feature, Auto Complete Polygon**, **Select Features Using a Line**, **Select Feature Using a Polygon**, **Extend/Trim Features**, **Modify Feature**, **Reshape Feature**, and **Cut Polygon Feature**.
	Target Layer Control Dropdown	Identifies which map layer, or subtype, will be edited.
	Split	Divides selected feature in two. User can select a line feature and click the **Split** tool to divide the line into two sections.
	Rotate	Rotates the selected features by clicking and dragging the “x” point at center of selection.
	Shared Edit	Selects common edge or point shared between features within feature dataset, coverage, or standalone feature class.
	Attributes	Displays and edits feature attributes. Inspects and modifies attribute values of selected features. Allows user to establish relationships between features.

7.1.1.1 Feature Geometry

The ArcMap **Editor** toolbar is used to create and edit sketches that become vector features. An ArcMap sketch is composed of vertices (the points at which the sketch changes direction, such as corners) and segments (the lines that connect the vertices). A sketch is created using the **Sketch** tool () located on the **Editor** toolbar (Figure 7-2), and it is used to complete the tasks listed in the **Task** dropdown list on the **Editor** toolbar. Available tasks are listed in Table 7-1 above.



Figure 7-2 Editor Toolbar Settings for Digitizing New Polygon

The **Target** dropdown list on the **Editor** toolbar contains the names of all available layers in the **ArcMap** window. When the **Task** "Create New Feature" is selected, the **Sketch** tool will add a new feature to whichever layer is identified as the Target. The target layer also determines the new feature type (point, line, or polygon).

To create point features, select the **Sketch** tool and click once on the map. To create line or polygon features, use the **Sketch** tool to click on the map to digitize the vertices that make up that feature. To create the last vertex and finish the sketch, double click with the mouse. After the sketch is finished, the **Editor** adds the final segment of the sketch, and the sketch turns into a feature. The user can also set editing tolerances, which affect when features are snapped together, and other editing tasks. To find out more about setting tolerances in ArcInfo applications, see Section 7.1.1.1.2, *User Tolerances*. Follow the steps below to create a polygon feature.

1. Open the data to be edited in ArcMap by using the **Add Data** button ( ) and navigating to the appropriate file(s). To facilitate data editing, it may be desirable to display a mix of ArcInfo data types, i.e., geodatabase, coverage, shapefile, as well as background images, in the same **ArcMap** window.

2. On the **Editor** toolbar, select ***Editor/Start Editing***. If more than one data type has been added to the ArcMap application, the **Start Editing** window will open (Figure 7-3).

NOTE

If an error message appears stating that the user cannot edit data, check the coordinate reference information for each data type included in the Display panel. If the projections do not match, change the coordinate reference as appropriate. If projections do match, also check to see if any empty feature classes were included in the dataset.

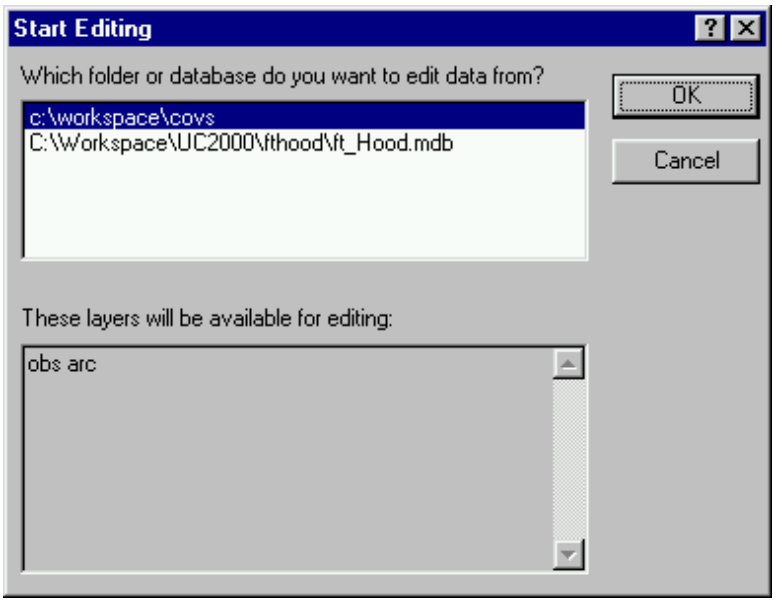


Figure 7-3 Start Editing Window in ArcMap

3. Select the folder that contains the data layer to be edited. Layers are listed in the bottom half of the window as the folder is selected. If only one ArcInfo data type is being used, the **Start Editing** window will not appear.

4. On the **Editor** toolbar, click the ***Task*** dropdown menu and select ***Create New Feature*** from the list.

5. Click the ***Target*** dropdown arrow and select the layer to be edited. The type of feature to be added is determined by the feature type contained in the target layer. For this example, select a layer containing polygon features (within a geodatabase, coverage, or shapefile).

NOTE

If the layer to be edited has subtypes, the subtype to be edited should be selected. For example, a VITD layer with the feature class Vegetation_forest_area *has three subtypes:* veg_Trees_area, veg_Marsh/Swamp_area, *and* veg_Orchard/Plantation_area.

6. Click the ***Tool*** palette dropdown arrow ( ), and click the ***Sketch*** tool ( ).

7. Click on the map to create a polygon vertex (Figure 7-4). Continue clicking the left mouse button to create vertices and shape the polygon. Double click on the last vertex to close the polygon.

NOTE

It may take a few seconds for the layer to update with the new feature, which will appear highlighted in the ArcMap Display panel.

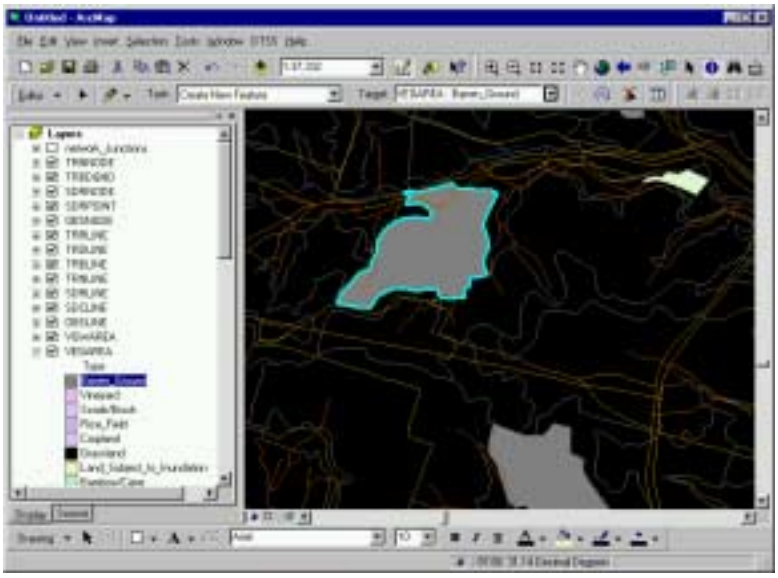


Figure 7-4 New Polygon in ArcMap

8. While the feature is selected, it is easy to add attributes to the new feature using the steps outlined in Section 7.1.1.3.2, *Assigning Attributes to New Features*.

9. When the features have been successfully added, go to the **Editor** toolbar and select ***Editor/Save Edits***.

10. To stop editing, select ***Editor/Stop Editing***.

Although the **Sketch** tool ( ) is the main tool used to create a new feature, ArcMap provides several other feature construction tools, including the **Arc** tool ( ), the **Distance-Distance** tool ( ), and the **Intersection** tool ( ). The **Arc** tool creates a segment that is a parametric (true) curve. The **Distance-Distance** and **Intersection** tools create either points or vertices. These tools are located on the tool palette with the **Sketch** tool.

The ArcMap "snapping environment" can help create points or vertices at more exact locations relative to other features and other data layers. The **Snapping Environment** window can be accessed by selecting ***Editor/Snapping*** from the **Editor** toolbar. For more information on snapping, see ArcMap's online Help topic "Use the Snapping

Environment." For more information on digitizing new features in ArcMap, refer to ArcMap's online Help or printed user documentation.

7.1.1.1.1 Sketch Tool Context Menu

The **Sketch** tool context menu is accessed by right clicking the mouse while the pointer is positioned over any part of the sketch. This menu allows the analyst to place points and line segments at precise locations within the sketch. For instance, the **Parallel** and **Perpendicular** commands help the analyst create segments with angles relative to segments that already exist. For more information on creating new features in ArcMap using these tools, refer to ArcMap's online Help or printed documentation.

7.1.1.1.2 User Tolerances

Many editing operations use tolerances. A tolerance is defined as an "allowable deviation from a standard." For example, when digitizing or editing with node snapping turned on, two nodes are automatically snapped together if they fall within a given distance of each other; that distance is referred to as the Node Snap tolerance.

Tolerances represent distances, either in screen pixels or in the dataset's projection units. Default tolerances are set for each data layer, but the analyst may want to define his or her own tolerance values that are more appropriate for the type of features being added, and/or for the scale of the data. The analyst can use ArcMap to set tolerances for all types of ArcInfo data layers, or ArcCatalog can be used to set tolerances for ArcInfo coverages. Refer to the ArcInfo applications' online Help or printed user documentation for more details on how to set user-defined tolerances.

Use the following steps to change a tolerance using the ArcMap **Editor** toolbar:

1. On the **Editor** toolbar, go to the **Editor** dropdown menu and select ***Start Editing***. The items on the toolbar are now activated.

2. Return to the **Editor** dropdown menu and select ***Options***. The **Editing Options** window will appear (Figure 7-5).

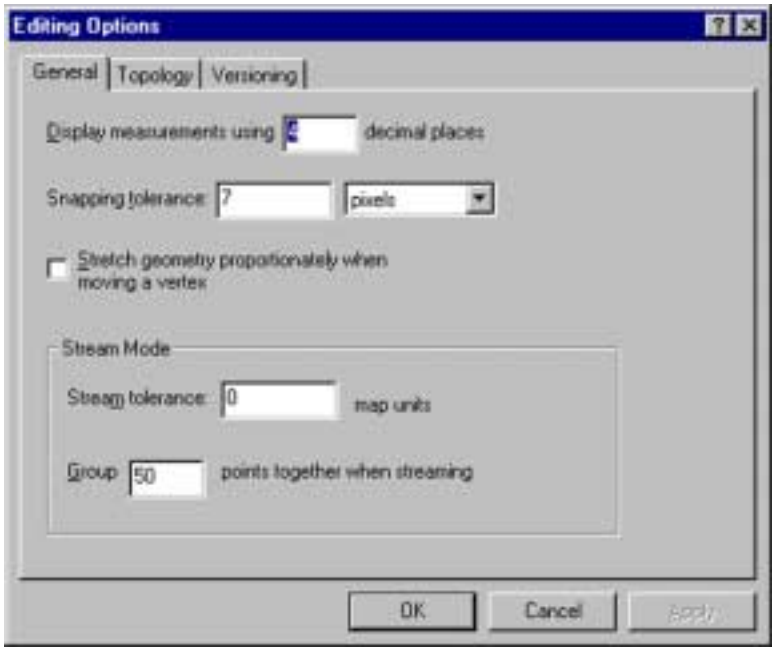


Figure 7-5 ArcMap Editing Options Window

3. Click on the **General** tab to view and edit the layer tolerances. See Table 7-2 for a description of these tabs and their functions.

4. After making changes to the tolerance settings, click ***OK*** to accept and close the window.

The **Editing Options** window allows the analyst to change tolerances using the **General**, **Topology**, and **Versioning** tabs, described briefly in Table 7-2. For more information on any item in this window, highlight the item with the mouse and press ***[F1]*** to activate ArcMap's online Help.

Table 7-2 Tab Functions for ArcMap Editing Options Window

Tab	Functions
General	Accesses information on the measurements' display, snapping tolerance, and stream mode settings.
Topology	Allows analyst to toggle integration of visible extent and set cluster tolerance.
Versioning	Contains statement about saving edits to same version; allows user to toggle whether to save changes automatically after merging edits from other users.

7.1.1.1.3 Layer Coordinate System

In ArcMap, the analyst can edit data in any projection, but it is recommended to edit data in the same projection as that of the data source, then reproject the data after it has been created. For more information on specifying a coordinate system, see the online Help

topic “Creating maps” in ArcMap. For more information about converting coordinate projections using ArcToolbox, refer to Section 6.1.3.1, *Vector Data Projection*.

7.1.1.2 Feature Selection

By selecting features, the DTSS analyst identifies which features to edit or change. For example, before moving, deleting, or coping a feature, it must be selected. Features must also be selected before their attributes can be viewed.

Features can be selected by clicking them with the **Edit** tool ( ) from the **Editor** toolbar, or by creating a line or a polygon that intersects the features the analyst wants to select. The number of features selected is shown in the lower left corner of the **ArcMap** window after the selection is made. The small “x” located in the center of the selected features is the selection anchor. The selection anchor is used when rotating, scaling, and moving features using snapping. See Figure 7-6 for an example of features selected in ArcMap.

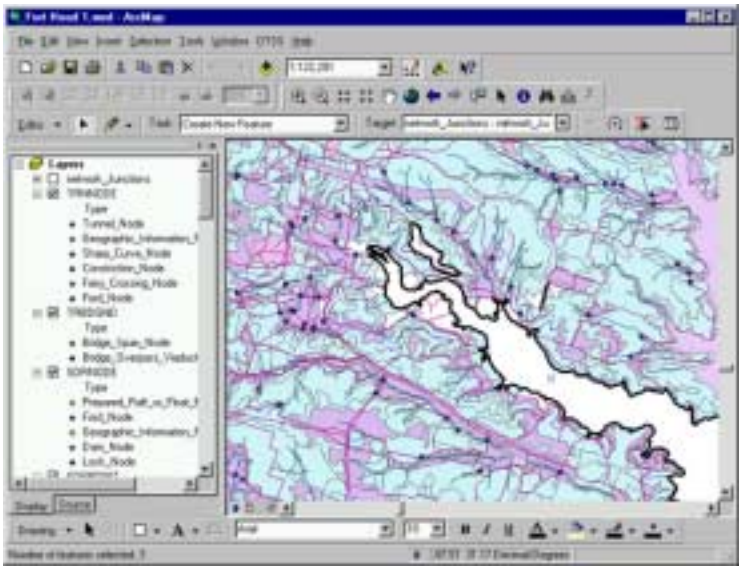


Figure 7-6 Selected Feature and Selection Anchor in ArcMap

7.1.1.2.1 Selecting All Elements

The analyst may select all items in ArcMap for global edits or to copy and paste elsewhere. To select all elements click ***Edit/Select All Elements*** from the ArcMap menu. In Data View, this command selects all text and graphics that have been drawn on the active data frame. In Layout View, this command selects all text, graphics, and other map elements, such as north arrows, scale bars, and data frames, that have been placed on the map layout.

7.1.1.3 Feature Attributes

Attributes of data layer features can be edited or created in several ways. The analyst can add new records and delete existing ones, modify a record's values, or copy and paste values between records. The ability to add, change, and delete attributes helps the analyst to update information quickly and easily.

7.1.1.3.1 Modifying Feature Attributes

The analyst can modify feature attributes to reflect changes in the real world using the **Editor** toolbar in ArcMap. For example, the analyst may learn that a road within the current dataset has recently been resurfaced. To maintain the most accurate information, the analyst must record this feature change in the feature's attributes. The analyst can change that road's surface attribute from unpaved to paved.

NOTE

The procedure below describes how to modify a feature attribute using a geodatabase that has predefined attribute values. The same procedures can be used with any ArcInfo geodatabase, coverage, or shapefile; however, predefined values will not always be provided to the user.

1. Open the data to be edited in ArcMap by using the **Add Data** button ( ) and navigating to the appropriate files. To facilitate data editing, it may be desirable to display a mix of ArcInfo data types, i.e., geodatabase, coverage, shapefile, as well as image backgrounds, in the same **ArcMap** window.

2. Select ***Editor/Start Editing***. If more than one data type has been added to the ArcMap application, the **Start Editing** window will open (Figure 7-7).

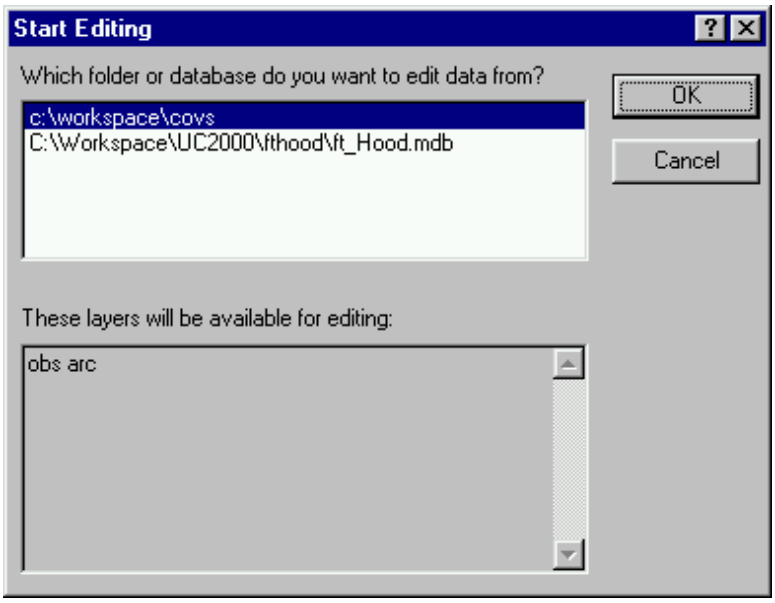


Figure 7-7 Start Editing Window in ArcMap

3. Select the folder that contains the data layer to be edited. Layers are listed in the bottom half of the window as the folder is selected. If only one ArcInfo data type is being used, the **Start Editing** window will not appear.

4. Select the feature whose attribute is to be modified using the ***Edit*** tool ( ), or by selecting the feature from its layer's attribute table (see Section 7.1.1.2 for more information on selecting features). The selected feature will appear highlighted in the Display panel (Figure 7-8).

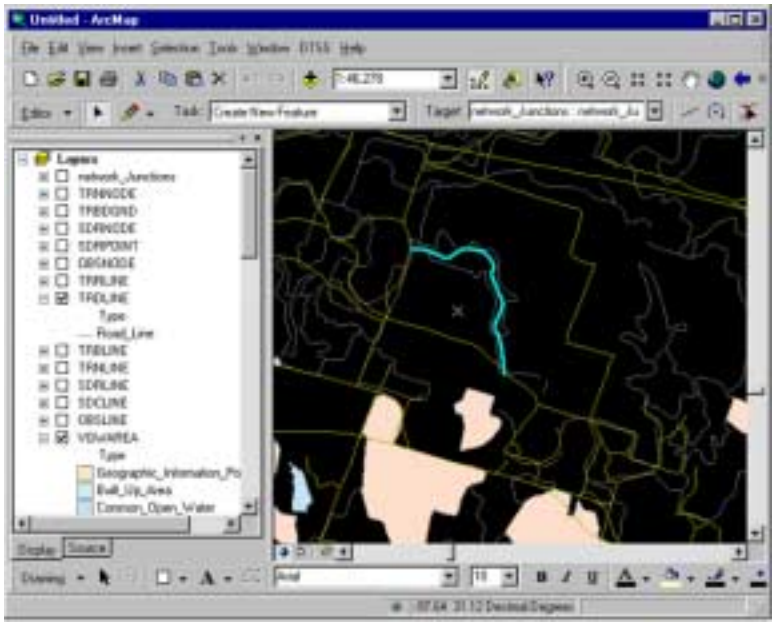


Figure 7-8 Selected Road in ArcMap

5. With the feature selected, click the ***Attribute*** button ( ) on the ArcMap **Editor** toolbar. The **Attributes** window will appear (Figure 7-9).

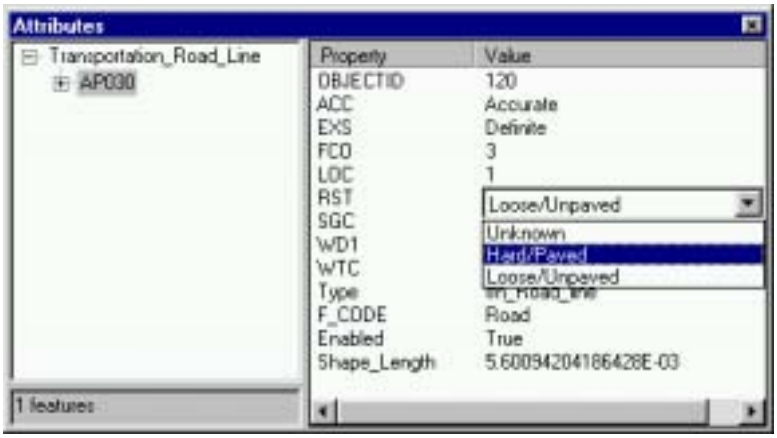


Figure 7-9 Attributes Window in ArcMap

NOTE

A listing of feature attribute codes is available in DTSS online Help.

6. Change the value by clicking the appropriate field in the "Value" column and typing a new attribute value. Predefined values are provided for data that has been imported into available geodatabase templates such as ITD and VITD. In this case, valid attribute values are provided in a dropdown list.

7. Press ***[Enter]***. The attribute value is modified for the feature.

8. When the attributes have been successfully modified, close the **Attributes** window and go to the **Editor** toolbar and select ***Editor/Save Edits***.

9. To stop editing, select ***Editor/Stop Editing***.

To modify the attributes of all selected features in a layer, click the layer name in the left panel of the **Attributes** window. Then click in the "Value" column, type or select the new value for the appropriate property, and press ***[Enter]***. To undo edits, click the ***Undo*** button ( ) on ArcMap's **Standard** toolbar.

When editing attributes, calculations can be done using the field calculator in the feature layer's attribute table window. For more information on modifying attributes from the attribute table, see ArcMap's online Help topic "Working with tables."

7.1.1.3.2 Assigning Attributes to New Features

To assign attributes to new features added to a dataset, follow the procedure below.

1. Select the feature whose attribute is to be assigned using the ***Edit*** tool ( ), or by selecting the feature from its layer's attribute table (see Section 7.1.1.2 for more information on selecting features). The selected feature will appear highlighted in the Display panel (Figure 7-10).

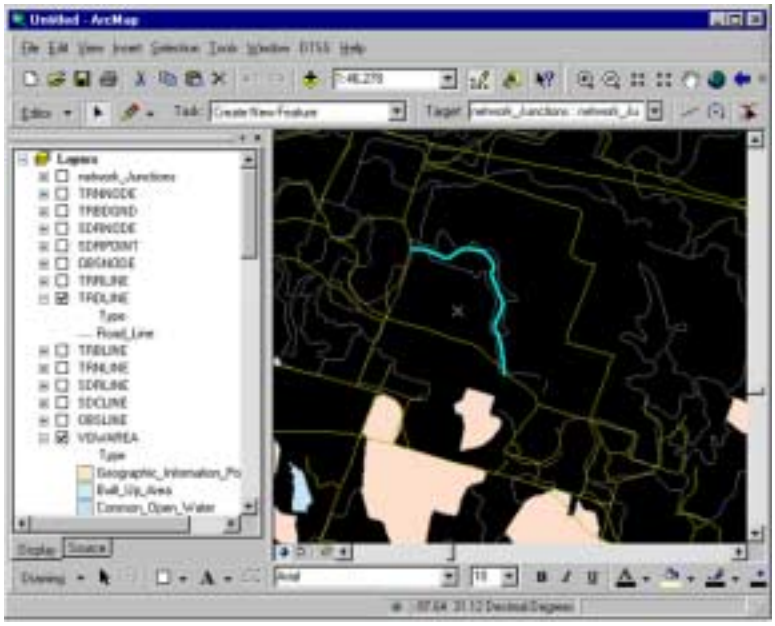


Figure 7-10 Selected Road in ArcMap

2. With the feature selected, click the ***Attribute*** button ( ) on the ArcMap Editor toolbar. The **Attributes** window will appear (Figure 7-11).

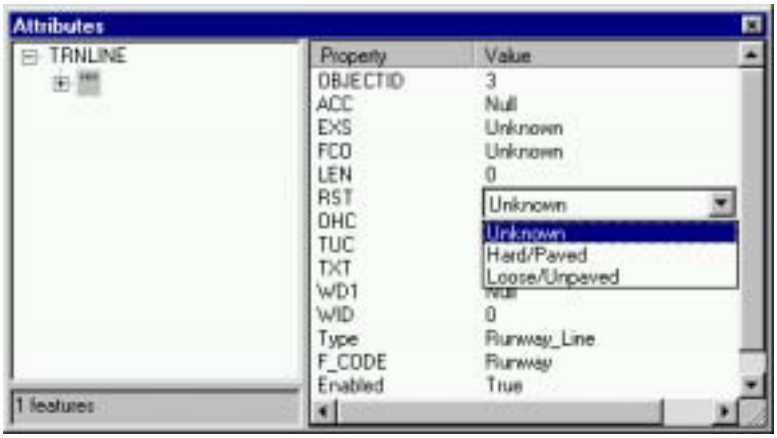


Figure 7-11 Attributes Window in ArcMap

3. Change the value by clicking the appropriate field in the "Value" column and typing a new attribute value. Predefined values are provided for data that has been imported into available geodatabase templates such as ITD and VITD. In this case, valid attribute values are provided in a dropdown list.

4. Press ***[Enter]***. The attribute value is modified for the feature.

5. When the attributes have been successfully modified, go to the **Editor** toolbar and select ***Editor/Save Edits***.

6. To stop editing, select ***Editor/Stop Editing***.

Attributes from an existing feature can also be copied to a new feature(s). To copy the attributes of an existing feature to a new feature, perform the following steps.

1. Select the feature that has the attributes you want, hold down the ***[Shift]*** key, and select the new feature(s).

2. Open the attribute table by clicking on the **Attributes** button ( ) on the **Editor** toolbar.

3. When the **Attributes** window opens (Figure 7-12), select the feature in the left panel of the window that has the attributes you want, right click, and select **Copy** from the context menu.

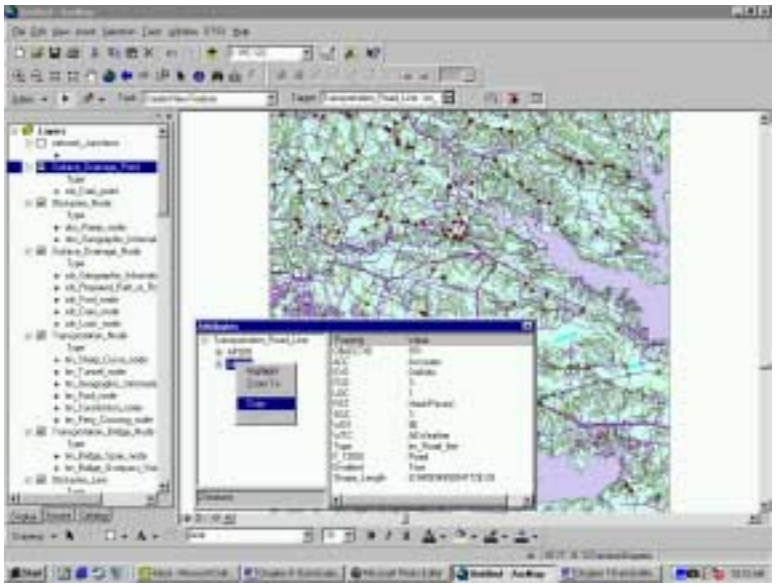


Figure 7-12 Copying Feature Attributes in ArcMap

4. Now highlight the new feature in the left panel of the **Attributes** window, right click, and select **Paste** (Figure 7-13).



Figure 7-13 Pasting Feature Attributes to New Feature

5. Once attributes are copied over, modify attributes of the new feature as necessary using the procedures detailed in Section 7.1.1.3.1.

For more information on adding, copying, and modifying feature attributes in ArcMap, refer to the vendor's online Help or printed user documentation.

7.1.1.3.3 Adding and Deleting Records

The DTSS analyst can add new attributes to a feature by adding records to the attributes table in ArcMap. The attributes table also enables the analyst to delete records if needed. To add or delete records in an attribute table, follow the procedure below.

1. With data already open in ArcMap, go to the **Editor** toolbar, and select ***Editor/Start Editing***. The items on the toolbar become activated.

2. In ArcMap's Table of Contents panel, right click the desired layer. A context menu appears (Figure 7-14).

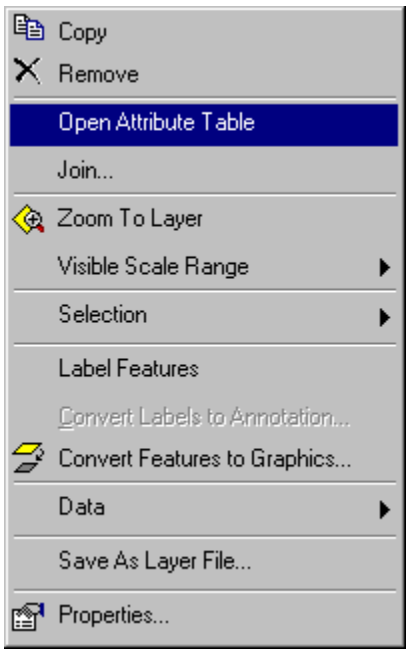


Figure 7-14 Context Menu for Layer in ArcMap

3. Select ***Open Attribute Table***, and the layer's attribute table opens (Figure 7-15).

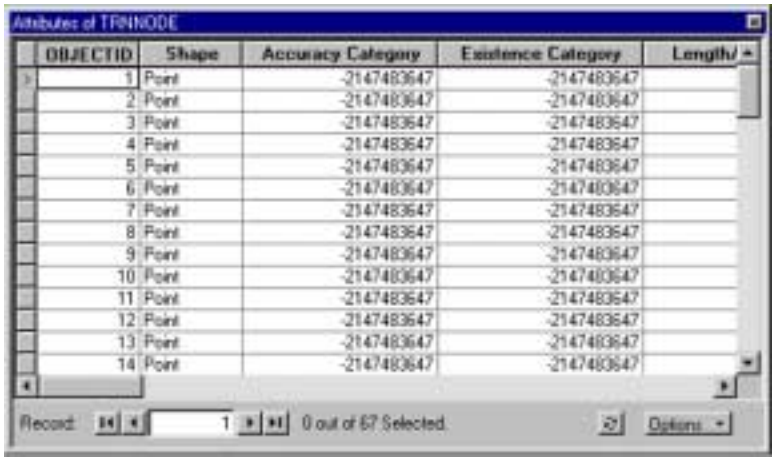


Figure 7-15 Attributes Table in ArcMap

4. To add a record, click the ***Move to end of table*** button () located at the bottom of the window. A new record is added at the end of the table. Enter the desired values for the new record, and then close the window to accept the change.

5. To delete a record, right click the record and select ***Delete*** from the context menu that appears.

For more information on adding and deleting records in a layer's attribute table, refer to ArcMap's online Help or printed user documentation.

7.1.1.3.4 Editing Records

To add or delete values to an existing record, follow the procedure below.

1. From the **Editor** toolbar, select ***Editor/Start Editing***.
2. In the ArcMap Table of Contents panel, right click the desired layer and select ***Open Attribute Table*** from the context menu that appears.
3. Once the attribute table opens, click the cell in which to add a value.
4. Type the desired values and press ***[Enter]*** to accept changes.
5. To delete a value from a cell, right click the cell that contains the value to be deleted, and select ***Delete*** from the context menu that appears.
6. Close the window when finished making changes.

Records can also be selected directly from a table. If the table queried is a feature attribute table, making a table selection produces selected features on the map. When a record is selected, it is highlighted for easy identification. Many records can be selected at a time by either holding down the ***[Ctrl]*** key and selecting other records with the mouse, or by clicking and dragging the mouse down through several adjacent records.

For more information on editing records in ArcMap, refer to ArcMap's online Help or printed user documentation.

7.1.2 Adding and Creating New Feature Classes

Depending on the situation, the DTSS analyst has a number of tools available for adding and creating feature classes in ArcInfo. The following sections outline procedures for creating feature classes in existing and new geodatabases.

7.1.2.1 Adding New Feature Classes to Existing Geodatabase

The analyst may need to add a new feature class to an existing geodatabase for a number of reasons. For example, if the analyst has imported a dataset that does not contain any railroads, but imagery shows that a railroad exists, a new railroad feature can be created to update the dataset.

When the analyst imports data into ArcMap using the custom DTSS importers described in Section 5.2, an existing geodatabase template is used to create a new geodatabase to store the imported data. The created geodatabase contains not only feature classes that

represent those features present in the imported data, but also blank feature class templates for all feature classes that can be contained in the data.

For example, if railroads are a permitted feature of the imported data type, the geodatabase template will include a feature class for railroads, whether or not the imported data includes any railroads. Using the geodatabase template, the analyst can easily add railroad features to the dataset using ArcMap's **Editor** functionality. To create a new feature class using an existing geodatabase template, simply identify the desired feature class as the Target layer, and then use the same procedures described in Section 7.1.1.1, *Feature Geometry*.

7.1.2.2 Creating Data Using an Existing Geodatabase Template

The analyst may need to digitize new features in an empty geodatabase, where the structure for the data exists, but the data itself must be filled in. This procedure is helpful when imagery exists for a certain region, but data is either sparse or nonexistent. For the following example, a blank geodatabase template is used with a background image for reference. If a blank geodatabase does not already exist on the analyst's system, refer to Section 7.1.2.3, *Creating a New Geodatabase*.

7.1.2.2.1 Copying a Blank Geodatabase Template

First, the analyst must create a copy of the blank template, to avoid overwriting it. This copying procedure can be accomplished in ArcCatalog.

NOTE

The following procedure can also be used for copying coverages and shapefiles.

1. With ArcCatalog open on the desktop, navigate to the blank geodatabase template to copy in the Tree View panel on the left side of the window.

2. Right click on the appropriate geodatabase, and select ***Copy*** from the context menu that appears (Figure 7-16).

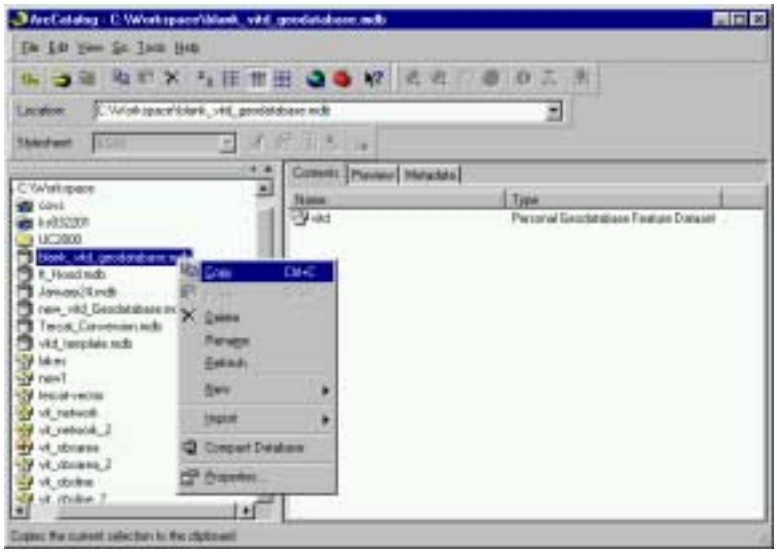


Figure 7-16 Copy Command on Context Menu in ArcCatalog

3. Now navigate to the desired destination directory, right click, and select ***Paste*** from the context menu (Figure 7-17).

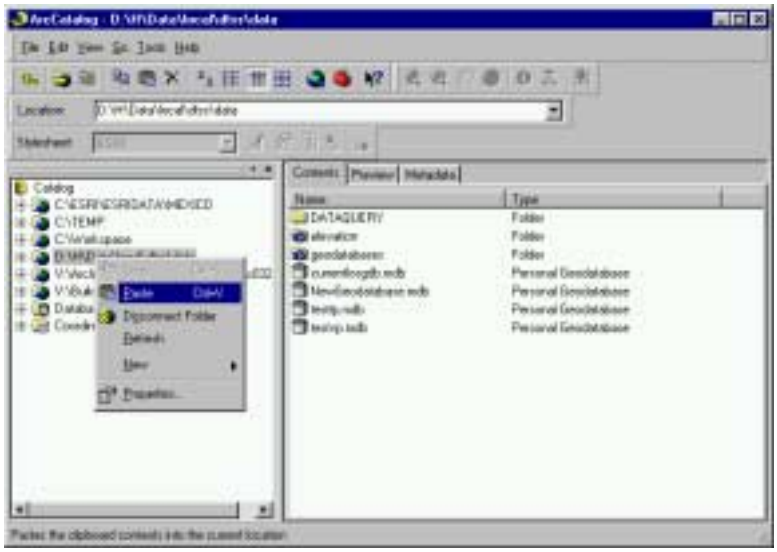


Figure 7-17 Paste Command on Context Menu in ArcCatalog

4. Once the copied geodatabase appears in the correct directory, right click on it again, and select ***Rename*** from the context menu (Figure 7-18). A cursor appears in the text area, allowing the user to type in the new name for the geodatabase.

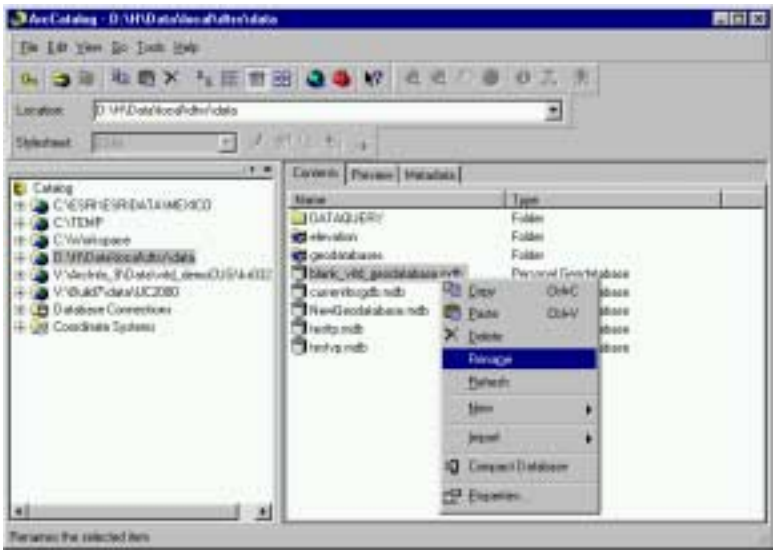


Figure 7-18 Rename Command on Context Menu in ArcCatalog

5. Now right click on the new geodatabase and select ***Properties***. Use the settings in this window to set projection and bounding coordinates to the geodatabase.

6. Use this renamed geodatabase to perform the procedure outlined in Section 7.1.2.2.2, below.

7.1.2.2.2 Digitizing Features in Blank Geodatabase Template

Follow the procedure below to digitize features in the blank geodatabase template.

1. Open ArcMap from the desktop icon or the **Start** menu.

2. When the **ArcMap** window opens, click the ***Add Data*** button ( ) to access the **Add Data** window (Figure 7-19).



Figure 7-19 Add Data Window

3. In the **Add Data** window, navigate to the appropriate *.img* file to give the new data a background reference map. Select the image, and click ***Add***. The image appears in the Display panel of the **ArcMap** window (Figure 7-20).

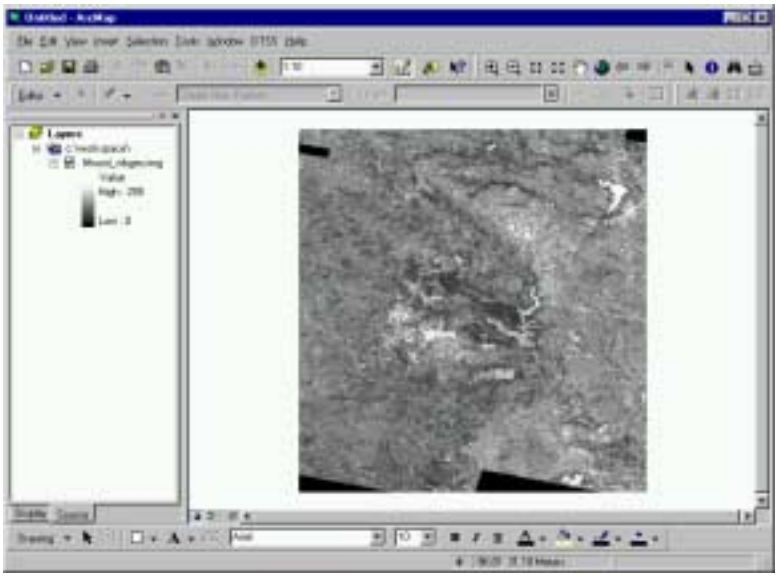


Figure 7-20 Background Image Open in ArcMap

4. First copy the template into a new geodatabase using ArcCatalog (see Section 7.1.2.2.1). Now click the **Add Data** button again to access the blank geodatabase. Blank geodatabase templates are located under the file directory path: C:\H\DTSS\datamodels. Navigate to the appropriate folder, and double click the desired geodatabase to access the VITD dataset (Figure 7-21). Highlight the dataset, and then click ***Add***.

NOTE

Blank geodatabase templates for each data type are provided with the DTSS system under the directory C:\H\DTSS\datamodels. If a blank geodatabase template does not already exist on the analyst's system, refer to Section 7.1.2.3, Creating a New Geodatabase.



Figure 7-21 Add Data Window With VITD Dataset

5. Once the data is added, it is automatically listed above the background image in the Table of Contents panel in the **ArcMap** window (Figure 7-22). Notice, however, that no data appears in the Display panel, as the geodatabase itself is empty.

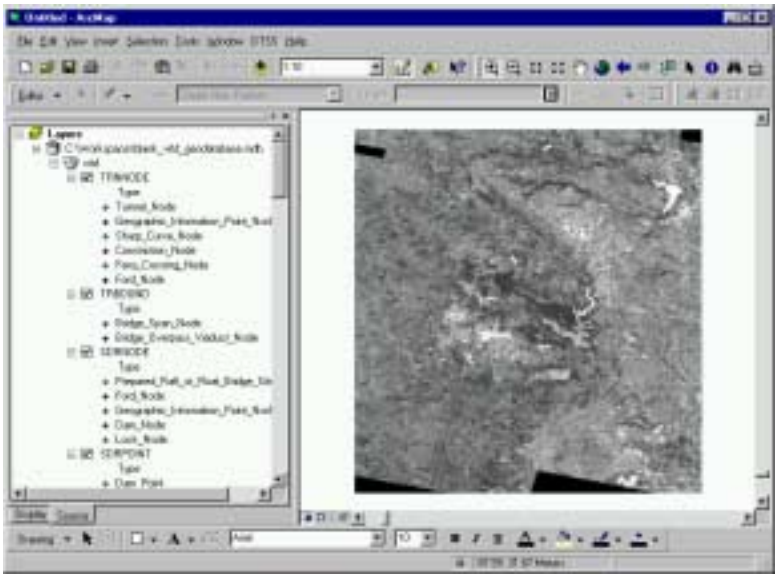


Figure 7-22 Blank Geodatabase Loaded Over Image in ArcMap

6. Now go to the **Editor** toolbar, and select ***Editor/Start Editing***. The items on the toolbar become active.

7. The default setting for the **Task** dropdown menu is "Create New Feature." Leave this setting, and click on the **Target** dropdown to select a target layer for the new feature. For this example, select "Transportation_Road_Line" which is a road.

8. Use the **Zoom** tool ( ) from the **Tools** toolbar to click and drag an area to magnify in the Display panel, as a high degree of accuracy is necessary for feature creation.

9. Now click the **Tool** dropdown ( ), and select the **Sketch** tool ( ). Notice that when the mouse is moved across the image in the Display panel, a crosshair symbol appears as the cursor.

10. Click on the desired start point for the road to digitize it. Single click for any nodes, or changes in direction, for the road. Double click to end the sketch (or right click and select ***Finish Sketch*** from the context menu that appears). The new road appears highlighted in the Display panel (Figure 7-23).

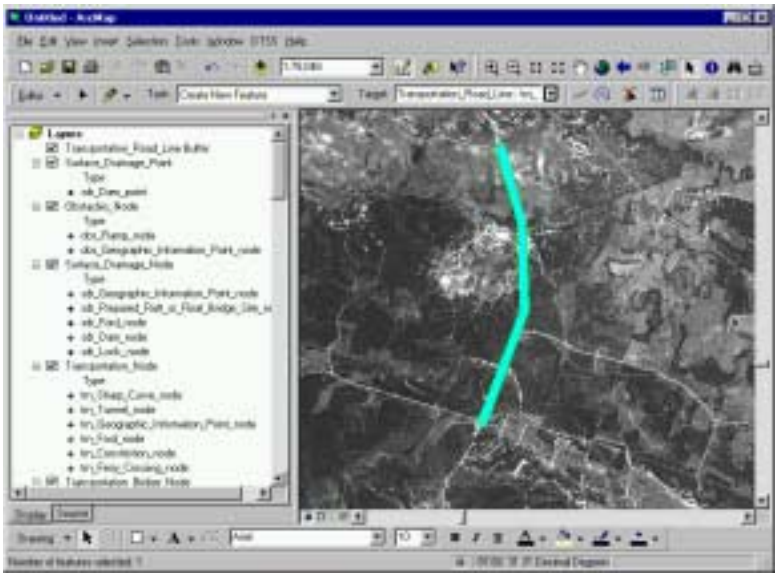


Figure 7-23 New Road Feature Digitized in ArcMap

11. With the new road feature still highlighted, click the **Attributes** button ( ) on the **Editor** toolbar. The **Attributes** window opens (Figure 7-24), allowing for edits and changes to the values of different attribute fields for this feature.

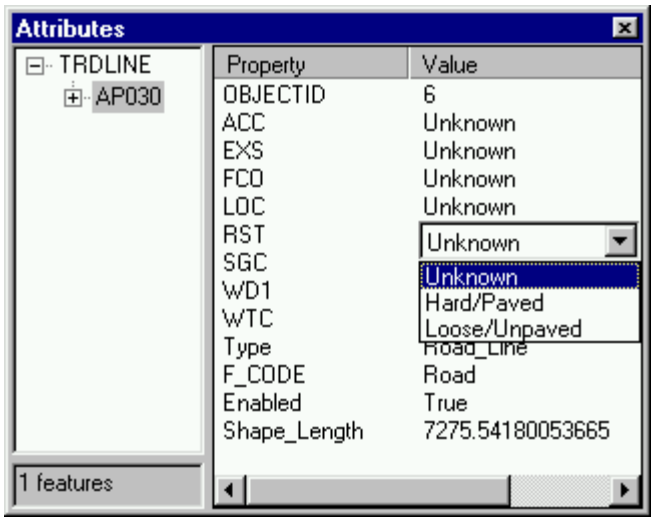


Figure 7-24 Attributes Window for New Feature

12. Continue digitizing and editing new features in this fashion, repeating Steps 9–11 for each new feature, until all features have been created.

13. When all new features have been digitized successfully, go to the **Editor** toolbar and select ***Editor/Save Edits***.

14. To stop editing, select ***Editor/Stop Editing***.

For more information on digitizing new features in ArcMap, refer to ArcMap's online Help or printed user documentation.

7.1.2.2.3 Deleting Features

The analyst may wish to delete existing features from a geodatabase in ArcMap. The software offers easy-to-use editing tools to delete features. Follow the procedure below to delete a feature in ArcMap.

1. With data open in ArcMap, zoom to the desired magnification to view the feature to delete.

2. From the **Editor** toolbar, select ***Editor/Start Editing*** to enable the appropriate tools.

3. Now click on the **Edit** tool ( ), and click on the feature to delete. The feature will appear highlighted, as shown in Figure 7-25.

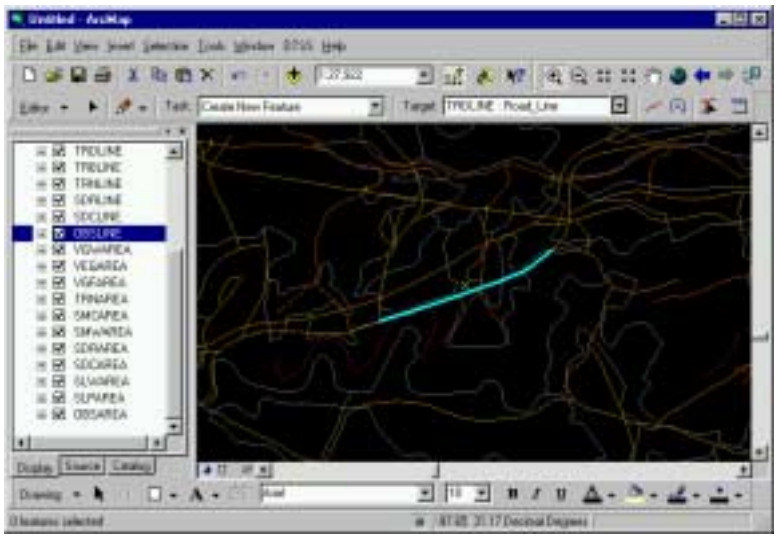


Figure 7-25 Selected Feature in ArcMap

4. On the **Standard** toolbar, click on the ***Delete*** icon ( ). The selected feature will be removed from the map display.

NOTE

*Use **Edit/Undo** (or the keyboard shortcut **[Ctrl+Z]**) to undo any feature deletion.*

For more information on deleting features in ArcMap, refer to the program's online Help or printed documentation.

7.1.2.3 Creating a New Geodatabase

If the DTSS analyst does not have a blank geodatabase template, one can be created using ArcCatalog, which will provide a container for any feature dataset(s) the analyst wishes to add, import, or create. The sections below outline procedures for creating a new geodatabase with a feature dataset and feature classes. Once these structures are set up, the analyst can add individual feature classes to the new dataset. For information on digitizing features once the new dataset and feature classes are in place, see Sections 7.1.1.1, *Feature Geometry*, and 7.1.2.1, *Adding New Feature Classes to Existing Geodatabase*.

The following procedure outlines steps for creating a new geodatabase in ArcCatalog.

1. Open ArcCatalog by double clicking its icon on the desktop or by using the **Start** menu.

2. When the **ArcCatalog** window opens, go to the Tree View panel on the left, and navigate to the appropriate folder for the new geodatabase. Right click on the folder to access the context menu (Figure 7-26).

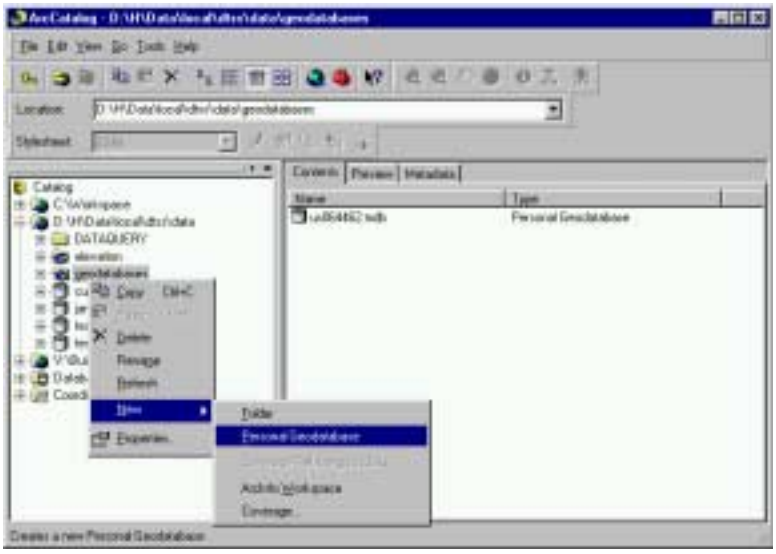


Figure 7-26 ArcCatalog Context Menu for New Geodatabase

3. Select ***New/Personal Geodatabase*** from the menu. Notice that the new geodatabase appears on the **Contents** tab in the right panel of the window (Figure 7-27).

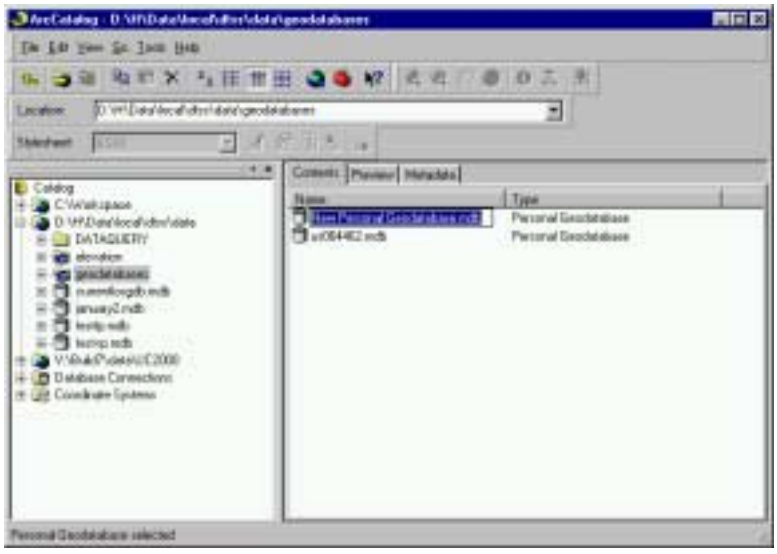


Figure 7-27 New Geodatabase on Contents Tab in ArcCatalog

4. Click in the highlighted text field and type the appropriate filename for the geodatabase, and then press ***[Enter]*** to accept the change.

For more information on creating a new geodatabase, refer to ArcCatalog's online Help or printed documentation.

7.1.2.3.1 Creating a New Feature Dataset

Once a geodatabase has been created, the analyst can create a new feature dataset to be contained within it. The new dataset must be assigned appropriate spatial reference information, including the data's coordinate system and its coordinate domain (minimum and maximum *x*, *y*, and *z* values). To create a new dataset and assign its spatial reference information, follow the steps below.

1. Right click on the appropriate geodatabase listed in the Tree View panel in ArcCatalog to access the context menu shown in Figure 7-28.

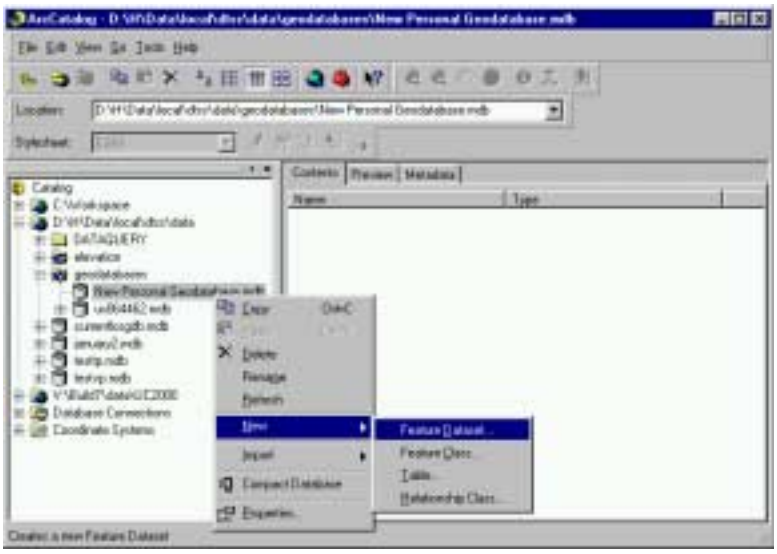


Figure 7-28 ArcCatalog Context Menu for New Feature Dataset

2. Select ***New/Feature Dataset*** to access the **Feature Dataset** window (Figure 7-29).

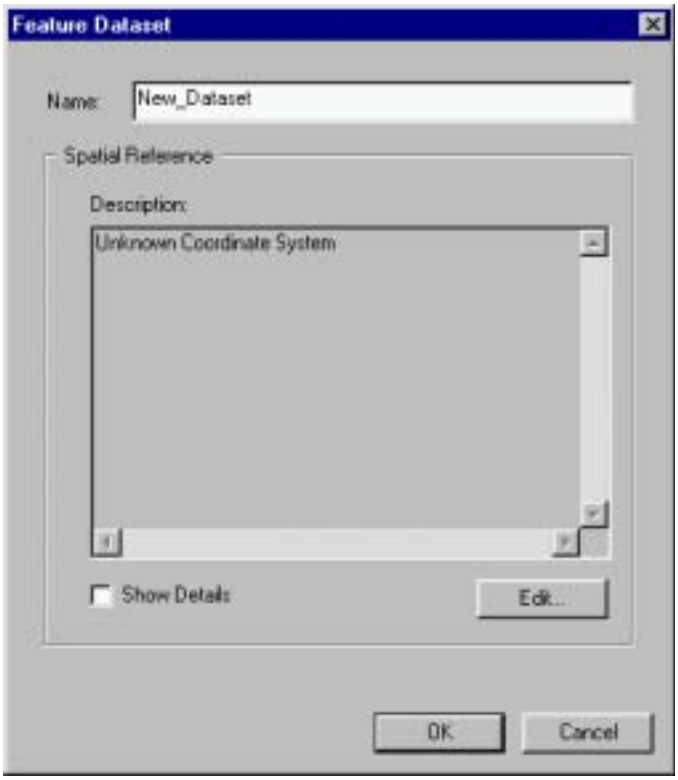


Figure 7-29 Feature Dataset Window in ArcCatalog

3. Type in a name for the dataset in the "Name" field, and then click the ***Edit*** button under the "Spatial Reference" heading. The **Spatial Reference Properties** window opens (Figure 7-30), which contains four tabs for coordinate settings.

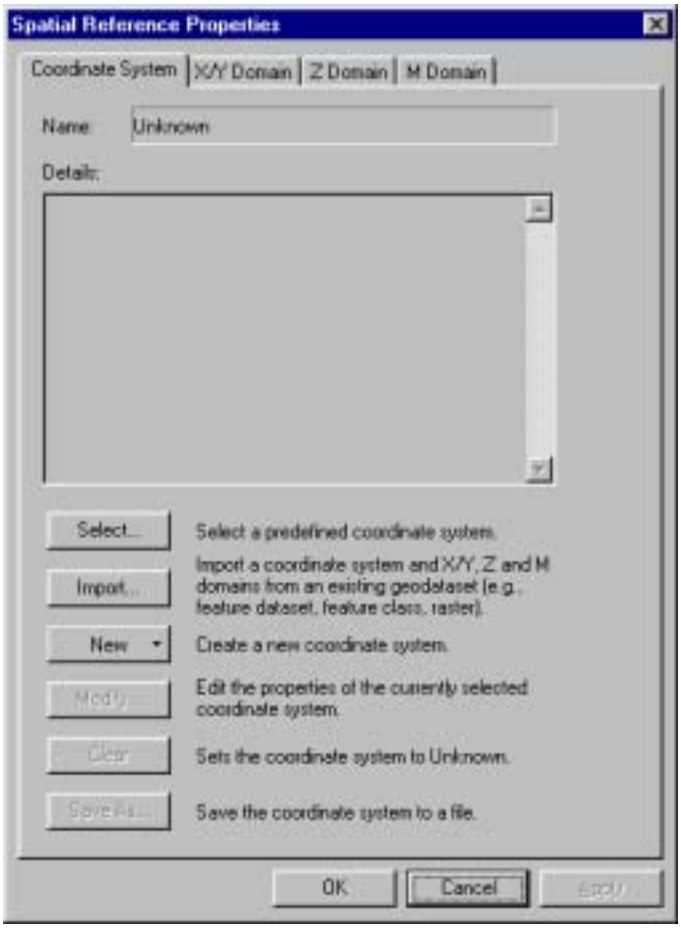


Figure 7-30 Spatial Reference Properties Window for New Feature Dataset

4. On the **Coordinate System** tab, which displays first by default, click the ***Select*** button to open the **Browse for Coordinate System** window (Figure 7-31).

NOTE

*The analyst may select a predefined coordinate system (using the **Select** button), match the coordinate system of an existing dataset or standalone feature class (using the **Import** button), or define a custom coordinate system (using the **New** button).*



Figure 7-31 Browse for Coordinate System Window in ArcCatalog

5. Navigate to and select a predefined coordinate system (either geographic or projected) from the appropriate folder, and then click ***Add***. Notice that the **Coordinate System** tab now displays information on the selected coordinate system (Figure 7-32).

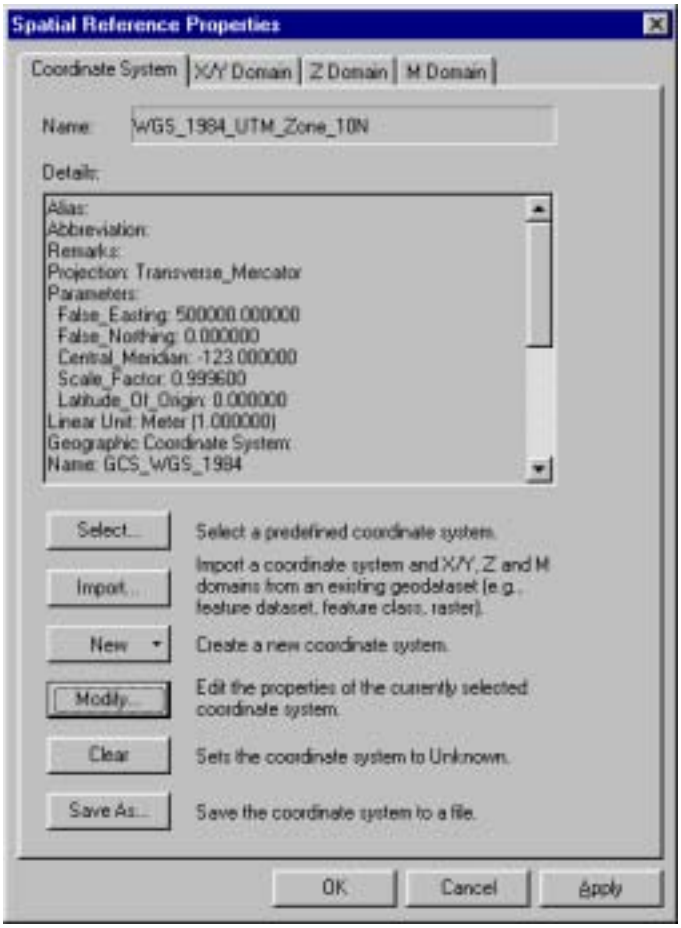


Figure 7-32 Coordinate System Tab in Spatial Reference Properties Window

NOTE

*The analyst can click the **Save As** button to save the coordinate system to a .prj file.*

6. Click the ***Modify*** button. The **Projected Coordinate System Properties** window (or **Geographic Coordinate System Properties** window) will appear (Figure 7-33).

NOTE

This window may appear different, depending on the type of coordinate system selected.

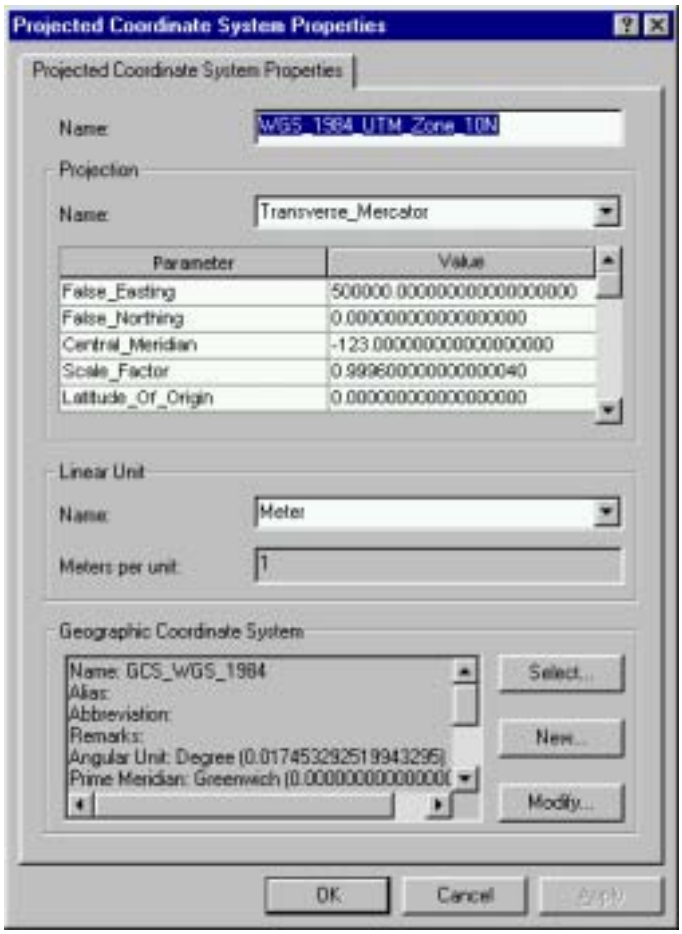


Figure 7-33 Projected Coordinate System Properties Window

7. Make any necessary changes to the chosen system, and then click ***OK***. The window closes and returns to the **Spatial Reference Properties** window.

8. Now click on the ***X/Y Domain*** tab (Figure 7-34) to make changes to the minimum and maximum values for *x* and *y* coordinates, and to adjust the "Precision," or resolution, setting.

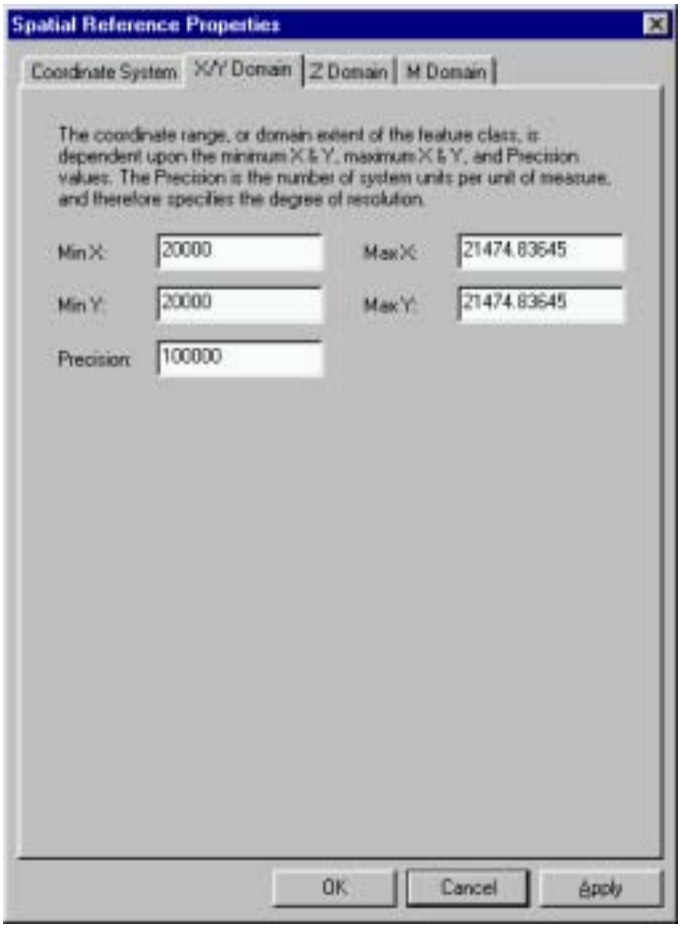


Figure 7-34 X/Y Domain Tab in Spatial Reference Properties Window

NOTE

Each existing template geodatabase included with the DTSS software is built so that the data bounds cover the entire earth. To have the coordinate range cover the earth, set the X/Y domains as follows: Min X: -180, Max X: 180, Min Y: -90, Max Y: 270.

9. Repeat Step 8 for the **Z Domain** and **M Domain** tabs in the window, as needed. Then click ***OK*** to accept the changes. The window closes and returns to the **Feature Dataset** window.

10. Click the checkbox next to "Show Details" in the **Feature Dataset** window to view the data's coordinate system information in detail (Figure 7-35).

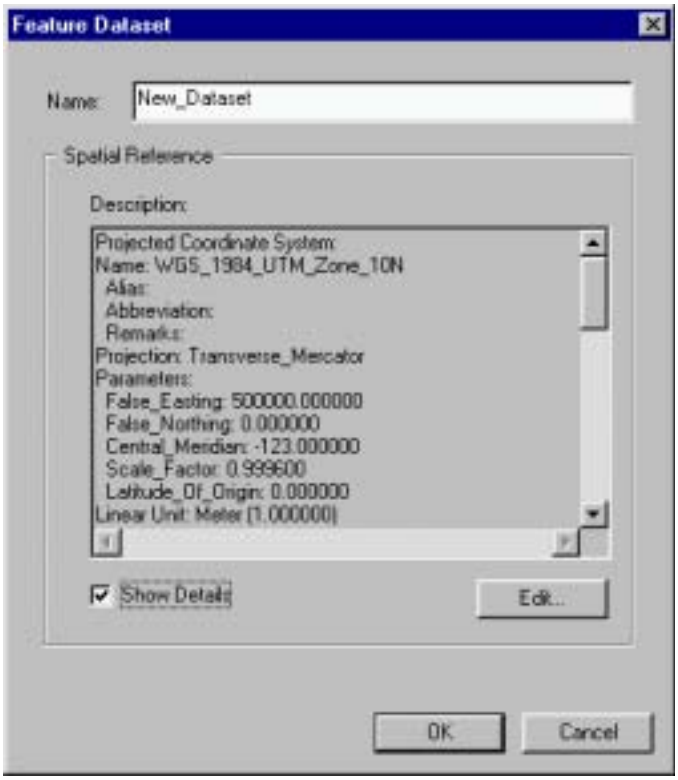


Figure 7-35 Feature Dataset Window Showing Spatial Reference Information

11. Click ***OK*** to save the changes and close the window. The new dataset appears on the **Contents** tab in ArcCatalog (Figure 7-36).

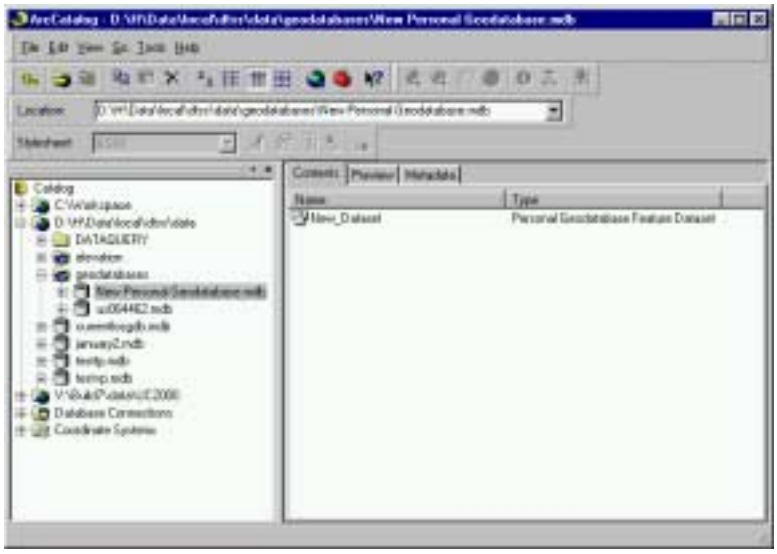


Figure 7-36 New Dataset on Contents Tab in ArcCatalog

For more information on creating feature datasets in ArcCatalog, refer to the online Help or printed user documentation.

7.1.2.3.2 Creating New Feature Classes

Once the analyst has created a new feature dataset with spatial reference information, feature classes can be added to fill out the dataset. To create a new feature class in a new or existing feature dataset, follow the steps below. For more information on creating a new feature dataset, refer to Section 7.1.2.3.1.

1. With ArcCatalog already open, navigate to the appropriate dataset in the Tree View panel on the left. Right click the dataset to access the context menu (Figure 7-37).

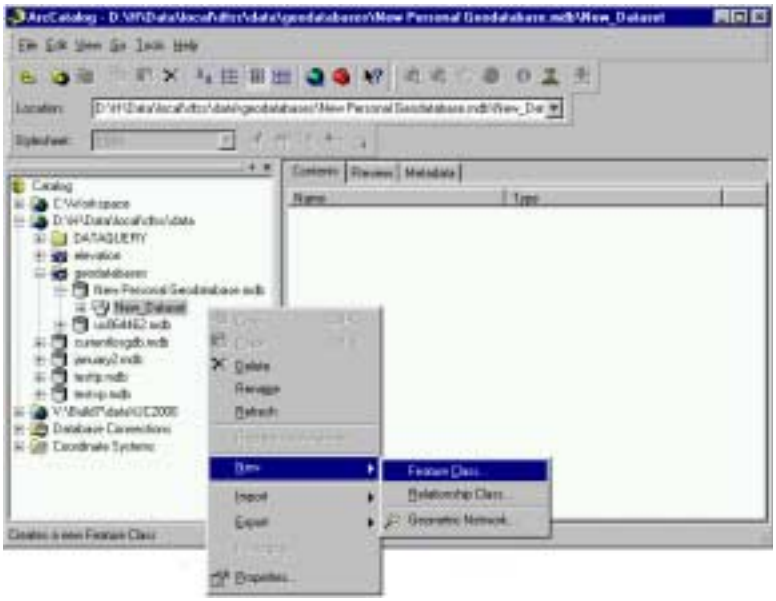


Figure 7-37 Context Menu for New Feature Class

2. Select ***New/Feature Class*** from the context menu to open the **New Feature Class** window shown in Figure 7-38.

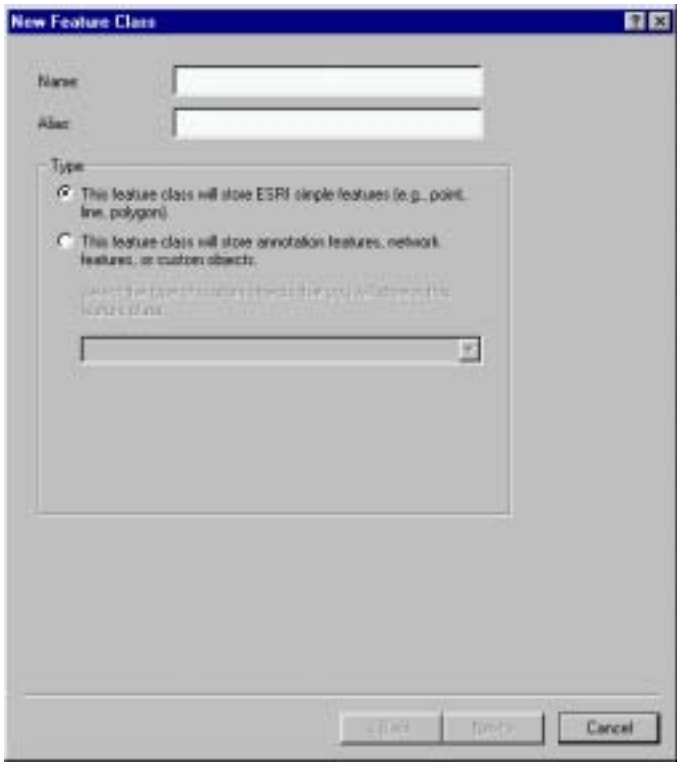


Figure 7-38 New Feature Class Window in ArcCatalog

3. Enter a name and alias for the new feature class in the appropriate fields. Be sure to leave no spaces between words.

4. Select the radio button next to the desired type of feature to include in the feature class. If the second option is chosen, the field below it must indicate what type of custom objects will be stored in the feature class.

5. Click ***Next*** to proceed to the next window (Figure 7-39), which specifies the database storage configuration.



Figure 7-39 New Feature Class Storage Configuration Window

6. Choose whether to use default storage parameters or a configuration keyword. If the second option is chosen, the field below it must indicate the appropriate configuration keyword to reference database storage parameters for the new feature class.

7. Click ***Next*** to proceed to the next window (Figure 7-40), which displays a table of feature attributes.

NOTE

The table shown in this figure may look different if the "Default" option is not chosen in the previous window.



Figure 7-40 New Feature Class Attribute Table Window

8. Make any necessary changes to the feature attributes and aliases. Notice that the **Import** button in the bottom right of the window allows for importing field values from existing data.

9. To change any previous settings, click the ***Back*** button. Review information in this window, and click ***Finish*** when changes are complete. The new feature class appears on the **Contents** tab in ArcCatalog (Figure 7-41).

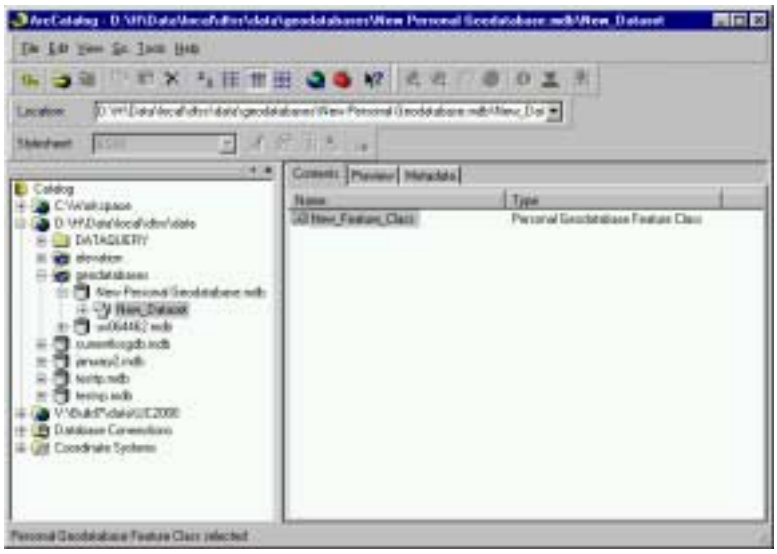


Figure 7-41 New Feature Class on Contents Tab in ArcCatalog

10. Repeat these steps for each feature class desired for the dataset.

For more information on creating new feature classes, refer to ArcCatalog's online Help or printed user documentation.

7.1.2.3.3 Creating New Attribute Fields for Feature Classes

ArcCatalog enables the DTSS analyst to add fields to individual features if needed. For example, the analyst may wish to add a "Road_Name" field to a road feature. That field can be added in ArcCatalog, and then digitized or edited in ArcMap to update the geodatabase. To add a field to a feature class, follow the procedure below.

1. With ArcCatalog open, navigate to the appropriate geodatabase and feature dataset using the Catalog Tree View panel on the left side of the window.

2. Double click the desired feature dataset. Then right click on the desired feature class, and select ***Properties*** from the context menu that appears (Figure 7-42).

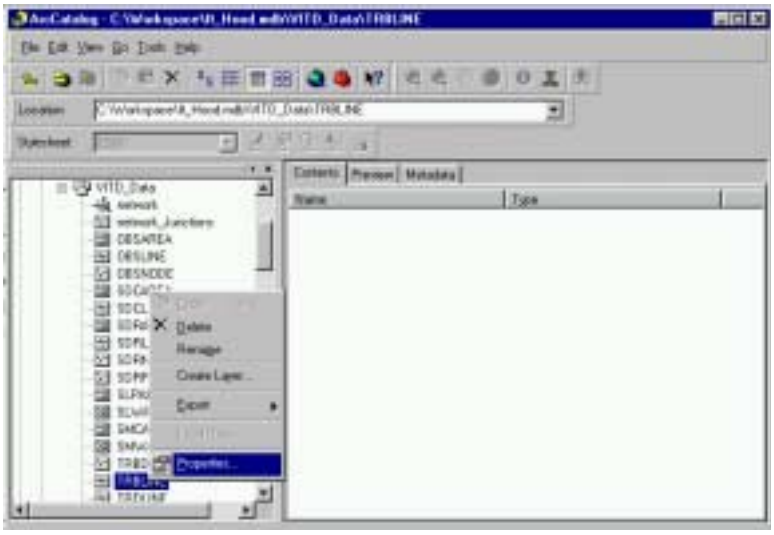


Figure 7-42 Feature Class Context Menu in ArcCatalog

3. The **Feature Class Properties** window opens, with tabs for information on this feature class. Click on the **Fields** tab, and then scroll down to a blank field at the end of the "Field Name" column (Figure 7-43).



Figure 7-43 Feature Class Properties Window in ArcCatalog

4. Click on the blank field in the “Field Name” column, and enter the desired field name. For this example, type “Road_Name”.

5. Now click on the blank field in the “Data Type” column, and select “Text” from the dropdown menu that opens. Notice that the “Field Properties” panel at the bottom of the tab now displays information about this new field (Figure 7-44).

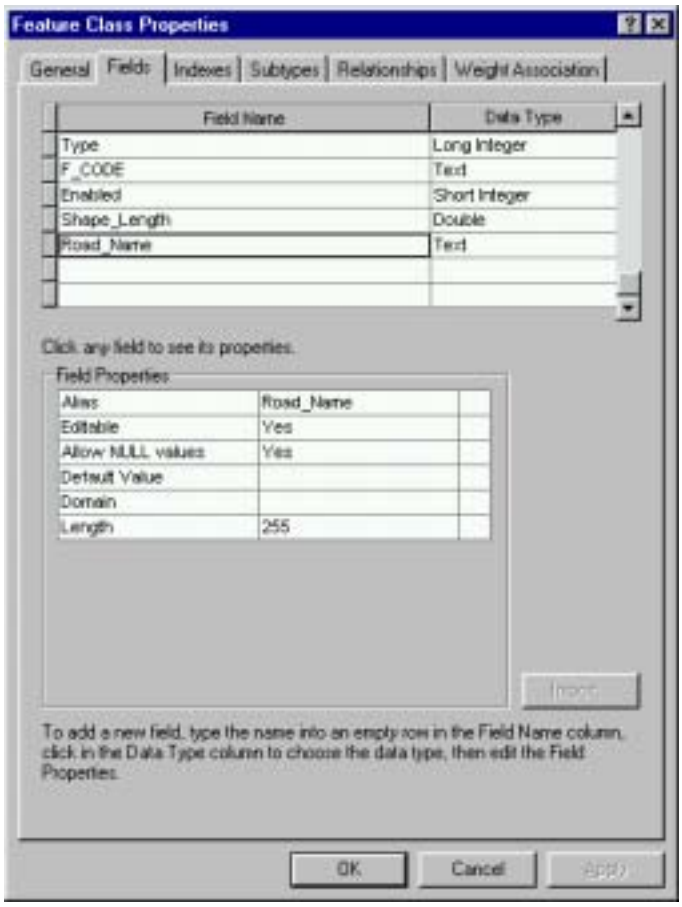


Figure 7-44 Feature Class Properties Window With New Field

6. Click ***OK*** to close the window and return to the ArcCatalog main window.

7. While still in ArcCatalog, click the feature class just updated, and drag it to the ArcMap Display panel.

NOTE

If ArcMap is not already open, the user can click on the ArcMap icon ( ) in ArcCatalog.

8. Once the dataset is loaded in ArcMap, zoom in to the desired feature and select it, as outlined in the substeps below and shown in Figure 7-45.

   a. On the **Editor** toolbar, select ***Editor/Start Editing***.

   b. Click the **Edit** tool ( ), and then click on the desired feature in the ArcMap Display panel—in this case, a bridge line (display will differ depending on chosen feature).

c. With the bridge selected, click the **Attributes** button on the **Editor** toolbar to open the **Attributes** window.

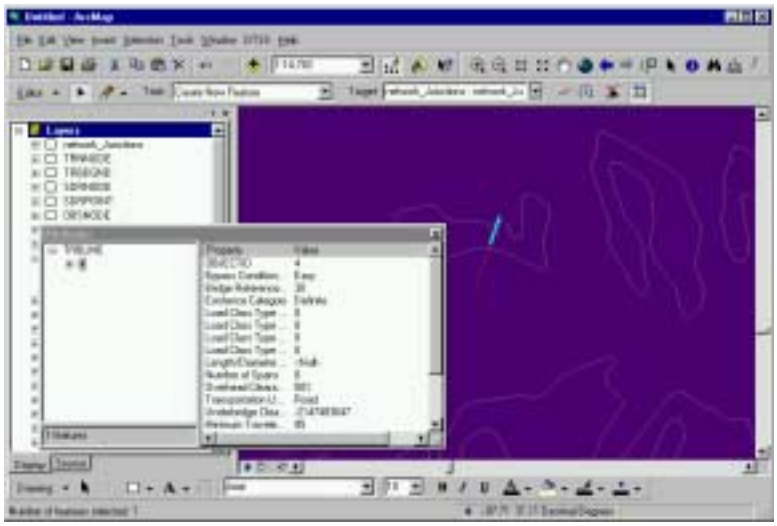


Figure 7-45 Selected Bridge Line in ArcMap

9. In the **Attributes** window, scroll down to the "Road_Name" field that was added to the feature class.

10. The default setting for this new field is "<Null>." Click in the "Value" column for this field, and type in the desired name for the bridge line (Figure 7-46), and then press ***[Enter]***.

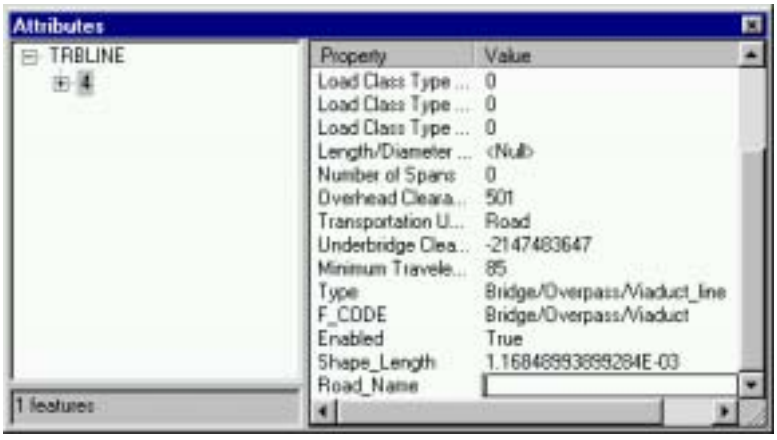


Figure 7-46 Attributes Window in ArcMap With New Field

11. Close the **Attributes** window. The new attribute field has been added to the feature class and assigned a value.

For more information on adding fields and attributes to features in ArcCatalog, refer to the program's online Help or printed user documentation.

7.1.3 Feature Extraction Using ERDAS Imagine

ERDAS Imagine provides several tools to perform feature extraction from imagery. Imagine software provides terrain categorization tools to perform supervised and unsupervised feature classification from multi-spectral imagery. Sub-Pixel Classifier and Expert Classifier are advanced spectral classifiers that provide a more detailed feature classification than standard Imagine tools can provide. Stereo Analyst performs stereoscopic feature collection to extract elevation/height information.

7.1.3.1 Terrain Categorization

The analyst can perform a terrain categorization, or TERCAT, from raster imagery using ERDAS Imagine. An example of a TERCAT is a land cover map, showing vegetation, open water, bare land, urban area, etc as terrain categories (or classes). To create a TERCAT, the analyst will use the Imagine Classifier function. Classification is the process of sorting pixels into a finite number of individual classes, or categories of data, based on their spectral reflectance values. If a pixel satisfies a certain set of criteria, then the pixel is assigned to a class that corresponds to those criteria.

The classification process breaks down into two parts: training and classifying. For the training part, Imagine must be "trained" to recognize patterns in the data. Training is the process of defining the criteria by which these patterns are recognized. The result of training is a set of spectral signatures, which are criteria for a set of proposed classes used by the classifier. For the classifying part, Imagine analyzes each pixel in the image by comparing its spectral reflectance values against the training sets. Based on mathematical decision criteria, each pixel is assigned to the class (spectral signature) that best matches its spectral reflectance values. In many cases, this is a repetitious process.

There are two ways to classify pixels into different categories (classes):

- **Supervised**—Analyst collects several spectral signatures from each known type of land cover. After the supervised classification, each pixel will be assigned to one of the land cover classes (category).
- **Unsupervised**—Analyst does not collect signatures. Instead, the software splits the image into a number of categories. The analyst has the option to save the Signature Sets as an output file. After the unsupervised classification, the analyst must determine what each category (class) represents.

The following example describes a supervised classification:

1. With Imagine 8.4 open on the desktop, open a raster image in the **Viewer #1** window (Figure 7-47).

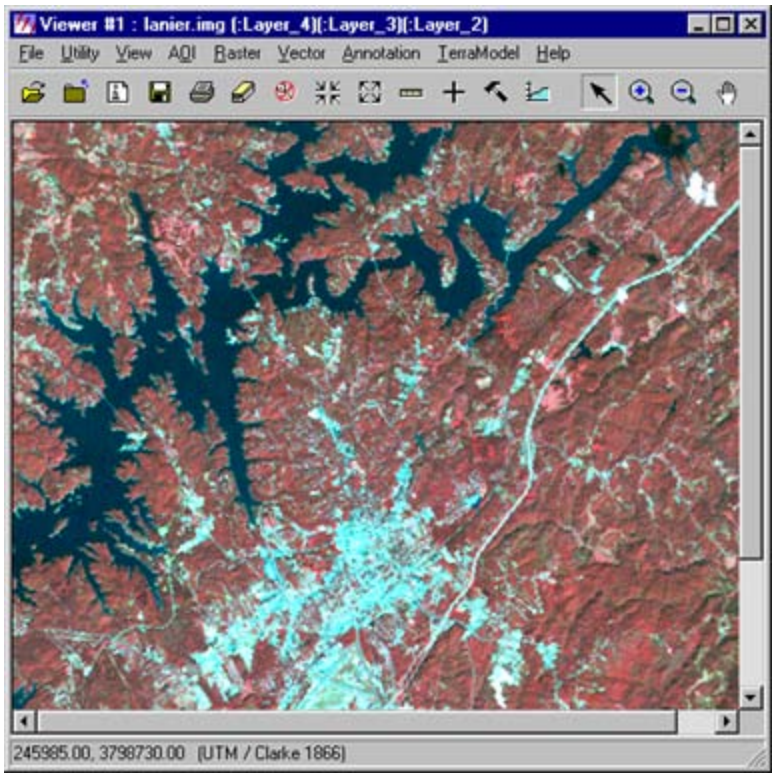


Figure 7-47 Viewer #1 Window Showing a Raster Image

2. Click the ***Classifier*** icon ( ) on the Imagine icon panel to open the **Classification** window (Figure 7-48).

NOTE

For more information on any function in this window or others in Imagine, click the **Help** *button in the window to access Imagine's online Help.*

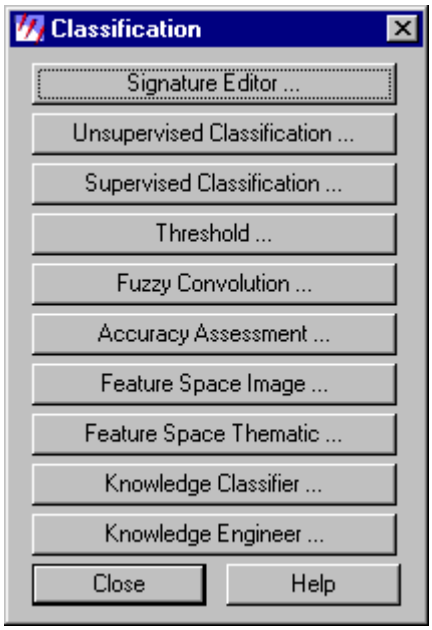


Figure 7-48 Classification Window

3. Click the ***Signature Editor*** button to open the **Signature Editor** window (Figure 7-49).

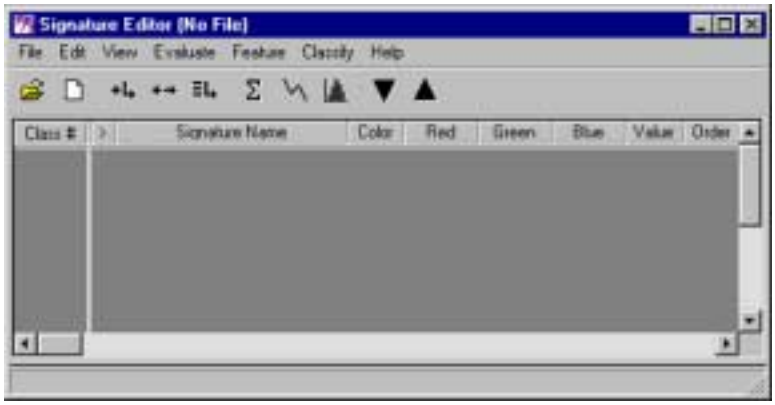


Figure 7-49 Signature Editor Window

4. In the **Viewer #1** window, click ***AOI/Seed Properties*** from the menu bar. The **Region Growing Properties** window will appear (Figure 7-50).

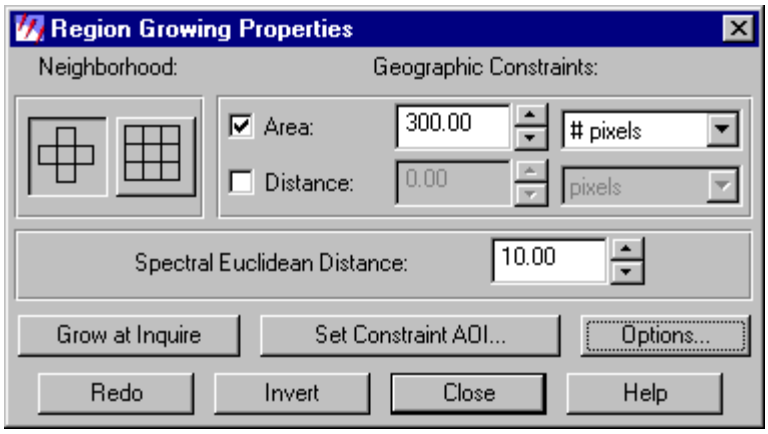


Figure 7-50 Region Growing Properties Window

5. Set the appropriate options for "Neighborhood," "Geographic Constraints," and "Spectral Euclidean Distance." The analyst may adjust these for each training set collected. For more information on any item in this window, click the ***Help*** button. Click ***Close*** when finished.

   - Neighborhood—clicking the button on the right considers more pixels, which tends to result in smaller regions.
   - Geographic Constraints—for obtaining training sets, it is recommended to start with a smaller number, like 100.
   - Spectral Euclidean Distance—enter a value between 1 and 20. Higher values indicate a larger range of pixel values to be included in a region. It is recommended to start with a smaller number, like 1 or 2.

6. In the **Viewer #1** window, click ***AOI/Tools*** from the menu bar. The **AOI** window will appear, showing the available tools (Figure 7-51).



Figure 7-51 AOI Window

7. Zoom in on an area in the image by clicking the ***Interactive Zoom In*** icon ( ) and then clicking on an area in the **Viewer #1** window display to enlarge the image.

8. To collect a signature, click the ***Grow Region*** icon ( ) in the **AOI** window, and click on a known land cover area in the **Viewer #1** window to select it (Figure 7-52). To increase or decrease the size of the region, go back to ***AOI/Seed Properties*** and modify the parameters.

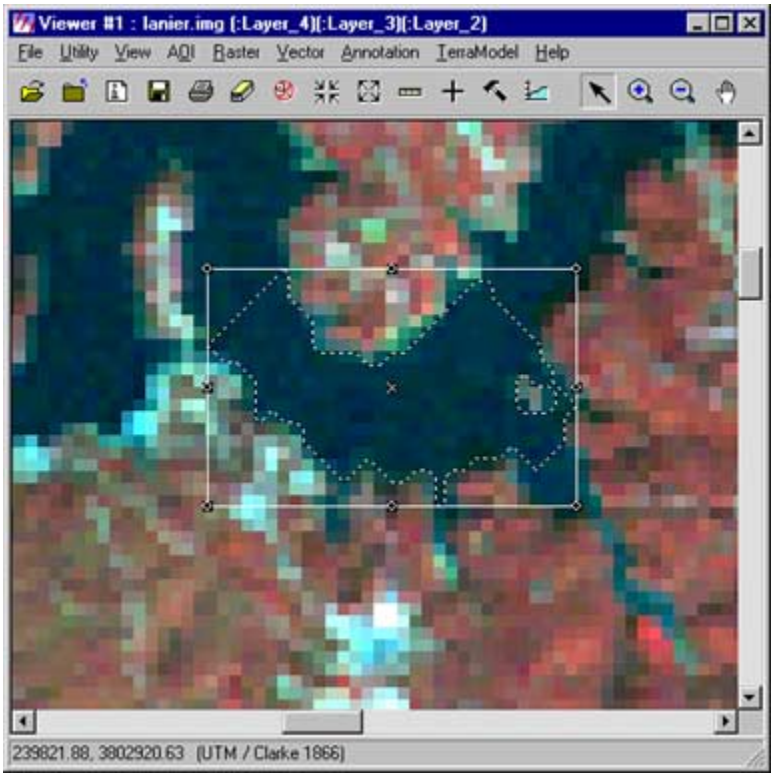


Figure 7-52 Viewer #1 Window Showing Selected Boundary

9. Click the ***Create New Signature*** icon ( ) from the **Signature Editor** window. New information will appear in the **Signature Editor** window (Figure 7-53).

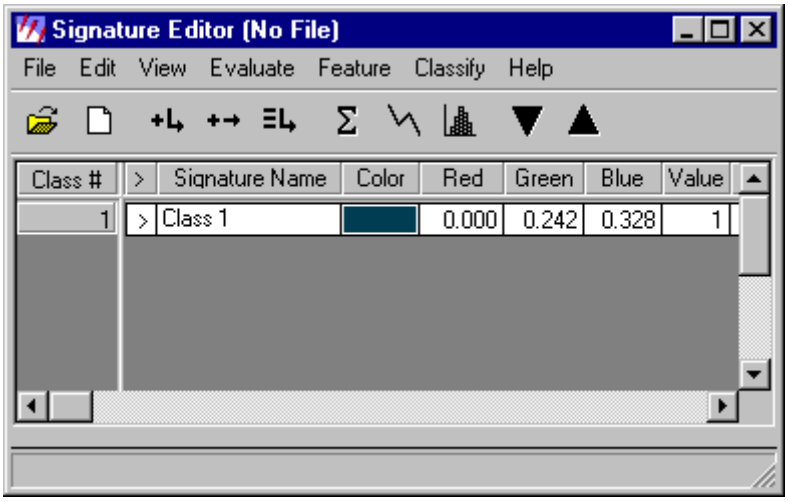


Figure 7-53 Signature Editor Window

10. In the **Signature Editor** window, click inside the "Signature Name" column and type in the appropriate name for the class. Then click inside the "Color" column and select the appropriate color.

11. When finished specifying the signature, it is recommended to keep the signature graphic in the Viewer for reference. If the analyst does not want it kept in the Viewer, it can be cut by clicking on the ***Scissors*** tool ( ) in the **AOI** window. The selected area in the **Viewer #1** window will disappear. Another signature can now be collected.

12. Repeat steps 6 through 10 to create signatures for other areas in the image in the **Signature Editor** window. See Figure 7-54 for an example of the **Signature Editor** window showing other signatures added.

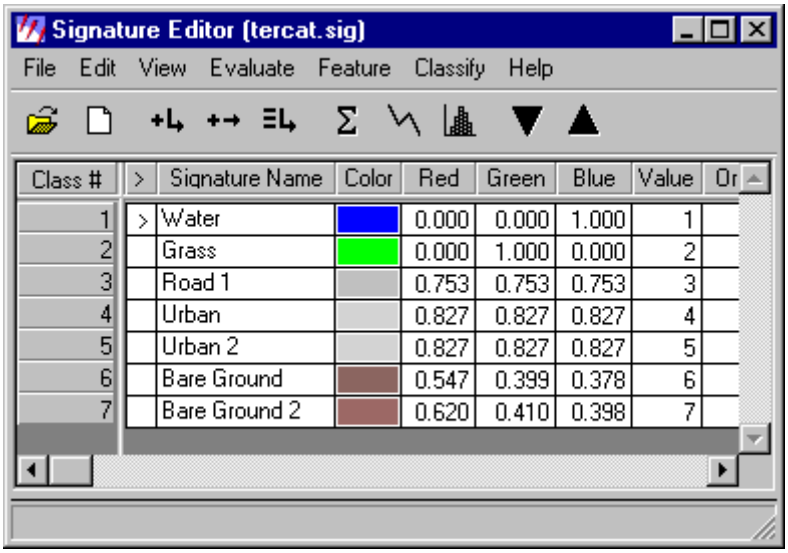


Figure 7-54 Signature Editor Window

13. Imagine provides several advanced tools to analyze spectral signatures, such as viewing statistics and histograms, evaluating signature separability and contingency matrices, and merging signatures. The analyst may utilize these tools, but they will not be used in this example.

14. When finished, save the work in the **Signature Editor** by clicking ***File/Save As*** from the menu bar. Choose a name and directory for the file and click ***OK***. The file will be saved with an *.sig* extension.

15. An output image needs to be created in order to view the image with the colors specified in the signature (*.sig*) file. Select ***Classify/Supervised*** from the **Signature Editor** menu bar. The **Supervised Classification** window will appear (Figure 7-55).

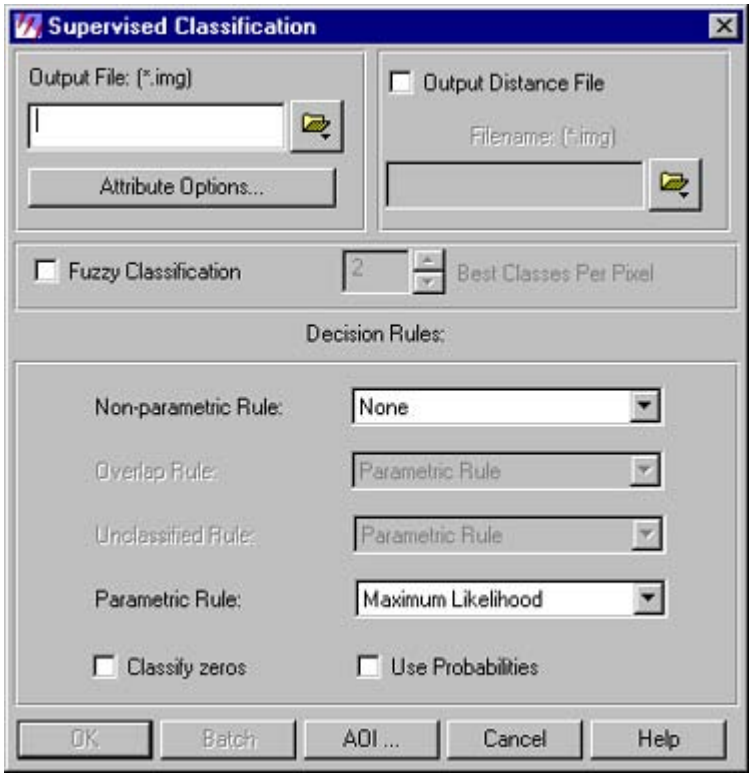


Figure 7-55 Supervised Classification Window

16. Choose a name and directory for the output file. The file will be saved with an *.img* extension. Click ***OK***. The **Classify—Performing Classification** window will appear (Figure 7-56).

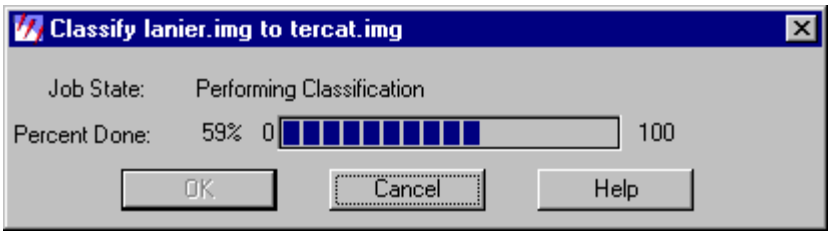


Figure 7-56 Classify—Performing Classification Window

17. Processing will take several minutes. When finished, click ***OK***. The supervised classification has been completed.

18. Open another viewer by clicking the ***Viewer*** icon ( ) on the Imagine icon panel to view the classified output image. The **Viewer #2** window will appear.

19. Click the ***Open Layer*** icon ( ) from the **Viewer #2** window, navigate to the output file, and click ***OK***. The classified output image will appear in the **Viewer #2** window, as shown in Figure 7-57.

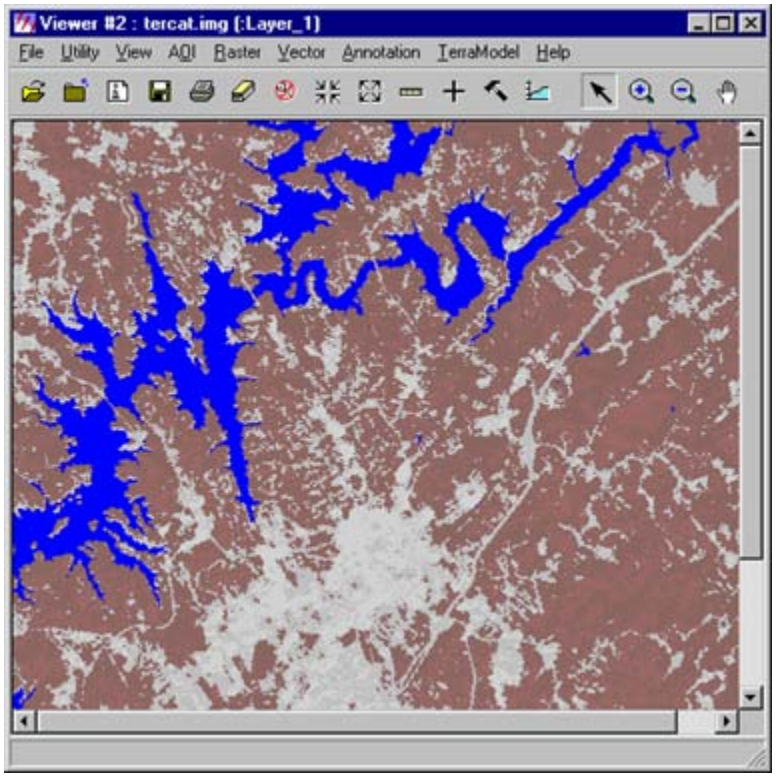


Figure 7-57 Viewer #2 Window Showing Image Classified

The images in **Viewer #1** and **Viewer #2** can be compared and used for analysis. The classification process is iterative, so the analyst may have to repeat the terrain classification process several times. The analyst can add, delete, and/or modify signatures and re-classify the image. Output from the TERCAT process is an Imagine raster *.img*

file. In order to use the DTSS Data Query function with this data, it must be converted to an ArcInfo vector format (Section 7.1.3.4). For more detailed information on TERCAT (Terrain Categorization), or image classification, refer to Imagine's online Help or printed documentation.

7.1.3.2 Sub-Pixel Classifier

The Imagine Sub-Pixel Classifier is an advanced spectral classifier designed to identify objects or materials of interest that occupy a fraction of a pixel, or to discriminate between spectrally similar materials. It is capable of classifying materials contributing as little as 20% of a pixel's reflectance value, allowing users to exploit remotely sensed imagery to find specific materials in complex environments.

Output from the Sub-Pixel Classifier is an Imagine raster *.img* file. To use the DTSS Data Query function with this data, it must be converted to an ArcInfo vector format (Section 7.1.3.4). For more information on the Sub-Pixel Classifier, refer to the online Help or to the vendor's printed documentation.

7.1.3.3 Expert Classifier

The Imagine Expert Classification module provides a rules-based approach to multispectral image classification, post-classification refinement, and GIS modeling. It is composed of two parts: the Knowledge Engineer and the Knowledge Classifier. The Knowledge Engineer provides the interface for an expert with first-hand knowledge of the data and the application to identify the variables, rules, and output classes of interest, and to create the hierarchical decision tree. The Knowledge Classifier provides an interface for a non-expert to apply the knowledge base and create the output classification.

Output from the Expert Classifier is an Imagine raster *.img* file. To use the DTSS Data Query function with this data, it must be converted to an ArcInfo vector format (Section 7.1.3.4). For more information on the Expert Classifier, refer the online Help or to the vendor's printed documentation.

7.1.3.4 Using Imagine Feature Data in ArcMap

Once the analyst has performed an image classification in Imagine, the output *.img* file can be used in ArcMap as a raster background, or it can be converted to an ArcInfo coverage using the Imagine **Raster to Vector** command, documented in Section 6.1.2, *Raster-to-Vector Conversion*. The coverage can be used directly in ArcMap, or it can be converted to a geodatabase using the steps outlined in Section 6.1.1.1, *ArcToolbox Data Conversions*.

7.1.3.5 Stereo Analyst

Stereo Analyst is a software module that can be used for collecting, interpreting, and visualizing both 2-D and 3-D data from a variety of sources, without having to create a digital terrain model. The software allows users to perform 3-D feature extraction such as directly measuring the height of a tree, collecting a 3-D model of a building, delineating (in 3-D) a highway along a mountainside, or interpreting the topography associated with a drainage pattern while defining a stream. Stereo Analyst also allows the user to transform existing 2-D feature data into 3-D data and to verify the accuracy of feature data using digital stereo models.

Output from Stereo Analyst is an ESRI shapefile. For more information on creating 3-D vectors with Stereo Analyst, refer to the vender's online Help or printed documentation.

Feature extraction within Stereo Analyst is accomplished with a Stereo Analyst Feature Project. The feature projects are created first by opening a stereo model. Imagine provides default feature categories and features classes, but it also provides tools to allow the user to create custom categories and features. To update a feature from an ArcInfo geodatabase, the feature must be exported from the geodatabase as an ArcInfo shapefile. To create data from scratch, export an empty shapefile from the geodatabase. The feature can then be imported into the feature project and categorized appropriately by the analyst. Use the following procedures for data creation/update with Imagine Stereo Analyst, using data from an ArcInfo geodatabase.

1. In ArcCatalog, select a geodatabase.
2. Right click on a feature class to export.
3. Select ***Export/Geodatabase To Shapefile*** from the context menu.
4. Enter the input feature class and the output shapefile, and then click ***OK***. This creates a shapefile from the feature class.
5. Start Stereo Analyst.
6. Select the **Open Folder** button.
7. Navigate to an OrthoBASE Block (*.blk*) file.
8. Once the stereo model is opened, select ***File/New/Stereo Analyst Feature Project***.
9. Enter the name for the new Stereo Analyst Feature Project and select ***OK***.
10. Select ***Feature/Import Features***.

11. Change the "File Type" field to **Shapefile** (*.shp*).

12. Navigate to the desired shapefile for import, and click ***OK***.

13. Import using a constant 'z' value. Select ***OK***.

14. In the **Edit Class Properties** window, select the **General** tab. In the "Category" field, select the desired category of the new feature class, or type the name of the new category where the shapefile (feature class) will be entered.

15. Additional features can be imported into the new category.

16. Once the feature classes are selected, the icons appear to the left of the stereo display.

17. To digitize, select (highlight) the icon of the desired feature.

18. Use the left mouse button to digitize points, lines, or polygons.

19. To add feature attributes, select the "**…**" button to the right of the feature icon.

20. Enter the desired attributes into the feature attribute table.

21. Once the feature extraction is complete, select ***Feature/Export Features***.

22. Change the file type to Shapefile (.shp). This writes each feature class in the project out to separate shapefiles.

23. Select the destination directory for the output shapefiles. Then designate each as a 2-D or 3-D shapefile. Once the shapefiles are created, they can then be imported back into the geodatabase.

24. Open ArcToolbox to import the shapefile into a geodatabase.

25. In ArcToolbox, select ***Conversion Tools***.

26. Select ***Import To Geodatabase***.

27. Double click ***Shapefile To Geodatabase Wizard***.

28. Follow the steps in the wizard to import the shapefiles into a geodatabase.

For more information on Stereo Analyst functionality, refer to Imagine's online Help or printed documentation. For more information on ArcToolbox conversions, refer to that program's online Help or printed documentation.

7.2 Digital Elevation Data

ERDAS Imagine provides two very powerful software packages to generate digital elevation data: 1) the Imagine Interferometric Synthetic Aperture Radar (IFSAR) Digital Elevation Model (DEM) module of the Imagine Radar Mapping Suite, designed to create DEMs from radar interferometric pairs, and 2) the Imagine Stereo Synthetic Aperture Radar (SAR) DEM, designed to create DEMs from synthetic aperture radar.

7.2.1 IFSAR DEM

Imagine IFSAR DEM uses interferometry to generate accurate DEMs. Interferometry is the method of subtracting the distance of one radar image from another to derive height information. If two raw radar images are available for the same area, but from slightly different vantage points, the distance of one image can be subtracted from the distance of the other to produce a distance difference. From this difference and the orbit information, the height of every pixel can be calculated. The IFSAR DEM module was designed to generate this information.

The DEM generation process is divided into eight "Process Steps" listed along the left side of the dialog window. The analyst works through these steps (some are optional) to create a DEM. This section shows how to start the DEM generation process, identifies the "Process Steps," and provides directions to use Imagine's online Help functions. The following example shows how to start generating a DEM.

1. With Imagine open on the desktop, click the ***Radar*** icon () on the Imagine icon panel. The **Radar** window will appear, as shown in Figure 7-58.

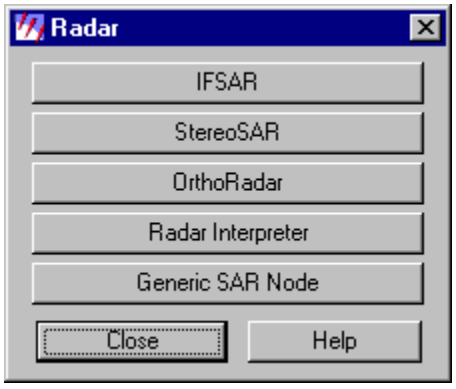


Figure 7-58 Radar Window

2. Click the ***IFSAR*** button in the **Radar** window. The **IFSAR Project Selector** window will appear (Figure 7-59).

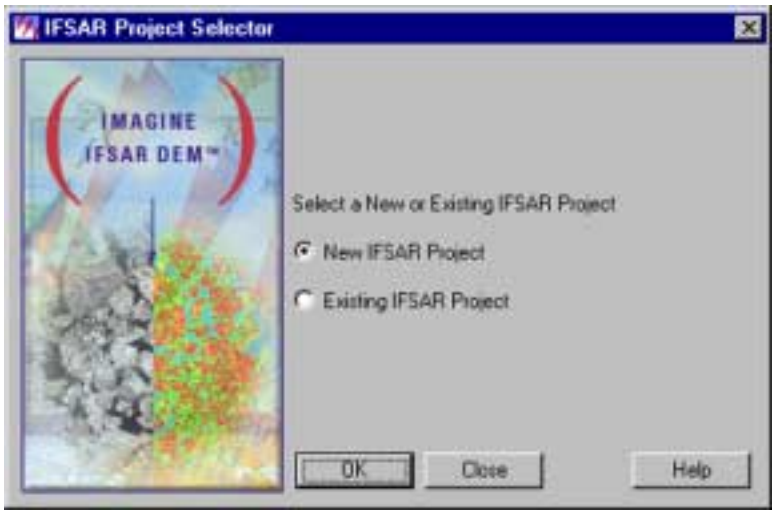


Figure 7-59 IFSAR Project Selector Window

3. The default option setting is for a **New IFSAR Project**. Leave this setting, and click ***OK*** to start a new IFSAR project. The **Open New IFSAR Project** window appears (Figure 7-60).

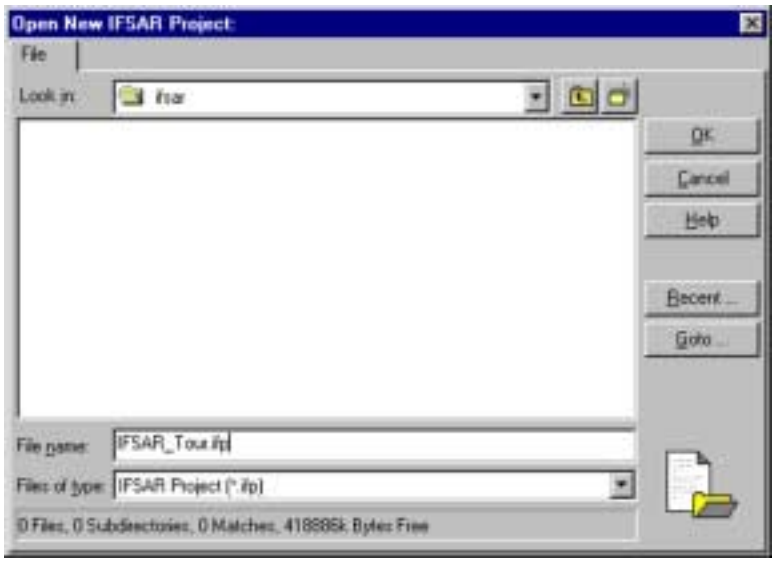


Figure 7-60 Open New IFSAR Project Window

4. Navigate to the appropriate folder and type the name of the new Imagine IFSAR DEM project in the "File name" field, and then click ***OK***. The **IFSAR—Input** window will appear (Figure 7-61).

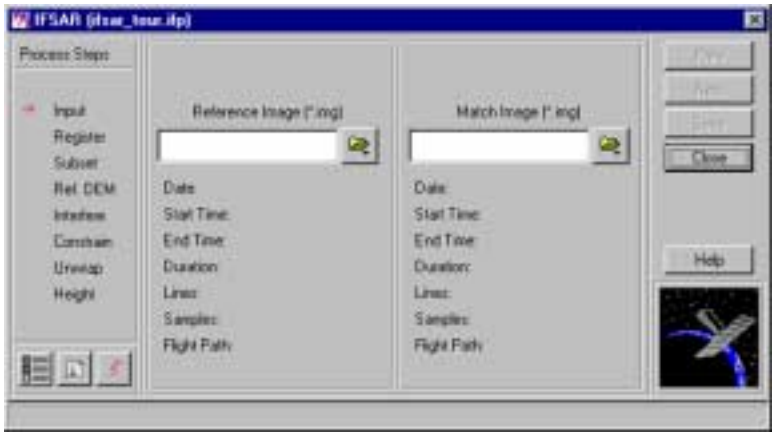


Figure 7-61 IFSAR—Input Window

5. Click the ***Options*** icon ( ) located in the lower left corner of the **IFSAR—Input** window. The **IFSAR Options** window will appear (Figure 7-62).

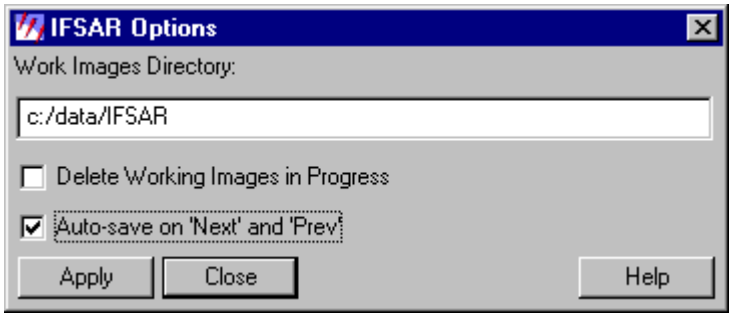


Figure 7-62 IFSAR Options Window

NOTE

The IFSAR DEM module automatically saves the current project when the user clicks **Next**.

6. The **IFSAR Options** window specifies the directory where work images are saved. If any changes are made in this window, click ***Apply***. Click ***Close*** to return to the **IFSAR—Input** window.

7. Select the images to use as the “Reference Image” and “Match Image” in the **IFSAR—Input** window by clicking the ***Open*** icon ( ) for each item and navigating to the appropriate image. The **IFSAR—Input** window will appear as seen in Figure 7-63.

NOTE

The IFSAR Project Selector has automatic checks to achieve the best possible results. If the geometry of the images is not optimal, a ***Warning*** *window appears. For best results, the Reference image must be closer to the*

*target area on the ground. Click **OK** in the **Warning** window to assign the correct Reference and Match designations.*

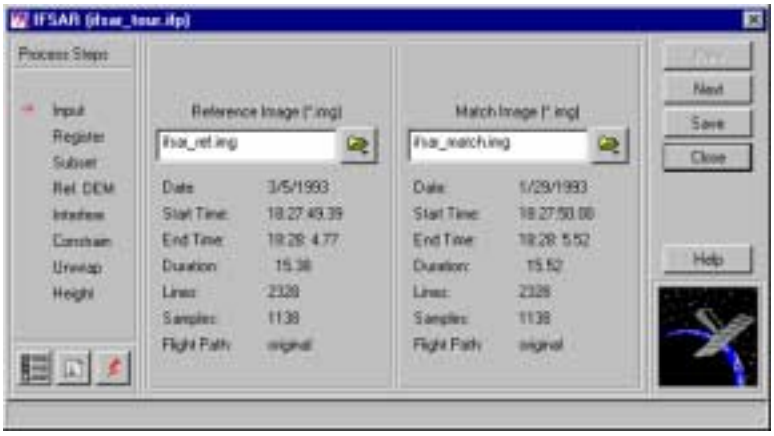


Figure 7-63 IFSAR—Input Window

The Imagine **IFSAR** DEM main window has "Process Steps" listed along the left side that the analyst follows to create a DEM. Click ***Next*** to move to the next step. As a step is in progress, a red arrow appears to its left. After a step is completed and executed, it is indicated with a blue check mark. Not all of the "Process Steps" have to be executed. The user can proceed to the next step instead. Refer to Table 7-3 for a listing of the "Process Steps" and their descriptions.

Table 7-3 IFSAR DEM Process Step Descriptions

Process Step	Description
Input	Selects the reference and match images to use to generate the DEM. Has built-in checks that ensure the best possible geometry with which to create the DEM.
Register	Collects a point that is visible in both the reference and the match image so that the images can be registered. The user has access to the IFSAR **Pixel Register** tool and the IFSAR **Subpixel Register** tool from this step. The user can also correct the flight paths of the sensors.
Subset	Accesses the IFSAR **Subset** tool. Subsetting images is optional. Allows the user to limit DEM output to a portion of the image. User chooses subset coordinates in the Reference image only; Match image coordinates update accordingly.
Ref. DEM	Gives the user the option of inputting a DEM to help create the new DEM. An input DEM allows Imagine IFSAR DEM to calculate local slopes on a pixel-by-pixel basis instead of using a constant slope.
Interfere	Calculates the slope needed to generate phase, wrapped, and correlation images. Applies a constant slope to the entire image.
Constrain	Allows user to identify portions of an image to unwrap last.

Table 7-3 IFSAR DEM Process Step Descriptions (Cont'd)

Process Step	Description
Unwrap	Specifies the correlation cutoff and threshold values IFSAR considers when it unwraps the phase image.
Height	Gives the output DEM a name and specifies its spacing (cell size). Additionally, the user can correct the flight paths of the sensors in this step.

For more information on any of the steps in the IFSAR DEM module, click the ***Help*** button located in the bottom right corner of the window to access Imagine's online Help, or refer to Chapter 5 of the *Imagine Radar Mapping Suite Tour Guide*.

7.2.2 StereoSAR DEM

Imagine StereoSAR DEM uses multiple SAR images to generate accurate DEMs. The SAR device is a radar sensor mounted on satellites, aircraft, and the NASA Space Shuttle, and it uses a fixed antenna to create a synthetic aperture. The sensor transmits and receives signals as it is moving. The signals received over a time interval are combined to create an image. If two raw radar images are available for the same area, but from slightly different vantage points, the distance of one image can be subtracted from the distance of the other to produce a distance difference. The Imagine Stereo SAR DEM registers the images, calculates stereo triangulation geometry using built-in algorithms, and then applies processing options and parameters, ultimately generating a DEM.

The Stereo SAR DEM generation process is divided into nine "Process Steps," which are listed along the left side of the window. The analyst works through these steps to create a DEM. This section shows how to start the DEM generation process, identifies the "Process Steps," and provides directions to use Imagine's online Help functions. The following example shows how to start generating a DEM.

1. With Imagine open on the desktop, click the ***Radar*** icon () on the Imagine icon panel. The **Radar** window will appear, as shown in Figure 7-64.

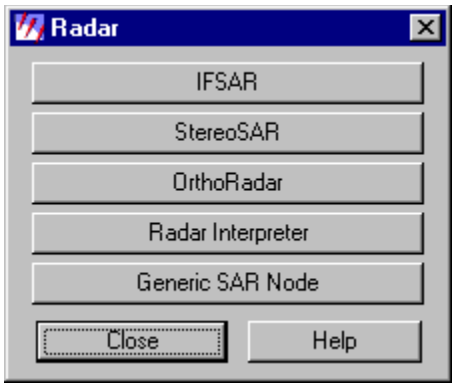


Figure 7-64 Radar Window

2. Click the ***StereoSAR*** button in the **Radar** window. The **StereoSAR Project Selector** window will appear (Figure 7-65).



Figure 7-65 StereoSAR Project Selector Window

3. The default option setting is for a **New StereoSAR Project**. Leave this setting, and click ***OK*** to start a new StereoSAR project. The **Open New StereoSAR Project** window appears (Figure 7-66).

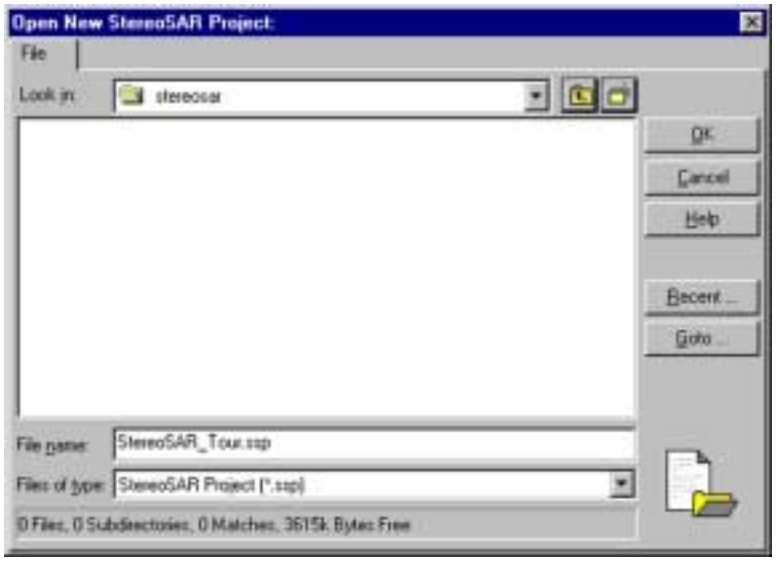


Figure 7-66 Open New StereoSAR Project Window

4. Navigate to the appropriate folder and type the name of the new Imagine StereoSAR DEM project in the "File name" field, and then click ***OK***. The **StereoSAR—Input** window will appear (Figure 7-67).

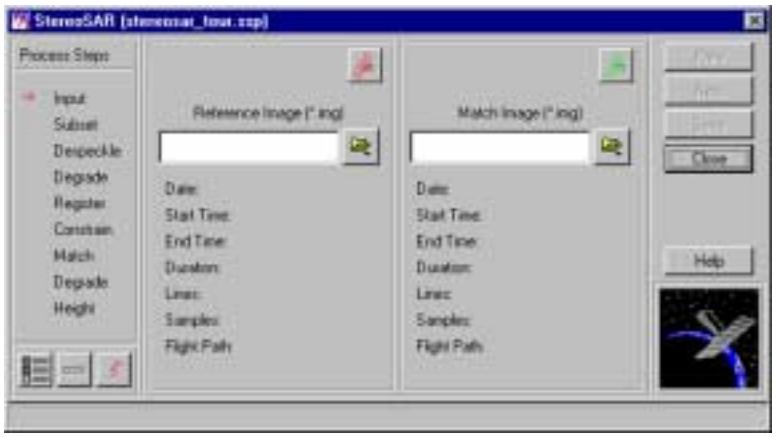


Figure 7-67 StereoSAR—Input Window

5. Click the ***Options*** icon (), located in the lower left corner of the **StereoSAR—Input** window. The **StereoSAR Options** window will appear (Figure 7-68).

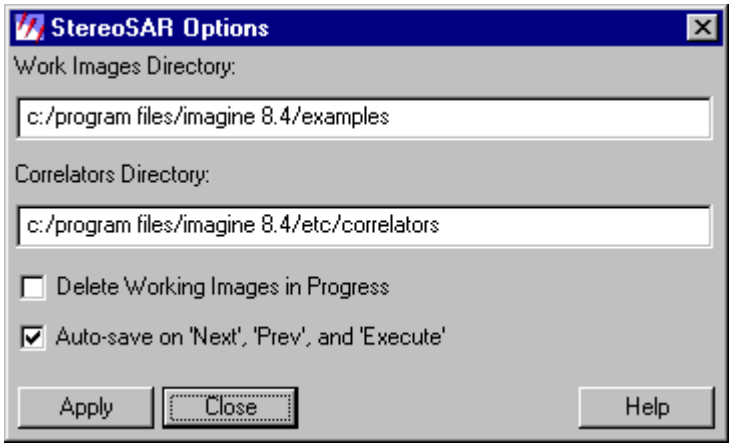


Figure 7-68 StereoSAR Options Window

NOTE

The StereoSAR DEM module automatically saves the current project when the user clicks **Next**.

6. The **StereoSAR Options** window specifies the directory where work images are saved. If any changes are made in this window, click ***Apply***. Click **Close** to return to the **StereoSAR—Input** window.

7. Select the images to use as the "Reference Image" and "Match Image" in the **StereoSAR—Input** window by clicking the ***Open*** icon ( ) for each item and navigating to the appropriate image. The **StereoSAR—Input** window will appear as seen in Figure 7-69.

NOTE

The StereoSAR Project Selector has automatic checks to achieve the best possible results. If the geometry of the images is not optimal, a ***Warning*** *window appears. For best results, the Reference image must be closer to the target area on the ground than the Match image. Click* **OK** *in the* ***Warning*** *window to assign the correct Reference and Match designations.*

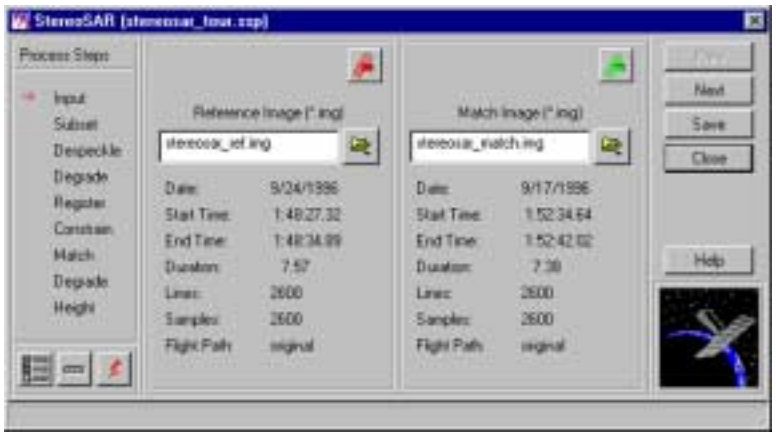


Figure 7-69 StereoSAR—Input Window

The Imagine **StereoSAR** DEM main window has "Process Steps" listed along the left side that the analyst follows to create a DEM. Click ***Next*** to move to the next step. As a step is in progress, a red arrow appears to its left. After a step is executed, it is indicated with a blue check mark. Not all "Process Steps" have to be executed. The user can proceed to the next step instead. Refer to Table 7-4 for a listing of the "Process Steps" and their descriptions.

Table 7-4 StereoSAR DEM Process Step Descriptions

Process Step	Description
Input	Selects the reference and match images to use to generate the DEM. Has built-in checks that ensure the best possible geometry with which to create the DEM.
Subset	Creates a subset of two images by entering the desired coordinates, or graphically by using the StereoSAR **Subset** tool. The user defines the regions of overlap needed to create the DEM. Subsetting images is optional.
Despeckle	Removes radar speckle noise by applying filters to the input images.
Degrade	First Degrade step. Changes the resolution of the output images. User can also rescale the images to unsigned 8-bit.
Register	Makes the match image agree with the reference image on a pixel-by-pixel basis.
Constrain	Limits an area defined with a complex polygon (instead of a rectangle) to using a specific correlator range.
Match	Calculates the shift, or parallax, for every pixel in the Match image. This process uses a correlator.
Degrade	Second Degrade step. Further increases or decreases the output images' resolutions. At this point, the user is working with parallax images, which already have the shift information necessary to create the DEM.
Height	Designates the name, area, and projection of the output DEM. Using the parallax information, StereoSAR DEM calculates the height of areas in the image.

For more information on any of the steps in the StereoSAR DEM module, click the ***Help*** button located in the bottom right corner of the window to access Imagine's online Help, or refer to Chapters 3 and 4 of the *Imagine Radar Mapping Suite Tour Guide.*

7.3 Metadata Editor

ArcCatalog allows the analyst to access the Metadata Editor to change and update information for various geographic datasets. Metadata related to data properties and documentation hints are automatically created by ArcCatalog. Some of the properties added to the metadata by ArcCatalog are best left unmodified, such as the data file size. However the analyst may wish to change other properties filled in by ArcCatalog. For most elements, text boxes are provided in which the analyst can type the appropriate information. When typing information for several elements on a tab, quickly move from one element to the next by pressing the ***[Tab]*** key.

A customized DTSS Metadata Editor function provides a dropdown list of predefined values for several elements to facilitate data tracking by the DTSS analyst. To get a description of an element, use the **What's This?** button (?) to see what information is expected for that item. When the analyst clicks ***OK***, the editor saves any changes in the metadata. All elements are stored using the eXtensible Markup Language (XML) tags defined by the Federal Geographic Data Committee (FGDC) standard and the ESRI profile. Use the following steps to access the DTSS Metadata Editor.

1. From the ArcCatalog menu bar, select ***Tools/Options***. The **Options** window will appear (Figure 7-70).

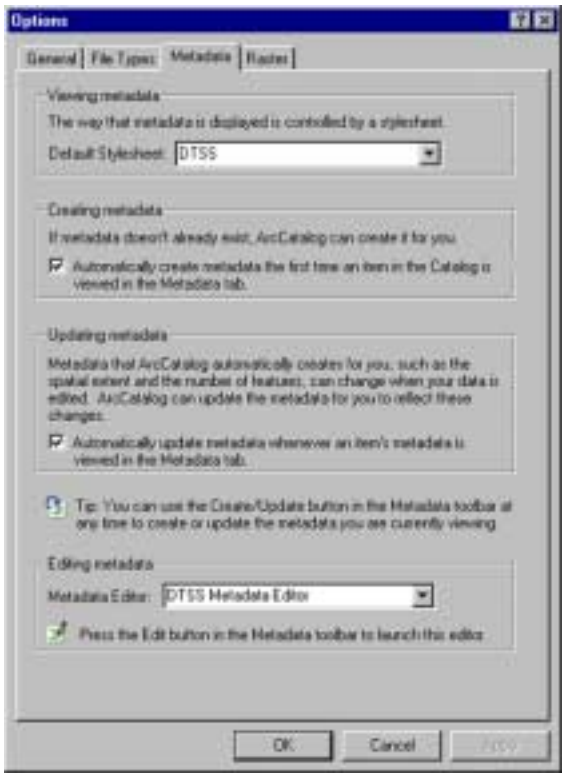


Figure 7-70 Options Window Showing Metadata Tab in ArcCatalog

2. Click the **Metadata** tab. Notice that the tab has labeled sections for settings to view, create, update, and edit metadata.

3. At the bottom of the window, in the "Editing metadata" section, click the "Metadata Editor" dropdown arrow, and select ***DTSS Metadata Editor***. Click ***OK***.

4. In the Catalog Tree View panel, click the desired item whose metadata needs to be edited.

5. Click the **Metadata** tab in the **ArcCatalog** window (Figure 7-71).

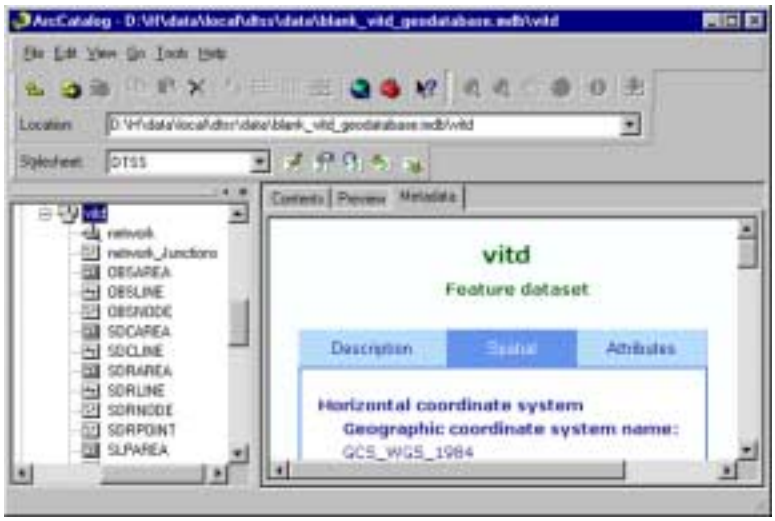


Figure 7-71 Metadata Tab and Toolbar in ArcCatalog

6. Select ***DTSS*** from the "Stylesheet" dropdown menu.

7. Click the ***Edit Metadata*** button ( ) on the **Metadata** toolbar. The **DTSS Metadata Editor** window appears (Figure 7-72).

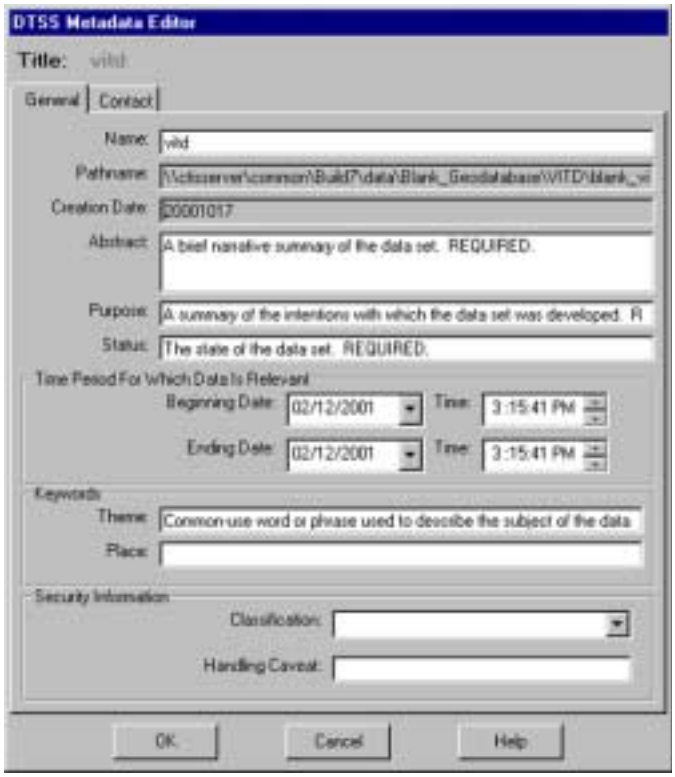


Figure 7-72 General Tab in DTSS Metadata Editor Window

8. The **General** tab shows as the default. It contains areas to input general information about the selected data, such as what it is, when it was created,

and what level of security is required. Click in the text box for the appropriate element and type the appropriate information, or click the dropdown arrow and select a value in the list. The "Pathname" and "Creation Date" fields contain predefined values for DTSS data.

9. Next, click the **Contact** tab (Figure 7-73). It contains areas to input information about the person who entered the metadata. Click the text box for the appropriate element and type the information, or click the dropdown arrow and select a value in the list. Clicking on the **Use My Contact Information** button will automatically update the required fields with the information stored in the DTSS Contact Information Editor, which is discussed in Section 7.4.

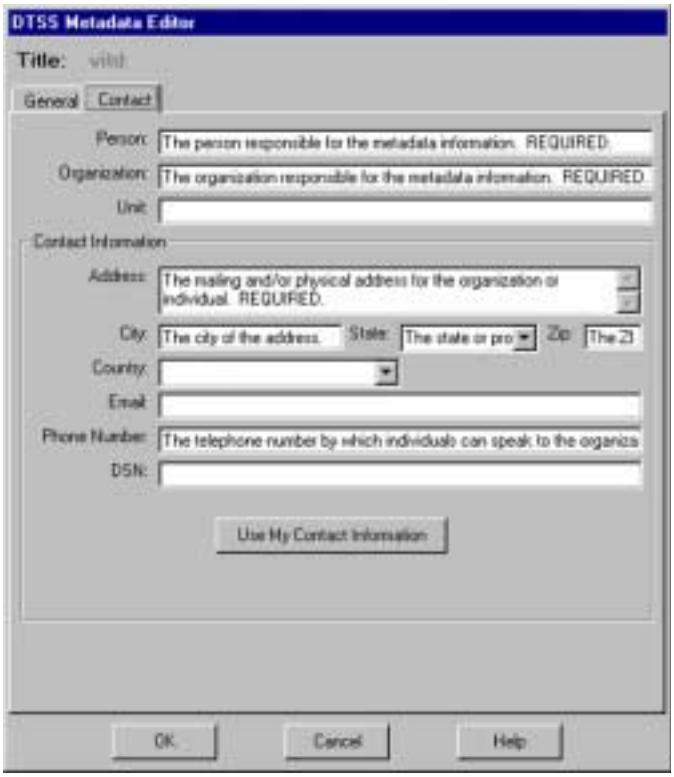


Figure 7-73 Contact Tab in DTSS Metadata Editor Window

10. Once all desired changes have been made, click ***OK*** to save changes to the metadata and exit the metadata editor.

For more information on using the Metadata Editor in ArcCatalog, refer to ArcCatalog's online Help or printed user documentation.

7.4 DTSS Contact Information Editor

When the DTSS analyst produces a TDA, the end product contains metadata information about the author and date. This metadata comes from information entered by the analyst

in the DTSS Contact Information Editor. To access the Contact Information Editor, choose ***DTSS/Utilities/Contact Information Editor*** from the ArcMap main menu. This information is auto-populated for data query and metadata. The **Contact Information** window appears, as shown in Figure 7-74.

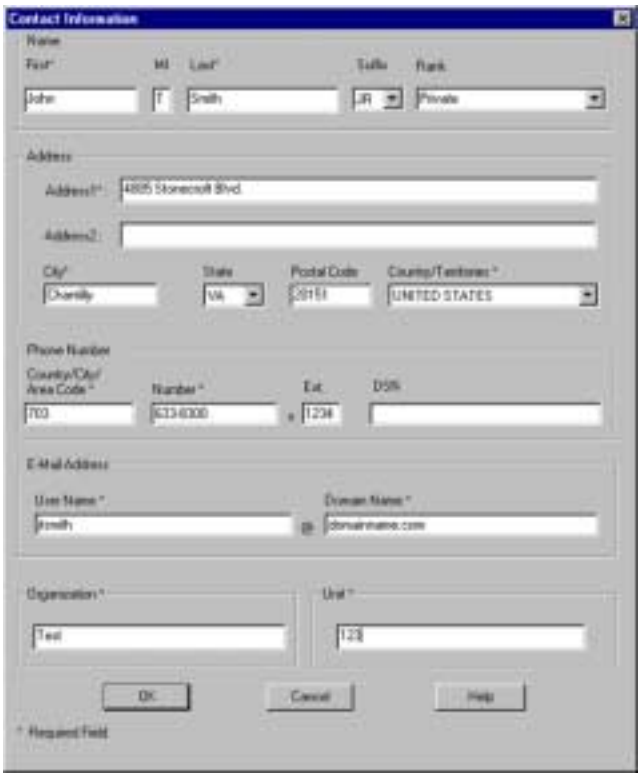


Figure 7-74 Contact Information Window

The analyst enters data in each field as needed. Note that fields with asterisks (*) are required. See Table 7-5 for a description of the field requirements in the DTSS Contact Information Editor.

Table 7-5 DTSS Contact Information Editor Field Requirements

Field	Required?	Notes
First Name	Yes	Cannot contain digits.
MI (Middle Initial)	No	Cannot contain digits.
Last Name	Yes	Cannot contain digits.
Suffix	No	Dropdown menu provided.
Rank	No	Dropdown menu provided.
Address 1	Yes	No restrictions.
Address 2	No	No restrictions.
City	Yes	Cannot contain digits.

Table 7-5 DTSS Contact Information Editor Field Descriptions (Cont'd)

Field	Required?	Notes
State	No	Dropdown menu provided.
Postal Code	No	Can only contain digits.
Country/Territories	Yes	Dropdown menu provided.
Country/City/Area Code	Yes	Cannot contain letters.
Phone Number	Yes	Cannot contain letters.
Extension	No	Cannot contain letters.
DSN	No	Cannot contain letters.
E-mail User Name	Yes	No restrictions.
E-mail Domain Name	Yes	No restrictions.
Organization	Yes	No restrictions.
Unit	Yes	No restrictions.

THIS PAGE INTENTIONALLY LEFT BLANK

Chapter 8

DATA EXPLOITATION—CUSTOM

8	**DATA EXPLOITATION—CUSTOM**	8-3
8.1	Mobility Overview	8-3
8.1.1	NRMM II Overview	8-3
8.1.1.1	Scenario Factors	8-5
8.1.2	NRMM II Products	8-5
8.1.2.1	Cross-Country Movement	8-5
8.1.2.2	On-Road Speed	8-6
8.1.2.3	Gap Crossing	8-6
8.1.3	User-Defined Parameters	8-7
8.1.4	Creating a Mobility TDA	8-8
8.1.5	NRMM II Output	8-14
8.1.5.1	Cross-Country Movement Factors	8-14
8.1.5.2	On-Road Speed Factors	8-15
8.1.5.3	Gap Crossing Factors	8-16
8.1.5.4	Accessing Original Data Values	8-17
8.1.5.5	Sample Output	8-18
8.2	Line of Sight Overview	8-20
8.2.1	Line of Sight Products	8-21
8.2.2	Line of Sight Parameters	8-21
8.2.2.1	Target Height	8-21
8.2.2.2	Target Altitude	8-22
8.2.2.3	Target Reference	8-22
8.2.2.4	Interpolation Method	8-22
8.2.2.5	Range Bands	8-23
8.2.2.6	Coordinate Reference	8-23
8.2.2.6.1	Latitude/Longitude (Lat/Lon)	8-23
8.2.2.6.2	Universal Transverse Mercator (UTM)	8-24
8.2.2.6.3	Military Grid Reference System (MGRS)	8-24
8.2.2.7	Observer Selection Method	8-25
8.2.2.8	Visibility Fan	8-25
8.2.2.9	Observer Height	8-25

8.2.2.10 LOS Mode 8-26
8.2.2.11 LOS Range 8-26
8.2.2.12 Observer Reference 8-26
8.2.2.13 Sample Spacing 8-26
8.2.3 Visibility Plot 8-27
8.2.3.1 Creating a Visibility Plot 8-27
8.2.3.2 Visibility Plot Output 8-38
8.2.3.2.1 Best and Worst Case Graph 8-38
8.2.3.2.2 Visible, Partially Visible, and Masked Areas 8-39
8.2.3.2.3 Fused and Combination Products 8-39
8.2.4 Target Profile 8-40
8.2.4.1 Creating a Target Profile 8-40
8.2.4.2 Target Profile Output 8-51
8.3 Data Query Overview 8-52
8.3.1 Data Query Structure 8-53
8.3.2 Data Query Wizard 8-55
8.3.2.1 Creating a New Query 8-55
8.3.2.2 Loading and Modifying Existing Queries 8-63
8.3.2.3 Reassigning Data When Loading Queries 8-69
8.3.2.4 Data Query Output 8-72
8.3.3 Query Manager 8-72
8.3.3.1 Searching Queries 8-74
8.3.3.2 Exporting Queries 8-76
8.3.3.2.1 Exporting to Drive or Directory 8-76
8.3.3.2.2 Exporting to E-mail 8-77
8.3.3.3 Importing Queries 8-78
8.3.3.3.1 Importing From Drive or Directory 8-78
8.3.3.3.2 Importing From E-mail 8-79
8.3.4 Creating Queries From Multiple DTSS Products 8-80
8.4 Slope Generator 8-80

8 DATA EXPLOITATION—CUSTOM

The DTSS software offers custom tools to help the analyst produce Tactical Decision Aids (TDAs) and map products. The TDAs discussed in this chapter include Mobility, Line of Sight (Intervisibility), Data Query, and Slope Generator.

NOTE

When running any DTSS TDA, the analyst may experience a Run Time error if trying to overwrite an existing .mdb *file in the same ArcMap session. ArcMap assumes that a saved geodatabase (*.mdb *file) is still active if the program is not closed. It is recommended that the user either save the new TDA with a new filename or close ArcMap before running a new TDA.*

The DTSS TDAs may show many layers when displayed in ArcMap. These layers can be turned on and off to view specific information by selecting the check box next to the layer name in the Table of Contents panel. To automatically have all layers turned off when adding new data to ArcMap, select ***Tools/Options*** from the ArcMap menu bar and select the **Application** tab from the **Options** window that appears. Click in the check box next to "Make newly added layers visible by default" to change the default for displaying layers.

8.1 Mobility Overview

The DTSS mobility wizard implements the North Atlantic Treaty Organization (NATO) Reference Mobility Model II (NRMM II), developed by the U.S. Army Engineer Research and Development Center, Waterways Experiment Station (WES). An overview of NRMM II and user-defined input to the model will be discussed.

8.1.1 NRMM II Overview

The NRMM II is a collection of algorithms designed to predict the operating capability of a given vehicle in known terrain. The primary performance prediction of this model is the vehicle's effective maximum speed in a terrain unit. NRMM II consists of three primary modules: a vehicle dynamics module, an obstacle-crossing performance module, and a primary prediction module. The primary prediction module consists of three sub-modules: cross-country prediction, on-road prediction, and gap crossing prediction. These modules use a combination of terrain, scenario, and vehicle factors to determine the maximum possible vehicle speed for all input terrain units. Figure 8-1 shows a graphical representation of the NRMM II mobility model.

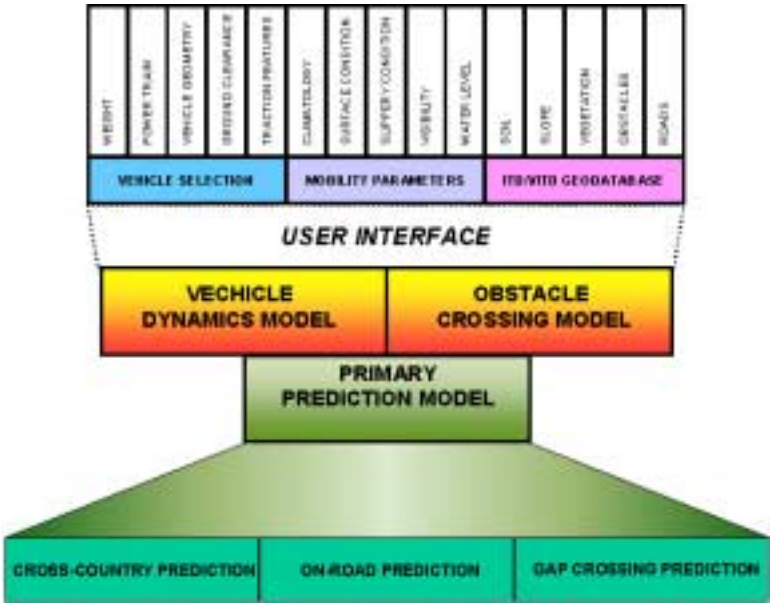


Figure 8-1 Three Primary Modules of NRMM II Mobility Model

Terrain factors such as soil strength, slope, and vegetation density impart a movement resistance to the selected vehicle, which, in turn, influences its speed. Scenario data consists of generic vehicle and terrain data that are independent of a specific terrain or vehicle and remain constant for any given prediction. Examples of such data include a driver's reaction time, weather and climatic conditions, vegetation override strategy, etc. The vehicle data describes various physical aspects of the selected vehicle in engineering terms such as power train, surface traction elements, sizes, weights, geometry, etc. The input preprocessors then use analytical equations and statistical techniques to infer prediction parameters that are not specifically provided in the input data. These include soil strength, wetness index, visibility, obstacle geometry, vegetation stem size and spacing, and surface roughness.

All of the previously mentioned factors will serve to prevent a given vehicle from reaching its maximum speed potential. If these factors are so predominate that a given vehicle cannot attain motion, a NOGO is determined, and the most predominate and controlling factor is output in a REASON code. If the vehicle can overcome the terrain, then a GO speed is computed by determining the controlling influences of resistive forces, obstacle and vegetation avoidance, visibility, surface roughness, and tire deflection. This speed is also assigned a REASON code to explain the limiting influence(s). More details regarding the development and use of NRMM II can be found in the Technical Report "NATO REFERENCE MOBILITY MODEL EDITION II, NRMM II USER'S GUIDE." Distribution of this report is limited to U.S. government

agencies and their contractors and is available from the Defense Technical Information Center for a nominal charge (order number ADB170301).

8.1.1.1 Scenario Factors

NRMM II input includes scenario factors that remain constant throughout the course of a prediction calculation. For instance, a default value is assigned to represent the maximum acceleration that a driver can withstand when negotiating obstalces or overriding vegetation (pushing vegetation down/aside with the vehicle). Another example is the visibility distance, which is used to calculate a maximum vehicle speed controlled by the driver's ability to safely brake the vehicle. NRMM II uses this distance to calculate the reaction time a driver needs in situations of limited visibility.

Another type of scenario factor used by NRMM II is related to worldwide climatic data. The DTSS version of NRMM II separates the world into six climatic zones: tropical rainy, dry, humid mesothermal, humid microthermal, polar, and undifferentiated highlands. The zonal boundaries are defined by those found in Goode's *World Atlas*. Based upon the user-prescribed area of analysis, NRMM II assigns constant climate parameters to an area as determined by the specific climatic zone(s) for that area.

The climatic zone, along with the user-selected month (time of year for the analysis), is used to infer driver visibility on roads and cross-country based on vegetation descriptors extracted from the terrain data and general atmospheric conditions for the area of analysis. This visibility calculation depends on scenario and terrain and varies from the user-defined value for visibility, which is subjective and can be imposed to restrict vehicle speed. Climatic zone and month of the year are also used to determine soil moisture content based on long-term monthly rainfall statistics. Moisture content directly correlates with soil strength.

8.1.2 NRMM II Products

Three mobility products can be generated using the DTSS NRMM II mobility wizard: cross-country movement (CCM), on-road speed, and gap crossing analysis.

8.1.2.1 Cross-Country Movement

Cross-Country Movement is a product used to demonstrate the off-road speeds for a vehicle as determined from terrain, scenario, and vehicle data. Several sub-modules are used to determine the operating conditions relevant to computing off-road speeds. These sub-modules include surface traction and resistance, slope, vehicle dynamics, obstacle override, acceleration and obstacles, and vegetation override. A description of these sub-modules can be found in the NRMM II user's guide identified in Section 8.1.1.

Each terrain unit within the area of analysis is assigned up slope, down slope, cross slope and average slope speeds which can be thought of as being the minimum predicted speed from all the sub-modules.

8.1.2.2 On-Road Speed

On-road speeds for a given vehicle are determined from weather data, surface conditions, slope, and transportation feature characteristics. Many of the same sub-modules used for CCM are used to determine on-road speed. Because there are no obstacles or vegetation to consider for on-road predictions, the sub-modules involving obstacle and vegetation override are bypassed. However two additional sub-modules are used: surface traction and curvature.

NOTE

In DTSS, a slope of 0 is used for ALL road segments.

The final on-road speed predictions are determined by calculating the speed-limiting effects of surface roughness, curvature, and visibility on the maximum speed potential of the vehicle when operated on roads.

NOTE

On-road speed values are not calculated for railroads or bridges because the input data, ITD or VITD, does not have sufficient attribution to make a reliable prediction.

8.1.2.3 Gap Crossing

The NRMM II gap crossing module determines the speed and time for a vehicle to cross drainage features and, if the feature can be crossed, whether the vehicle was required to span, ford, or swim the drainage feature. Perhaps the most important aspect in calculating whether a vehicle can negotiate drainage features is stream geometry. Because this information is not captured in enough detail in the terrain data, it is not possible to provide a reliable gap crossing prediction using NRMM II.

NOTE

CAUTION: If a gap crossing prediction is required, it is recommended that output from NRMM II be replaced or supplemented with a manual analysis.

8.1.3 User-Defined Parameters

In the DTSS Mobility Wizard that follows (in Section 8.1.4), the analyst must choose certain options for environmental conditions. These options are outlined below. The analyst may enter the following mobility parameters.

- **Surface Condition—**Select **Dry**, **Average**, or **Wet**—These options are based on an assessment of the current state of the soil. **Dry** describes a condition of soil moisture and associated soil strength found during the driest consecutive 30 day period of an average rainfall year. **Wet** describes a condition of soil moisture and associated soil strength found during the wettest consecutive 30-day period of an average rainfall year. **Average** describes a condition of soil moisture that is neither Wet or Dry.
- **Slippery Condition—**Select **Normal** or **Slippery**—**Slippery** implies that it is currently raining or has rained within the last six hours, and there is standing water on the surface.
- **Water Level—**Select **Low**, **Medium**, or **High**—This option is set to **Low**, by default, but the user can override it by selecting a different level. User selection should be based on an assessment of the type of weather and climate conditions that are suitable for the analysis. For example, if the user has chosen to calculate speed predictions during March or April (typically transition months with higher rainfall and runoff), the water level would be set to **High**.
- **Visibility—**in meters (m). Driver visibility is the maximum distance the driver can see in front of the vehicle (default is 100 meters). Fog, smoke, haze, precipitation, and darkness are examples of scenario factors that affect driver visibility.
- **Historical Rain Information—**Choose a month to specify the time period for historical rainfall statistics. Soil moisture content directly affects soil strength and, thus, vehicle mobility. This is a subjective field and is determined by user requirements for mobility assessment.
- **Vehicle Selection—**Select the vehicle to use. Multiple vehicles can be selected for the same mobility product. Vehicles other than the ones currently provided cannot be added using the DTSS software.

Table 8-1 gives descriptions of the vehicles available in the DTSS Mobility Wizard.

Table 8-1 DTSS Mobility Wizard Vehicle Descriptions

Vehicle	Description
brdm2	BRDM-2 4X4 (Russian)
btr-60pb	BTR-60PB, (Russian) APC (Armored Personnel Carrier), 8X8, Amphibious
cucv	CUCV M1008 Cargo Truck, 4X4

Table 8-1 DTSS Mobility Wizard Vehicle Descriptions (Cont'd)

Vehicle	Description
hmmwv	HMMWV, M998, Cargo/Troop Carrier, 4X4, 1-1/4 Ton, With Out Winch (Radial Tires)
lav25	LAV25, 8X8 Light Armor Vehicle
m1075	M1075 OSHPLS CTI (16 1/2 Ton) 10X10 STD With Winch; With Out Crane
m113a1	M113A1 APC (Armored Personnel Carrier)
m1a1	M1A1 Abrams Tank (WES Standard)
m2a1	M2A1 Bradley
m35a2	M35A2, Modified, 6X6 Cargo Truck
m551a1	M551A1
m60a3	M60A3
m923	M923, 6X6, 5 Ton Truck
m977	M977 (HEMTT) 10 Ton, Cargo Truck, 8X8
m978	M978 (HEMTT) 10 Ton Fuel Truck, 8X8
t55	T55, Russian Tank
t59	T59, (Type 59) Chinese Medium Tank
t62	T62, Combat Tank, Russian
t72	T72 MBT (Main Battle Tank), Russian
t80	T80, MBT (Main Battle Tank), Russian

NOTE

If the vehicle "hmmwv" is used to represent the DTSS-L, or the vehicle "m923" is used to represent the DTSS-H, be sure to account for the additional weight of the shelter, equipment, and anything the vehicle may be towing when assessing the mobility of the system(s).

8.1.4 Creating a Mobility TDA

The DTSS software creates the NRMM-II mobility geodatabase using ITD or VITD datasets as input. The DTSS Mobility TDA feeds data and parameters to the NRMM-II models through an Application Programmer's Interface (API).

The results for CCM, On-Road Speed, and Gap Crossing are combined into a single geodatabase, consisting of both the results and the model input. The DTSS Mobility TDA receives the results from the model and displays them graphically on the screen, updating the metadata in the process.

To create a Mobility TDA in DTSS, follow the procedure below.

1. With ArcMap open on the desktop, pull down the **DTSS** menu and select ***Mobility/NRMM II***. The **DTSS—NATO Reference Mobility Model II** window will appear (Figure 8-2).



Figure 8-2 DTSS—NATO Reference Mobility Model II Window

NOTE

*To skip the **Mobility Wizard Introduction** window in the future, click the box next to the words "Don't show this window in the future" located in the bottom left portion of the window.*

2. Click ***Next*** to continue. The **DTSS—NATO Reference Mobility Model II—Select Data** window will appear, showing fields for input and output geodatabase locations (Figure 8-3).

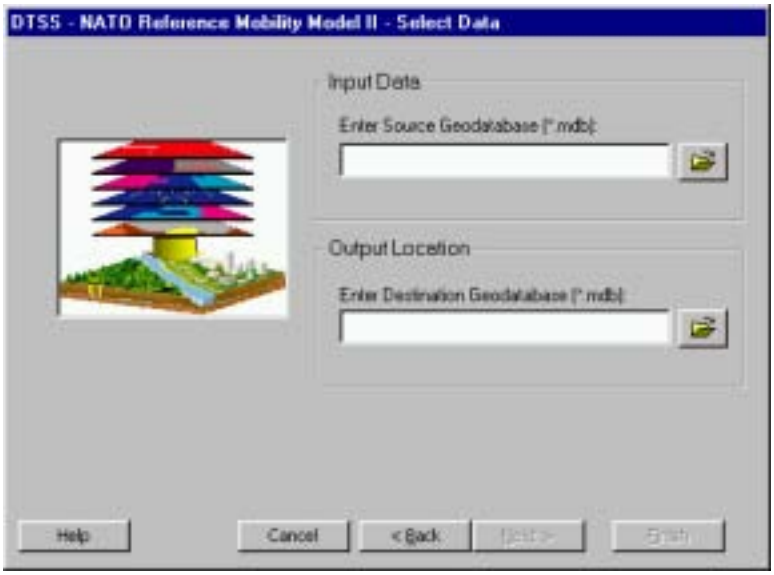


Figure 8-3 DTSS—NATO Reference Mobility Model II—Select Data Window

3. In the "Enter Source Geodatabase (*.mdb)" field, type the name and location of the geodatabase, or click the ***Open Folder*** button ( ) to access the **Select an existing geodatabase** window, shown in Figure 8-4.



Figure 8-4 Select an Existing Geodatabase Window

4. Navigate to the appropriate geodatabase file and click ***Open*** to continue. This returns to the **DTSS—NATO Reference Mobility Model II—Select Data** window (Figure 8-5). Notice the selected geodatabase now appears in the "Enter Source Geodatabase (*.mdb)" and "Enter Destination Geodatabase (*.mdb)" fields.

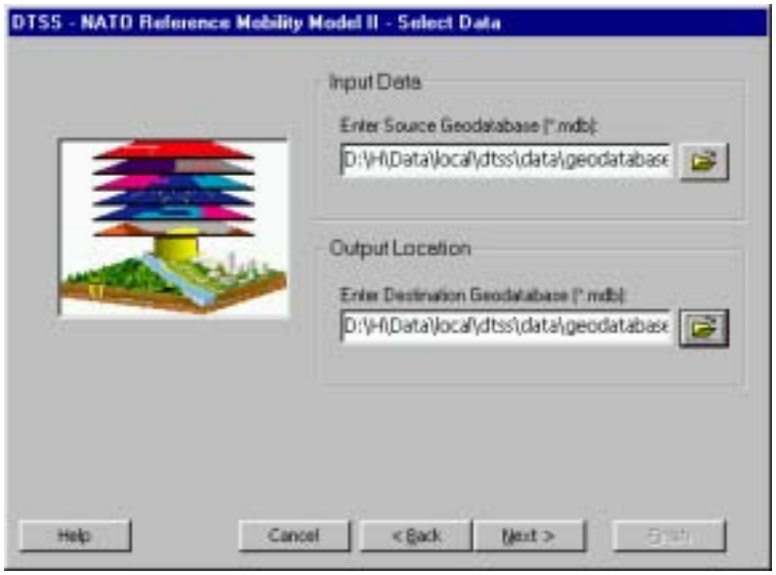


Figure 8-5 DTSS—NATO Reference Mobility Model II—Select Data Window

5. The Mobility Wizard automatically adds "-mobility.mdb" to the name of the output location file. To save the mobility product to another output location, type the name and location for the geodatabase in the "Enter Destination Geodatabase (*.mdb)" field, or click the ***Open File*** button ( ) to access the **Select new geodatabase location** window, shown in Figure 8-6.



Figure 8-6 Select New Geodatabase Location Window

6. Navigate to the appropriate geodatabase file, or type in the new location and click ***Save*** to continue. This returns to the **DTSS—NATO Reference Mobility Model II—Select Data** window. The newly selected geodatabase now appears in the "Enter Destination Geodatabase (*.mdb)" field.

7. Click ***Next*** to continue. The **DTSS—NATO Reference Mobility Model II—Select Parameter** window will appear, showing mobility parameters (Figure 8-7).

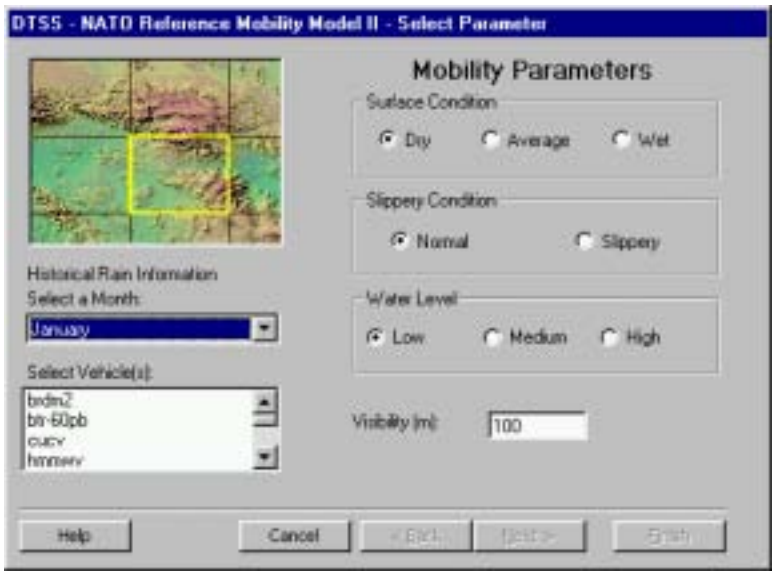


Figure 8-7 DTSS—NATO Reference Mobility Model II—Select Parameter Window

8. Select the appropriate mobility parameters. For more information on any of the parameters, see Section 8.1.3. Once all selections have been made, click ***Next***. The **DTSS—NATO Reference Mobility Model II—Summary** window will appear, showing a summary of the selected items (Figure 8-8).

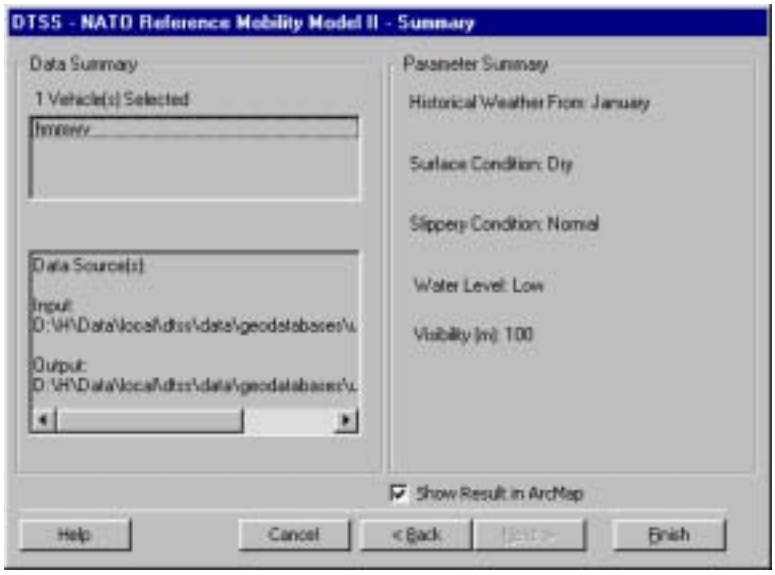


Figure 8-8 DTSS—NATO Reference Mobility Model II—Summary Window

9. The left-hand box is titled “Data Summary,” and the right-hand box is titled “Parameter Summary.” Selections from this wizard session are shown here. Perform any one of the following steps, if necessary.

   a. Click ***Back*** to modify selections.

   b. Click ***Cancel*** to stop the creation of this particular mobility product.

   c. Leave a check in the box next to “Show Result in ArcMap” to have the layers display in ArcMap when the Mobility wizard is finished processing. If unchecked, the Mobility product will not be displayed in ArcMap after it is finished processing.

10. If satisfied with the selections displayed in the window, click ***Finish*** to create the Mobility product. It will take several minutes to generate.

NOTE

If an unsupported data type is selected, the ***DTSS Mobility Wizard*** *window will appear (Figure 8-9), informing the user. Click* **OK** *to return to the Mobility Wizard and choose a supported data type.*



Figure 8-9 DTSS Mobility Wizard Window

11. The **DTSS Mobility Engine Status** window will appear (Figure 8-10), indicating progress of the Mobility engine. The Mobility product will take several minutes to generate.

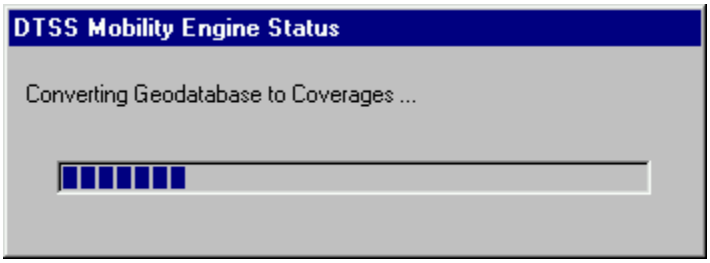


Figure 8-10 DTSS Mobility Engine Status Window

12. The **Information—Production Complete** window will appear when the product has been generated (Figure 8-11).



Figure 8-11 Information—Production Complete Window

13. Click ***OK***. If previously selected, the Mobility product will appear in ArcMap (Figure 8-12), where it can be displayed and edited using ArcMap functionality.

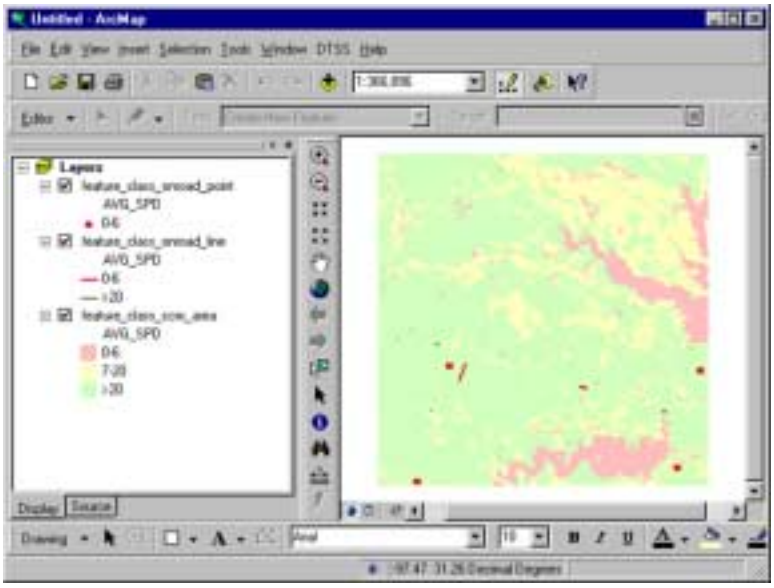


Figure 8-12 Sample Mobility Product Displayed in ArcMap Window

8.1.5 NRMM II Output

As previously stated, output from a single run of the NRMM II wizard results in a geodatabase containing evaluated terrain units. For each terrain unit, factors related to CCM, on-road speed, and gap crossing, are provided. The following sections discuss these factors.

8.1.5.1 Cross-Country Movement Factors

Each terrain unit in the NRMM II output geodatabase contains the following attributes related to CCM:

- **UP_SPD**—Vehicle speed, in kilometers per hour (KPH), in a direction parallel to the slope vector, moving uphill.
- **UP_RSN**—NRMM II reason code for GO or NOGO speed prediction.

- **DOWN_SPD**—Vehicle speed (KPH) in a direction parallel to the slope vector, moving downhill.
- **DOWN_RSN**—NRMM II reason code for GO or NOGO speed prediction.
- **XSLP_SPD**—Vehicle speed (KPH) in a direction perpendicular to the slope vector (across the slope).
- **XSLP_RSN**—NRMM II reason code for GO or NOGO speed prediction.
- **AVG_SPD**—Weighted average of the predicted speeds (KPH) for up, down, and cross-slope.
- **AVG_RSN**—NRMM II reason code for GO or NOGO speed prediction.
- **CTL_VEH**—Slowest vehicle, if more than one vehicle chosen.

8.1.5.2 On-Road Speed Factors

Each terrain unit in the NRMM II output geodatabase contains the following attributes related to on-road speed:

- **UP_SPD**—Vehicle speed in kilometers per hour (KPH) in one direction along the road (from Point A to Point B).
- **UP_RSN**—NRMM II reason code for GO or NOGO speed prediction.
- **DOWN_SPD**—Vehicle speed (KPH) in the direction opposite of the UP_SPD direction (i.e., from Point B to Point A).
- **DOWN_RSN**—NRMM II reason code for GO or NOGO speed prediction.
- **AVG_SPD**—Weighted average of the predicted speeds (KPH) for up, down, and cross slope.
- **AVG_RSN**—NRMM II reason code for GO or NOGO speed prediction.
- **CTL_VEH**—Slowest vehicle, if more than one vehicle chosen.

Table 8-2 gives a description for each of the CCM and On-Road Reason codes included in the NRMM II output.

NOTE

Negative codes represent "NO-GO" reasons. Positive codes represent controlling factor reasons.

Table 8-2 CCM and On-Road Reason Codes and Descriptions

Code	Description
-99	Unknown cause “NO-GO”
-10	Water “NO-GO”
-9	Tipping on side slope “NO-GO”
-8	Sliding on side slope NO-GO
-7	Soil “NO-GO” on level (VCI)
-6	Obstacle override “NO-GO”
-5	Vegetation override “NO-GO”
-4	Obstacle belly interference “NO-GO”
-3	Obstacle clearance interference “NO-GO”
-2	Soil & slope resistance “NO-GO”
-1	Inability to brake (visibility) “NO-GO”
0	No prediction made
1	Ride dynamics (vride) limit
2	Tire speed limit
3	Soil, slope & vegetation resistances
4	Visibility
5	Maneuver around obstacles & vegetation
6	Maneuver around vegetation (overriding obstacles)
7	Obstacle impact (VOOB) speed
8	Obstacle override force
9	Driver prudence overriding vegetation
10	External (scenario) limit
11	AASHTO curvature speed limit
12	Sliding on curves/side slopes
13	Tipping on curves/side slopes
20	Urban
99	Unknown cause

8.1.5.3 Gap Crossing Factors

Each terrain unit in the NRMM II output geodatabase contains the following attributes related to Gap Crossing:

- **Gap_Time**—Time, in seconds (SEC), for the vehicle to negotiate the gap.
- **Gap_SPD**—Vehicle average speed (KPH) while negotiating the gap.

- **Gap_RSN**—If negative, the reason for failure to cross gap. If positive, the method of crossing the gap.
- **CTL_VEH**—Slowest vehicle, if more than one vehicle chosen.

Table 8-3 gives a description for each of the Reason codes appearing for Gap Crossing in the NRMM II output.

Table 8-3 Gap Crossing Reason Codes and Descriptions

Code	Description
-8	"NO-GO", Insufficient traction available
-4	"NO-GO", Geometric interference within gap
-2	"NO-GO", Vegetation too dense
-1	"NO-GO", Water crossing
0	No prediction made
1	Span
2	Ford
3	Swim

NOTE

Negative reason codes range from –15 to –1. Negative reason codes not listed above are the sum of multiple negative reason codes listed above as follows: -3 (-1,-2), -5(-1,-4), -9 (-1,-8), -6 (-2,-4), -10(-2,-8), -11 (-1,-2,-8), -12(-4,-8), -13 (-1,-4,-8), -14(-2,-4,-8), -15(-1,-2,-4,-8).

8.1.5.4 Accessing Original Data Values

It is possible to identify the input data values for each prediction generated by NRMM II by linking to a related table that contains the initial data values.

To identify selected feature attributes:

1. Select a feature in the ArcMap Data View using the feature selection tool.
2. Use the **Identify** button ( ) to pinpoint the feature's layer.
3. Right click on the feature class layer in the ArcMap Table of Contents and select ***Selection/Open Table for Selected Features***. This will bring up the feature class attribute table with the selected records identified. Changing the selected feature(s) will also change the records in the Attribute Table.

4. Select ***Options*** at the bottom of the **Attribute Table** window and select ***Relationship***. Select the related table that is identified. This will open the table with the input data values.

5. When the related table opens, click the move to end of table button ( ).

6. To find an individual record in the related table, highlight the TU_ID column in the related table, and in the "Record" field, enter the TU_ID from the CCM Attribute Table, or the TERR_UNIT_ID value from the On-Road or Gap Crossing Attribute Table. Press ***[Enter]*** after inputting the value, and the table will scroll to the appropriate record in the related table.

To join the related table to the feature class Attribute Table:

1. Right click on the feature class in the Table of Contents and select ***Join***. This will open the **Join Data** window.

2. To join the feature class with the related table, select either the "Name or attribute" radio button, then choose TU_ID (CCM) or TERR_UNIT_ID (On-Road and Gap Crossing) as the field in the layer that contains the values to join to.

3. Choose the appropriate table to join to, and select either TU_ID or TERR_UNIT_ID as the field that contains values that match.

4. This will create a TEMPORARY new layer that has all the attributes in both tables. This layer is only available for use in the current map document. If a permanent copy of the joined feature class is desired, the "Create a new feature class" check box can be selected. This will create a shapefile in the location specified by the user in the **Save As** window.

5. All the attributes in both the feature class Attribute Table and the related table are now available for query and symbolization. To make the view appear like the default mobility output, select the appropriate display field, categories, and symbology. Refer to Section 10.1.2, *Symbology*, for more information.

8.1.5.5 Sample Output

An example of a Mobility product output is shown in Figure 8-13. Note that feature classes are listed in ArcMap's Table of Contents panel on the left for points, lines, and areas that appear in the Display panel to the right.

NOTE

The points on this sample map are red, indicating a speed of 0–6 kph. According to background information, these points represent bridges. The NRMM II model does not

provide a speed prediction for bridges, and thus, the output indicates a speed of 0.

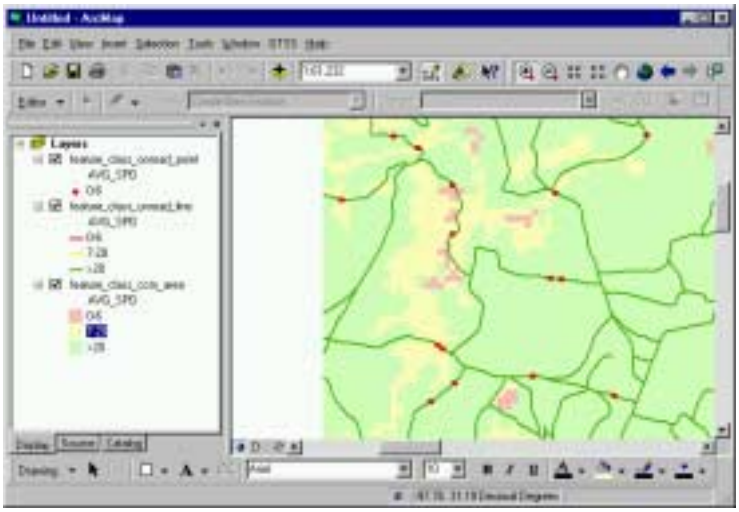


Figure 8-13 Sample NRMM II Output in ArcMap

Each symbol represents a given range or feature value. Click on any symbol in the Table of Contents panel to open the **Symbol Selector** window, shown in Figure 8-14. In this window, it is possible to change the appearance of any feature's symbology.

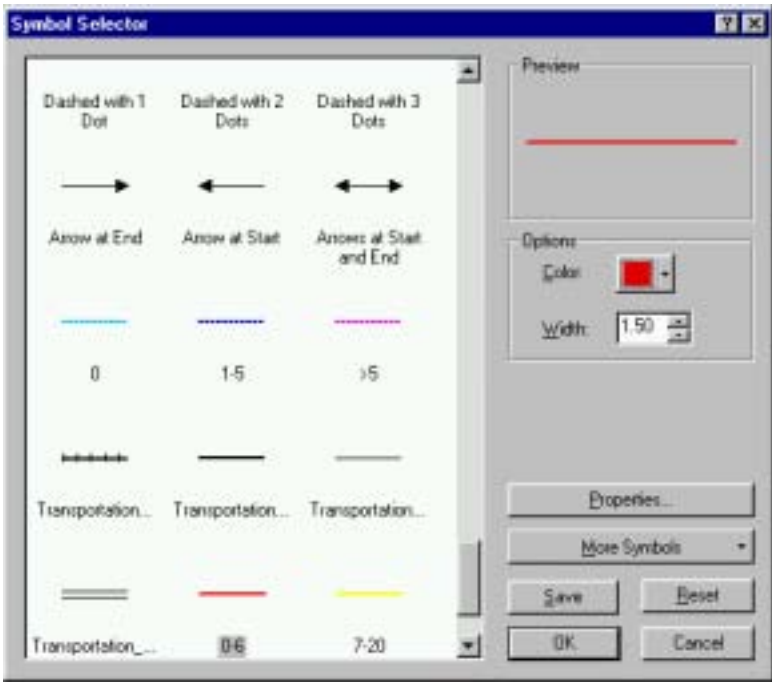


Figure 8-14 Symbol Selector Window

For more advanced options in adjusting symbols' appearance, right click any layer, and select ***Properties*** from the context menu that appears. In the **Properties** window, select the **Symbology** tab (Figure 8-15).

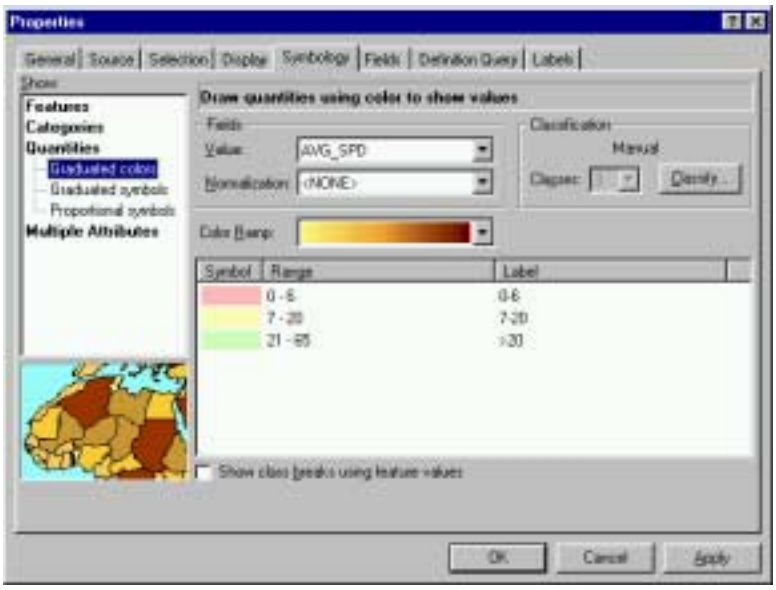


Figure 8-15 Symbology Tab in Properties Window

For more information on adjusting a feature's symbology, refer to Section 10.1.2, *Symbology*. For more information on displaying any DTSS TDA as a finished map in an ArcMap document, refer to Section 10.2.6, *DTSS Map Production Tool*.

8.2 Line of Sight Overview

DTSS provides the analyst with two Line of Sight (LOS) wizards to create Visibility Plot and Target Profile TDAs. These were referred to as "Intervisibility" products in previous DTSS versions. Both LOS products depict areas from a user-defined observation point as: 1) not visible (masked), 2) partially visible (i.e., only a portion of the target is visible), and/or 3) visible.

All models implemented are based on GOTS software developed by TEC and the U.S. Army Training and Doctrine Command Analysis Center—White Sands Missile Range (TRAC-WSMR). Information from the following publications is implemented in the DTSS Line of Sight TDAs:

- *The Effects of Different Line of Sight (LOS) Algorithms and Terrain Elevation Representations on Contact Simulations*, U.S. Army TRAC-WSMR, Publication TR-95-032, September 1995.

- *The Effects of Digital Terrain Elevation Data (DTED) Representation on Contact Simulations*, U.S. Army TRAC-WSMR, Publication TR-93-031, December 1993.
- *A Line of Sight Software Reusability Assessment Project*, U.S. Army Corps of Engineers – Topographic Engineering Center, Publication TEC-0108, August 1999.

This section reviews the LOS products, gives explanations of the LOS parameters, and presents the common format that all LOS TDAs will follow.

8.2.1 Line of Sight Products

The Visibility Plot and Target Profile TDAs are generated from digital elevation data alone or from elevation data plus vegetation height information. Acceptable elevation data formats include NIMA DTED format, USGS digital elevation (DE) format, and ERDAS Imagine files that contain elevation data. Vegetation data must be contained in a geodatabase that has been created from VITD using the DTSS VPF Importer.

NOTE

Elevation data MUST have geographic (Lat/Lon) coordinates.

The system reads the data and the parameter information entered by the user into the LOS Application Programmer's Interface (API), and the results are presented graphically in ArcMap. Metadata will automatically update for the data, and options are provided to save the results.

Previously created profiles can be saved, accessed, and modified. Visibility Proflies are stored with a *.vlp* file extension. Target Profiles are stored with a *.tlp* file extension.

8.2.2 Line of Sight Parameters

The following sections describe all parameters used in the DTSS LOS functions. Not all parameters are used in both Visibility Plot and Target Profile.

8.2.2.1 Target Height

The height of the target is specified in decimal meters, ranging from 0.0 to 20.0 meters. The height of the target can be entered manually or chosen from one of the following available selections:

- **2.0 meters**—Average foot soldier height *(default value)*
- **3.5 meters**—Average tank height
- **5.0 meters**—Unspecified object height

- **10.0 meters**—Stationary target (i.e., radar system)

8.2.2.2 Target Altitude

The altitude of the target is specified in decimal meters, ranging from -20.0 to 30000.0 meters. Negative target altitudes allow dug-in target positions to be analyzed in LOS products. The target altitude can be entered manually or chosen from one of the following selections:

- **0.0 meters**—Ground targets *(default value)*
- **20.0 meters**—Helicopter targets
- **100.0 meters**—Ground support aircraft targets
- **300.0 meters**—Low level bombers

8.2.2.3 Target Reference

The target reference specifies the system of reference for the height of the target. There are three options to choose from:

- **Above Ground Level**—A system of reference for the correct target height (in meters) with respect to the elevation height at the target's position. *(default value)*
- **Mean Sea Level**—A system of reference for the target height (in meters) above Mean Sea Level.
- **Nap of Earth**—A system of reference for the target height (in meters) above the elevation height and any feature height at the position the target occupies.

8.2.2.4 Interpolation Method

Elevation heights must be calculated for the observer and target locations, as well as points along rays that radiate out from the observer location to the user-defined target or range. The location of these points is determined by the user-specified sample spacing. A height must be calculated for each point along the ray in order to determine LOS from the observer location.

For Visibility Plot, heights can be calculated in one of three ways:

- **Bi-Linear Interpolation**—Uses the elevation of the two nearest X or Y elevation samples to interpolate the elevation of the point in question. *(default value)*
- **Nearest Point**—Assigns the elevation of the closest know elevation sample to the point in question.
- **Maximum Point**—Sets the elevation of the point in question to the highest elevation of the four closest elevation samples.

Bi-Linear Interpolation is the most accurate method of the three, but it also takes longer to compute.

For Target Profile, heights can be calculated using one of the following methods:

- **4-pt Interpolation**—Uses the four closest elevation samples in relation to the point in question and approximates the elevation based upon a weighted average of the four elevation sample points. *(default value)*
- **Nearest Point**—Assigns the elevation of the closest know elevation sample to the point in question.
- **Maximum Point**—Sets the elevation of the point in question to the highest elevation of the four closest elevation samples.

The 4-pt Interpolation method is the most accurate of the three, but it also takes longer to compute.

8.2.2.5 Range Bands

Range bands are user-selectable range indicators that provide a quick range determination when LOS products are displayed. The distance can be entered manually or chosen from one of the following available selections:

- **500 meters** *(default value)*
- **1000 meters**
- **2500 meters**
- **5000 meters**

8.2.2.6 Coordinate Reference

The DTSS analyst can set the coordinate reference for coordinates used to define the location of the observer and/or target, regardless of the projection of the data being used. Available coordinate references include Geographic (Latitude/Longitude), Universal Transverse Mercator (UTM), and Military Grid Reference System (MGRS). All coordinates are assumed to use the WGS84 datum. Site selection coordinates can be entered in UTM or MGRS coordinates, even though the input data is in geographic coordinates.

8.2.2.6.1 Latitude/Longitude (Lat/Lon)

The following values must be entered when selecting observer or target locations in geographic (Lat/Lon) coordinates:

- Latitude degrees: 0 to 90
- Latitude minutes: 0 to 59

- Latitude decimal seconds: 0 to 59.999
- Latitude hemisphere: N/S
- Longitude degrees: 0 to 180
- Longitude minutes: 0 to 59
- Longitude decimal seconds: 0 to 59.999
- Longitude hemisphere: W/E

8.2.2.6.2 Universal Transverse Mercator (UTM)

The user may need to enter values for observer or target coordinates in UTM or Universal Polar Stereographic (UPS) coordinate format. The UTM coordinate system divides the globe into 60 north and south zones, each six degrees wide. UTM coordinates to be entered include the following information:

- **Zone**—The UTM Zone in which the observer is located. The globe is divided into 60 6-degree zones. These zones are numbered 1 to 60 and start at 180 degrees West (middle of Pacific Ocean), proceeding eastward around the world. If the **UTM Zone** is left blank, the coordinate being entered by the user is considered to be UPS.
- **X**—The UTM X-coordinate value with reference to the zone in which it appears. The acceptable range for X-coordinates is 100000 to 900000. If the **UTM Zone** is blank, the UPS coordinate limits are 0 to 4000000 integer meters.
- **Y**—The UTM Y-coordinate value with reference to the zone in which it appears and the number of meters it is above/below the Equator. The acceptable range for Y-coordinates is 0 to 10000000. If the **UTM Zone** is blank, the UPS coordinate limits are 0 to 4000000 integer meters.
- **N/S**—The Northern or Southern Hemisphere.

8.2.2.6.3 Military Grid Reference System (MGRS)

Observer or target coordinates in the MGRS coordinate format are explained below.

MGRS Zone Specifics:

- If the first character in the zone is an A, B, Y, or Z, no other information is valid within the MGRS Zone designation. This indicates that the MGRS coordinate will be in one of the Northern or Southern Polar regions.
- If the first character is a number, the MGRS coordinate will have a number between 1 and 60 (same as UTM), followed by 1 character (not to include I and O). This last character represents latitude bands starting at 80 degrees south and proceeding northward in 8-degree bands, except for the X-band, which is 12 degrees.

MGRS Coordinate Specifics:

- An MGRS coordinate can contain up to 12 characters, the first two of which must be characters (not to include I and O) that map to a particular 100000-meter grid square on the Earth.
- MGRS coordinates must be even in length, and contain a minimum of six characters.
- A full 12-character MGRS coordinate will provide one-meter coordinate precision, whereas 6-character MGRS coordinates will provide only 1-kilometer coordinate precision.

8.2.2.7 Observer Selection Method

The LOS TDA wizards provide two interfaces that can be used to enter observer locations. In the case of Target Profile, these methods apply to entering both the observer and target locations.

- **Graphical**: An ArcMap canvas in which to enter observer locations and attribute information associated with the LOS analysis. *(default value)*
- **Manual**: A wizard interface in which to enter observer and target locations, along with additional attribute information associated with the LOS analysis.

8.2.2.8 Visibility Fan

Visibility Fan represents the range of view for the observer from 0 to 360 degrees.

NOTE

This is only applicable to the Visibility Plot TDA.

- **Begin**—The starting angle, in degrees, at which LOS information will be collected, acceptable values range from 0 to 360 degrees.
- **End**—The ending angle, in degrees, at which LOS information will be collected, acceptable values range from 0 to 360 degrees.

8.2.2.9 Observer Height

The height of the observer is specified in decimal meters, ranging from 0.0 to 20.0 meters. The height of the observer can be entered manually or chosen from one of the following available selections:

- **2.0 meters**—Average foot soldier height *(default value)*
- **3.5 meters**—Average tank height
- **5.0 meters**—Unspecified object height

- **0.0 meters**—Stationary target (i.e., radar system)

8.2.2.10 LOS Mode

The available LOS Mode options include the following:

- **Optical**—LOS analysis will use a straight-line method between observer and target to determine visibility. *(default value)*
- **Radar**—LOS analysis will factor in the over-the-horizon capabilities of radar systems, using a 4/3 Earth curvature factor.

8.2.2.11 LOS Range

The LOS Range is the maximum distance (measured in integer meters) for which LOS determinations will be made for an observer.

NOTE

This is only applicable to the Visibility Plot TDA.

8.2.2.12 Observer Reference

The observer reference specifies the system of reference for the height of the observer. There are three options available:

- **Above Ground Level**—Places the observer on the ground. The observer height is added to the elevation value and vegetation height, if being used, at the observer location. Above Ground Level is the default reference system for all LOS analysis. *(default value)*
- **Mean Sea Level**—Places the base of the observer at Mean Sea Level. Selection of this may place the observer below the actual elevation of the ground at the observer location, depending on the relief in the area.
- **Nap of Earth**—This reference places the observer above the elevation height and any feature height at the position the observer occupies.

8.2.2.13 Sample Spacing

Samples can be taken at equal distances along the Target Profile. The selected Interpolation Method is used to determine the elevation height at each point along the profile. The following sample spacing options are available.

NOTE

This is only applicable to the Target Profile TDA.

- 1.0 Meters (equivalent to 0.037 Seconds, *default setting*)
- 3.0 Meters (equivalent to 0.111 Seconds)

- 10.0 Meters (equivalent to 0.333 Seconds)
- 30.0 Meters (equivalent to 1.0 Seconds, approx. spacing of DTED 2)
- 100.0 Meters (equivalent to 3.0 Seconds, approx. spacing of DTED 1)

8.2.3 Visibility Plot

The Visibility Plot wizard is designed to create a two-dimensional vector product that displays the areas around a selected site in which a target, at a specified altitude, is visible, partially visible, or not visible. The user can identify up to 250 different observers and can have a mix of optical and radar LOS analyses in the same output product.

8.2.3.1 Creating a Visibility Plot

Once the analyst becomes familiar with the terminology and parameters for an LOS analysis, a product can be created. To create a Visibility Plot in DTSS, perform the following steps.

1. With ArcMap open on the desktop, go to the **DTSS** menu, and select ***Line of Sight/Visibility Plot***. The **DTSS—LOS Visibility Plot TDA Wizard—Introduction** window will appear (Figure 8-16).

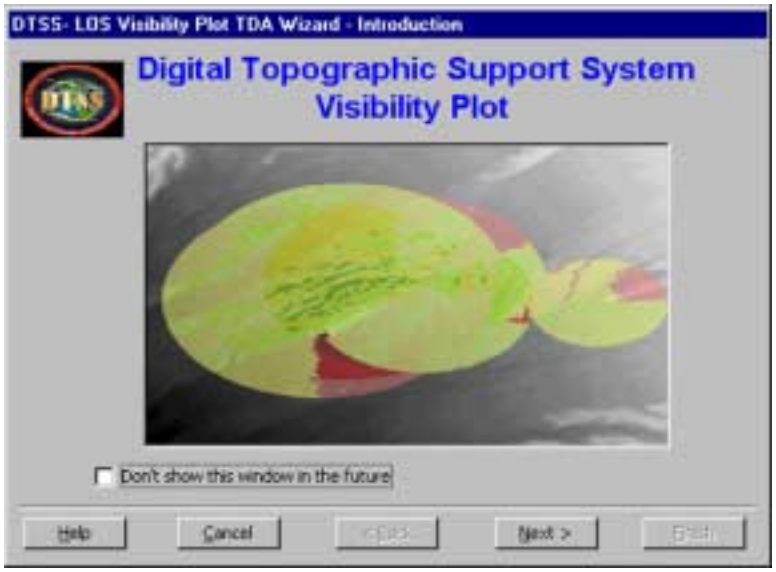


Figure 8-16 DTSS—LOS Visibility Plot TDA Wizard—Introduction Window

NOTE

*To skip the **DTSS—LOS Visibility Plot TDA Wizard—Introduction** window in the future, click the box next to the words "Don't show this window in the future," located in the lower left portion of the window.*

2. Click ***Next*** to continue. The **DTSS—LOS Visibility Plot TDA Wizard—Select Data** window will now appear (Figure 8-17).

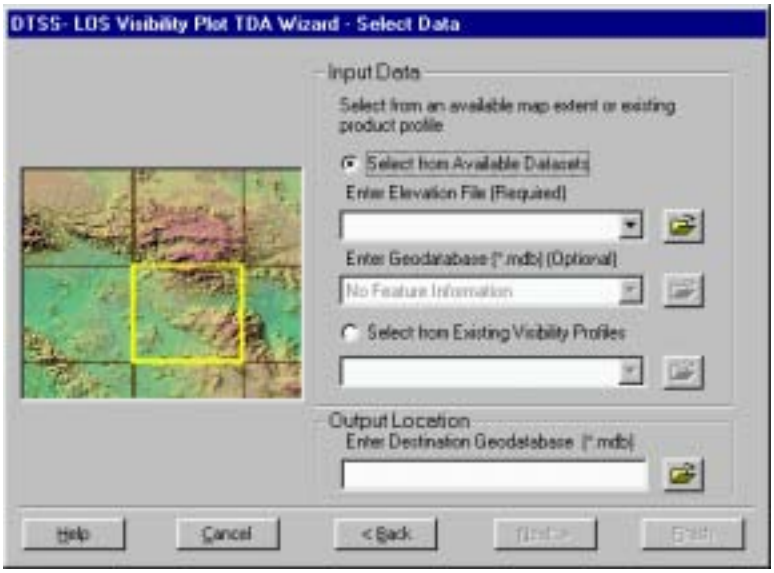


Figure 8-17 DTSS—LOS Visibility Plot TDA Wizard—Select Data Window

3. Select the input data from an available dataset or existing product profile by clicking the radio button next to “Select from Available Datasets” or “Select from Existing Visibility Profiles.” If “Select from Available Datasets” is selected, use Step a. If “Select from Existing Product Profiles” is selected, use Step b.

   a. If “Select from Available Datasets” was chosen, use the following step:

      1) Click the ***Open File*** button ( ) to the right of the “Enter Elevation File” field to access the **DTSS Visibility Plot—Select an Elevation dataset** window shown in Figure 8-18. Acceptable elevation files are identified in Section 8.2.1.

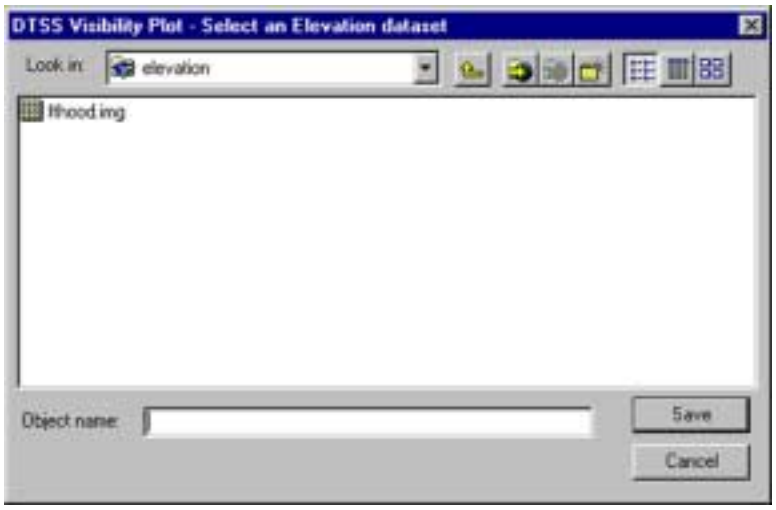


Figure 8-18 DTSS Visibility Plot—Select an Elevation Dataset Window

2) Navigate to the appropriate elevation file and click ***Save*** to return to the **DTSS—LOS Visibility Plot TDA Wizard—Select Data** window (Figure 8-19). Notice that the selected elevation file now appears in the "Enter Elevation File" field, and the "Enter Geodatabase" field shows the text "No Feature Information."

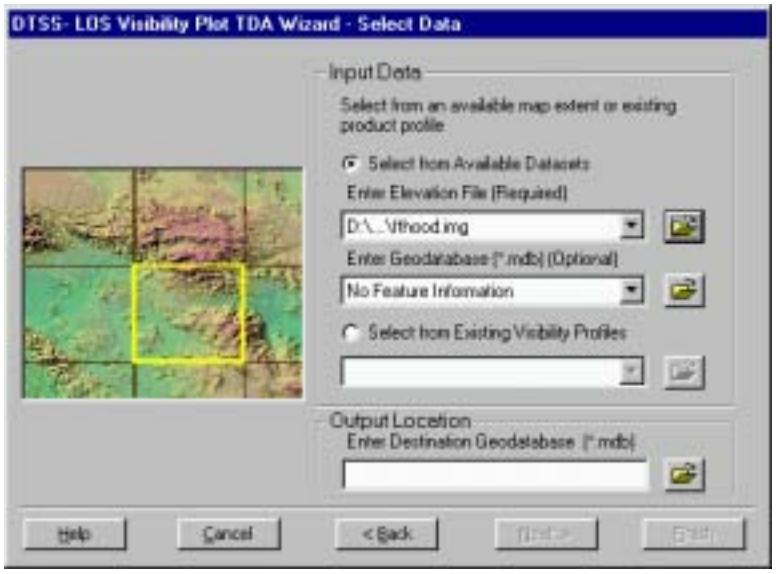


Figure 8-19 DTSS—LOS Visibility Plot TDA Wizard—Select Data Window

3) It is not necessary to enter a geodatabase in the "Enter Geodatabase" field to proceed to the next step of the wizard. If it is desired to add feature information from a VITD geodatabase, click the ***Open File*** button ( ) to the right of the "Enter Geodatabase" field to access the **Select a Data Set** window, shown in Figure 8-20.

NOTE

If an ITD geodatabase is selected, the user will receive an error message, indicating that an unsupported format has been chosen. Click ***OK****, and then select a VITD geodatabase.*



Figure 8-20 Select a Data Set Window From LOS Visibility Plot TDA Wizard

4) Navigate to the appropriate geodatabase (*.mdb*) file, and click ***Save*** to return to the **DTSS—LOS Visibility Plot TDA Wizard—Select Data** window (Figure 8-21). Notice the selected geodatabase file now appears in the "Enter Geodatabase" field. Notice, also, that the **Next** button is not yet enabled.

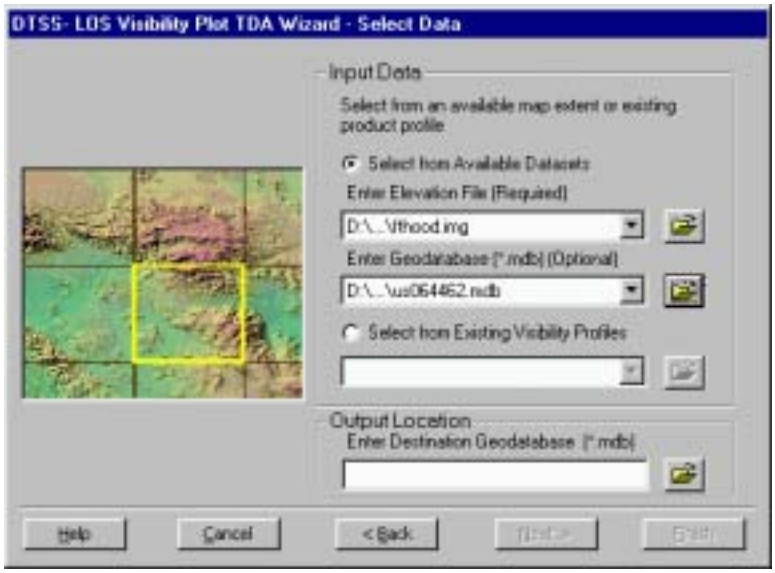


Figure 8-21 DTSS—LOS Visibility Plot TDA Wizard—Select Data Window

b. If "Select from Existing Visibility Profiles" was chosen, use the following steps. Otherwise, proceed to Step 4 below.

2) Click the ***Open File*** button ( ) to the right of the "Select from Existing Visibility Profiles" field to access the **DTSS—Open product profile** window, shown in Figure 8-22.



Figure 8-22 DTSS—Open Product Profile Window From Visibility Plot Wizard

3) Navigate to the appropriate visibility profile (*.vlp*) file, and click ***Save*** to return to the **DTSS—LOS Visibility Plot TDA Wizard—Select Data** window (Figure 8-23). Notice the selected visibility profile file now appears in the "Select from Existing Visibility Profiles" field, and the information under the "Select from Available Datasets" radio button populates with the appropriate input data.

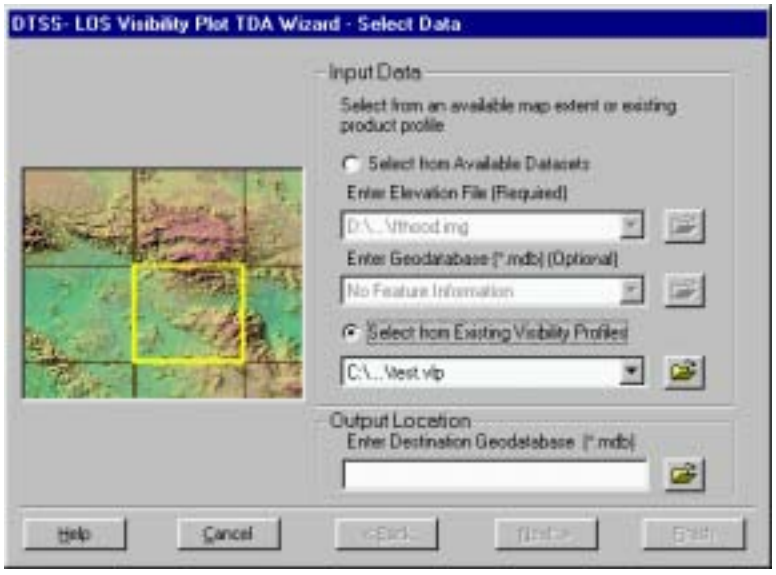


Figure 8-23 DTSS—LOS Visibility Plot TDA Wizard—Select Data Window

4. Enter an output location for the visibility plot by clicking the ***Open File*** button ( ) to the right of the "Enter Output Location (*.mdb)" field to access the **DTSS Visibility Plot—Select new geodatabase location** window shown in Figure 8-24.



Figure 8-24 DTSS Visibility Plot—Select New Geodatabase Location Window

5. Navigate to the appropriate geodatabase (*.mdb*) file, and click ***Save*** to return to the **DTSS—LOS Visibility Plot TDA Wizard—Select Data** window (Figure 8-25). Notice the selected geodatabase file now appears in the "Enter Destination Geodatabase" field.

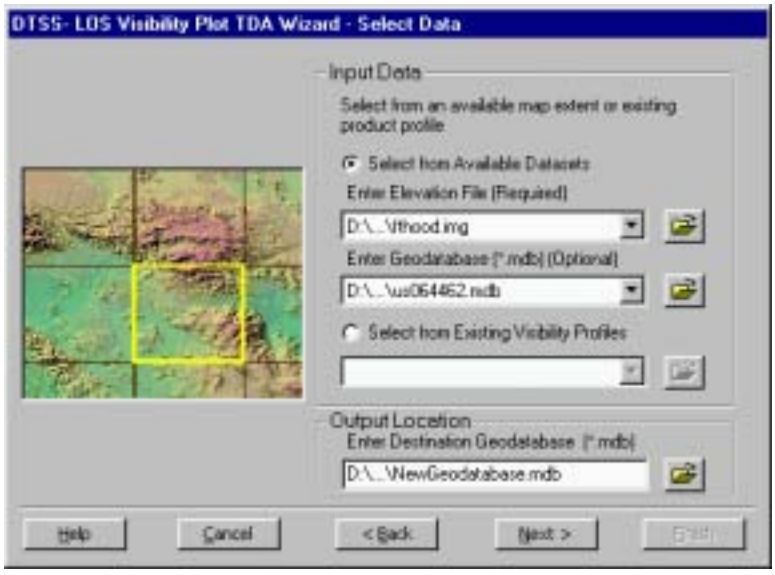


Figure 8-25 DTSS—LOS Visibility Plot TDA Wizard—Select Data Window

6. Click ***Next*** to continue. The **DTSS—LOS Visibility Plot TDA Wizard—Visibility Plot** window will appear (Figure 8-26).

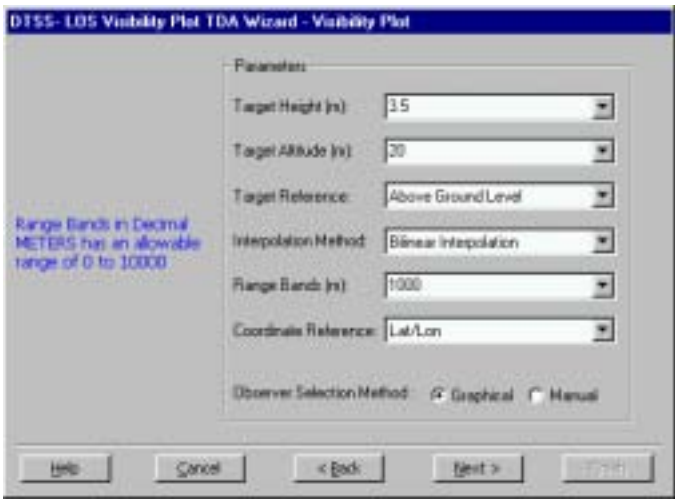


Figure 8-26 DTSS—LOS Visibility Plot TDA Wizard—Visibility Plot Window

7. Select the appropriate LOS visibility plot parameters. For more information on any of the parameters, see Section 8.2.2, *Line of Sight Parameters*, or click in any field to bring up a description for that parameter in the left area of the window. Once all selections have been made, click ***Next***. Depending on which Observer Selection Method was chosen, the next window will be a map or wizard interface in which to enter observer locations and attribute information associated with the LOS analysis. If "Graphical" was selected, proceed to Substep a. If "Manual" was selected, go on to Substep b.

   a. If the radio button next to "Graphical" was selected as the Observation Selection Method, the **DTSS—Visibility Plot Observer Selection** window will appear (Figure 8-27).

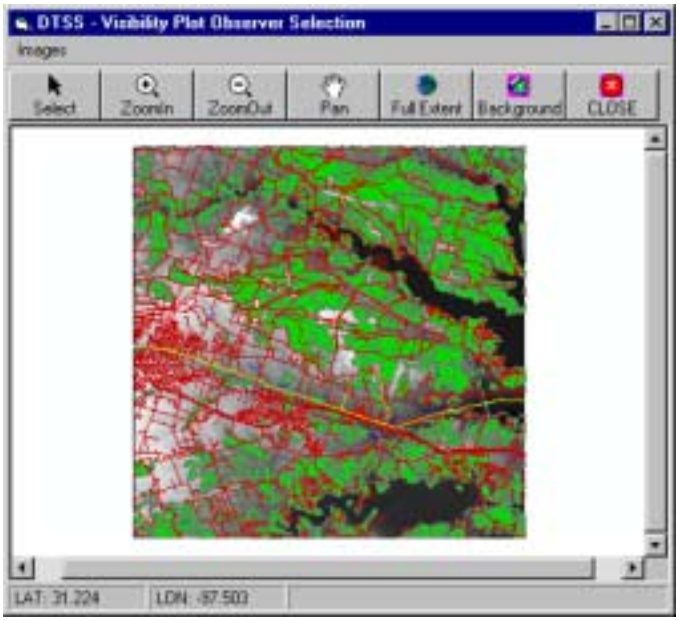


Figure 8-27 DTSS—Visibility Plot Observer Selection Window

1) This window displays a map of the image, geodatabase, and existing visibility product profile selected in the **DTSS—LOS Visibility Plot TDA Wizard—Select Data** window. If a geodatabase and/or existing product was not selected, they will not appear in the window. When the mouse is moved across the image, a crosshair symbol appears as the cursor. As the mouse is moved, the coordinate location is shown in the bottom left corner of the window.

2) Use the tools from the toolbar to better view an area of the map. Table 8-4 shows each tool on the toolbar and gives a description of its functions.

Table 8-4 Graphical Observer Selection Window Toolbar Descriptions

Tool	Description
	Selects observer and target locations on the map. User can right click on a location to access a dropdown menu of editing functions.
	Zooms in on the data in the map. User can click and drag with the mouse to define a particular area to zoom in on.
	Pans the view of data in the map. The user can move the cursor anywhere, hold down the left mouse button, and drag the display in any direction.
	Returns map image to its original size.
	Accesses the **DTSS Visibility Plot—Select Background Image** window. Allows user to bring in a new background image.
	Closes current window and returns to **LOS Visibility Plot—Observer Parameters** wizard window.

3) To hide the images or layers displayed on the map, click the **Images** menu, and select the image or layer to show/hide. A check next to the image or layer means it will be displayed in the window.

4) If an existing visibility profile product was selected in the **DTSS—LOS Visibility Plot TDA Wizard—Select Data** window, then blue symbols representing observer locations will appear on the map. If a visibility profile product was not previously selected, then no locations will appear on the map. To graphically add observer locations to the map, click the ***Select*** tool. Single click the mouse on the desired observer location. The **DTSS—Observer Parameters** window will appear (Figure 8-28).



Figure 8-28 DTSS—Observer Parameters Window

5) Select the appropriate parameters. For more information on any of the parameters, see Section 8.2.2, *Line of Sight Parameters*, or click in any field to bring up a description for that parameter in the right area of the window.

6) Once all selections have been made, click ***OK***. The observer location will appear on the map as a blue symbol.

7) To delete a selected observer's parameters or location, right click on one of the observer symbols, and click ***Delete*** from the context menu shown in Figure 8-29. The observer location is removed from the map.

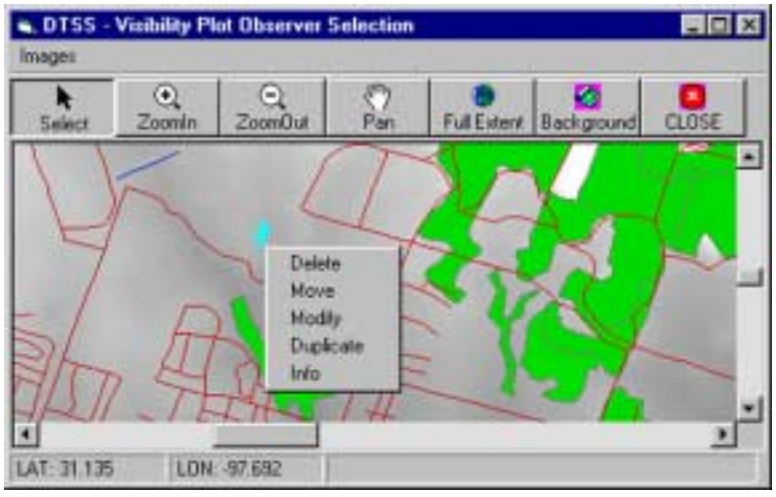


Figure 8-29 Context Menu From DTSS—Visibility Plot Observer Selection Window

8) To move the selected parameters or locations, right click on one of the observer symbols, and click ***Move*** from the context menu shown in Figure 8-29. Notice the message "Select new observer Location with right mouse button" appears in the bottom portion of the window.

Move the cursor to the desired area and right click the mouse. The observer location is moved to that location on the map.

9) To modify the selected parameters or locations of an observer, right click on one of the observer symbols, and click ***Modify*** from the context menu shown in Figure 8-29. The **DTSS—Observer Parameters** window will appear (Figure 8-28). Make the appropriate changes, and click ***OK*** when finished. The observer location and parameter information is updated on the map.

10) To duplicate the selected parameters, right click on one of the observer symbols, and click ***Duplicate*** from the context menu shown in Figure 8-29. Notice the message "Select new observer Location with right mouse button" appears in the bottom portion of the window. Move the cursor to the desired area and right click the mouse. The observer parameters are duplicated to that location on the map.

11) To get parameter and location information on an observer symbol, right click the symbol, and click ***Info*** from the context menu. The **DTSS—Observer Parameter Information** window will appear (Figure 8-30). Click ***OK*** when finished reviewing the information to return to the map.

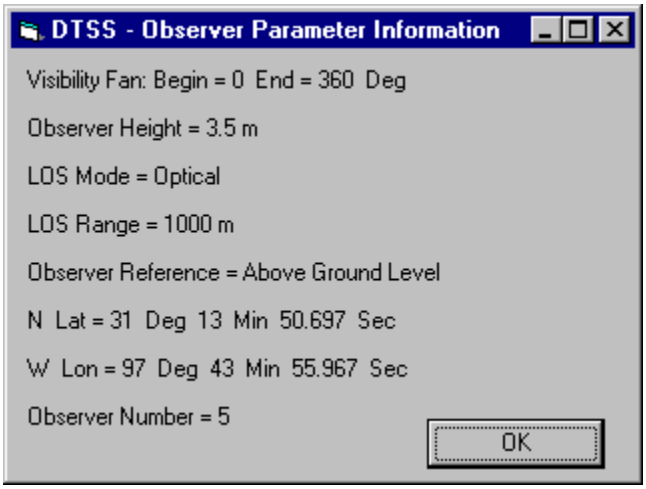


Figure 8-30 DTSS—Observer Parameter Information Window

12) Once all selections have been made, click ***Close*** from the toolbar. The **DTSS—LOS Visibility Plot TDA Wizard—Observer Parameters** wizard window will appear (Figure 8-31).

b. If the radio button next to "Manual" was selected as the Observer Selection Method, the **DTSS—LOS Visibility Plot TDA Wizard—Observer Parameters** wizard window will appear (Figure 8-31).

NOTE

*The **DTSS—LOS Visibility Plot TDA Wizard—Observer Parameters** window shown in Figure 8-31 will be different for each coordinate reference parameter (Lat/Lng, UTM, and MGRS) selected in the **DTSS—LOS Visibility Plot TDA Wizard—Visibility Plot** window.*

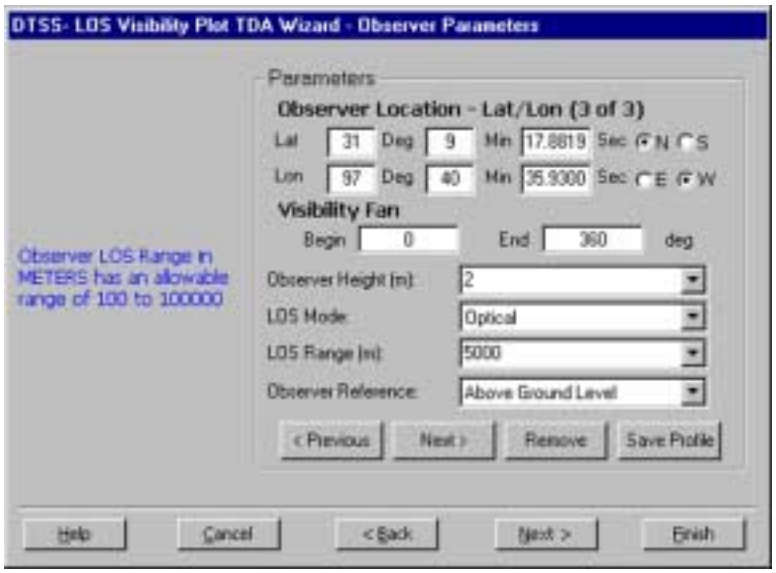


Figure 8-31 DTSS-LOS Visibility Plot TDA Wizard-Observer Parameters Window

8. Select the appropriate LOS observer parameters. For more information on any of the parameters, see Section 8.2.2, *Line of Sight Parameters*, or click in any field to bring up a description for that parameter in the left area of the window. The selected parameters can be saved as a profile, removed, or edited by using the **Previous**, **New**, **Remove**, and **Save Profile** buttons in the **DTSS—LOS Visibility Plot TDA Wizard—Observer Parameters** window. See Table 8-5 for a description of each button's functions.

Table 8-5 Observer Parameter Profile Button Descriptions for LOS Visibility Plot

Button	Description
< Previous	Returns to the previous observer parameter profile. This button becomes enabled when a new observer parameter profile is created.
New >	Moves to the next observer parameter profile or creates a new blank observer parameter profile if there are no other profiles.
Remove	Removes the current observer parameter profile selections. The next available observer parameter profile will appear. If none remain, all settings in the window are cleared.
Save Profile	Accesses the **DTSS – Save profile** window. User can navigate to the appropriate file location to save the current profile with a *.vlp* file extension.

9. Once all selections have been made, click ***Finish***. The LOS Visibility TDA Wizard closes, and the application status bar appears indicating progress in processing (Figure 8-32).

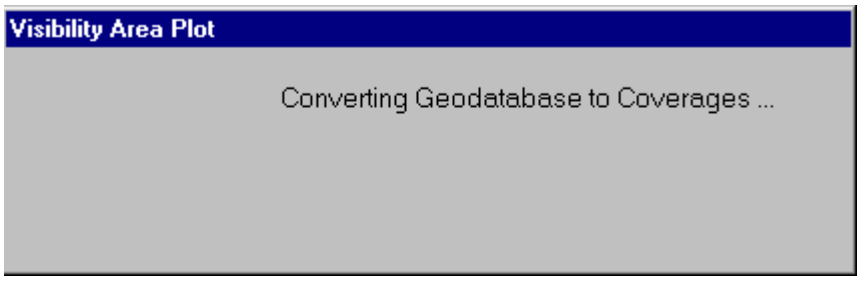


Figure 8-32 Visibility Area Plot Window

10. The Visibility Plot may take up to an hour to generate, depending on computer processing speed and parameters, including any pertinent vegetation information. When complete, the LOS Visibility Plot product will appear in ArcMap (Figure 8-33).

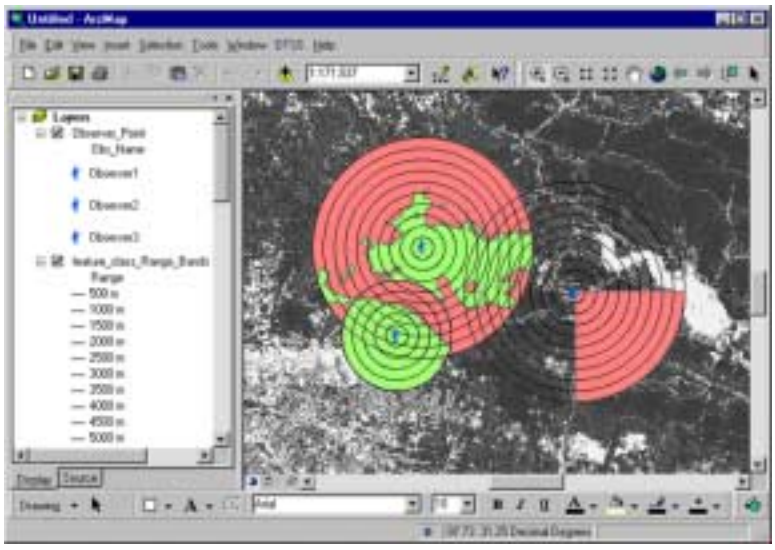


Figure 8-33 Visibility Plot Displayed in ArcMap

8.2.3.2 Visibility Plot Output

A sample Visibility Plot output is shown above, in Figure 8-33. Symbology shown in the Table of Contents panel of ArcMap can be changed using procedures outlined in Section 10.1.2, *Symbology*. Default values are described in the following sections.

8.2.3.2.1 Best and Worst Case Graph

The best and worst case analyses are based on vegetation height from the VITD dataset that the analyst selects. Area plot processing factors in the predominate height of the vegetation. That value is retrieved from the predominate height (PHT) attribute from the

vegetation forested area feature class. The PHT attribute is a range, and it therefore has a minimum and maximum value. For example, a vegetation forested area polygon with a value of 1 means that the PHT of the vegetation is between 0 and 2 meters. The Best Case analysis processes the minimum height of the PHT range (0 meters), and the Worst Case analysis processes the maximum value of the range (2 meters).

8.2.3.2.2 Visible, Partially Visible, and Masked Areas

The values for visible, partially visible, and masked areas are based on target height. If a target is 4 meters tall, it is considered visible if the observer can see all 4 meters of the target, partially visible if the observer can see only a part of those 4 meters, masked if the observer cannot see any part of the 4 meters. Masked areas appear red on the map; partially visible areas appear yellow; and fully visible areas appear green.

NOTE

Height should not be confused with altitude. If the target is an antenna that is 4 meters tall located at the top of a 3000-meter tall mountain, then the target height is 4 meters, and the target altitude is 3000 meters.

8.2.3.2.3 Fused and Combination Products

The fused product ignores the number of observers. Regardless of the number of observers, any area where a target can be fully seen by one or more observers is shaded green, any area where a target can be partially seen by one or more observers is shaded yellow, and any area where a target cannot be seen by any observer is shaded red.

The combination product is not fused, it varies in color by the number of observers. The combination product has multiple shades of red (masked), yellow (partially visible), and green (visible), based on the number of observers who can see or cannot see a target in the particular area. For example, if an analysis has three (3) observers, and there are areas where one (1) observer can see a target, areas where two (2) observers can see a target, and areas where three (3) observers can see a target, the product will contain up to three (3) shades of red, three (3) shades of yellow, and three (3) shades of green.

NOTE

Each color (red, yellow, and green) can display a maximum of 10 shades. If more than 10 observers are included in the product, the program starts assigning multiple observers per shade. A maximum of 26 observers per shade can be used.

In a product with three observers, areas where a target is visible to three observers are shaded dark green. Areas where a target is visible to two observers are shaded lighter green. Areas where a target is visible to one observer are shaded the lightest green. The same shading logic, only with yellow, applies to the partially visible areas, and with red for masked areas. The legend matches the shade with the number of observers.

NOTE

To use output from Visibility Plot in Data Query, select the Type attribute from the desired category.

8.2.4 Target Profile

Target Profile is used to calculate a line of sight between an observer location and a target location. Output from Target Profile consists of a profile line drawn on a flat map surface, as well as a graph that shows a side view of the line of sight between the observer and the target.

8.2.4.1 Creating a Target Profile

To create a Target Profile in DTSS, use the following steps.

1. With ArcMap open on the desktop, go to the **DTSS** menu and select ***Line of Sight/Target Profile***. The **LOS Target Profile—Introduction** window will appear (Figure 8-34).

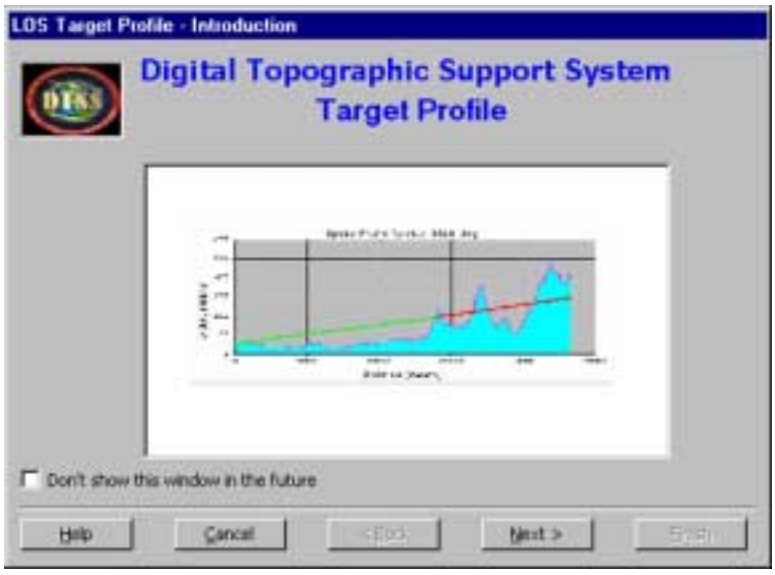


Figure 8-34 LOS Target Profile—Introduction Window

NOTE

*To skip the **LOS Target Profile—Introduction** window in the future, click the box next to the words "Don't show this window in the future," located in the lower left portion of the window.*

2. Click ***Next*** to continue. The **LOS Target Profile—Select Data** window will now appear (Figure 8-35).

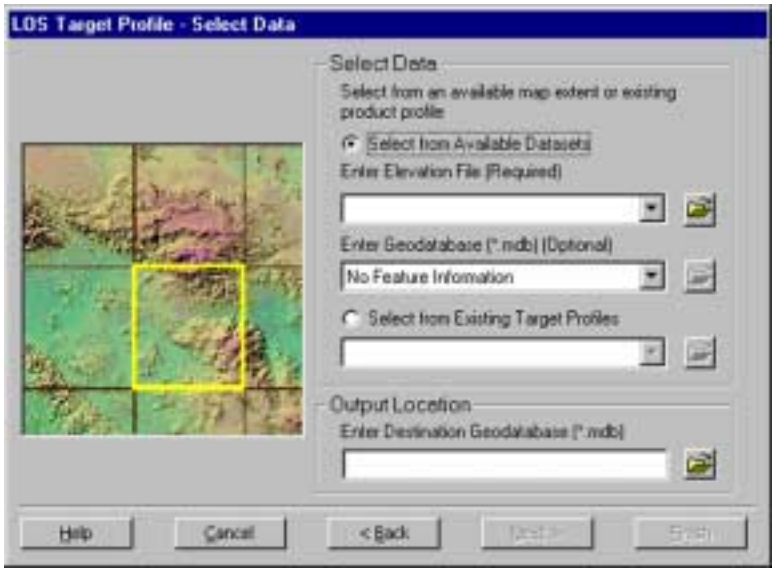


Figure 8-35 LOS Target Profile—Select Data Window

3. Select the input data from an available dataset or existing product profile by clicking the radio button next to "Select from Available Datasets" or "Select from Existing Target Profiles." If "Select from Available Datasets" is selected, proceed Substep a. If "Select from Existing Target Profiles" is selected, go on to Substep b.

   a. If "Select from Available Datasets" was chosen, use the following steps.

      1) Click the ***Open File*** button ( ) to the right of the "Enter Elevation" field to access the **Select an Elevation Data Set** window, shown in Figure 8-36. Acceptable elevation files are identified in Section 8.2.1.



Figure 8-36 Select an Elevation Dataset Window From Target Profile Wizard

2) Navigate to the appropriate elevation file, highlight it, and click ***Save*** to return to the **LOS Target Profile—Select Data** window (Figure 8-37). Notice the selected elevation file now appears in the "Enter Elevation" field and the "Enter Geodatabase (*.mdb)" field shows the text "No Feature Information."

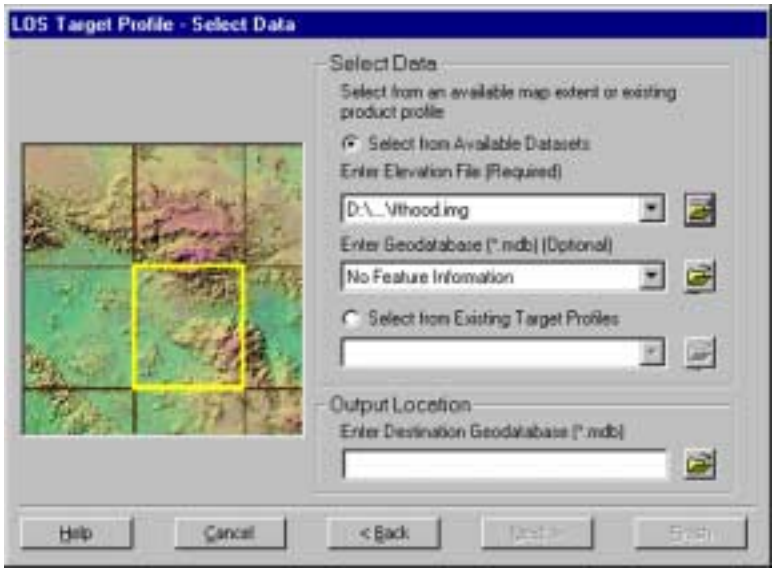


Figure 8-37 LOS Target Profile—Select Data Window

3) To add feature information from a VITD geodatabase, click the ***Open File*** button ( ) to the right of the "Enter Geodatabase (*.mdb)" field to access the **Select a Data Set** window shown in Figure 8-38. It is not necessary to enter a geodatabase to proceed to the next step of the wizard.

NOTE

If an ITD geodatabase is selected, the user will receive an error message, indicating that an unsupported format has been chosen. Click ***OK****, and then select a VITD geodatabase.*



Figure 8-38 Select a Data Set Window From LOS Target Profile Wizard

4) Navigate to the appropriate geodatabase (*.mdb*) file, and click ***Save*** to return to the **LOS Target Profile—Select Data** window (Figure 8-39). Notice the selected geodatabase file now appears in the "Enter Geodatabase (*.mdb)" field.

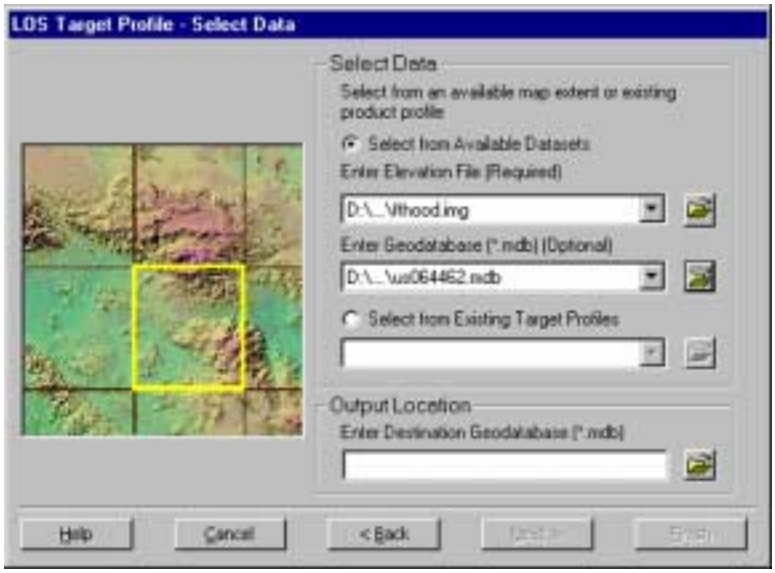


Figure 8-39 LOS Target Profile—Select Data Window

b. If "Select from Existing Target Profiles" was chosen, use the following steps.

1) Click the ***Open File*** button ( ) to the right of the "Select from Existing Product Profiles" field to access the **Open** window shown in Figure 8-40.

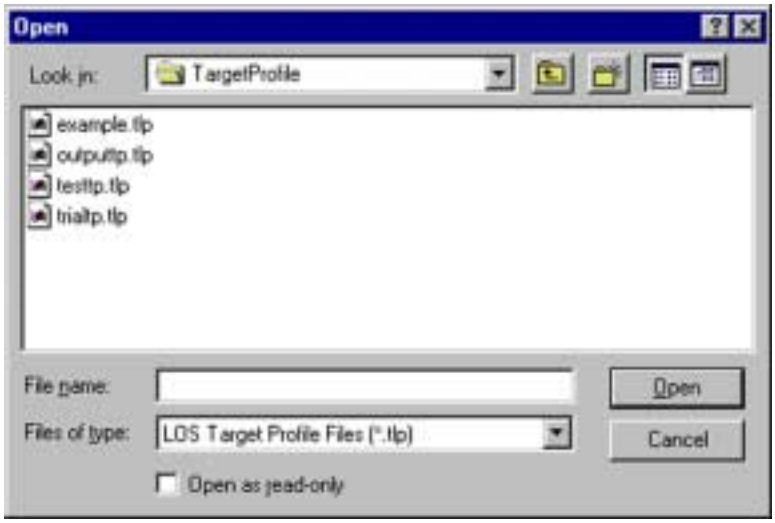


Figure 8-40 Open Target Profile Window From Target Profile Wizard

2) Navigate to the appropriate Target Profile (*.tlp*) file, and click ***Open*** to return to the **LOS Target Profile—Select Data** window (Figure 8-41). Notice the selected product profile file now appears in the "Select from Existing Target Profiles" field, and the information under the "Select from Available Datasets" radio button populates with the appropriate input data.

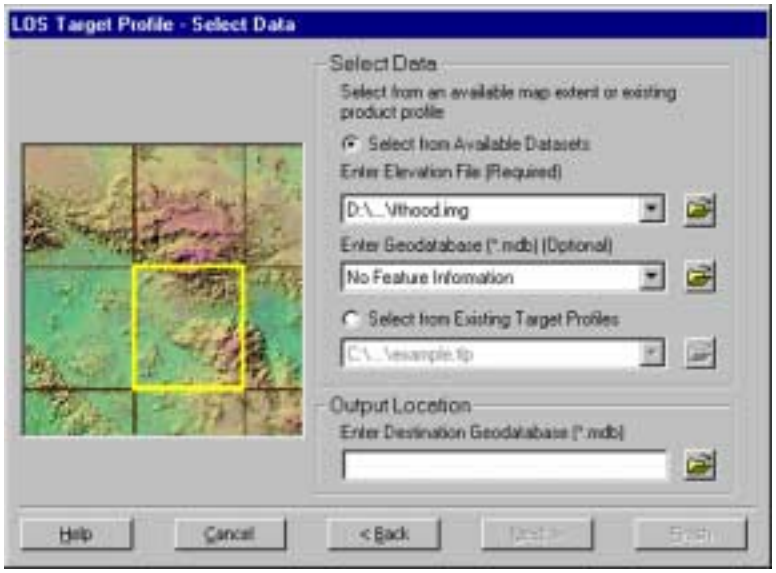


Figure 8-41 LOS Target Profile—Select Data Window

4. Enter an output location for the Target Profile by clicking the ***Open File*** button ( ) to the right of the "Enter Destination Geodatabase (*.mdb)" field to access the **DTSS Target Profile—Select new geodatabase location** window shown in Figure 8-42.



Figure 8-42 DTSS Target Profile—Select New Geodatabase Location Window

5. Enter a new geodatabase name in the "Object name" field, or navigate to the appropriate geodatabase (*.mdb*) file, and click ***Save*** to return to the **LOS Target Profile—Select Data** window (Figure 8-43). Notice the selected geodatabase file now appears in the "Enter Destination Geodatabase" field.

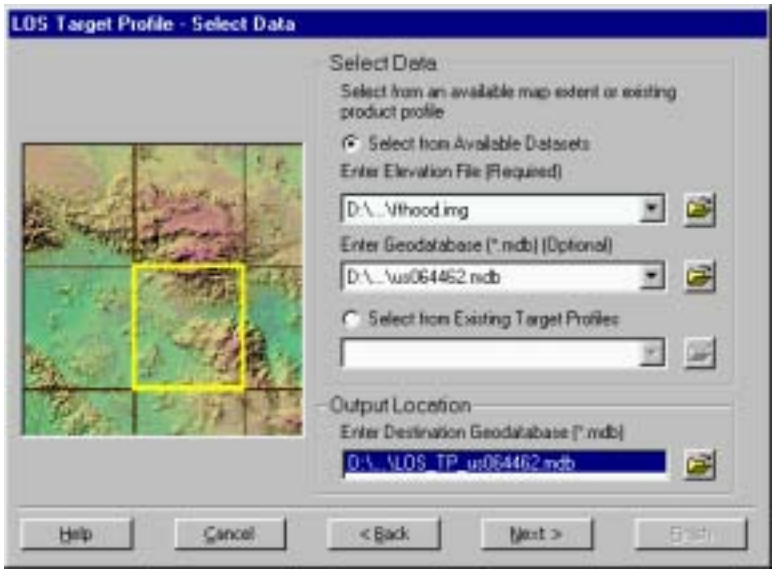


Figure 8-43 LOS Target Profile—Select Data Window

6. Click ***Next*** to continue. The **LOS Target Profile—Parameters** window will appear (Figure 8-44).

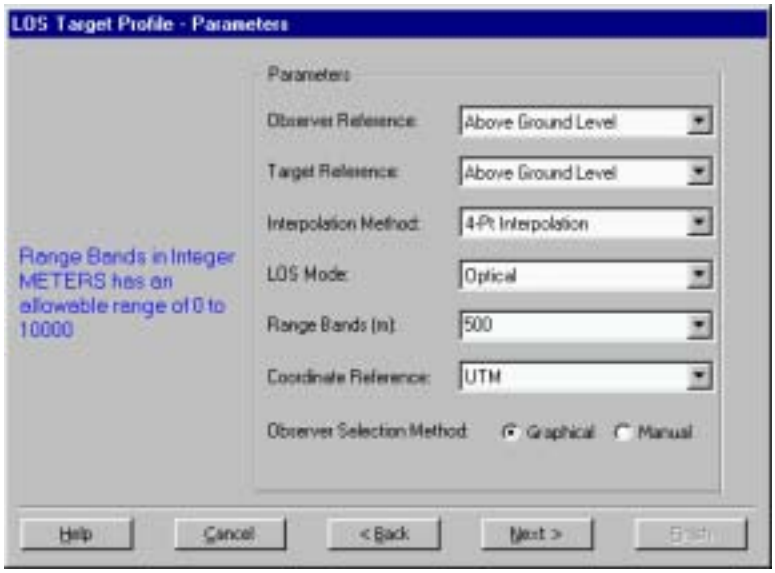


Figure 8-44 LOS Target Profile—Parameters Window

7. Select the appropriate parameters. For more information on any of the parameters, see Section 8.2.2, *Line of Sight Parameters*, or click in any field to bring up a description for that parameter in the left area of the window. Once all selections have been made, click ***Next***. Depending on which Observer Selection Method was chosen, the next window will be a map or wizard interface in which to enter observer and target locations and attribute information associated with the LOS analysis. If "Graphical" was selected, proceed to Substep a. If "Manual" was selected, go on to Substep b.

a. If the radio button next to "Graphical" was selected as the Observation Selection Method, the **DTSS—Target Profile—Observer Selection** window will appear (Figure 8-45).

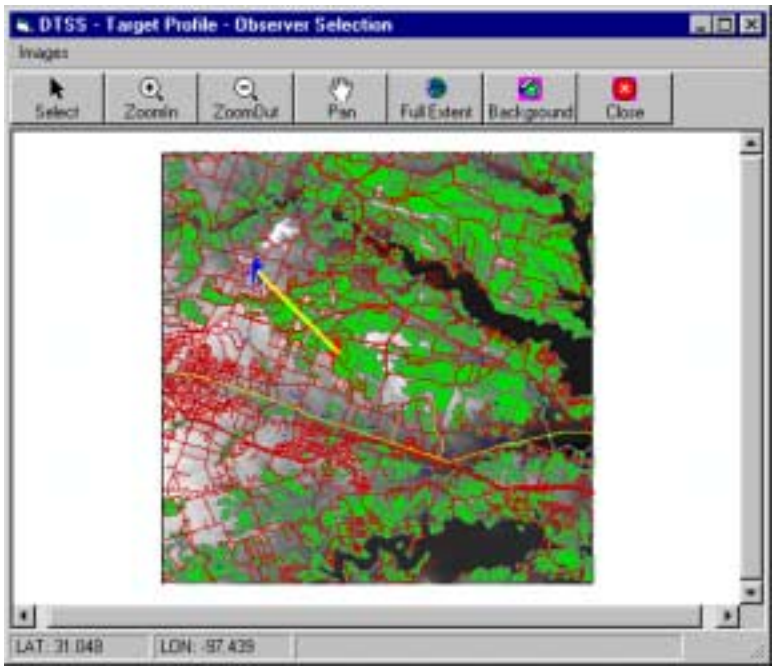


Figure 8-45 DTSS—Target Profile Observer Selection Window

1) This window displays a map of the image, geodatabase, and existing Target Profile product selected in the **LOS Target Profile—Select Data** window. If a geodatabase and/or existing product was not selected, they will not appear in the window. When the mouse is moved across the image, a crosshair symbol appears as the cursor. As the mouse is moved the coordinate location is shown in the bottom left corner of the window.

2) Use the tools from the toolbar to better view an area of the map. Table 8-6 shows each tool on the toolbar and gives a description of its functions.

Table 8-6 Graphical Observer Selection Window Toolbar Descriptions

Tool	Description
Select	Selects observer and target locations on the map. User can right click on a location to access a dropdown menu of editing functions.
ZoomIn	Zooms in on the data in the map. User can click and drag with the mouse to define a particular area to zoom in on.
ZoomOut	Zooms out the data in the map. User can click on a location to zoom out a fixed amount.

Table 8-6 Graphical Observer Selection Window Toolbar Descriptions (Cont'd)

Tool	Description
Full Extent	Returns map image to its original size.
Background	Accesses the **DTSS Target Profile—Select Background Image** window. Allows user to bring in a new background image.
Close	Closes current window and returns to **LOS Target Profile—Observer Parameters** wizard window.

3) To hide the images or layers displayed on the map, click the **Images** menu, and select the image or layer to show/hide. A check next to the image or layer means it will be displayed in the window.

4) If an existing Target Profile product was selected in the **LOS Target Profile—Select Data** window, target and observer locations will appear on the map with a yellow line connecting the two locations. The red symbol represents the target location, and the blue symbol represents the observer location. If a Target Profile product was not previously selected, no locations will appear on the map. To graphically add target and observer locations to the map, click the ***Select*** tool.

5) Click and drag the mouse to define the desired target and observer locations. When finished, the **DTSS—Observer Parameters** window will appear (Figure 8-46).

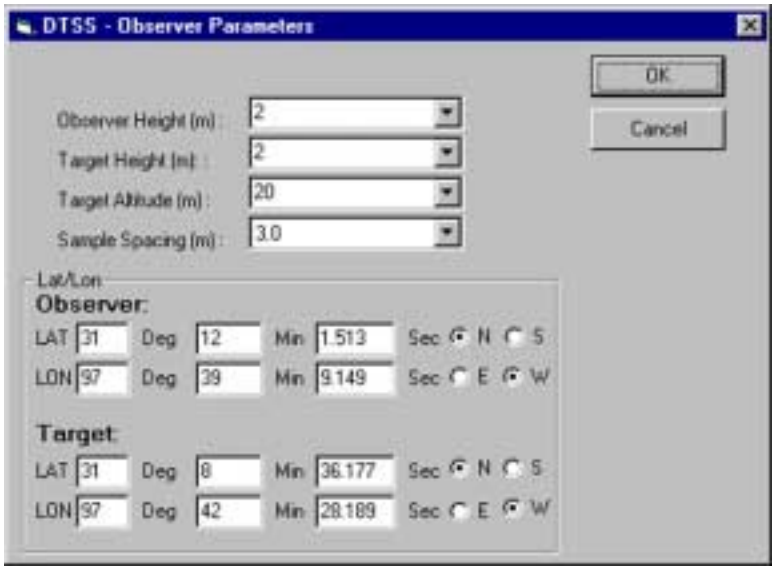


Figure 8-46 DTSS—Observer Parameters Window

6) Select the appropriate parameters. For more information on any of the parameters, see Section 8.2.2, *Line of Sight Parameters*, or click in any field to bring up a description for that parameter in the right area of the window.

7) Once all selections have been made, click ***OK***. The target and observer locations appear on the map with a yellow line connecting the two locations.

8) To delete any of the selected parameters or locations, right click on one of the target or observer symbols, and click ***Delete*** from the context menu shown in Figure 8-47. The target and observer locations are removed from the map.

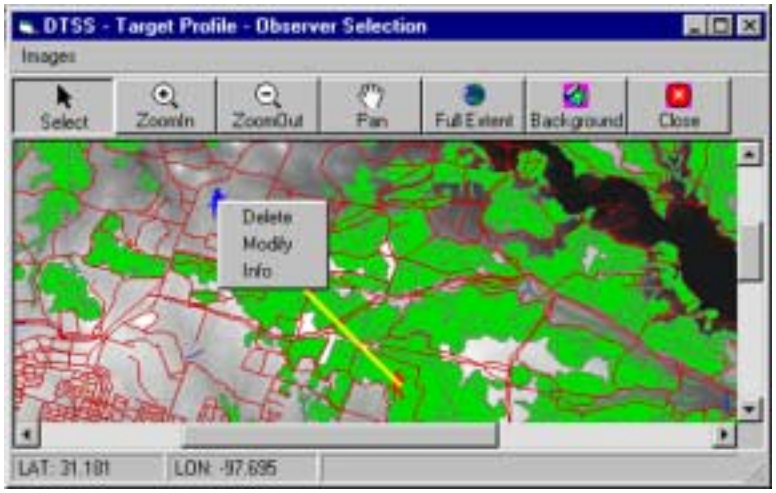


Figure 8-47 Context Menu in DTSS—Target Profile—Observer Selection Window

9) To modify the selected parameters or locations, right click on one of the target or observer symbols and click ***Modify*** from the context menu shown in Figure 8-47. The **DTSS—Observer Parameters** window will appear (Figure 8-46). Make the appropriate changes and click ***OK*** when finished. The target and observer locations are updated on the map.

10) To get parameter and location information on either of the target or observer symbols, right click the symbol and click ***Info*** from the context menu shown in Figure 8-47. The **DTSS—Observer Parameter Information** window will appear (Figure 8-48). Click ***OK*** when finished reviewing the information to return to the map.

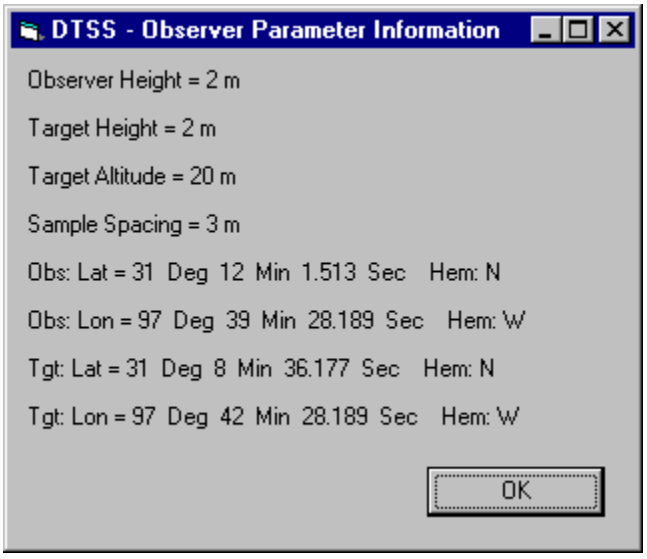


Figure 8-48 DTSS—Observer Parameter Information Window

11) Once all selections have been made, click ***Close*** from the toolbar. The **LOS Target Profile—Observer Parameters** wizard window will appear (Figure 8-49).

b. If the radio button next to "Manual" was selected as the Observer Selection Method, the **LOS Target Profile—Observer Parameters** wizard window will appear (Figure 8-49).

NOTE

*The **LOS Target Profile—Observer Parameters** window shown in Figure 8-49 will be different for each coordinate reference parameter (Lat/Lng, UTM, and MGRS) selected in the **LOS Target Profile—Parameters** window.*



Figure 8-49 LOS Target Profile—Observer Parameters

8. Select or modify the appropriate parameters. To save the parameters, click the **Save Profile** button located in the lower left part of the window. The current profile will be saved with a *.tlp* file extension. For more information on any of the parameters, see Section 8.2.2, *Line of Sight Parameters*, or click in any field to bring up a description for that parameter in the left area of the window.

9. Once all selections have been made, click ***Finish***. The LOS Target Profile TDA Wizard closes, and the application status bar appears indicating progress in processing (Figure 8-50).



Figure 8-50 Target Profile Line of Sight Window

10. The Target Profile may take up to 30 minutes or more to generate, depending on parameters and computer processing speed. When complete, the Line of Sight product will appear in ArcMap (Figure 8-51).

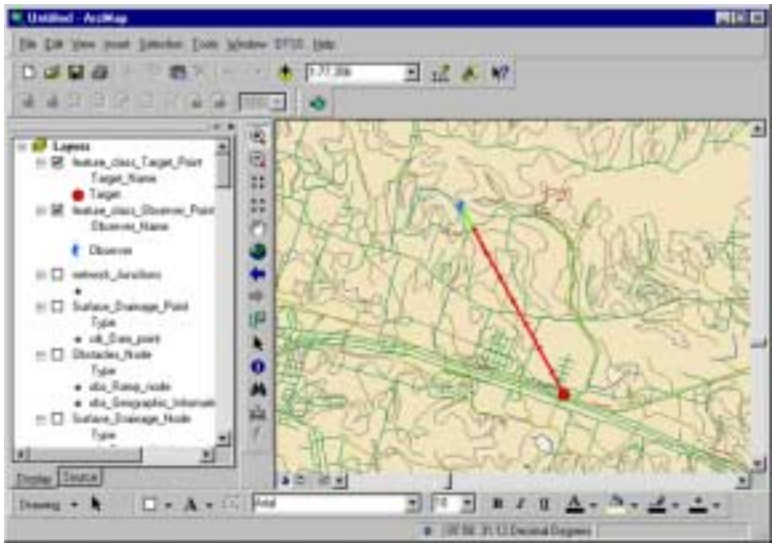


Figure 8-51 Target Profile Product Displayed In ArcMap

8.2.4.2 Target Profile Output

The Target Profile consists of an observer, a target, and a multi-colored line between the two. This line will be green in areas where the observer can see the entire target, yellow

where only a portion of the target is visible, and red where the entire target is masked. A sample Target Profile output appears above, in Figure 8-51.

In addition to the profile line being drawn on the ArcMap canvas, a graph of the results is created and stored as a bitmap (*.bmp*) file. This graph shows a side view of the profile to highlight the actual elevation of the terrain (and vegetation, if provided) and gives the user a different view of the profile. The area under the elevation uses the same color scheme as the line on the map. In addition, two lines are drawn from the observer (always located on the left) to the target. One is drawn from the observer to the top of the target, and the other from the observer to the bottom of the target. See Figure 8-52 for an example of a Target Profile graph.

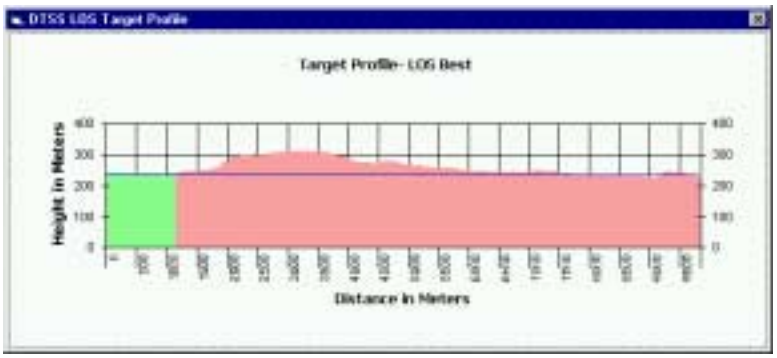


Figure 8-52 Target Profile Graph

The Target Profile graph is automatically added to the map elements if the Map Production Tool is used with a Target Profile. The graph itself can also be opened by double clicking on the *.bmp* file in Windows Explorer NT. For more information on displaying this graph with the DTSS Map Production Tool, refer to Section 10.2.6 of this document.

8.3 Data Query Overview

Data Query enables the DTSS analyst to tailor their analyses to their specific area-of-operation and to the data available for use. Using the Data Query Wizard, the analyst can build their own query from imported NIMA data or from other DTSS Mobility, Line of Sight, or Data Query products.

The Data Query Wizard supports two types of queries: Common and Personal. Thirty-six Common Queries are distributed with the software: 18 for use with VITD, and 18 for use with ITD. These queries cannot be deleted from the system. Provided Common Queries include the following: Aerial Concealment, Air Avenues of Approach, Avenues of Approach, Bivouac Sites, Construction, Construction Resources, Drop Zone, Field of Fire, Helicopter Landing Zone, Hydrology, Key Terrain, Linear Obstacles, Lines of

Communication, Soil Trafficability, Surface Materials, Tactical Routes, Transportation, and Vegetation.

NOTE

*The Common Queries distributed with the DTSS are **examples only** of the types of features, attributes, and values that might be selected for different types of TDAs. These queries may, or may not, be appropriate for a specific area-of-operation and/or mission. These system-provided queries cannot be moved, renamed, or deleted. Any user-created queries in the Common folder, however, may be copied, renamed, and deleted.*

Personal Queries are defined by the user and can only be accessed by the creator. Common Queries are available for use by all system users. Personal Queries can be moved and saved as Common Queries for use by all system users. The Query Manager, discussed in Section 8.3.3, allows the user to easily manage both Common and Personal Queries.

For each query, a *.ddq* file is created. These are text files containing detailed searchable information to facilitate location and selection of stored queries. A metadata template is automatically attached to a query, with fields for creation information (i.e., author name, date, phone number, e-mail, unit), update information (i.e., name, date, phone number, e-mail, unit, last run date), and description. The Query Manager provides an interface to easily store, organize, and distribute *.ddq* files. The following sections discuss the structure of queries, as well as the functionality of the Data Query Wizard and Query Manager.

NOTE

The DTSS Build 7 Data Query Wizard will only create and/or load geodatabases. Enhancements are planned for later versions so that other data formats, such as coverages and shapefiles, can also be used in the Data Query Wizard.

8.3.1 Data Query Structure

A Data Query consists of one or more *categories*, one or more *selections*, and one or more *feature queries*. Categories and selections define how the data is organized. Within each category, a selection is made; within each selection, a feature query is chosen. Feature queries have four parts: *layer*, *feature*, *attribute*, and *value*. A layer is a grouping of similar terrain features, such as Transportation Line. A feature is a feature type found

in the selected layer (Transportation Line), such as a road. An attribute narrows it down to a specific road characteristic, such as weather type. A value is the lowest level and describes the attribute, such as *All Weather*.

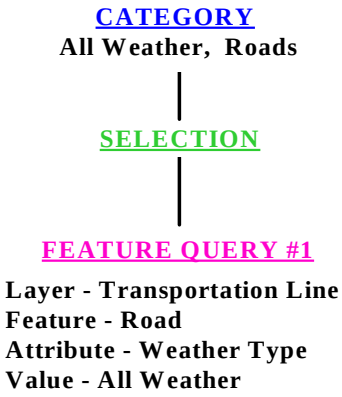


Figure 8-53 Simple Data Query

A simple Data Query, as illustrated in Figure 8-53, consists of one category, one selection, and one feature query. For this example, the category is *All Weather, Roads*. Feature queries within the same selection can be combined using the logical operator 'AND.' In this case, for a road to be selected, it must satisfy *all* feature queries. In the example shown in Figure 8-54, for a road to be selected, it must have values of *All Weather* AND *Hard/Paved*.

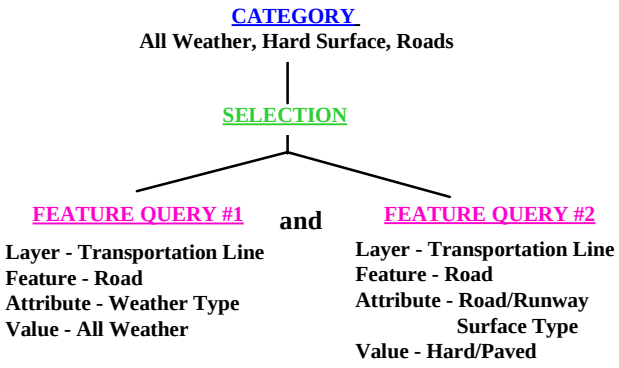


Figure 8-54 Data Query Logic (Logical 'AND')

Selections within the same category can also be combined using the logical operator 'OR.' In this case, for an area to be selected, it need satisfy only one of the selections. For example, if an analyst constructs a category that contains *All Weather* OR *Hard Surface Roads* criteria, the first selection would have a feature query with a feature of *Road* and a value of *All Weather*. The second would have a feature query with a feature of *Road* and

a value of *Hard Surface*. Therefore, for a feature to be selected, it could be *All Weather* or *Hard Surface*. This example is illustrated in Figure 8-55.

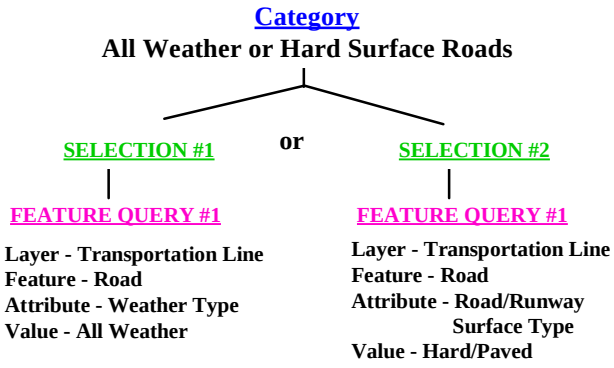


Figure 8-55 Data Query Logic (Logical 'OR')

8.3.2 Data Query Wizard

The DTSS Data Query Wizard is used to facilitate user-defined analyses. The Data Query Wizard provides the option to create a new query or to load an existing one. It gives the DTSS analyst the capability to select geodatabases and to modify the query by adding and removing datasets and features. At the end of the Data Query Wizard, the analyst can run and save the query, or run the query for viewing purposes only, without saving. The following sections outline how to create new and load existing queries using the Data Query Wizard.

8.3.2.1 Creating a New Query

Follow the procedure below to create a new data query using the DTSS Data Query Wizard.

1. With ArcMap open on the desktop, select ***DTSS/Data Query/Query Wizard*** from the main menu bar. The **DTSS—Data Query—Introduction** window will appear (Figure 8-56).



Figure 8-56 DTSS—Data Query—Introduction Window

NOTE

*To skip the **DTSS—Data Query—Introduction** window in the future, check the box next to the words "Skip this screen in the future" in the lower left corner of the window.*

2. Click ***Next*** to continue. The **DTSS—Data Query—Setup** window will appear (Figure 8-57).



Figure 8-57 DTSS—Data Query—Setup Window

3. Click the radio button beside "Create A New Query" in the "Query Selection" panel on the left side of the window.

4. Click ***Next*** to open the **DTSS Data Query—Data Source Selection** window (Figure 8-58).

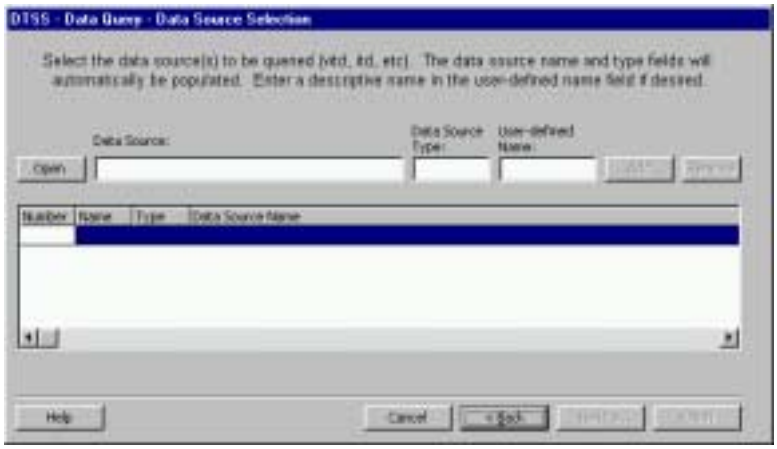


Figure 8-58 DTSS—Data Query—Data Source Selection Window

5. Now click ***Open*** to access the **Select a Data Source** window (Figure 8-59).

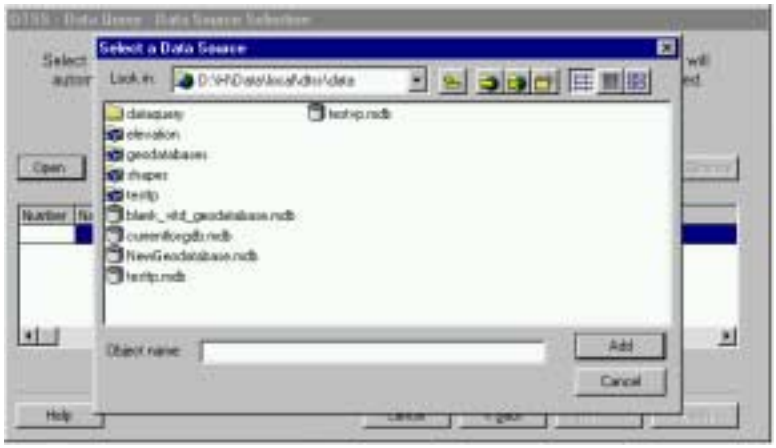


Figure 8-59 Select a Data Source Window in DTSS Data Query Wizard

6. Navigate to the appropriate dataset, and click ***Add*** to continue, returning to the **DTSS—Data Query—Data Source Selection** window (Figure 8-60).

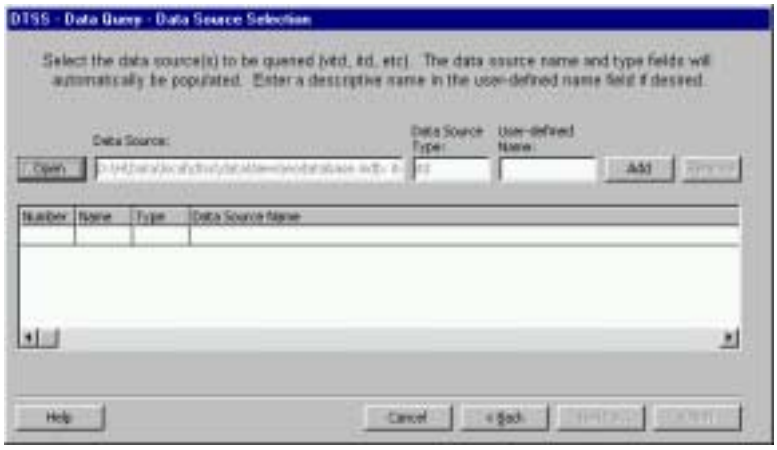


Figure 8-60 DTSS—Data Query—Data Source Selection Window

7. The selected dataset now appears in the "Data Source" field. If desired, enter text in the "User-defined Name" field to the left of the **Add** button. This field helps identify data sources whose filenames may not indicate contents.

NOTE

If the geodatabase entered for this query is not available, a "?" will display in the "Number" field, and a message will display, stating, "Geodatabase identified in query is not available. Select an appropriate geodatabase for the Data Source." *If this is the case, refer to Section 8.3.2.3,* Reassigning Data When Loading Queries.

8. Now click ***Add***. The data source will appear as a numbered entry in the table below the **Add** button (Figure 8-61). Continue adding data sources in this manner (geodatabases only) as needed.

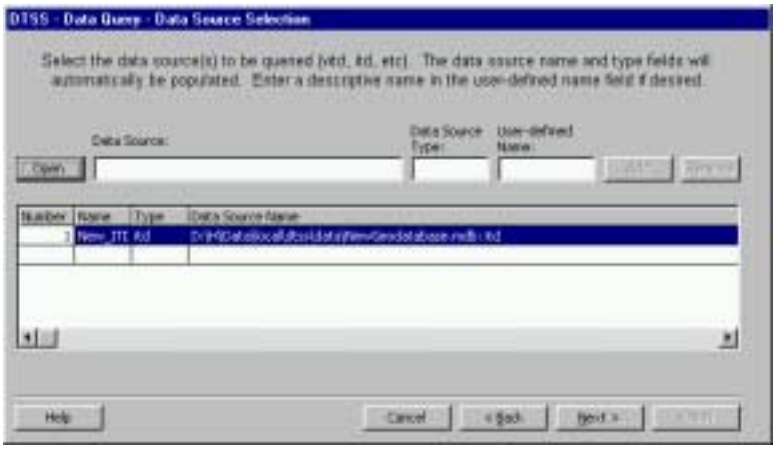


Figure 8-61 DTSS—Data Query—Data Source Selection Window

9. Click ***Next*** to continue to the **DTSS—Data Query—Query Builder** window (Figure 8-62). The selected data source appears in the "Data Source" dropdown menu on the left side of the window. The "Dataset and Features" panel is populated with the data source information for the data source selected in the dropdown box.

NOTE

If more than one data source was added in the ***Data Source Selection*** *window, all data sources will appear in the "Data Source" dropdown menu. Click the dropdown arrow to select the desired data source to work with. Note that the contents of the "Dataset and Features" panel differ, depending on the chosen data source.*

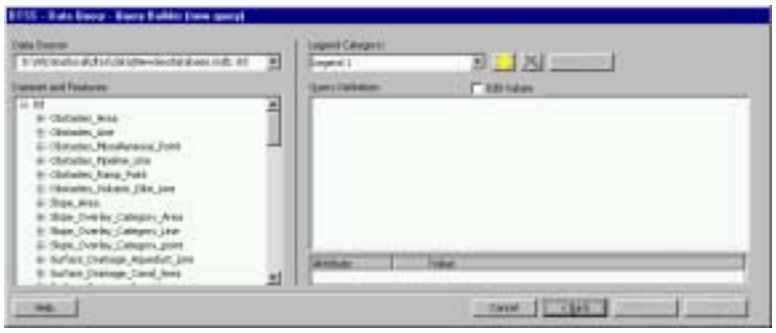


Figure 8-62 DTSS—Data Query—Query Builder Window

10. Because this is a new query, the wizard defaults to "Legend 1" as a title in the "Legend Category" field. This category indicates the data classification, such as farmland or forested area. Right click in the "Query Definition" panel below this field, and select ***Rename Legend*** from the context menu that appears. The **New Legend** window opens (Figure 8-63).



Figure 8-63 New Legend Window in Data Query Wizard

11. Type in a new name for the legend, and click ***Rename*** to accept the change and close the window. The new legend name appears in the "Legend Category" field of the **DTSS—Data Query—Query Builder** window.

NOTE

*To create a new legend, click the **Add Legend** button ( ), or right click in the "Query Definition" panel and select* **Add Legend** *from the context menu. To remove a legend, click the **Delete Legend** button ( ), or right click in the "Query Definition" panel and select* **Delete Legend** *from the context menu.*

12. Construct a query definition, or filter, by double clicking on the appropriate feature classes (or clicking the plus sign beside them) to access individual attributes. Drag and drop the desired attributes into the "Query Definition"

panel on the right side of the window (Figure 8-64). This creates filters, which are the sets of conditions using logical operators to narrow the search.

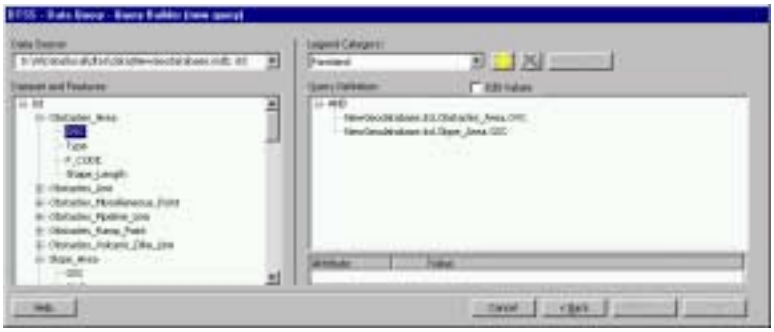


Figure 8-64 DTSS—Data Query—Query Builder Window

NOTE

By default, the DTSS Data Query Wizard uses the logical operator 'AND' for new attributes. To change an operator between 'AND' and 'OR,' right click the operator, and select the appropriate option from the context menu that appears.

13. To group attributes together, click on a desired attribute in the "Dataset and Features" panel on the left side of the window, and drag it over to an attribute in the "Query Definition" panel on the right side of the window, so that the existing attribute is highlighted. Dragging a new attribute from the "Dataset and Features" panel on top of an existing attribute in the "Query Definition" panel in this manner will group the two attributes together with an 'AND' logical operator.

14. Release the mouse button, and the attributes are lined up together as a new grouping.

15. To add an attribute to an existing group in the right panel, click and drag it over to a logical operator ('AND' or 'OR'), and release. This drag-and-drop capability is also possible for different attributes within the "Query Definition" panel, if it is necessary to move attributes among groups.

NOTE

It is recommended to plan these groupings ahead of time, before starting to move attributes, to avoid confusion and to save time.

16. To add filters from different data sources, click the dropdown arrow beside the "Data Source" field on the left side of the window. Then select the appropriate data source, and click and drag the desired attributes to the

appropriate group. Note that the wizard lists the data sources of the attributes to help differentiate them (Figure 8-65).

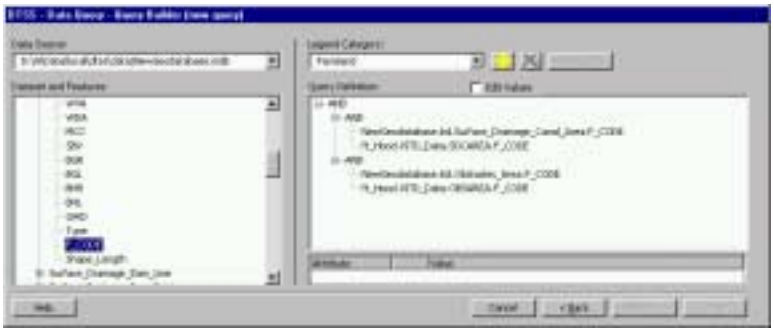


Figure 8-65 DTSS—Data Query—Query Builder Window

17. To edit the values for a filter (attribute), put a checkmark in the "Edit Values" box above the "Query Definition" panel, or right click the item in the "Query Definition" panel, and select ***Edit Filter*** from the context menu that appears (Figure 8-66).

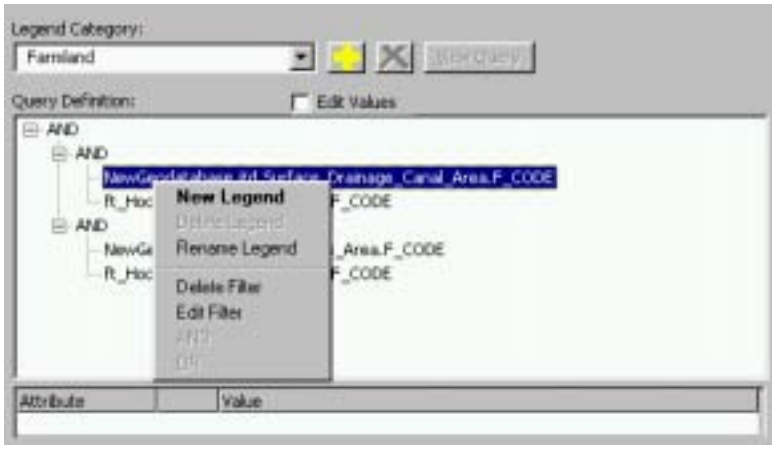


Figure 8-66 Context Menu From DTSS—Data Query—Query Builder Window

18. The fields at the lower right of the window will display information about the selected filter (Figure 8-67). Select or enter the appropriate Value for the selected Attribute.

Attribute		Value
VEG	=	<No Value Selected>

Figure 8-67 DTSS—Data Query—Edit Filter Fields

a. Click on the Logical Operator "=" to select a different operator, if "=" is not desired. A dropdown list of available operators is provided, including those listed in Table 8-7 below.

Table 8-7 Data Query Logical Operators and Definitions

Logical Operator	Definition
=	Attribute listed on left equals Value listed on right.
Not =	Attribute listed on left does not equal Value listed on right.
<	Attribute listed on left is less than Value listed on right.
<=	Attribute listed on left is less than or equal to Value listed on right.
>	Attribute listed on left is greater than Value listed on right.
>=	Attribute listed on left is greater than or equal to Value listed on right.

b. Click in the "Value" field to access a dropdown menu with a selection of available choices. Some attributes necessitate numeric entries or ranges. In the case of a range, for instance 10–20, the same Attribute must be selected twice, once where the Logical Operator is changed to ">=" and the Value is set to 10, and a second time where the Logical Operator is changed to "<=" and the Value is set to 20. These Attributes would be "ANDed," resulting in an evaluation of everything between 10 and 20.

NOTE

*In order to proceed from this window of the wizard, all attributes must be assigned values by editing them. When all attributes have been assigned valid values, the **View Query** button in this window becomes enabled. The user can then click this button to access a text version of the query in Notepad.*

19. Define the appropriate items for each attribute in the "Query Definition" panel, and click ***Next*** to continue. The **DTSS—Data Query—Run Options** window will appear (Figure 8-68).



Figure 8-68 DTSS—Data Query—Run Options Window

20. Click the radio button next to the appropriate run and save options.

    a. In the "Run Options" area, select either "Do not run query" or "Run Query." If "Run Query" is selected, a destination geodatabase is needed. Type in the filename of the desired geodatabase, or click the ***Open File*** icon ( ) and navigate to the desired directory and supply a geodatabase filename.

    b. Leave the check in the box next to "Display results in ArcMap" to view the query results after completing the DTSS Data Query TDA.

    c. In the "Save Options" area, specify whether or not to save the query by clicking the radio button next to the appropriate option. If "Save as Common Query" or "Save as Personal Query" is selected, enter a name for the query in the "Enter Query Name" field.

21. Click ***Finish*** to save and/or run the DTSS Data Query TDA. The **Data Query Status** window opens, indicating progress of the engine.

22. When the query engine is finished, the **Query Complete** window appears (Figure 8-69). Click ***OK*** to close this window and view results in ArcMap (if selected in previous window). Legends appear in the Table of Contents panel of ArcMap. Legends with checkmarks contain data, and those without checkmarks do not have data (i.e., query returned no information).



Figure 8-69 Query Complete Window

The DTSS Data Query Wizard will save the data as a *.ddq* file, unless the user has indicated not to save the query. The system stores the resultant dataset with the appropriate name and in the correct location before displaying it in ArcMap.

8.3.2.2 Loading and Modifying Existing Queries

Once a query has been saved to a *.ddq* file, the analyst can use and reuse the same query on different data sources to find similar information. If desired, the analyst can also load an existing query, modify it for special cases, and then save the query as a separate *.ddq* file. Follow the procedure below to load and modify an existing query.

1. With ArcMap open on the desktop, select ***DTSS/Data Query/Data Query*** from the main menu bar. The **DTSS—Data Query—Introduction** window will appear (Figure 8-70).



Figure 8-70 DTSS—Data Query—Introduction Window

NOTE

*To skip the **DTSS—Data Query—Introduction** window in the future, check the box next to the words "Skip this screen in the future" in the bottom left corner of the window.*

2. Click ***Next*** to continue. The **DTSS—Data Query—Setup** window will appear (Figure 8-71).



Figure 8-71 DTSS—Data Query—Setup Window

3. Click in the radio button next to either "Load Common Query" or "Load Personal Query" in the "Query Selection" panel on the left side of the window. Then select the appropriate file from the dropdown menu that has been activated. Notice that query file information appears in the "Description" box in the lower right-hand corner of the window.

4. Click ***Next*** to open the **DTSS Data Query—Data Source Selection** window (Figure 8-72). If the geodatabase used with this query is not available, a "?" will display in the "Number" field, and a message will display, stating,

"*Geodatabase identified in query is not available. Select an appropriate geodatabase for the Data Source*." If this is the case, refer to Section 8.3.2.3, *Reassigning Data When Loading Queries*.

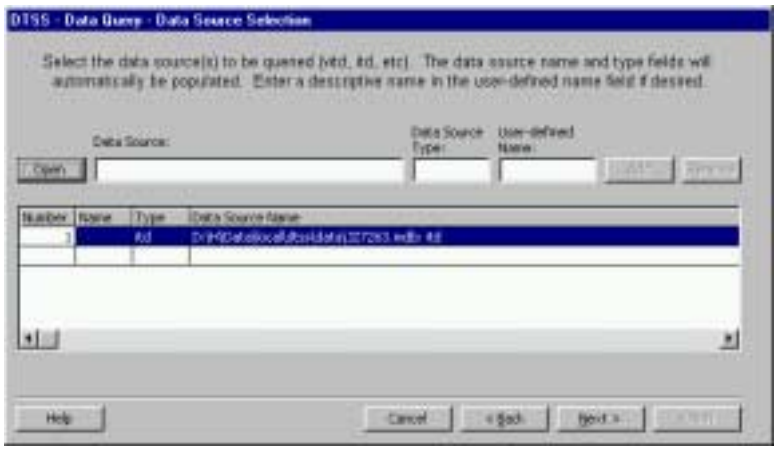


Figure 8-72 DTSS—Data Query—Data Source Selection Window

5. To open additional datasets, click the ***Open*** button and navigate to the desired directory and dataset(s) (Figure 8-73). Select the dataset, and click ***Add*** in the **Select a Data Source** window to return to the wizard.

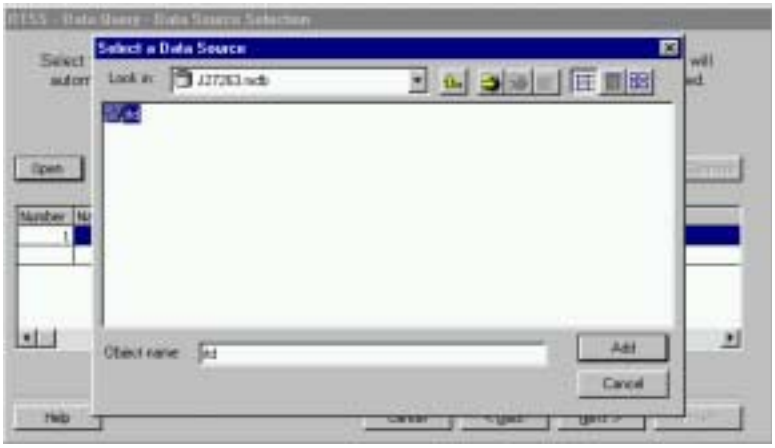


Figure 8-73 Select a Data Source Window

6. The new dataset appears in the "Data Source" field. If desired, type a name in the "User-defined Name" field to the left of the **Add** button. This field is useful when working with data sources whose filenames may not clearly indicate contents.

7. Click ***Add*** to include the data source in the table below the **Open** button. Continue adding data sources in this manner as needed.

8. Once all desired data sources have been added to the table in the **DTSS—Data Query—Data Source Selection** window, click ***Next*** to open the **DTSS—Data Query—Query Builder** window (Figure 8-74).

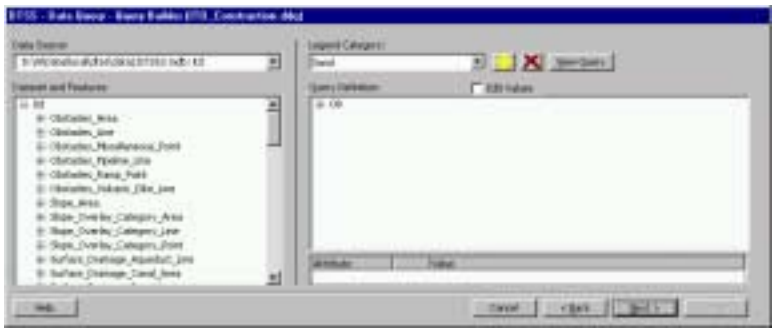


Figure 8-74 DTSS—Data Query—Query Builder Window

9. Note that the "Legend Category" field may already be populated. Click the dropdown arrow to access the categories available for this data source (Figure 8-75). If desired, right click in the "Query Definition" panel, and select ***Rename Legend*** from the context menu to assign a new name for any legend.

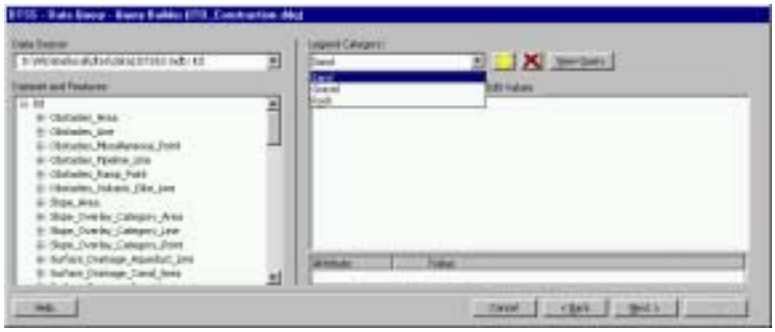


Figure 8-75 Legend Categories in Query Builder Window

NOTE

To create a new legend, click the ***Add Legend*** *button ( ), or right click in the "Query Definition" panel, and select* **Add Legend** *from the context menu. To remove a legend, click the* ***Delete Legend*** *button ( ), or right click in the "Query Definition" panel, and select* **Delete Legend** *from the context menu.*

10. Note that the logical operator(s) in the "Query Definition" panel may already be present, with plus sign(s) indicating that they contain information. Click the plus sign beside any operator to view the filters it contains (Figure 8-76).

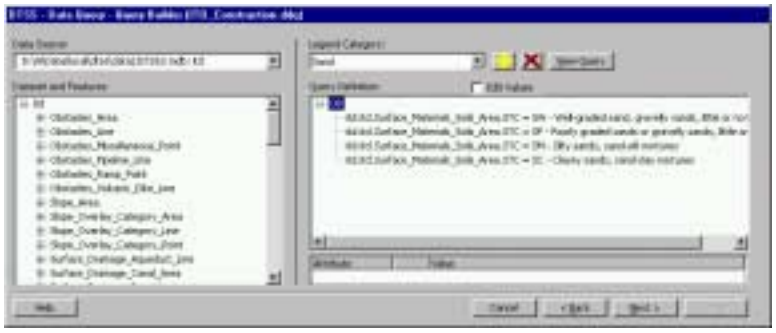


Figure 8-76 Filters Displayed in Query Builder Window

11. If desired, modifications can be made to an existing query by clicking and dragging additional attributes from the "Dataset and Features" panel to the appropriate logical operator in the "Query Definition" panel.

NOTE

For more information on these modification procedures, refer to Steps 12–18 in Section 8.3.2.1, Creating a New Query.

12. Once modifications are complete and attribute values have been assigned, click ***Next*** to access the **DTSS—Data Query—Run Options** window (Figure 8-77).



Figure 8-77 DTSS—Data Query—Run Options Window

13. Click the radio button next to the appropriate run and save options.

    a. In the "Run Options" area select the radio button next to either "Do not run query" or "Run Query." If "Run Query" is selected, a destination geodatabase is needed. Type in the filename of the desired geodatabase, or click the **File Open** icon ( ) and navigate to the appropriate geodatabase file.

b. Leave the check in the box next to “Display results in ArcMap” to view the query results after completing the DTSS Data Query TDA.

c. In the “Save Options” area specify whether or not to save the query by clicking the radio button next to the appropriate option. If “Save as Common Query” or “Save as Personal Query” is selected, the query name will automatically appear in the “Enter Query Name” field.

NOTE

A Common Query cannot be overwritten.

14. Click ***Finish*** to save or run the DTSS Data Query TDA. The **Data Query Status** window opens, indicating progress in processing. This process may take several minutes.

15. When the query engine is finished, the **Query Complete** window appears (Figure 8-78). Click ***OK*** to close this window and view the query results in ArcMap (if selected in the previous window).



Figure 8-78 Query Complete Window

16. If selected in the previous window, the wizard closes and returns to the ArcMap main window (Figure 8-79). Notice that legends appear in the Table of Contents panel of ArcMap. Legends with checkmarks contain data, and those without checkmarks do not have data (i.e., query returned no information).

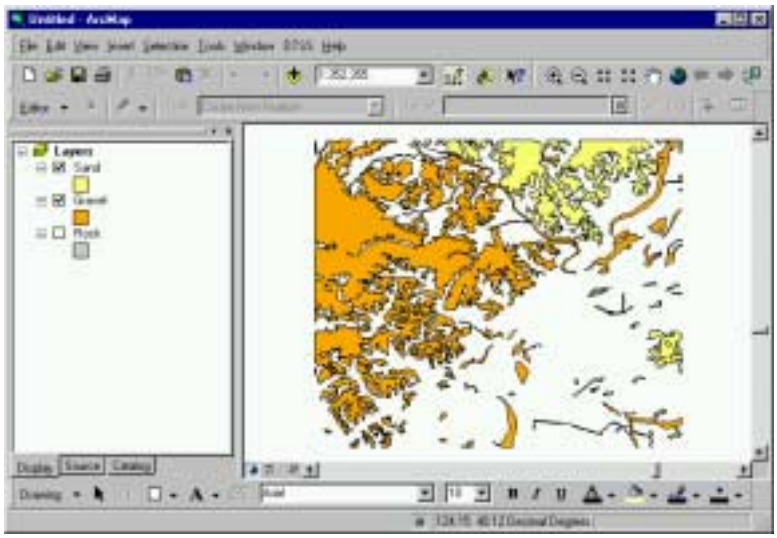


Figure 8-79 DTSS Data Query Results in ArcMap

The Data Query Wizard will save the data query as a *.ddq* file, unless the analyst has chosen not to save the query. The system stores the resultant dataset with the appropriate name and in the correct location before displaying it in ArcMap.

8.3.2.3 Reassigning Data When Loading Queries

If the data source location has changed or is not valid, a message will appear (Figure 8-80), indicating this, and a "?" will display in the "Number" column in the **Data Source Selection** window. In this case, the user must change the data source using the procedure below.

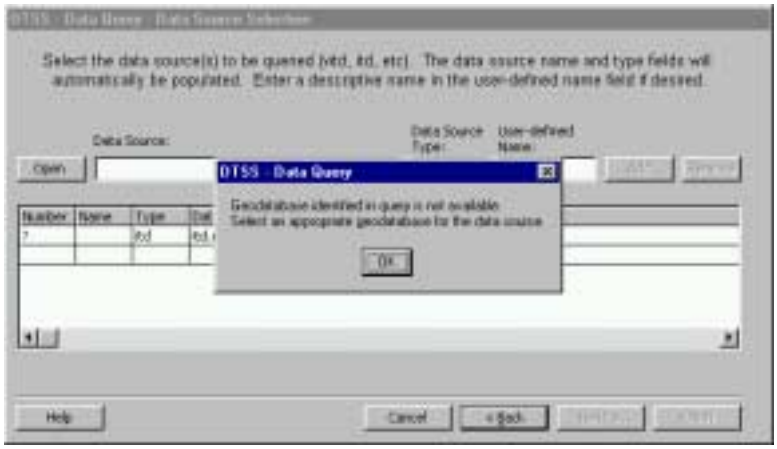


Figure 8-80 DTSS—Data Query Error Message

1. Click ***OK*** to close the **DTSS-Data Query** message window. Then click on the invalid dataset listed in the "Data Source Name" field. The data source name will appear grayed out in the "Data Source" field (Figure 8-81).

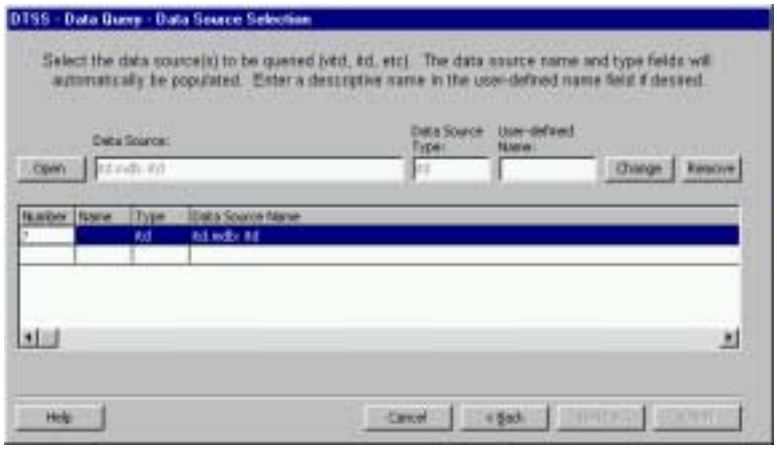


Figure 8-81 DTSS—Data Query—Data Source Selection Window

2. Click ***Open*** to navigate to and select a valid dataset (Figure 8-82), and then click ***Add***, returning to the **DTSS—Data Query—Data Source Selection** window.

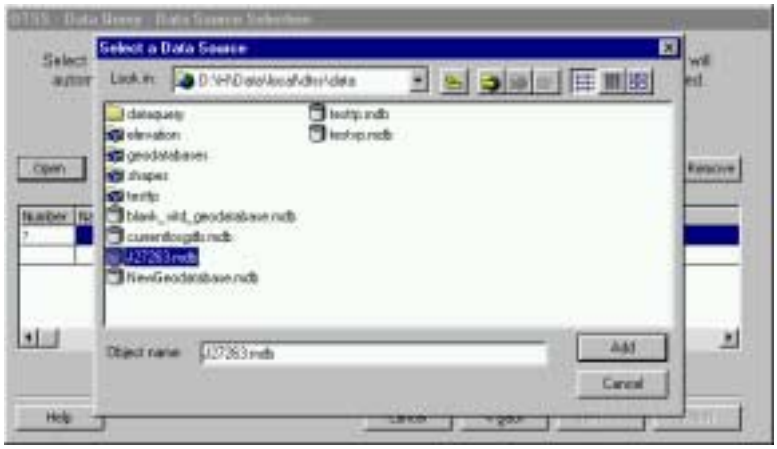


Figure 8-82 Select a Data Source Window

3. The new dataset will appear in the "Data Source" field. If desired, type a name in the "User-defined Name" field. This field is useful when working with data sources whose filenames may not clearly indicate contents.

4. Notice that the **Add** button in this window is now labeled **Change** (Figure 8-83). Click the ***Change*** button to include the new dataset.

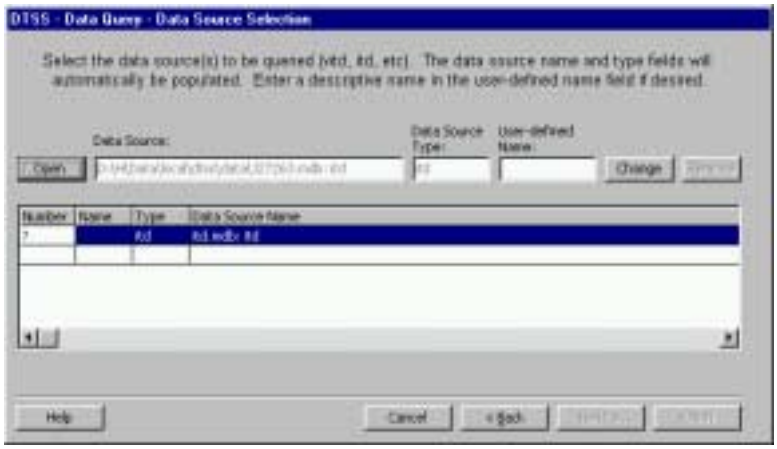


Figure 8-83 DTSS—Data Query—Data Source Selection Window

5. The new dataset appears in the table below the **Change** button (Figure 8-84), and the **Next** button is now enabled. Click ***Next*** to proceed to the **Query Builder** window, described in Section 8.3.2.2 above, steps 8–16.

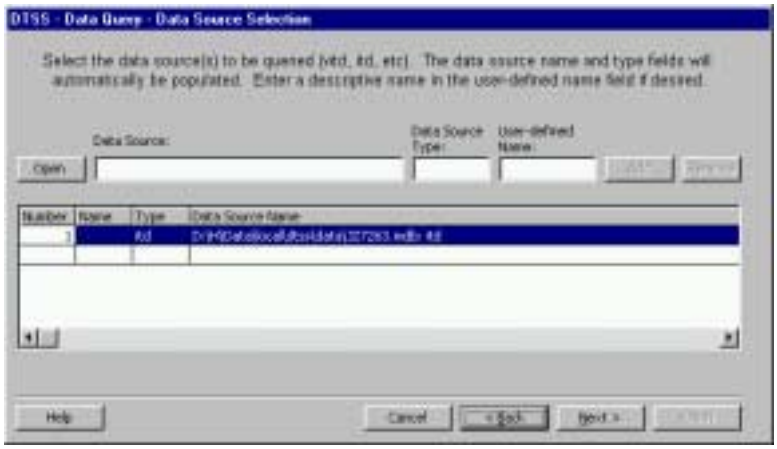


Figure 8-84 DTSS—Data Query—Data Source Selection Window

NOTE

*The steps outlined above can be used to change any dataset for any reason. Accordingly, the **Add** button will read **Change**.*

8.3.2.4 Querying Existing Products

Data Query can be used to query Mobility, Line-Of-Sight, and Data Query Products. Attributes and values used in the Mobility and Line-Of-Sight products are pre-defined because they use custom geodatabases making it fairly easy to query the product categories.

Products created from Data Query do not use custom geodatabases. The attributes in the output Data Query categories reflect the same attributes used in the original query. If the Analyst wishes to select an entire category, such as Acceptable HLZs, it is necessary to select a NUMERIC attribute of the category (for example, Shape_Length), and set the value to > 0.

8.3.2.5 Data Query Output

A sample data query output is shown in Figure 8-85. The ranges depicted by the different layers in the Table of Contents panel reflect the legends defined in the **Query Builder** window of the Data Query Wizard. To access these settings, open the pertinent *.ddq* file in Notepad for a text-version view.

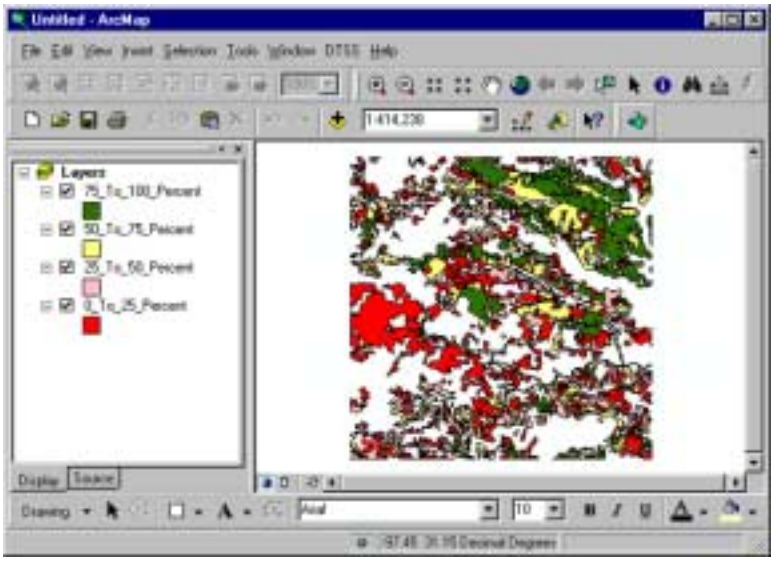


Figure 8-85 Sample Data Query Output in ArcMap

To change ranges and colors for these layers, right click on any layer, and select ***Properties*** from the context menu. Then click the **Symbology** tab in the **Properties** window to modify settings. For more information on adjusting a feature's symbology, refer to Section 10.1.2, *Symbology*. For more information on displaying a DTSS TDA as a finished map in an ArcMap document, see Section 10.2.6, *DTSS Map Production Tool*.

8.3.3 Query Manager

The Query Manager allows the DTSS analyst to store queries in a directory that can be accessed in the future to copy, delete, move, import from, or export to another directory or location. All query files have a *.ddq* extension.

To open the Query Manager, pull down the **DTSS** menu in the ArcMap window and select ***Data Query/Query Manager***. The **DTSS—Query Manager** window will appear (Figure 8-86).

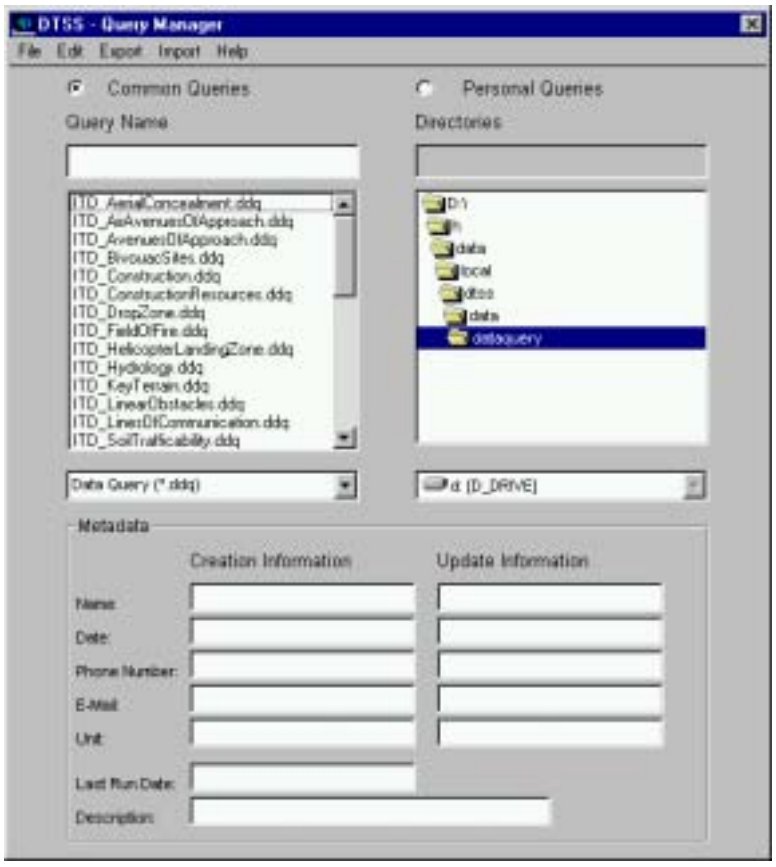


Figure 8-86 DTSS—Query Manager Window

Note the two radio button options at the top of the window: "Common Queries" and "Personal Queries." Common Queries are available to all DTSS users, whereas Personal Queries are used only by a specific DTSS analyst with a password. Metadata associated with the query is displayed at the bottom of the window.

The Query Manager has a variety of functions described in Table 8-8. More complicated functions, such as Search, Export, and Import, are covered in more detail in Sections 8.3.3.1 through 8.3.3.3.

Table 8-8 Query Manager Functions

Function	Description
View	Appears on the Query Manager **File** menu. Opens the selected query in a Notepad document. User can print the query from this document.
Delete	Appears on the Query Manager **File** menu. Deletes an existing query. See note below.

Rename	Appears on the Query Manager **File** menu. Renames an existing query. See note below.
Refresh	Appears on the Query Manager **File** menu. Lists all queries stored in the common/personal directory.

Table 8-8 Query Manager Functions (Cont'd)

Function	Description
Exit	Appears on the Query Manager **File** menu. Closes the Query Manager.
Copy	Appears on the Query Manager **Edit** menu. Copies queries from either the common or personal directory to the other.
Move	Appears on the Query Manager **Edit** menu. Moves personal queries to the common directory.
Search	Appears on the Query Manager **Edit** menu. Searches queries for a string entered by the user.
Export	Copies a query to a removable drive; creates an e-mail message with the query as an attachment; copies the query to another directory.
Import	Copies a query from a removable drive; lists all e-mails that contain a query attachment for the user to import desired queries; copies from another directory.
Help	Accesses DTSS online Help.

NOTE

Predefined common queries that come with DTSS cannot be deleted, renamed, or moved. However, newly created queries saved in the Common folder can be deleted and renamed.

8.3.3.1 Searching Queries

The **Search** command on the Query Manager **Edit** menu allows the DTSS analyst to search for specific queries. Follow the steps below to use the search function in the DTSS Query Manager.

1. Once the DTSS Query Manager has been activated, select ***Edit/Search*** from the main menu bar. The **DTSS—Data Query Search** window will appear (Figure 8-87).

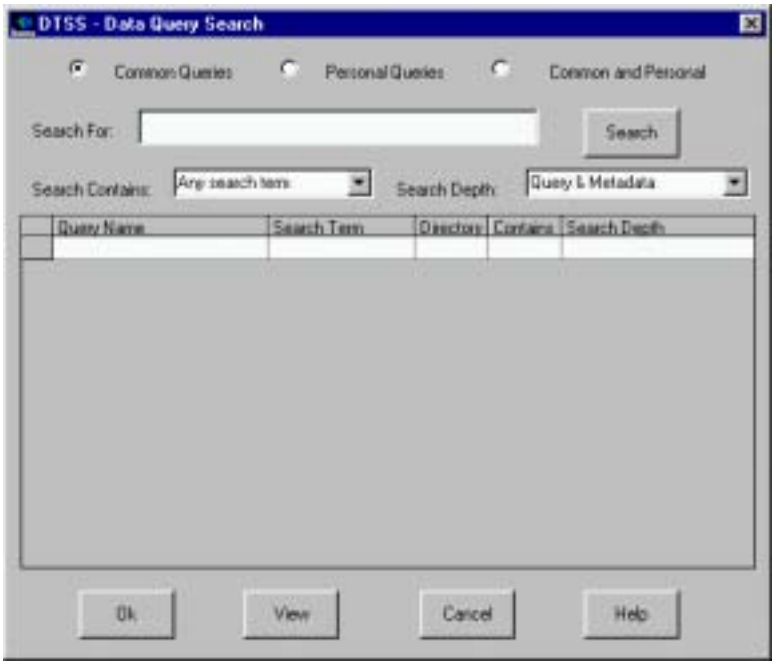


Figure 8-87 DTSS—Data Query Search Window

2. Select to search under a "Common Queries," "Personal Queries," or "Common and Personal" by clicking the appropriate radio button.

3. In the "Search For" field, type in a search string for the desired query.

4. In the "Search Contains" field, select an item from the dropdown menu. A search string can be made up of multiple strings separated by spaces. Select from the following keyword search options:

   - Any search term—A match occurs if at least one search string is located in the query file.
   - All search terms—A match occurs only if all search strings are located in the query file.

5. In the "Search Depth" field, select an item from the dropdown menu. Select from three possible search depths:

   - Query & Metadata—The entire query file and the filename are searched.
   - Query Name & Description—The "Description" metadata field in the query file and the filename are searched.
   - Query Name Only—Only the query's filename is searched.

6. Click the ***Search*** button. The queries defined by the search will be displayed in the **DTSS—Data Query Search** window (Figure 8-88). A message box is displayed if no matches are found.

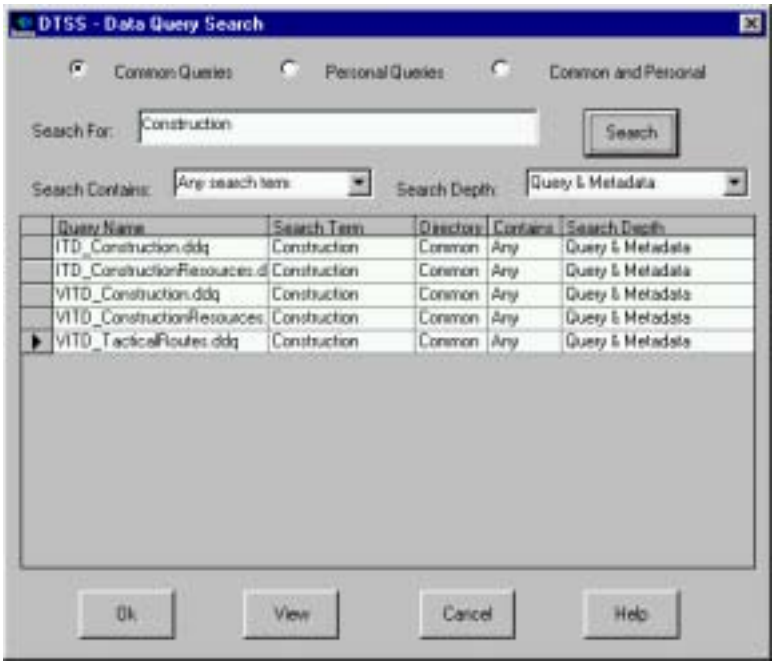


Figure 8-88 DTSS—Data Query Search Window With Results

7. Select the appropriate query by clicking on it. Then click ***OK*** to bring the query into the Query Manager, where the query can be moved, copied, renamed, printed, or exported as needed.

For more information on building data queries in DTSS, refer to Section 8.3.2, *Data Query Wizard*.

8.3.3.2 Exporting Queries

The **Export** menu in the DTSS Query Manager allows the analyst to copy a query to a removable drive or another directory, or to create an e-mail message with the query as an attachment. The following sections cover this functionality.

8.3.3.2.1 Exporting to Drive or Directory

Perform the following steps to export a data query file to another directory or drive.

1. Once the DTSS Query Manager has been activated, highlight the file to export, and then select ***Export/To Directory*** from the main menu bar to open the **Export Directory** window (Figure 8-89).



Figure 8-89 Export Directory Window

2. Navigate to the appropriate directory or drive and click ***Save*** to continue. The file is exported to the appropriate location and returns the analyst to the **Query Manager** window.

8.3.3.2.2 Exporting to E-mail

The analyst may wish to export the pertinent query as an e-mail attachment. Perform the following steps to create an e-mail message with the query as an attachment.

NOTE

If the user is not already running an e-mail program, such as Microsoft Outlook, a message will appear prompting for an appropriate program to be opened.

1. Once the Data Query Manager has been activated, highlight the file to export, and then select ***Export/To E-Mail*** from the main menu bar. The **DTSS EXPORT E-Mail** window will appear (Figure 8-90).

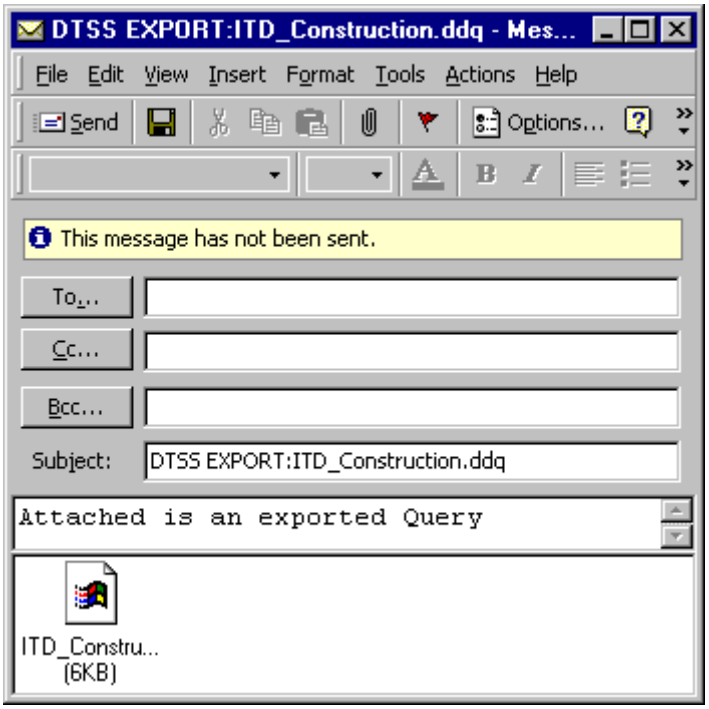


Figure 8-90 DTSS EXPORT E-Mail Window

2. Enter the e-mail address in the "To" field, and click the ***Send*** button to export the attached data query file.

8.3.3.3 Importing Queries

The **Import** menu in the DTSS Query Manager allows the DTSS analyst to copy a query from a removable drive or another directory, or list all e-mail messages that contain a query attachment to bring into the Query Manager. The following sections cover this functionality.

8.3.3.3.1 Importing From Drive or Directory

The analyst can use the following steps to import a data query file from another directory or drive into the DTSS Query Manager.

1. Once the Data Query Manager has been activated, select ***Import/From Directory/To Common*** to import to a common query, or ***Import/From Directory/To Personal*** to import to a personal query. The DTSS **Import Common** or **Import Personal** window will appear (Figure 8-91).



Figure 8-91 Import Common Window

2. Navigate to the appropriate directory or drive and click ***Open*** to continue. The file is imported into the "File Name" field at the top left of the **Query Manager** window.

8.3.3.3.2 Importing From E-mail

To import from e-mail, perform the following steps to create a list of e-mail messages that have queries as attachments.

NOTE

If the user is not already running an e-mail program, such as Microsoft Outlook, a message will appear prompting for an appropriate program to be opened.

1. Once the Data Query Manager has been activated, select ***Import/From E-Mail*** from the main menu bar. The **DTSS—Data Query Import From E-mail** window will appear (Figure 8-92).

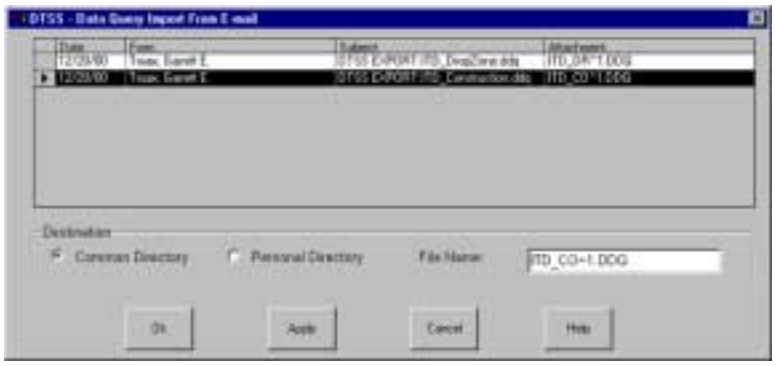


Figure 8-92 DTSS—Data Query Import From E-mail Window

2. Any e-mail message in the user's inbox that has an attachment with a *.ddq* extension is retrieved. Select the appropriate query by highlighting it, and the filename appears in the "File Name" field in the lower right area of the window. Because filenames are truncated to eight characters, it is possible to rename the file in this field before proceeding.

3. Click ***OK*** to bring the query into the Query Manager, where the analyst can perform necessary operations on the query.

For more information on building queries, refer to Section 8.3.2, *Data Query Wizard*.

8.3.4 Creating Queries From Multiple DTSS Products

Previously created DTSS vector products can be queried using the DTSS Data Query Wizard to create a new vector product. For example, the analyst can find all helicopter landing zones in masked areas and determine areas where a helicopter could land and not be seen by an observer. This product is built in the same way as other Data Query products, using Categories, Selections, and Feature Queries. To create a product from the two DTSS TDAs (Helicopter Landing Zones in Data Query and Masked Area Plot in Line of Sight), use the following steps.

1. Create a query for helicopter landing zones with the Data Query Wizard and then save the query. See Section 8.3, *Data Query Overview* for more information on constructing and saving queries.

2. Create a Line of Sight Visibility Plot with the Line of Sight Visibility Plot TDA and then save the product. See Section 8.2, *Line of Sight Overview* for more information on creating and saving a Visibility Plot.

3. Build a new query with the Data Query Wizard using the products saved from steps one and two. See Section 8.3, *Data Query Overview* for more information on constructing and saving queries.

4. The output of the new query will be a single product. This query can be saved so it can be used again at a later time.

8.4 Slope Generator

The DTSS Slope Generator takes an elevation data set in ERDAS Imagine (*.img*) format and creates an ArcInfo geodatabase (*.mdb*) file. The elevation data must be in UTM coordinates. The Slope Generator has ITD, VITD, and DTOP output options. Output from the Slope Generator is in geographic coordinates.

NOTE

The DTOP option is not operational at this time.

Selection of any of the ITD or VITD options will create a geodatabase that stores slope information in the format specified by the user. The database structure (table and fields) is populated differently, depending on the output format. Both ITD and VITD have the same basic slope categories, but the internal codes associated with those ranges (found in a specific field in the geodatabase) are different. Table 8-9 shows a brief description of each of the ground slope codes (GSC) for ITD and VITD.

Table 8-9 Internal Codes for Slope Generator Values

ITD	
GSC	**Value**
0	Unknown
1	0% to <= 3%
2	> 3% to <= 10%
3	> 10% to <= 20%
4	> 20% to <= 30%
5	> 30% to <= 45%
6	> 45%
7	Naturally or culturally dissected
VITD	
GSC	**Value**
0	Unknown
1	Naturally or culturally dissected
2	0% to <= 3%
3	> 3% to <= 10%
4	> 10% to <= 20%
5	> 20% to <= 30%
6	> 30% to <= 45%
7	> 45%

Use the following steps to run the DTSS Slope Generator.

1. With ArcMap open on the desktop, select ***DTSS/Utilities/Slope Generator*** from the ArcMap menu bar. The **Generate Slope Product** window will appear (Figure 8-93).



Figure 8-93 Generate Slope Product Window

2. Click the **Open File** button ( ) next to the "Enter Elevation File (*.img)" field. The **Select ERDAS Elevation File** window will appear (Figure 8-94).

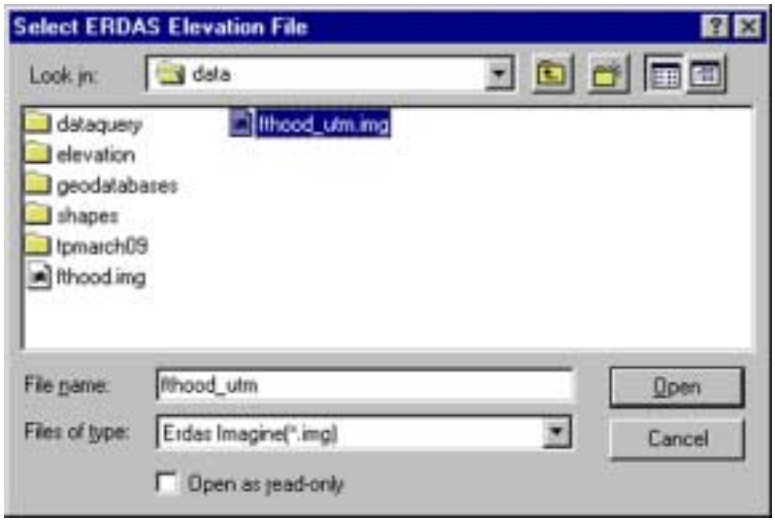


Figure 8-94 Select ERDAS Elevation File Window

3. Navigate to the directory that contains the input elevation (*.img*) file, select the desired file, and click ***Open*** to return to the **Generate Slope Product** window. The selected information appears in the "Enter Elevation File (*.img)" field and in the map preview area in the top left portion of the window (Figure

8-95). The map provides a preview of the geographic extents for the elevation file and provides a geographic readout when the mouse cursor is moved over the map area.

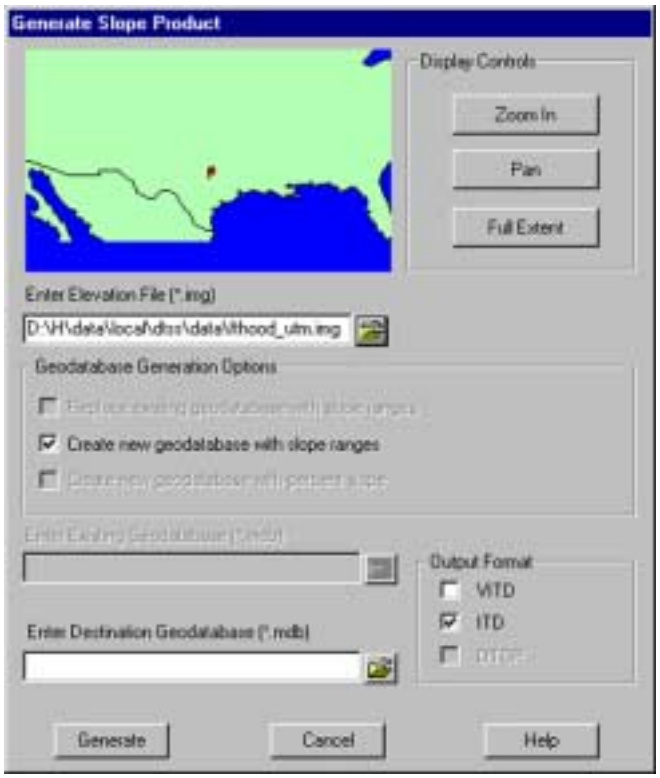


Figure 8-95 Generate Slope Product Window Showing Selected Elevation File

4. Use the buttons in the "Display Controls" box to view the map area shown in the top left portion of the window. The functions of each button are covered below.
   - **Zoom In**—Zooms in on an area of the map. User can click and drag with the mouse to define a particular area to zoom in on.
   - **Pan**—Pans the view of the area displayed on the map. User can hold down the mouse and drag the display in any direction.
   - **Full Extent**—Returns map image to its original size.
5. Select the appropriate method for generating the geodatabase in the "Geodatabase Generation Options" box. At this time, only the "Create new geodatabase with slope ranges" option is available.
6. Select the appropriate data type in the "Output Format" box. At this time, only the VITD and ITD options are available.
7. Click the **Open File** button ( ) next to the "Enter Existing Geodatabase (*.mdb)" or "Enter Destination Geodatabase (*.mdb)" field. The **Save As**

Geodatabase window will appear (Figure 8-96). At this time, only the "Enter Destination Geodatabase (*.mdb)" field option is available.



Figure 8-96 Save As Geodatabase Window

8. Navigate to the directory in which to store the geodatabase (*.mdb*) file, type the name in the "File name" field, and click ***Save*** to return to the **Generate Slope Product** window. The selected geodatabase information will appear in the "Enter Destination Geodatabase (*.mdb)" field (Figure 8-97).



Figure 8-97 Generate Slope Product Window Showing Selected Geodatabase File

9. Click the ***Generate*** button at the bottom of the window. The **Generating Slope** window will appear (Figure 8-98), indicating progress in processing.



Figure 8-98 Generating Slope Window

10. The process will take several minutes. When finished, the **Slope Generator Info** window will appear (Figure 8-99).

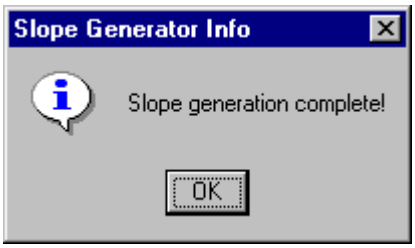


Figure 8-99 Slope Generator Info Window

11. Click ***OK***. The window closes and returns to the main ArcMap window.

12. To view the new geodatabase showing slope coverages, click the **Add Data** button ( ) and navigate to the previously saved geodatabase. An example output is shown in Figure 8-100.

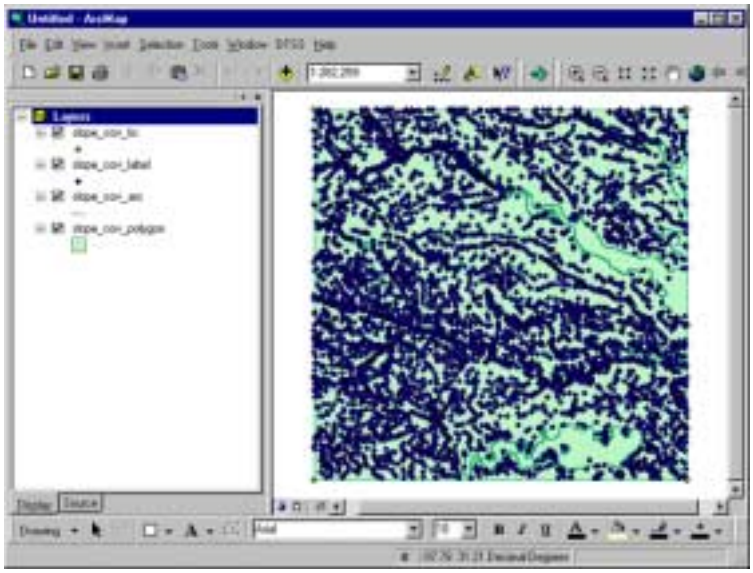


Figure 8-100 Slope Generation Data Displayed in ArcMap Window

13. When viewing the output product, the analyst must provide the symbology and rendering options in order to properly display the slope overlay. Right click on the slope polygon layer (slope_cov_polygon in Figure 8-100), and select ***Properties*** from the context menu. The **Properties** window opens.

NOTE

If VITD was chosen as the "Output Format" in the Slope Generator, choose the slope_cov_region_slp area layer.

14. In the **Properties** window, select the **Symbology** tab.

15. In the "Show" panel on the left side of the **Symbology** tab, select ***Categories/Unique Values***. The **Properties** window will appear similar to Figure 8-101.

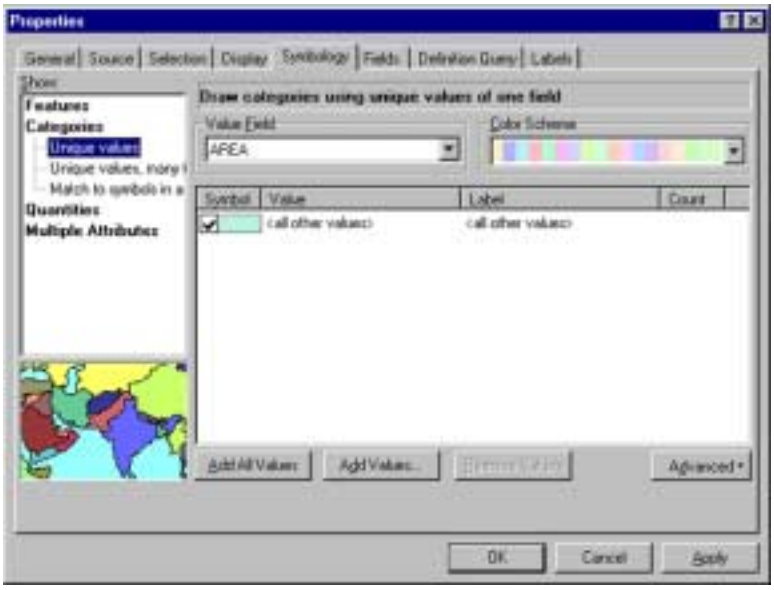


Figure 8-101 Properties Window Showing Symbology Tab

16. In the "Value Field" dropdown menu, select ***GSC*** as the field to symbolize.

17. Next, click the **Add All Values** button at the bottom left of the window to add all of the slope values to the renderer.

18. Click ***OK***. The **Properties** window closes, and the slope overlay information will be displayed in ArcMap (Figure 8-102).

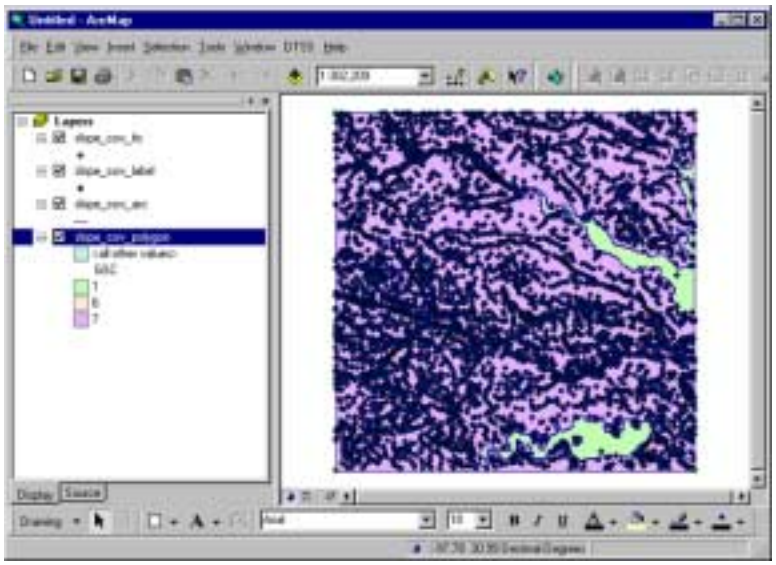


Figure 8-102 Slope Generation Data With Added Symbology in ArcMap Window

THIS PAGE INTENTIONALLY LEFT BLANK

Chapter 9

DATA EXPLOITATION—COTS

9	**DATA EXPLOITATION—COTS**	9-3
9.1	Feature Query and Selection	9-3
9.1.1	Identifying Features	9-3
9.1.1.1	Map Tips	9-3
9.1.2	Selecting Features	9-5
9.1.2.1	Feature Selection Color	9-5
9.1.2.1.1	Changing Selection Color for All Layers	9-6
9.1.2.1.2	Changing Selection Color for an Individual Layer	9-6
9.1.2.2	Setting Selectable Layers	9-7
9.1.2.3	Graphical Feature Selection	9-8
9.1.2.3.1	Selecting Individual Features	9-8
9.1.2.3.2	Selecting Multiple Features	9-9
9.1.2.4	Selecting From Attribute Table	9-10
9.1.2.5	Selecting by Location	9-11
9.1.2.6	Selecting by Attributes	9-13
9.1.2.7	Additional Feature Selection Operations	9-16
9.1.3	Deselecting Features	9-17
9.1.4	Exporting Selected Features	9-17
9.1.5	Finding Features	9-17
9.1.5.1	Finding Features and Attributes in NIMA Data Specifications	9-20
9.1.6	Spatial Bookmarks	9-21
9.1.6.1	Creating Spatial Bookmarks	9-22
9.1.6.2	Accessing Existing Spatial Bookmarks	9-22
9.1.6.3	Removing Existing Spatial Bookmarks	9-22
9.2	Geoprocessing Tools	9-23
9.2.1	ArcMap Tools	9-23
9.2.1.1	Buffer Wizard	9-23
9.2.1.2	Dissolve Wizard	9-27
9.2.2	ArcToolbox Analysis Tools	9-28
9.2.2.1	Extract	9-28
9.2.2.2	Overlay	9-28

9.2.2.2.1 Erase Tool 9-29
9.2.2.2.2 Overlay Wizard 9-31
9.2.2.3 Proximity Directory 9-35
9.2.2.3.1 Buffer Wizard 9-36
9.2.2.4 Statistics Directory 9-36
9.2.2.5 Surface Tools 9-37
9.2.3 ArcToolbox Data Management Tools 9-37
9.2.3.1 Append Wizard 9-37

9 DATA EXPLOITATION—COTS

ArcInfo provides numerous off-the-shelf tools and wizards for data exploitation. These include functions for querying and selecting features in a dataset, as well as for performing many common geoprocessing tasks.

9.1 Feature Query and Selection

ArcMap provides several functions that allow the DTSS analyst to interact with single or multiple features in a dataset. The following section details these functions.

9.1.1 Identifying Features

The **Identify** tool allows the analyst to click on a geographic feature to view its attributes. If there are several features at the clicked location, the analyst will see the attributes for all of these features, with the attributes of the uppermost layer displayed first.

To identify features, click the ***Identify*** icon ( ) on the **Tools** toolbar. Then click the mouse pointer over the map feature to identify. The features in all visible layers under the pointer will be identified in the **Identify Results** window shown in Figure 9-1.

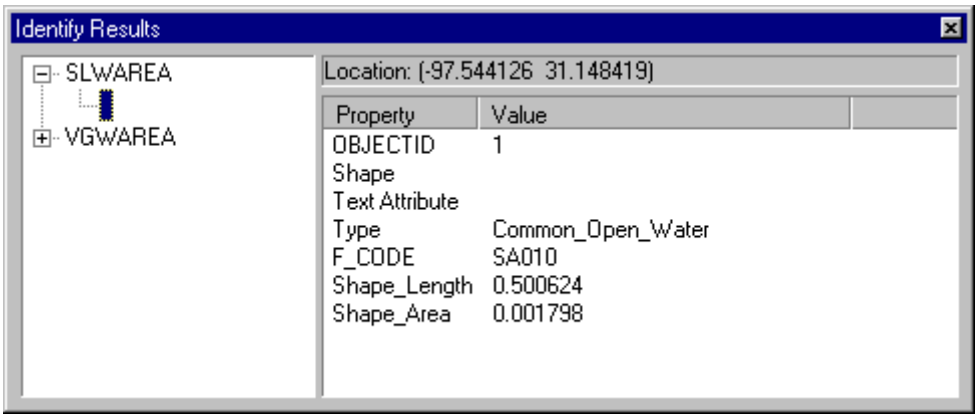


Figure 9-1 Identify Results Window

For more information on using the **Identify** tool, refer to ArcMap's online Help or printed user documentation.

9.1.1.1 Map Tips

Map Tips display on-screen descriptions of map features when the mouse is paused over the feature. The user can select which attribute field is displayed by the map tip.

To display map tips, follow the steps below.

1. With ArcMap open on the desktop, right-click the layer for which to display map tips in the Table of Contents panel. Click ***Properties*** from the context menu (Figure 9-2).

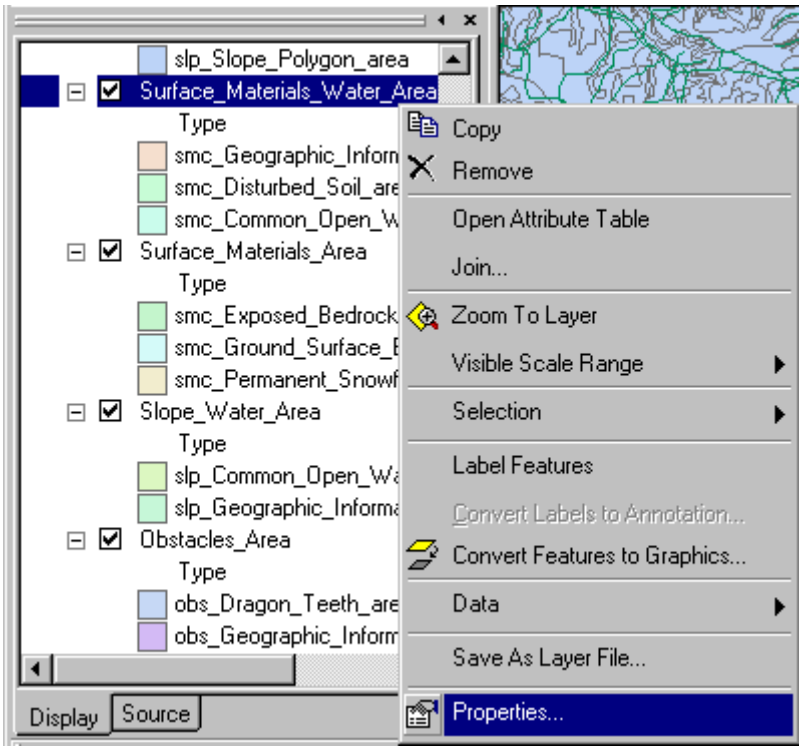


Figure 9-2 Context Menu Showing Properties Selected

2. The **Properties** window will appear. Click the **Display** tab and check the box next to "Show Map Tips" (Figure 9-3).

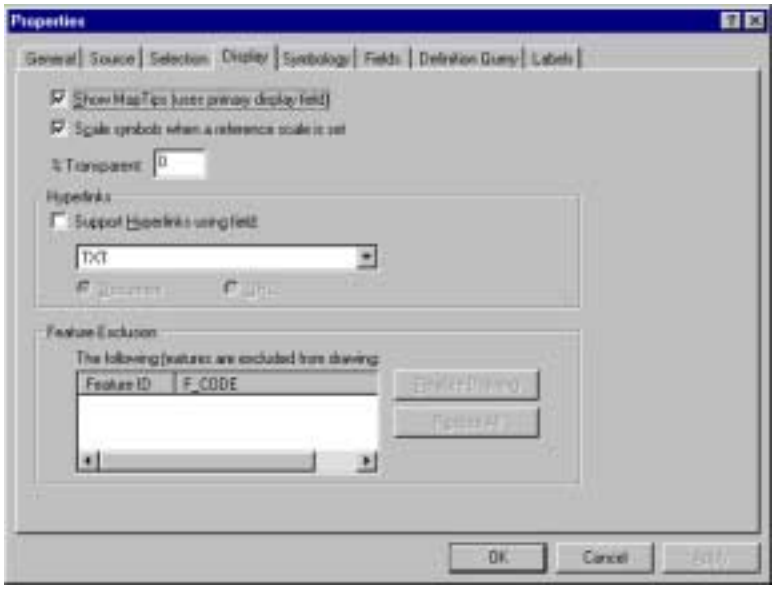


Figure 9-3 Properties Window Showing Display Tab

3. Click the **Fields** tab (Figure 9-4).

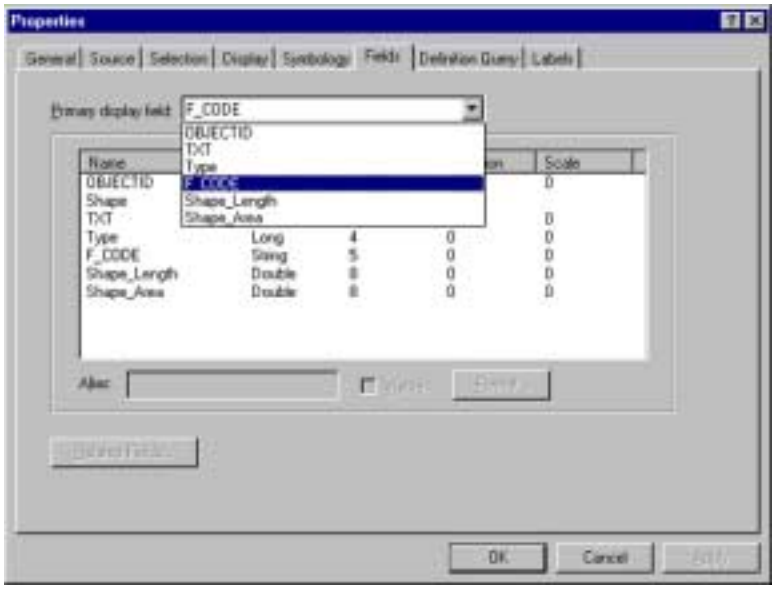


Figure 9-4 Properties Window Showing Fields Tab

4. Click the "Primary display field" dropdown arrow and click the attribute field to display as the map tip.

5. Click ***OK***. The window closes and returns to the ArcMap main window.

6. Move the mouse pointer over the feature in the Display panel to see the map tip.

If map tips cannot be seen after they have been enabled, make sure the layer is turned on and that the features in the layer are not being hidden by features in overlapping layers.

9.1.2 Selecting Features

ArcMap provides the DTSS analyst with many functions, tools, and options for feature selection. These include setting the selection color, selecting features by attribute or location, adding to or deleting from the selection set, zooming to the selected feature(s), etc. Many of these operations are provided under the ArcMap **Selection** option in the main menu bar or by right clicking on the layer in the Table of Contents panel and choosing ***Selection*** from the context menu that appears. Many of these operations are described in the following sections.

9.1.2.1 Feature Selection Color

Selected features can be displayed in any color or symbol. They can also be defined for all layers at once or for any specific layer. The following sections outline procedures for defining the highlight color of selected features.

9.1.2.1.1 Changing Selection Color for All Layers

To specify how all layers highlight, follow the procedure below.

1. Click ***Selection/Options*** from the ArcMap menu bar. The **Selection Options** window will appear (Figure 9-5).

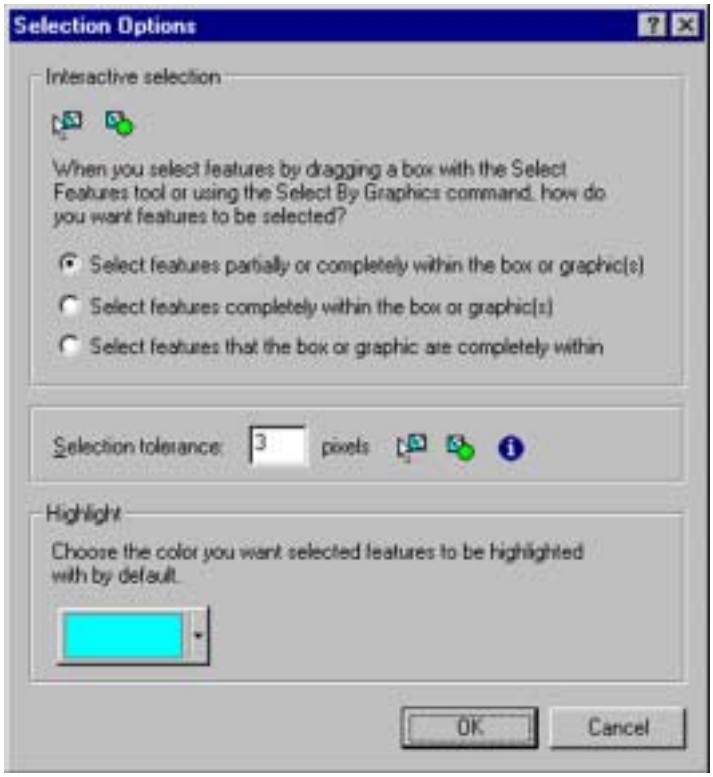


Figure 9-5 ArcMap Selection Options Window

2. In the "Highlight" section in the lower left corner of the window, click the color dropdown menu. The **Color Selection** window will appear.

3. Click the desired color swatch, or click **More Colors** for other options. The selected color will appear in the **Selection Options** window. For polygons, this is the highlight color for the edges. For points and lines, this is the highlight color for the entire feature.

4. Click ***OK*** in the **Selection Options** window to accept changes for the highlight color and to close the window.

9.1.2.1.2 Changing Selection Color for an Individual Layer

To specify how a specific layer highlights, follow the procedure below.

1. With data already open in ArcMap, double click the desired layer in the Table of Contents panel to display the **Layer Properties** window.

2. Click the **Selection** tab. The window will appear as seen in Figure 9-6.

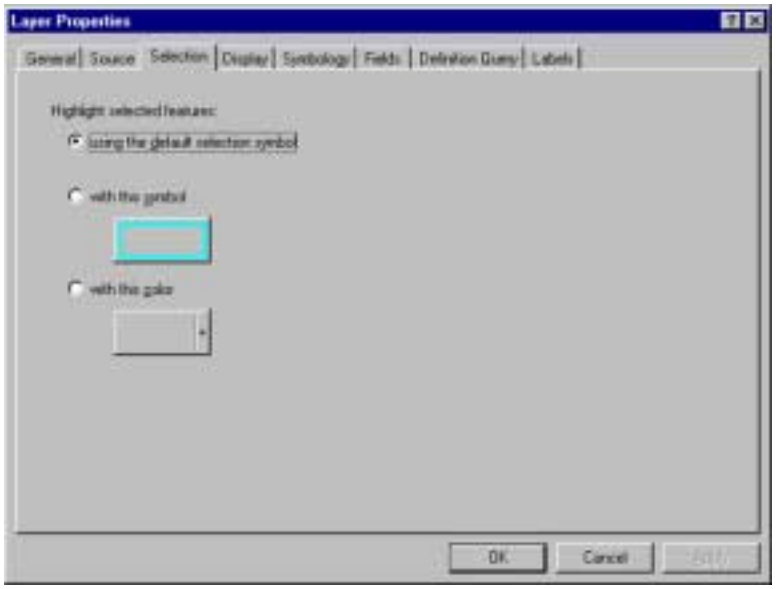


Figure 9-6 ArcMap Layer Properties Window Showing Selection Tab

3. To display features using a particular symbol, click the radio button next to the "with this symbol" option. Click the symbol selection box located directly below, and choose a symbol from the **Symbol Selector** window.

4. To display selected features in a particular color, click the radio button next to the "with this color" option. Click the color selection box located directly below, and choose a color from the window that opens.

5. Click ***OK*** to finish selecting the highlight symbol and color. This setting overrides any setting made with the **Selection Options** window, but only for the designated layer. Other layers' selections may display differently.

For more detailed information on changing the selection color, refer to ArcMap's online Help or printed documentation.

9.1.2.2 Setting Selectable Layers

Before selecting features, the analyst can specify which layers to work with. This is done when the desired features overlap or are very close to features from other layers. For example, if a layer of cities exists where many of the cities are on rivers, the analyst can avoid selecting rivers by specifying the cities layer only. Use the procedure below to make a layer selectable:

1. From the **Selection** menu, point to **Set Selectable Layers**. A dropdown menu appears (Figure 9-7), listing all of the layers in the current data frame.

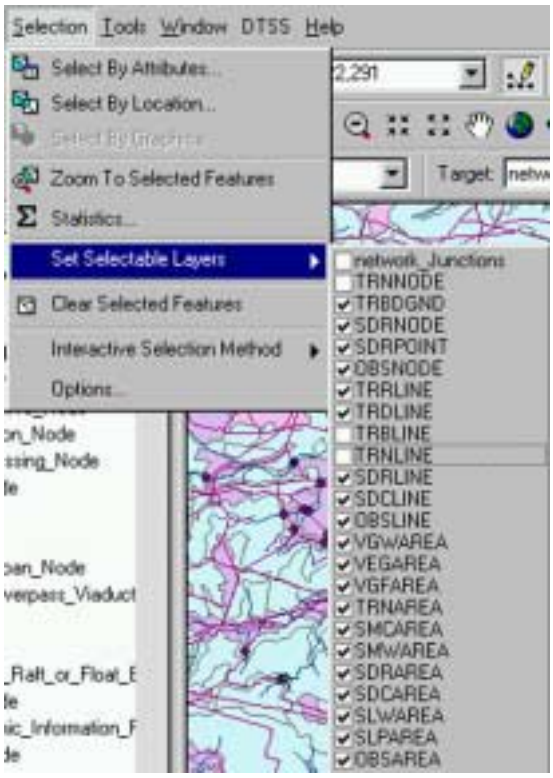


Figure 9-7 ArcMap Menu Bar Showing Set Selectable Layers

2. In the dropdown menu, click the mouse in the checkboxes next to the layers. Uncheck the boxes next to unwanted layers. Layers whose names are unchecked are still visible in the map, but cannot be selected.

NOTE

When setting selectable layers, the analyst can check or uncheck all layers by holding down the **[Ctrl]** *key while clicking one of the check boxes.*

9.1.2.3 Graphical Feature Selection

Depending on the need at the time, the analyst may choose from a variety of methods for selecting features from the graphically displayed data. For example, features can be selected with the pointer by clicking one feature at a time or by dragging a box around the desired features.

9.1.2.3.1 Selecting Individual Features

To manually select individual features from a displayed dataset, follow the procedure below.

1. If multiple data layers are displayed, use the procedure described in Section 9.1.2.2 to set the selectable layers.

2. Click the **Select Features** icon ( ) on the ArcMap **Tools** toolbar, and then click the desired feature to select it.

3. To select additional features, hold down the ***[Shift]*** key while clicking the features.

The ***Selection/Interactive Selection Method*** option on the ArcMap main menu bar provides several options for manipulating the features in the selected set, such as adding and removing features. See the ArcMap documentation for more details regarding these options.

9.1.2.3.2 Selecting Multiple Features

The analyst may wish to select a group of features by graphically drawing a box around them. To select features by dragging a box, follow the procedure below.

1. If multiple data layers are displayed, use the procedure described in Section 9.1.2.2 to set the selectable layers.

2. Click the **Select Features** icon ( ) on the ArcMap **Tools** toolbar.

3. On the dataset in the ArcMap Display panel, click and drag a box around the features to select .

4. To select additional features, hold down the ***[Shift]*** key while dragging the box.

Multiple feature selection by graphically drawing a box can be refined using the following steps.

1. Click ***Selection/Options*** from the ArcMap main menu bar. The **Selection Options** window opens (Figure 9-8).

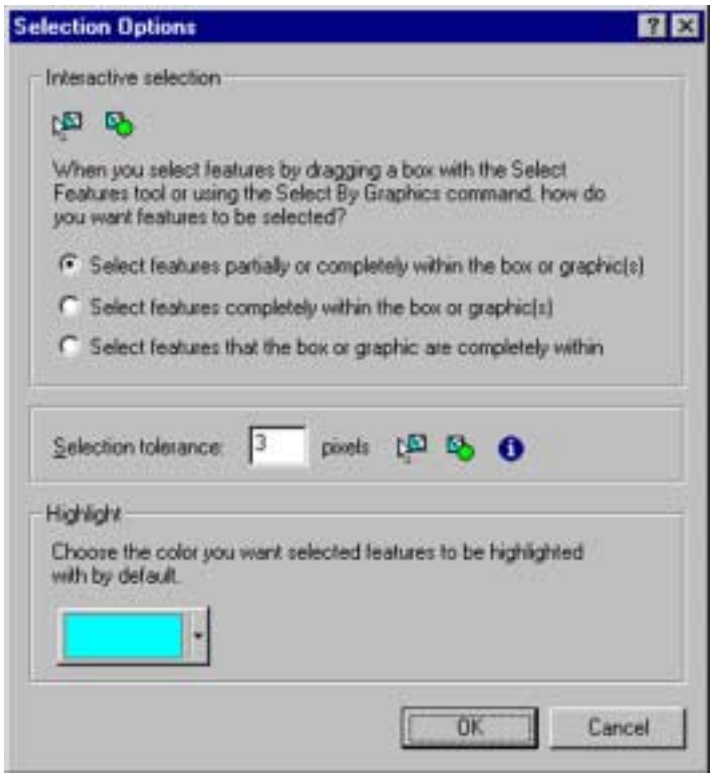


Figure 9-8 Selection Options Window in ArcMap

2. Specify the preferred method of selecting features, and click ***OK***.

The ***Selection/Interactive Selection Method*** option in the ArcMap main menu bar provides several options for manipulating the features in the selected set, such as adding and removing features. See the ArcMap documentation for more details regarding these options.

9.1.2.4 Selecting From Attribute Table

Aside from graphical methods, the analyst may wish to highlight a feature from the dataset's attribute table. To select a feature by clicking it in the attribute table, follow the procedure below.

1. Right click a layer in the Table of Contents panel and select ***Open Attribute Table*** from the context menu. The **Attributes** window opens (Figure 9-9).

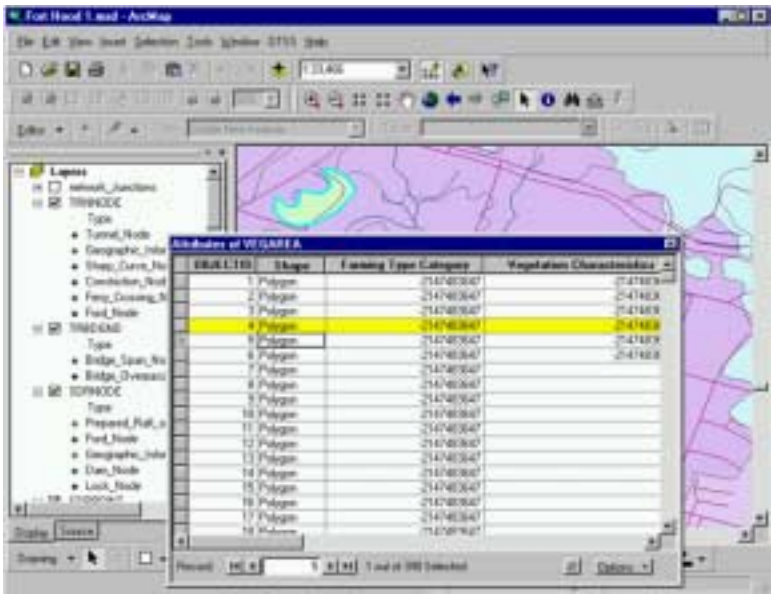


Figure 9-9 Selected Feature From Attributes Table in ArcMap

2. Select a feature in the table by clicking the gray square to the left of the record.

3. To select additional features, hold down the ***[Ctrl]*** key and click on the features. To deselect a feature, hold down the ***[Ctrl]*** key and click the feature.

4. Close the **Attributes** table by clicking the **Close Window** button (✕) at the top right corner of the table. The features selected in the table will appear highlighted in the ArcMap Display panel.

For more detailed information on selecting features from the attributes table, refer to ArcMap's online Help or printed documentation.

9.1.2.5 Selecting by Location

The **Select By Location** tool selects features based on their spatial relationship to features in other layers. This tool is useful when the analyst wishes to select features based on their locations relative to other features. Use the procedure below to select features by location.

1. With data open in ArcMap, click ***Selection/Select By Location*** from the ArcMap main menu bar. The **Select By Location** window appears (Figure 9-10).

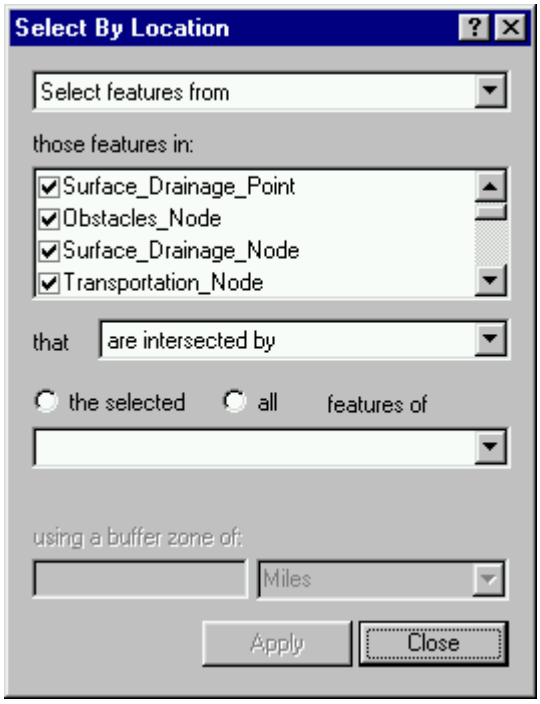


Figure 9-10 ArcMap Select by Location Window

2. Click the dropdown arrow located at the top of the window and choose a selection method from the dropdown list. The selection criteria specified will affect the selected state of the layers. For instance, “Select features from” creates a new selection on the specified layers.

3. In the area labeled “those features in,” check the layer to select. Checked layers in this list will have the selection changed given the other criteria specified in this window.

4. Click the dropdown arrow located next to “that,” and choose a selection method. This setting defines the relationship that each feature in the layer chosen below will use to select any of the features in the layers checked above. Some methods may not be appropriate given the type of data chosen to alter the selection, and those layers will be ignored if such a method is selected. For example, “share a line segment with” does not apply to point layers.

5. Click the dropdown arrow located below “features of,” and select the layer to be used for searching features. Click the radio button next to “the selected” to use the selected features in the layer, or click the radio button next to “all” to use all features in the layer.

6. If applicable, in the fields below “using a buffer zone of,” the analyst can limit the search by inputting a distance. Entering the number of units to buffer the features of the chosen layer will alter the selection of the other layers. Make

sure to select the appropriate distance units from the dropdown list to the right.

7. Click ***Apply***. ArcMap selects the designated features and displays the information in the Display panel. Click ***Close*** to close the window.

For more detailed information on selecting features by location, refer to ArcMap's online Help or printed documentation.

9.1.2.6 Selecting by Attributes

Features can be selected from one of the layers in the active data frame by specifying a query based on the attributes of its features. The **Select By Attribute** window lets the user select features in a layer, or records in a table, by building a query. Use the procedure below to select by attributes.

1. Click ***Selection/Select By Attributes*** from the ArcMap main menu bar. The **Select By Attribute** window will appear (Figure 9-11).

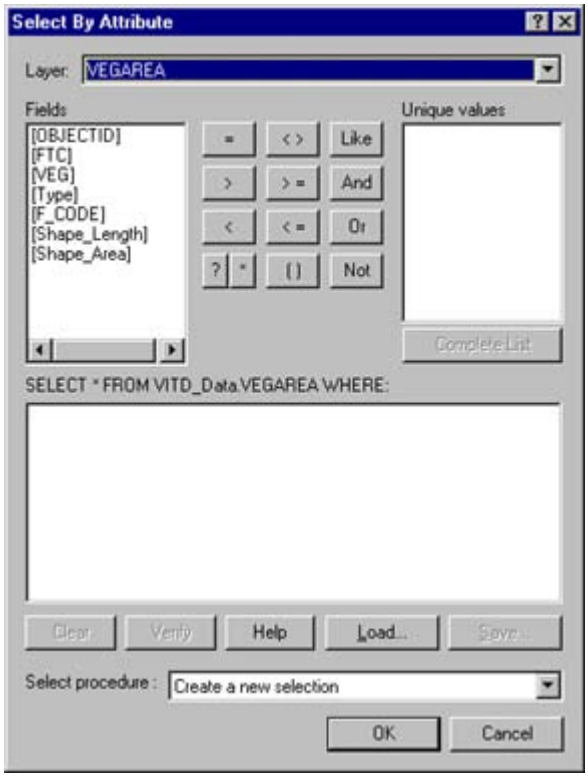


Figure 9-11 ArcMap Select by Attribute Window

2. Select the appropriate layer from the "Layer" dropdown list at the top of the window. This list contains only those layers that can be used in this operation, so it may not list all the layers in the currently active data frame.

3. To add a field to the query, double click it in the "Fields" panel on the left. Fields in the selected layer or table that can be included in the query are displayed there. Fields are represented in query expressions in different ways according to the data source of the layer or table being queried. For example:

   - Fields in ArcInfo coverages, shapefiles, INFO tables, and dBASE tables are enclosed in double quotes:

     "AREA"

   - Fields in personal geodatabase (Access) data are enclosed in square brackets:

     [AREA]

   - Fields in SDE data are not enclosed:

     AREA

4. Click which logical operator to use from the buttons in the middle of the window. For more information on the logical operator buttons, see Table 9-1, or click the **What's This** button (?) and then the desired logical operator button for a description.

Table 9-1 Logical Operator Descriptions

Button	Name	Description
=	Equals Operator	Compares two expressions and determines whether *expression 1* is equal to *expression 2*, or whether *expression 1* is not equal to *expression 2*.
>	Greater Than Operator	Compares two expressions and determines whether *expression 1* is greater than *expression 2*, or whether *expression 1* is less than or equal to *expression 2*.
<	Less Than Operator	Compares two expressions and determines whether *expression 1* is less than *expression 2*, or whether *expression 1* is greater than or equal to *expression 2*.
<>	Not Equal To Operator	Compares two expressions and determines whether *expression 1* is not equal to *expression 2*, or whether *expression 1* is equal to *expression 2*.
>=	Greater Than Or Equal To Operator	Compares two expressions and determines whether *expression 1* is greater than or equal to *expression 2*, or whether *expression 1* is less than *expression 2*.
<=	Less Than Or Equal To Operator	Compares two expressions and determines whether *expression 1* is less than or equal to *expression 2*, or whether *expression 1* is greater than *expression 2*.
_ ?	Single Character Wildcard	If the user is querying an ArcInfo coverage, shapefile, INFO table, dBASE table or SDE data, the single character wildcard is _. If the user is querying personal geodatabase (Access) data, the single character wildcard is **?**.

Table 9-1 Logical Operator Descriptions (Cont'd)

Button	Name	Description
% *	Multiple Character Wildcard	If the user is querying an ArcInfo coverage, shapefile, INFO table, dBASE table or SDE data, the multiple character wildcard is **%**. If the user is querying personal geodatabase (Access) data, the multiple character wildcard is *****.
( )	Precedence Parentheses	Expressions enclosed in parentheses are evaluated first.
Like	Like Operator	Enables user to create queries that look for character strings using wildcards. Strings are case-sensitive for coverages, shapefiles, and shared geodatabases. When unsure of case, use the operator LIKE, not =.
And	And Operator	Enables user to build an expression with more than one criterion, when *both* criteria must be true.
Or	Or Operator	Enables user to build an expression with more than one criterion, when *at least one* of the criteria must be true.
Not	Not Operator	Enables user to exclude an expression. Use the NOT operator at the beginning of an expression to find records that do not match the specified expression.

5. To add a value into the query, scroll to and double click on the value in the appropriate "Unique" values list.

NOTE

To view the unique values of a field, click on it with the mouse. The information will appear in the area below the "Unique sample values" heading. When there are a very large number of unique values, only a partial list of values is shown. Press the **Complete List** *button to see them all.*

6. The expression is displayed in the "SELECT * FROM" field in the center of the window (Figure 9-12). Click ***Verify*** to verify the selection. The system will display an error message if there is a problem.

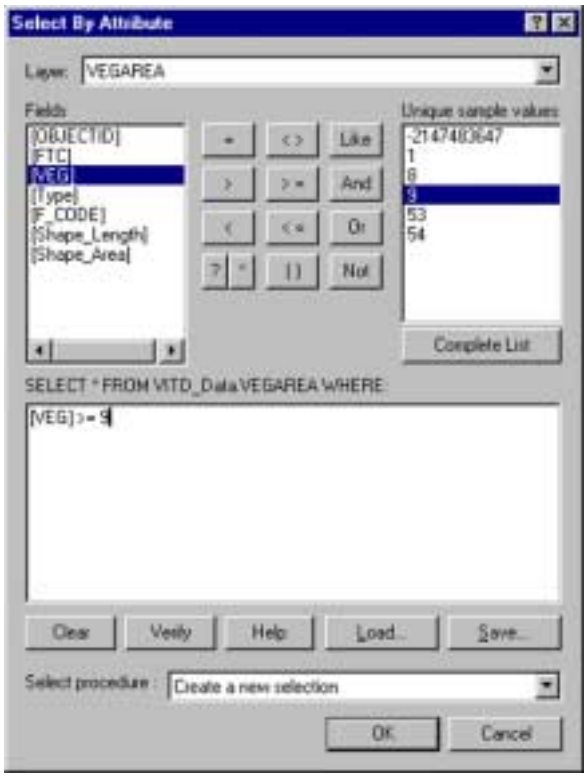


Figure 9-12 ArcMap Select by Attribute Window Showing Entered Expression

7. Click ***OK***. The selection is highlighted in ArcMap's Display panel.

NOTE

*Selection expressions can be saved and reloaded using the **Save** and **Load** buttons at the bottom of the **Select By Attribute** window, which can save time for the analyst. Then a set of selected records can be regenerated. Expressions are saved with an* .exp *extension.*

For more detailed information on selecting features by attributes, refer to ArcMap's online Help or printed documentation.

9.1.2.7 Additional Feature Selection Operations

Additional feature selection operations are available by right clicking on the layer in the Table of Contents panel and choosing the ***Selection*** option. This option allows the user to ***Zoom to the Selected Features***, ***Clear Selected Features***, ***Open Table for Selected Features***, ***Copy Records for Selected Features***, ***Annotate Selected Features***, or ***Create Layer From Selected Features***. See the ArcMap documentation for a detailed description of these options.

9.1.3 Deselecting Features

Features can be deselected individually or all at once. To remove individual features from a selection set, choose ***Selection/Interactive Selection Method/Remove From Current Selection*** from the ArcMap main menu bar, and click on the feature to be removed. To deselect all selected features at once, click the map where there are no features, or click a feature of a layer that is not selectable. Otherwise, choose ***Selection/Clear Selected Features*** from the ArcMap main menu bar.

9.1.4 Exporting Selected Features

Selected features can be exported to a new feature class regardless of the data source format of the features being exported. To export the data, right click on the layer in the Table of Contents panel, and select ***Data/Export Data***. Refer to the ArcMap documentation for more details regarding exporting selected features to a new feature class.

9.1.5 Finding Features

The **Find** tool helps the analyst locate a particular geographic feature on the map based on one of its attributes. For example, if the analyst is trying to find City Hall on a map of a town, this option can be used to find it. In the **Find** window, the analyst can type "City Hall," or just "City," and get a list of the features that contain that search string in any of its attributes.

NOTE

If the user has difficulty getting Find results, it may be caused by unlinked feature attributes in the data. ArcMap will find numeric values, but text strings must be linked for positive results.

To find features with particular attributes, follow the procedure below.

1. With ArcMap open on the desktop and data already added, click the ***Find*** button ( ) on the **Tools** toolbar. The ArcMap **Find** window will appear (Figure 9-13).

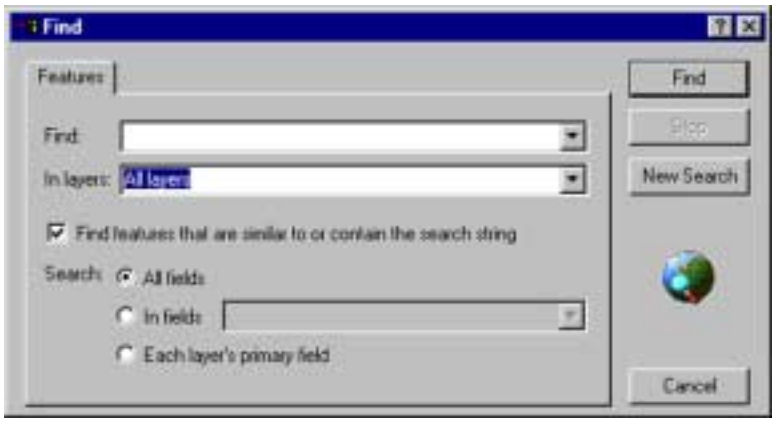


Figure 9-13 ArcMap Find Window

2. Type the text or numeric string to search for in the "Find" text box.

3. Click the "In layers" dropdown arrow to choose which layers will be searched during the **Find** operation. Select from the following options:

   - All Layers—Searches all the layers in the map, whether or not they are in the active data frame.
   - Layers in active data frame—Searches layers in the active data frame. (Layers in the map are organized into data frames that appear on the layout page. These data frames appear in the Table of Contents panel. The default data frame is called "Layers.")
   - Selectable layers in active data frame—Searches layers that are currently checked on in the **Selection|Set Selectable Layers** submenu. For more information on setting selectable layers, see Section 9.1.2.2 of this chapter.

   NOTE

   Each individual layer in the active data frame is also listed. Select a layer to limit the search to that layer. Choosing a particular layer will speed up the search.

4. If the string of words must match exactly, uncheck the option "Find features that are similar to or contain the search string." When checked, the searching capabilities of the **Find** operation will use a LIKE operator, rather than an EQUALS operator. This is useful when the user doesn't know a specific spelling or wants to enter a much longer or complete text string.

5. For the "Search" option, click the radio button corresponding to the desired search method:

   - All fields—Searches through all fields in the specified layers for the text string entered.

- In fields—Searches through only the field specified from the dropdown list.
- Each layer's primary field—Searches through each layer's primary display field. The primary display field is set in the **Layer Properties** window on the **Fields** tab. Double click the layer's name in the Table of Contents panel to gets its layer properties.

6. Click ***Find*** to perform the search. Features that met the search parameters will appear in the bottom portion of the window (Figure 9-14).

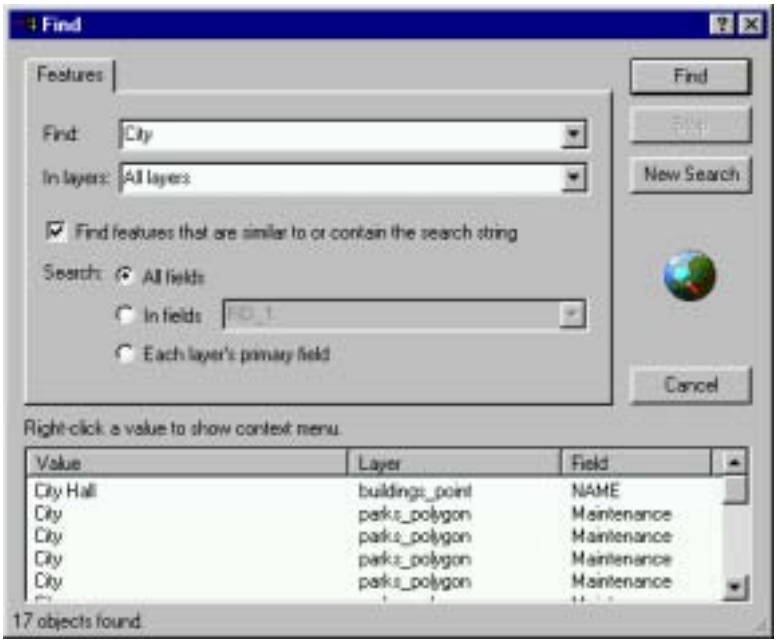


Figure 9-14 ArcMap Find Window

7. Right click on any row to get options for showing or working with that feature in the map (Figure 9-15).

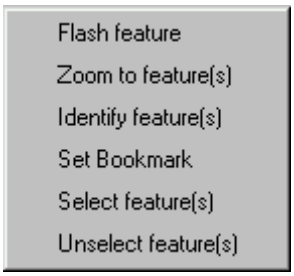


Figure 9-15 Option Menu for Find Results

For more detailed information on using the **Find** tool, refer to ArcMap's online Help or printed documents.

9.1.5.1 Finding Features and Attributes in NIMA Data Specifications

The DTSS analyst may need to search for features or attributes in NIMA data specifications that have been distributed in Portable Document Format (PDF). These specifications define the content and format for different data types, and each PDF addresses a different data type. They can be read and explored using the commercial program Adobe Acrobat Reader.

NOTE

If Adobe Acrobat Reader does not reside on the analyst's system, the latest version can be downloaded free from the Adobe Website: http://www.adobe.com/products/acrobat/morethanreader.html.

Follow the procedure below to access and search NIMA and other PDF files for features and/or attributes.

1. Open the desired NIMA Data Specification document by selecting ***Start/Programs/Dtss /Documents/Data Specs*** from the Windows NT desktop. The **Acrobat Reader** window opens showing the selected document (Figure 9-16).



Figure 9-16 Acrobat Reader Window

2. On the toolbar at the top of the window, click the **Find** tool ( ) to access the **Find** window shown in Figure 9-17.

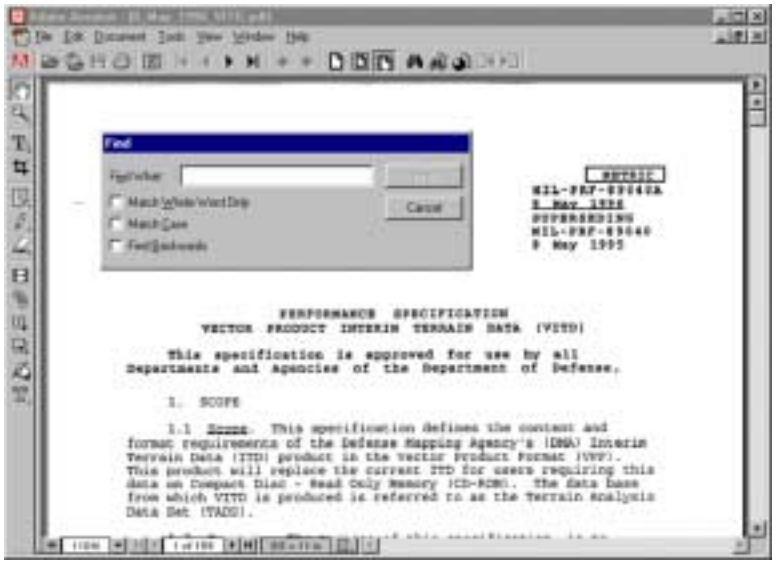


Figure 9-17 Find Window in Acrobat Reader

3. In this window, type the text string for the feature or attribute to find. Note that this window allows for search options on whole word matches and matching case.

4. When the appropriate string and options have been entered, click ***Find***. Acrobat Reader will highlight the first occurrence of a match. Continue clicking ***Find Next*** to go through all occurrences in the document.

NOTE

Because ITD and VITD specifications are scanned documents, the Find command is not functional for these PDF files.

For more information on using the Find capabilities in Adobe Acrobat Reader, refer to the program's online Help or printed user documentation.

9.1.6 Spatial Bookmarks

A spatial bookmark identifies a particular geographic location to save and refer to later. For example, a spatial bookmark may be created that identifies a study area. As the analyst pans and zooms other portions of the map, the bookmark allows easy access back to the desired study area. Spatial bookmarks can also be used to highlight areas on the map the analyst wants to show others. As a shortcut, the analyst can also create bookmarks when finding and identifying map features.

A spatial bookmark can be created at any time. It can only be defined on spatial data, however, not for an area of the page in Layout View. Each data frame on the page

maintains its own list of bookmarks. In Layout View, the list reflects the bookmarks of the active data frame.

9.1.6.1 Creating Spatial Bookmarks

To create a spatial bookmark, follow the procedure below.

1. With data already open in ArcMap, pan and zoom the map image to the area needed to create a bookmark.
2. Select ***View/Bookmarks/Create*** from the ArcMap menu bar. The ArcMap **Spatial Bookmark** window will appear (Figure 9-18).

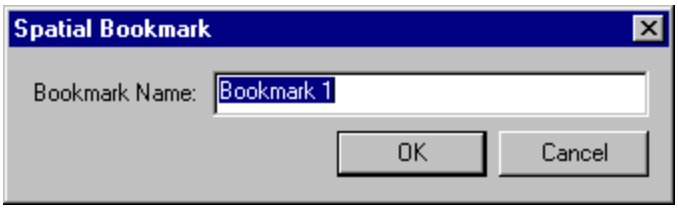


Figure 9-18 ArcMap Spatial Bookmark Window

3. Type a name for the bookmark in the "Bookmark Name" field.
4. Click ***OK*** to create and save the bookmark.

9.1.6.2 Accessing Existing Spatial Bookmarks

To use an existing spatial bookmark, click ***View/Bookmarks*** from the ArcMap menu bar, and click the name of the desired bookmark. The bookmarked display will appear in ArcMap's Display panel.

9.1.6.3 Removing Existing Spatial Bookmarks

To remove an existing spatial bookmark, follow the procedure below.

1. Click ***View/Bookmarks/Manage*** from the ArcMap menu bar. The ArcMap **Spatial Bookmarks** window will appear (Figure 9-19).

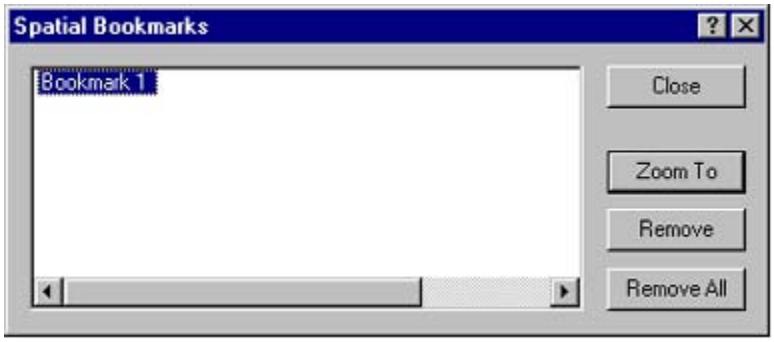


Figure 9-19 ArcMap Spatial Bookmarks – Manage Window

2. Click on a bookmark. If more than one bookmark exists, hold down the ***[Shift]*** key to select more than one bookmark to remove.

3. Click ***Remove***.

For more detailed information on using spatial bookmarks, refer to ArcMap's online Help or printed documentation.

9.2 Geoprocessing Tools

The tools available in ArcInfo's collection of programs help the DTSS analyst perform specific geoprocessing tasks. ArcMap provides two common geoprocessing tools, buffer and dissolve, that operate on geodatabases, coverages, and shapefiles. ArcToolbox provides many more geoprocessing tools, but these only work on ArcInfo coverages. Some of the commonly used ArcInfo geoprocessing tools are discussed in the sections that follow. For more information on any of the wizards or tools in ArcMap or ArcToolbox, use the ***[F1]*** key or the enabled **Help** buttons to activate ArcInfo's online Help, or refer to the printed documentation.

9.2.1 ArcMap Tools

Several tools and wizards are provided within the **Tools** menu on the ArcMap main menu bar. The **Buffer Wizard** and **Dissolve Wizard** are discussed in the following sections.

9.2.1.1 Buffer Wizard

A buffer is a zone of a specified distance around features. Both constant- and variable-width buffers can be generated on a feature's attribute values. Buffer zones form polygons that are either inside or outside the specified buffer distance of a feature. Buffers are useful for proximity analysis. For example, the analyst can use buffers to find all stream segments within 300 feet of a mobility route.

The **Buffer Wizard** in ArcMap allows the user to create a buffer around features in geodatabases, coverages, or shapefiles. The **Buffer Wizard** enables the analyst to apply a

buffer around selected features, or around all features in a graphics layer. More than one feature can have a buffer, and the analyst can choose to retain or dissolve boundaries between buffered features.

Follow the procedures below to use the ArcMap **Buffer Wizard**.

1. With a geodatabase, coverage, or shapefile open in ArcMap, go to the **Tools** menu on the ArcMap menu bar and select ***Buffer Wizard***. The **Buffering Wizard. Step 1 of 3.** window opens (Figure 9-20).

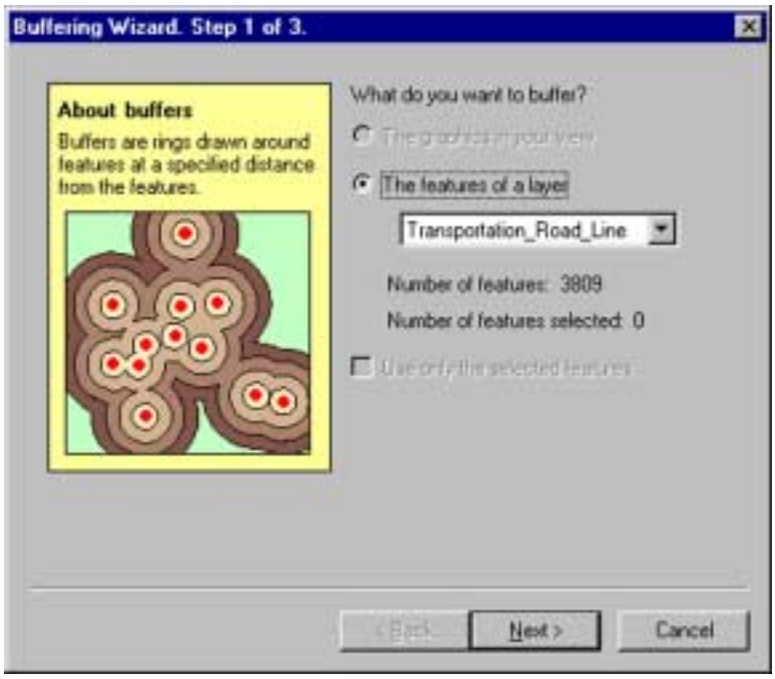


Figure 9-20 ArcMap Buffering Wizard, Step 1 of 3 Window

2. Click the radio button beside the option “The features of a layer.” From the dropdown menu, select the chosen feature to buffer. Notice that the number of features, and number of features selected, updates automatically to reflect the layer’s contents.

3. The “Use only the selected features” option is grayed out unless features have been selected for buffering. Features can be selected using any of the methods presented in Section 9.1.2. Without selected features, buffers will be applied to all features in a given layer. Click ***Next*** to continue to the **Buffering Wizard. Step 2 of 3.** window (Figure 9-21).

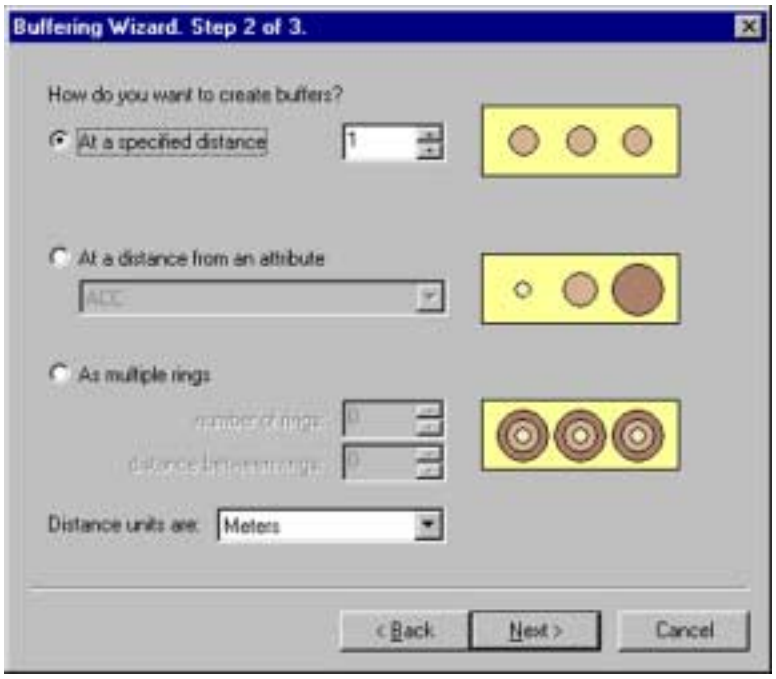


Figure 9-21 ArcMap Buffering Wizard, Step 2 of 3 Window

4. Click the radio button next to the desired buffer to create. Choose from one of the available buffer options.
   - At a specified distance—type in the appropriate distance (ex: *100*) in the field to the right.
   - At a distance from an attribute—select from the list of available attributes in the dropdown menu. The buffer will appear larger, the closer the selected feature comes to the selected attribute.
   - As multiple rings—type in the number of rings and the distance between each ring in the fields below the radio button.
5. In the "Distance units are" field, click the dropdown arrow and select the desired units of measurement from the list.
6. Click ***Next*** to continue, and the **Buffering Wizard. Step 3 of 3.** window appears (Figure 9-22).

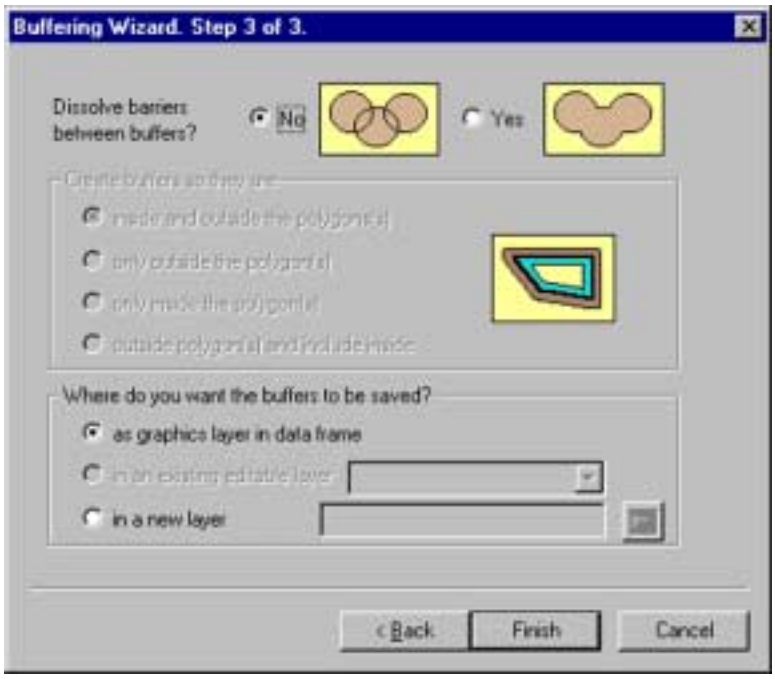


Figure 9-22 ArcMap Buffering Wizard, Step 3 of 3 Window

7. Make any changes to the buffer barriers or where buffers are saved. Click ***Finish*** to create the buffer. The Buffer Wizard closes and the "Buffering features" status message appears in the bottom left corner of the ArcMap window indicating progress in processing. The process may take a few minutes. When complete, the new buffer appears in ArcMap, surrounding the selected feature (Figure 9-23). Notice that the buffer layer has also been added to the Table of Contents panel of the window.

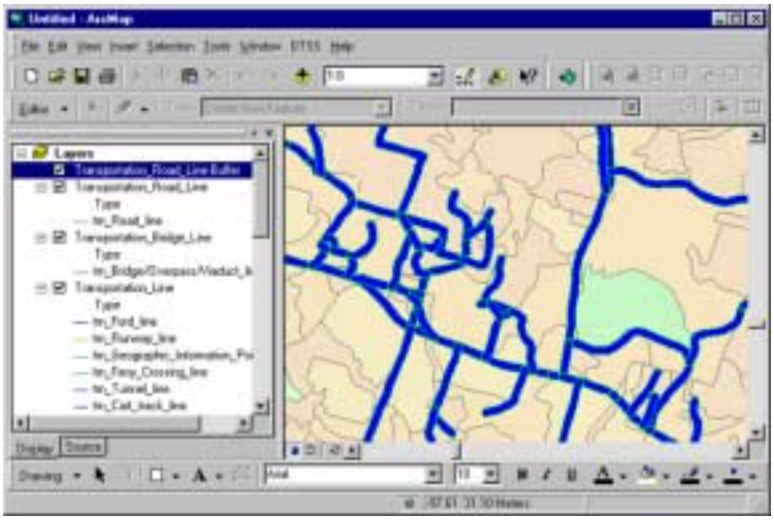


Figure 9-23 Completed Feature Buffer Displayed in ArcMap

NOTE

*To change the color of the displayed buffer, double click on the buffered feature with the **Select Graphics** tool from the **Standard** toolbar ( ). To remove the buffer, right click on the buffer layer in the Table of Contents panel, and select **Remove** from the context menu.*

Once a map with buffers has been created, it can be exported to a variety of file formats using the **File|Export Map** command. For more information on using buffers in ArcMap, refer to ArcMap's online Help or printed documentation.

9.2.1.2 Dissolve Wizard

The **Dissolve Wizard** is used to merge features together that have the same attribute value(s). This function is frequently used after other types of geoprocessing operations are performed that result in merging or appending features together, such as overlay and append.

The **Dissolve Wizard** merges adjacent features in a layer to form new aggregated features, based on a particular attribute. The new aggregated features can be given new attributes that contain summary statistics about the component features that were aggregated to create them. For example, the number of component features, and the sum, minimum, maximum, average, and standard deviation of any of the attributes of these component features, could be used to create new attributes.

If the layer contains polygon features, the **Dissolve Wizard** will remove the boundaries between adjacent polygons that have the same value for the specified attribute. For example, the boundaries between adjacent counties can be dissolved to create larger aggregated regions that have the same rate of population growth.

If the layer contains line features, the **Dissolve Wizard** will remove the nodes (end points) between connected lines that have the same value for the specified attribute. For example, the lines making up a river network can be dissolved into contiguous stretches that have the same rate of flow.

If the layer contains point features, the **Dissolve Wizard** will create a single new point at the center of gravity of points that have the same value for the specified attribute.

The output from the dissolve operation is either a shapefile or a geodatabase feature class, depending on whether it is saved into a folder or a database. For more information on using the dissolve option in ArcMap, refer to ArcMap's online Help or printed documentation.

9.2.2 ArcToolbox Analysis Tools

Several groups of tools and wizards are provided within the **Analysis Tools** directory in ArcToolbox. These include: **Extract**, **Overlay**, **Proximity**, **Statistics**, and **Surface**.

9.2.2.1 Extract

Several tools and wizards are provided under the **Extract** directory in ArcToolbox. Some of these that are most relevant to the DTSS analyst include:

- **Clip**—extracts features from an input coverage that overlay with a clip coverage.
- **Extract Wizard**—provides a step-by-step guide through the process of extracting features from single or multiple coverages.
- **Select**—extracts map features from the input coverage based on their attribute values.
- **Split**—breaks a single coverage into many coverages.

See the ArcToolbox online Help or hardcopy documentation for a description of these, and other, **Extract** tools and wizards.

9.2.2.2 Overlay

The following tools and wizards are provided in the **Overlay** directory within ArcToolbox:

- **Eliminate**—merges selected polygons with neighboring polygons that have the largest shared border between them, or that have the largest area. With the LINE option, ELIMINATE merges selected arcs separated by pseudo nodes into single arcs.
- **Erase**—erases the input coverage features that overlap with the erase coverage polygons.
- **Identity**—computes the geometric intersection of two coverages. All features of the input coverage, as well as those features of the identity coverage that overlap the input coverage, are preserved in the output coverage. It raises the input coverage features that overlap with the erase coverage polygons.
- **Intersect**—computes the geometric intersection of two coverages. Only those features in the area common to both coverages will be preserved in the output coverage.
- **Overlay Wizard**—a wizard leads the user through the process of overlaying two coverages. It combines the Identity, Intersect, and Union commands.
- **Union**—computes the geometric intersection of two polygon coverages. All polygons from both coverages will be split at their intersections and preserved in the output coverage.

- **Update**—replaces the input coverage areas with the update coverage polygons using a cut-and-paste operation.

See the ArcToolbox online Help or hardcopy documentation for a description of these tools and wizards.

9.2.2.2.1 Erase Tool

Erase is an ArcToolbox command that erases the input coverage features that overlap the Erase coverage polygons. It creates a new coverage by overlaying the polygons of the Erase coverage with the features of the input coverage. Only those portions of the input coverage features falling outside the erase polygon's outer boundaries are copied to the output coverage.

The **Erase** tool discovers the feature classes in the input coverage and offers the following available erasing methods:

- **Poly**—Splits the input polygon arcs where they overlap the Erase polygons. Drops the arcs inside the erase polygons. Builds the remaining arcs into a new polygon coverage. Retains label points lying outside the erase area. Generates new polygon label points as required.
- **Line**—Splits the input arcs where they overlap the Erase polygons. Drops those portions inside the Erase polygons. Builds the remaining arcs into a new line coverage.
- **Point**—Drops points inside the Erase polygons. Builds remaining points into a new point coverage.
- **Poly & Line (Net)**—Erases polygons and arcs. Rebuilds polygon topology with an updated polygon attribute table (PAT) and arc attribute table (AAT).
- **Line & Point (Link)**—Erases arcs and points. Rebuilds line topology with an updated arc attribute table (AAT) and polygon attribute table (PAT).
- **Geometry**—Erases arcs, data points, and annotation in a coverage, with or without topology (no attribute files). Ignores attributes.

Follow the procedure below to use the **Erase** tool in ArcToolbox.

1. Open ArcToolbox from the desktop icon or from the **Start** menu. The **ArcToolbox** window appears.
2. Navigate to the **Erase** tool by clicking the plus sign (+) next to **Analysis Tools**, clicking the plus sign next to **Overlay**, and then selecting **Erase** with the mouse (Figure 9-24).

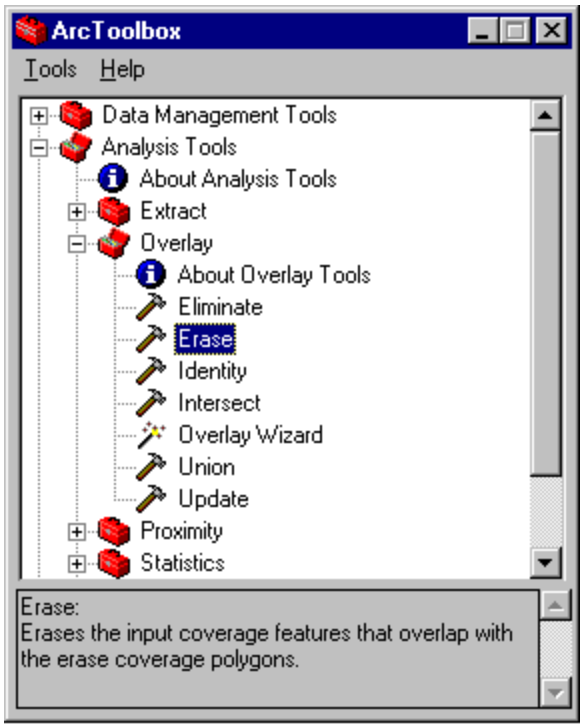


Figure 9-24 ArcToolbox Window Showing Erase Tool Selected

3. Double click on the ***Erase*** tool to open the **Erase** window (Figure 9-25).

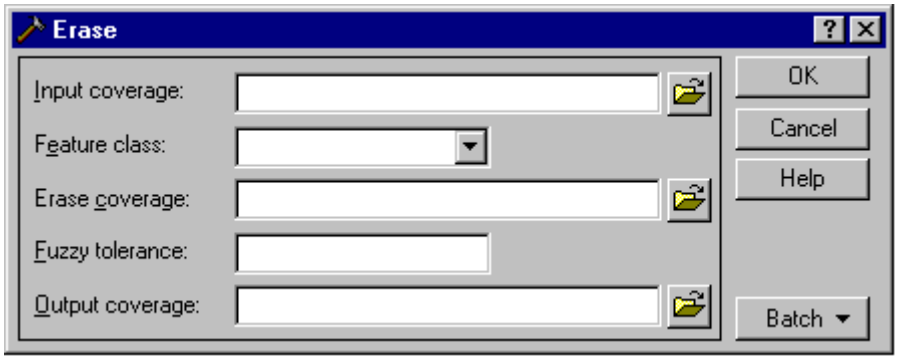


Figure 9-25 Erase Window in ArcToolbox

4. Enter the appropriate information in the fields and click ***OK*** to generate the Erase coverage. See Table 9-2 for a description of the **Erase** tool fields and buttons.

Table 9-2 Erase Tool Window Functions

Field or Button	Description
Input coverage	Coverage with features the user wants to remove.

Table 9-2 Erase Tool Window Functions (Cont'd)

Field or Button	Description
Feature class	Features the user wants to erase. Choices include the following: Poly—polygons Line—arcs Point—points Poly & Line (Net)—polygons and arcs Line & Point (Link)—arcs and points Geometry—arcs, data points, and annotation in a coverage, with or without topology.
Erase coverage	Outer polygon of this coverage defines erasing area.
Fuzzy tolerance	Very small distance used to resolve inexact intersection locations due to the limited arithmetic precision of computers.
Output coverage	Coverage user is creating.
Batch	Batch environment, where multiple instances of the task can be performed from a single session.

For more information on using the **Erase** tool, or any other tool in this program, refer to ArcToolbox's online Help or printed documentation.

9.2.2.2.2 Overlay Wizard

Follow the procedures below to use the **Overlay Wizard** in ArcToolbox.

1. Open ArcToolbox from the desktop icon or from the **Start** menu. The ArcToolbox window appears.

2. Navigate to the **Overlay** wizard by clicking the plus sign (+) next to **Analysis Tools**, clicking on the plus sign next to **Overlay**, and then selecting **Overlay Wizard** with the mouse (Figure 9-26).

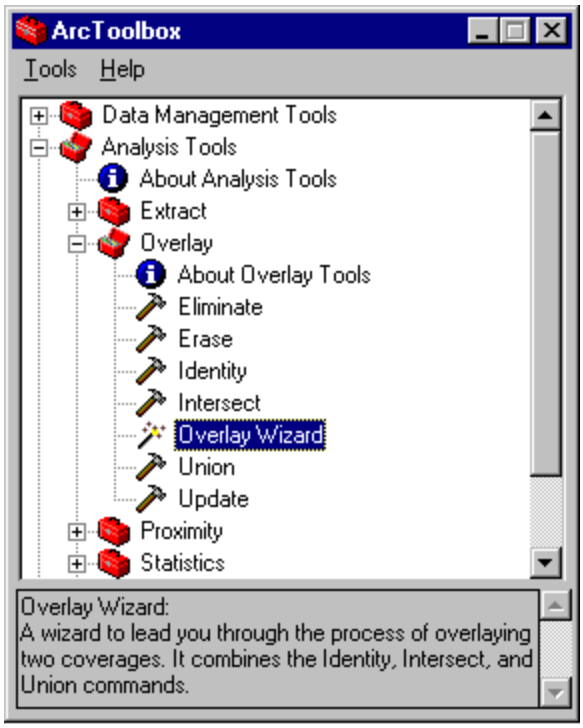


Figure 9-26 ArcToolbox Window Showing Overlay Wizard Selected

3. Double click on ***Overlay Wizard***. The **Overlay Wizard—What type of overlay do you want?** window appears (Figure 9-27).

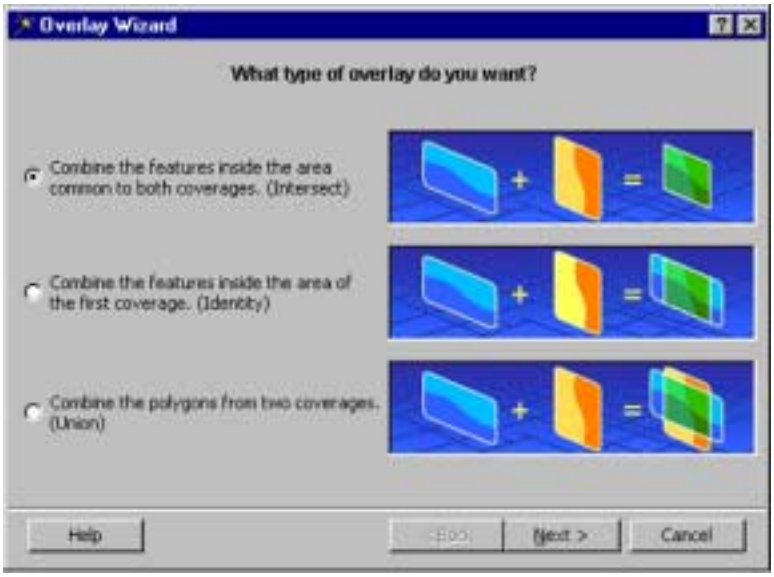


Figure 9-27 Overlay Wizard—What Type of Overlay Do You Want? Window

4. Click the radio button next to the appropriate option, and click ***Next*** to continue to the **Overlay Wizard—Input coverage** window (Figure 9-28).

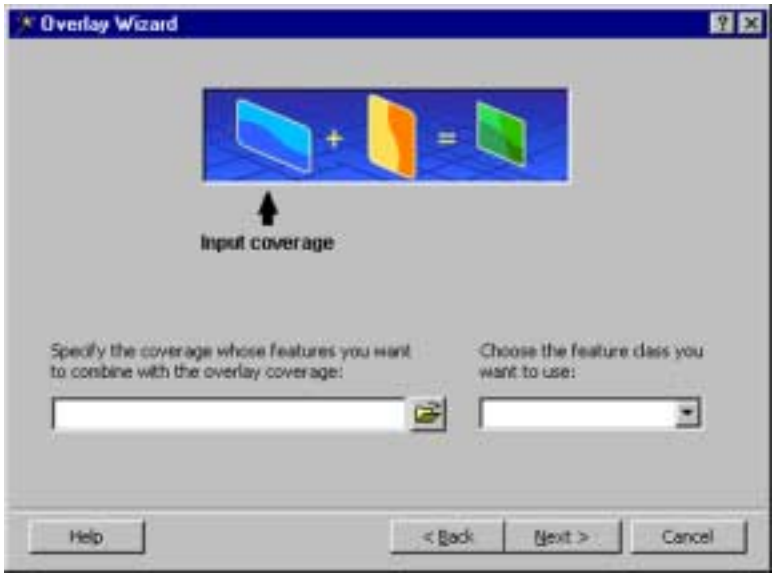


Figure 9-28 Overlay Wizard—Input Coverage Window

5. Choose the desired polygon coverage to overlay, and feature class to use, and click ***Next*** to continue. The **Overlay Wizard—Overlay coverage** window will appear (Figure 9-29).



Figure 9-29 Overlay Wizard—Overlay Coverage Window

6. Specify the overlay coverage and click ***Next***. The **Overlay Wizard—Join attributes** window will appear (Figure 9-30).

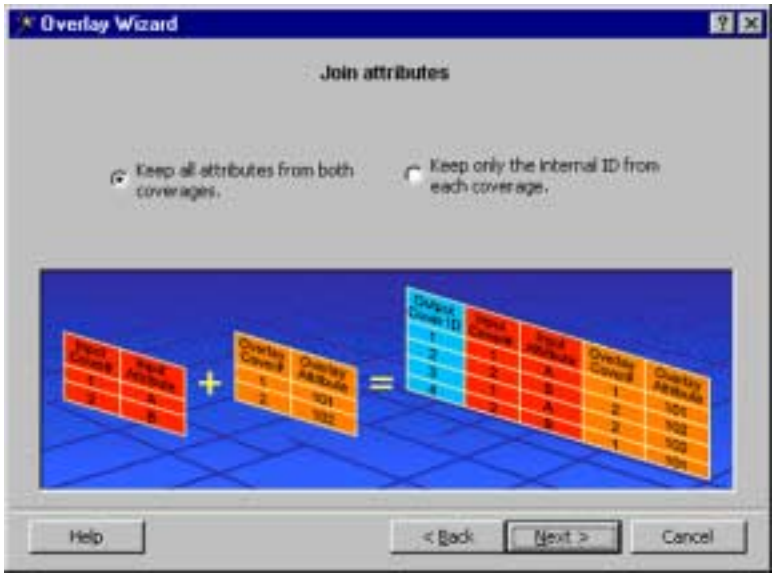


Figure 9-30 Overlay Wizard—Join Attributes Window

7. Click the radio button beside the appropriate option and click ***Next***. The **Overlay Wizard—Output coverage** window will appear (Figure 9-31).

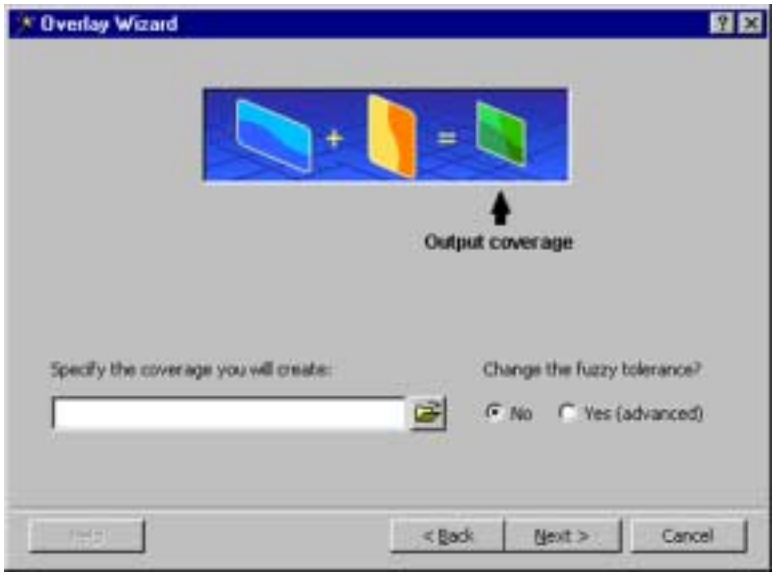


Figure 9-31 Overlay Wizard—Output Coverage Window

8. Specify the overlay coverage being created and whether to change the fuzzy tolerance, and click ***Next***. The **Overlay Wizard—Summary of your input** window will appear (Figure 9-32).

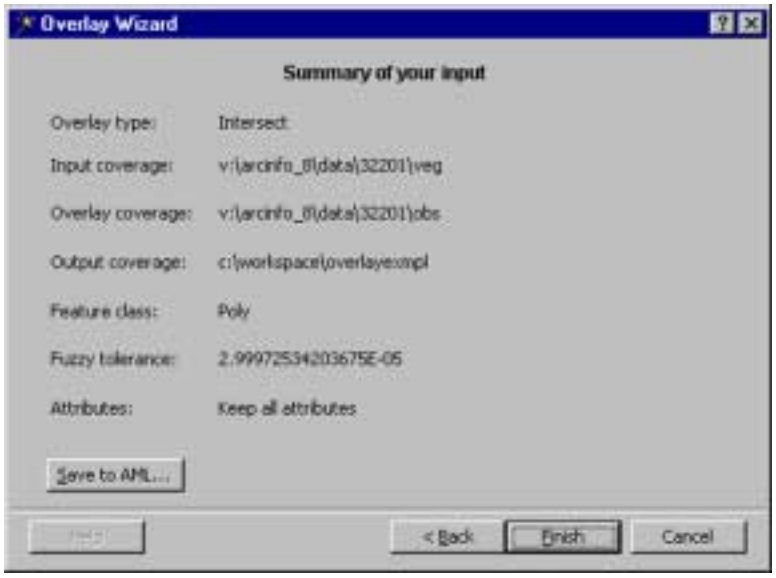


Figure 9-32 Overlay Wizard—Summary of Your Input Window

9. Verify the summary of the items entered in the **Overlay** wizard. If any items appear incorrect, use the ***Back*** button to move to a prior wizard window and make the appropriate changes. The appended coverage can be saved to AML by clicking the **Save to AML…** button. When finished, click ***Finish*** to complete the **Overlay Wizard**. The **Processing…** window appears (Figure 9-33). The process will take several minutes.

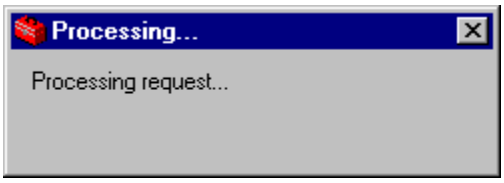


Figure 9-33 Processing Window From ArcToolbox Overlay Wizard

10. When the **Processing…** window disappears, the overlaid coverages have been generated.

For more information on the **Overlay Wizard**, refer to ArcToolbox's online Help or printed documentation.

9.2.2.3 Proximity Directory

Several tools and wizards are provided under the **Proximity** directory in ArcToolbox. Some of these that are most relevant to the DTSS analyst include:

- **Buffer**—creates buffer polygons around specified input coverage features.
- **Buffer Regions**—creates buffer regions around grouped input coverage features.

- **Buffer Wizard**—a wizard leads the user through the process of buffering specified input coverage features.

See the ArcToolbox online Help or hardcopy documentation for a description of these, and other, **Proximity** tools and wizards.

9.2.2.3.1 Buffer Wizard

ArcToolbox provides several tools and wizards to perform buffer operations on ArcInfo coverages. The **Buffer Wizard** in ArcToolbox creates buffer polygons or regions around specified input coverage features. Input features can be polygons, lines, points, nodes, or regions. The output coverage can be either a polygon or a region coverage.

The **Buffer Wizard** differs from the other buffer tools in ArcToolbox (**Buffer, Buffer Regions**) in that it provides increased functionality, enabling the analyst to create multiple polygon buffers, create multiple region buffers, and change the names and values of certain items. All the ArcToolbox buffer functions can be accessed by clicking the plus sign (+) next to **Analysis Tools** then clicking the plus sign next to **Proximity.** The ArcToolbox **Buffer Wizard** is similar to the ArcMap **Buffer Wizard** presented in Section 9.2.1.1 with regard to the options provided to the users.

NOTE

Different Buffer Wizard windows will appear depending on the type of coverage and feature classes chosen.

For more information on creating buffers in ArcToolbox, refer to ArcToolbox's online Help or printed documentation.

9.2.2.4 Statistics Directory

Several tools and wizards are provided under the **Statistics** directory in ArcToolbox. These include:

- **Frequency**—produces a list of the unique code occurrences and their frequency for a specified set of items in an INFO table. Optionally, summary items may be totaled for each unique code combination (e.g., the total AREA for unique combinations of ZONING and LAND-USE).
- **Statistics Wizard**—a wizard to perform attribute statistics.
- **Summary Statistics**—generates summary statistics for items in an INFO table and saves them in an output INFO table.

See the ArcToolbox online Help or hardcopy documentation for a description of these tools and wizards.

9.2.2.5 Surface Tools

The ArcToolbox **Surface** tools which include: **Contour Wizard**, **Cut & Fill**, **Visibility**, and **Volume** are designed to perform various surface functions on elevation data stored as ArcInfo grids. See the ArcToolbox online Help or printed documentation for a description of these tools and wizards.

9.2.3 ArcToolbox Data Management Tools

ArcToolbox provides several Data Management Tools. The Append tool is described in the following section.

9.2.3.1 Append Wizard

The **Append Wizard** in ArcToolbox merges features from two or more coverages into a single coverage, both horizontally and vertically. This tool is useful when two or more coverages share common features, and the analyst wishes to combine these coverages. The wizard rebuilds topology only for the feature classes Poly or Poly & Line (Net), but not for others.

When the coverages to be appended are adjacent, they should meet accurately at their shared boundaries such that the arc coordinates that define the common boundary are the same for both coverages. Equally important, arcs that meet at borders between adjacent coverages should match. Polygon codes should be the same if a polygon extends into an adjacent coverage.

Follow the procedures below to use the **Append Wizard** in ArcToolbox.

1. Open ArcToolbox from the desktop icon or from the **Start** menu. The **ArcToolbox** window appears.

2. Navigate to the **Append** wizard by clicking the plus sign (+) next to **Data Management Tools**, clicking the plus sign next to **Aggregate**, and then selecting **Append Wizard** with the mouse (Figure 9-34).

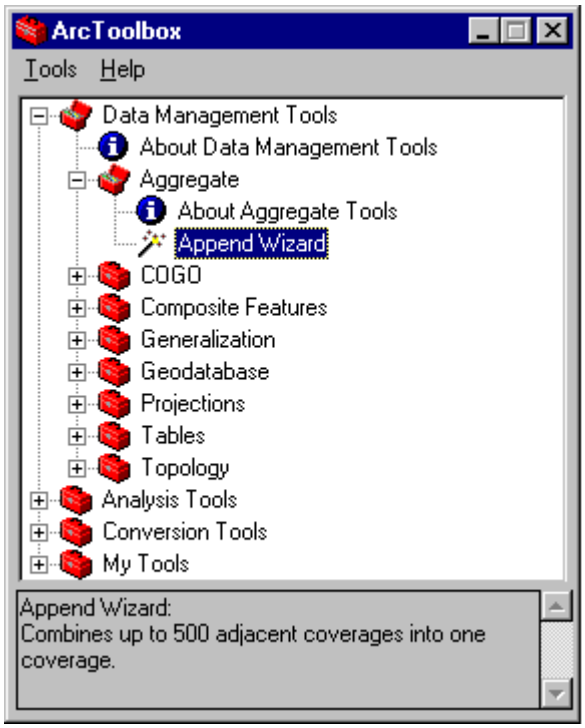


Figure 9-34 ArcToolbox Window Showing Append Wizard Selected

3. Double click on ***Append Wizard***. The **Append Wizard—Which coverages do you want to append?** window appears (Figure 9-35).

NOTE

Wizard windows may differ from those shown, depending on the types of coverages selected by the analyst.

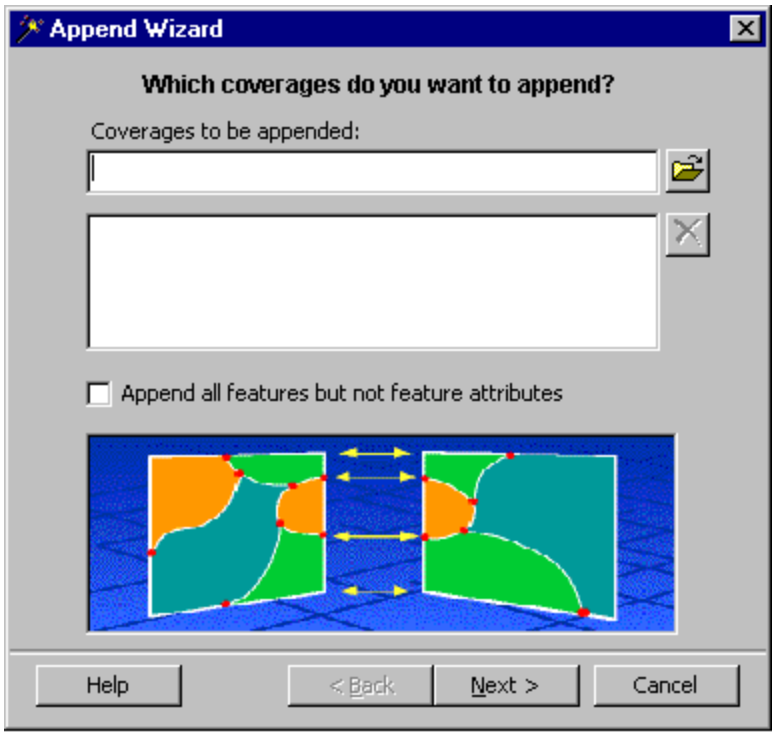


Figure 9-35 Append Wizard—Which Coverages to Append Window

4. Click on the ***Open*** folder icon ( ) to open the **Choose an input coverage...** window (Figure 9-36).

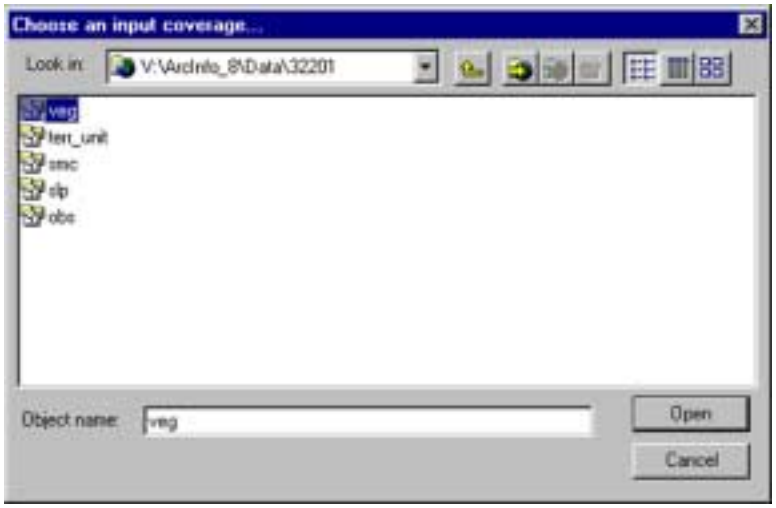


Figure 9-36 Choose an Input Coverage Window

5. Select the appropriate coverage and click ***Open*** to add it to the **Append Wizard—Which coverage do you want to append?** window (Figure 9-37). Repeat this step to add at least two coverages to append.

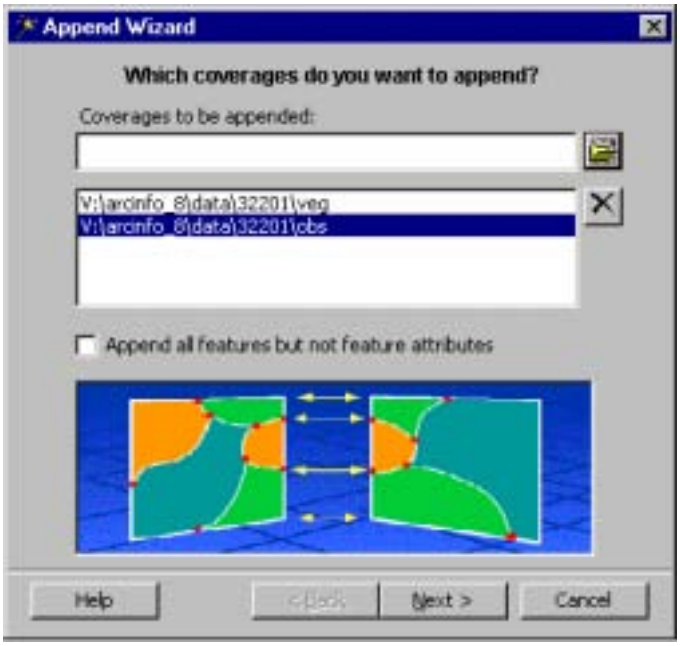


Figure 9-37 Append Wizard—Which Coverages Do You Want to Append Window

6. The option "Append all features but not feature attributes" will merge different feature types (e.g., points from one coverage and arcs from another). If left unchecked, the ***Next*** button advances the wizard to the **Append Wizard—Select the desired feature classes** window (Figure 9-38). If checked, the wizard advances to the output coverage window shown later in this procedure.

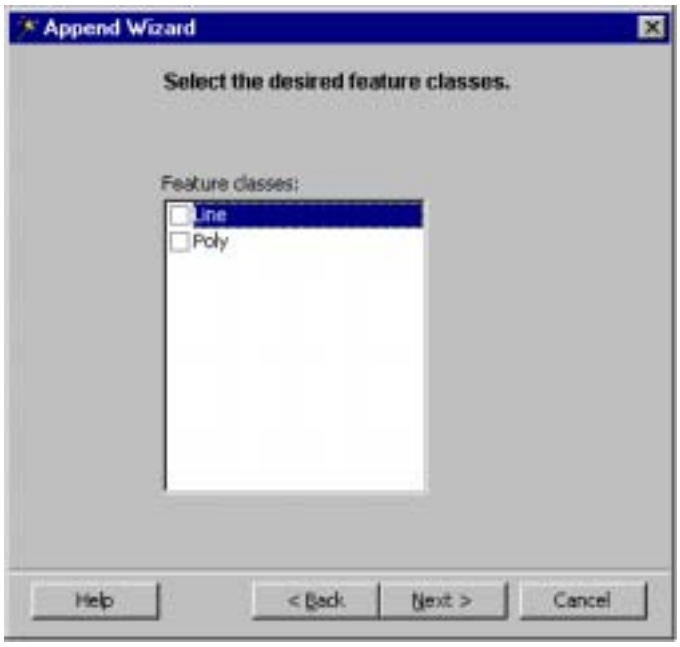


Figure 9-38 Append Wizard—Select the Desired Feature Classes Window

7. Choose from available feature classes and click ***Next***. If more than one feature class is selected, the **Append Wizard—Select a clip coverage** window appears (Figure 9-39). Otherwise, the wizard advances to the output coverage window that follows.

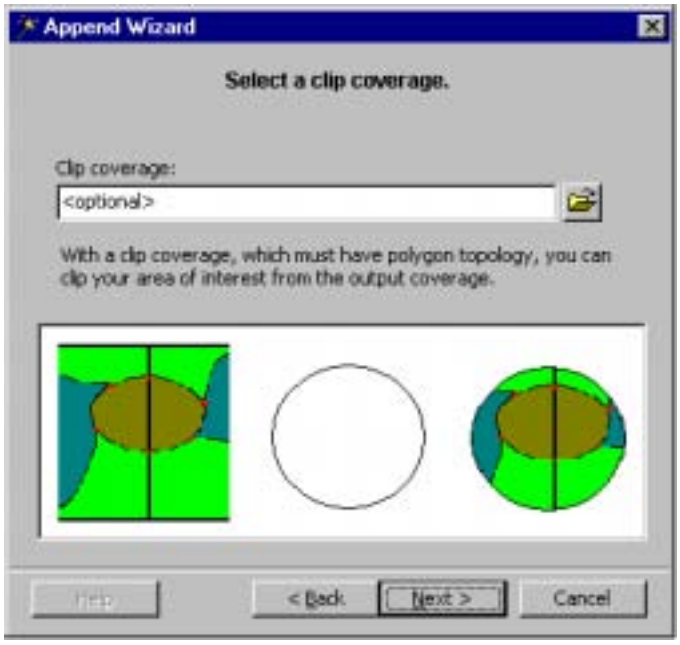


Figure 9-39 Append Wizard—Select a Clip Coverage Window

8. Choose a clip coverage to clip the area of interest from the output coverage. This step is optional. Click ***Next*** to continue. The **Append Wizard—Select the output coverage** window appears (Figure 9-40).

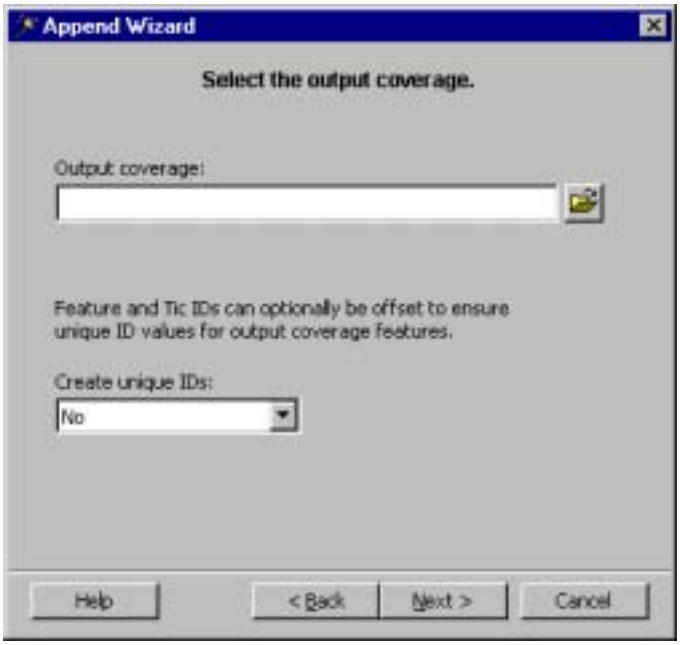


Figure 9-40 Append Wizard—Select the Output Coverage Window

9. Click on the ***Open*** folder icon ( ) to open the **Specify an output coverage...** window.

10. Select the appropriate coverage, and click ***Save***. The output coverage filename appears in the "Output coverage" field.

11. Select the appropriate option from the "Create unique IDs" dropdown menu.

NOTE:

*Only coordinates are appended in the **Append Wizard**; feature attribute tables are neither appended nor copied. To merge feature attributes in the output coverage after using the **Append Wizard**, do not create unique IDs for features in the **Select the output coverage** window. After the wizard has executed, the **Join Tables** tool can be used to merge attributes from the input coverage feature attribute table into the **Append Wizard** output coverage.*

12. Click ***Next*** to continue. The **Append Wizard—Summary of your input** window appears (Figure 9-41).

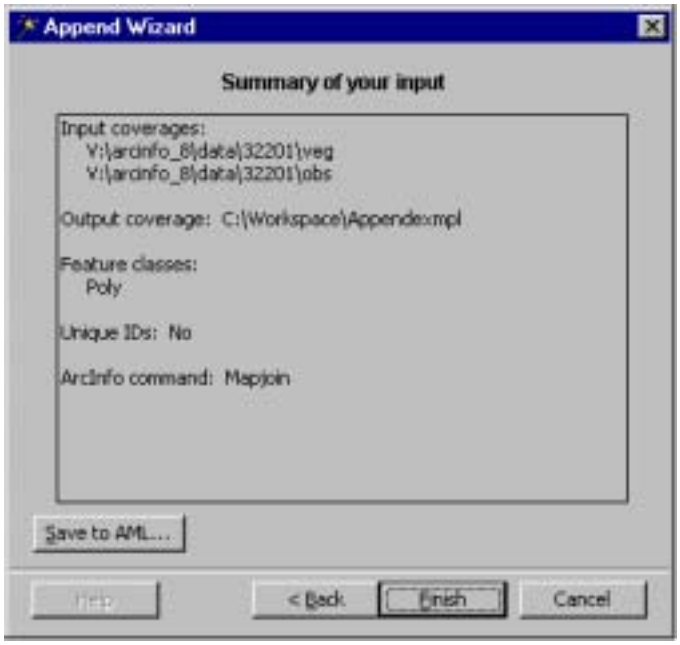


Figure 9-41 Append Wizard—Summary of Your Input Window

13. Verify the summary of the items entered in the **Append Wizard**. If any items appear incorrect, use the ***Back*** button to move to a prior wizard window and make the appropriate changes. The appended coverage can be saved to AML by clicking the **Save to AML…** button. When done, click ***Finish*** to complete the **Append Wizard**. The **Processing…** window appears (Figure 9-42). The process will take several minutes.

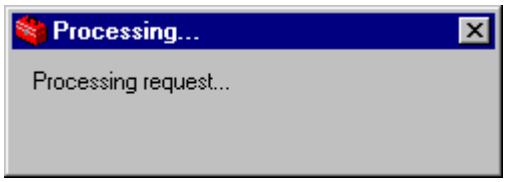


Figure 9-42 Processing Window From ArcToolbox Append Wizard

14. When the **Processing…** window disappears, the appended coverages have been generated.

Coverages created with the **Append Wizard** generally require further processing before they can be used as input with other tools. Recommended post-processing items include the following:

- Splitting intersecting arcs (using the **Clean** command).
- Edgematching arcs that cross over adjacent coverage boundaries (using **ARC MATCHNODE** or **Link coverages in ArcEdit**).
- Removing sliver polygons or boundaries between adjacent coverages (using **Eliminate**, **Select**, or **Dissolve**).

- Removing dangling arcs (using **Clean**).
- Matching nodes (**ARC SNAPCOVER**, **MATCHNODE**, or **ArcEdit**).
- Dissolving interior boundaries between adjacent coverages (**Dissolve**).
- Building topology (**Clean** or **Build**).

For more information on performing any of the listed post-processing items, refer to ArcToolbox's online Help or printed documentation.

Chapter 10

DATA PRESENTATION

10	**DATA PRESENTATION**	10-3
10.1	Displaying Data in ArcMap	10-3
10.1.1	Data Layers	10-4
10.1.1.1	Adding Layers	10-4
10.1.1.1.1	Adding a Single Geodatabase Feature Class	10-4
10.1.1.1.2	Adding an Entire Geodatabase Feature Dataset	10-6
10.1.1.2	Copying Layers	10-7
10.1.1.3	Working With Multiple Layers	10-8
10.1.1.4	Group Layers	10-8
10.1.1.4.1	Creating Group Layers	10-8
10.1.1.4.2	Adding Layers to a Group Layer	10-10
10.1.1.4.3	Changing the Layer Order in a Group Layer	10-12
10.1.1.4.4	Removing Layers	10-12
10.1.2	Symbology	10-13
10.1.2.1	Transparency	10-16
10.1.2.1.1	Adjusting Vector Layer Transparency	10-16
10.1.2.1.2	Adjusting Raster Layer Transparency	10-17
10.1.2.2	Saving Symbology	10-18
10.2	Map Composition	10-19
10.2.1	Map Documents and Map Templates	10-19
10.2.1.1	Choosing a Template	10-19
10.2.1.2	Saving a Map Template	10-21
10.2.1.3	Data Links	10-21
10.2.2	Layout View	10-21
10.2.2.1	Data Frames	10-22
10.2.2.1.1	Data Frame Scale	10-24
10.2.2.2	Page Setup	10-28
10.2.2.3	Scale Bar	10-29
10.2.2.4	Grids and Graticules	10-31
10.2.2.5	Legend	10-35
10.2.2.6	Text Fields	10-37

10.2.2.7 North Arrow 10-38
10.2.2.8 Align and Group Functions 10-40
10.2.3 Annotating Imagery 10-41
10.2.3.1 Dynamic Labeling 10-41
10.2.3.2 Converting Labels to Annotation 10-43
10.2.4 Saving a Map Composition 10-46
10.2.4.1 Exporting a Map Image 10-46
10.2.5 Printing a Map 10-46
10.2.6 DTSS Map Production Tool 10-46
10.2.6.1 DTSS Map Template 10-47
10.2.6.2 DTSS Map Elements 10-49
10.3 Terrain Visualization 10-51
10.3.1 3-D Perspective Views 10-51
10.3.2 3-D Anaglyph 10-59
10.3.3 Shaded Relief 10-61

10 DATA PRESENTATION

The DTSS analyst can visualize geographic data in a variety of ways. This chapter will discuss how to display data, create presentable map documents, and utilize methods of terrain visualization.

10.1 Displaying Data in ArcMap

ArcMap allows the analyst to view data, edit its properties and appearance, and create map presentations. ArcMap provides the analyst with two modes of operation: Data View and Layout View. Data View is used to display, query, and edit geographic data. Layout View is used to layout a map composition and add map elements. Layout view is described under Map Composition, Section 10.2. To toggle between these two modes, use the ***View*** menu, and select either ***Data View*** or ***Layout View***. Another method for changing the view mode is to click on either the ***Data View*** ( ) or ***Layout View*** ( ) button on the bottom left corner of the Display panel.

Data View enables the analyst to view data without other map layout elements such as scale bars, north arrows, text, etc. This allows the analyst to focus on and work interactively with the data itself. If the current map document contains more than one data frame (in Layout View), the data from the active data frame will appear in Data View. An example of Data View in the ArcMap Display panel appears below (Figure 10-1).



Figure 10-1 Sample Data View in ArcMap Display Panel

10.1.1 Data Layers

Geographic information appears on a map as layers, with each layer representing a particular feature type such as stream, lake, highway, political boundary, or vegetation type. A layer does not store the actual geographic data; instead, it references the data contained in coverages, shapefiles, geodatabases, images, grids, etc. Referencing data in this way allows the layers on a map to automatically reflect the most up-to-date information in the database.

10.1.1.1 Adding Layers

To add data to ArcMap, follow one of the following options:

- Click the ***Add Data*** button ( ) in the ArcMap **Standard** toolbar (or select the ***File/Add Data*** command on the ArcMap menu bar). Navigate to the appropriate dataset, and click ***Add***.
- Click and drag dataset(s) or feature class(es) from ArcCatalog to the ArcMap Display panel.

When a layer is added in ArcMap, it will appear in the Table of Contents panel of the ArcMap main window.

10.1.1.1.1 Adding a Single Geodatabase Feature Class

The Windows NT operating environment makes it easy for the analyst to drag and drop feature classes from ArcCatalog into ArcMap. Follow the steps below to add a feature layer in ArcMap using ArcCatalog.

1. Open ArcCatalog by clicking the **ArcCatalog** icon ( ) on ArcMap's **Standard** toolbar.

2. When ArcCatalog opens, browse for the appropriate geodatabase in the Catalog Tree View panel on the left side of the window. Double click the geodatabase and then double click the geodatabase feature dataset that contains the data to be displayed in ArcMap.

3. Click on the required geodatabase feature class (Figure 10-2). Then hold down the mouse button while dragging the mouse to the ArcMap window's Display panel. Notice the plus sign (+) next to the pointer. Release the mouse button.

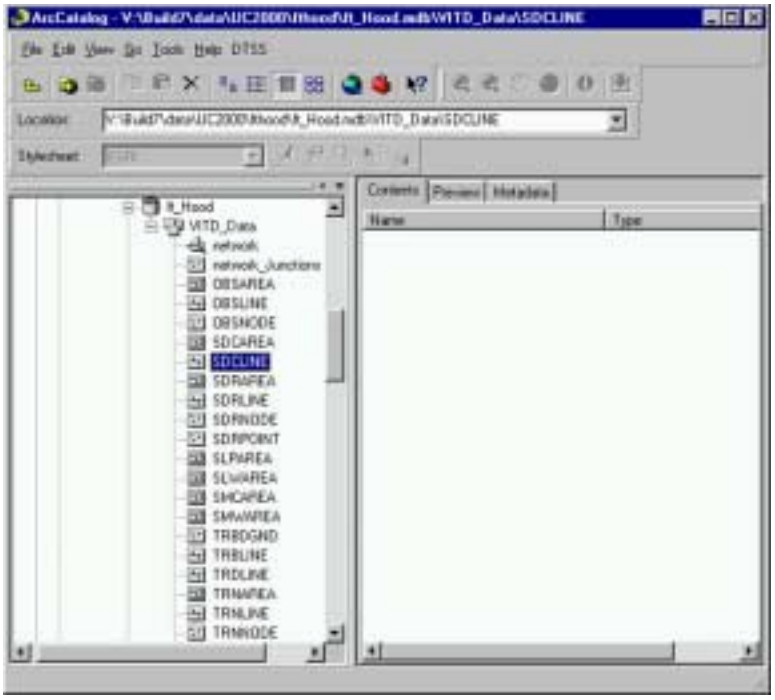


Figure 10-2 Highlighted Feature Class in ArcCatalog

4. The new feature class layer appears in the Table of Contents panel in ArcMap, where data can now be displayed, queried, and edited (see Figure 10-3).

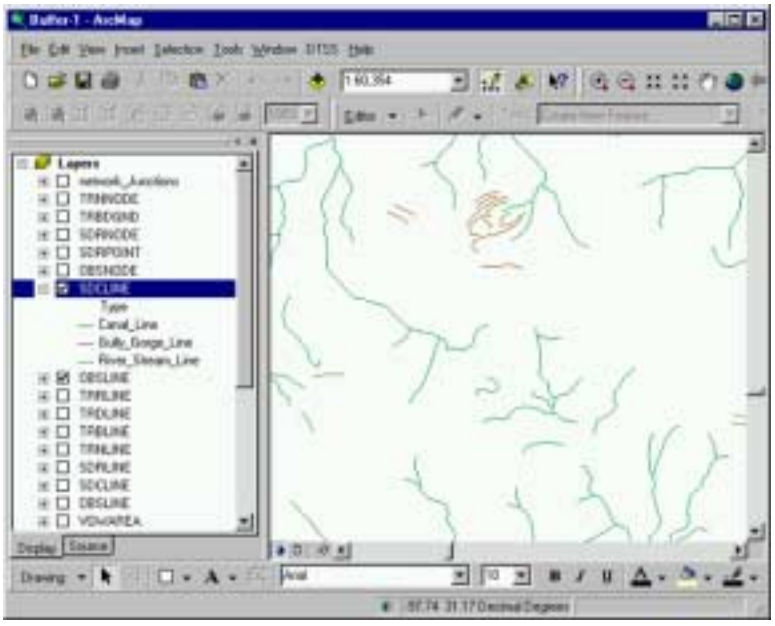


Figure 10-3 Added Feature Class Layer in ArcMap

For more information on adding features from a geodatabase, refer to the ArcMap user documentation or online Help.

10.1.1.1.2 Adding an Entire Geodatabase Feature Dataset

All the feature classes in an entire geodatabase feature dataset can be added to ArcMap at the same time. Follow the steps below to add a feature dataset using the ArcMap **Add Data** icon.

1. Click the ArcMap **Add Data** icon (), and browse for the appropriate geodatabase in the **Add Data** window.

2. Double click the geodatabase. Then single click the geodatabase feature dataset that contains the data to be displayed in ArcMap (Figure 10-4), and select ***Add***.

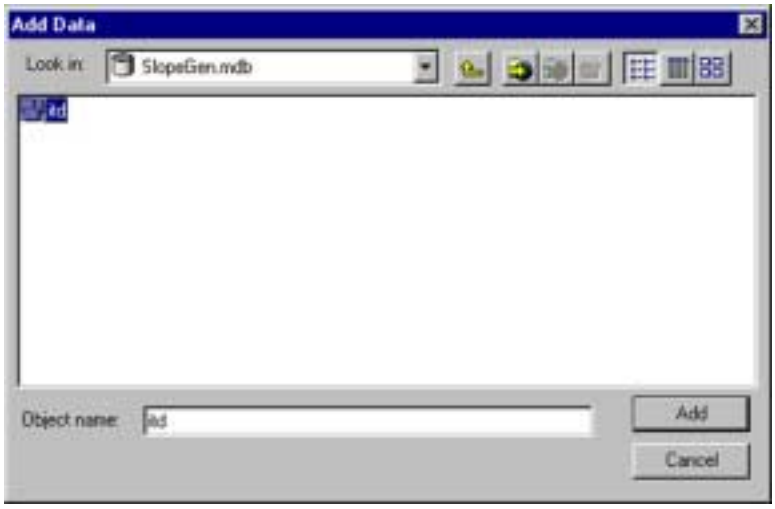


Figure 10-4 Add Data Window

3. All of the feature classes in the feature dataset appear in the Table of Contents panel in ArcMap (see Figure 10-5).

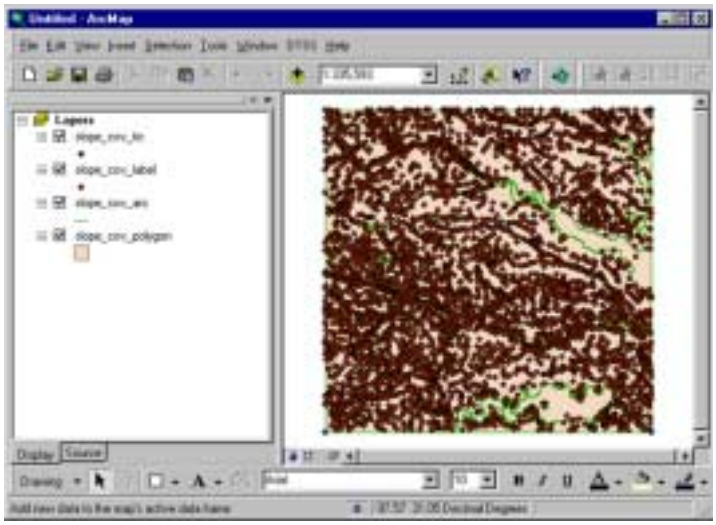


Figure 10-5 Added Feature Classes in ArcMap

NOTE

When displaying a custom geodatabase, such as ITD or VITD, feature classes without any features associated with them will appear in the Table of Contents panel without symbology displayed.

4. If there are data layers in the feature dataset that do not contain data, the data may display as a small dot in the ArcMap display. This is because the extent of any feature class that does not contain data is set to the entire world. If this happens, do one of the following:
   - Select a data layer in the Table of Contents panel, right click and select "Zoom to Layer" from the context menu, or
   - Use the ArcMap **Zoom In** tool to zoom in on the data.

10.1.1.2 Copying Layers

The analyst can copy individual layers from one data frame to another using ArcMap's copy and paste functionality. To copy a layer to another map, follow the procedure below.

1. Right click the mouse on the layer to copy into another data frame, and select ***Copy*** from the context menu that appears (Figure 10-6).

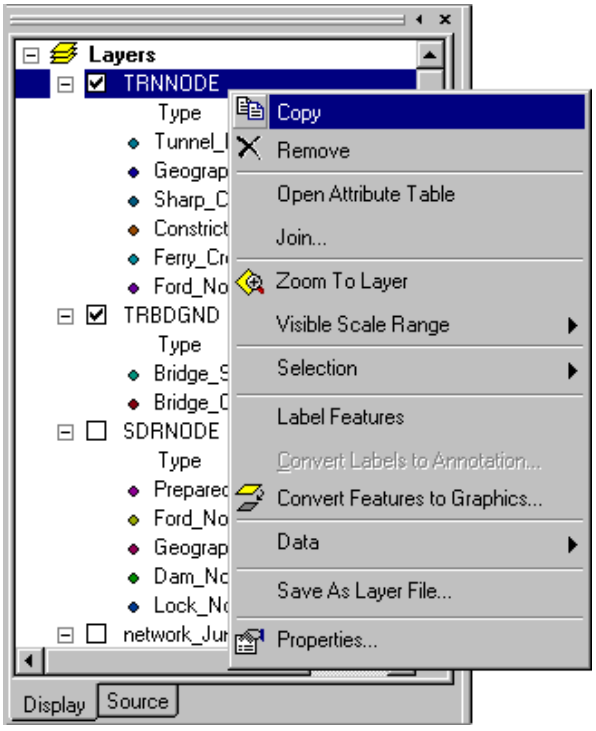


Figure 10-6 Context Menu Showing Copy Selected

2. Click the **Open** button () on the **Standard** toolbar and open the map to copy the layer into. ArcMap may prompt the analyst to save the current map document.

3. Right click the data frame to copy the layer into, and click ***Paste***. The copied layer will appear in the Table of Contents panel.

10.1.1.3 Working With Multiple Layers

Layers in ArcMap are organized and managed through the Table of Contents panel on the left side of the **ArcMap** window. The table of contents controls whether a layer displays, how it draws, and in what data frame it appears. The analyst can also remove layers, group them, and save them to disk.

A layer at the top of the Table of Contents panel draws on top of those below it. Thus, layers that form the background of a map, such as an ocean layer, are placed at the bottom of the table of contents. A layer is visible in the Display panel if a checkmark appears in the checkbox next to it in the table of contents. To hide a layer in the display area, leave the checkbox unchecked.

NOTE

All layers can be turned on or off at the same time by holding down the **[Ctrl]** *key and selecting the checkbox next to any layer.*

10.1.1.4 Group Layers

A group layer is several layers that appear and act like an individual layer in the table of contents in ArcMap. For example, two layers on a map representing railroads and highways could be grouped together as a single group layer and named “transportation networks.”

A group layer appears and acts like an individual layer in the table of contents. Turning off the display of a group layer turns off all its component layers. The properties of the group layer override any conflicting properties of its constituent layers. The user can still work with individual layers in the group, however. For instance, changes can be made to how an individual layer is drawn, displayed, and whether or not it is drawn as part of the group. Changes can also be made to the drawing order of the group, and layers can be added to, and removed from, the group as needed.

10.1.1.4.1 Creating Group Layers

The analyst’s first step is to create a group in which to place layers. To create a group layer, follow the procedure below.

1. Right click the desired data frame for a new group layer to access a context menu (Figure 10-7).

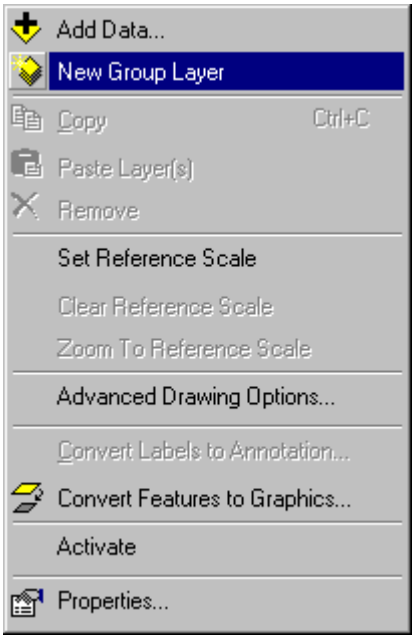


Figure 10-7 Context Menu Showing New Group Layer Selected

2. Click ***New Group Layer***. A layer titled "New Group Layer" appears in the Table of Contents panel.

3. To change the title, double click the group layer in the Table of Contents panel. The **Layer Properties** window will appear (Figure 10-8).

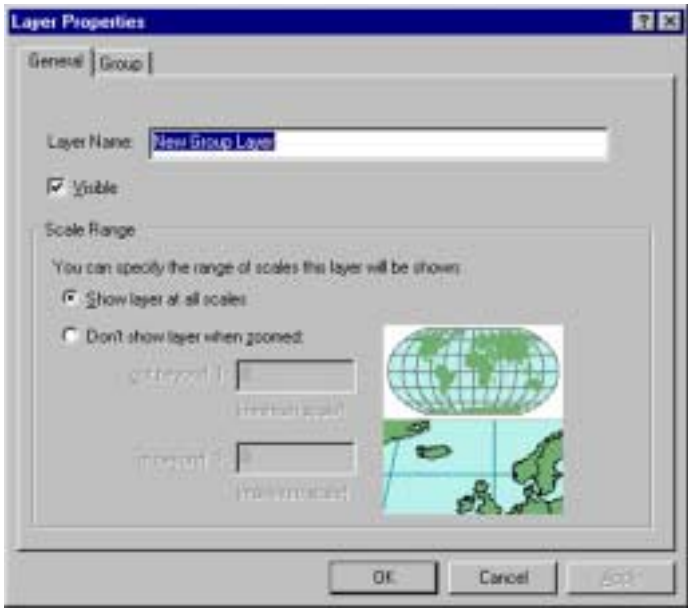


Figure 10-8 Layer Properties Window

4. Type the desired name for the group layer in the text field next to “Layer Name.”

5. Click ***OK***. The new group title will appear in the Table of Contents panel.

10.1.1.4.2 Adding Layers to a Group Layer

Once the group has been created, the analyst can add layers from the available data. To add a layer to a group, follow the procedure below.

1. Double click the group layer in the Table of Contents panel to display its properties. The **Layer Properties** window will appear (Figure 10-9).

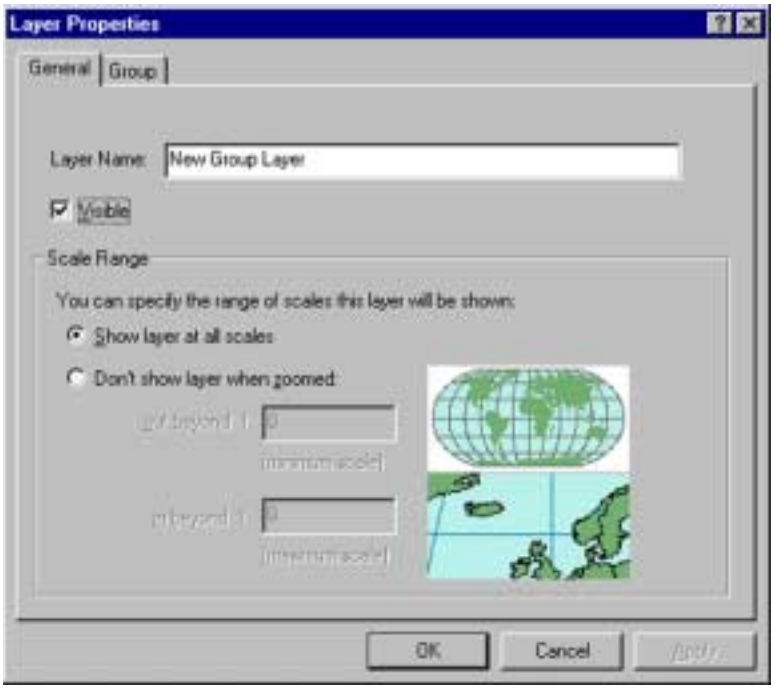


Figure 10-9 Layer Properties Window

2. Click the **Group** tab.

3. Click ***Add***. The **Add Data** window will appear (Figure 10-10).

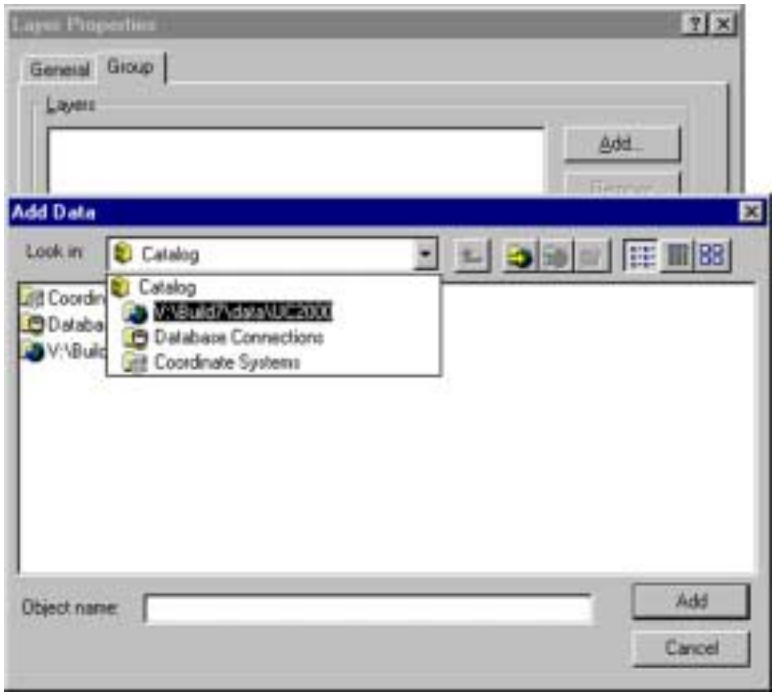


Figure 10-10 Add Data Window

4. Click the "Look in" dropdown arrow, and navigate to the desired data source to add to the group, and then click ***Add***. The added layer appears in the **Layer Properties** window (Figure 10-11).

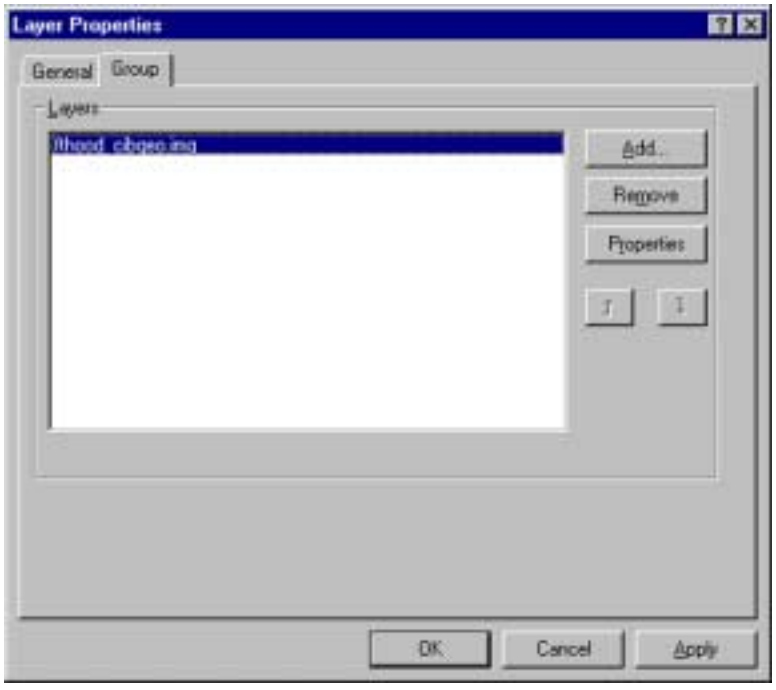


Figure 10-11 Layer Properties Window

5. Click ***OK***. The added layer appears below the group layer in the Table of Contents panel (Figure 10-12).

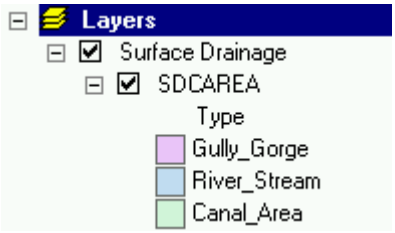


Figure 10-12 Group Layer With Added Layer

10.1.1.4.3 Changing the Layer Order in a Group Layer

To change the layer order in a group layer, follow the procedure below.

1. Double click the group layer in the Table of Contents panel to display its properties in the **Layer Properties** window.
2. Click the **Group** tab.
3. Click the layer to move.
4. Click the appropriate arrow button on the **Group** tab of the **Layer Properties** window to move the layer up or down.
5. Click ***OK***. Notice that the layer order has now changed in the Table of Contents panel.

10.1.1.4.4 Removing Layers

To remove a layer from a group layer, follow the procedure below.

1. Double click the group layer in the Table of Contents panel to display its properties in the **Layer Properties** window.
2. Click the **Group** tab.
3. Click the layer to remove. To remove several layers from a group layer, hold down the ***[Shift]*** or ***[Ctrl]*** key and select more than one layer in the group with the mouse.
4. Click ***Remove***.
5. Click ***OK***. The layer is removed from the Table of Contents panel.

For more information on working with group layers, refer to ArcMap's online Help or printed documentation.

10.1.2 Symbology

ArcMap provides default symbology for all features appearing in the Data View. The analyst, however, may wish to change colors and/or symbols to affect the appearance of certain features, or to meet accepted symbology for selected features. ArcMap allows the analyst to display data using features, categories, quantities, or multiple attributes.

In the example below, the analyst will change the color and style of symbols used to display road features.

1. In ArcCatalog, navigate to a transportation file and drag it into ArcMap. Make sure ArcMap is in Data View mode, using the ***View/Data View*** command or the ***Data View*** icon ( ) at the bottom left corner of the Display panel.

2. To change the symbology of the file (Road_Line in Figure 10-13), either right click on the layer (TRDLINE in Figure 10-13) in the Table of Contents panel, and select ***Properties*** from the context menu (Figure 10-13), or double click on the layer in the Table of Contents panel to open the **Layer Properties** window. If other layers exist is the Data View, ArcMap places the selected layer at the top of the Table of Contents panel by default. If changes have been made, however, the analyst may have to scroll to find the layer.

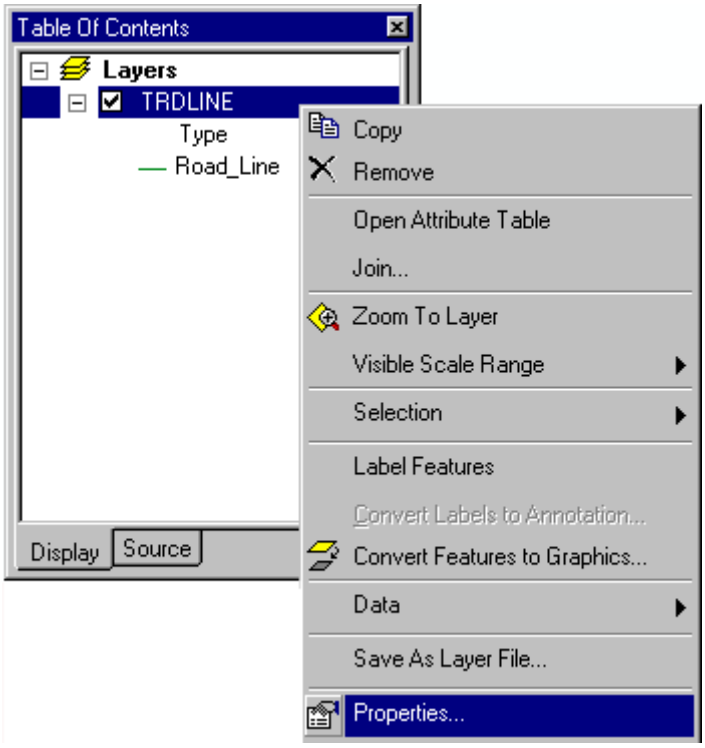


Figure 10-13 Context Menu for Layers

3. Click on the **Symbology** tab in the **Layer Properties** window to view the default color and symbol for the selected layer (Figure 10-14).

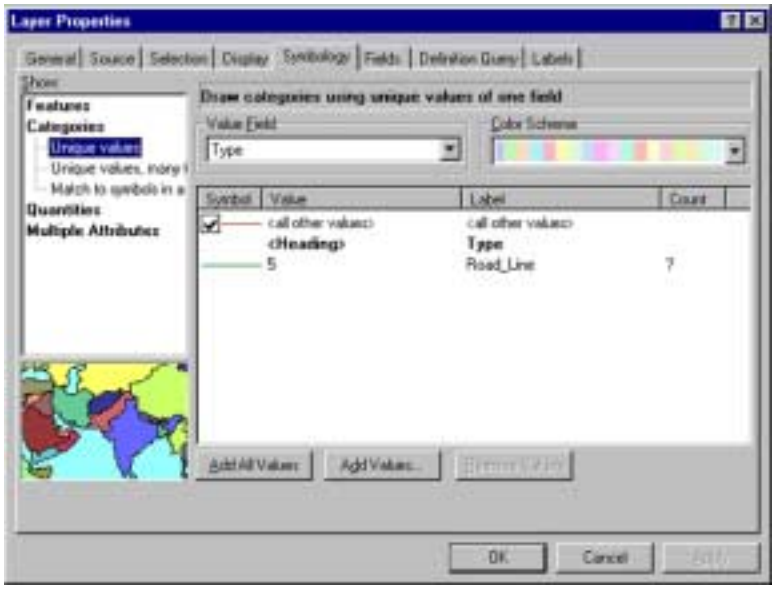


Figure 10-14 Symbology Tab in ArcMap Layer Properties Window

4. To use a single symbol to display all features, perform these steps:

    a. Make sure that **Features|Single Symbol** is highlighted in the "Show" panel located on the left side of the window. Double click on the **Symbol** button in the middle of the window. The **Symbol Selector** window opens (Figure 10-15).



Figure 10-15 Symbol Selector Window in ArcMap

    b. Scroll down the left panel to see the default symbols provided (additional default symbol files can be found by clicking the **More**

Symbols button). Select the red line symbol called Highway at the top of the list and notice that it appears in the "Preview" box at the top right of the window. Notice that the "Options" box in this window allows for changes in the color, size, and angle of the symbol. The **Properties** button accesses further modifications, all of which are explained in ArcMap's online Help. When finished, click ***OK*** to close the **Symbol Selector** window and return to the **Layer Properties** window.

c. Click ***Apply***. The symbology on the map behind the **Layer Properties** window automatically updates. Notice that the symbology icon for the layer has also changed in the Table of Contents panel. At this point, the analyst may continue modifying the feature's symbology. For this example, click ***OK*** to accept these changes and close the window.

5. To display features using unique values found in the data, follow these steps:

a. Make sure that **Categories|Unique Values** is highlighted in the Show panel located on the left side of the **Layer Properties** window. In the "Value Field" dropdown menu select ***Type***.

b. Click the **Add All Values** button, and then remove selected values if desired. Uncheck the box next to "all other values" to display any value that is not captured by the other fields. Default symbols are provided for all values of the selected type. A symbol can be changed by double clicking it and following substeps 4b and 4c.

c. Change the labels of the features by clicking in the "Label" column and typing the new value. For example, the labels could be changed to the following: 3 = Cart Track, 4 = Loose Surface, 5 = Paved Surface.

In addition to displaying a feature using a unique value, it is also possible to use multiple values or attributes, as well as match features to a pre-defined symbol style. In some cases, the user may want to classify data into ranges, or reclassify the default ranges output with various custom DTSS products.

To add ranges or change default ranges, follow the steps below.

1. With data open in ArcMap, right click on the desired layer and select ***Properties*** from the context menu.

2. Click the **Symbology** tab, and then click ***Quantities/Graduated Symbols*** in the "Show" panel on the left side of the **Layer Properties** window.

3. Select the appropriate value to classify from the "Value" dropdown menu in the "Fields" area of the window.

4. Now select the number of classes in the "Classification" area, and select the **Classify** button. This opens the **Classification** window, where the user can interact with a histogram to set the class breaks or enter explicit values in the "Break Values" field. The value entered will be the upper limit of the class.

For more detailed information on editing symbol properties and symbol styles, refer to ArcMap's online Help or printed documentation. Another resource is to press ***[F1]*** while highlighting any field or item on the **Symbology** tab in the **Layer Properties** window.

10.1.2.1 Transparency

To view multiple layers simultaneously, the DTSS analyst may find it useful to change the transparency of a vector or raster data layer in ArcMap. The following sections outline two different procedures for adjusting transparency. Both procedures work for vector and raster data.

10.1.2.1.1 Adjusting Vector Layer Transparency

Follow the procedure below to adjust the transparency of a vector data layer in ArcMap.

1. With a vector data layer open and displayed in ArcMap, right click the desired layer, and select ***Properties*** from the context menu that appears (Figure 10-16).



Figure 10-16 Context Menu in ArcMap

2. In the **Properties** window, click the **Display** tab, and enter the desired value for the layer's transparency in the "% Transparent" field (Figure 10-17).

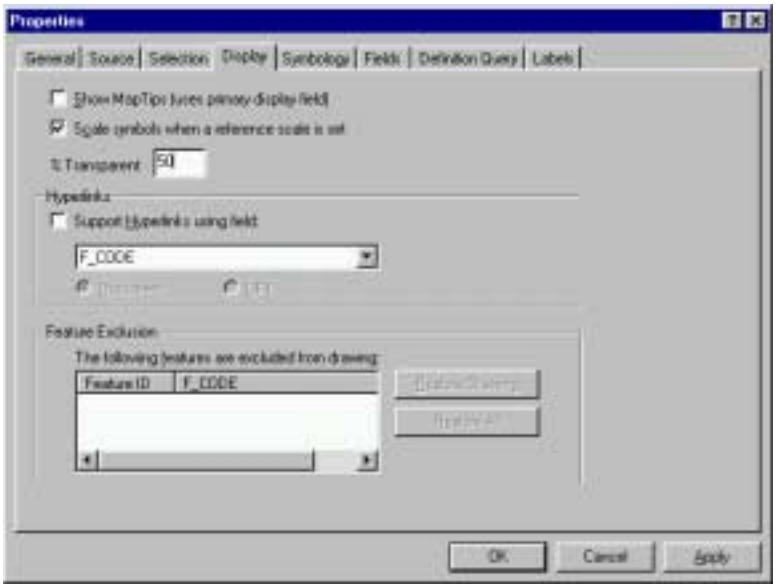


Figure 10-17 Display Tab in ArcMap Properties Window

3. Click ***OK*** to accept changes and close the **Properties** window. Notice that the layer's appearance changes accordingly in ArcMap's Display panel.

For more information on changing a data layer's transparency value, refer to ArcMap's online Help or printed user documentation.

10.1.2.1.2 Adjusting Raster Layer Transparency

Follow the procedure below to adjust the transparency of a raster data layer in ArcMap.

1. With a raster data layer open and displayed in ArcMap, select ***View/Toolbars/Effects*** from ArcMap's main menu. The **Effects** toolbar shown in Figure 10-18 appears.



Figure 10-18 Effects Toolbar in ArcMap

2. Select the desired raster layer from the **Layer** dropdown menu on the **Effects** toolbar. Notice that the icons to the right of this dropdown menu become active.

3. Click the **Adjust Transparency** icon ( ) to the far right on the toolbar to adjust the layer's transparency using the sliding scale that appears (Figure 10-19).

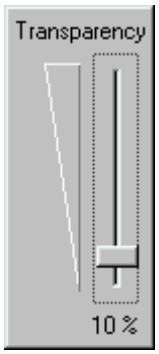


Figure 10-19 Transparency Sliding Scale in ArcMap

4. Click and drag the transparency setting to the desired percentage, and release to accept this change. The sliding scale disappears, and the layer changes accordingly in the Display panel.

10.1.2.2 Saving Symbology

The **File|Save As** command from the ArcMap menu bar creates a map document that saves the defined symbology.

10.2 Map Composition

An ArcMap map composition can be used to display DTSS products, as well as imagery and other data for display and printing. ArcMap offers tools to change map appearance, properties, and graphic elements. While the bulk of information about map composition is covered by ArcInfo documentation, this section gives a brief overview of basic ArcMap functionality and how it relates to the display of DTSS products.

10.2.1 Map Documents and Map Templates

Before creating a map composition in ArcMap the user must create a new map document. A new map document can be created from an empty map or by using a map template as a starting point. ArcMap comes with many pre-defined map templates. Once a template has been selected, the analyst can display a finished DTSS product in the template. Within the template, the DTSS product will be displayed in a data frame, which is the bounding box where the data appears. In addition to the data frame, the template may include map elements used to define parameters and values for the product, a symbol legend, a scale bar, a title, a north arrow, and other text fields.

10.2.1.1 Choosing a Template

To select a template, follow the steps listed below.

1. Open ArcMap by double clicking on the desktop icon, or by going to the **Start** menu, pointing to ***Programs***/***ArcInfo***, and clicking ***ArcMap***.

2. Once ArcMap opens, go to the **File** menu and select ***New***.

3. The **New** map document window appears (Figure 10-20). Select the desired template, or click the **Browse** button to find another template.

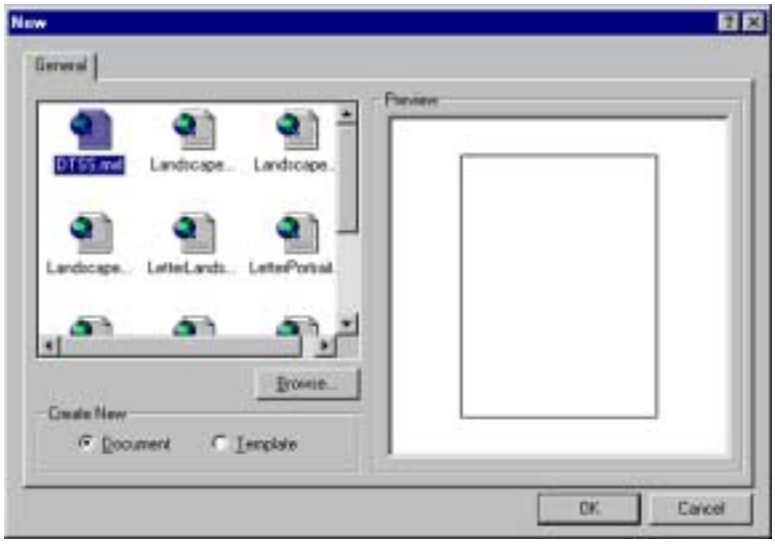


Figure 10-20 ArcMap New Map Document Window

4. Click the radio button next to "Document" in the "Create New" area of the window to use the template for a new map document. A map document uses the pre-defined template to display data. Click the radio button next to "Template" to create a brand new map template. A map template is created so that the same layout can be reused with other data.

5. Click ***OK***, and the selected template appears in the Display panel on the right side of the **ArcMap** program window (Figure 10-21).

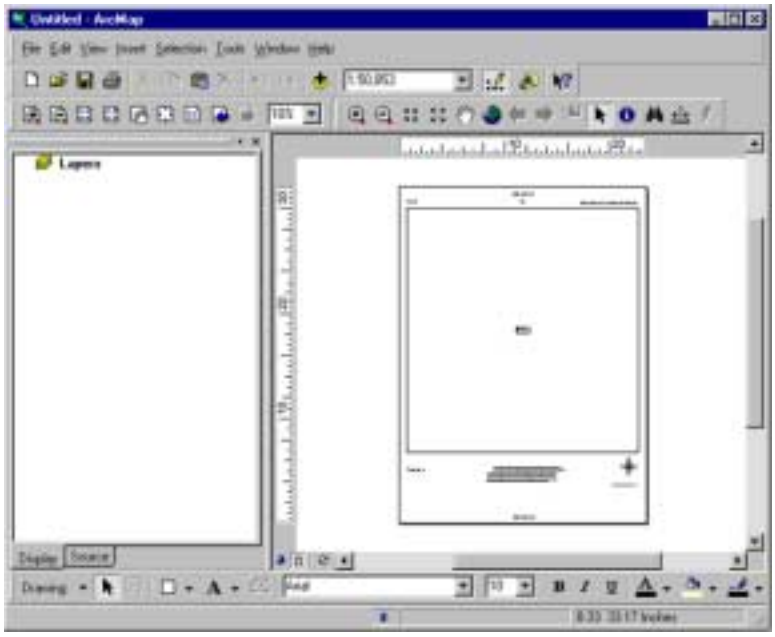


Figure 10-21 New Map Template in ArcMap

10.2.1.2 Saving a Map Template

Changes can be made to a map template and then saved to be used again. To save a map template select ***File/Save As*** from the ArcMap main menu bar. Make sure that the "Save As Type" is set to ArcMap Template (*.mxt*).

10.2.1.3 Data Links

When using an existing map document or map template, ArcMap searches for the data referenced by the layers on the map. If the link to the data is no longer valid because the data has been moved, deleted, or renamed, a red exclamation point and grayed out check box will appear next to the layer name in the Table of Contents panel.

To permanently repair the data link, right click on the layer in the Table of Contents panel, select ***Data/Set Data Source*** from the context menu, or left click the grayed out check box beside the red exclamation point. A window will appear allowing the user to navigate to the location of the data, select the data source, and create the link by clicking the ***Add*** button.

Data links can also be temporarily assigned to the data layers in a map document by double clicking on the grayed-out check box next to a layer and navigating to the applicable data layer. This method will automatically assign temporary data links to *all* the layers in the map document that are located in the data directory being accessed. For example, if a map document contains bad data links for a Helicopter Landing Zone product with two categories: Acceptable and Acceptable with Caution, temporary assignment of the Acceptable will also provide temporary assignment of the Acceptable with Caution layer if it is located in the same directory as the Acceptable layer.

10.2.2 Layout View

Map compositions are created using the Layout View in ArcMap. The Layout View can be opened by selecting ***View/Layout View*** from the ArcMap menu bar, or by clicking the ***Layout View*** icon ( ) in the bottom left corner of the Display panel. The Layout View (Figure 10-22) shows the virtual page upon which the analyst places and arranges geographic data and map elements. Map elements can include: a title, a north arrow, a legend, a scale bar, scale text, graphs, reports, text labels, and other images. To help with map layout, the analyst can display rulers, guides, and grids by right clicking in Layout View, outside the data frame, and selecting the desired items from the context menu that appears.

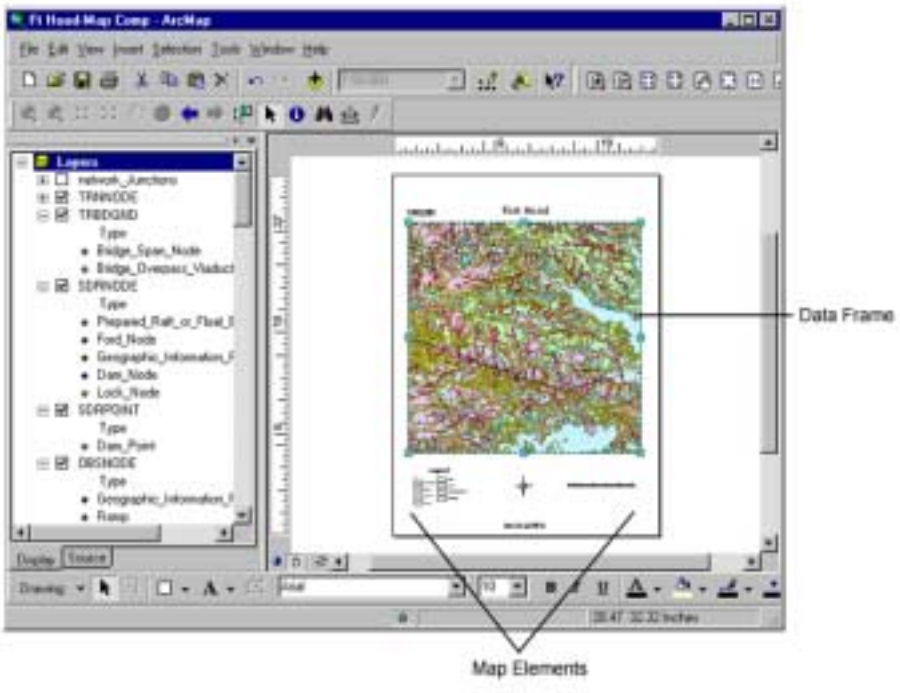


Figure 10-22 Sample Layout View in ArcMap

The Layout View window has two main panels: the Table of Contents panel on the left, and the Display panel on the right. The Table of Contents panel lists all layers in the map. Layers provide a reference to data in the form of coverages, shapefiles, geodatabases, images, grids, etc. The data layers can be ordered and/or displayed using the procedures identified in Section 10.1.1.3.

Modify the display order of layers by dragging and dropping the layer within the Table of Contents panel. Layers at the top of the Table of Contents listing will display on top of other layers shown in the map layout. The checkbox next to the layer determines whether or not it is displayed in ArcMap's Display panel. Toggle the display of all layers at the same time by holding down the ***[Ctrl]*** key and selecting the checkbox next to any layer.

To add data to the map composition, use the **Add Data** icon ( ) to navigate to the appropriate file. To remove a data layer, right click the layer in the Table of Contents panel, and select ***Remove.***

10.2.2.1 Data Frames

In the Layout View, geographic data is presented in a data frame. When a new layout is created, a default data frame is provided. This default data frame is listed in the Table of Contents panel as "Layers." Data can be easily added to the empty data frame. When

selecting a data frame with the mouse, the analyst will see handlebars appear around the data (Figure 10-23).

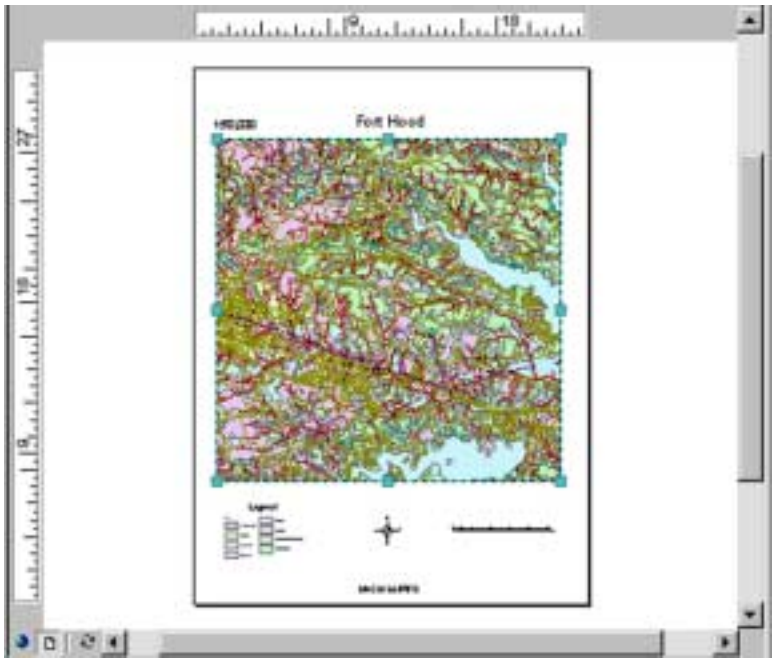


Figure 10-23 Sample Data Frame From Layout View in ArcMap

More than one data frame can be displayed on a map layout. Additional data frames can be used to show different information for a specific area. For example, the DTSS **Map Production Tool** generates a map with a location diagram, or "Locator," that displays in the bottom right portion of the map layout. When a map has more than one data frame, one becomes the active frame. The active frame responds to ArcMap tools such as zooming and panning. To activate a data frame, click on the frame in the Layout View. To add a data frame, select ***Insert/Data Frame*** from the ArcMap menu bar. Figure 10-24 shows an example of an added data frame.

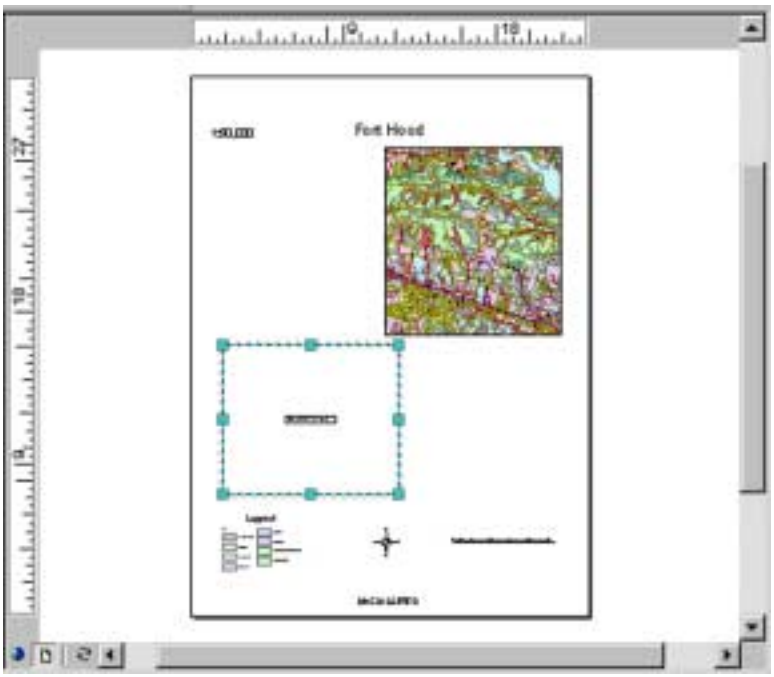


Figure 10-24 Additional Data Frame From Layout View in ArcMap

It is good practice to rename a data frame from the default name of "Layers" to a more meaningful name. To rename a data frame, double click on the name in the Table of Contents panel, and type a new name.

If the extent of the data is larger than what is actually displayed in the data frame, the analyst can pan to display a different part of the data. To pan, select the **Pan** button ( ) from the **Tools** toolbar, and click and drag the mouse in the data frame to display the desired area.

To remove a data frame, select the data frame in the Layout View, and press ***[Delete]*** on the keyboard.

10.2.2.1.1 Data Frame Scale

Although the analyst can zoom in on data to highlight specific geographic features, ArcMap allows for freezing the data frame scale to a set ratio. For example, the standard scale for many military maps is 1:50000. Any map that the analyst creates can be set to this scale for consistency of presentation. The **Map Production Tool** sometimes causes the scale to change when a map layout is generated. Therefore, it is a good idea to freeze the map scale so the information on the map remains accurate. To freeze the map scale in ArcMap, follow the steps below.

1. Begin with data that appears in a variable scale on the Layout View page, surrounded by a data frame, as shown in Figure 10-25. Notice the "Scale" field on the **Standard** toolbar: .

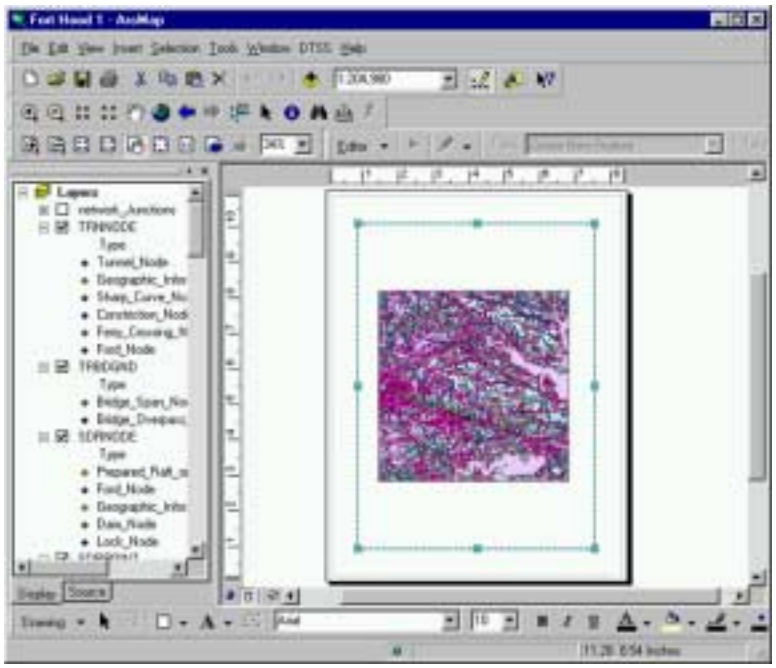


Figure 10-25 Active Data Frame With Variable Scale in ArcMap

2. Right click on the data frame, and select ***Properties*** from the context menu. The **Layer Properties** window opens (Figure 10-26).

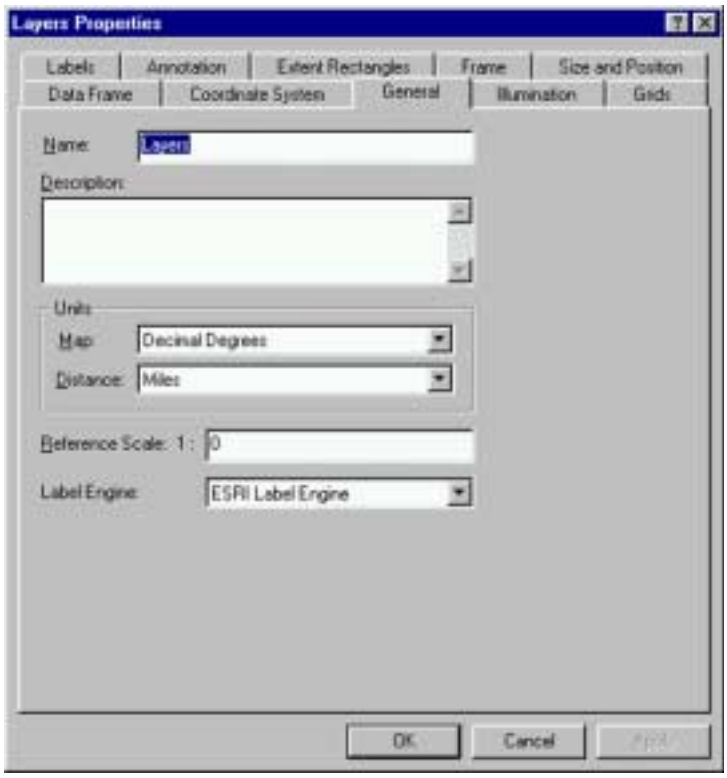


Figure 10-26 Layers Properties Window in ArcMap

3. Now click on the **Data Frame** tab to access information about the active data frame. Notice that there are three options in the "Extent" box: Automatic, Fixed Scale, and Fixed Extent.

4. Click the radio button beside the "Fixed Scale" option, and type in the desired scale in the text fields below and to the right: ***1:50000*** (settings shown in Figure 10-27).



Figure 10-27 Data Frame Settings in Layers Properties Window

5. Click ***OK*** to accept changes. The **Layers Properties** window closes, and the map reflects the new scale. Notice that the "Scale" field on the **Standard** toolbar shows the correct scale, grayed out to indicate a fixed field (Figure 10-28).

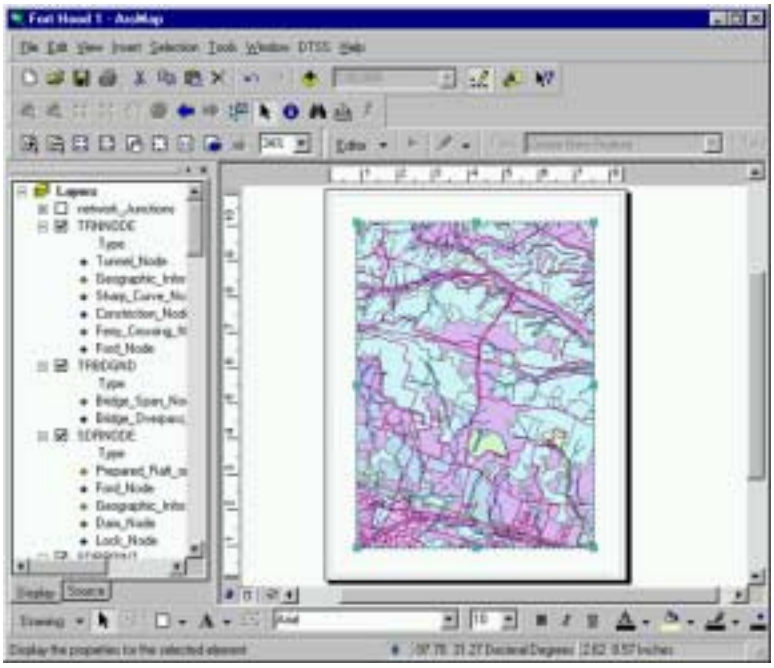


Figure 10-28 Fixed-Scale Map in ArcMap

For more information on scale options in ArcMap, refer to ArcMap's user documentation or online Help.

10.2.2.2 Page Setup

Once data is brought into the map composition, the look and size of the page can be changed using the Page Setup command. To adjust the page, right click outside the data frame to access a context menu, and select ***Page Setup*** to open the **Page Setup** window seen in Figure 10-29.

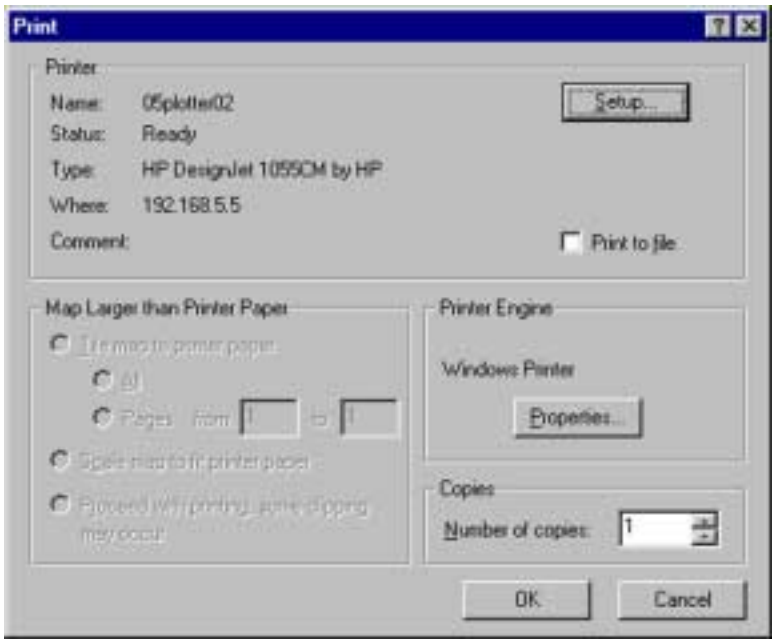


Figure 10-29 Page Setup Window

In this window the map size, map setup, and printer setup can be changed. It is also possible to scale map elements to the paper size. The page size for the DTSS **Map Production Tool** is 25 inches by 33 inches. Once the desired changes have been made, click ***OK*** to accept changes to the map. For more information about any field or button in a window, highlight the item with the mouse and press ***[F1]*** to activate ArcMap's online Help. See Section 11.2.7, *Printing*, for more information.

10.2.2.3 Scale Bar

The scale bar gives a map its measurement scale. To insert one or more scale bars, select ***Insert/Scale Bar*** from the ArcMap menu bar. The **Scale Bar Selector** window, shown in Figure 10-30, will appear. Choose a style and click ***OK*** to add it to the map. For more information about any field or button, highlight the item with the mouse and press ***[F1]*** to activate ArcMap's online Help.

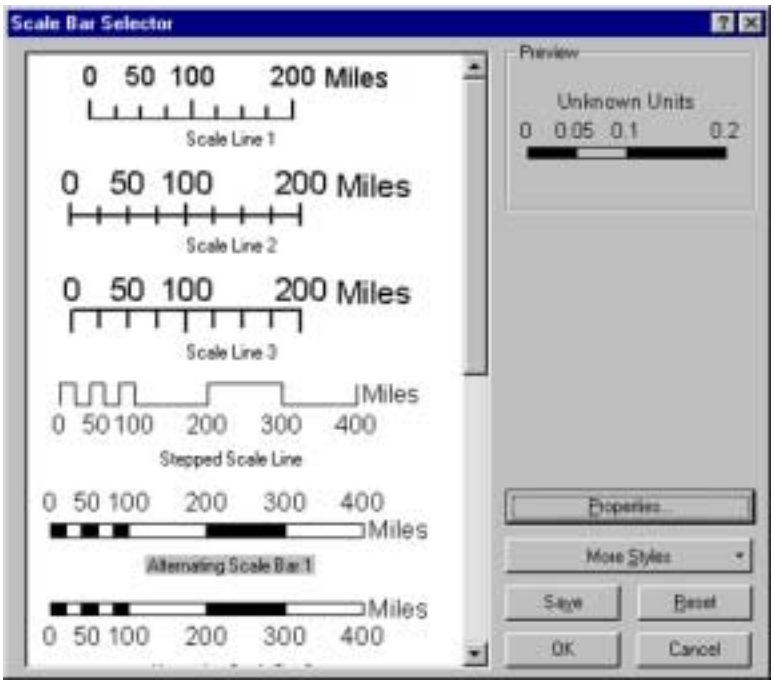


Figure 10-30 Scale Bar Selector Window

To edit an existing scale bar, double click on the scale bar in the Layout View, and the **Scale Bar Properties** window shown in Figure 10-31 will appear.



Figure 10-31 Scale Bar Properties Window

Table 10-1 gives a brief description of each tab's functions. For more information about any field or button, highlight the item with the mouse and press ***[F1]*** to activate ArcMap's online Help.

Table 10-1 Scale Bar Properties Tab Descriptions

Tab	Description
Scale and Units	Adjusts division value, number of divisions, and number of subdivisions; toggles display of a division before zero; indicates resizing options; defines and formats division units and unit labels.
Numbers and Marks	Defines and formats marks and numbers on scale.
Format	Changes text font, size, and style; adjusts color and style of scale bar.
Frame	Formats style, background color, and line size around scale bar; toggles fast draw method.
Size and Position	Adjusts placement of scale bar by its anchor point; shows current scale bar size (read-only fields).

10.2.2.4 Grids and Graticules

Grids and graticules help the analyst display the data's location based on a given coordinate system. Grids give a geographic representation of the world as divided into equally sized square cells, which are referenced by their *x*,*y* location. Graticules differ from grids in that they are a graphic representation of the actual latitude and longitude lines (parallels and meridians) on the globe. Depending on the coordinate system being used, the analyst can add grids or graticules to a map layout for easier geographic reference. For example, the analyst could add grid markers to a map based on the UTM coordinate system, or graticules for a map in latitude/longitude coordinates. Multiple grids and/or graticules can be added to a single map composition.

To add a grid or graticule to an existing map, follow the steps below.

1. With data open in ArcMap, make sure the Display panel is in Layout View. Use the ***View/Layout View*** command from the ArcMap menu bar, or the ***Layout View*** button ( ) at the bottom left corner of the Display panel, to change to Layout View.

2. Click on the data frame with the mouse. Handlebars appear around the data frame to indicate that it is active.

3. Right click on the active data frame and select ***Properties*** from the context menu to open the **Layers Properties** window (Figure 10-32).

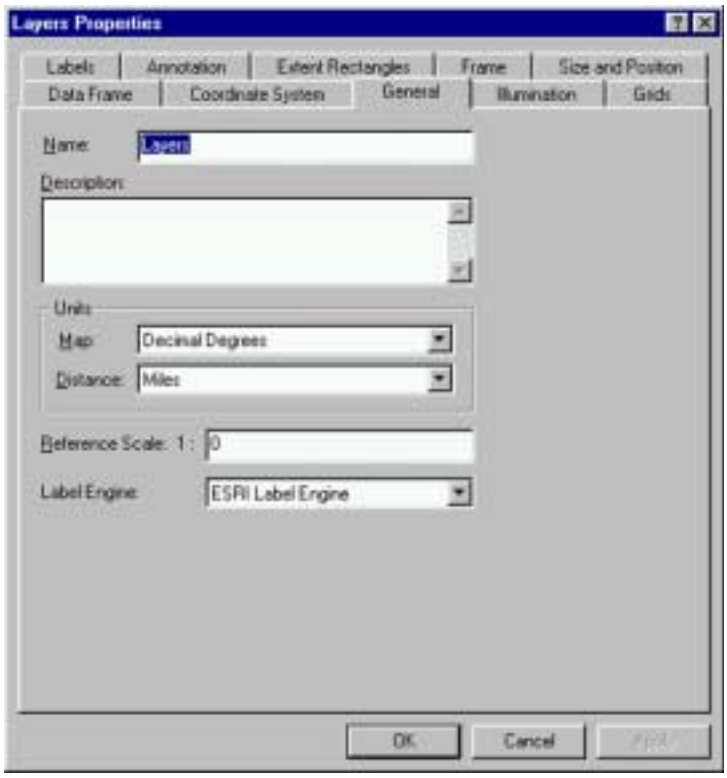


Figure 10-32 Layers Properties Window in ArcMap

4. Now click the **Grids** tab. Notice that the left panel is currently empty (Figure 10-33).

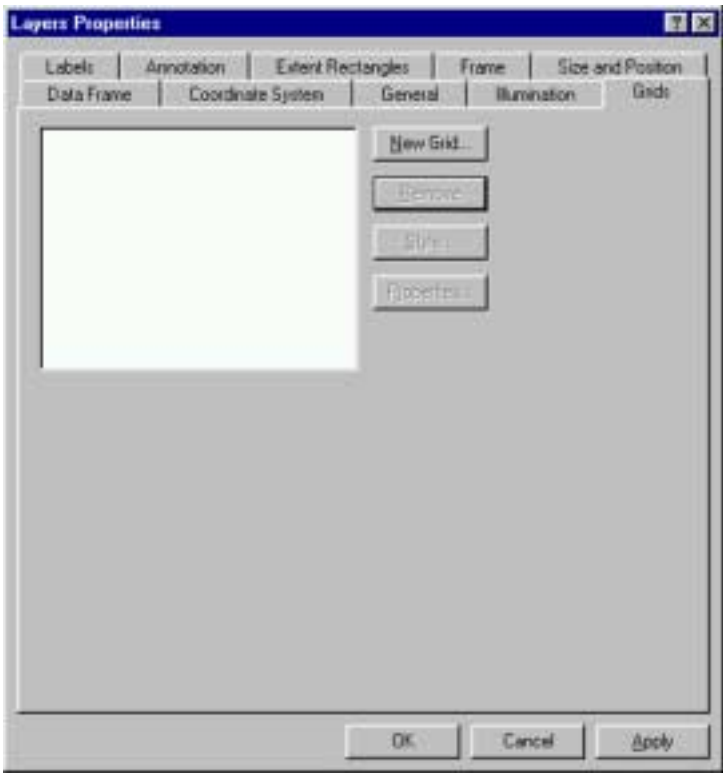


Figure 10-33 Grids Tab in Layers Properties Window

5. To add a grid, click the **New Grid** button, which opens the **Reference System Selector** window (Figure 10-34).

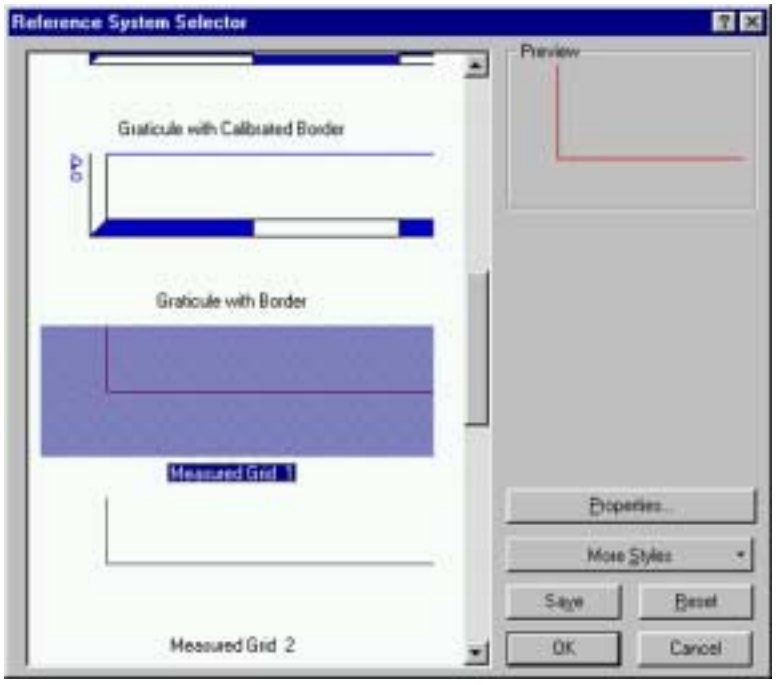


Figure 10-34 Reference System Selector Window in ArcMap

6. Now scroll down the left panel to select the appropriate grid or graticule for the displayed data. Notice that buttons to the right of this panel allow changes in grid properties and style. Click ***OK*** when finished.

7. The **Reference System Selector** window closes, returning to the **Grids** tab in the **Layers Properties** window. Notice that the left panel now has the selected item listed (Figure 10-35). Click ***OK*** again to accept changes.



Figure 10-35 Selected Grid on Grids Tab in ArcMap

8. The map now displays the selected grid around the outside of the data (Figure 10-36). Zoom in on the layout to check the coordinates.

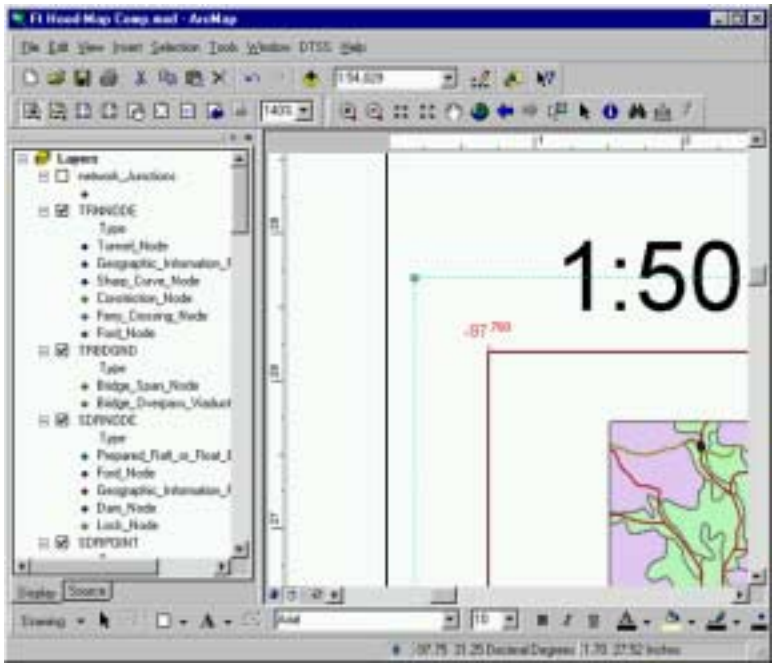


Figure 10-36 Inserted Grid Displayed in ArcMap

Analysts can modify grid and graticule properties, as well as apply multiple grids, based on map display needs. To remove a grid, select the **Grids** tab from the **Layers Properties** window and uncheck the desired grid. For more information on coordinate reference systems, refer to ArcMap's online Help or printed documentation.

10.2.2.5 Legend

Symbol legends allow the reader to understand the parameters and values visually displayed in the data frame. If no legend exists, one can be added to the map by selecting ***Insert/Legend*** from the ArcMap menu bar (see Figure 10-37). A legend title appears on the map, which can then be moved and/or edited as described above in this section.

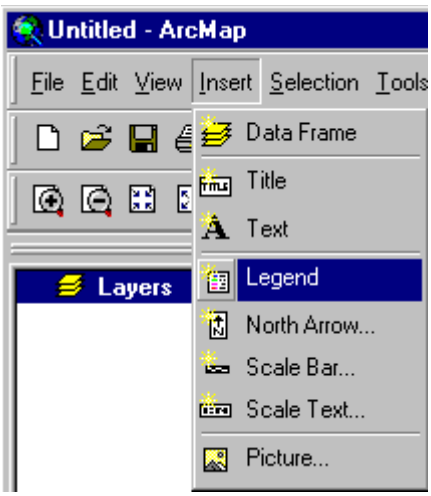


Figure 10-37 ArcMap Insert Menu

If a legend already exists, right click or double click on it to access the **Legend Properties** window shown in Figure 10-38. To edit the legend properties, make changes in the appropriate fields, and click ***OK*** to accept the changes.

NOTE

*The **Items** tab allows the user to easily define which layers in the display are included in the legend. This is particularly useful to remove image files from the legend so that colors assigned to background images are not displayed.*

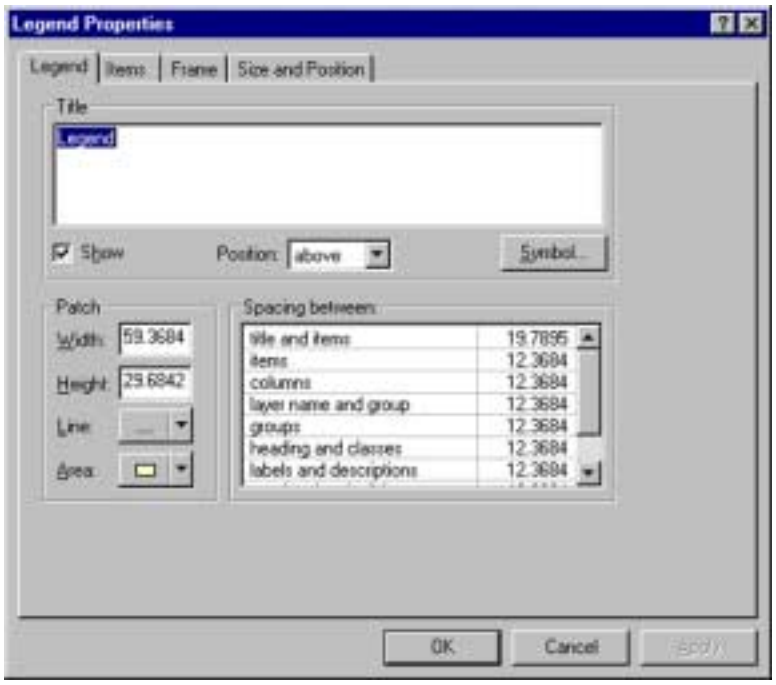


Figure 10-38 Legend Properties Window

Table 10-2 gives a brief description of each tab in this window. For more information about any field or button, highlight the item with the mouse and press ***[F1]*** to activate ArcMap's online Help.

Table 10-2 Legend Properties Tab Descriptions

Tab	Description
Legend	Changes content, display, position, and format of legend title; changes shape and line of patch for attribute; adjusts spacing within legend.
Items	Defines map layers included in legend; arranges and formats labels, patches, and descriptions; defines how legend updates relative to displayed map layers.
Frame	Formats style, background color, and line size around legend; toggles fast draw method.
Size and Position	Adjusts placement of legend by its anchor point; shows current legend size (read-only).

10.2.2.6 Text Fields

Text fields allow the user to label and define information on the map. To add new text fields, select ***Insert/Text*** from the ArcMap menu bar. A new text field will appear on the map and can then be edited and moved as needed. To edit existing text, double click on the text to access the **Properties** window seen in Figure 10-39. This window allows the user to format and place text in the map. Once the text has been edited, select ***OK*** to add to the map.

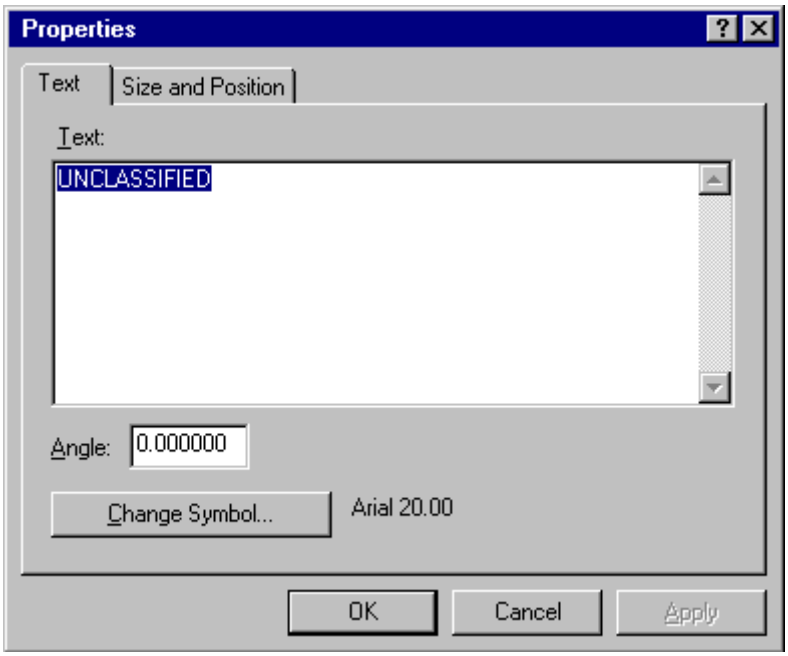


Figure 10-39 Text Properties Window

Table 10-3 gives a brief overview of each tab's functions. For more information about any field or button, highlight the item with the mouse and press ***[F1]*** to activate ArcMap's online Help.

Table 10-3 Text Properties Tab Descriptions

Tab	Description
Text	Defines and formats text in field.
Size and Position	Adjusts placement of text field by its anchor point; shows current size (read-only field).

10.2.2.7 North Arrow

To insert a north arrow, select ***Insert/North Arrow*** from the ArcMap menu bar. The **North Arrow Selector** window shown in Figure 10-40 will appear. Select a north arrow style and click ***OK*** to add it to the map. For more information about any field or button, highlight the item with the mouse and press ***[F1]*** to activate ArcMap's online Help.

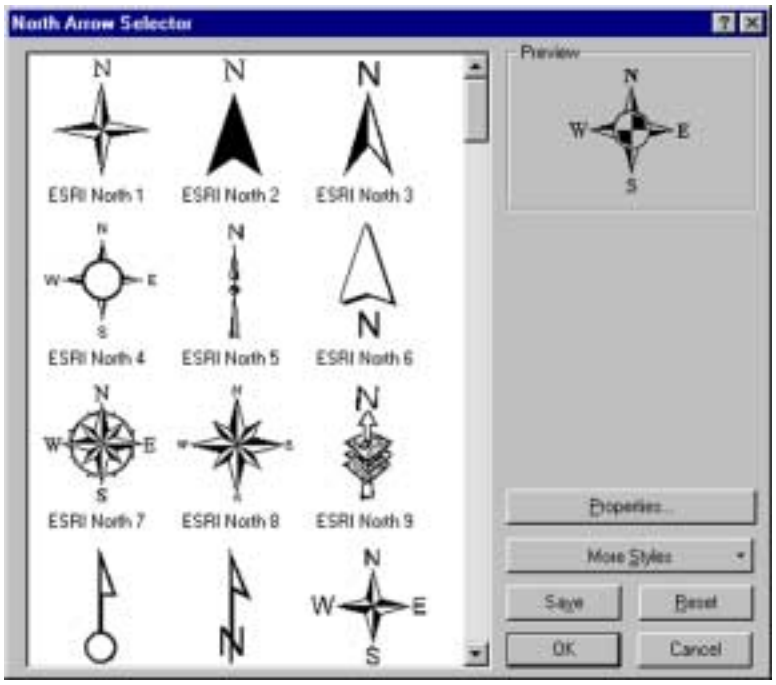


Figure 10-40 North Arrow Selector Window

To edit an existing north arrow, double click on the ***North Arrow*** symbol in ArcMap's Layout View to bring up the **North Arrow Properties** window shown in Figure 10-41. Click ***OK*** to accept changes to the map.

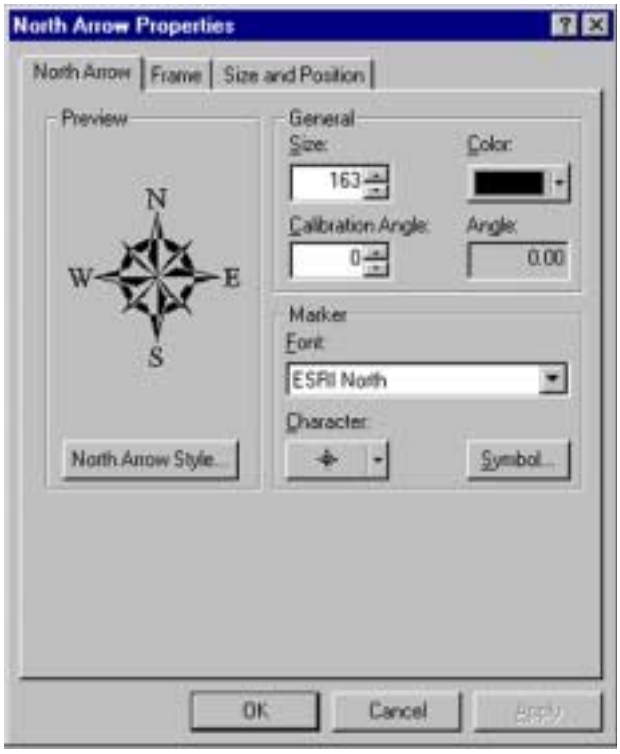


Figure 10-41 North Arrow Properties Window

Table 10-4 gives a brief description of each tab's functions. For more information about any field or button, highlight the item with the mouse and press ***[F1]*** to activate ArcMap's online Help.

Table 10-4 North Arrow Properties Tab Descriptions

Tab	Description
North Arrow	Formats size and appearance of north arrow symbol.
Frame	Formats style, background color, and line for north arrow; toggles fast draw method.
Size and Position	Adjusts placement of north arrow by its anchor point; shows size (read-only fields).

The north arrow used from the DTSS **Map Production Tool** is a group element. Individual elements that make up the north arrow can be dragged and dropped as a group. To edit individual objects in the north arrow group, follow the ungroup functions in Section 10.2.2.9, *Align and Group Functions*.

10.2.2.8 Align and Group Functions

The **Align** and **Group** functions allow the user to arrange two or more map objects in the map layout. The **Align** function arranges objects in relationship to each other, while the **Group** function groups multiple objects together, which can then be moved as a single unit. These functions can be accessed from the **Drawing** menu of the ArcMap **Draw** toolbar (Figure 10-42). When more than one object is selected, the same functions are accessed by right clicking on any of the selected objects. To select multiple items, hold down the ***[Shift]*** key and click on the item with the mouse.

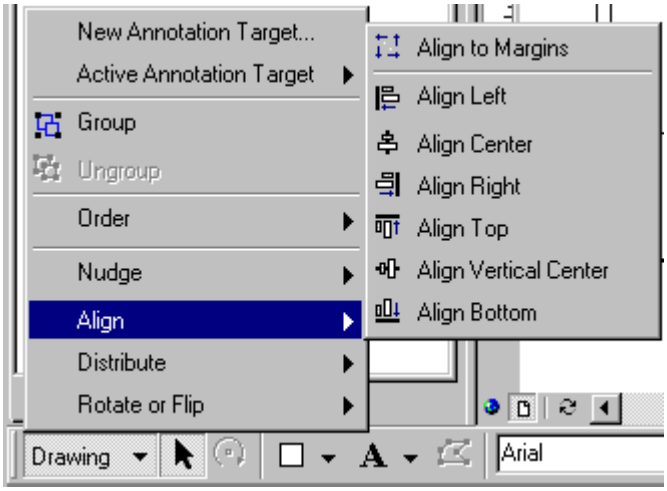


Figure 10-42 Align Function From Draw Toolbar in ArcMap

For more information on **Align** and **Group** functions, refer to ArcMap's online Help or printed user documentation.

10.2.3 Annotating Imagery

Annotation, or labeling, is the process of placing a descriptive text string next to one or more features on a map. How maps are labeled depends on the type of data being displayed, what features need to be labeled, and how the map will ultimately be used.

To label a few features, simply type in a text label and place it next to the feature it identifies. Use the **Draw** toolbar (Figure 10-43) to edit and place text on the map. For more information about any of the toolbars in ArcMap, see Chapter 4, *Software Introduction.*



Figure 10-43 Draw Toolbar in ArcMap

When labeling only a few features, the analyst can simply insert text fields individually, using the ***Insert/Text*** command from the ArcMap menu bar. To label all features in a layer, or features in several layers, the analyst can use ArcMap to generate and place the labels dynamically. For more control over placement and formatting of labels, the analyst can convert labels to annotation.

10.2.3.1 Dynamic Labeling

Dynamic labels automatically adjust as the analyst resizes the view of the data. The closer the zoom level, the more features are labeled, and vice versa, depending on the space available. The analyst can also set each layer's labeling priority, to make sure crucial features are labeled before those of less importance. Because of variance in priority and placement, dynamic labeling is best suited to maps in which the analyst does not need precise control. For more detail about control over labels, see the discussion on converting labels to annotation in Section 10.2.3.2.

To display dynamic labels:

1. Begin in Layout View mode. Zoom in on the data frame whose layers need labels.

2. Highlight the desired data frame and right click it. Then select ***Properties*** from the context menu. The **Layers Properties** window opens (Figure 10-44).



Figure 10-44 Labels Tab in Layers Properties Window in ArcMap

3. Click on the **Labels** tab, which shows a list of the layers in the data frame. Note the text at the top of this panel: "Labels of the layers at the top of the list are more likely to be placed."

4. While on this tab, check the boxes next to the layers to be labeled. Also, move layers up or down within the list to increase or decrease the likelihood of labels appearing, by either using the up and down arrows to the right of the panel or clicking and dragging the layer up or down the list. Click the **Properties** button on the right side of the window to edit the symbology for any given layer.

5. When finished identifying layers to label, click ***OK***. The **Layers Properties** window closes, returning to the map in Layout View. Notice the labels that now appear on the map (Figure 10-45).

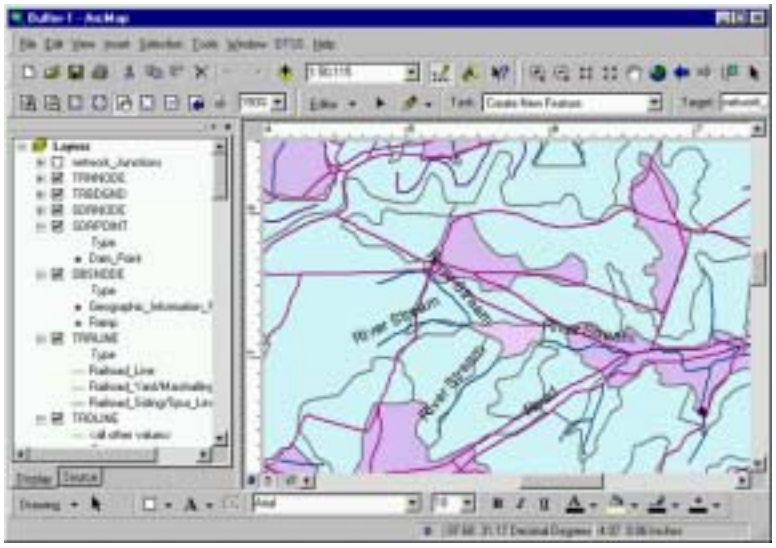


Figure 10-45 Dynamic Labeling in ArcMap

For more information on displaying dynamic labels in ArcMap, refer to ArcMap's online Help or printed user documentation.

10.2.3.2 Converting Labels to Annotation

Once labels have been applied to feature layers, the analyst can convert those labels to annotation, allowing the analyst to format and place individual labels with precision.

The conversion process creates text graphics from the dynamic labels and displays them on the map. The analyst can then work with each label individually: move it, change its size or font, or change the text itself. ArcMap also provides a list of all the labels not placed, allowing the analyst to place them interactively on the map as needed. While annotation is typically text, it can also be any graphic element that annotates the map, such as lines, circles, and polygons.

To convert map labels to annotation, use the following steps.

1. After applying dynamic labeling to the layers in the map, right click on a layer in the Table of Contents panel. Select ***Convert Labels to Annotation*** from the context menu (Figure 10-46).

NOTE

If this command is grayed out on the context menu, the feature layer does not have dynamic labeling applied to it. To apply labels, refer to Section 10.2.3.1, Dynamic Labeling.

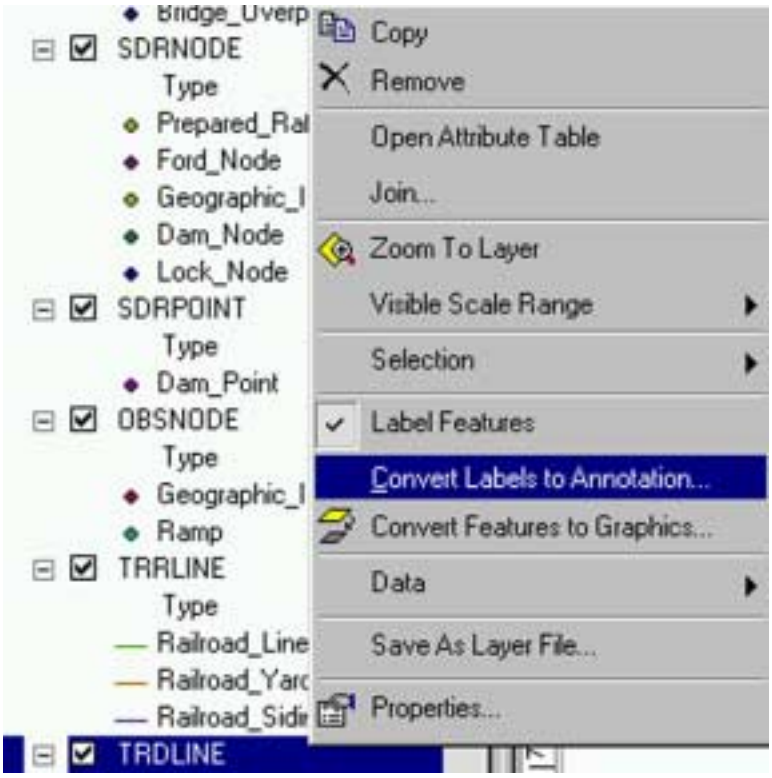


Figure 10-46 Context Menu in ArcMap

2. The **Convert Labels to Annotation** window opens (Figure 10-47). Click ***OK*** to accept the default values in the window.

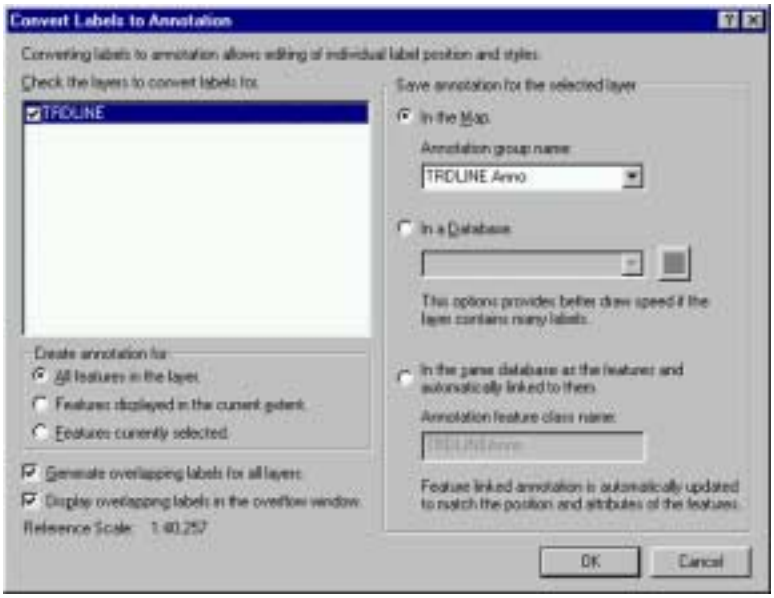


Figure 10-47 Convert Labels to Annotation Window in ArcMap

3. The **Progress** window appears (Figure 10-48), indicating the functions ArcMap is completing as it converts labels.



Figure 10-48 Label Conversion Progress Window in ArcMap

4. If any labels conflict, the **Overflow** window appears (Figure 10-49). Right click the desired label to place on the map, and click ***Add Label*** from the context menu. It may be necessary to move other labels in order to place a new label on the map.

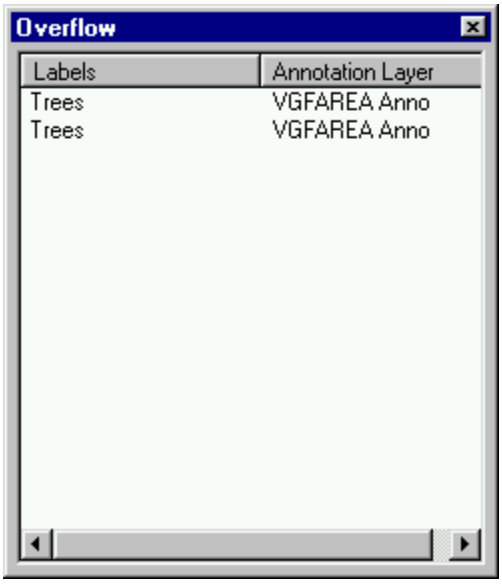


Figure 10-49 Labels Overflow Window in ArcMap

5. Repeat Step 4 until all desired labels have been placed on the map.

For more information on annotation, including storage and feature-linked annotation, refer to ArcMap's online Help or printed documentation.

10.2.4 Saving a Map Composition

After creating a map composition and adjusting its data properties and layout, the analyst can access standard Windows print and save functions through ArcMap's **File** menu. Save the map composition using the ***File/Save*** command from the ArcMap menu bar. Notice that this menu also has a command **Save As**. This command enables saving the composition as a map document (*.mxd*) or as a map template (*.mxt*).

10.2.4.1 Exporting a Map Image

A page sized JPEG image of the map can be created for display on other computers or on the Web. Set the appropriate page size and font size of the map composition and click ***File/Export Map*** from the ArcMap menu bar to export the map image. Refer to ArcMap's online Help or printed documentation for more information on exporting an image.

10.2.5 Printing a Map

Like other Windows programs, ArcMap opens a **Print** window, where an appropriate printer and other print settings can be identified for the job. To access the **Print** window select ***File/Print*** from the menu bar. This window also allows access to the **Page Setup** window in ArcMap, discussed in Section 10.2.2.2. For thorough information on printing a DTSS product, refer to Section 11.2.7, *Printing*.

10.2.6 DTSS Map Production Tool

The DTSS **Map Production Tool** automatically generates a map layout for any DTSS custom product and/or NIMA data that has been imported into a geodatabase using the custom DTSS importers. The **Map Production Tool** automatically places selected map elements into the layout. These elements are discussed in Section 10.2.6.2.

NOTE

*The current **Map Production Tool** allows only for the creation of 1:50,000 scale maps.*

The **Map Production Tool** will be disabled if there are no layers present in the map. It will also be disabled if the user is in an edit session. The user will have to stop editing before using the tool.

The **Map Production Tool** only supports layers that use a geographic coordinate system. If the data contains even one layer that does not use a geographic coordinate system, and the user attempts to run the **Map Production Tool**, an error message will appear. To proceed, remove the projected layer(s), run the **Map Production Tool**, and add the layer(s) after the map layout has been generated.

NOTE

*Even though all input data to the **Map Production Tool** must be in geographic coordinates, all data in the output map document is displayed in Transverse Mercator.*

10.2.6.1 DTSS Map Template

The DTSS map template is stored under the name *DTSS.mxt*. The DTSS map template works with the DTSS **Map Production Tool**, discussed in Section 10.2.6. It is not absolutely necessary to use the DTSS map template in order to run the **Map Production Tool**, but it sets the page size to 25 x 33 inches, which is the page size the **Map Production Tool** uses to create maps. It is good to start out any DTSS operation using the template, to facilitate using the **Map Production Tool**.

If a TDA is run before opening the DTSS map template, the user should set the page size manually to 25 x 33 inches before running the map tool. If the **Map Production Tool** is run using another page size, then the **Set Map Size** information window will appear, informing the user that the page size needs to be set to 25 x 33 inches. The **Page Setup** window automatically opens, allowing the user to set the new page size. Click ***OK*** in the **Page Setup** window to set the page size and close the window. The user will now need to click the **Map Production Tool** icon again to proceed with producing the map layout.

Follow the steps below to create a map layout using the DTSS map template and the **Map Production Tool**.

1. With ArcMap open on the desktop, select ***File/New*** from the menu bar, and select the DTSS map template (*DTSS.mxt*) from the **New** window.

2. Select ***View/Data View*** from the ArcMap menu.

3. Open the desired DTSS custom product in ArcMap using the **Add Data** button ( ).

4. Display data as desired in the data frame. The selected layers from the Table of Contents panel on the left side of the ArcMap window are used to create the legend information in the map layout.

5. Access the **DTSS** toolbar by selecting ***View/Toolbars/DTSS*** from ArcMap's main menu.

6. Now click the **Map Production Tool** icon ( ) from the **DTSS** toolbar. The **DTSS Map Production** window will appear (Figure 10-50).



Figure 10-50 DTSS Map Production Window

7. Enter the appropriate information. The "Product Type" and "Title" fields are required. Click ***Finish***. The **Creating DTSS Map Layout** window appears (Figure 10-51), indicating progress in processing.

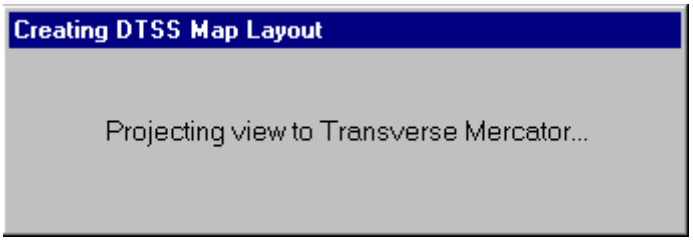


Figure 10-51 Creating DTSS Map Layout Window

8. When the map layout process is complete, the DTSS map layout will appear in the Display panel on the right side of the ArcMap window (Figure 10-52), where the analyst can edit the map layout using ArcMap functionality.

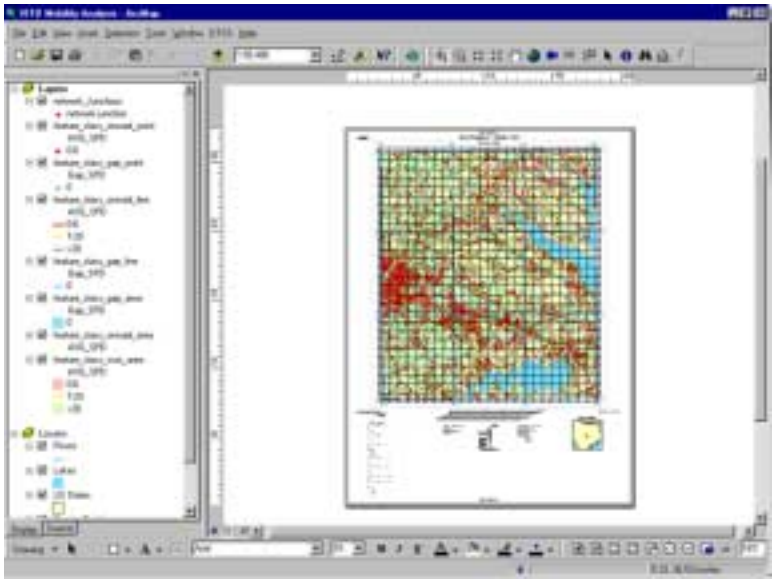


Figure 10-52 ArcMap Window Showing DTSS Map Layout

If the user wishes to change any elements, as described in Section 10.2.2.1 in the Layout View, or add data to the layers, these changes can be saved to a new map template using steps outlined in Section 10.2.1.2.

Output from the **Map Production Tool** can be printed using the procedures outlined in Section 11.2.7.1, *Printing in ArcMap*.

10.2.6.2 DTSS Map Elements

There are several map elements automatically created using the DTSS **Map Production Tool**. See Table 10-5 for a description of the DTSS map elements generated.

Table 10-5 DTSS Map Element Descriptions

DTSS Map Element	Description
Title	Generated from information entered into "Title" and "Subtitle" fields in **DTSS Map Production** window.
Map Scale	Displayed in upper left corner of map and just above the scale bars. The **Map Production Tool** automatically sets the scale to 1:50,000.
Classification	Displays text stating whether map is Classified, Confidential, or Secret. Set from "Classification" field in **DTSS Map Production** window.
Production Date	Displays date map was produced. Generated from "Production Date" field in **DTSS Map Production** window.
North Arrow	Shows magnetic declination using calculations from Department of Defense World Magnetic Model (2000), as well as true north and grid north.
Locator Map	Displays another data frame of map data zoomed out by preset ratio, labeled "Location Diagram."

Table 10-5 DTSS Map Element Descriptions (Cont'd)

DTSS Map Element	Description
Grids	Displays two grids: 1000 Meter Grid and Lat/Lon Graticule. The Lat/Lon Graticule uses 5 minutes spacing.
Product Parameters	Displays parameter selections of DTSS product. Taken from metadata of DTSS product being displayed.
Legend	Displays layers selected in Table of Contents panel.
Scale Bars	Automatically generated to show scale in kilometers, miles, and nautical miles.

Other text might display on the map depending on input to the tool, or if additional information is entered in the various fields of the **DTSS Map Production** window. Once the **Map Production Tool** has been generated, the map elements can be edited or modified using ArcMap functionality, as discussed in Section 10.2.2.

The analyst can use a scale other than 1:50,000 by removing the grid and scale bar and generating new ones, or by adjusting the grid properties automatically generated from the DTSS **Map Production Tool**. Use the following steps to change the map scale properties.

1. Double click the name of the data frame (e.g, "Layers") at the top of the Table of Contents panel. The **Data Frame Properties** window appears.

2. Select the **Grids** tab. Two grids are listed: 1000 Meter Grid and Lat/Lon Graticule.

3. Adjust the properties of the grids as desired. Change the grid properties by clicking the **Properties** button. Turn the grids on or off by checking or unchecking the box next to the grid name. Remove a grid by selecting the grid and clicking the **Remove** button.

4. When finished, click ***Apply*** to add the changes to the map layout.

If the analyst saves the map document after changing the settings on the **Grids** tab, the grids will continue to appear as selected on that map document. When a new map document is created or opened using the DTSS **Map Production Tool**, the default grids will appear, and the analyst will need to follow the steps above to change the grid settings, if desired.

NOTE

*Once a grid has been removed (as opposed to simply turned off), the analyst must run the **Map Production Tool** from the beginning in order to restore the removed grid.*

For more information on changing grid properties, see Section 10.2.2.5, *Grids and Graticules*, or refer to ArcMap's online Help or printed user documentation.

10.3 Terrain Visualization

ERDAS Imagine software provides several out-of-the-box tools to create 3-D perspective views, stereo anaglyph images, and shaded relief. This section provides an overview of these capabilities. For more specific information on any of these Imagine features, refer to the Imagine online Help or printed user documentation.

10.3.1 3-D Perspective Views

Imagine VirtualGIS can display vector data draped over elevation models and raster imagery. The vector data can be in either ESRI coverage or shapefile format. (Refer to Section 6.1.1.2.1, *Converting Geodatabase to Coverage* for information on how to convert geodatabases to coverages or shapefiles.) However, VirtualGIS requires that all elevation models, raster data, and vector data be using the same coordinate system. For this reason, it is recommended that DTSS data and products be converted from geodatabase to ESRI coverage format. (Imagine cannot currently reproject shapefiles.)

NOTE

Only UTM-projected data can be used for movies.

The following example shows how to generate a 3-D perspective view using VirtualGIS.

1. Click the ***VirtualGIS*** icon ( ) on the Imagine icon panel. The **VirtualGIS** window will appear as shown in Figure 10-53.

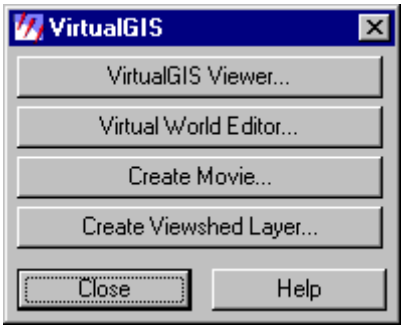


Figure 10-53 VirtualGIS Window

2. Click the ***VirtualGIS Viewer*** button. The **VirtualGIS Viewer** window will appear (Figure 10-54).

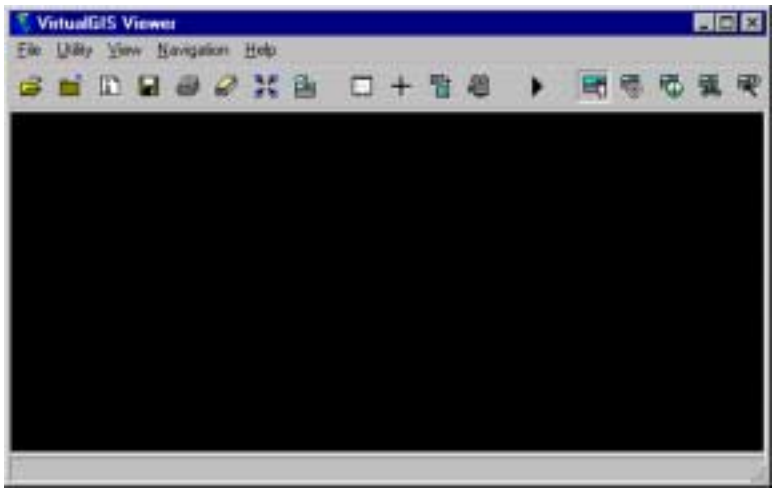


Figure 10-54 VirtualGIS Viewer Window

3. Select ***File/Open/DEM*** from the menu bar. The **Select Layer to Add** window will appear (Figure 10-55).



Figure 10-55 Select Layer to Add Window

4. Navigate to the appropriate file and click ***OK***. The **VirtualGIS Viewer** window will appear with the DEM image (Figure 10-56).

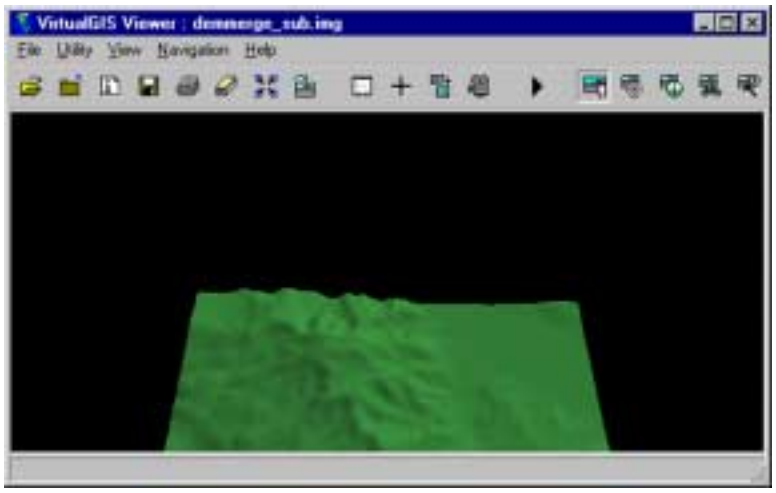


Figure 10-56 VirtualGIS Viewer Window

5. To drape a raster image on top of the DEM, select ***File/Open/Raster Layer*** from the menu bar.

NOTE

In the Select Layer to Add window, make sure that the "Clear Overlays" check box on the Raster Options tab is left unchecked.

6. Navigate to the appropriate file and click ***OK***. The **VirtualGIS Viewer** window will appear showing the overlaid raster image (Figure 10-57).

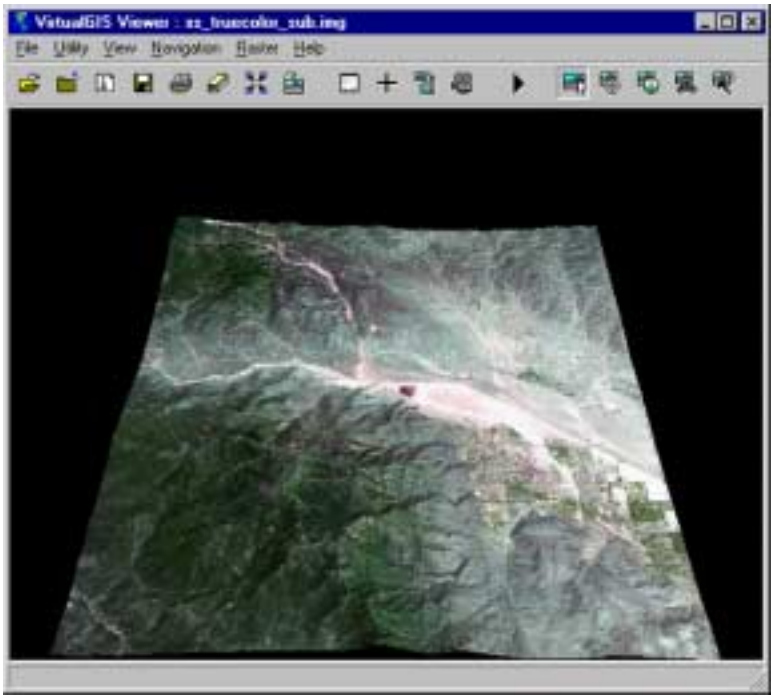


Figure 10-57 VirtualGIS Viewer Window

7. Next, click ***View/Scene Properties*** from the menu bar. The **Scene Properties** window will appear (Figure 10-58).

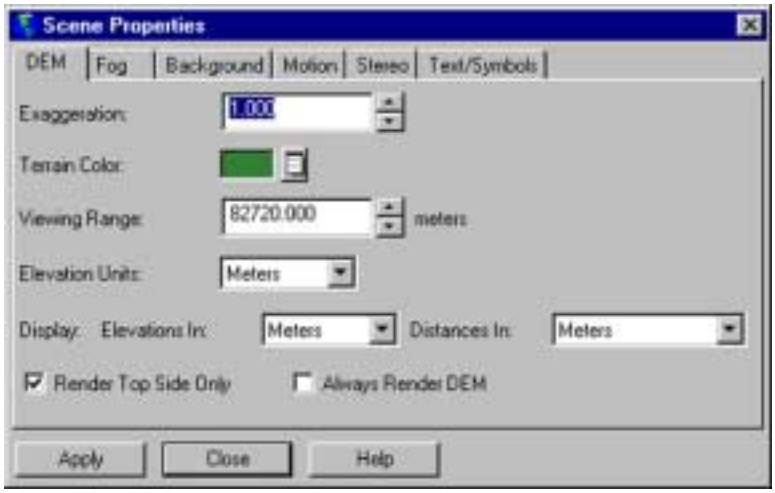


Figure 10-58 Scene Properties Window

8. The **Scene Properties** window contains several tabs used to view or change characteristics of the VirtualGIS Viewer display. Click the **Apply** button to make any changes to the VirtualGIS display, and click the **Close** button to close the window.

9. To perform a "Fly Through" of the terrain, click the **Set Navigation to Terrain Mode** icon ( ) on the VirtualGIS Viewer toolbar. The view of the

image in the **VirtualGIS Viewer** window shifts so the observer is eye-level with the terrain (Figure 10-59).

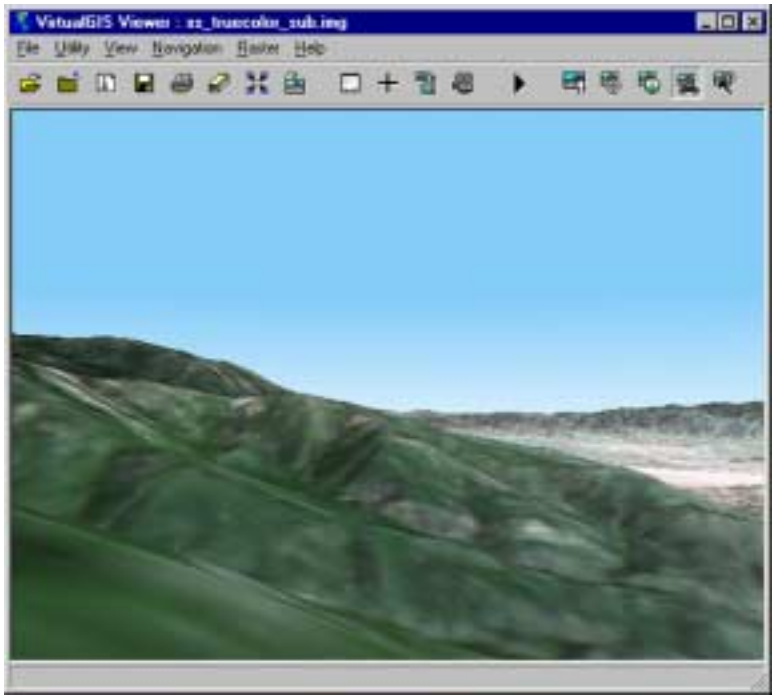


Figure 10-59 VirtualGIS Viewer Window in Terrain Mode

10. Click and hold the left mouse button and then drag the mouse in the viewer to change the viewing direction from the fixed position on the terrain. Release the left mouse button to halt the movement.

11. Press and hold the ***[Shift]*** key while holding and moving the left mouse button to fly along the terrain. To return the image to its original position, click the **Set Navigation to Position Mode** icon ( ), and then click the **Fit Scene to Window** icon ( ).

12. Specific flight paths can be defined in VirtualGIS by digitizing a polyline in the **VirtualGIS Viewer**. Click the **Load to Viewer** icon ( ) on the VirtualGIS toolbar. A new viewer automatically opens with the layers from the **VirtualGIS Viewer** window displayed in 2-D (Figure 10-60).



Figure 10-60 Viewer Window

13. From the **VirtualGIS Viewer** menu bar, select ***Navigation/Flight Path Editor*** to open the **Flight Path Editor** window (Figure 10-61).

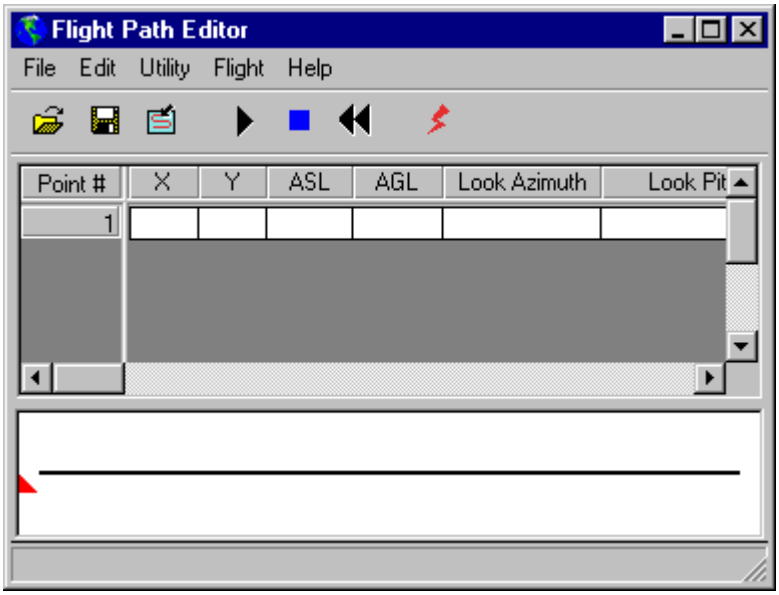


Figure 10-61 Flight Path Editor Window

14. In the **Flight Path Editor** window, click the **Digitize Flight Path** icon ( ). The **Viewer Selection Instructions** window opens, prompting the user to click in the appropriate viewer (Figure 10-62).

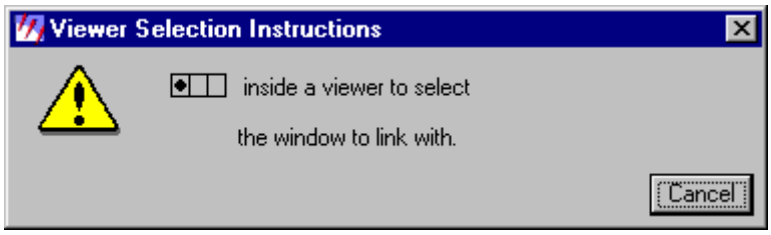


Figure 10-62 Viewer Selection Instructions Window

15. Click the mouse in the **Viewer** window containing the 2-D image of the scene displayed in the **VirtualGIS Viewer** window. The **Define Flight Path** window appears (Figure 10-63). Notice the cursor turns into a crosshair in the viewer.

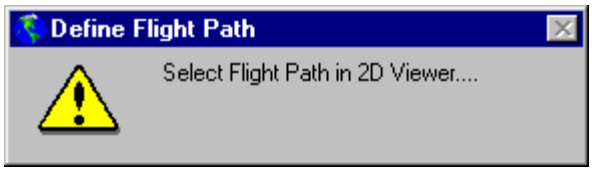


Figure 10-63 Define Flight Path Window

16. Using the mouse, move the crosshair around the scene and click on the left mouse button to mark points for the flight direction. A line from point to point will be visible in the viewer. End the flight path by double clicking the mouse. The points of the flight path are visually displayed in the **Viewer** window (Figure 10-64) and numerically displayed in the **Flight Path Editor** window.



Figure 10-64 Viewer Window Showing Digitized Flight Path

17. Click the **Apply changes to Flight path** icon ( ) from the **Flight Path Editor** toolbar. The numbered points of the flight path appear as numbered lines at the bottom of the **Flight Path Editor** window (Figure 10-65).

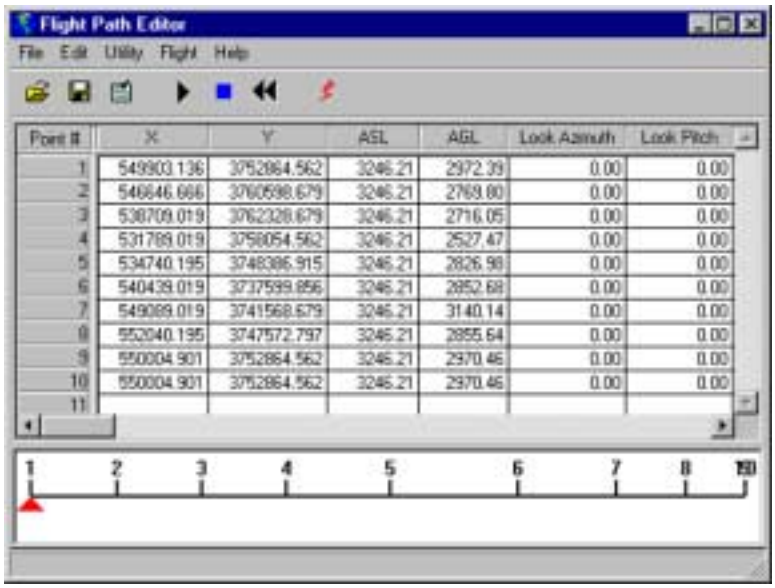


Figure 10-65 Flight Path Editor Window

18. The elevation of the flight path can be adjusted by clicking ***Edit/Set Elevation*** from the **Flight Path Editor** menu bar. The **Flight Path Elevation** window opens (Figure 10-66). The default elevation appears in meters under the "ASL" (Above Sea Level) or "AGL" (Above Ground Level) columns of the **Flight Path Editor** window.

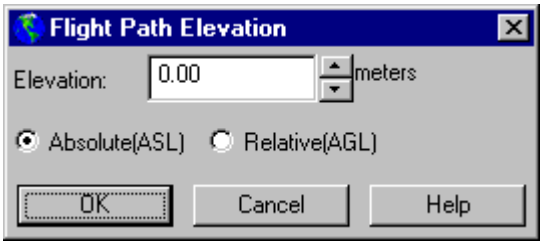


Figure 10-66 Flight Path Elevation Window

19. Enter the desired height of the flight path in the "Elevation" field. Select the radio button next to "Absolute (ASL)" to set the elevation above sea level or "Relative (AGL)" to set the elevation above ground level. Click ***OK*** when finished.

20. Click the **Apply changes to Flight path** icon ( ) from the **Flight Path Editor** toolbar to add the elevation information to the flight path instructions.

21. Click the **Start Flight** icon ( ) from the **Flight Path Editor** toolbar. The fly-through visualization will begin.

22. Click the **Stop Flight** icon ( ) from the **Flight Path Editor** toolbar to halt the flight.

23. Click **Reset to Beginning of Flight Path** icon ( ) from the **Flight Path Editor** toolbar to return to the first point of the flight path.

24. Click ***File/Save As*** from the **Flight Path Editor** menu bar to open the **Save Flight Path** window. Choose a file name and directory location, and click ***OK*** to save. The flight path file is saved with an *.flt* extension.

25. To reopen this or any other saved flight path, click the **Open Flight Path** icon ( ) from the **Flight Path Editor** toolbar and navigate to the appropriate *.flt* file.

For more information on terrain visualization with VirtualGIS, refer to Imagine's online Help or the *Imagine VirtualGIS Tour Guide*.

10.3.2 3-D Anaglyph

Imagine VirtualGIS software can create and display anaglyph images resulting in 3-D stereo views. The anaglyph images are displayed in two different colors with one image

"shifted" to create a parallax effect related to differences in elevation. Viewing the images through anaglyphic glasses, which have colored lenses that correspond to the color of the anaglyph images, produces the stereo effect.

To visualize terrain in anaglyph, use the following steps.

1. Follow Steps 1–7 of Section 10.3.1 to get to the **Scene Properties** window.

2. Click the **Stereo** tab in the **Scene Properties** window. The options for stereo properties will appear (Figure 10-67).

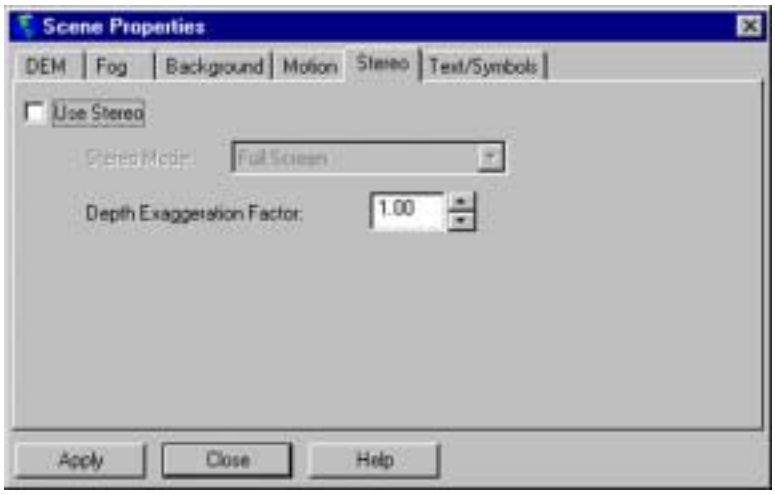


Figure 10-67 Scene Properties Window Showing Stereo Tab

3. Click in the box next to "Use Stereo" to enable stereo rendering.

4. The "Stereo Mode" field becomes enabled. Click on the dropdown menu and select ***Anaglyph***. The window changes (Figure 10-68).

NOTE

*In the "Stereo Mode" field, the options **Full Screen Stereo** and **Stereo-in-a-Window** are more advanced options and require a graphics card capable of frame-sequential or interlaced stereo as well as an emitter and special glasses. The **Anaglyph** option requires no extra equipment other than the anaglyph glasses provided with the VirtualGIS software.*

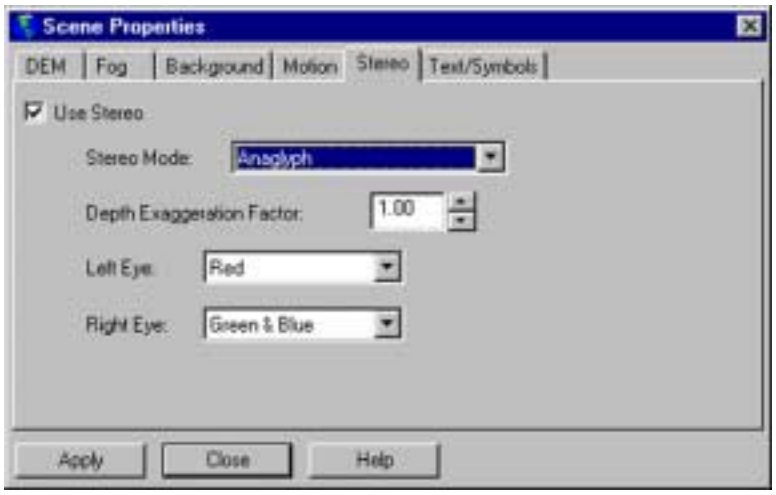


Figure 10-68 Scene Properties Window Showing Anaglyph Selected

5. Set the "Depth Exaggeration Factor" to ***5.00***. The "Depth Exaggeration Factor" allows the analyst to increase or decrease the apparent relief between high and low elevations in the data set. The higher the "Depth Exaggeration Factor," the greater the apparent relief.

6. Match the colors for "Left Eye" and "Right Eye" with the anaglyph glasses. The glasses provided with VirtualGIS work best when set to "Left Eye: *Red*" and "Right Eye: *Green & Blue*."

7. Click ***Apply*** in the **Scene Properties** window. The anaglyph rendering can be viewed in the **VirtualGIS Viewer** window.

8. Click the **Set Navigation to Terrain Following Mode** icon () from the **VirtualGIS Viewer** toolbar. Put on the anaglyph glasses and navigate through the scene in the stereo display.

NOTE

Stereo display generally doubles the rendering of the graphics card. Therefore it is not recommended to attempt real-time operations in stereo mode when using lower-end graphics cards.

For more information on viewing anaglyph images using VirtualGIS, refer to Imagine's online Help or the *Imagine VirtualGIS Tour Guide*.

10.3.3 Shaded Relief

A shaded relief image provides the analyst with an easy to interpret representation of digital elevation data. Based on a user-specified position of the sun, areas that would be in sunlight are highlighted and areas that would be in shadow are shaded.

To open the Shaded Relief module, use the following steps.

1. Click the **Interpreter** () icon on the Imagine icon panel. The **Image Interpreter** window will appear as shown in Figure 10-69.

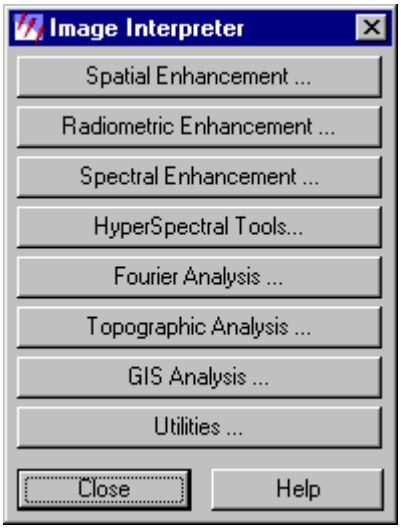


Figure 10-69 Image Interpreter Window

2. Click on the **Topographic Analysis** button. The **Topo Analysis** window will appear (Figure 10-70).

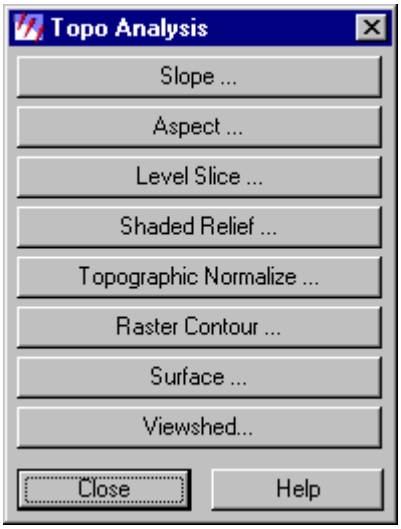


Figure 10-70 Topo Analysis Window

3. Click on the **Shaded Relief** button. The **Shaded Relief** window will appear (Figure 10-71).



Figure 10-71 Shaded Relief Window

4. Type the name of the "Input DEM" elevation file, or click on the **File Selector** button ( ) to navigate to the appropriate file. The default file extension is *.img*.

5. Click on the dropdown menu next to "Select DEM Layer" to select the DEM layer to use for this operation.

6. To merge an image into the shaded relief, click the checkbox next to "Use Overlay in Relief." The "Input Overlay" filename field will become enabled. Based on the type of input file (gray scale, pseudo color, or true color), the **Shaded Relief** window will ask for the following information:

   a. Overlay Type: To override the default overlay file type, select another option from this popup list.

   b. True Color: Select this option if the overlay file is a true color image. Assign layers to color guns as described below.

      1) R: Enter the layer to be used for the red color gun in the output file.

      2) G: Enter the layer to be used for the green color gun in the output file.

      3) B: Enter the layer to be used for the blue color gun in the output file.

c. Gray Scale: Select this option if the overlay file is a gray scale image.

- Layer: If the overlay file is a gray scale image, enter the layer to be used for the overlay.

d. Pseudocolor: Select this option if the overlay file is a pseudocolor image.

- Layer: If the overlay file is a pseudocolor image, enter the layer to be used for the overlay.

7. Enter the name of the "Output File" or click on the **File Selector** button () to navigate to the appropriate file. The *.img* extension is automatically added.

8. When the checkbox next to "Ignore Zero in Output Stats" is on, pixels with zero values in the file will be ignored when statistics are calculated for the output file.

9. Click the appropriate radio button to select the type of coordinates to use. If the input file does not have map coordinates, the coordinate type will automatically default to "File."

10. Use "Subset Definition" to define a rectangular subset of the data to be used as the output file. The coordinates of the subset may be derived from an inquire box in the **Viewer** window or by entering explicit X,Y values for the upper left and lower right corners of the subset. The default coordinates are the entire input file.

    a. To use coordinates from an inquire box, open an image or DEM corresponding to the shaded relief DEM in an Imagine **Viewer**. Click the **From Inquire Box** button to define a subset area of the data by using the **Viewer** inquire box.

NOTE

*Activate the Inquire Box in the **Viewer** window by selecting* **Utility/Inquire Box** *from the **Viewer** window menu.*

    b. When this button is used, the coordinates shown below in the **Shaded Relief** window are updated with the coordinates of the cursor box in the **Viewer** window. To change these coordinates, move and/or resize the cursor box in the **Viewer** window, and then click the **From Inquire Box** button again.

    c. Otherwise, the coordinates may be manually entered in the fields shown below.

UL X: Upper Left X coordinate

UL Y: Upper Left Y coordinate

LR X: Lower Right X coordinate

LR Y: Lower Right Y coordinate

11. Select the type of units used to measure the elevation from the dropdown menu next to “Elevation Units.”

12. Enter a number in the field next to “DEM scale” to exaggerate the elevation in the DEM for the output file, if desired.

13. Enter the position of the sun in degrees measured counterclockwise from due East in the “Solar Azimuth” field.

NOTE

Studies have shown that in order for the brain to most easily process the shaded relief image correctly, i.e., with the mountains high and the valleys low, the Solar Azimuth must have the sunlight coming from the North West, regardless of where the data actually is in the world. Using a Solar Azimuth from the South East actually results in “inverted” terrain, meaning valleys are high and mountains are low.

14. Enter the sun angle in degrees above the horizon in the “Solar Elevation” field.

15. In the “Ambient Light” field, enter the desired amount of light to use (0.0-1.0) for the background (overall) lighting. For example, 0 would create a very high contrast image, while 1 would create a washed out (no contrast) image.

16. Click ***OK*** to run the shaded relief model with the options selected. The **Modeler** window will appear (Figure 10-72).



Figure 10-72 Modeler Window

17. Click ***OK***. The shaded relief model is complete.

18. To compare the input DEM image with the newly created shaded relief output image, open the input DEM image in **Viewer #1**, and then open the shaded relief output image in **Viewer #2**.

For more information on shaded relief, refer to Imagine 8.4 online Help or the *Imagine 8.4 Field Guide*.

Chapter 11

DATA OUTPUT AND DISSEMINATION

11	**DATA OUTPUT AND DISSEMINATION**	11-4
11.1	Data Output	11-4
11.1.1	Exporting Data With ArcInfo	11-4
11.1.2	Exporting Data With Imagine	11-4
11.1.2.1	Exporting ARC Digitized Raster Graphics (ADRG) Data	11-5
11.1.2.2	Exporting Raster Product Format (RPF) Data	11-8
11.1.2.3	Exporting National Imagery Transmission Format (NITF) Data	11-15
11.1.2.3.1	Preparing Image for NITF Export	11-16
11.1.2.3.2	NITF Export	11-16
11.1.3	DOP Exporter	11-21
11.1.4	DTSS Geodatabase Exporter	11-24
11.2	Data Dissemination	11-27
11.2.1	DTSS Website Overview	11-27
11.2.1.1	DTSS Web Exporter	11-28
11.2.1.1.1	Add Product to Website	11-28
11.2.1.1.2	Updating Product Data on Website	11-31
11.2.1.1.3	Removing Product From Website	11-34
11.2.1.1.4	Managing Website Product Folders	11-36
11.2.1.2	Downloading Product From DTSS Website	11-40
11.2.2	Adaptec Easy CD Creator	11-44
11.2.2.1	CD Creator Main Window	11-45
11.2.2.1.1	Layout Tabs	11-46
11.2.2.1.2	Menu	11-46
11.2.2.1.3	Toolbar	11-50
11.2.2.2	Creating a Data CD	11-51
11.2.2.2.1	CD Layout	11-51

11.2.2.2.2 Define CD Layout Properties 11-53
11.2.2.2.2.1 General Tab 11-53
11.2.2.2.2.2 Data Settings Tab 11-53
11.2.2.2.2.3 File Types Tab 11-55
11.2.2.2.3 Creating the CD 11-55
11.2.3 DVD-RAM 11-58
11.2.4 Tape Archive 11-59
11.2.4.1 Backup Main Window 11-59
11.2.4.1.1 Menu 11-59
11.2.4.1.2 Toolbar 11-62
11.2.4.1.3 Backup Disk Files To Tape 11-63
11.2.4.1.3.1 Backing Up All Files 11-63
11.2.4.1.3.2 Backing Up Individual Files 11-63
11.2.4.1.3.3 Setting Tape Options 11-63
11.2.4.1.3.4 Setting Backup Set Options 11-64
11.2.4.1.3.5 Setting Log Options 11-64
11.2.4.1.3.6 Checking Backup Status 11-65
11.2.4.1.4 Restoring Tape Files to Disk 11-65
11.2.4.1.4.1 Loading Catalogs 11-66
11.2.4.1.4.2 Restoring Tapes Or Backup Sets 11-66
11.2.4.1.4.3 Restoring Individual Files 11-67
11.2.4.1.4.4 Setting Restore Options 11-67
11.2.4.1.4.5 Setting Log Options 11-67
11.2.4.1.4.6 Checking Restore Status 11-68
11.2.4.1.5 Maintain Tapes 11-68
11.2.4.1.5.1 Erasing Tapes 11-68
11.2.4.1.5.2 Retensioning Tapes 11-69
11.2.4.1.5.3 Formatting Tapes 11-69
11.2.5 Jaz Drive 11-69
11.2.6 LS-120 Floppy Drive 11-71
11.2.7 Printing 11-71
11.2.7.1 Printing in ArcMap 11-72
11.2.7.2 Printing in ERDAS Imagine 11-76

11.3 Common Message Processor (CMP) 11-79

11 DATA OUTPUT AND DISSEMINATION

DTSS provides the analyst with COTS, GOTS, and custom-developed functions to output and distribute data. This chapter covers several methods for creating output files from data generated and stored in ArcInfo and Imagine, as well as products created using the DTSS software.

The DTSS provides the analyst with many ways to disseminate softcopy data including the DTSS Website, DVD-RAM, CD-ROM, 8mm tape drive, Jaz drive, and LS-120 floppy drive. Hardcopy information can also be created and distributed using the DTSS. The Common Message Processor (CMP) can be used to read, create, and edit United States Message Text Format (USMTF) messages.

11.1 Data Output

Data used in DTSS can be exported using ArcInfo and ERDAS Imagine software. Both ArcInfo and ERDAS Imagine provide capabilities to convert their internal data formats to numerous other commercial and government formats. The DTSS Overlay Provider (DOP) Exporter allows the analyst to convert data and products used by the DTSS software into a file format useable by the Joint Mapping Toolkit Viewer (JMV).

11.1.1 Exporting Data With ArcInfo

To share the data in a geodatabase with others, the user can export feature classes to shapefiles and coverages, and export tables to INFO or dBASE format. To export an item in ArcCatalog, right-click it, point to **Export**, then click the data conversion tool to use. Each conversion tool has a Help file that provides detailed instructions. Several feature classes or tables can be exported at once. Select the items to export in the Contents list; the conversion tool will open in batch mode with each item occupying a row in the batch table. Refer to Section 6.1 on Data Conversion for more information on converting between internal ArcInfo formats.

Once a geodatabase and/or shapefile is converted to a coverage, the analyst can use the Conversion Tools provided in ArcToolbox to convert the coverage to various commercial and government formats. For more information on exporting spatial data in ArcInfo, refer to ArcMap, ArcCatalog and ArcToolbox online Help or printed documentation.

11.1.2 Exporting Data With Imagine

Imagine's data exporter allows the user to convert *.img* files to formats that may be compatible with other applications. The following sections discuss how to export ARC

Digitized Raster Graphics (ADRG), Raster Product Format (RPF), and National Imagery Transmission Format (NITF) data types in Imagine.

11.1.2.1 Exporting ARC Digitized Raster Graphics (ADRG) Data

Use the steps below to export ADRG in Imagine.

1. With Imagine open on the desktop, click the **Import/Export** icon ( ) from the Imagine icon panel. The **Import/Export** window will appear (Figure 11-1).

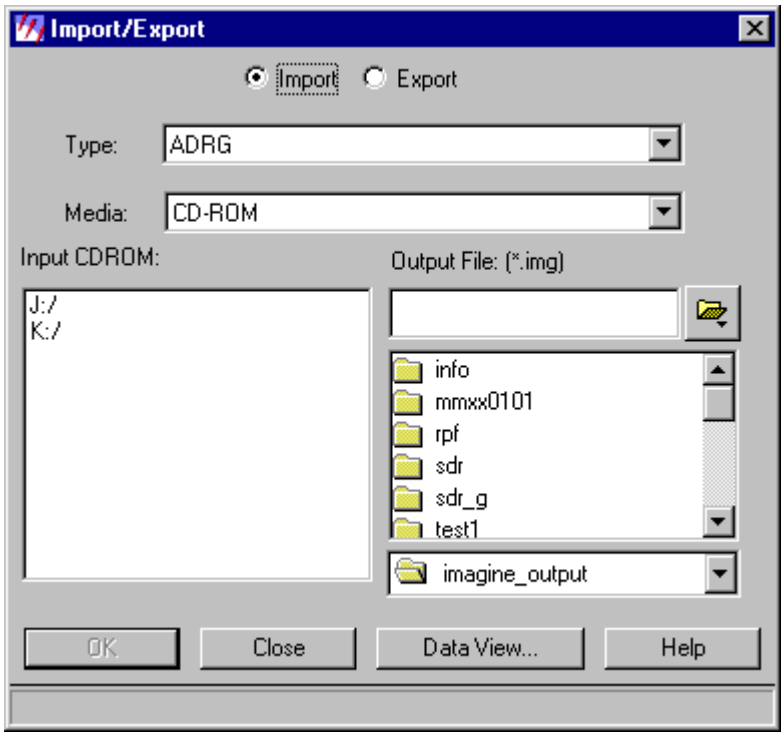


Figure 11-1 Import/Export Window

2. Click the radio button next to “Export” to export an Imagine file into another format. The window will change as shown in Figure 11-2.

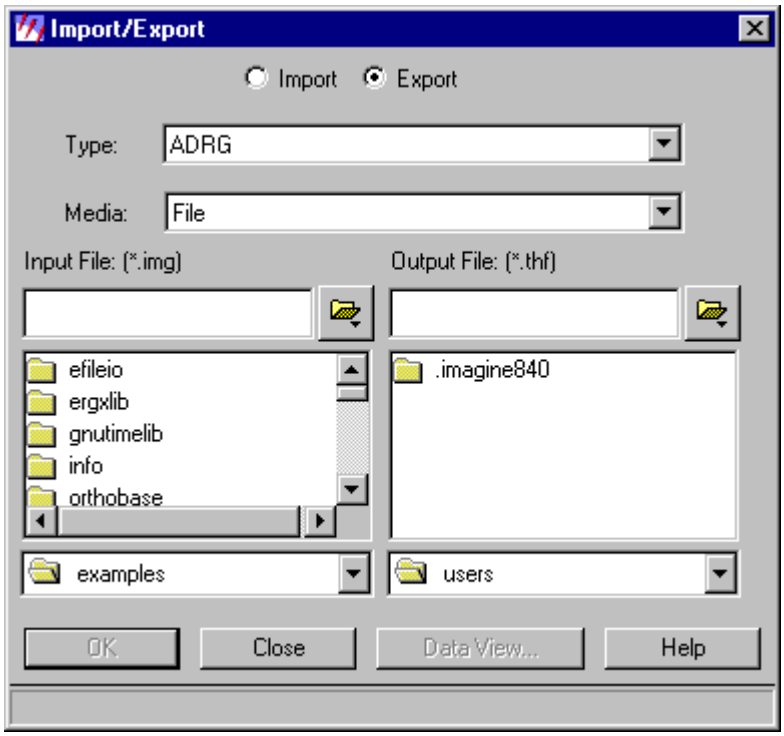


Figure 11-2 Import/Export Window With Export Option Selected

3. Select ***ADRG*** from the "Type" dropdown menu. For more information on the different data types, click the **Help** button to view Imagine on-line Help, or refer to the *Imagine 8.4 Field Guide*.

4. Click the "Media" dropdown menu to select the media from which the data is being imported: CD-ROM, Tape, or File. Not all data types can be exported from all media types. If the selected data type cannot be exported from a particular media type, an error message will appear informing the user the media type is not supported. The ADRG exporter only supports media from File.

5. Select the appropriate input file. Type the name manually or select the name from the **File Open** icon ( ) or the file navigation panels located below the "Input File" field on the left-hand side of the window.

6. Imagine automatically enters a name as the output file. The appropriate Imagine default file extension and ADRG output directory structure will be provided.

NOTE

When the output filename is entered, the user will see the entered name in the "Output File" field. This filename,

however, is a placeholder only. Imagine automatically creates a transmittal header file (.thf*) called* ***transh01.thf****.*

7. Click ***OK*** to use the options selected and open the **Export ADRG** window (Figure 11-3).

NOTE

The eleven tabs across the top of the Export ADRG window contain header and metadata information as defined by the ADRG product specification (Mil-Spec Arc Digitized Raster Graphics MIL-A-89007 February 1990).

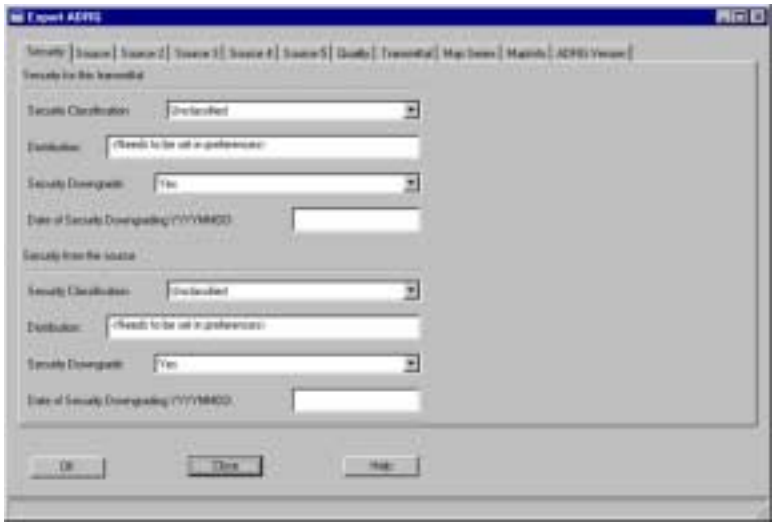


Figure 11-3 Export ADRG Window

8. Use the default settings or enter the appropriate information in the tabs and fields provided. The analyst should input information into the following fields, as they are used for naming ADRG folders when the output files are created.

   a. Click the **Map Series** tab. In the "Chart Series" field, enter the applicable two-character code using uppercase letters. MM is automatically displayed in the field but is not a valid code. The chart series code must be in accordance with MIL-A-89007 60.5.

NOTE

If the chart series code is not entered correctly, certain applications (e.g., JMV) may not be able to interpret product scale.

b. In the “Country Code” field, enter the applicable two-character code using uppercase letters. XX is automatically displayed in the field but is not a valid code. The country code must be in accordance with DIAM 65-18.

c. If a unit has its own specific unit-related stock numbers, enter the applicable stock number.

9. Click ***OK*** in the **Export ADRG** window. The **Job Status** window appears.

10. When processing is completed, the ADRG data will reside in the selected directory. The system automatically creates the directory and output files using the chart series and country codes selected.

NOTE

*To write this ADRG export to a CD, be sure to include both the **transh01.thf** file (created in Step 6) and the image directory created in Step 10. Write both to the top level of the CD, so they are visible immediately.*

11.1.2.2 Exporting Raster Product Format (RPF) Data

Raster Product Format (RPF) is a data distribution format for the NIMA Compressed ADRG (CADRG) and Controlled Image Base (CIB) products. A CADRG file has multiple layers (at least three), and the recommended format is an unsigned 8-bit continuous image. A CIB file is single-layer (panchromatic), and the recommended format is an unsigned 8-bit continuous image. Since CADRG is a compressed version of ADRG (scanned maps), and CIB is based on panchromatic imagery, the analyst will typically choose scanned map and panchromatic *.img* files to export as CADRG and CIB respectively.

NOTE

*Ensure that in the RPF Export Parameters Preferences (from **Session/Preferences** on the Imagine menu bar) that the CIB Rescale File, Worldwide CIB Grayscale Table, and Default Parameters File are set to **$Imagine_Home/etc/RPF_Export**.*

This exporter has been added to DTSS so that images can be passed to customers who may be limited to RPF data import. To export an image file in RPF, perform the following steps.

NOTE

Windows may appear different from those shown in the figures, depending on the type of RPF file selected to export.

1. With Imagine open on the desktop, click the **Import/Export** icon ( ) from the Imagine icon panel. The **Import/Export** window will appear (Figure 11-4).

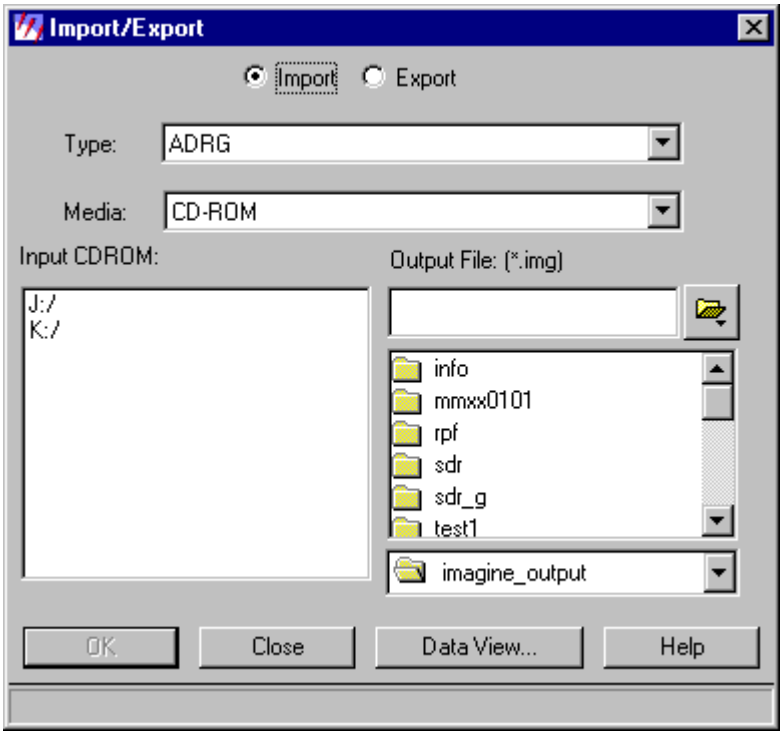


Figure 11-4 Import/Export Window

2. Click the radio button next to “Export” to export an Imagine file into another format. The window will change as shown in Figure 11-5.

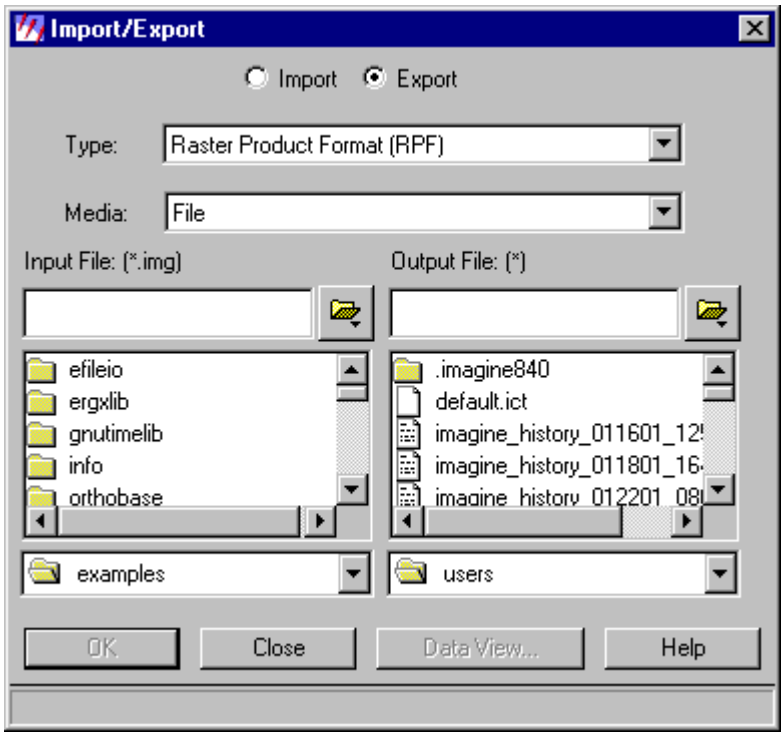


Figure 11-5 Import/Export Window With Export Option Selected

3. Select ***Raster Product Format (RPF)*** from the "Type" dropdown menu. For more information on the different data types, click the **Help** button to view Imagine on-line Help, or refer to the *Imagine 8.4 Field Guide*.

4. From the "Media" dropdown menu, select File. The RPF exporter only supports media from File. If other media is chosen, an error message appears.

5. Select the appropriate input file. Typically, the analyst selects scanned maps and panchromatic *.img* files to export. Type the name manually, or select the name from the **File Open** icon ( ) or the file navigation panels located below the "Input File" field on the left-hand side of the window.

6. Imagine automatically enters a name as the output file. To change the name, enter the new name for the output file in the "Output File" field. Type the name manually or select the name from the **File Open** icon ( ) or the file navigation panels located below the "Output File" field on the right-hand side of the window.

NOTE

When the output filename is entered, the user will see the entered name in the "Output File" field. This filename, however, is a placeholder only. Imagine automatically

creates an RPF folder, image subdirectories, and image frames.

7. Click ***OK*** to use the options selected and open the **Export RPF** window (Figure 11-6).

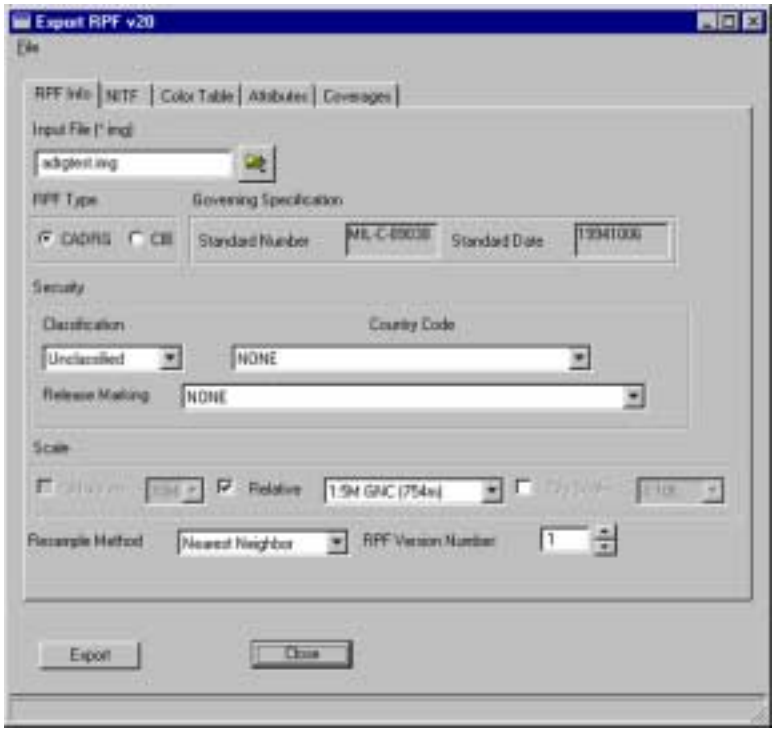


Figure 11-6 Export RPF Window

8. The **RPF Info** tab displays as the default. Enter the appropriate information as follows.

   a. The "Input File *(*.img)*" text box should display the input filename selected on the **Import/Export** window.

   b. The radio button next to CADRG or CIB in the "RPF Type" box is set automatically, depending on the input image. This example uses CADRG.

NOTE

Multispectral images default to CADRG. Panchromatic images default to CIB.

c. Under the "Governing Specification" box, the Military Standard specification number and date of issue are listed.

d. Select the appropriate information from the "Classification," "Country Code," and "Release Marking" dropdown menus.

e. In the "Scale" area**,** select the "Absolute" scale for CIB and "Relative" or "City Scale" for CADRG. Select the appropriate option from the dropdown menu, based on the source image scale.

NOTE

Selected scale will determine pixel size/ground resolution of output image frames.

9. On the **Export RPF** window select the **NITF** tab (Figure 11-7).

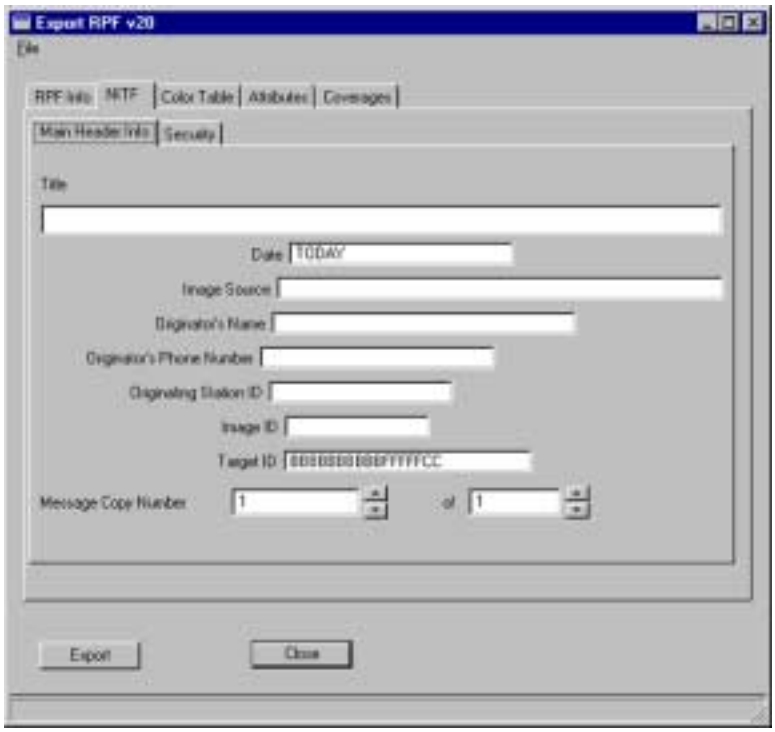


Figure 11-7 NITF Tab in Export RPF Window

10. The **NITF** tab has two sub-tabs, labeled **Main Header Info** and **Security**. The fields on these two sub-tabs allow the user to input information written to the NITF headers. Entering this information is optional.

11. On the **Export RPF** window, select the **Color Table** tab (Figure 11-8).

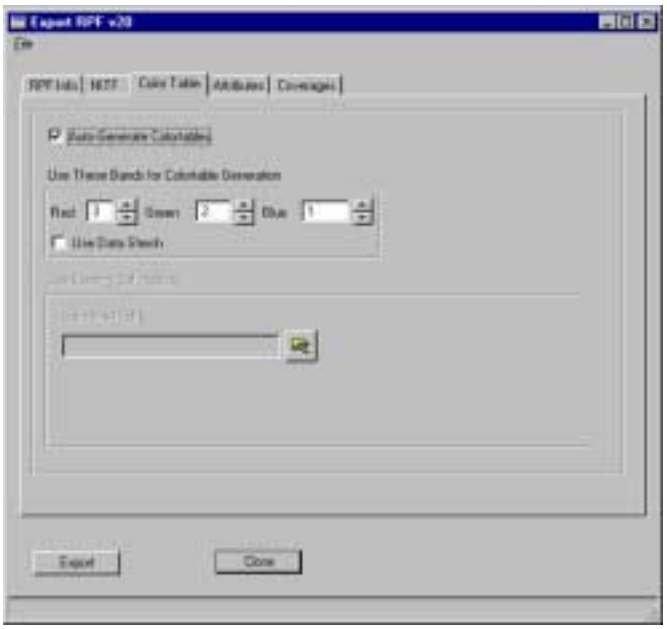


Figure 11-8 Color Table Tab in Export RPF Window

NOTE

*For **RPF Type** CIB, the user will receive the message **"Rescaling 8-bit data using Worldwide CIB grayscale table."** This process may take several minutes. No color table is generated.*

12. On the **Color Table** tab, for CADRG data, select the **Auto-Generate Color Tables** checkbox. Selecting this box will create the color table used for compression of the *.img* file selected.

13. Change the fields in the "Use These Bands for Color Table Generation" to the appropriate values, depending on the source image band combination.

14. On the **Export RPF** window, select the **Attributes** tab (Figure 11-9).

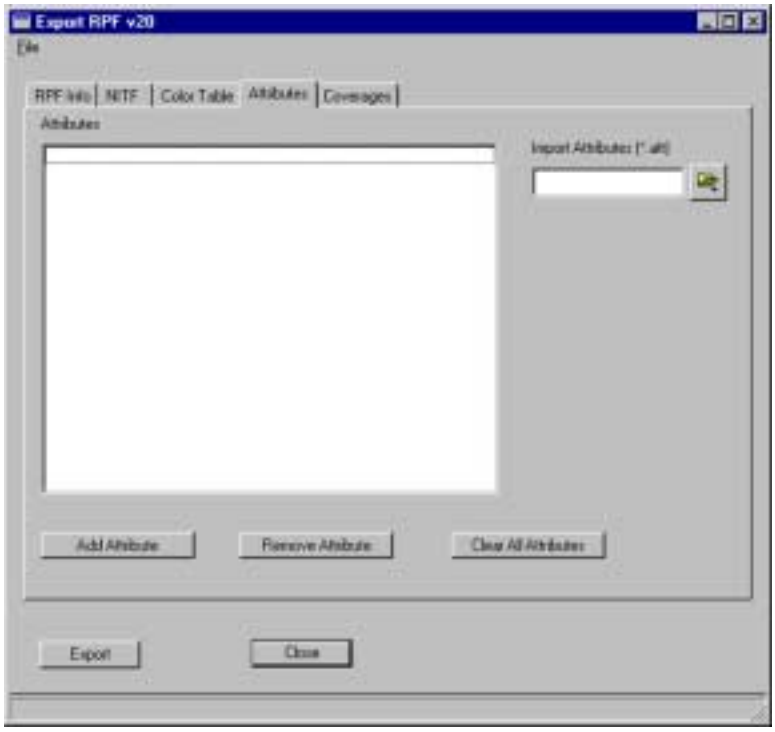


Figure 11-9 Attributes Tab in Export RPF Window

15. Entering information on the **Attributes** tab is optional. By using this page, the analyst can display various types of information about selected attributes.

16. On the **Export RPF** window, select the **Coverages** tab (Figure 11-10).

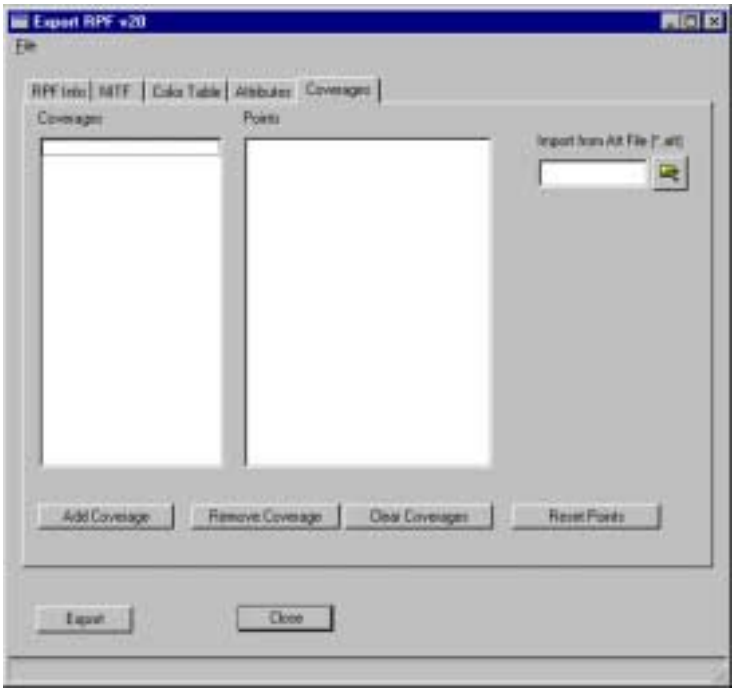


Figure 11-10 Coverages Tab in Export RPF Window

17. Entering information to the **Coverages** tab is optional. By using the **Coverages** tab, the user can select an *.img* file from which to derive the aerial extent of the exported image. This information may then be added to the attributes on the **Attributes** tab.

18. Click ***Export*** in the **Export RPF** window. The **Job Status** window appears.

19. When processing is completed, the file will reside in the selected directory. The system automatically creates the output file using information selected.

Although the user can determine the directory to which the RPF file is saved, the subdirectory and individual frames will be named automatically, depending on the type of image (CIB or CADRG).

For more information on exporting RPF in Imagine, refer to Imagine's online Help or printed documentation.

11.1.2.3 Exporting National Imagery Transmission Format (NITF) Data

NITF is the standard format for transmitting digital imagery and imagery-related products used by the Department of Defense (DoD) and the Intelligence Community. The NITF is designed to be a common format for the exchange of imagery data between normally incompatible systems. Imagine *.img* or *.map* files can be exported into specially

formatted files that can be read by any system complying with NITF standards. In turn, the analyst can import any file in this special format into Imagine.

This section covers the following topics:

- Preparing an image for NITF Export
- Exporting *.img* files to NITF
- Exporting *.map* files to NITF

NOTE

The current version of the NITF module supports NITF 2.0 only.

11.1.2.3.1 Preparing Image for NITF Export

Although ERDAS Imagine will allow both map composition (*.map*) files and image (*.img*) files to be exported as NITF, there are instances when one may be more appropriate than another. Map composition should be used when the operator wants to include overlays (annotations, or *.ovr* files). This procedure is likely to result in the loss of spatial resolution of the background image. If the operator wishes to export an image only, and the spatial quality of that image must be maintained, the *.img* file should be exported directly to NITF.

11.1.2.3.2 NITF Export

The following procedures cover exporting ERDAS *.img* and *.map* files to NITF. To export an ERDAS *.img* to NITF, perform the following steps.

1. With Imagine open on the desktop, click the **Import/Export** icon () from the Imagine icon panel. The **Import/Export** window will appear (Figure 11-11).

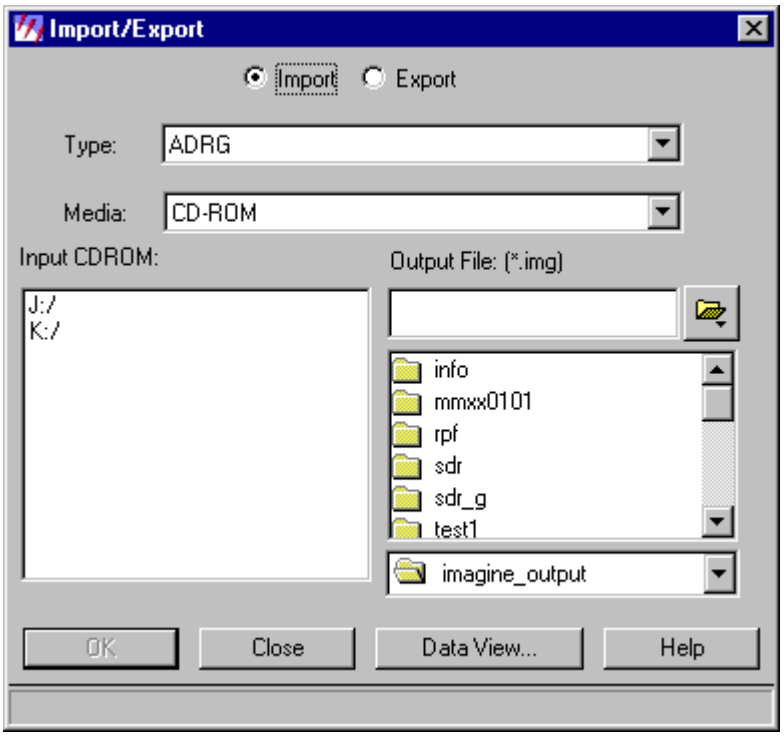


Figure 11-11 Import/Export Window

2. Click the radio button next to "Export" to export an Imagine file into another format. The window will change as shown in Figure 11-12.

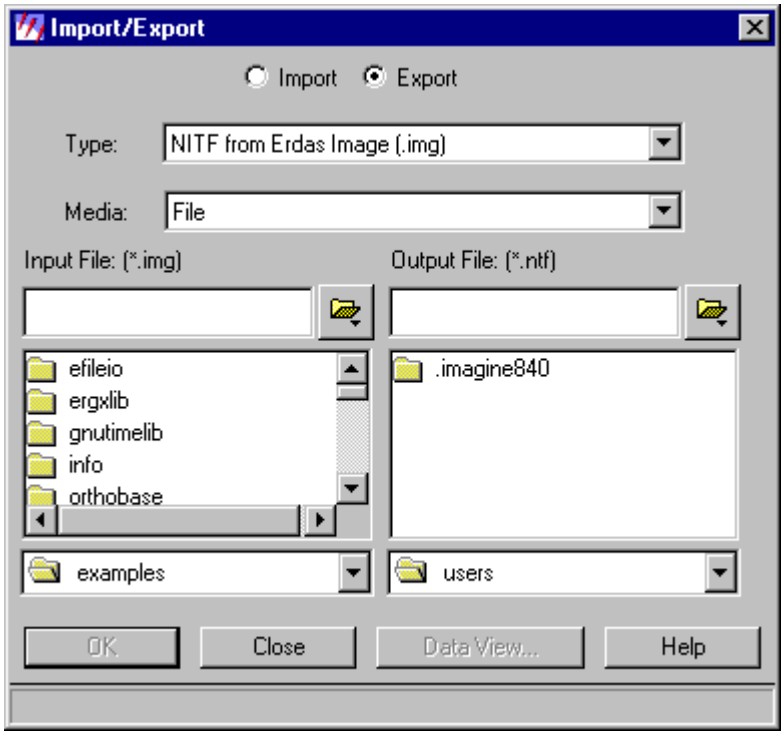


Figure 11-12 Import/Export Window With Export Option Selected

3. Select ***NITF from Erdas Image (.img)*** from the "Type" dropdown menu. For more information on the different data types, click the **Help** button to view Imagine on-line Help, or refer to the *Imagine 8.4 Field Guide*.

4. Click the "Media" dropdown menu to select the media from which the data is being imported: CD-ROM, Tape, or File. Not all data types can be exported from all media types. If the selected data type cannot be exported from a particular media type, an error message will appear informing the user the media type is not supported. The NITF exporter only supports media from File.

5. Select the appropriate input file. Type the name manually or select the name from the **File Open** icon ( ) or the file navigation panels located below the "Input File" field on the left-hand side of the window. Depending on the selection, the following would apply.

   - Input File: Enter the name of the input file. Type the name manually or select the name from the file name part.

   - Input Device: When importing data, if Tape was selected as the media source, the name of the input device tape drive must be selected from the list that is opened. Click on the device name.

   - Input CD-ROM: If CD-ROM was selected as the media source, the CD device name must be selected from the list that is opened (ex: J:/ or K:/). Click on the device name to select it.

6. Imagine automatically enters a name as the output file. To change the name, enter the new name for the output file in the "Output File" field. Type the name manually or select the name from the **File Open** icon ( ) or the file navigation panels located below the "Output File" field on the right-hand side of the window. The appropriate Imagine default file extension will be appended to raster output files.

7. Click ***OK*** to use the options selected and open the **Export NITF Data** window (Figure 11-13).

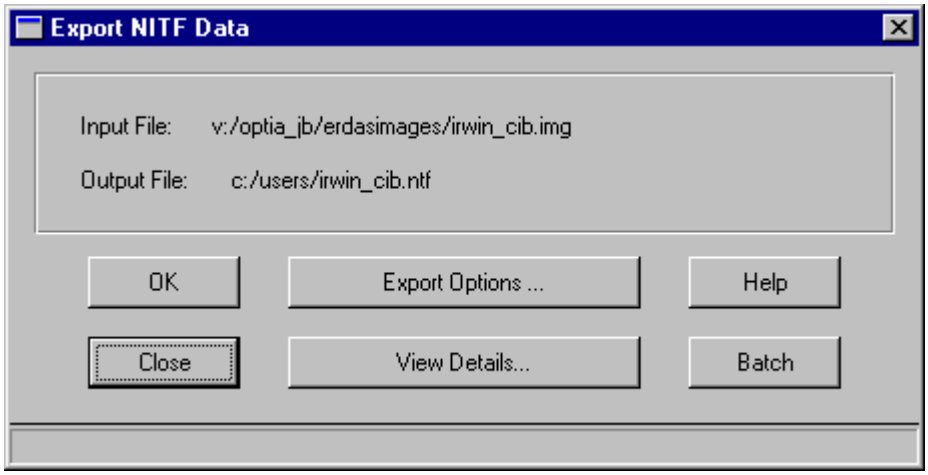


Figure 11-13 Export NITF Data Window

8. If desired, select ***Export Options***. The **NITF Export Options** window will appear (Figure 11-14).

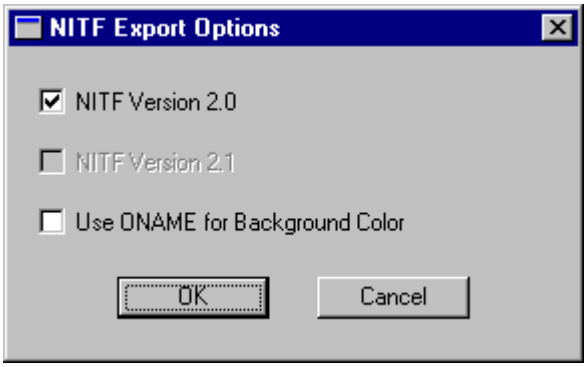


Figure 11-14 NITF Export Options

9. Leave a check mark in the box next to "NITF Version 2.0." Click ***OK*** to return to the **Export NITF Data** window.

10. If desired, click ***View Details*** to view and edit the file structure and data of the specified NITF output file. The window will appear as shown in Figure 11-15.

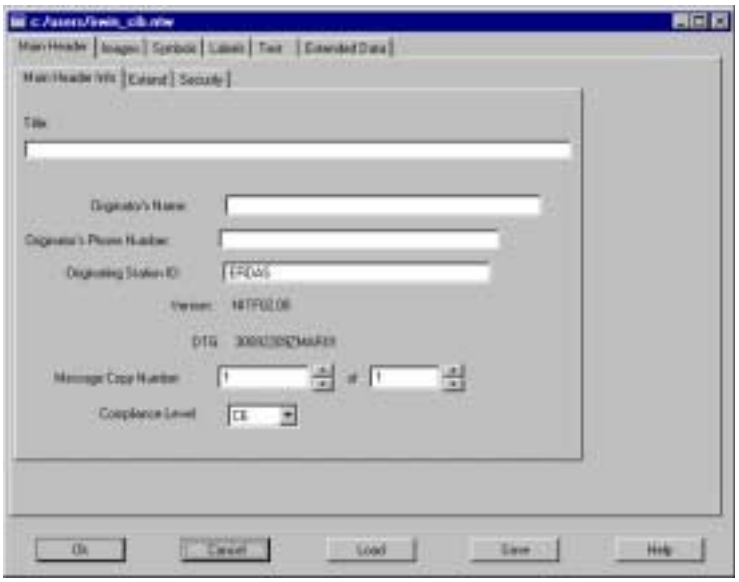


Figure 11-15 NITF View Details Window Showing Main Header Info Tab

11. All NITF files have a main header that contains basic information about the NITF file. The **NITF Main Header Info** tab shows as the default. Each unit may require that specific information be placed into the NITF main header file by entering data into the data fields at the top of the **NITF Main Header Info** tab. Complete the empty fields by entering data as required by the unit.

12. Select the **Security** tab to enter or edit the image's security data. The window will appear as shown in Figure 11-16.

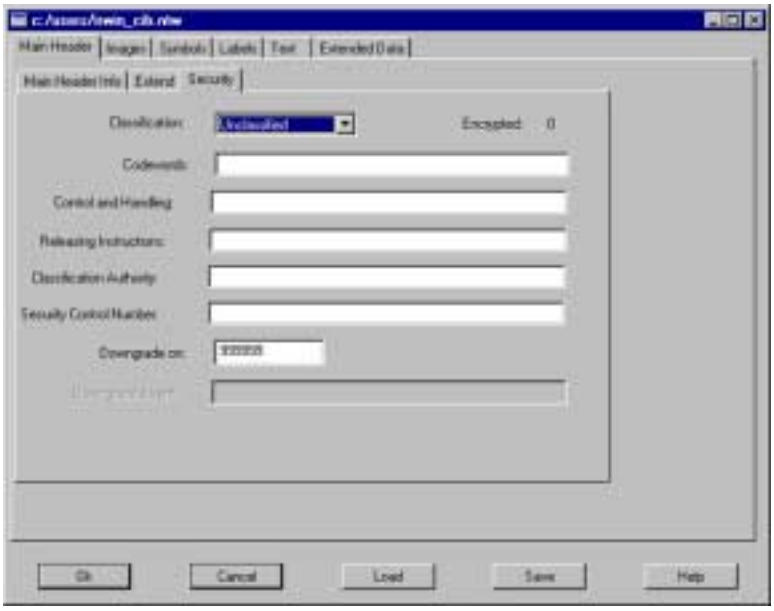


Figure 11-16 NITF View Details Window Showing Security Tab

13. Army regulations and unit SOPs will dictate how these fields are completed. When the entries are completed, select the **OK** button located at the bottom left portion of the window.

NOTE

For information on other sub headers, refer to the NITF Tour Guide, National Imagery Transmission Format Standard (MIL-STD-2500) and the Military Handbook for the National Imagery Transmission Format Standard (MIL-HDBK-1300).

The procedure for exporting ERDAS map files to NITF is the same as for exporting image files, with the following exceptions:

- In the **Import/Export** window, select ***NITF from Erdas Map (.map)*** from the "Type" dropdown menu.
- In the **Import/Export** window, select a map file (*.map*) from the "Input File (*.map)" field.

For more information on exporting ERDAS *.img* and *.map* files to NITF, refer to the manual *Imagine NITF 2.0 for Windows*, or the online Help.

11.1.3 DOP Exporter

The DTSS Overlay Provider (DOP) Exporter exports a geodatabase (*.mdb* file) displayed in ArcMap. The DOP Exporter cannot export other information that might be displayed in the map document such as coverages, shapefiles, or images.

The DOP Exporter uses the geodatabase as a data source to perform automated layer extraction, whereby the geodatabase information is converted into a series of text files. These files are then packaged into a single compressed *.tar* file for import into the Joint Mapping Toolkit Viewer (JMV). The exported file contains all the information needed to reconstruct the overlay in JMV.

NOTE

The DOP Exporter only exports feature classes that are in a single geodatabase, not feature classes contained in several different geodatabases.

Follow the procedure below to use the DTSS DOP Exporter function.

1. With ArcMap open on the desktop, open and display the desired geodatabase to export using the Add Data button ( ).

2. Select ***DTSS/Export/DOP Exporter*** from the main menu bar. The **DOP Exporter will export the following layers** window will appear (Figure 11-17).

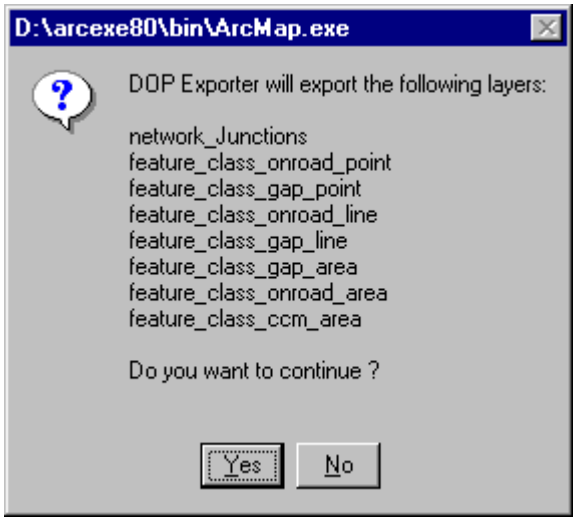


Figure 11-17 DOP Exporter Will Export The Following Layers Window

3. The layers to export are listed in the window. Click ***Yes*** to continue. The **Browse for Folder** window will now appear (Figure 11-18).

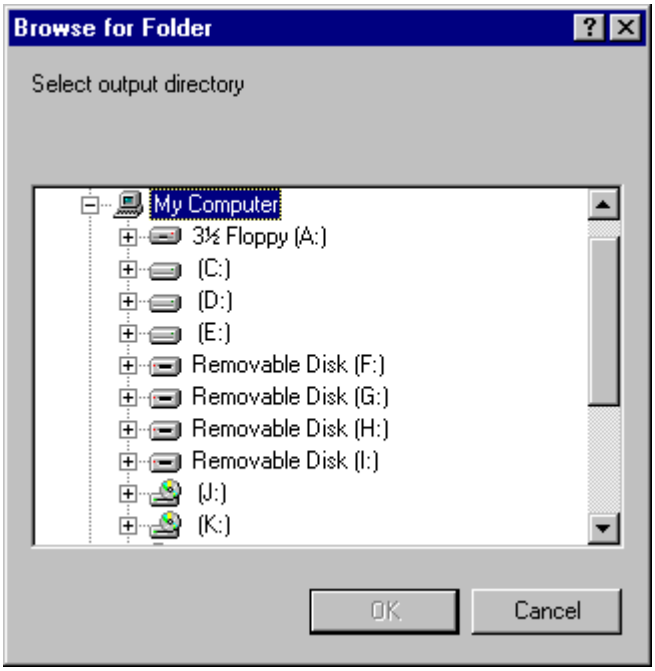


Figure 11-18 Browse for Folder Window

4. Navigate to the appropriate output directory, and click ***OK***. The **Enter Metadata** window will appear (Figure 11-19).

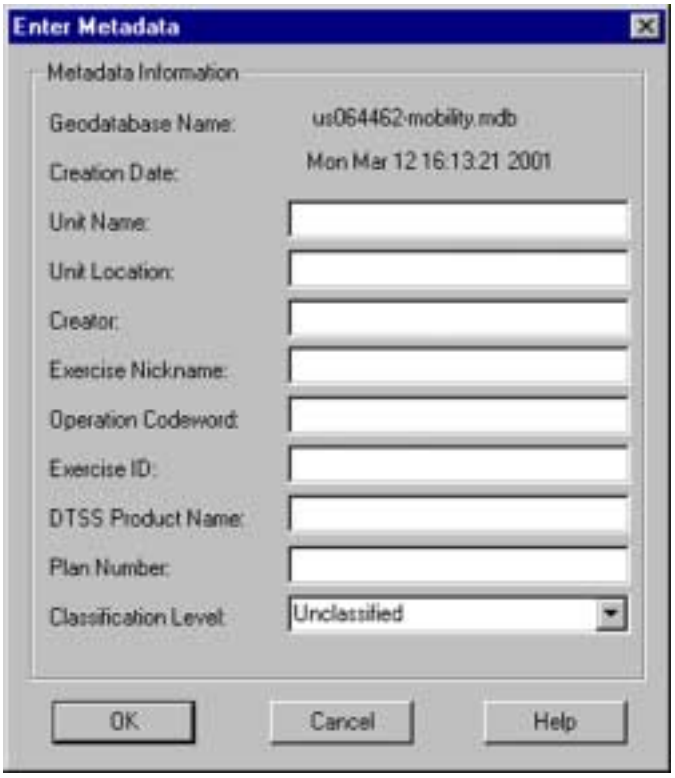


Figure 11-19 Enter Metadata Window

5. Enter the appropriate metadata information as desired. When finished, click ***OK***. The **DOP Exporter Status** window will appear (Figure 11-20). This process will take a few moments.

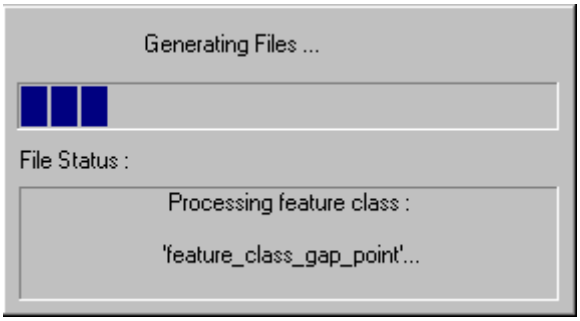


Figure 11-20 DOP Exporter Status Window

6. When the export process is completed, the **DOP export process complete** window shown in Figure 11-21 will appear. Click ***OK*** to finish and return to the ArcMap main window. The exported file can be found in the selected directory.



Figure 11-21 DOP Export Process Complete Window

If the user receives the error message shown in Figure 11-22, this means that the layer is in another database, or that the layer is a coverage, shapefile, or some other data source (i.e., not a geodatabase). The exporter only exports feature classes that are in a single geodatabase, not feature classes spread out over several geodatabases. ArcMap simply stores and displays data, which may exist in layers located in several different geodatabases.

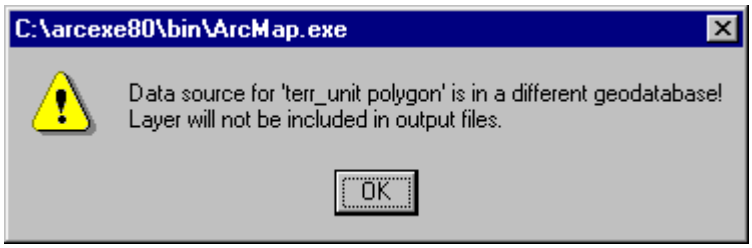


Figure 11-22 Error Message From DOP Exporter

11.1.4 DTSS Geodatabase Exporter

The DTSS Geodatabase Exporter allows the analyst to convert custom DTSS geodatabases into generic geodatabases, which can then be used on any system using the desktop ArcInfo software. The DTSS Geodatabase Exporter removes any DTSS-specific rendering, etc., associated with the custom DTSS geodatabases, which include ITD, VITD, FFD, and DTOP imported using the DTSS importers, as well as all products created using the Mobility, Line of Sight, and Data Query wizards. To convert a custom DTSS geodatabase to a generic geodatabase, follow the procedure below.

1. With a map open in the ArcMap window, choose ***DTSS/Export/Geodatabase Exporter*** from the ArcMap main menu. The first DTSS Geodatabase Exporter window opens (Figure 11-23). Notice the text above the section labeled “Export Options,” which indicates the purpose of the exporter.



Figure 11-23 DTSS Geodatabase Exporter Window

2. In the "Select geodatabase to export (*.mdb)" field, type the path and filename of the geodatabase file to export, or click the ***Open File*** icon ( ) to the right of this field to open the **Select an existing geodatabase** window (Figure 11-24).



Figure 11-24 Select an Existing Geodatabase Window

3. Navigate to the appropriate geodatabase, and click ***Open*** to bring it back into the **Geodatabase Exporter** window. Notice that the path and filename appear in the "Select geodatabase to export (*.mdb)" field (Figure 11-25).



Figure 11-25 DTSS Geodatabase Exporter Window With Geodatabase Selected

4. Now type or select the appropriate path and filename in the "Select exported geodatabase (*.mdb)" field. This field indicates the destination directory and filename for the exported geodatabase (Figure 11-26). By default, the DTSS Geodatabase Exporter adds "_export" to the filename and attaches the *.mdb* extension. To accept the default name, press ***[Enter]***. Otherwise, click the ***Open File*** icon ( ) to the right of this field to open the **Select geodatabase location** window and select the desired path and filename.



Figure 11-26 DTSS Geodatabase Exporter Window With Destination Path

5. Once the destination path and filename appear in black text in the "Select exported geodatabase (*.mdb)" field, the **Export** button is enabled. Click ***Export*** to proceed. The **DTSS Geodatabase Exporter—Export Status** window will appear (Figure 11-27), indicating progress of the export. This process may take several minutes.



Figure 11-27 DTSS Geodatabase Exporter—Export Status Window

6. The **Export Status** window will appear when the export is complete (Figure 11-28). The exported geodatabase is now located in the selected directory and can be viewed on a non-DTSS computer.



Figure 11-28 DTSS Geodatabase Exporter—Export Complete Window

11.2 Data Dissemination

The DTSS provides COTS, GOTS, and custom-developed capabilities for dissemination of softcopy and hardcopy information. These capabilities facilitate use of DTSS data and products by other battlefield systems.

11.2.1 DTSS Website Overview

The DTSS Website is available for the user to add, store, and download data and products. The DTSS Web Exporter facilitates product management on the DTSS Website.

11.2.1.1 DTSS Web Exporter

The DTSS Web Exporter provides an interface to add, update, remove, and manage DTSS products, commercial format data, NIMA data, DOP Overlays, etc. on the DTSS Website.

11.2.1.1.1 Add Product to Website

The DTSS analyst can add a product to the DTSS Website by following the steps listed below.

1. With ArcMap open on the desktop, select ***DTSS/Export/Web Exporter*** from the ArcMap menu bar. The **DTSS Web Exporter** window will appear (Figure 11-29) allowing the user to select the desired option for managing data on the DTSS Website.



Figure 11-29 DTSS Web Exporter Window

2. To add a new product to the Website, click the radio button next to "Add Product to Website," and click ***Next*** to continue. The **Add Product To Website** window will appear (Figure 11-30).

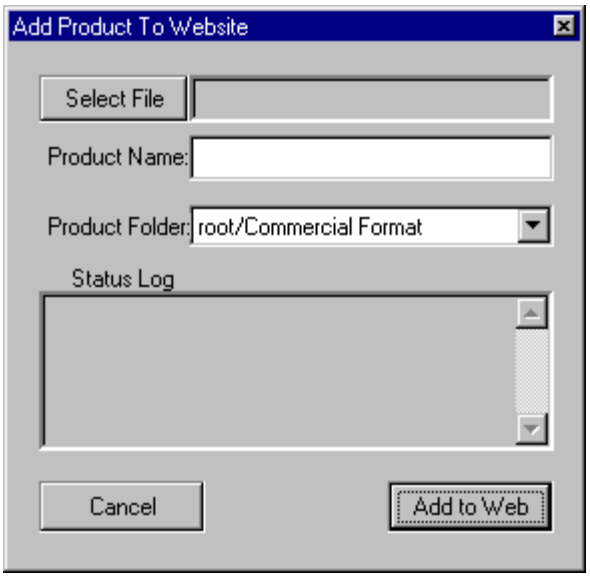


Figure 11-30 Add Product to Website Window

3. Click the **Select File** button. The **Open** window will appear (Figure 11-31).

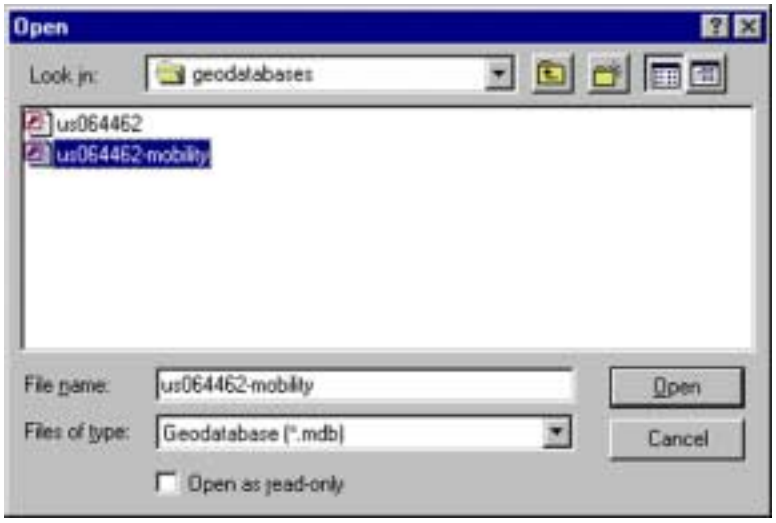


Figure 11-31 Open Window

4. Navigate to the file to add and click ***Open***. The selected information will appear in the **Add Product To Website** window (Figure 11-32).

NOTE

This file can be of any type that is stored on the DTSS.



Figure 11-32 Add Product to Website Window Showing Selected Product

5. Select the desired folder to add the product into from the "Product Folder" dropdown menu.

6. Click ***Add to Web*** to add the product to the DTSS Website. The **Web Metadata Editor** window will appear (Figure 11-33).

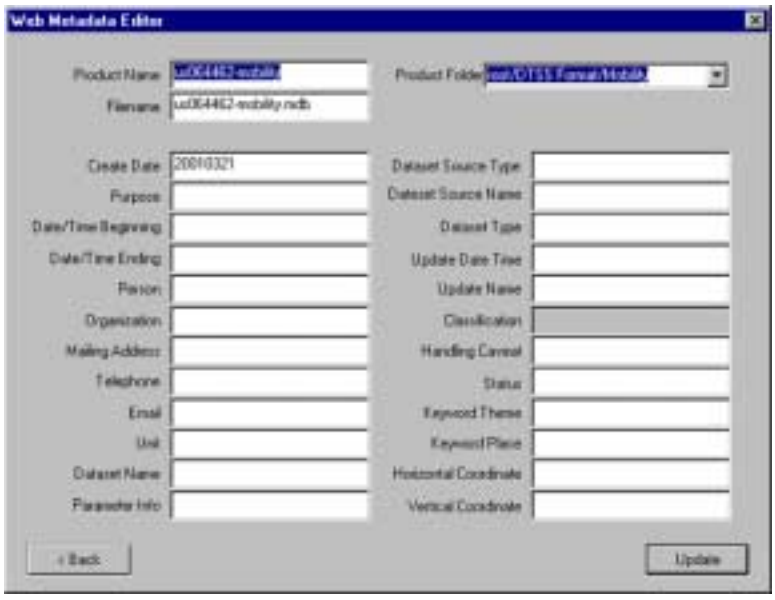


Figure 11-33 Web Metadata Editor Window

7. Provide any metadata necessary for adding the product, and click ***Update***. The update process will take a few moments. The **DTSS Web Exporter—Successful Update** window will appear when complete (Figure 11-34).

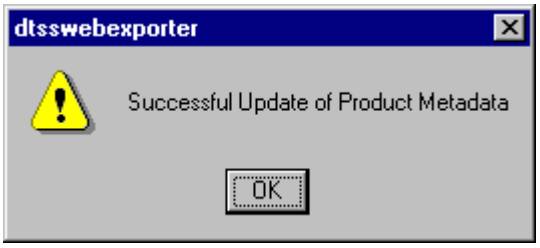


Figure 11-34 DTSS Web Exporter—Successful Update Window

8. Click ***OK***. The window closes and returns to the **Web Metadata Editor** window.

9. Click ***Back*** in the **Web Metadata Editor** window to return to the **Add Product To Website** window

10. Select another product to add to the DTSS Website, or click ***Cancel*** to return to the **DTSS Web Exporter** main window.

11. The system has generated the product in the specified format and placed it on the DTSS Website. Another user can download the map from the DTSS Website for use on that user's system.

11.2.1.1.2 Updating Product Data on Website

The DTSS analyst can update a product on the DTSS Website by following the steps listed below.

1. With ArcMap open on the desktop, select ***DTSS/Export/Web Exporter*** from the ArcMap menu bar. The **DTSS Web Exporter** window will appear (Figure 11-35), allowing the user to select the desired option for managing data on the DTSS Website.



Figure 11-35 DTSS Web Exporter Window

2. To update a product on the Website, click the radio button next to "Update Product Data" and click ***Next*** to continue. The **Update Product Data** window will appear (Figure 11-36).

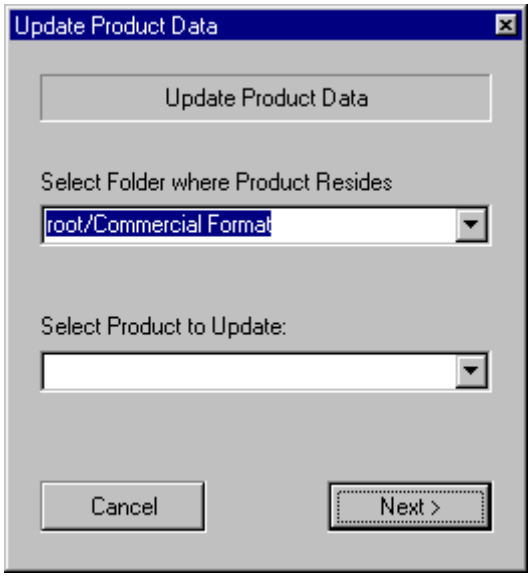


Figure 11-36 Update Product Data Window

3. Select the folder where the product is stored from the "Select Folder where Product Resides" dropdown menu and select the desired product to update from the "Select Product to Update" dropdown menu (Figure 11-37).

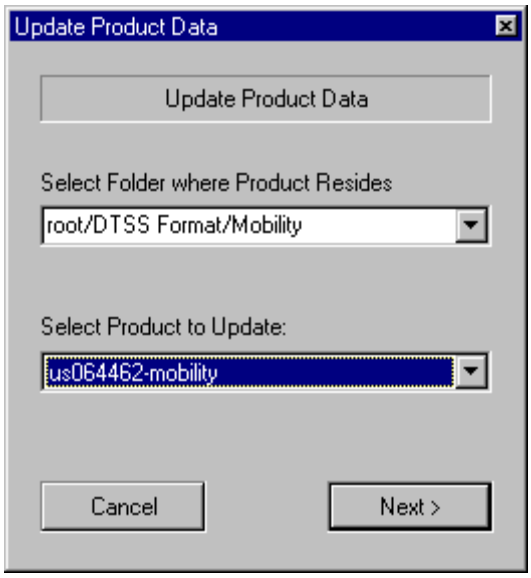


Figure 11-37 Update Product Data Window Showing Product Selected

4. Click ***Next*** to continue. The **Web Metadata Editor** window will appear (Figure 11-38).

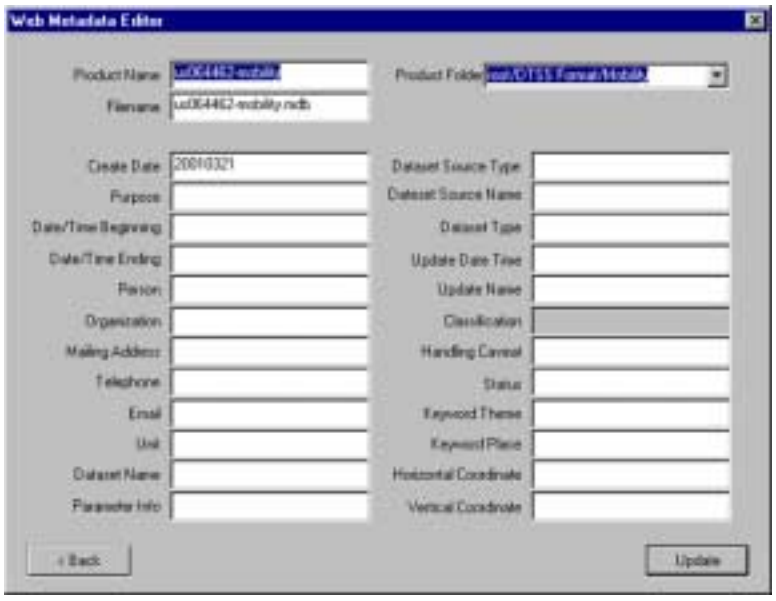


Figure 11-38 Web Metadata Editor Window

5. Enter the appropriate metadata information and click ***Update***. The update process will take a few moments. The **DTSS Web Exporter—Successful Update** window will appear when complete (Figure 11-39).



Figure 11-39 DTSS Web Exporter—Successful Update Window

6. Click ***OK***. The window closes and returns to the **Web Metadata Editor** window.

7. Click ***Back*** in the **Web Metadata Editor** window to return to the **Update Product Data** window.

8. Select another product to update on the DTSS Website, or click ***Cancel*** to return to the **DTSS Web Exporter** main window.

9. The system has updated the product metadata and placed it on the DTSS Website. Another user can view the product's metadata from the DTSS Website.

11.2.1.1.3 Removing Product From Website

The DTSS analyst can remove a product from the DTSS Website by following the steps listed below.

1. With ArcMap open on the desktop, select ***DTSS/Export/Web Exporter*** from the ArcMap menu bar. The **DTSS Web Exporter** window will appear (Figure 11-40), allowing the user to select the desired option for managing data on the DTSS Website.



Figure 11-40 DTSS Web Exporter Window

2. To remove a product on the Website, click the radio button next to "Remove a Product" and click ***Next*** to continue. The **Remove A Product** window will appear (Figure 11-41).

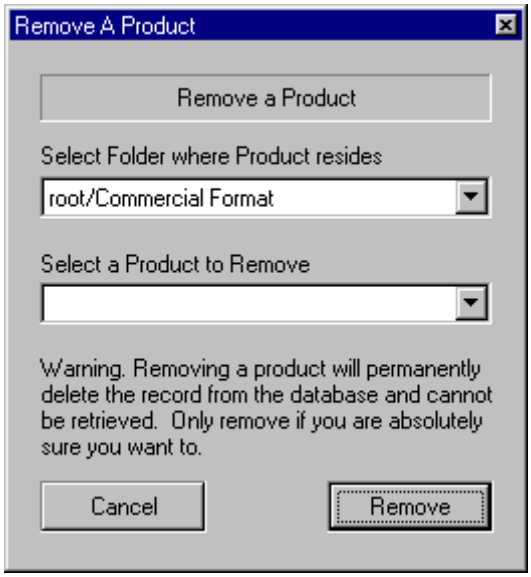


Figure 11-41 Remove a Product Window

3. Select the folder where the product is stored from the "Select Folder where Product resides" dropdown menu, and select the desired product to remove from the "Select a Product to Remove" dropdown menu (Figure 11-42).

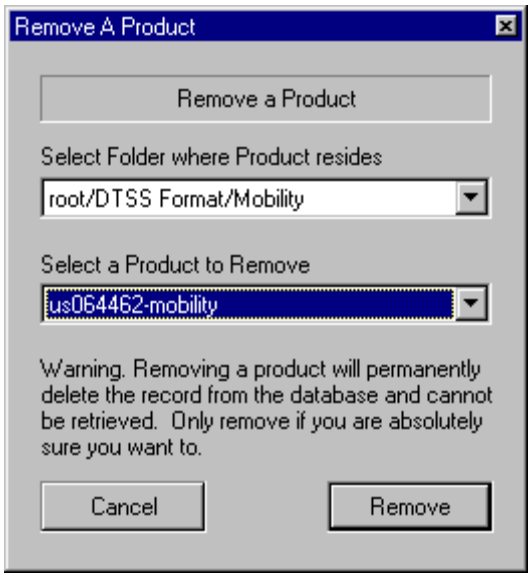


Figure 11-42 Remove a Product Window Showing Product Selected

4. Click ***Remove*** to continue. The **DTSS Web Exporter—Success** window will appear (Figure 11-43).



Figure 11-43 DTSS Web Exporter—Success Window

5. Click ***OK***. The window closes and returns to the **Remove a Product** window.

6. Select another product to remove from the DTSS Website, or click ***Cancel*** to return to the **DTSS Web Exporter** main window.

7. The system has removed the product from the DTSS Website.

11.2.1.1.4 Managing Website Product Folders

The DTSS analyst can manage the product folders on the DTSS Website by following the steps listed below.

1. With ArcMap open on the desktop, select ***DTSS/Export/Web Exporter*** from the ArcMap menu bar. The **DTSS Web Exporter** window will appear (Figure

11-44), allowing the user to select the desired option for managing data on the DTSS Website.



Figure 11-44 DTSS Web Exporter Window

2. To manage product folders on the Website, click the radio button next to "Manage Product Folders" and click ***Next*** to continue. The **Manage Product Folders** window will appear (Figure 11-45) allowing the user to add, rename, and remove folders from the DTSS Website.

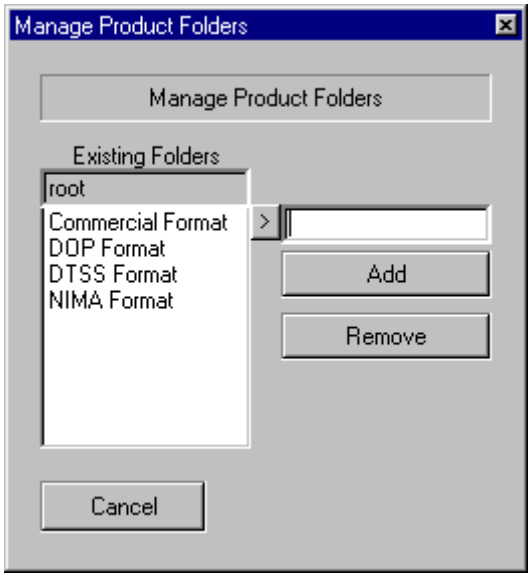


Figure 11-45 Manage Product Folders Window

3. Use the following substeps to add a new folder.

a. Type the name of the folder in the text field located directly above the **Add** button (Figure 11-46).

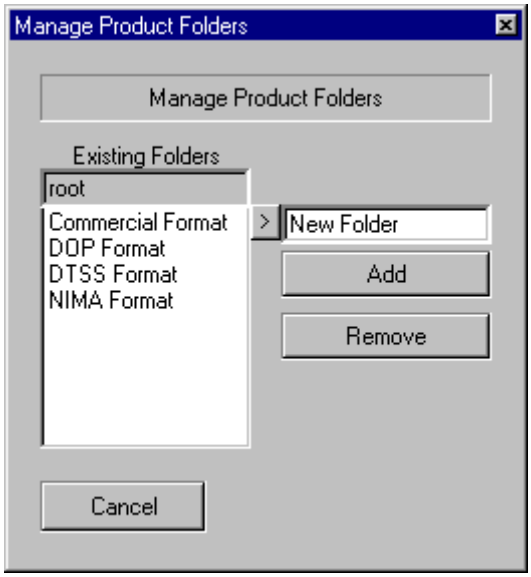


Figure 11-46 Manage Product Folders Window Showing New Folder Typed

b. Click the **Add** button. The new folder's name will appear in the "Existing Folders" panel (Figure 11-47). The new folder will appear on the DTSS Website.

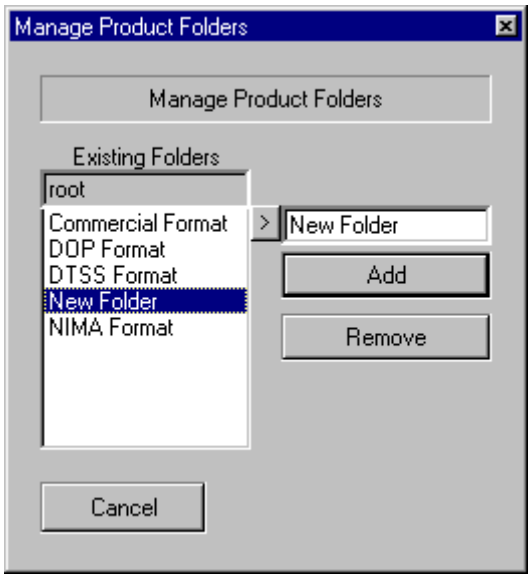


Figure 11-47 Manage Product Folders Window Showing Added Folder

4. Use the following substeps to remove an existing folder.

a. Click the folder to remove in the "Existing Folders" panel (Figure 11-48).

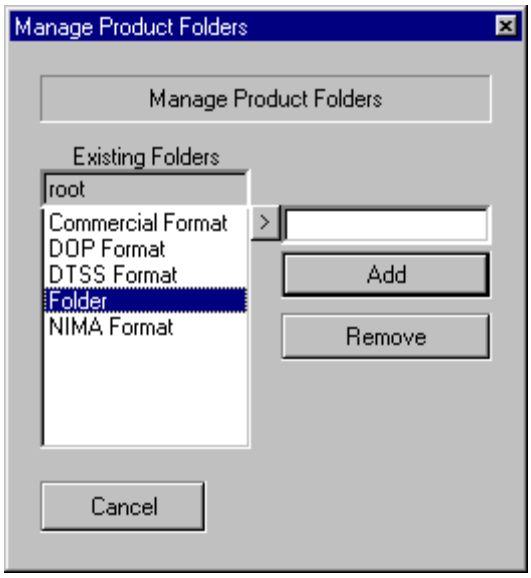


Figure 11-48 Manage Product Folders Window

b. Click the arrow button (>) located to the right of the "Existing Folders" panel. The selected folder name appears in the text field on the right side of the window (Figure 11-49).

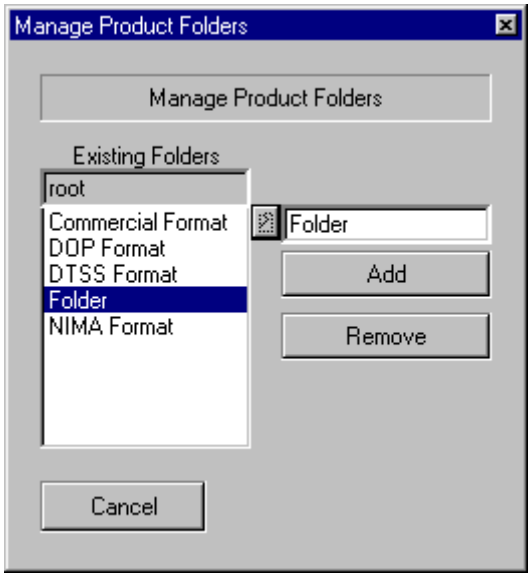


Figure 11-49 Manage Product Folders Window

c. Click ***Remove***. The folder will be removed from the "Existing Folders" panel (Figure 11-50) and from the DTSS Website.

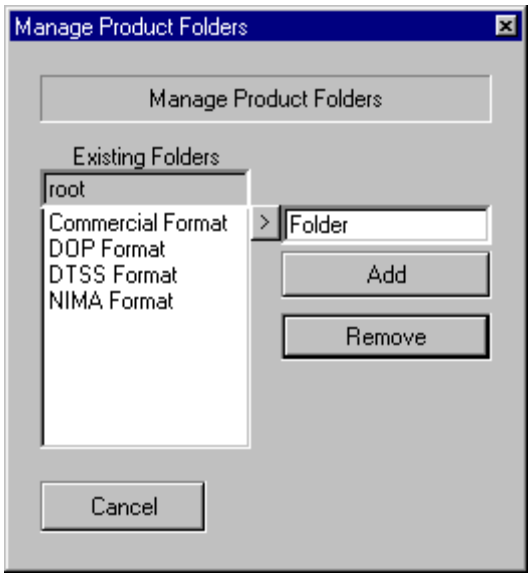


Figure 11-50 Manage Product Folders Window

5. Select another folder to manage on the DTSS Website, or click ***Cancel*** to return to the **DTSS Web Exporter** main window. The system has updated the product folders on the DTSS Website.

11.2.1.2 Downloading Product From DTSS Website

To download a product from the DTSS Website, use the procedures below.

1. Open Netscape Navigator by clicking the **Netscape Navigator** icon from the desktop, or by clicking on the **Start** menu and going to ***Programs/Netscape Communicator/Netscape Navigator***. The **Netscape** main window will appear.

2. Type in the DTSS Website address, http://localhost/dtssdb/DTSSWeb, in the address, or "Netsite," field and press ***[Enter]***. The DTSS Website home page will appear in the **Netscape** window (Figure 11-51).

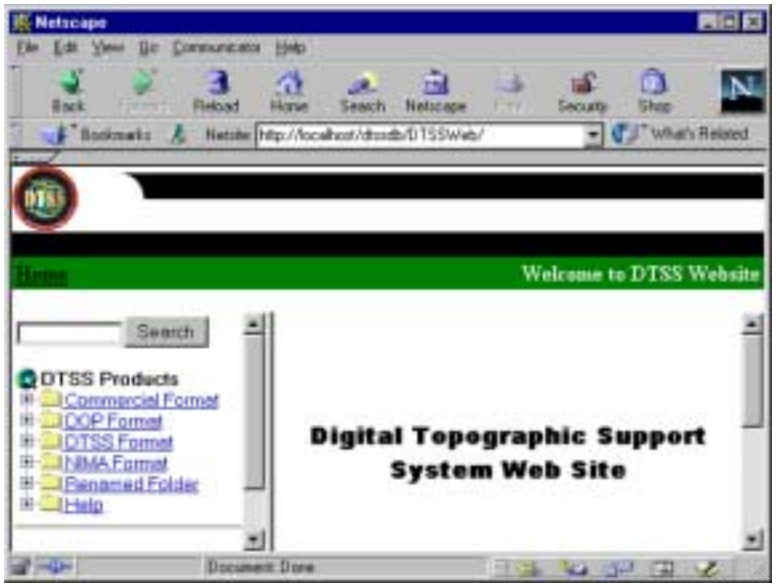


Figure 11-51 DTSS Website Home Page in the Netscape Window

3. The available products are listed under "DTSS Products" in folders on the left side of the Web page. Click on a folder to access its available subfolders and products (Figure 11-52).

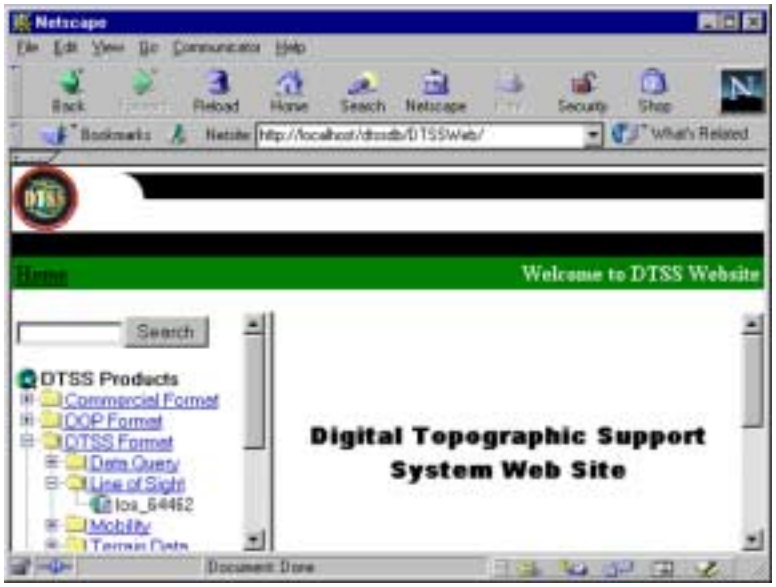


Figure 11-52 DTSS Website Showing DTSS Products Menu Tree

4. To search for a specific product, type the product name in the field next to the **Search** button, and then click ***Search***. The search results will appear in the left panel of the Web page as shown in Figure 11-53.

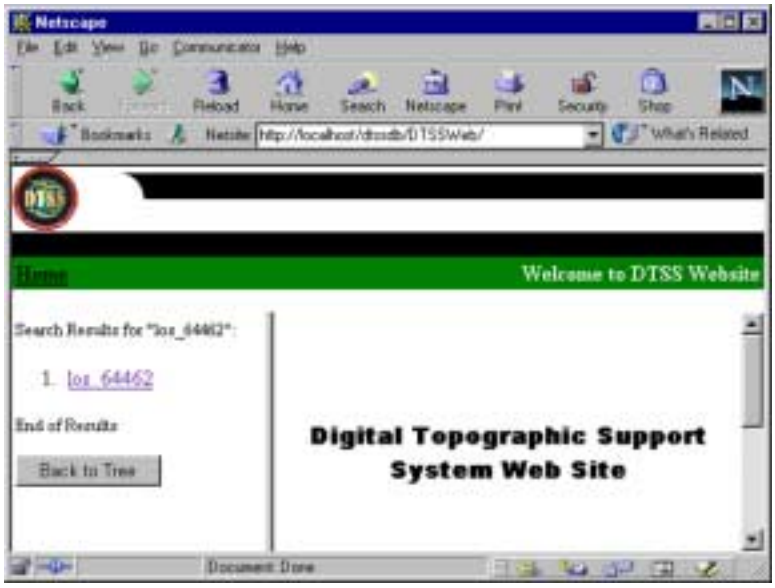


Figure 11-53 DTSS Website Showing Search Results

5. If the desired product name appears in the search results, click the product name to display the product information screen shown in Figure 11-54.

6. If the desired product name does not appear, the product has not been exported using the DTSS Web Exporter function to the DTSS Website. In this case, click the ***Back to Tree*** button to return to the "DTSS Products" tree and look for other available products.

7. Click on the desired product to download. Products are shown with a product icon ( ). The screen will appear as shown in Figure 11-54.

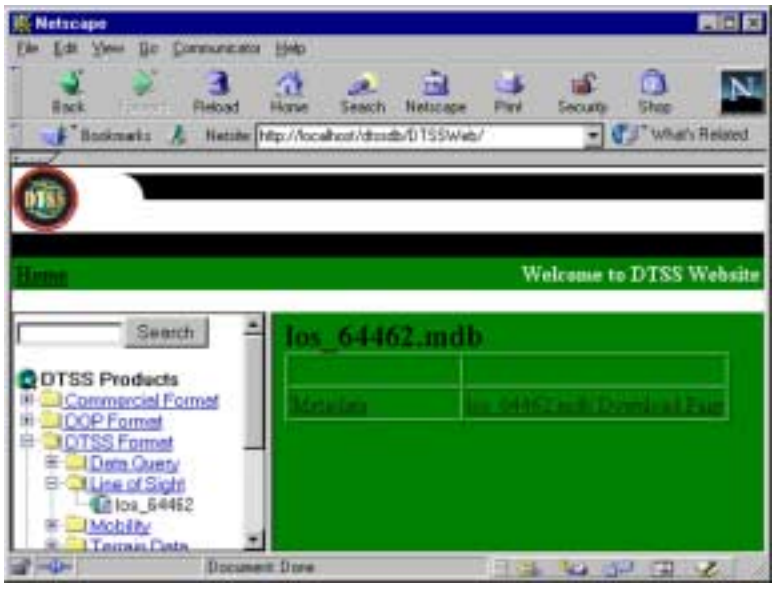


Figure 11-54 DTSS Website Showing DTSS Products Selected

8. To view the product's metadata, click the "Metadata" link on the product Web page located in the right panel of the window. The product's metadata information will appear (Figure 11-55).

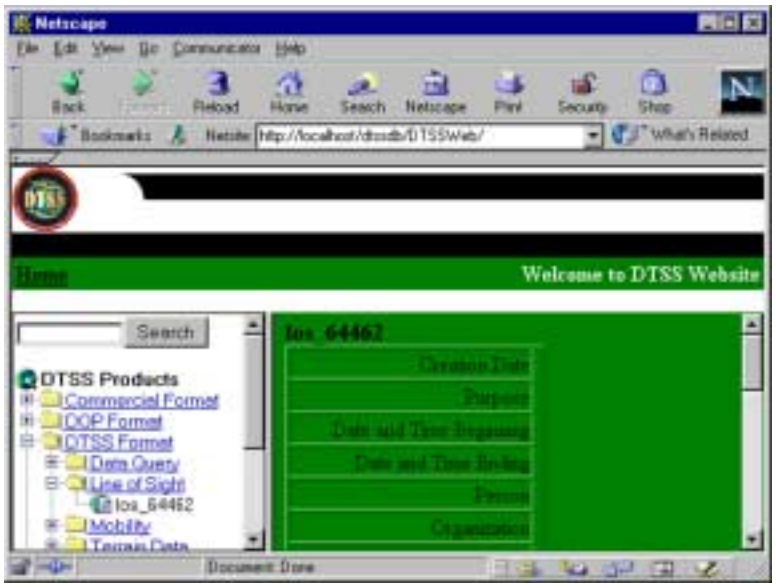


Figure 11-55 DTSS Website Showing Product's Metadata

9. After viewing the metadata information, click the ***Back*** button in the **Netscape** window to go back to the product page. To download the product, click the "Product Download Page" link. The product download information will appear (Figure 11-56).

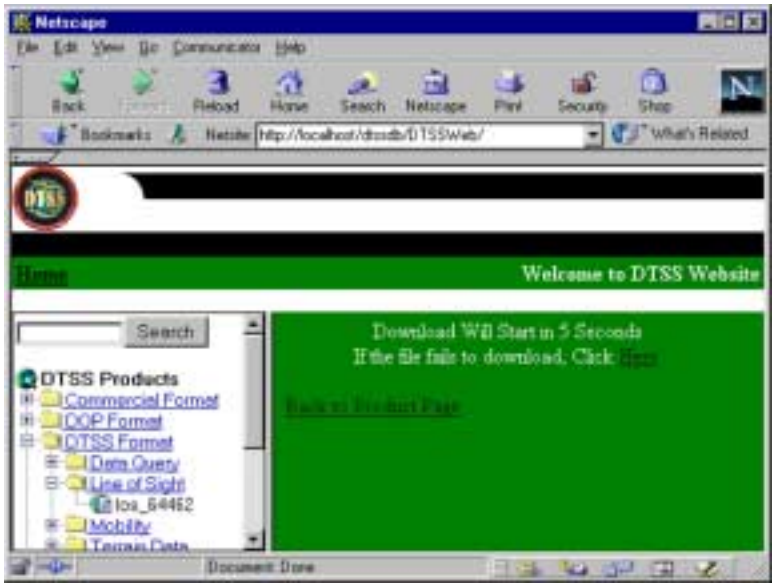


Figure 11-56 DTSS Website Showing Product Download

10. The product download will take a few moments. Eventually the **Save As** window appears (Figure 11-57).

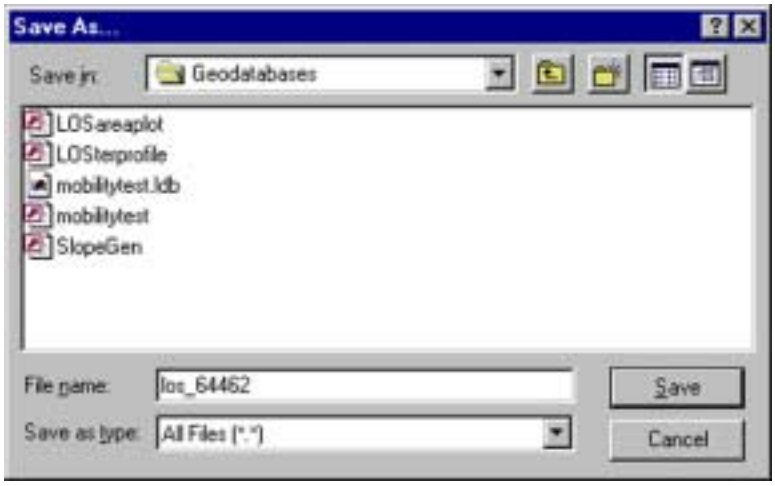


Figure 11-57 Save As Window

11. Navigate to the appropriate directory. The "File name" field is populated automatically. Click ***Save***. The product is successfully downloaded into the selected location.

For more help using the DTSS Website, click the "Help" folder located under the "DTSS Products" tree on the Web page. To return to the DTSS Website home page, click the "Home" link.

11.2.2 Adaptec Easy CD Creator

The Adaptec Easy CD Creator is a CD recording tool that is capable of generating a CD of multiple formats for different uses. Some of the supported data formats are listed in Table 11-1.

NOTE

This section will focus on the standard CD-ROM format, which best suits data dissemination and cross compatibility with other DOD systems. For more information on other formats, refer to the Easy CD Creator online Help.

Table 11-1 Easy CD Creator Supported CD Formats

Format	Name	Uses	DTSS
CD-ROM	Compact Disc Read-only Memory	Standard data CD format	DTSS Standard

Table 11-1 Easy CD Creator Supported CD Formats (Cont'd)

Format	Name	Uses	DTSS
CD-ROM XA	Compact Disc Read-only Memory Extended Architecture	Multimedia	(Not Used)
CD Extra	Compact Disc Extra	Data and Audio	(Not Used)
Mixed-Mode	Compact Disc Mixed-Mode	Data and Audio	(Not Used)
CD-I	Compact Disc Interactive	Audio and Video	(Not Used)
CD-XA Bridge Disc	Combines CD-ROM XA and CD-I	Photo CD and Video CD	(Not Used)
CD-DA	Compact Disc Digital Audio	Audio CD	(Not Used)

Adaptec Easy CD Creator and the CD-RW drives supplied with DTSS support both Compact Disc Recordable (CD-R) and Compact Disc Rewritable (CD-RW) media types. Each media type involves unique compatibility, updates, and necessary additional preparation, discussed in Table 11-2.

Table 11-2 Comparison of CD Media Types

Media Type	Compatibility	Updates / Changes	Additional Preparation
CD-R	Read by all but the oldest CD-ROM Drives	Data can be added in a Multi-session CD but not removed or altered.	None.
CD-RW	Read-only by CD-RW drives	Data may be written and erased as a standard session. When the media is properly formatted it is treated as a hard drive with the ability to add, alter, and delete files and folders.	UDF formatting allows the disk to be accessed as a read/write file system. (The Direct CD application provides this capability.)

11.2.2.1 CD Creator Main Window

The CD Creator main window is the central point from which all functions and setting changes are launched. To open the Adaptec Easy CD Creator, select ***Start/Programs/Adaptec Easy CD Creator/Easy CD Creator*** from the desktop. The **Easy CD Creator** window and **Adaptec Easy CD Creator Wizard** will appear. Figure 11-58 shows the **Easy CD Creator** window divided into the basic functional areas discussed in the following sections. The **Adaptec Easy CD Creator Wizard** is covered in Section 11.2.2.2.3, *Creating the CD.*

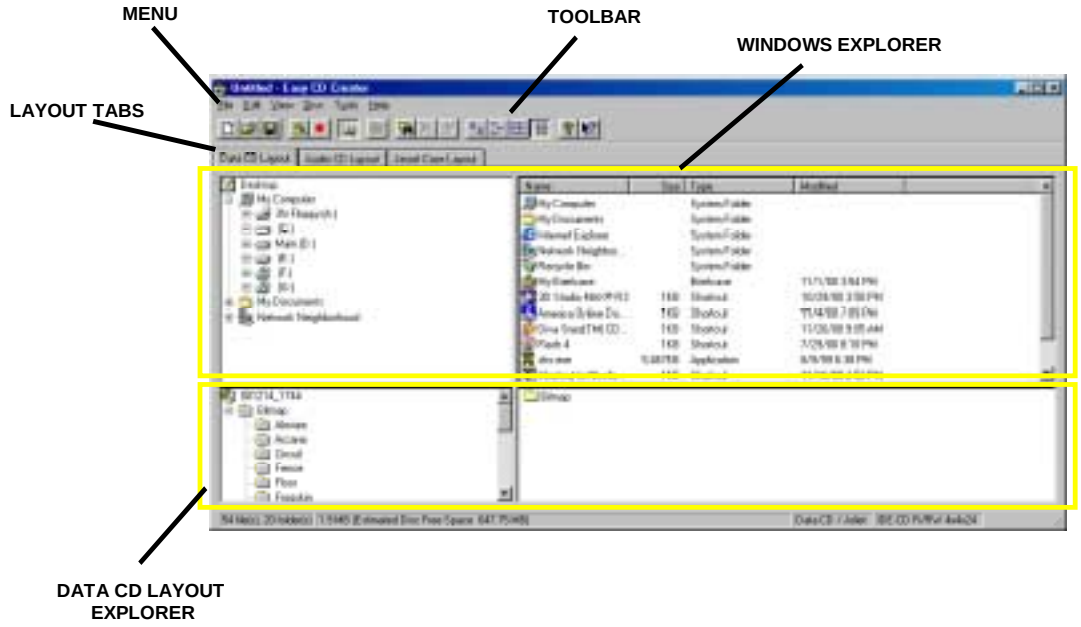


Figure 11-58 Adaptec Easy CD Creator Main Window

11.2.2.1.1 Layout Tabs

The layout tabs switch between Data, Audio and Jewel Case Layout. Each of these tabs will enable a different set of tools. The **Data CD Layout** tab contains two sets of windows. The two windows at the top of the **Data CD Layout** tab make up the Windows Explorer portion of the display. It is used for navigating to the desired files and folders, so they can be copied into the Data CD Layout Explorer area using drag-and-drop functionality.

11.2.2.1.2 Menu

The Adaptec Easy CD Creator main menu bar provides access to most of the program's functionality through textual menu choices. The main menu bar arranges commands into related lists of tasks. Tables 11-3 through 11-8 describe each menu item and its corresponding list of commands.

Table 11-3 shows each **File** menu command and a description of its functions. For more information, refer to Adaptec Easy CD Creator's online Help or printed documentation.

Table 11-3 Easy CD Creator File Menu Command Descriptions

Command	Description
New CD Layout	Creates a new CD layout in the main window. User can open an existing CD layout with the **Open** command. If the user is preparing a CD layout and uses the **New** command without having saved it, a dialog box will appear prompting user to do so. A CD layout includes all the settings made for this recording session, as well as all the files listed under the **Data** or **Audio CD Layout** tabs and all of their settings. When a CD layout is re-opened, everything is set up exactly as it was before.
Open CD Layout	Opens an existing CD layout. If one is already open and it hasn't been modified since it was opened, the user will be asked if the existing CD should be saved before opening a new one. If **No** is selected, all changes will be lost. A new CD layout can be created with the **New** command. In the window, type or select the desired project filename to open. This box lists only files with the extension *.cl3*; no other file types can be opened using this command.
Save	Saves the opened CD layout at its current name and location. When a CD Layout is saved for the first time, the **Save As** window appears so the user can name the file. To save an existing project under a different name or location, use **Save As**.
Save As	Saves the open CD layout under a different name or location. To save a CD Layout with its existing name, use the **Save** command.
Validate Layout	Allows user to verify that source contents have not been moved, modified, deleted, or renamed since being added to the CD layout.
Wizard	Easy CD Creator opens the Wizard, which guides the user step-by-step in the creation of a data or audio CD.
Properties	Displays property settings and options about volume descriptors, data and audio settings, as well as file types.
CD Layout Properties	Displays property settings and options about volume descriptors, data and audio settings, as well as file types.
Create CD	Writes the items listed in the CD layout to CD.
Create Disc Image	Writes the items listed in the CD layout to a file on the hard drive.
Create CD from Disc Image	Writes the items contained in a file on the hard drive to CD.
Print	Prints the items listed in the Jewel Case Layout.
Print Preview	Previews the jewel case insert for the CD before printing (Jewel Case Layout).
Print Setup	Previews the printer setup options before printing the Jewel Case Layout.
Recent CD Layout	Opens the most recently saved CD layout.
Exit	Ends the Easy CD Creator session. The **Close** command can also be used on the application Control menu. Easy CD Creator prompts the user to save CD layouts with unsaved changes.

Table 11-4 shows each **Edit** menu command and a description of its functions. For more information on the commands, refer to Adaptec Easy CD Creator's online Help or printed documentation.

Table 11-4 Easy CD Creator Edit Menu Command Descriptions

Command	Description
New Folder	Creates a new folder.
Cut	Removes the selected item and places it on the Clipboard.
Copy	Makes a copy of the selected item(s) and places it on the Clipboard.
Paste	The **Copy** command can be used in the Windows Explorer or a desktop window to select one or more items to paste to the Clipboard. Then use **Paste** in Easy CD Creator to insert the items into the Data or Audio Tracks list.
Paste Special	Works for Jewel Case Insert only. A link can be pasted to an object in another document. See Microsoft Windows 95 Online Help for information about linking information between documents.
Rename	Changes the name of a file, folder, or audio track.
Remove	Removes selected files, folders, or audio tracks from the CD layout.
Select All	Selects all of the items in the layout.

In addition to the menus shown above, the Jewel Case Layout includes the following **Edit** menu commands: **Select**, **Unremove**, **Insert**, and **Object**.

Table 11-5 shows each **View** menu command and a description of its functions. For more information on any of these commands, refer to Adaptec Easy CD Creator's online Help or printed documentation.

Table 11-5 Easy CD Creator View Menu Command Descriptions

Command	Description
Data CD Layout	Allows user to view data files to be written to CD.
Audio CD Layout	Allows user to view audio tracks to be written to CD.
Jewel Case Layout	Allows user to view jewel case artwork for CD.
Toolbar	Displays and hides the toolbar, which includes buttons for some of the most common commands in Easy CD Creator, such as **Open**. A check mark appears next to the menu item when the toolbar is displayed.
Status Bar	Displays or hides the Status bar. The Status bar displays information about the CD layout and is located on the bottom of the Easy CD Creator window.
Disc Info Bar	Displays or hides the Disc Information bar. The Disc Information bar displays the amount of space written on the current CD and the amount of free space available and is located on the bottom of the Easy CD Creator window.
Ruler	Views the ruler on the top part of the **Jewel Case Insert** window. Jewel Case Layout only.
Large Icons	Views the large icons representing the contents of the CD Layout.
Small Icons	Views the small icons representing the contents of the CD Layout.

Table 11-5 Easy CD Creator View Menu Command Descriptions (Cont'd)

Command	Description
List	Views the names of the files and folders listed in the CD Layout.
Details	Views the details of the files and folders listed in the CD Layout, including file size and the date last modified.
Arrange Icons	Sorts the icons listed in the CD layout in the order specified.
Hide/Show Windows Explorer	Hides or shows Windows Explorer directly in Easy CD Creator.
Split	Separates the Easy CD Creator layout windows to Left-Right or Up-Down orientation.
Refresh	Updates the contents of the window

Table 11-6 shows each **Disc** menu command and a description of its functions. For more information, refer to Adaptec Easy CD Creator's online Help or printed documentation.

Table 11-6 Easy CD Creator Disc Menu Command Descriptions

Command	Description
Eject	Opens or closes the CD recorder's tray/caddy.
Erase Disc	Erases the contents of a CD-RW disc. Note: Must use a CD-RW disc in a RW drive to erase the contents of a CD.
Import Session	Imports a specific session of a multisession CD to the current session being written.
Disc Information	Displays information about the CD, including the type of CD, the number of sessions, and the number of tracks on the CD. Also, this command can be used to close a session or close the disc (which write-protects the CD).

Table 11-7 shows each **Tools** menu command and a description of its functions. For more information, refer to Adaptec Easy CD Creator's online Help or printed documentation.

Table 11-7 Easy CD Creator Tools Menu Command Descriptions

Command	Description
Find	Finds a file or folder on the CD.
CD Copier	Opens CD Copier to make a backup copy of a CD.
System Tests	Opens the **Easy CD Creator Systems Tests** window. Allows user to choose the type of test to run on the system.
CD-Recorder Properties	Displays information about the CD recorder connected to the computer.
Options	Selects the desired view and temporary file options to use.

Table 11-8 shows each **Help** menu command and a description of its functions. For more information, refer to Adaptec Easy CD Creator's online Help or printed documentation.

Table 11-8 Easy CD Creator Help Menu Command Descriptions

Command	Description
Help Topics	Opens the Easy CD Creator online Help.
About Easy CD Creator	Opens the **About** window box for the Easy CD Creator which, displays the application's version number and copyright notice.

In addition to the menus listed above, the Jewel Case Layout provides the following menus: **Layout**, **Text**, **Arrange**, and **Page**.

11.2.2.1.3 Toolbar

The icons on the Easy CD Creator toolbar provide much of the same functionality as the menu but are easier to access. Table 11-9 lists the function of each toolbar icon. For more information, refer to Adaptec Easy CD Creator's online Help or printed documentation.

Table 11-9 Easy CD Creator Toolbar Functions

Button	Command	Function
	New	Starts a new CD layout without the Wizard.
	Open	Opens an existing CD layout. Easy CD Creator displays the **Open** window in which user can locate and open the desired file.
	Save	Saves current CD layout with its current name. If user has not named the CD layout, Easy CD Creator displays the **Save As** window.
	Wizard	Opens the Wizard, which guides the user step by step in the creation of a data or audio CD.
	Create CD	Records the CD layout to a CD.
	Hide/Show Windows Explorer	Hides or shows Windows Explorer directly in Easy CD Creator.
	Up One Level	Moves up one directory level.
	Find Files	Finds files or folders on the CD.
	Remove	Removes selected items from the list.
	Properties	Displays the properties of a selected item.

Table 11-9 Easy CD Creator Toolbar Functions (Cont'd)

Button	Command	Function
	Large Icons	Displays large icons representing the contents of the CD Layout
	Small Icons	Displays small icons representing the contents of the CD Layout.
	List	Displays the names of the files and folders listed in the CD Layout.
	Details	Displays the details of the files and folders listed in the CD Layout, including file size and the date last modified.
	Help Topics	Opens the online Easy CD Creator online Help topics.
	Screen/Menu Help	Activates context-sensitive help. User clicks this button, then on the item in question.

In addition to those listed above, the Jewel Case Layout provides the following toolbar functions: **Print**, **Cut**, **Copy**, **Paste**, **Front Cover**, **Back Cover**, **Disc Printer**, **Align**, **To Front**, **To Back**, **Left**, **Center**, **Right**, **One-column**, **Two-column**, **Zoom**, and **Grid**.

11.2.2.2 Creating a Data CD

To make a data CD, there are three overall procedures:

1. Add files and folders to a CD Layout
2. Define the Disc Properties that specify how the CD will be read (optional)
3. Write the CD layout to a blank CD (create the CD)

The following sections cover the steps to creating a data CD listed above.

11.2.2.2.1 CD Layout

The CD Layout is central to the CD creation process. A CD Layout is a file that contains the list of files and the order in which they will be recorded. In many cases a user needs to write the same files to multiple CDs, or update archival records of files over time. To accomplish this, a CD Layout must be used. As Figure 11-59 illustrates, a CD Layout is a list of instructions on how to find data, and the specific format in which to write it. It is important to note that this list of instructions is only valid if the data is still located where the CD Layout says it is. This CD Layout may be saved and used at a later time.

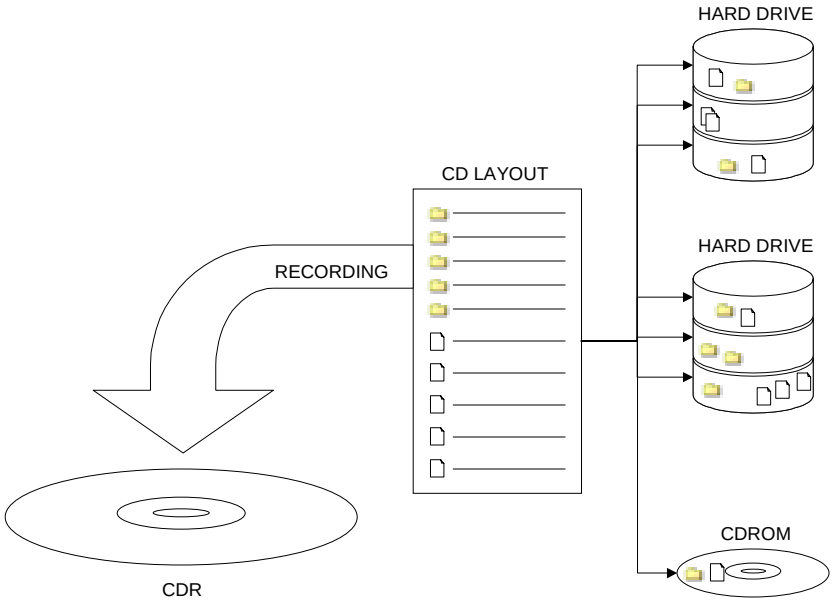


Figure 11-59 CD Layout Diagram

To add files and folders to a CD layout, use the following steps.

1. Select ***New CD Layout*** from the **File** menu or open an existing layout.

2. Click the **Data CD Layout** tab. The top part of the window shows a Windows Explorer panel, where the user can select the desired files and folders needed to write to the CD. The bottom part shows the Data CD Layout panel, which allows the user to view the contents of the CD layout.

3. Select the files and folders to add to the CD from the Windows Explorer panel and drag them into the Data CD Layout panel.

To make changes to the list of files and folders in the **Data CD Layout** tab, refer to the Adaptec Easy CD Creator online Help.

NOTE

If the Data CD Layout panel includes identically-named folders from two different sources (such as from two different hard drives), the two folders are merged on the CD. If there are identically-named files in the two different folders, the files that are added last to the Data CD Layout panel are recorded to the CD.

11.2.2.2.2 Define CD Layout Properties

Easy CD Creator allows the user to specify the disc properties for the CD—meaning the user can customize the CD depending on how it is going to be used. Selecting ***File/CD Layout Properties*** from the menu bar accesses the **CD Layout Properties** window (Figure 11-60). The window contains four tabs. Each tab is discussed below with the exception of the **Audio Settings** tab, because the DTSS software will not be using Audio CD outputs.

11.2.2.2.2.1 General Tab

The **General** tab displays the volume label, or name, and general information as well as the number and size of data files in the layout.

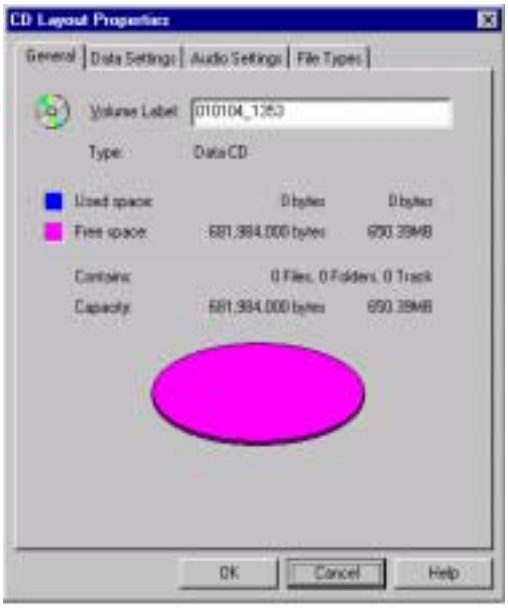


Figure 11-60 General Tab From CD Layout Properties Window

11.2.2.2.2.2 Data Settings Tab

The **Data Settings** tab (Figure 11-61) specifies the file system used, the ordering of files, and whether to automatically import previous sessions. The file system type dictates how file names are stored on the CD. Joliet and ISO9660 are the two choices available for data CDs. ISO9660 is an older standard and limits file names to eight characters for the name, and three characters for the file extension. Joliet file systems may use longer (30 character) filenames and are preferred.



Figure 11-61 Data Settings Tab in CD Layout Properties Window

For more information on the selected file system, click the **Properties** button to access the **File System Properties** window. The window will contain different information depending on the file system chosen (Figure 11-62). Clicking the **Save As Default** button saves the settings in this tab. Update any of the fields and click ***OK*** to return to the **Data Settings** tab.

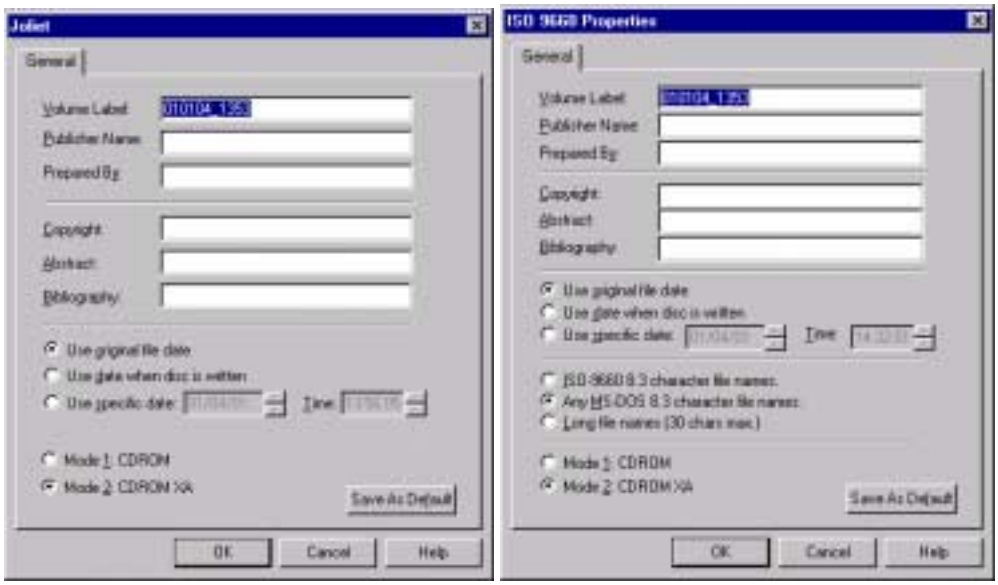


Figure 11-62 Examples of the File System Properties Windows

For more information on any of the items in this window, click the **Help** button to access the online Help, or refer to Adaptec Easy CD Creator's printed documentation.

11.2.2.2.2.3 File Types Tab

The **File Types** tab (Figure 11-63) allows the user to specify what files to add to the CD. Clicking the **Save As Default** button saves the settings in this tab.



Figure 11-63 File Types Tab From CD Layout Properties Window

Once all of the desired property selections have been made, click ***OK***. The CD Layout Properties are now set for the CD.

11.2.2.2.3 Creating the CD

Use the following steps to create a new CD.

1. Insert a blank CD and select ***File/Create CD*** from the **Adaptec Easy CD Creator** menu bar, the **Adaptec Easy CD Creator Wizard Welcome** window will appear (Figure 11-64). This wizard will guide the user in the creation of a CD.



Figure 11-64 Adaptec Easy CD Creator Wizard—Welcome Window

2. To create a data CD click the radio button next to the "Data CD" option, and click the ***Next*** button. The next wizard window appears, allowing the user to navigate to and select the data for the new CD-ROM. The window is divided into the functional areas shown in Figure 11-65. The following bullet points describe each functional area.

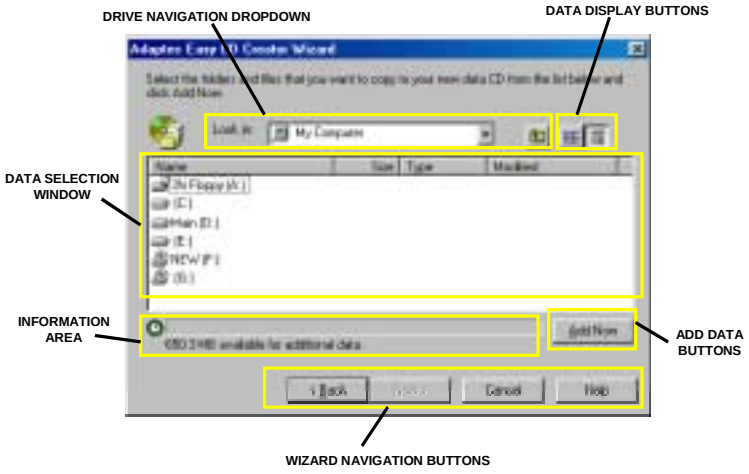


Figure 11-65 Adaptec Easy CD Creator Wizard—Data Selection Window

- **Drive Navigation Dropdown**—begins the search at different hard drives for the desired data. By using My Computer as the start point for the search, multiple drives will be displayed in the "Data Selection" portion of the window.

- **Data Selection Window**—displays folders and files for addition to a CD-ROM.

- **Data Display Buttons**—displays the data in icon form or in a detailed list that shows file size, date, and other important information.

- **Add Data Button**—allows user to add selected data from the Data Selection window.

- **Information Area**—displays size of the CD and space remaining as data is added to the layout.

- **Wizard Navigation Buttons**—allows user to move backward and forward through the wizard windows.

3. Select the desired datasets and click the **Add Now** button.

4. Once all data has been added, click the ***Next*** button to continue. The next wizard window, the **Adaptec Easy CD Creator Wizard—Test Before Writing** window will appear (Figure 11-66). This window allows the user to choose whether or not to perform a test of the CD writing process. This test will evaluate the system's ability to write a CD-ROM by executing all functions with the exception of actually writing to the CD Media. The test will take as long as a complete recording to the CD-ROM. At the end of the test the user will be prompted to reinsert the CD-ROM and continue, or be informed that the test has failed.



Figure 11-66 Adaptec Easy CD Creator Wizard—Test Before Writing Window

NOTE

Data is written to the CD-ROM as a continuous stream of information processed at a constant rate. To accomplish this, the program caches the data before it is streamed to the CD media. The cache acts as a broker that ensures the data stream is maintained in the event of system degradation due to SCSI bottlenecking or processing

overloads. If the cache fails to maintain a constant stream of data, the CD-ROM will contain partial and/or invalid data. Performing a test will determine if the computer system is fast enough to keep up with the writing process.

5. Click ***Next*** to proceed to the **Adaptec Easy CD Creator Wizard—Ready to Create CD** window (Figure 11-67). This window presents the user with a choice to create the CD now or later.



Figure 11-67 Adaptec Easy CD Creator Wizard—Ready to Create CD Window

6. Select the radio button next to "Create CD now" and click ***Finish***. Easy CD Creator begins writing the files and folders listed in the CD layout to a blank CD. When the CD is finished, a final message box notifies the user that the recording is complete.

7. When complete, the CD will contain the selected data and is available for output.

For more information on any procedures or commands in the Easy CD Creator, refer to the program's online Help or printed user documentation.

11.2.3 DVD-RAM

The DVD-RAM is a tool for storing information on a disk. The DVD-RAM drive, located under drive J:/ on the DTSS, comes with software called Write DVD!, which is a recording tool capable of reading and writing DVD-RAM disks in UDF (Universal Disk Format). To access the Write DVD! software, point to ***Program/Write DVD!*** from the **Start** menu in Windows NT. Then choose the **Format UDF!** or **SAI File System Switch Utility** option, as appropriate. The Write DVD! program includes a special format

software, Format UDF!, to allow users to produce UDF- or FAT- formatted disks. Write DVD! also includes a special utility, "SAI File System Switch Utility," to allow users to enable/disable the filesystem dynamically. Refer to the online Help file within the program for more information.

11.2.4 Tape Archive

Windows NT Backup is a tool for protecting data from accidental loss or hardware and media failures. Backup makes it easy to use an 8mm tape drive to back up and restore important files on either the Windows NT file system (NTFS) or file allocation table (FAT) file system. The tape drive is located under drive I:/ on the DTSS.

11.2.4.1 Backup Main Window

The **Backup** main window is the central point from which all functions and setting changes are launched. To open Backup, click the **Start** menu from the desktop and select ***Programs/Administrative Tools (Common)/Backup***. The **Backup** window will appear as shown in Figure 11-68.

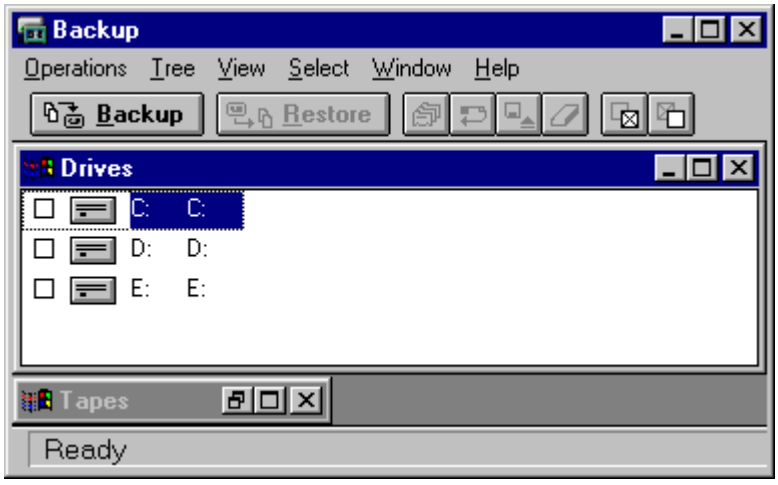


Figure 11-68 Backup Window

11.2.4.1.1 Menu

The Backup main menu bar provides access to most of the program's functionality through textual menu choices. The main menu bar arranges commands into related lists of tasks. Tables 11-10 through 11-14 describe each menu and its corresponding list of commands.

Table 11-10 shows each **Operations** menu command and a description of its functions. For more information, refer to Backup's online Help or printed documentation.

Table 11-10 Operations Menu Command Functions

Command	Description
Backup	Backs up information to tape after selecting one or more drives, directories, or files to be backed up.
Restore	Provides access to tapes, backup sets, and files for restoring as they are needed.
Catalog	Adds catalog information for a tape to the disk.
Erase Tape	Removes data and sensitive information from a tape. NOTE: Does not declassify media. Refer to the Security Manual for information on declassifying media.
Retension Tape	Enables user to run the tape its entire length and rewind at a fast speed, to tension the tape evenly. This operation is not necessary on 4 mm and 8 mm tape drives, so the option is unavailable when using them.
Eject Tape	Rewinds the tape and then ejects the tape from the tape drive.
Format Tape	Formats an unformatted mini-cartridge tape. This type of tape is treated like a floppy disk and must be formatted before it can be used. If the user does not have a mini-cartridge drive installed and activated, this command is unavailable.
Hardware Setup	Checks automatically for the proper hardware when Windows NT is started, and initializes it each time backup is started.
Exit	Quits Backup.

Table 11-11 shows each **Tree** menu command and a description of its functions. For more information, refer to Backup's online Help or printed documentation.

Table 11-11 Tree Menu Command Functions

Command	Description
Expand One Level	Expands one level of a collapsed directory in the directory tree and displays the directory one level below the currently selected directory.
Expand Branch	Expands a collapsed directory and all of its subdirectories in the directory tree, and displays the entire directory tree below the currently selected directory.
Expand All	Expands all the branches in the directory tree and displays the entire directory tree of the drive displayed in the active window.
Collapse Branch	Collapses directory levels below the directory selected in the directory tree.

Table 11-12 shows each **View** menu command and a description of its functions. For more information, refer to Backup's online Help or printed documentation.

Table 11-12 View Menu Command Functions

Command	Description
Tree and Directory	Changes the selected window to display the directory tree in the left panel and the file list in the right panel.

Table 11-12 View Menu Command Functions (Cont'd)

Command	Description
Tree Only	Displays only the directory tree in the selected window.
Directory Only	Displays only the contents of the current directory in the selected window.
Split	Splits a directory window. If the window is already split, this command moves the split bar to the left or right. Use the mouse or the arrow keys to move the bar, and then press ***[Enter]***. Press ***[Esc]*** to cancel the command.
All File Details	Displays all available information about files and directories in the selected window. This information includes the filename, size, last modification date and time, and file attributes for each file. This command does not affect the directory tree.
Status Bar	Displays or hides the status bar at the bottom of the Backup window. The status bar shows the status of current program activity and also provides basic information on each selected command. A check mark next to Status Bar means that it is displayed.
Toolbar	Displays or hides the toolbar in the Backup window. A check mark next to Toolbar means that it is displayed.
Font	Enables user to change the font selection. These settings affect all windows.

Table 11-13 shows each **Select** menu command and a description of its functions. For more information, refer to Backup's online Help or printed documentation.

Table 11-13 Select Menu Command Functions

Command	Description
Check	Places a check mark in the check box of highlighted selections.
Uncheck	Removes a check mark from the check box of highlighted selections.

Table 11-14 shows each **Window** menu command and a description of its functions. For more information, refer to Backup's online Help or printed documentation.

Table 11-14 Window Menu Command Functions

Command	Description
Cascade	Arranges windows so that they overlap. The title bar of each window remains visible, making it easy to select any window.
Tile	Arranges the windows side by side, so that each window is visible and none overlap.
Arrange Icons	Arranges all of the minimized windows into rows at the bottom of the display.
Refresh	Updates the contents of the active window.
Close All	Closes all but the application window. The Drives and Tapes windows will be minimized.

Table 11-15 shows each Help menu command and a description of its functions. For more information, refer to Backup's online Help or printed user documentation.

Table 11-15 Help Menu Command Functions

Command	Description
Contents	Displays Help Index window.
Search for Help on…	Allows user to search for information on a specific subject.
How to Use Help	Displays instructions on using Help system.
About Backup	Displays version and license information about the Backup utility.

11.2.4.1.2 Toolbar

The icons of the toolbar provide much of the same functionality as the menu, but provide quicker access. Table 11-15 lists the function of each toolbar icon. For more information, refer to Backup's online Help or printed documentation.

Table 11-15 Toolbar Functions

Button	Command	Function
	Backup	Backs up information to tape after selecting one or more drives or files to be backed up.
	Restore	Provides access to tapes, backup sets, and files for restoring as they are needed.
	Catalog	Adds catalog information for a tape to the disk.
	Retension Tape	Enables user to run the tape its entire length and rewind at a fast speed, to tension the tape evenly. This operation is not necessary on 4 mm and 8 mm tape drives, so the option is unavailable when using them.
	Eject Tape	Rewinds the tape and then ejects the tape from the tape drive.
	Erase Tape	Removes data and sensitive information from a tape.
	Check	Places a check mark in the check box of highlighted selections.
	Uncheck	Removes a check mark from the check box of highlighted selections.

11.2.4.1.3 Backup Disk Files To Tape

All the files on a drive shown in the **Drives** window can be backed up. However, the program will not back up those files (including hidden files) and directories that the user does not own or to which access has been restricted, even when such a drive is selected. Hidden files are displayed with an exclamation point in the file icon. All file attributes are preserved, including permissions.

11.2.4.1.3.1 Backing Up All Files

To back up all the files on a disk, follow the steps below.

1. In the **Drives** window, select the desired drive to back up.
2. From the **Select** menu, click ***Check***.
3. On the **Operations** menu, click ***Backup***.

11.2.4.1.3.2 Backing Up Individual Files

To back up individual files on a disk, follow the steps below.

1. In the **Drives** window, double click the drive in which the files are located.
2. Select all the desired individual files to back up.
3. On the **Select** menu, click ***Check*** to specify the selected files for backing up. A check mark appears in the check box beside each selected file.
4. On **Operations** menu, click ***Backup***.

11.2.4.1.3.3 Setting Tape Options

To set the tape options, follow the steps below.

1. Click ***Operations/Backup*** to open the **Backup Information** window. The upper section provides information on the tape that is loaded.
2. In the “Tape Name” field, type a name of fewer than 32 characters for the new tape.
3. In the “Operation” field, click ***Append*** to place the new backup set after the last backup set. Or, click ***Replace*** to overwrite all the information on the tape.
4. Click the desired settings, as follows:

a. To confirm that the tape was backed up accurately, select the "Verify After Backup" check box.

b. To add a copy of the registry to the backup set, select the "Backup Local Registry" check box.

5. To limit access to the files on the tape, select the "Restrict Access To Owner Or Administrator" check box.

6. To have the tape drive compress the data onto the tape media, select the "Hardware Compression" check box.

For more information on the various options, click ***Help*** or press ***[F1]*** while using the window.

11.2.4.1.3.4 Setting Backup Set Options

To set the backup set options, follow the steps below.

1. Click ***Operations/Backup*** to open the **Backup Information** window. The second section shows how many backup sets have been selected, each set being a collection of related files on one drive that is backed up during a single backup operation.

2. In the "Backup Set Information" field, type a description for the backup set.

3. In the "Backup Type" field, enter the desired type of backup operation.

For more information on the various options, click ***Help*** or press ***[F1]*** while using the window.

11.2.4.1.3.5 Setting Log Options

To set the log options, follow the steps below.

1. Click ***Operations/Backup*** to open the **Backup Information** window.

2. Click ***Full Detail*** to log all operations information, click ***Summary Only*** to set logging for only major operations, or click ***Don't Log*** to not log any operations information.

3. In the "Log File" field, enter the name of the text file to use for logging completed tape operations.

4. Click ***OK*** to display the **Backup Status** window and start the backup process.

For more information on the various options, click ***Help*** or press ***[F1]*** while using the window.

11.2.4.1.3.6 Checking Backup Status

To check the backup status, click ***Backup*** on the **Operations** menu to open the **Backup Information** window. Click ***OK***. The **Backup Status** window appears, and backup begins. If a backup job needs to be stopped before it is completed, click ***Abort***. A **Backup Abort** message appears, asking whether to continue the backup of the current file or to stop now and show it as a corrupted file.

The **Backup Status** window displays the following information:

- An active status area.
- The names of the drive, directory, and files that are being backed up.
- A summary area, showing a log of major operations, including whether or not the operation completed successfully.

If a large backup operation reaches the end of a tape before finishing, the **Insert New Tape** window appears and prompts the user to insert a new tape. A collection of related tapes containing several backup sets is called a "family set."

11.2.4.1.4 Restoring Tape Files to Disk

The **Tapes** window is not normally open when the Backup program is started. After opening the **Tapes** window, the user can choose to restore either the current tape, one or more backup sets, or individual files. All catalog information is maintained on the corresponding tape for that backup set. Family sets have the information on the last tape.

To open the **Tapes** window, click ***Tapes*** on the **Windows** menu. The tape name appears in the left panel of the **Tapes** window to the right of each tape icon. The following information is shown in the right panel:

- Drive backed up.
- Backup set number.
- Tape number, and what number it is in a set of tapes.
- Backup type.
- Date and time of backup.

- Backup description.

The following sections provide instructions for restoring tape files.

11.2.4.1.4.1 Loading Catalogs

To load catalogs for tapes and backup sets, follow the steps below.

1. In the **Tapes** window, select the desired tape or backup set for which a catalog is to be loaded.
2. On the **Operations** menu, click ***Catalog*** to load the catalog of backup sets for a tape. The **Catalog Status** window appears and searches until a complete list of backup sets on the tape appears in the **Tapes** window.
3. To load a backup-set catalog of directories and files, double-click the icon for that backup set.

The **Catalog Status** window appears; when the list in the **Tapes** window appears, a plus sign in the backup-set icon indicates that it has been cataloged. Corrupt files, and their corresponding directories, are marked by an icon with a red "X."

When inserting a tape to be restored, only information on the first backup set is displayed in the right panel. To restore the entire tape, load the tape catalog to display a list of any other backup sets. To know what files are in each backup set, load the individual catalogs for each backup set.

11.2.4.1.4.2 Restoring Tapes Or Backup Sets

To restore a tape or individual backup sets, follow the steps below.

1. On the **Operations** menu, click ***Catalog*** to load the tape catalog of backup sets.
2. In the **Tapes** window, select the desired files, sets, or tape to restore.
3. On the **Select** menu, click ***Check***.
4. Select the desired backup sets in the right panel of the **Tapes** window.
5. On the **Select** menu, click ***Check*** to select the check boxes for the selected backup sets.
6. On the **Operations** menu, click ***Restore***.

11.2.4.1.4.3 Restoring Individual Files

To restore individual files in a backup set on a tape, follow the steps below.

1. In the **Tapes** window, load the catalog of the backup set from which to restore certain files.
2. Select all the files to restore.
3. On the **Select** menu, click ***Check***. A check mark appears in the check box for each selected file.
4. On the **Operations** menu, click ***Restore***.

11.2.4.1.4.4 Setting Restore Options

To set the restore options, follow the steps below.

1. Select the tapes, backup sets, or files, and then click ***Restore*** on the **Operations** menu. The **Restore Information** window will appear.
2. In the **Restore Information** window, specify the drive to which the selections are to be restored.
3. To place backup-set files into a directory other than the original one on the default drive, enter the path in the “Alternate Path” field.
4. Click the desired settings as follows:
    a. To restore the registry files, select the “Restore Local Registry” check box.
    b. To restore the permissions information along with the file, select the “Restore File Permissions” check box. If the “Restore File Permissions” check box is not selected, the restored files inherit the permissions of the directory into which they are restored.
    c. To verify the contents of the restored files against the files on tape and to log any exceptions, select the “Verify After Restore” check box.

For more information on the various options, click ***Help*** or press ***[F1]*** while using the window.

11.2.4.1.4.5 Setting Log Options

To set the log options, follow the steps below.

1. In the "Restore Information" window, click ***Full Detail*** to set Backup to log all operations information, click ***Summary Only*** to set logging for only major operations, or click ***Don't Log*** to not log any operations information.

2. In the "Log File" field, enter the name of the text file to use for logging completed tape operations.

3. Click ***OK*** to open the **Restore Status** window and start the restore operation.

For more information on the various options, click ***Help*** or press ***[F1]*** while using the window.

11.2.4.1.4.6 Checking Restore Status

To check the restore status, click ***Restore*** on the **Operations** menu to open the **Restore Information** window. Click ***OK***, the **Restore Status** window appears, and the restore operation begins. If a restore operation needs to be stopped before it is completed, click ***Abort***. A **Restore Abort** message appears, asking whether to continue the restoration of the current file or to stop now and show it as a corrupted file.

If the restore operation reaches the end of a tape before finishing, the **Insert New Tape** window will prompt the user to insert a new tape.

11.2.4.1.5 Maintain Tapes

The Backup software provides erase, retensioning, and formatting functions for the user to maintain tapes.

11.2.4.1.5.1 Erasing Tapes

To erase a tape, follow the steps below.

1. On the **Operations** menu, click ***Erase Tape***.

2. In the **Erase Tape** window, click ***Quick Erase*** to simply rewrite the tape header, or click ***Secure Erase*** to overwrite the entire tape.

NOTE

Erase Tape always erases the whole tape. Secure Erase can take several hours, depending on the drive technology and tape length. The user should categorize the information on the backup tapes by the method of erasing to be used, and then create and maintain a list for easy reference.

3. Click ***Continue*** when a message appears, warning that all information on the designated tape will be destroyed.

11.2.4.1.5.2 Retensioning Tapes

The **Retension Tape** command on the **Operations** menu tightens loose spots on the tape by fast forwarding to the end of the tape and then rewinding. This procedure winds the tape evenly, so it will run more smoothly past the tape drive heads.

To reduce tape slippage, manufacturers of tape backup drives recommend that the user retension .211-inch tape once every 20 uses. Since 4mm and 8mm tapes do not require retensioning, the **Retension Tape** command is unavailable for such tapes. The device and drive technology determines how much time is spent forwarding and rewinding the media. See the manufacturer's documentation for specific retensioning requirements.

11.2.4.1.5.3 Formatting Tapes

The **Format Tape** command on the **Operations** menu formats an unformatted mini-cartridge tape. This type of tape is treated like a floppy disk and must be formatted before it can be used. If a mini-cartridge drive is not installed and activated, the **Format Tape** command is unavailable.

11.2.5 Jaz Drive

The Iomega Jaz Drive, located under drive H:\ on the DTSS, provides backup and storage directly to disk. The DTSS contains software called IomegaWare, which allows access to Jaz Drive tools, Iomega applications, Web links, and online Help.

To access IomegaWare, double click the **IomegaWare** icon () on the desktop. If the shortcut is not on the desktop, click the **Start** menu, and select ***Programs/Iomega/ IomegaWare***. The **IomegaWare** window will appear (Figure 11-69).

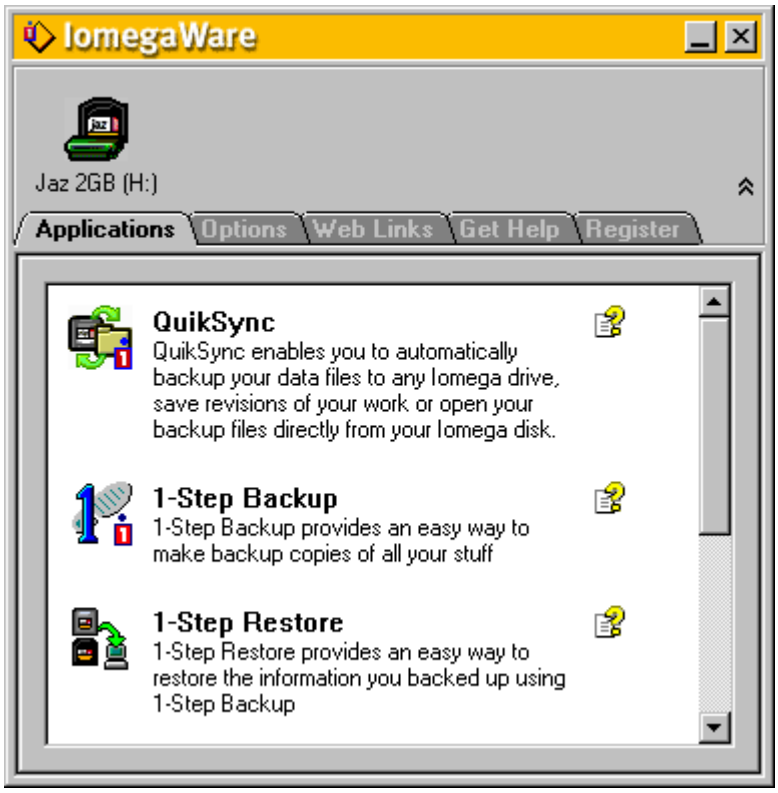


Figure 11-69 IomegaWare Window

To access the **Properties** window (Figure 11-70), click the Jaz Drive icon located in the top left portion of the window, and choose ***Properties*** from the context menu that appears.

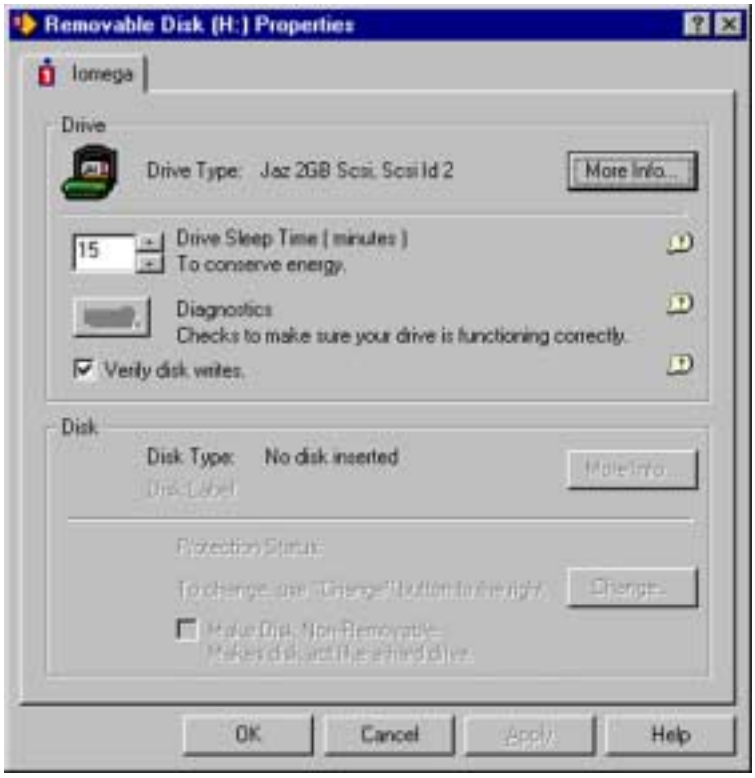


Figure 11-70 Removable Disk (H:) Properties Window

For more information on the Iomega Jaz Drive or the IomegaWare software, click the **Help** button in the **Properties** window, or select the **Get Help** tab in the **IomegaWare** window.

11.2.6 LS-120 Floppy Drive

The LS-120 floppy drive, located under drive A:\ on the DTSS, provides backup and storage of files directly to a 3.5" LS-120 Superdisk floppy disk, which holds up to 120 MB of data. Use Windows NT Explorer functionality to copy and save files to the LS-120 floppy drive.

11.2.7 Printing

It is often necessary to output hardcopy material from digital softcopy data to facilitate data dissemination. The DTSS provides the HP Design Jet 1055CM for this purpose. Files can be printed directly from both ArcMap and ERDAS Imagine.

NOTE

It is recommended to preview the map before printing it, to make sure that the map page and printer page sizes are correctly matched.

11.2.7.1 Printing in ArcMap

Follow the steps below to preview and print a map from ArcMap.

NOTE

Before printing, make sure that the Zoom is set to the full extent of the displayed data, to ensure correct scaling of the printed result.

1. With the map document already open, select ***File/Print Preview,*** from the ArcMap main menu. The print preview window opens, titled with the filename of the map document (Figure 11-71).

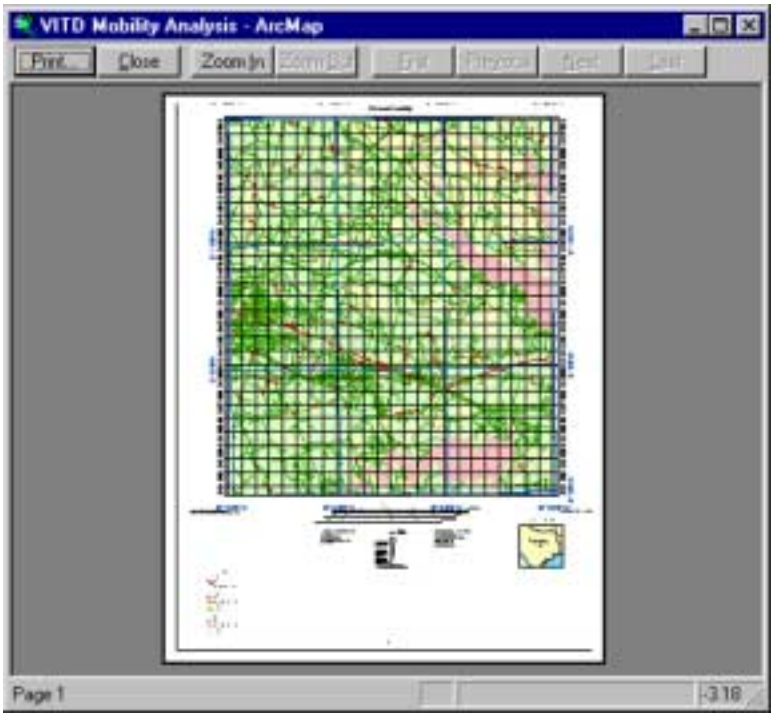


Figure 11-71 Map Document Print Preview in ArcMap

2. Examine the preview. If it looks correct, click ***Print***. The **Print** window will open (Figure 11-72).

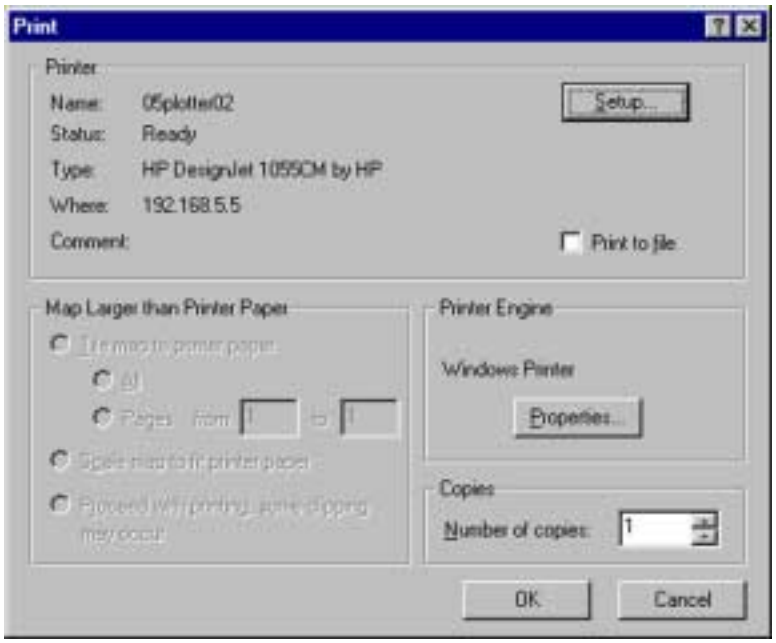


Figure 11-72 Print Window in ArcMap

3. Here, make sure print settings are correct. Click the ***Setup*** button to change the output printer. The **Page Setup** window opens (Figure 11-73).

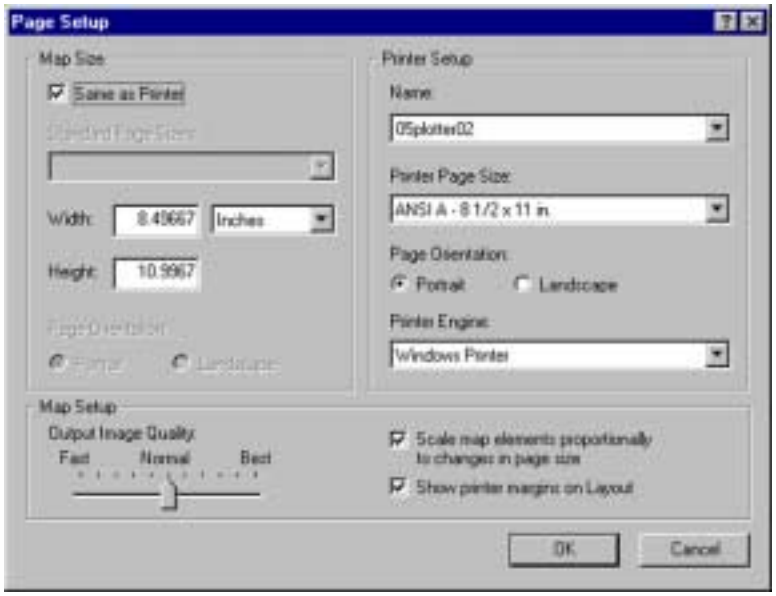


Figure 11-73 Page Setup Window in ArcMap

NOTE

If the map is smaller than the printer page size, go ahead and print, or choose a smaller page size on the printer. If the map is larger than the printer's default page size, the

user can change the page size of the printer, use a different printer, or change the page size of the map.

4. In the **Page Setup** window, set map size, output quality, scale, and other print settings as desired. Verify that the correct printer plotter is chosen (HP Design Jet 1055CM) and assigned with the appropriate name (e.g., **05plotter02**), and click ***OK***. The **Page Setup** window closes and returns to the **Print** window.

5. Click the **Properties** button from the **Print** window. The **Printer Properties** window will appear (Figure 11-74), showing several tabs, with Paper Size as the default.



Figure 11-74 Page Setup Tab in Printer Properties Window

6. Make any needed changes to the paper size. If using the DTSS **Map Production** tool to generate and print a map, set the paper size to 26 x 34 inches. (The map size generated from the **Map Production** tool is 25 x 33 inches. Setting the paper size one inch bigger than the map size provides a margin and avoids clipping of the map.) To set the paper size, click the **More sizes…** button next to the "Application page size" dropdown menu. The **Paper Sizes** window will appear (Figure 11-75).

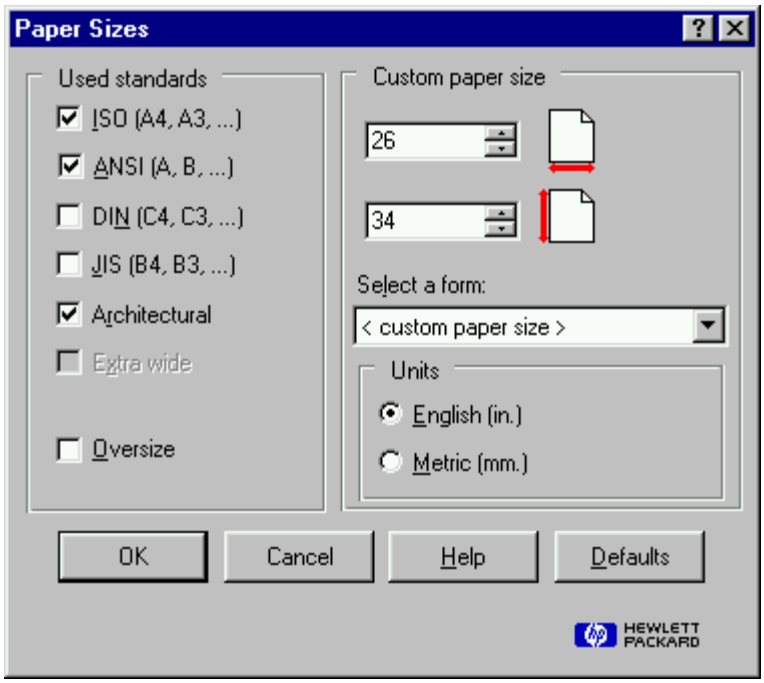


Figure 11-75 Paper Sizes Window With Custom Size for Map Production Tool

7. In the "Custom paper size" fields, enter ***26*** for the width and ***34*** for the height. Click ***OK***. The **Paper Sizes** window closes and returns to the **Printer Properties** window.

8. Click the **Advanced** tab on the **Printer Properties** window (Figure 11-76).

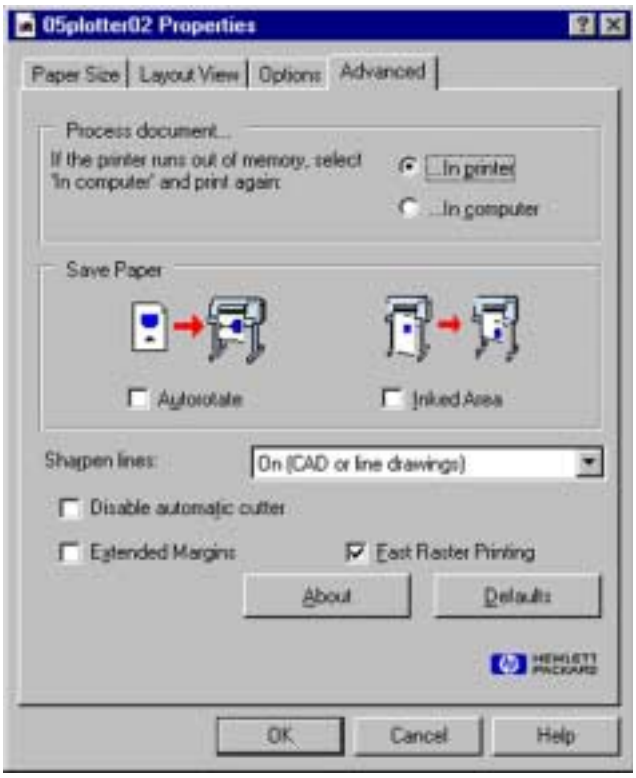


Figure 11-76 Advanced Tab in Printer Properties Window

9. In the "Save Paper" area, click the checkbox next to "Autorotate," so that the print comes off the plotter sideways. This saves paper and avoids having to trim empty space.

10. Click ***OK***. The **Printer Properties** window closes, returning to the **Print** window.

11. Click ***OK*** to print the map.

For more information on printing maps from ArcMap, refer to the program's online Help or printed user documentation. For more information on printer/plotter hardware, refer to the operator's manual TM 11-6675-294-10.

11.2.7.2 Printing in ERDAS Imagine

Follow the steps below to preview and print a file from ERDAS Imagine:

1. With ERDAS Imagine open and an image open in the **Viewer** window, select ***File/Print*** from the **Viewer** window's main menu (or use the ***[Ctrl+P]*** keyboard shortcut). The **Print** window opens (Figure 11-77).

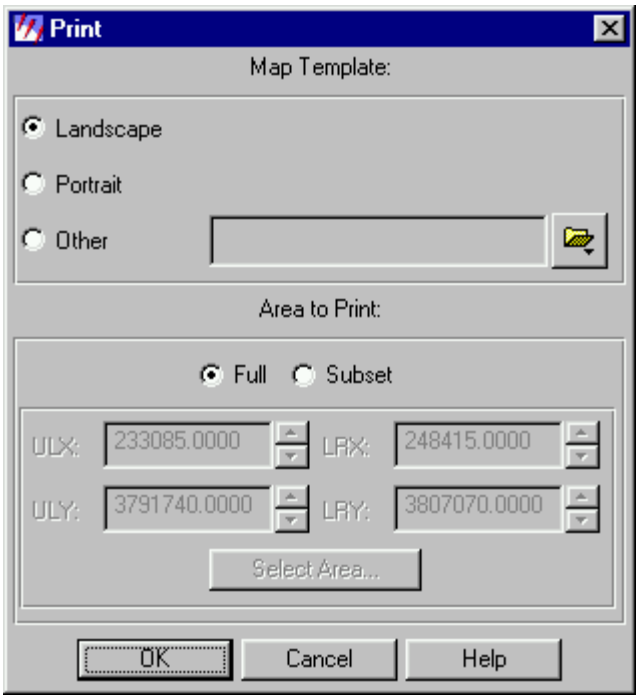


Figure 11-77 Print Window in ERDAS Imagine

2. In the **Print** window, select the options desired for printing, including a preset map template and print area. For more information on these settings, click the **Help** button in the lower right corner of this window to access Imagine's online Help.

3. When finished selecting printing options, click ***OK*** to open the **Print Map Composition** window shown in Figure 11-78.

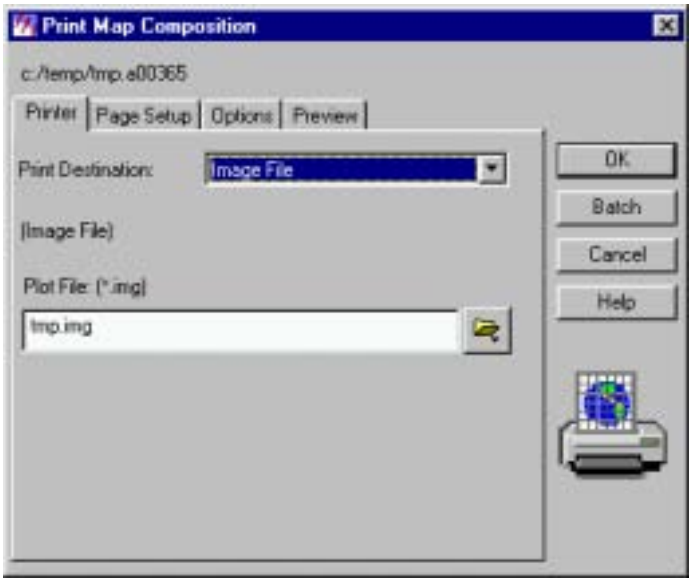


Figure 11-78 Print Map Composition Window in ERDAS Imagine

4. Notice that the default printer setting on the **Printer** tab is "Image File." Change this setting, if desired, by clicking the dropdown arrow and selecting the appropriate printer (HP Design Jet 1055CM). Once the printer or plotter is selected, click the **Change Printer Configuration** button to access and modify detailed information on the selected printer.

5. To preview the map before printing, click the **Preview** tab in this window to see a thumbnail (Figure 11-79).

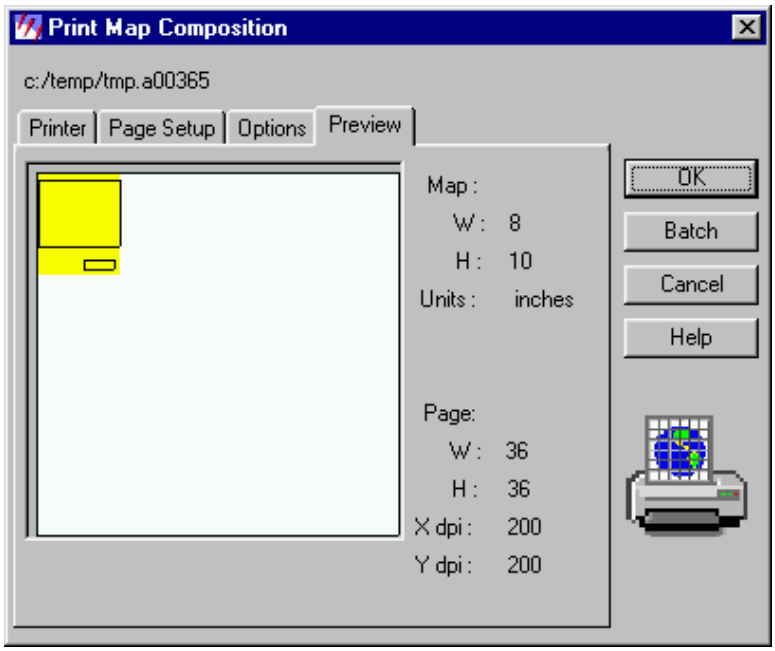


Figure 11-79 Print Map Composition Window Showing Preview Tab

6. When finished setting options, click ***OK***. The **MapMaker Rendering** window shown in Figure 11-80 appears, indicating progress of the print job.

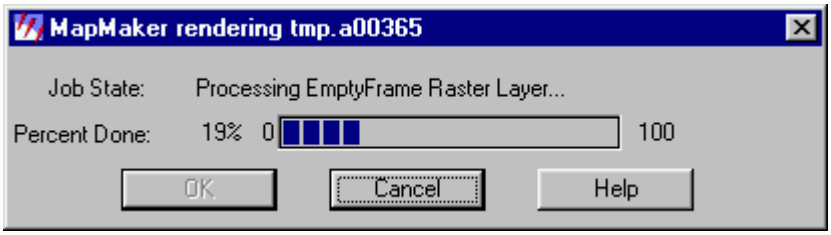


Figure 11-80 MapMaker Rendering Window in ERDAS Imagine

7. Click ***OK*** when this window indicates that printing has completed.

For more information on printing files from ERDAS Imagine, refer to Imagine's online Help or printed user documentation.

11.3 Common Message Processor (CMP)

The Common Message Processor (CMP) is used to read, create, and edit United States Message Text Format (USMTF) messages. It is a GOTS client/server package with the capability of processing many additional types of messages.

To access the Common Message Processor, click the **Start** menu and select ***Programs/Coe_mp/COE_MP_UI***. Refer to the online Help or printed user documentation for information on how to use the CMP.

THIS PAGE INTENTIONALLY LEFT BLANK

Chapter 12

HELP

12	**HELP**	12-2
12.1	COTS Online Help	12-2
12.1.1	ArcInfo Online Help	12-2
12.1.1.1	Contents Tab	12-2
12.1.1.2	Index Tab	12-3
12.1.1.3	Find Tab	12-5
12.1.2	Imagine Online Help Functionality	12-6
12.2	CTIS Online Help	12-7

12 HELP

There is a variety of resources available for using the DTSS software and the related COTS and GOTS programs. The following sections give instructions for accessing the available help functions.

12.1 COTS Online Help

Each major COTS software package has its own Help files that are accessed by using the **Help** menu within the specific software. The following sections give a brief overview of ArcInfo and Imagine Help functionalities and structures. For more information on either system's Help capability, refer to that system's documentation.

12.1.1 ArcInfo Online Help

ESRI's ArcInfo package offers extensive online Help documentation for the ArcMap, ArcCatalog, and ArcToolbox user. Aside from Portable Document Format (PDF) versions of printed documentation, which are available with distributed copies of the software, ArcInfo offers online capabilities (Table 12-1) to help the user more fully understand the functionalities of ArcMap, ArcCatalog, and ArcToolbox.

Table 12-1 ArcInfo Help Functions

Help Function	Description
Help menu	Accessed through the ArcMap, ArcCatalog or ArcToolbox toolbars. Allows user to open the **Help** window and search for a topic or keyword.
[F1] key	Accessed when an ArcMap or ArcCatalog informational window is opened. Allows user to hold the mouse pointer over any field or button and press the ***[F1]*** key to open a pop-up text box describing the use of the item.
What's This? () button	Accessed on the ArcMap or ArcCatalog toolbar. Allows user to get information about toolbar and menu items.
Status Bar Help	Accessed by moving the mouse over items in the ArcMap window. Allows user to access brief information on toolbar and menu items.

The online Help is organized around basic tasks. These tasks are divided into three areas, or tabs, in ArcInfo's Help interface: **Contents**, **Index**, and **Find**, outlined in the sections that follow. The following describes ArcMap Help, but ArcCatalog and ArcToolbox have the same basic functions.

12.1.1.1 Contents Tab

To access ArcMap's online Help window, select ***Help/ArcMap Help*** from the ArcMap menu bar. The **Help Topics: ArcMap** window will appear showing the **Contents**, **Index**, and **Find** tabs, with the **Contents** tab showing first (Figure 12-1).



Figure 12-1 Help Topics: ArcMap Window Showing Contents Tab

Online Help topics are organized hierarchically, under a number of main headings. Notice that instructional text is displayed in the top portion of the **Contents** tab, under which a series of books is listed. Double click any book to access its available topics. Double click any topic to read information about it.

12.1.1.2 Index Tab

The **Index** tab (Figure 12-2) enables the user to search for a Help topic by typing in the first few letters of the topic and then selecting from the list in the lower panel. Notice that instructional text on the tab helps facilitate this process.



Figure 12-2 Help Topics: ArcMap Window Showing Index Tab

If more than one topic is related to the desired selection, the **Topics Found** window appears (Figure 12-3). Select one of the topics in this window, and click ***Display*** to read information on that topic.

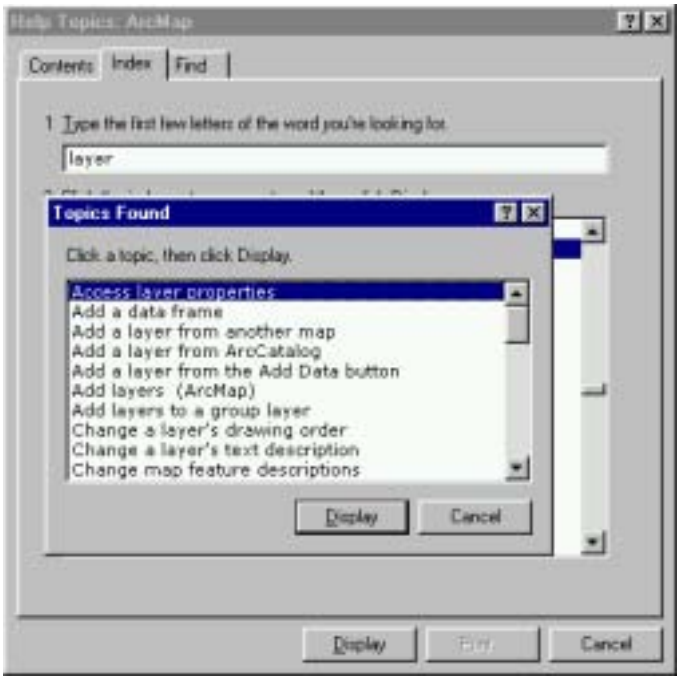


Figure 12-3 Topics Found Window in ArcMap Online Help

12.1.1.3 Find Tab

The **Find** tab allows the user to look for specific words in online Help topics. Any topic containing the keyword entered in the top field of the window will display in the lower panel (Figure 12-4). Note that this tab also has instructional text. The field in the bottom left corner of the window indicates the number of topics found.

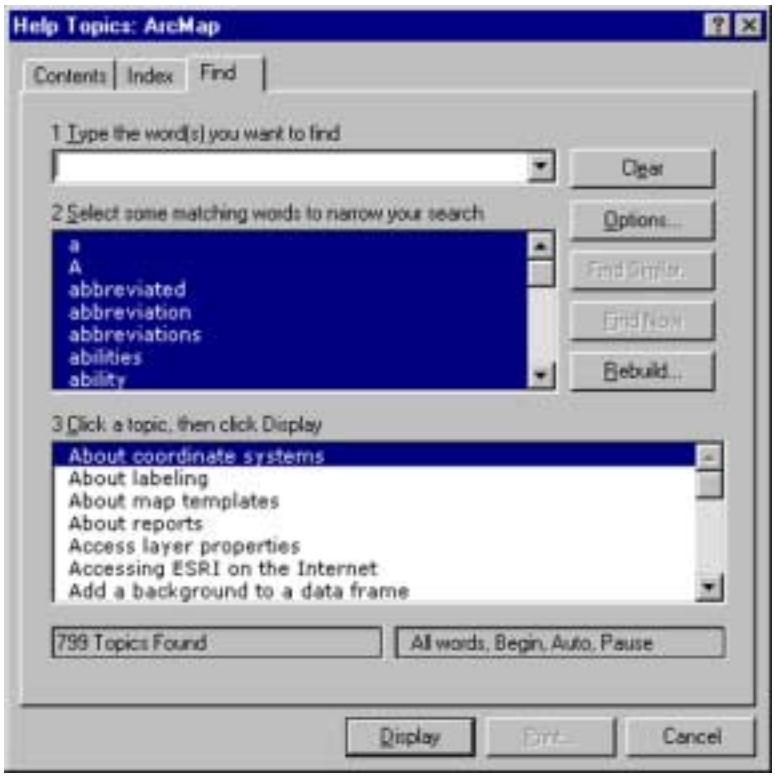


Figure 12-4 Help Topics: ArcMap Window Showing Find Tab

NOTE

*The first time the **Find** tab is accessed, a wizard appears that will compile a list of keywords for the user. It is recommended to accept the default settings in this wizard and click* **Finish** *to build the list.*

For more information on ArcMap's online Help capabilities, refer to ArcInfo's printed documentation, under the heading *ArcMap Basics*.

12.1.2 Imagine Online Help Functionality

ERDAS Imagine offers thorough online documentation to describe system capabilities, including PDF versions of printed documentation. See Table 12-2 for ways to access Imagine Help information.

Table 12-2 Imagine Help Functions

Help Function	Description
Help menu	Accessed through Imagine's main menu. Allows user to access the Help window, with contents listing and searchable index. Also allows access to ERDAS Imagine 8.4 user manuals in PDF format.

Table 12-2 Imagine Help Functions (Cont'd)

Help Function	Description
Help button	Accessed through any informational window in Imagine. Allows user to access specific information on the appropriate informational window.
Bubble Help	Accessed through **Preferences Editor** in Imagine (**Session**|**Preferences**). Allows user to set preferences for quick pop-up tags for items in the **Imagine** window.
Status Bar Help	Accessed by moving the mouse over items in the **Imagine** window. Allows access to brief information about appropriate items.

For more information on Imagine's online Help capabilities, refer to Imagine's printed documentation.

12.2 CTIS Online Help

To access online Help for DTSS functions, select ***Start/Programs/Dtss/Documents*** from the Windows NT desktop. The DTSS software provides this SUM as online documentation to describe system capabilities, as well as PDF versions of data models and data specifications as references. Troubleshooting Guide and Frequently Asked Questions documents are also available. See Table 12-3 for a description of the DTSS Help and reference functions.

Table 12-3 DTSS Help and Reference Functions

Help Function	Description
Help button	Accessed through any DTSS specific window in ArcInfo. Allows user to access specific information on the appropriate informational window.
Software User's Manual	Accessed by selecting ***Programs/Dtss/Documents/Software User's Manual*** from the **Start** menu. Allows user to access and search information from the entire Software User's Manual.
Data Models	Accessed by selecting ***Programs/Dtss/Documents/Data Models*** from the **Start** menu. Allows user to access the following data models: DTOP, FFD, Intervisibility, ITD, Mobility ITD, Mobility VITD, Terrain Profile, and VITD.
Data Specifications	Accessed by selecting ***Programs/Dtss/Documents/Data Specs*** from the **Start** menu. Allows user to access the following data specs: DTOP, FFD, ITD, and VITD.
Troubleshooting Guide	Accessed by selecting ***Programs/Dtss/Documents/Troubleshooting Guide*** from the **Start** menu. Allows user to access a listing of resolutions for specific problems.
Frequently Asked Questions	Accessed by selecting ***Programs/Dtss/Documents/FAQ Sheet*** from the **Start** menu. Allows user to access a listing of frequently asked questions and their answers.

The DTSS online Help is organized around basic tasks and is used in the same manner as the ArcInfo online Help. These tasks are divided into three areas, or tabs, in the DTSS Help interface: **Contents**, **Index**, and **Search**. When the **Help** button is selected in a DTSS-specific window, the system will automatically display the online Help information pertaining to the current window.

APPENDIX A:
SYSTEM ADMINISTRATION

1 SYSTEM ADMINISTRATION FUNCTIONS

The following sections outline functions to be carried out by the System Administrator, including information on the Cisco Ethernet Switch, sharing files and directories, mapping network drives, adding and changing user accounts and permissions, and using the Windows NT Task Manager.

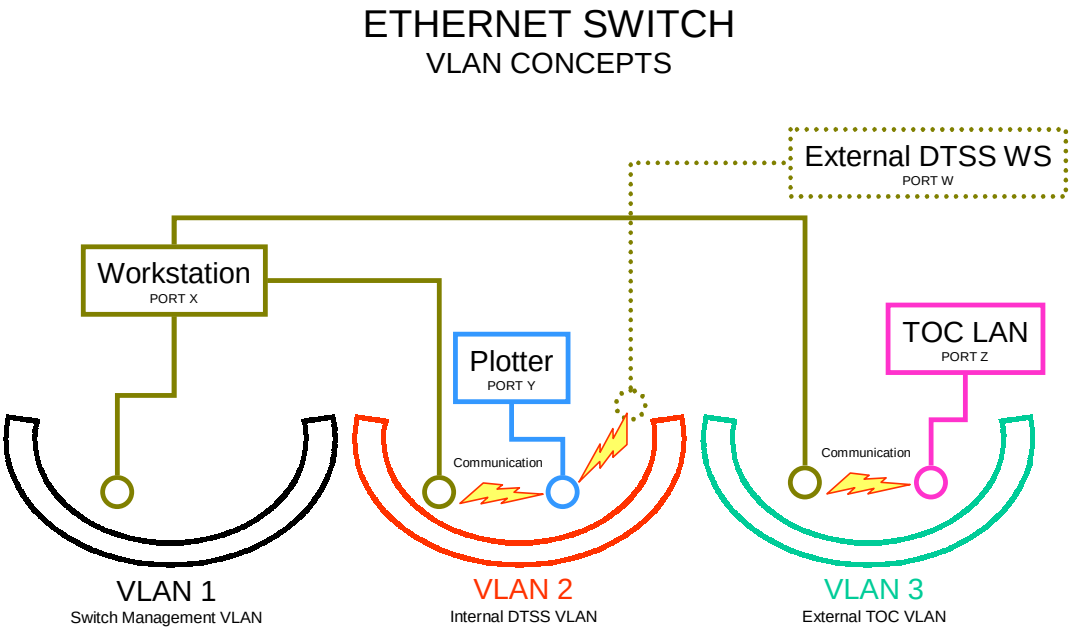
1.1 Configuring the Ethernet Switch

The Cisco Ethernet Switch serves as the central connection point for the DTSS networking environment. Each network connected device, or "Node," is connected to one of the twenty-four RJ45 ports on the switch. In its most basic mode, the switch serves as a simple hub for DTSS communications. In certain scenarios it may be necessary to use the switches for more advanced features.

1.1.1 Virtual Local Area Network (VLAN)

A Virtual LAN, or VLAN, emulates a separate physical network. The greatest level of network security is physical security. Two physically distinct networks may not communicate unless they are connected, making them one. The VLAN behaves as if it is disconnected from other VLANs. VLANs are assigned to ports. A port, and the Node connected to it, may belong to more than one VLAN.

In the illustration below, the workstation belongs to VLANs One and Two. The workstation may communicate with the plotter, which belongs only to VLAN 2. Notice that the plotter may communicate with any node that belongs to VLAN 2. Only the workstation may communicate with the TOC LAN.



A Virtual LAN (VLAN) acts as a separate physical network. Nodes contained within a VLAN may communicate only with other nodes in the same VLAN. A node may belong to multiple VLANs allowing it to communicate with the nodes in each of the VLANs it belongs to. Nodes in separate VLANs can not use a Multi VLAN node as a bridge between VLANs.

1.1.2 Initial Switch Configuration

Switch configuration is a two-step process. The first step is initial configuration. Using a serial connection from a computer to the switch, the user must set the IP address and password. Use the following steps to perform the initial configuration:

1. Connect the switch to the computer serial port using the serial terminal cable and connector end adapter.
2. From the **Start** menu, select ***Program/Accessories/Hyperterminal/Hyper Terminal*** to start the terminal program. The **Connection Description** window is displayed.
3. Enter the name "***switch***" for the connection in the **Connection Description** window and click ***OK***. The **Connect To** window is displayed.
4. Click ***OK*** to continue. The **COM1 Properties** window is displayed.
5. Set "Bits per second" to "9600" and click ***OK***.
6. Press ***[Enter]*** three times in the terminal window.

7. Follow the prompts in the terminal window. Refer to the following transcript of a terminal session:

START

Continue with configuration dialog? [yes/no]:

% Please answer 'yes' or 'no'.

Continue with configuration dialog? [yes/no]: **yes**

Enter IP address: **192.168.18.1**

Enter IP netmask: **255.255.255.0**

Would you like to enter a default gateway address? [yes]: **yes**

IP address of default gateway: **192.168.18.1**

Enter host name [Switch]: **Switch**

The enable secret is a one-way cryptographic secret used

instead of the enable password when it exists.

Enter enable secret: toor

Would you like to configure a Telnet password? [yes]: **y**

Enter Telnet password: **xxxx**

Would you like to enable as a cluster command switch? [yes/no]: **n**

The following configuration command script was created:

ip subnet-zero

interface VLAN1

ip address 192.168.18.1 255.255.255.0

ip default-gateway 192.168.18.1

enable secret 5 1h4TJ$ZlQSG3mUWMnQdm/AsNALm0

line vty 0 15

password toor

snmp community private rw

snmp community public ro

!

end

Use this configuration? [yes/no]: **y**

Building configuration...

Use the enabled mode 'configure' command to modify this configuration.

Press RETURN to get started.

Switch>

END

8. Initial configuration is now complete. Close Hyperterminal.

1.1.3 Secondary Switch Configuration

Secondary configuration is accomplished through the Cisco Visual Switch Manager. The switch contains internal software that is accessed with a web browser. The Switch Manager allows the user to configure VLANS and monitor all switch ports.

Use the following steps to perform the secondary configuration.

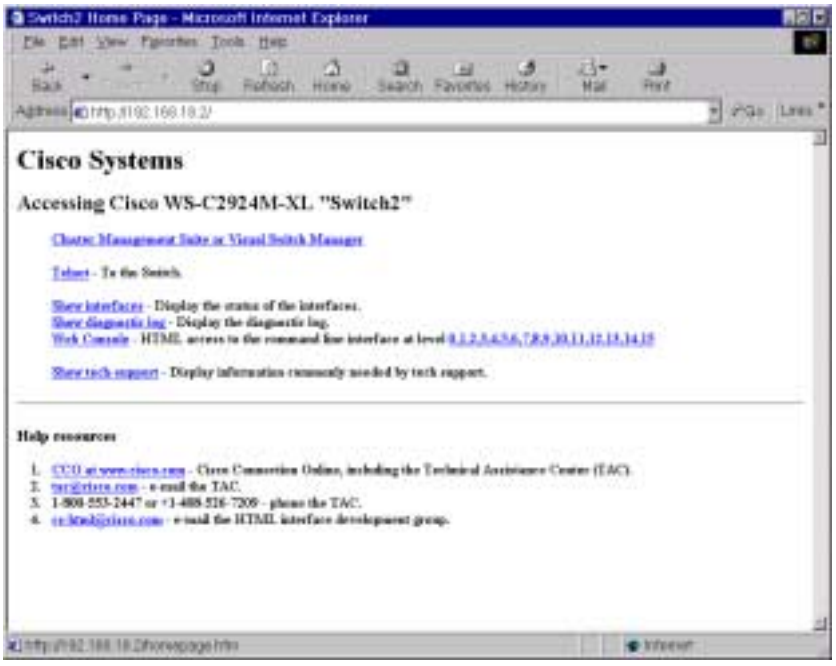
1. Start Netscape and enter the IP address of the switch as the URL. Press ***[Enter]*** to continue. The **Enter Network Password** window is displayed.



2. Enter the root user name and password. Click ***OK*** to continue. The Switch Homepage is displayed.

NOTE

*Do not check the "**Save this password in your password list"** option. This is a potential security hazard.*



3. Select "Cluster Management Suite or Visual Switch Manager." The **Username and Password Required** window is displayed.

4. Enter the root username and password again. Click ***OK*** to continue. The **Visual Switch Manager** is displayed.



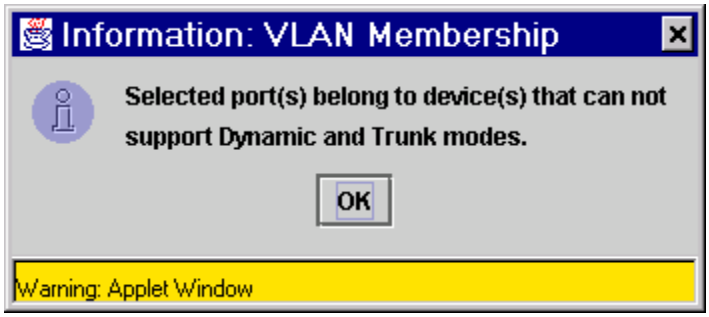
5. From the menu select ***VLAN/Membership***. The **VLAN Membership** window is displayed.



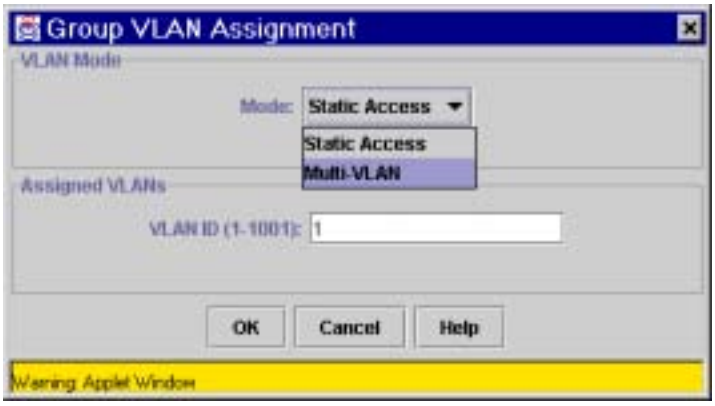
6. To alter VLAN assignments for any port, use the following sub-steps:

   a. Click on the port in the **VLAN Management** window. Click and drag to select multiple ports.

b. Click the **Modify…** button to display the **Group VLAN Assignment** window.



c. Click ***OK*** on the **Information: VLAN Membership** window. The **Group VLAN Assignment** window is displayed.



d. For ports that will belong to multiple VLANs, change the "Mode" from "Static Access" to "Multi-VLAN."

e. Enter the VLAN(s) in the field provided below. Enter multiple VLANs separated by commas or by a hyphen. (e.g. for VLAN 1, VLAN 2, and VLAN 3, enter "1-3." For VLAN 1 and VLAN 3 enter "1,3."

f. Click ***OK*** to commit your changes. The VLAN membership window reflects the changes you have just made. Click ***OK*** to accept the changes and reconfigure the ports with the new VLAN membership settings.

1.2 Sharing Drives Between Computers

Sharing drives is a two-step process. The host computer must first share the drive or directory. Once the share has been established, the client computer must map the shared resource as a network drive.

1.2.1 Sharing a File or Directory

To share a file or directory on the host computer, use the following steps.

1. Log into the workstation as “secman.” The “dtssuser” accounts do not have access to file sharing.

2. Double click “My Computer.”

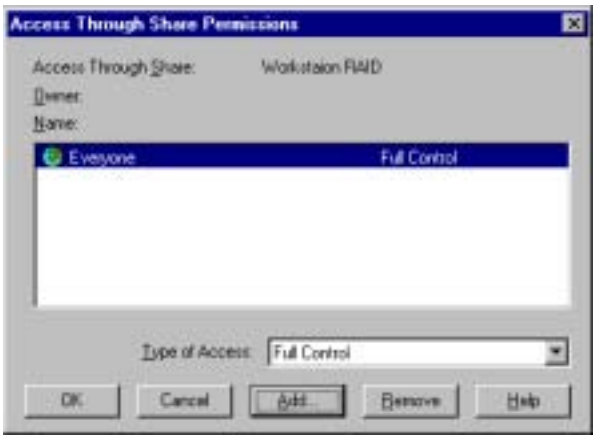
3. Right click on the **E:** drive and select ***Sharing*** from the popup menu. The **Properties** window is displayed and the **Sharing** tab is active.



4. Select the radio button next to “Shared As,” and enter a descriptive “Share Name.”

5. To limit the amount of users that may access the share, click the “Allow Users” radio button and enter a number in the file provided. If you only intend to share the drive with the laptop, enter a “1” in this field. Values from 1 to 10 are valid.

6. Click the **Permissions** button to set permissions for the share. The **Access Through Share Permissions** window is displayed.



7. By default, the share is available to all users with full control to read and change data on the shared drive. Access may be limited by selecting an item from the "Type of Access" dropdown menu. Click the **Add** button to display the **Add Users and Groups** window.



8. The "Names" area displays groups. Users belong to one or more groups. Clicking on a group and clicking the **Members** button will list groups. At this point, you may add groups to the "Add Names" field at the bottom of the window by clicking the **Add** button. If you need to assign permissions based on individual users, click the **Show Users** button. The users are then listed and available for addition. The type of access is defined at the "Type of Access" dropdown menu.

9. Click ***OK*** on the **Add Users and Groups** window.

10. Click ***OK*** on the **Access Through Share Permissions** window.

11. Click ***OK*** on the **Properties** window. If you entered a name with spaces, you may see the message that appears below. Click ***Yes*** to continue.



12. In the **My Computer** window, the E:\ drive icon is now displayed with a hand to indicate the share has succeeded.



1.2.2 Mapping a Network Drive

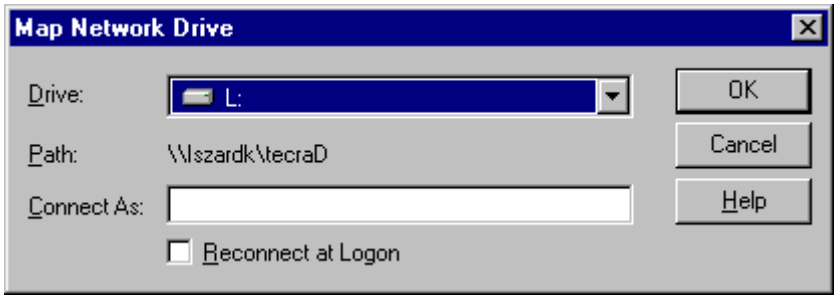
To map a network drive on the client computer, use the following steps.

1. Log into the laptop as “secman.” The “dtssuser” accounts do not have access to file sharing.

2. Double click on the Network Neighborhood icon.

3. Double click on the computer name of the host computer. A new window is displayed listing the shared resources of the host computer.

4. Right click on the shared resource and select ***Map Network Drive*** from the popup menu. The **Map Network Drive** window is displayed.



5. You may now select a drive letter for the Network Drive. If you are logged in as a user that does not have the share permissions you desire, enter the username in the "Connect As" field. You must know the password for the username you have entered. Leaving the "Connect As" field empty will connect you to the drive as the user you are currently logged in as.

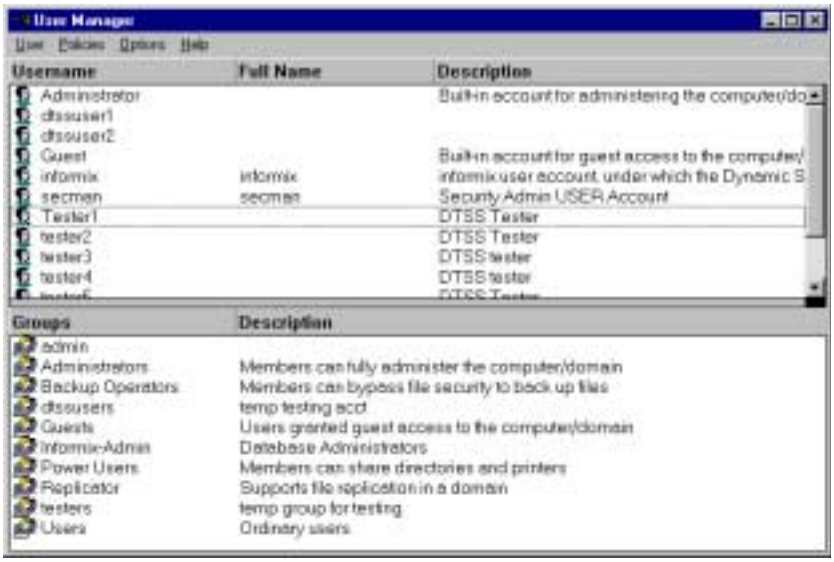
6. Putting a check next to "Reconnect at Login" will configure the Network Drive to survive a logout or a reboot. Click ***OK*** to map the Network Drive.

1.3 Adding Users

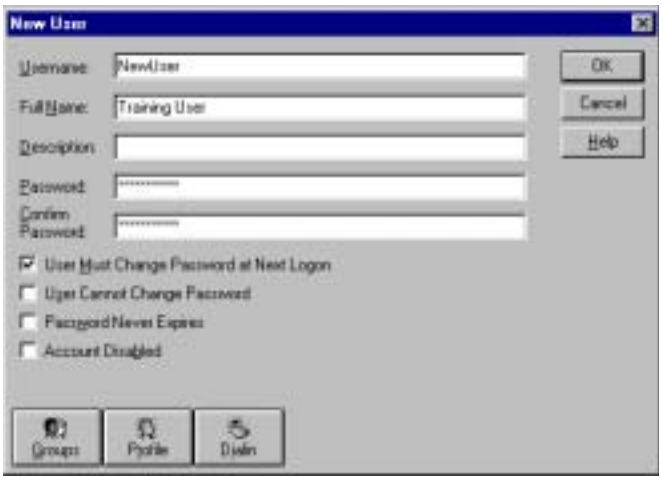
To add user accounts, use the following steps.

1. Log into the workstation "secman." The "dtssuser" accounts do not have access the User Manager.

2. Select ***Start/Programs/Administrative Tool (Common)/User Manager***. The **User Manager** window is displayed.



3. From the **User Manager** menu select ***User/New User***. The **New User** window is displayed.



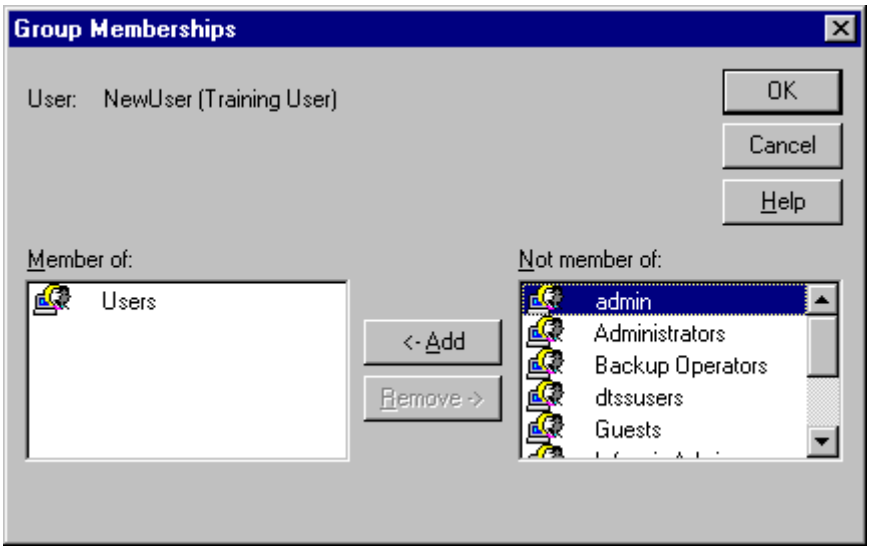
4. Enter the "Username" and "Password" for the new user.

5. Check the box next to the "User Must Change Password at Next Logon" option.

NOTE

The system administrator has complete access to the system. As an added security measure, the System Administrator should not know user passwords. DO NOT check the ***User Cannot Change Password*** *option. This will prohibit the user from changing his/her password while they are required to do so at the next login. This will effectively lock the user out of the system.*

6. Click the **Groups** button to display the **Group Memberships** window. Due to a bug in the DII COE environment, you must place all users in the "administrators" group.



7. Select ***Administrators*** and click the **Add** button. Click ***OK*** to accept the change.

8. Click ***OK*** on the **New User** window to add the new user.

9. Select ***User/Exit*** from the **User Manger** window.

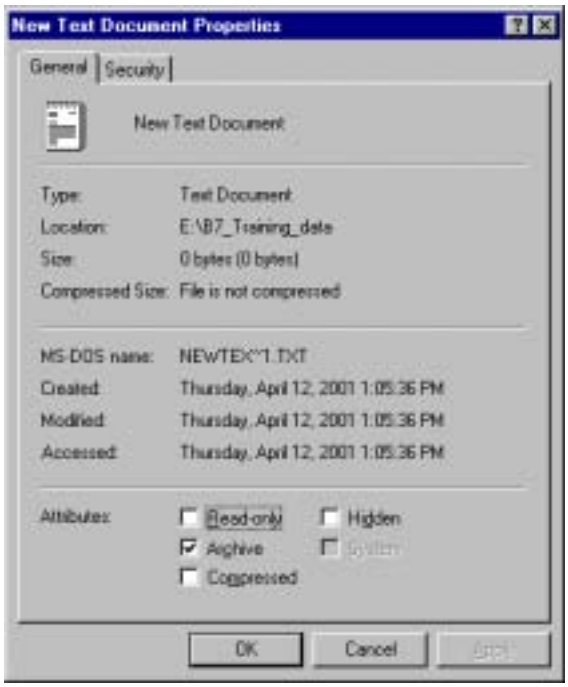
1.4 Setting File Permissions

To change the permissions of a file, use the following steps.

1. Ensure file is not open in any application.

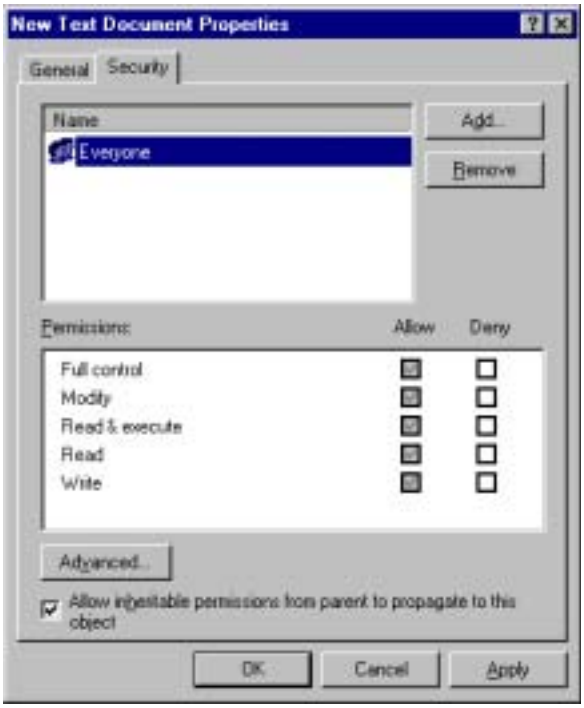
2. Navigate to file using Windows NT Explorer.

3. Right click on the file, and select ***Properties*** from the context window. The **File Properties** window is displayed.



4. The Attribute options are listed at the bottom of the window. The “Read-only” and “Hidden” options affect access to the file.

5. Select the **Security** tab.



6. Click the **Add** button to display the **Add Users and Groups** window. This is identical to the window of the same name that is used in the previous section. Add any groups or users in this window.

7. Once all groups and users have been added, click on the user or group and set the permission using the checkboxes provided. Click ***OK*** to accept the changes.

1.5 Task Manager

Occasionally, an application may stop functioning properly. If an application becomes unresponsive, use the Task Manager to end the errant process.

To use the Task Manager, use the following steps.

1. Start the **Paint** program by selecting ***Start/Programs/Accessories/Paint***. You will use the Task Manager to stop this program.

2. Press ***[Ctrl]*** + ***[Alt]*** + ***[Delete]***. The **Windows NT Security** window is displayed.

3. Click the **Task Manager** button. The **Windows NT Task Manager** window is displayed.



4. Select the paint item in the **Applications** tab and click the **End Task** button. The application closes. You may see a confirmation window when closing an application that is truly unresponsive. Confirm the choice at this window.

1.6 COTS Software Dongles

The dongles, or hardware keys, supplied for the COTS software are essential to effective system functionality. The following guidelines pertain to the care and maintenance of the dongles.

- DO NOT remove dongles unless absolutely necessary.
- Be especially careful with ESRI dongles, as they are particularly sensitive. If dropped or shaken, be sure that dongle is still operational.
- If dongles become unusable, contact ManTech at 254-288-1889.

NOTE:

Always keep a backup copy of key codes for COTS dongles.

1.7 Uninstalling Software Segments Using DII COE Installer

To remove installed segments from the DTSS system, follow the procedure below.

NOTE

Different segments may have special procedures not listed in the procedure that follows. Call the DTSS Help desk to report any problems.

1. Open the DII COE Installer from the **Start** menu.
2. In the right panel of the **COEInstaller** window, scroll to the segment to uninstall, and check the check box to the left of the item.
3. With the item highlighted, right click to access a context menu, and select ***Uninstall***. A message appears, asking to confirm uninstall.
4. Click ***Yes***. Another message appears, instructing the user to run Add/Remove programs from the Windows NT Control Panel after the COEInstaller finishes.
5. Leaving this reminder message open, go to ***Start/Settings/Control Panel*** to access the **Control Panel** window.

6. In the **Control Panel** window, double click the **Add/Remove Programs** item (either list item or icon) to open the **Add/Remove Programs Properties** window.

7. In the panel near the bottom of the window, scroll down to the program to remove. Then highlight the program and click the **Add/Remove** button at the bottom right of the window.

8. The **InstallShield Wizard** window opens temporarily, indicating progress. When this completes and the **Confirm File Deletion** window appears, click ***OK***.

9. Another **InstallShield Wizard** window opens, showing progress. If any Read-only files exist in the segment, a message appears indicating such. Check the box beside "Don't show this message again" to bypass this message in the future. Then click ***Yes***.

10. The **InstallShield** window now appears with a "Maintenance Complete" message. Click the **Finish** button to close the window.

11. When finished with the uninstall, close the **Add/Remove** window, and then click ***OK*** to the COEInstaller message that appeared earlier. The **Segment Un-Installation Status** window opens, showing progress of the segment's removal.

12. When the uninstall is complete, the **COE Installer** window appears, stating that the uninstall was successful. Click ***OK*** to close the window.

2 VCU SOFTWARE INSTALLATION

NT 4.0 WORKSTATION INSTALL	
Step	Procedure
1.	Power-up the VCU and press ***[Delete]*** when prompted during the POST in order to enter CMOS Setup Utility.
2.	Select “Advanced BIOS Features” so that you may change the boot device sequence.
3.	Select “First Boot Device” and press ***[Enter]***. Use your arrow keys to move to the LS120 device and press ***[Enter]*** to confirm the setting.
4.	Select “Second Boot Device” and press ***[Enter]***. Use your arrow keys to move to the HDD-0 device and select “enter to confirm the setting.” This will enable your computer to boot the HDD-0 hard-drive after first recognizing the LS120. Press ***[F10]*** to save settings and exit CMOS. The computer will prompt you for a YES or NO to save the settings. Select “Y” and the computer will exit and reboot. Be sure to insert the floppy disk labeled, **Microsoft Windows NT Workstation – Setup Disk 1**.
5.	With **Microsoft Windows NT Workstation – Setup Disk 1** already in the floppy drive, the Workstation installation process will automatically start. When the message “Windows is inspecting your computers hardware configuration” appears, hold down the **F6** button to go to the Advanced Setup. The Windows NT Setup window will prompt you to insert **Microsoft Windows NT Workstation – Setup Disk 2,** insert the disk 2 and press ***[Enter]*** to proceed.
6.	Select “S” to specify additional devices. Make sure “Other” is highlighted and select “enter” to proceed. Eject the **Microsoft Windows NT Workstation – Setup Disk 2** and insert the LS-120 disk. “Panasonic ATAPI SuperDisk” will be highlighted and press ***[Enter]*** to proceed.
7.	Select “S” again to specify additional devices. Make sure “Other” is highlighted and press ***[Enter]*** to proceed. Eject the LS-120 floppy disk from the drive and insert the **Adaptec 29160** disk and press ***[Enter]*** to continue. The system will recognize the “Adaptec Ultra160 Family PCI SCSI Controller (NT 4.0).” Press ***[Enter]*** to select and proceed.
8.	Eject the **Adaptec 29160** disk.
9.	At this point, do not specify any additional devices. Press ***[Enter]*** to continue.
10.	At the prompt, insert **Microsoft Windows NT Workstation – Setup Disk 3.** Press ***[Enter]*** to proceed.
11.	At the next prompt, insert **Microsoft Windows NT Workstation – Setup Disk 2**. Press ***[Enter]*** to proceed.
12.	At the next prompt, insert **Microsoft Windows NT Workstation – Setup Disk 3**. Press ***[Enter]*** to proceed.
13.	At the following prompt, insert **Microsoft Windows NT Workstation – Setup Disk 2**. Press ***[Enter]*** to proceed.

NT 4.0 WORKSTATION INSTALL	
Step	Procedure
14.	At the next prompt, insert **Microsoft Windows NT Workstation – Setup Disk 3**. Press ***[Enter]*** to proceed.
15.	At the next prompt, insert **Microsoft Windows NT Workstation – Setup Disk 2**. Press ***[Enter]*** to proceed.
16.	Press ***[Enter]*** to Setup Windows NT now. Setup will display the recognized mass storage devices in your computer. Press ***[Enter]*** to continue.
17.	At the next screen, press, ***[Enter]*** to continue.
18.	At the prompt, insert **Microsoft Windows NT Workstation – Setup Disk 3**. Press ***[Enter]*** to continue.
19.	At the prompt, insert the **Windows NT Workstation CD-ROM.** (Wait until the light on the cd-rom turns green). Press ***[Enter]*** to continue.
20.	Press ***[Page Down]*** until reaching the end of the Windows NT Licensing Agreement. Press the "F8" key to agree to the license and continue. ****NOTE: If you are not installing onto a new hard drive follow these steps to delete the partition and recreate it. A message will be displayed that it has found Windows NT on your hard disk in the directory shown below.**** Press the key "N" to make a new version. Press ***[Enter]*** to keep the default highlighted message: "The above list matches my computer." The next window will display your hard drive contents and its partition. Press the key "D" to delete the partition and press ***[Enter]*** to continue. Press the key "L" to delete the partition. Follow these steps to delete all the partitions if necessary. ***Once the partitions are deleted go to step 23.*** Press ***[Enter]*** to highlight appropriate selection.
21.	Press ***[Enter]*** to install a New Version of Windows NT.
22.	Press ***[Enter]*** to continue.
23.	Press the key "C" to create a new partition and type in ***4095*** and press ***[Enter]*** to Create. The next screen will display "C: New (Unformatted) 4095 MB" and "Unpartitioned Space 20105MB." Press ***[Enter]*** to install. At the next screen make sure to highlight: "Format the partition using the NTFS file system." Press ***[Enter]*** to continue. The computer will now format the hard drive, this may take a couple of minutes.
24.	Press ***[Enter]*** to install Windows NT to the "\WINNT" directory. Press ***[Enter]*** to let setup examine your hard drive for corruption.
25.	At the prompt, insert the LS120 driver disk and press ***[Enter]*** to continue.
26.	You will get a message that Setup was unable to copy the file **oemsetup.inf**. Press ***[Esc]*** to skip the file and continue.
27.	At the next prompt, insert the 29160-driver disk and press ***[Enter]*** to continue. Setup will start copying files.

NT 4.0 WORKSTATION INSTALL	
Step	Procedure
28.	A message appears: "This portion of setup has completed." Remove any floppy disks or CD's from the drive and press ***[Enter]*** to restart the computer.
29.	When the system reboots, insert the CD-ROM labeled Windows NT Workstation (wait until the there is just a green light on the CD-ROM drive) and select ***OK*** to continue. Files will be copied over to your hard drive.
30.	The Windows NT Setup window will appear and will now gather information about your computer. Select ***Next*** to continue.
31.	Choose "Typical" for the type of setup and select ***Next*** to continue.
32.	To personalize your installation, type the appropriate Name and Organization when prompted. Select ***Next*** to continue.
33.	Enter the 10 digit CD-key select located on the back cover of the CD. Select ***Next*** to continue.
34.	Type in the computer name and select ***Next*** to continue. (Computer name: VCU<system number>)
35.	At the Administrator Account window, type in "coconut123" in the first dialog and reconfirm it by typing it again in the second dialog box. Select ***Next*** to continue.
36.	Select "no" to bypass creating an emergency repair disk at this point. Select ***Next*** to continue.
37.	Select "install the most common components (recommended) and select ***Next*** to continue.
38.	Select ***Next*** to install Windows NT Networking.
39.	Select "Do not connect this computer to a network at this time." Select ***Next*** to continue.
40.	Select ***Finish*** to finish setup.
41.	At the **Date/Time Properties** screen, make the appropriate adjustments and select ***Close*** to continue.
42.	At the **Display Properties** screen select ***OK***. Select "test" to view the display settings (video driver will be installed at a later time), select ***OK*** to test a new graphics mode and "Yes" to confirm that you saw the test bitmap properly. Select ***OK*** to accept the settings you have just tested and select ***OK*** to confirm the display properties.
43.	Windows will now copy appropriate files to the system partition. At the prompt, press ***[Enter]*** to restart the computer.
44.	Press ***[Ctrl]***, ***[Alt]***, ***[Delete]*** to log back on. Type in "Administrator" for the user and "coconut123" for the password. Select ***OK*** to logon. Select ***Close*** to close the **Welcome to Windows NT** screen.
SERVICE PACK 6 INSTALLATION	
1.	Insert your **Windows NT SP6** disk.

SERVICE PACK 6 INSTALLATION	
Step	Procedure
2.	Select “Install Service Pack 6” from the IE window that opens from autorun. Select “Install Service Pack 6 for Intel-based systems.” Select ***Open*** to continue.
3.	Select “Accept the License Agreement (must accept before installing the Service Pack)” and deselect “Backup files necessary to uninstall this Service Pack at a later time (requires approximately 60MB additional disk space).” Select ***Install*** to continue. Files will start to copy on to your hard drive.
4.	Windows NT Service Pack Setup will now prompt you to restart your computer. Remove the SP6 CD and select ***Restart*** to continue.
5.	When the computer restarts, press ***[Ctrl]***, ***[Alt]***, ***[Delete]*** to logon. Uncheck “Show this Welcome Screen next time you start Windows NT.” Select ***Close*** to exit the **Windows NT Welcome** window.
6.	Insert the General Dynamics Power Sound Drivers CD. The CD will autorun (if not, navigate to the cd-rom drive and double click **setup.exe**). Select “driver,” and then select ***Next*** to continue.
7.	At the Yamaha DS-XG Audio Driver screen, select ***OK*** to continue.
8.	Select “No, I will restart my computer later” and select ***Finish*** to continue.
9.	Select ***Quit*** to exit audio installation. Eject the CD-ROM.
10.	Insert the E&S Tornado 3000 CD and the installation will autorun.
11.	Select “Install drivers.” Select ***Next*** to start the set-up program.
12.	Select “Yes” to agree to the software license.
13.	At the set-up screen, select “typical” and select ***Next*** to continue.
14.	Select ***Next*** to install the documentation to the default destination directory.
15.	Unselect the Readme file.
16.	Select ***Next*** to accept the default program folder. Drivers will not be installed.
17.	Select ***Cancel*** to install Acrobat Reader 3.0 set-up program.
18.	Select “No” to resume installing.
19.	Select “Yes, I want to restart my computer now” and then select ***Finish*** to reboot the computer. Eject the CD. Hold down ***[Ctrl]***, ***[Alt]***, and ***[Delete]*** at the same time. Logon to the computer as administrator.
20.	When the computer reboots, you will be prompted that a new graphics driver has been installed. Select ***[OK]*** to proceed to the Windows Display Properties.
21.	Set display properties to: Color Palette = *true color*, Desktop Area = *1024x768* Refresh Frequency=*120Hz*. Select “test” to test new settings and select ***OK*** to proceed.
22.	Select “Yes” if you saw the test bitmap properly.

SERVICE PACK 6 INSTALLATION	
Step	Procedure
23.	Select ***OK*** to close the **Display Properties** screen.
24.	Insert the Iomega CD and it will autorun.
25.	Select "Yes" to accept the license agreement.
26.	Select "No" when asked if installing Iomega for USB drive. Files will copy over.
27.	Select ***Next*** to accept default installation location settings. More files will copy over.
28.	Select "shut down later" and select ***OK*** to continue. Remove the Iomega CD and reboot the machine.
29.	Select ***Next*** to accept the default installation location settings. More files will copy over.
30.	Select "shut down later" and select ***OK*** to continue. Remove the Iomega CD and reboot the machine.
31.	Select ***OK*** for an error service control message.
32.	Log back on as Administrator.
33.	Select "Yes" for a listing of all your Iomega drives.
34.	Select ***OK*** on the **Iomega Software Setup** screen.
35.	Right click on the **Start** button located on the task bar.
36.	Select "Explore all users."
37.	Navigate to Programs\Start Up folder. Delete the **IomegaWare** icon by right clicking and selecting ***Delete***.
38.	Select "Yes" to send to the recycle bin.
39.	Close the **IomegaWare** screen by clicking on the "X" box in the top right-hand corner.
FIXING FAILED SERVICE ERROR MESSAGE	
1.	Double click "My Computer," "Control Panel," and then "Devices."
2.	Highlight "AIC78xx" and click the **Startup** button. Then select "Disable," select ***OK***, and select "Yes" for the message. Do the same for the "IMGATAPI" drivers.
3.	Select ***Close*** for the "Devices" screen and restart computer.
4.	Log back on as administrator. When the computer reboots, double click "My Computer," "Control Panel," and "Devices."
5.	Check to make sure that the "ADPU160m" driver and the "MKEATAPI" drivers are started on boot (check to see if it says "Started" by the device).
INSTALL NETWORK	
1.	Insert the Windows NT 4.0 CD.
2.	Double click the icon "My Computer" browse the Windows NT 4.0 CD and find the "i386" folder.
3.	Right click the folder and select ***Copy***. Navigate to the C:/ and right click it and select ***Paste***.

INSTALL NETWORK	
Step	Procedure
4.	Files will be copied from the CD-ROM to the hard drive. Close all the open windows by clicking the "X" box in the top right-hand corner for each one.
5.	Eject the CD.
6.	Right click on "Network Neighborhood" and select "Properties."
7.	Select "Yes" to install network components.
8.	Make sure that "wired to the network" is checked and select ***Next*** to continue.
9.	Insert the 3COM Etherlink EtherCD and exit the autorun utility.
10.	Choose "select from list" and "have disk." Type the appropriate path to the CD (i.e., g:\).
11.	Make sure that the 3Com EtherLink PCI NIC is highlighted and select ***OK*** to continue. Select ***Next*** to continue.
12.	In the **Network Protocols** window, make sure TCP/IP and NetBEUI are checked. Select ***Next*** to continue.
13.	Select ***Next*** to install selected components.
14.	In the next screen setup **Needs to Copy Some Windows NT Files** window, type the path "**c:\i386"** and select ***Continue***.
15.	At the **TCP/IP Setup** window, you will be asked if there is a DHCP server on your network – Do you wish to use DHCP? Select "No" and configure a static IP address.
16.	At the Microsoft TCP/IP Properties Window. Configure the following tabs: **IP ADDRESS** Adapter should read "[1] Intel® PRO/100+ MiniPCI." Make sure "Specify on IP Address" is selected. Type in your appropriate IP address, subnet mask, and default gateway. IP Address: *192.168.<system number>2* Default Gateway: *192.168.<system number>1* Subnet Mask: *255.255.255.0* **DNS** No configuration needed. **WINS ADDRESS** No configuration needed. **ROUTING** No configuration needed. Select ***OK*** to continue.
17.	Select ***Next*** to install selected components.
18.	Type in the workgroup name "DTSSD" and confirm the computer name.
19.	Select ***Next*** to continue.
20.	Select ***Finish*** to complete the network installation.
21.	Select "No" to restart your computer. BEFORE rebooting, double click "My Computer," "Control Panel," and "Devices."

INSTALL NETWORK	
Step	Procedure
22.	Highlight the **adpu160m** driver and select ***Startup***. Set the driver to "disabled" and select ***OK*** and select "Yes". Select ***Close***. **At this point it is very important to install the Service Pack 6.a after installation completes (SEE Service Pack 6a Section)** Reboot the machine. Eject the CD-ROM.
23.	Select ***OK*** on the error message.
24.	Log on as administrator.
DISK ADMINISTRATION	
1.	Select ***Start/Programs/Administrative Tools (common)/Disk Administrator.*** Select ***OK*** on the message.
2.	Highlight "free space (20113MB)." Right click and choose ***Create***. Select "Yes" to confirm partition creation.
3.	Accept the default partition size to be created and select ***OK*** to continue.
4.	Select "Yes" at the second confirmation window to create the new partitioned space.
5.	Right click on the new partition and select "commit changes now" and "Yes" to confirm this.
6.	Select ***OK*** to proceed through information window.
7.	Right click on newly partitioned space and select "format."
8.	Select "NTFS" located in the File System pull down menu and then select "quick format."
9.	Select ***Start*** to proceed with formatting.
10.	Select ***OK*** when format is complete and ***Close*** to exit the dialog window.
11.	Right click on the newly partitioned space and select "assign drive letters" and select D:
12.	Select ***OK***.
13.	Select "Yes" to continue if prompted. (You may or may not get this message.)
14.	Close Disk Administrator and double click "My Computer," "Control Panel," and then "Devices."
15.	Highlight the **adpu160m** driver and select ***Startup*** and select type to boot.
16.	Select ***OK*** and ***Close***.
17.	Select ***Start/Programs/Command Prompt***. At the command line type, "convert c: /FS:NTFS." Then press ***[Enter]***.
18.	Type "Y" for the system to do the conversion at the next reboot. Type "Exit."
19.	Close the control panel by clicking the "X" boxes in the top right-hand corner. Reboot the computer. Once the computer reboots log on as administrator.

8MM TAPE BACKUP CONFIGURATION	
Step	Procedure
1.	Insert one 8mm tape into the tape drive.
2.	Double click “My Computer,” “Control Panel,” and “Tape Devices.”
3.	The Exabyte EXB-85058E-0000 device will be located, but drivers will not be installed. You will be prompted to load drivers. Select ***OK*** to continue.
4.	Select ***OK*** to copy files and type “c:\i386” in the “COPY FROM FILES” field for the path. Select ***OK*** to continue
5.	Select ***OK*** to close dialog box.
DTSS LOGO SETUP	
1.	Insert DTSS Install Disk #9.
2.	Double click “My Computer” and the CD-ROM drive.
3.	Right click on “DTSSlogo” and select ***Copy***.
4.	Double click “My Computer,” “C:” and “Winnt” directory.
5.	Right click in the “Winnt” directory and select ***Paste*** to copy in the logo. Close all the windows.
6.	Go to ***Start/Settings/Control Panel/Display***.
7.	Click on the **Background** tab and select the “DTSSlogo” in the wallpaper menu, then select ***Center***, and ***Apply*** to continue.
8.	Click on the **Appearance** tab and change the desktop color setting to (black). Click ***OK*** to continue and confirm settings.
EMERGENCY REPAIR DISK	
1.	After logging on, go to ***Start/Programs/Command Prompt***. At the command line, type “rdisk /s.”
2.	Insert a 3.5 disk to create and Emergency Repair Disk and select “Yes” to continue.
3.	Type “Exit” to close the c: prompt.
4.	At this point shutdown the computer and power it off.
5.	Connect the 68-pin SCSI cable to the SCSI card located on the back of the VCU in the right hand corner. (Make sure all the devices are powered on and ready to go. The RAID will say ready on the front panel.) Power up the VCU.
DII COE INSTALL	
1.	Log into the system as Administrator and enter the administrator’s password.
2.	From the **Start** menu, select ***Programs/Administrative Tools(Common)/Event Viewer***.
3.	Select the application option from the log menu. A log appears showing Application events.
4.	Select the **Clear All Events** option from the log menu. A window opens to provide a chance to save the event log.
5.	Select “No” to continue without saving the event log.
6.	Select “Yes” on the confirmation window to clear all events from the events log.

DII COE INSTALL	
Step	Procedure
7.	Close the **Event Viewer** window by selecting ***Exit*** from the Log menu.
8.	Insert the DTSS Install Disk #1 CD-ROM for the DII COE Kernel Version 4.2.0.0 into the CD-ROM drive.
9.	Select ***Run*** from the **Start** menu.
10.	In the box labeled "Open," type "cd rom letter:\setup." (i.e. I:\setup)
11.	Select ***OK***. The **Welcome** window appears.
12.	Select ***Next***. Select "Yes." Several InstallShield progress bars appear as files copy to the system.
13.	Click on the "APM Authenticate" check box to enable it.
14.	Select ***Next***. The **Enter information** window appears.
15.	In the text box, type the hostname of the machine on which you are now installing the Kernel, if not already displayed.
16.	Select ***Next***. The **Secman Password** window appears.
17.	Type a password of at least 8 characters for the Security Administration (secman) account in the "Password" and "Confirm Password" text boxes. (use "buildnt7.0") Ensure that the same password is entered in both text boxes, as no text is echoed to the screen.
18.	Select ***OK***. The **Enter APM Authentication Key** window appears.
19.	Type an authentication key (password) containing between 6 and 16 characters in the "Password" and "Confirm Password" text boxes. (use "monkey123") Ensure that the same key is entered in both text boxes, as no text is echoed to the screen.
20.	Select ***OK***. The loaded kernel window appears.
21.	Select the "Yes, I want to Restart option."
22.	Remove all disks from all disk drives.
23.	Select ***Finish*** and wait for the workstation to restart. After the workstation has restarted, the Defense Information Systems Agency (DISA) Security banner appears.
24.	Hold down the ***[Ctrl]*** and ***[Alt]*** keys, and press the ***[Delete]*** key. The security warning is displayed.
25.	Select ***OK*** in the security warning's message window. The **Logon Information** window appears.
26.	Log into the system as Administrator and enter the Administrator's password. The **COE login Complete** window appears.
27.	Select ***OK***.
28.	Log out.

DII COE INSTALL	
Step	Procedure
29.	Log into the system as Secman and enter the password " buildnt7.0." You will be asked to change your password. Enter new password "Security123" and retype it to confirm it. Select ***OK***. Select ***OK*** again. Select ***OK*** on the **COE login Message** window.
30.	Select ***Start/Programs/COE Profile Selector***.
31.	Choose the SSO default in the available profiles. Select ">>Add" Select ***OK***. Select ***Done***. Select ***Start/Programs/DII Applications/SecAdmin/Edit APM Configuration***. Deselect "Enable Authentication." Select "Submit" and click ***OK***.
32.	Log out.
33.	Log into the system as Administrator and enter the Administrator's password. The **COE login Complete** window appears select ***OK***.
34.	Insert the DII COE 4.2 CD #1.
35.	Select ***DII Installer*** from the **Start** menu.
36.	Select ***File/Select Source Drive***. Browse to the CD-ROM folder. Select ***OK***.
37.	Select ***File/Read Table of Contents***. Scroll down. Select ***DII COE 4.2.0.0 Kernel Patch 1***. Select ***Available Software/Install***. Select ***OK***. Remove all media. Select "Yes" to reboot.
38.	Log into the system as Administrator and enter the Administrator's password. The **COE login Complete** window appears. Select ***OK*** on the message.
39.	Insert the DTSS Install Disk #1.
40.	Select ***DII Installer*** from the **Start** menu.
41.	Select ***File/Select Source Drive***. Browse to the CD-ROM folder. Select the KP2 folder. Select ***OK***.
42.	Select ***File/Read Table of Contents***. Select ***DII COE 4.2.0.0 Kernel Patch 2***. Select ***Available Software/Install***. Select ***OK***. Remove all media. Select "Yes" to reboot.
43.	Click ***Finish*** and wait for the workstation to restart. After the workstation has restarted, the Defense Information Systems Agency (DISA) Security banner appears.

DII COE INSTALL	
Step	Procedure
44.	Hold down the ***[Ctrl]*** and ***[Alt]*** keys, and press the ***[Delete]*** key. The security warning is displayed.
45.	Select ***OK*** from the security warning. The **Logon Information** window appears.
46.	Log into the system as Administrator and enter the Administrator's password. The **COE login Complete** window appears.
47.	Select ***OK***.
JAVA2	
1.	Insert DTSS Install Disk #1.
2.	Select ***Start/DII Installer***.
3.	Select ***File/Select Source Drive***. Browse to the CD-ROM folder. Select folder "java2" Select ***OK***.
4.	Select ***File/Read Table of Contents***.
5.	Select ***Java Platform 2***.
6.	Select ***Available Software/Install***.
7.	Select ***OK***.
8.	Select ***OK*** on the COE Message.
9.	Select "Yes" to accept the license agreement.
10.	Select "Browse" and change destination drive letter to "D" keeping the same path.
11.	Select ***OK***.
12.	Select "Yes" to create the folder.
13.	Select ***Next*** to proceed.
14.	Select "No." Do not restart the computer. Select ***Finish***.
15.	Select ***OK*** to complete install. Select ***OK*** after install has finished.
16.	Now select "JAVA Platform 2" from the **Installed Software** window in the COE Installer.
17.	Select ***Installed Software/Uninstall***.
18.	Select "Yes" to uninstall.
19.	Select ***OK***. Select ***OK*** on Add/Remove programs.
20.	DO NOT uninstall Java Platform 2 from the NT system.
21.	Select ***OK*** again.
22.	Select ***File/Select Source Drive***.
23.	Select "Yes" on the message to changing drives.
24.	Browse to the CD-ROM folder. Select folder "java2 blank." Select ***OK***.
25.	Select ***File/Read Table of Contents***.
26.	Select ***Java Platform2***.
27.	Select ***Available Software/Install***.

JAVA2	
Step	Procedure
28.	Select ***OK***.
29.	Select ***OK*** to complete install.
30.	Select ***OK*** after install has finished.
31.	Bring up Windows Explorer by selecting ***Start/Programs/Windows NT Explorer***.
32.	Navigate to "c:\WINNT\system32."
33.	Select "java.exe or java" and select ***Edit/Copy***.
34.	Navigate to "c:/h/COTS/Java2/bin."
35.	Select ***Edit/Paste***.
36.	Close the Windows Explorer.
37.	Right click on "My Computer." Select "Properties." Select the **Environment** tab.
38.	Select "Path" in the **System Variables** window. Add "D:\Program Files\JavaSoft\JRE\1.2\bin\classic" in the value edit box. Select "Set." Select ***OK***.
JMTK VISUALIZATION AND MAP DATA	
1.	DTSS Install Disk #1 should already be in the drive.
2.	Select ***File/Select Source Drive***. Select "Yes" to change source drive. Select the CD-ROM folder. Select ***OK***.
3.	Select ***File/Read Table of Contents***. Select "Integrated Foundation Library" in the **Available Software** window. Select Available Software/Install. Select ***OK*** to complete install.
4.	Select "JMTK-Visualization." In the **Available Software** window Select ***Available Software/Install***. Select ***OK***.
5.	Select "JMTK-V Map Data." Select ***Available Software/Install***. Select ***OK***. Eject the CD.
WINZIP	
1.	Insert Install Disk #2.
2.	Select ***File/Select Source Drive***.
3.	Click "Yes" to change the source drive.
4.	Browse to the CD-ROM folder.
5.	Select folder "winzip."
6.	Select ***OK***.
7.	Select ***File/Read Table of Contents***.
8.	Select "WinZIP."

WINZIP	
Step	Procedure
9.	Select ***Available Software/Install***.
10.	Change drive letter to “D” keeping the same path. Select ***OK***.
11.	Select ***Next***.
12.	Select “Yes” to accept the license agreement.
13.	Select ***Next***.
14.	Select “Start with WinZIP Classic.”
15.	Select ***Next***.
16.	Select “Express Setup.” Select ***Next***.
17.	Select ***Finish*** to complete the install.
18.	Select ***Close***. Select ***File/Exit*** to close WinZIP.
19.	Select ***OK*** to complete install.
20.	Select ***OK*** after install was successful.
WINTAR	
1.	Select ***File/Select Source Drive***.
2.	Select “Yes” to change the source drive.
3.	Browse to the CD-ROM folder.
4.	Select folder “wintar.”
5.	Select ***OK***.
6.	Select ***File/Read Table of Contents***. Select “No” to restart and select ***OK***. Select ***OK*** to complete install.
7.	Select “Win Tar.”
8.	Select ***Available Software/Install***.
9.	Select ***Next***.
10.	Select “Yes” to accept the license agreement. Enter Name: “DTSS.” (obtain the serial number from the floppy disk that contains the ESRI and ERDAS codes.)
11.	Enter the Serial No. (i.e. 01-2-001-5B2577-C17BA260).
12.	Select ***Browse*** and change the drive letter to “D” keeping the same path.
13.	Select ***OK***.
14.	When prompted to create directory select “Yes.” Select ***Next***.
15.	Select “No” to restart and select ***OK***.
16.	Select ***OK*** to complete install.
17.	Select ***OK*** for “Install was successful.”
EASY CD CREATOR DELUXE	
1.	Select ***File/Source Drive***. Select “Yes” to change the source drive. Select the cd-rom drive and select the “easy cd” folder.
2.	Select ***OK***. Select ***File/Read Table of Contents***.
3.	Select “Easy CD Creator Deluxe.” Select ***Available Software/Install***.

EASY CD CREATOR DELUXE	
Step	Procedure
4.	Select ***Next***. Select "Yes."
5.	Select ***Browse*** to change the directory from C: to D: keeping the same path.
6.	Select ***OK***. Select "Yes" to create the directory.
7.	Select ***Next***.
8.	Files will copy from the CD to the hard drive.
9.	Select "No" to restart computer.
10.	Select ***Finish***.
11.	Select ***OK*** to complete.
12.	Select ***OK*** to install was successful.
13.	Select "No" to reboot.
14.	Select ***File/Source Drive***.
15.	Select "Yes" to change the drives.
16.	Expand the CD-ROM drive and select the "wimage" folder.
17.	Select ***OK***.
18.	Select ***File/Read Table of Contents***.
19.	Select "Wide Image."
20.	Select ***Available Software/Install***.
21.	Select ***Next***.
22.	Select ***Browse***.
23.	Change the drive letter from C: to D: and keep the same path.
24.	Select "Yes" to create the directory.
25.	Select ***Next***.
26.	Select ***Next*** to keep the default selection.
27.	Select ***Next*** to create the program folder.
28.	A status bar will appear
29.	Select ***Finish***.
30.	Select ***OK*** to complete the install.
31.	Select ***OK*** for install was successful.
EZ SCSI	
1.	Select ***File/Select Source Drive***.
2.	Browse to the CD-ROM folder. Select folder "ezscsi."
3.	Select ***OK***.
4.	Select ***File/Read Table of Contents***.
5.	Select "Easy SCSI."
6.	Select ***File/Select Target Drive***.
7.	Choose the D: drive from the dropdown menu.
8.	Select ***OK***.
9.	Select ***Available Software/Install***.

EZ SCSI	
Step	Procedure
10.	Select “EZ-SCSI 5.0.”
11.	In the insert patch disk, type: “<cd rom drive letter>:\ezscsipatch” (e.g. I:\)
12.	Select ***OK***.
13.	Select “Yes” to accept the license agreement.
14.	Make sure “Typical” is selected and select ***Next***.
15.	All your scsi devices should show up. Select ***Next***.
16.	Select “other drive” and change the drive letter from c: to d: keeping the same path.
17.	Select ***Next***.
18.	A status bar will appear.
19.	Select ***OK*** for registry entry. Select ***OK*** for registry entry.
20.	Select ***Next***.
21.	Select ***Exit***.
22.	Select “Yes” to really exit.
23.	Select ***Exit***.
24.	Select ***OK*** to complete the install.
25.	Select ***OK*** for install was successful.
26.	Select “No” to reboot.
GEOTRANS	
1.	Select ***File/Source Drive***.
2.	Select “Yes” to change the drive.
3.	Expand the CD-ROM drive and select “geotrans.”
4.	Select ***OK***.
5.	Select ***File/Read Table of Contents***.
6.	Select “Geotrans.”
7.	Select ***Available Software/Install***.
8.	Select ***OK*** for the message to unzip.
9.	Select ***Extract*** on the winzip toolbar.
10.	Expand d: and select the “geotrans” folder under the d: drive.
11.	Select the **Extract** button.
12.	Select ***OK*** to complete the install.
13.	Select ***OK*** for “install was successful.”
TFTP	
1.	Select ***File/Source Drive***.
2.	Select “Yes” to change the drive.
3.	Select the “cd rom” folder and select the “utilities” folder.
4.	Select ***OK***.
5.	Select ***File/Read Table of Contents***.
6.	Select “TFTP and TeraTerm.”
7.	Select ***Available Software/Install***.
8.	Select “Yes” to accept the license agreement.

TFTP	
Step	Procedure
9.	Select ***Browse*** to change the drive letter from c: to d: keeping the same path.
10.	Select ***OK***.
11.	Select "Yes" to create.
12.	Select ***Next***.
13.	Select ***Next*** to create program folders.
14.	Files will copy.
15.	Keep the default selection and select ***Next***.
16.	Select ***Next***. Select ***Next***.
17.	Select "use taskbar icon."
18.	Select ***Finish***.
19.	Select ***Finish*** again.
20.	Select ***OK*** to complete the install.
21.	Select "No" to reboot.
22.	Select "java plug in."
23.	Select ***Available Software/Install***.
24.	Select "Yes" to accept the license agreement.
25.	Select ***Browse*** and change the drive letter from c: to d:
26.	Select ***OK***.
27.	Select ***Next***.
28.	Eject the CD.
NETSCAPE WEB BROWSER	
1.	Insert Install disk 1.
2.	Select ***File/Source Drive***.
3.	Select "Yes" to change the drive.
4.	Select the CD-ROM drive and select the "webbr" folder.
5.	Select ***OK***.
6.	Select ***File/Read Table of Contents***.
7.	Select "Netscape Web browser." Select ***Available Software/Install***.
8.	Select ***OK***.
9.	Files will extract.
10.	Select ***Next***.
11.	Select "Yes" to accept the license agreement.
12.	Select "custom" and change the destination directory from c: to d:
13.	Select ***Next***.
14.	Click "Yes" to create.
15.	Deselect all but "Communicator 4.75" and "multimedia support."
16.	Select ***Next***. Select ***Next*** to accept default selections.
17.	Deselect all but the first entry.
18.	Select ***Next***.
19.	Select ***Next*** to create program folders.

NETSCAPE WEB BROWSER	
Step	Procedure
20.	Select ***Install***.
21.	A status bar will appear.
22.	Select “No” to read the readme file.
23.	Select ***OK*** for netscape message.
24.	Select ***OK*** for coe message.
25.	Select ***OK*** for install was successful.
26.	Select “No” to reboot.
27.	Eject the CD.
28.	On the desktop select “aol instant messenger” and “free aol unlimited” by holding the ***[Shift]*** key and clicking on both of them.
29.	Press the ***[Delete]*** key.
MICROSOFT FRONT PAGE	
1.	Insert Install Disk 3.
2.	Select ***File/Source Drive***.
3.	Select “Yes” to change the drive.
4.	Select the CD-ROM drive and select the “front” folder.
5.	Select ***OK***.
6.	Select ***File/Read Table of Contents***.
7.	Select “Microsoft Front Page.”
8.	Select ***Available Software/Install***.
9.	Type in the user name and organization, if not already there.
10.	Type the CD-key located on the back of your CD-ROM jewel case that came with your system.
11.	Select ***Next***.
12.	Select “I accept the terms in the license agreement.”
13.	Select ***Next***.
14.	Select the **Customize** button.
15.	Change the install for “frontpage2000” from c: to d: keeping the same path.
16.	Select ***Next***.
17.	Select ***Install***.
18.	A status bar appears.
19.	Select “No” to reboot.
20.	Select ***OK*** to complete install.
21.	Select ***OK*** for “install was successful.”
22.	Select “Yes” to reboot.
23.	Eject the CD.
NETSCAPE IPLANET	
1.	After the workstation has restarted, the Defense Information Systems Agency (DISA) Security banner appears.
2.	Hold down the ***[Ctrl]*** and ***[Alt]*** keys, and press the ***[Delete]*** key. The security warning is displayed.

NETSCAPE IPLANET	
Step	Procedure
3.	Select ***OK*** from the security warning. The **Logon Information** window appears.
4.	Log into the system as Administrator and enter the Administrator's password. The **COE login Complete** window appears.
5.	Select ***OK***.
6.	Insert DTSS Install Disk #1.
7.	Select ***Start/DII Installer***.
8.	Select ***File/Select Source Drive***.
9.	Browse to the CD-ROM folder.
10.	Select the "ipent" folder.
11.	Select ***OK***.
12.	Select ***File/Read Table of Contents***.
13.	Select "iPlanet Enterprise Server."
14.	Select ***Available Software/Install***.
15.	Select ***Next***.
16.	Select "Yes" to accept the license agreement.
17.	Select "Typical" and then select ***Next***.
18.	Select ***Browse*** and change the drive letter to "D:" keeping the same path.
19.	Select "Yes" to create the directory.
20.	Select ***Next***.
21.	Keep the default setting and select ***Next***.
22.	Enter admin password "admin4Web." Re-type to confirm it.
23.	Select ***Next***. Select ***Next*** to keep default port id.
24.	Change the destination directory drive to "E:" and keep the same path.
25.	Select ***Next***.
26.	Select ***Install***.
27.	If you are presented with a message to replace a file, select "No."
28.	A status bar appears.
29.	Select "No. Do not restart the computer." Select ***Finish***.
30.	Select ***OK*** for "Install was successful." Select "No" to Reboot.
NORTON ANTIVIRUS	
1.	Select ***File/Source Drive***. Select "Yes" to change the source drive. Select the "cd rom" folder and choose the "NAV" folder.
2.	Select ***OK***.
3.	Select ***File/Read Table of Contents***.
4.	Select "Norton Antivirus."
5.	Select ***Available Software/Install***.
6.	Select ***Next*** to start install.
7.	Select "Yes" to accept the license agreement.

NORTON ANTIVIRUS	
Step	Procedure
8.	Select ***Browse*** and change the destination drive letter to "D" keeping the same path.
9.	Select ***OK***.
10.	Select "Yes" to create the directory.
11.	Select ***Next***.
12.	Select "Unmanaged" and select ***Next***.
13.	Select "File System Real-time Protection" and select ***Next***.
14.	Select ***Next***.
15.	Select the box next to "Don't remind me" and select ***Close*** for the old virus definition file.
16.	Select ***Next***. Select ***Next*** again.
17.	Deselect "Run LiveUpdate" after installation.
18.	Select ***Next***. Select ***Finish***.
19.	Select ***OK*** to complete the install.
20.	Select ***OK*** about default scan options.
21.	Select ***OK*** for "Install was successful."
22.	Select ***Start/Programs/Norton Antivirus Corporate Edition***.
23.	Expand "Scheduled Scans." Select "New Scheduled Scan."
24.	Type in the name "Daily Scan."
25.	Type in the description "Daily Scan of C & D."
26.	Select ***Next***. Select "Enable Scan."
27.	Select "Daily." Select Time: "10:30 PM" from the dropdown menu.
28.	Select ***Next***.
29.	Select the C drive and the D drive. Select ***Save***.
30.	Select "New Scheduled Scan."
31.	Type in the name "Weekly Scan."
32.	Type in the description "Weekly Scan of RAID."
33.	Select ***Next***.
34.	Select "Enable Scan."
35.	Select "Weekly."
36.	Select Day: "Saturday."
37.	Enter Time: "12:30 AM." Select ***Next***.
38.	Select the "E" drive.
39.	Select ***Save***.
40.	Expand "Configure."
41.	Select "File System Realtime Protection."
42.	Select "All Types."
43.	Select ***Close***. Select ***Exit***.
44.	Eject the CD.
NT PATCH	
1.	Insert DTSS Install Disk #1.

NT PATCH	
Step	Procedure
2.	Select ***File/Select Source Drive***.
3.	Select "Yes' to change the directory.
4.	Browse to the CD-ROM folder.
5.	Select folder "ntpth."
6.	Select ***OK***.
7.	Select ***File/Read Table of Contents***.
8.	Select "NT Patch Update."
9.	Select ***Available Software/Install***.
10.	Select "Yes" to proceed.
11.	Select ***File/Read Table of Contents***.
12.	Select ***OK*** for "Install was successful."
13.	Select "No" to Reboot.
MICROSOFT SECURITY EDITOR	
1.	Select ***File/Select Source Drive***.
2.	Select "Yes" to change the source drive.
3.	Browse to the CD-ROM folder.
4.	Select folder "Mssce."
5.	Select ***OK***.
6.	Select ***File/Read Table of Contents***.
7.	Select "MS Security Configuration Editor."
8.	Select ***Available Software/Install***.
9.	Select ***OK*** for the installing message.
10.	Select ***OK*** for service pack reinstall.
11.	Select ***OK*** to complete install.
12.	Select "Yes" to Reboot.
13.	After the workstation has restarted, the Defense Information Systems Agency (DISA) Security banner appears.
14.	Hold down the ***[Ctrl]*** and ***[Alt]*** keys, and press the ***[Delete]*** key. The security warning is displayed.
15.	Click ***OK*** to the security warning. The **Logon Information** window appears.
16.	Log into the system as Administrator and enter the Administrator's password. The **COE login Complete** window appears.
17.	Select ***OK***.
MICROSOFT SECURITY EDITOR TEMPLATES	
1.	Select ***Start/DII Installer***.
2.	Select ***File/Select Source Drive***.
3.	Browse to the CD-ROM folder. Select folder "Msscet."
4.	Select ***OK***.
5.	Select ***File/Read Table of Contents***.
6.	Select "MS Security Config Templates."
7.	Select ***Available Software/Install***.

MICROSOFT SECURITY EDITOR TEMPLATES	
Step	Procedure
8.	Select “Configure.” Enter “WKSTN.” Select ***OK***.
9.	Select ***Analyze/Config***.
10.	Select ***OK*** for registry editor message. Select ***OK*** again. Select ***OK*** again. Select ***OK*** again. Select ***OK*** again.
11.	Select ***OK*** to “install was successful.”
12.	Select “Yes” to Reboot.
13.	After the workstation has restarted, the Defense Information Systems Agency (DISA) Security banner appears.
14.	Hold down the ***[Ctrl]*** and ***[Alt]*** keys, and press the ***[Delete]*** key. The security warning is displayed.
15.	Select ***OK*** from the security warning. The **Logon Information** window appears.
16.	Log into the system as Administrator and enter the Administrator’s password. The **COE login Complete** window appears.
17.	Select ***OK***.
18.	Double click the **Microsoft Management** icon on the desktop.
19.	Select ***Console/Add/Remove Snap-in***.
20.	Select ***Add***. Select “Security Configuration Manager.”
21.	Select ***Add***. Select ***Close***. Select ***OK***.
22.	Right click on ***Console Root/Security Configuration Manager/Database: Not Loaded***.
23.	Select “Analyze system now.” Select ***OK*** for log file.
24.	Close log file.
25.	Expand “Local Policies” under Database. Select “Security Options.”
26.	Right click on “Restrict CDROM Access.” Select “Security.” Select “Disable.” Select ***OK***.
27.	Right click on “Database” and select “Configure System Now.”
28.	Select ***OK*** to generate log file.
29.	Select ***Console/Exit***. Select “NO.” Do not save settings.
ADOBE PHOTOSHOP	
1.	Insert DTSS Install Disk #2.

ADOBE PHOTOSHOP	
Step	Procedure
2.	After the workstation has restarted, the Defense Information Systems Agency (DISA) Security banner appears.
3.	Hold down the ***[Ctrl]*** and ***[Alt]*** keys, and press the ***[Delete]*** key. The security warning is displayed.
4.	Select ***OK*** from the security warning. The **Logon Information** window appears.
5.	Log into the system as Administrator and enter the Administrator's password. The **COE login Complete** window appears.
6.	Select ***OK***.
7.	Select ***Start/DII Installer***.
8.	Select ***File/Select Source Drive***. Browse to the CD-ROM folder. Select folder "adobe." Select ***OK***.
9.	Select ***File/Read Table of Contents***.
10.	Select "Adobe Photoshop 5.5."
11.	Select ***Available Software/Install***.
12.	Select ***Next***. Choose "United States."
13.	Select ***Next***.
14.	Select ***Accept*** to accept the license agreement.
15.	Select "Typical."
16.	Select ***Browse*** and change the drive letter to "D" keeping the same path.
17.	Select ***OK***.
18.	Select ***Next***.
19.	Select ***Next***.
20.	Type in Last Name: "DTSS."
21.	Enter in Company: "US Army TEC."
22.	Enter Serial Number off of the Adobe Photoshop CD (use "PWW550R7263103-727"). Select ***Next***.
23.	Select ***Next***.
24.	Uncheck the check boxes.
25.	Select ***Finish***.
26.	Select ***OK***.
27.	Select ***OK*** to complete install.
28.	Select ***OK*** to the reboot message.
29.	Select ***OK*** after install was successful.
30.	Eject the CD.
31.	Right click on the **Start** button. Select "Explore All Users."
32.	Navigate to \Profiles\Administrator\Start Menu\Programs. Press ***[Crtl]*** and "V" at the same time.

UPDATE SYSTEM SECURITY LEVEL	
Step	Procedure
1.	Insert DTSS Install Disk #1
2.	Select ***File/Select Source Drive***. Select "Yes" to change the drive.
3.	Browse to the CD-ROM folder.
4.	Select folder "updtsl."
5.	Select ***OK***.
6.	Select ***File/Read Table of Contents***.
7.	Select "COE Update System Security Level."
8.	Select ***Available Software/Install***.
9.	Select ***OK*** to configure security banner.
10.	Minimize the COE Installer Console to see the install dialog box.
11.	Select "Server Type Network." Select ***File/Close***.
12.	Select "Yes" to save before exit.
13.	Enter "DII COE 4.2" for System Information. Change Classification Level to "UNCLASS."
14.	Select ***File/Close***. Click "Yes" to save before exit.
15.	Select ***OK*** to complete install.
SECURITY BANNER	
1.	Select ***File/Select Source Drive***.
2.	Browse to the CD-ROM folder. Click "Yes" to change the drive.
3.	Select folder "Security Banner."
4.	Select ***OK***.
5.	Select ***File/Read Table of Contents***.
6.	Select "COE Security Banner."
7.	Select ***Available Software/Install***.
8.	Select ***OK*** to complete install.
9.	Exit COE Installer.
10.	Open Windows Explorer.
11.	Navigate to c:\h\Secbnr\bin.
12.	Right click on SECBNR_Service.exe and select "Create Shortcut."
13.	Select shortcut and select "Cut."
14.	Navigate to c:\WINNT\Profiles\All Users\Start Menu\Programs\Startup and Paste shortcut.
MICROSOFT OFFICE	
1.	Insert DTSS Install Disk #3.
2.	Select ***Start/DII Installer***.
3.	Select ***File/Select Source Drive***. Select "Yes" to change the drive.
4.	Browse to the CD-ROM folder.
5.	Select folder "office."
6.	Select ***OK***.
7.	Select ***File/Read Table of Contents***.
8.	Select "Microsoft Office 2000 Pro."
9.	Select ***Available Software/Install***.

MICROSOFT OFFICE	
Step	Procedure
10.	Eject the DTSS Install CD and insert the MS Office 2000 CD.
11.	Wait for the Office CD to auto-run.
12.	Enter User Name: "DTSS."
13.	Enter Organization: "US ARMY TEC."
14.	Enter CD Key "CGF2J-GW77R-6CJGJ-9DVTQ-6GRMM" or use the key from the Office CD case.
15.	Select ***Next***.
16.	Select "I accept the terms of the License agreement," and select ***Next***.
17.	Select "Customize Icon."
18.	Change the destination directory from C: to D: keeping the same path.
19.	If the **Files In Use** window appears, select "Ignore."
20.	Select "NO, Do Not Restart Computer."
21.	Select ***OK*** to complete install.
22.	Select ***OK*** after install has been successful.
23.	Select ***OK*** for "Install was successful." Select "No" to Reboot.
24.	Eject the CD.
25.	Close the Windows Explorer.
26.	Select ***Start/Shutdown***. Select "Restart Computer" and select "Yes."
27.	After the workstation has restarted, the Defense Information Systems Agency (DISA) Security banner appears.
28.	Hold down the ***[Ctrl]*** and ***[Alt]*** keys, and press the ***[Delete]*** key. The security warning is displayed.
29.	Select ***OK*** from the security warning. The **Logon Information** window appears.
30.	Log into the system as Administrator and enter the Administrator's password. The **COE login Complete** window appears.
31.	Select ***OK***.
CMP	
1.	Insert DTSS Install Disk #1.
2.	Select ***Start/DII Installer***.
3.	Select ***File/Select Source Drive***.
4.	Browse to the CD-ROM folder.
5.	Select folder "CMP."
6.	Select ***OK***.
7.	Select ***File/Read Table of Contents***.
8.	Select "CMP."
9.	Select ***Available Software/Install***.
10.	Select ***Next***.
11.	Enter Name: "DTSS." Enter Company: "US ARMY TEC."
12.	Select ***Next***.
13.	Select ***Browse*** and change the destination drive letter to "D."

CMP	
Step	Procedure
14.	Select ***OK*** and select "Yes" to create the directory.
15.	Select ***Next***. Select "Client." Select ***Next***.
16.	Enter Number "8."
17.	Select ***Next***.
18.	Select ***Next***.
19.	Select ***Next***.
20.	Select "No. Do Not Restart Computer."
21.	Select ***Finish***.
22.	Click ***OK*** for "Install was successful."
23.	Eject the CD.
ARCINFO	
1.	Insert DTSS Install Disk #7.
2.	Before you install ArcInfo you must put the dongle on the lpt port located on the back of the VCU.
3.	Insert a floppy disk with the ESRI and ERDAS codes into the floppy drive.
4.	Double click "My Computer." Select "A:/" Select the "vcuesri" and select ***Edit/Copy***.
5.	Close the window.
6.	Double click "C:/" and right click on an open space and select ***New/Folder***.
7.	Name the folder "Licenses."
8.	Open the newly created "Licenses" folder and select ***Edit/Paste***.
9.	Close the window.
10.	Select ***File/Select Source Drive***.
11.	Click "Yes" to change the source drive.
12.	Browse to the CD-ROM folder.
13.	Select folder "ArcInfoDesk."
14.	Select ***OK***.
15.	Select ***File/Read Table of Contents***.
16.	Select "ArcInfo Desktop."
17.	Select ***Available Software/Install***.
18.	Select ***Next***.
19.	Select "Install the ArcInfo Desktop 8.0.2 Software."
20.	Select ***Next***.
21.	Select "Install the ArcInfo Desktop 8.02 Software," if not all ready selected. Select ***Next***.
22.	Be sure that "I will be using the License Manager locally on this computer" is selected.
23.	Select ***Next***.
24.	Select ***Browse*** and navigate to "C:\Licenses." Choose the "vcuesri" license file.
25.	Select ***Open***.
26.	Select ***Next***.

ARCINFO	
Step	Procedure
27.	Select ***Next***.
28.	Select ***Browse*** and change the destination drive to "D" keeping the same path.
29.	Select ***OK***.
30.	Select ***Next***.
31.	Select all items.
32.	Select ***Next***.
33.	Select ***Next*** to install Microsoft Internet Explorer.
34.	Select ***Next***.
35.	Select ***Install***.
36.	Select "Yes" to setup sample data.
37.	Select ***Next***.
38.	Select ***Next***. Select ***Next***.
39.	Select ***Install***.
40.	Select ***Finish***.
41.	Select ***Next*** on ArcToolbox Geoprocessing.
42.	Select "No, Do Not restart computer."
43.	Select ***OK***.
44.	Select ***Finish***.
45.	Select ***OK*** to complete install.
46.	Select ***OK*** after install has finished.
47.	Select ***OK*** for "Install was successful."
48.	Select "Yes" to Reboot.
49.	Eject the CD.
50.	After the workstation has restarted, the Defense Information Systems Agency (DISA) Security banner appears.
51.	Hold down the ***[Ctrl]*** and ***[Alt]*** keys, and press the ***[Delete]*** key. The security warning is displayed.
52.	Select ***OK*** from the security warning. The **Logon Information** window appears.
53.	Log into the system as Administrator and enter the Administrator's password. Wait for ArcInfo to finish setup. The **COE login Complete** window appears.
54.	Select ***OK***.
55.	Select ***Start/DII Installer***.
56.	Insert the Install Disk #8.
57.	Select ***File/Select Source Drive***.
58.	Select the CD-ROM folder and select "ArcInfo Work."
59.	Select ***OK***.
60.	Select ***File/Read Table of Contents***.
61.	Select "ArcInfo Workstation."
62.	Select ***Available Software/Install***.
63.	Select ***Next***.

ARCINFO	
Step	Procedure
64.	Select “Install the ArcInfo Workstation 8.0.2 software,” and select ***Next***.
65.	Select “Yes.”
66.	Select ***Next***.
67.	Select ***Next***.
68.	Select ***Next***.
69.	Change the “Workspace” folder drive to “D.”
70.	Select ***Next***.
71.	Select “Yes” to create the directory.
72.	Select ***Install***.
73.	Select “No, Do Not restart computer.”
74.	Select ***OK***.
75.	Select ***Finish***.
76.	Select ***OK*** to complete install.
77.	Select ***OK*** after install has finished.
78.	Select ***OK*** for “Install was successful.” Select “Yes” to Reboot. Remove all media.
79.	After the workstation has restarted, the Defense Information Systems Agency (DISA) Security banner appears.
80.	Hold down the ***[Ctrl]*** and ***[Alt]*** keys, and press the ***[Delete]*** key. The security warning is displayed.
81.	Select ***OK*** from the security warning. The **Logon Information** window appears.
82.	Log into the system as Administrator and enter the Administrator’s password. The **COE login Complete** window appears.
83.	Select ***OK***.
84.	Insert Install Disk #7. Select ***Start/DII Installer***. Select ***File/Read Table of Contents***.
85.	Click ***File/Select Source Drive***.
86.	Select the CD-ROM drive and chose the folder “deskpatch.”
87.	Select “aipatc.”
88.	Select ***Available Software/Install***.
89.	Select ***Next***.
90.	Select ***Next***.
91.	Select “Yes” and select ***Next***.
92.	Select ***Next***.
93.	Select ***Next***.
94.	Select ***Finish***.
95.	Select ***OK***.
96.	Select ***OK*** to “install was successful.”
97.	Select ***OK*** after install has finished.

ARCINFO	
Step	Procedure
98.	Eject the CD.
99.	Insert DTSS Install Disk #8.
100.	Select ***File/Select Source Drive***. Select ***OK***.
101.	Select "Yes" to change the source drive.
102.	Browse to the CD-ROM folder.
103.	Select folder "workpatch."
104.	Select ***File/Read Table of Contents***.
105.	Select "aiwkpt."
106.	Select ***Available Software/Install***.
107.	Select ***Next***.
108.	Select ***Next***.
109.	Select "Yes" and select ***Next***.
110.	Select ***Next***.
111.	Select ***Next***.
112.	Select ***Finish***.
113.	Select ***OK*** to complete install.
114.	Eject the CD.
IMAGINE 8.4	
Step	Procedure
1.	Insert DTSS Install Disk #4.
2.	Select ***File/Source Drive***.
3.	Click "Yes" to change the drive.
4.	Browse to the CD-ROM folder.
5.	Select folder "Imagine 8.4."
6.	Select ***OK***.
7.	Select ***File/Read Table of Contents***.
8.	Select "Imagine."
9.	Select ***Available Software/Install***.
10.	Select ***Next***.
11.	Select "Yes" to accept the license agreement. Click ***Next***. Enter Name: "DTSS." Enter Company: "US ARMY TEC."
12.	Select ***Next***.
13.	Select ***Server/Local***.
14.	Select ***Next***.
15.	Click ***Browse*** and change the destination directory to "D" and keep the same path.
16.	Select ***OK***.
17.	Select ***Next***.
18.	Select "No."
19.	Select ***Next***.
20.	Check all items.

IMAGINE 8.4	
Step	Procedure
21.	Select ***Next***. Select ***Next***. Select ***Next***.
22.	Select ***Finish***.
23.	Select ***Cancel***.
24.	Select ***OK*** to complete install.
25.	Select ***OK*** after install has finished.
26.	Select "Yes" to Reboot.
27.	Eject the CD.
28.	After the workstation has restarted, the Defense Information Systems Agency (DISA) Security banner appears.
29.	Hold down the ***[Ctrl]*** and ***[Alt]*** keys, and press the ***[Delete]*** key. The security warning is displayed.
30.	Select ***OK*** from the security warning. The **Logon Information** window appears.
31.	Log into the system as Administrator and enter the Administrator's password. The **COE login Complete** window appears.
32.	Select ***OK***.
33.	Insert Install Disk #4.
34.	Select ***Start/DII Installer***.
35.	Select ***File/Select Source Drive***.
36.	Browse to the CD-ROM folder.
37.	Select folder "nitf."
38.	Select ***OK***.
39.	Select ***File/Read Table of Contents***.
40.	Select "Imagine NITF."
41.	Select ***Available Software/Install***.
42.	Select ***Next***.
43.	Select "Yes" to accept the license agreement.
44.	Select ***Next***. Select ***Next***.
45.	Select all items if not selected, and select ***Next***.
46.	Select ***Next***.
47.	Select ***OK*** to configure installation.
48.	Select ***Finish***.
49.	Select ***OK*** to complete install.
50.	Select ***OK*** after install was successful.
51.	Select ***File/Select Source Drive***.
52.	Select "Yes" to change the drive.
53.	Browse to the CD-ROM folder.
54.	Select folder "subpix."
55.	Select ***OK***.
56.	Select ***File/Read Table of Contents***.
57.	Select "Subpixel Classifier."
58.	Select ***Available Software/Install***.

IMAGINE 8.4	
Step	Procedure
59.	Select ***Next***.
60.	Select "Yes" to accept the license agreement.
61.	Select ***Finish***.
62.	Select ***OK*** to complete install.
63.	Select ***OK*** after install was successful.
64.	Select ***File/Select Source Drive***.
65.	Select "Yes" to change the directory.
66.	Browse to the CD-ROM folder.
67.	Select folder "adrg."
68.	Select ***OK***.
69.	Select ***File/Read Table of Contents***.
70.	Select "Erdas ADRG."
71.	Select ***Available Software/Install***.
72.	Select "Yes" to continue.
73.	Select ***Next***.
74.	Select ***Browse*** and change the Directory to D: and keep the same path.
75.	Select ***OK***.
76.	Select ***Next***.
77.	Select ***Next***.
78.	Select ***OK*** to complete the setup.
79.	Select ***OK*** for "install was successful."
80.	Select ***File/Select Source Drive***. Browse to the CD-ROM folder. Select folder "anaglyph." Select ***OK***.
81.	Select ***File/Read Table of Contents***.
82.	Select "ERDAS ANAGLYPH."
83.	Select ***Available Software/Install***.
84.	Select ***Next***. Select ***Next***. Select ***Next***. Select ***Next***.
85.	Select ***Finish***.
86.	Select ***OK*** to complete install.
87.	Select ***OK*** after install was successful.
88.	Eject the CD.
89.	Insert DTSS Install Disk #5.
90.	Select ***File/Select Source Drive***.
91.	Select "Yes" to change the drive.
92.	Browse to the CD-ROM folder. Select folder "stereo." Select ***OK***.
93.	Select ***File/Read Table of Contents***.
94.	Select "Stereo Analyst."
95.	Select ***Available Software/Install***.
96.	Select ***Next***. Select "Yes."

IMAGINE 8.4	
Step	Procedure
97.	Select ***Next***.
98.	Select ***Next***.
99.	Select ***Next***.
100.	Select ***Next***.
101.	Select ***Finish***.
102.	Select ***Finish***.
103.	Select ***Cancel***.
104.	Select ***OK*** to complete install.
105.	Select ***OK*** after install was successful.
106.	Select "No" to reboot.
107.	Navigate to Start\Programs\ERDAS Imagine 8.4.
108.	Select "Imagine Properties."
109.	Select the **Codewords** tab.
110.	Select load from file.
111.	Browse to the file that contains the codewords for the dongle on this machine.
112.	Double click "My Computer."
113.	Select C:\ Right click the users directory and select "Properties."
114.	Select the **Security** tab.
115.	Select the **Permissions** button.
116.	Select "Authenticated Users."
117.	In the type of access menu, select "Full Control."
118.	Select ***OK***. Select ***OK***.
119.	Close all windows except the dii installer.
120.	Eject the CD.
ARCVIEW	
1.	Insert DTSS Install Disk #6.
2.	Select ***File/Select Source Drive***.
3.	Select "Yes" to change the drive.
4.	Browse to the CD-ROM folder.
5.	Select folder "arcview."
6.	Select ***OK***.
7.	Select ***File/Read Table of Contents***.
8.	Select "ArcView 3.2."
9.	Select ***Available Software/Install***.
10.	Select ***Next***.
11.	Select "Yes" to accept the license agreement.
12.	Select "Local Install."
13.	Select ***Next***.
14.	Select "Typical."

ARCVIEW	
Step	Procedure
15.	Select ***Browse***. Change the destination directory to "D" and keep the same path.
16.	Select ***OK***. Select ***Next***.
17.	Select ***Next*** to use the default program folder.
18.	Select ***Install***.
19.	Select "No" to install crystal reports.
20.	Select "No. Do Not restart the computer."
21.	Select ***Finish***.
22.	Select ***OK*** to complete install.
23.	Select ***OK*** after install was successful.
24.	Select "Yes" to Reboot.
25.	Eject the CD.
26.	After the workstation has restarted, the Defense Information Systems Agency (DISA) Security banner appears.
27.	Hold down the ***[Ctrl]*** and ***[Alt]*** keys, and press the ***[Delete]*** key. The security warning is displayed.
28.	Select ***OK*** from the security warning. The **Logon Information** window appears.
29.	Log into the system as Administrator and enter the Administrator's password. The **COE login Complete** window appears.
30.	Select ***OK***.
31.	Select Start\Programs\ESRI\ArcView GIS 3.2a.
32.	Select "ArcView GIS 3.2a." Enter name: "DTSS." Enter Organization: "US Army TEC."
33.	Enter the registration number from the ArcView Documentation Box. (Use 798481123680)
34.	Select ***OK***.
35.	Select ***OK***.
36.	Select "No."
37.	Select ***File/Exit***.
38.	Select "No" to save.
39.	Right click on the **Start** button.
40.	Select "Explore All Users."
41.	Navigate to..\Profiles\Administrator\Start Menu\Programs.
42.	Select "ESRI."
43.	Press ***[Crtl]*** and "X."
44.	Navigate to..\Profiles\All Users\Start Menu\Programs.
45.	Press ***[Crtl]*** and "V."
WRITE DVD	
1.	Insert DTSS Install Disk #2.
2.	Select ***File/Select Source Drive***.

WRITE DVD	
Step	Procedure
3.	Browse to the CD-ROM folder.
4.	Select folder "write." Select ***OK***.
5.	Select ***File/Read Table of Contents***.
6.	Select "Write DVD."
7.	Select ***Available Software/Install***.
8.	Select ***Next***. Select "Yes" to accept the license agreement.
9.	Select ***Next***.
10.	Change the destination folder by selecting ***Browse*** and change the drive letter to D. Select ***OK***.
11.	Select ***Next***. Select ***Next*** to accept the default folder.
12.	Select "No, Do not restart computer."
13.	Select ***Finish***.
14.	Select ***OK*** to complete install.
15.	Select ***OK*** for "Install was successful."
16.	Eject the CD.
17.	Select "Yes" to reboot.
PERL	
1.	Log into the system as Administrator and enter the Administrator's password. The **COE login Complete** window appears.
2.	Select ***File/Select Source Drive***. Browse to the CD-ROM folder. Select folder "Perl." Select ***OK***.
3.	Select ***File/Read Table of Contents***.
4.	Select "Perl."
5.	Select ***Available Software/Install***.
6.	Type "D:\" in the Unzip to Folder. Select "Unzip." Select ***OK***. Select ***Close***.
7.	Select ***OK*** on the Registry update message. Select ***OK*** again.
8.	Select ***OK*** to complete install.
9.	Select ***OK*** after install has finished.
10.	Select ***OK*** for "Install was successful."
11.	Select "No" to Reboot.
12.	Remove all media.
13.	To eject the CD-ROM, navigate to drive "J" and right-click and select ***Eject***.
14.	Close the Windows Explorer.
15.	Select ***Start/Shutdown***. Select "Restart Computer" and select "Yes."
INFORMIX	
1.	Log into the system as Administrator and enter the Administrator's password. The **COE login Complete** window appears.
2.	Insert DTSS Install Disk #3
3.	Select ***Start/DII Installer***.
4.	Enter APM Authentication Password "monkey123."

INFORMIX	
Step	Procedure
5.	Select ***File/Select Source Drive***. Browse to the CD-ROM folder. Select folder "Informix."
6.	Select ***OK***.
7.	Select ***File/Read Table of Contents***.
8.	Select "INFORMIX-Internet Foundation."
9.	Select ***Available Software/Install***.
10.	Select "Accept" to accept the license agreement.
11.	Enter Serial Number: "AAC#J916509."
12.	Enter Serial Number Key: "YRRFKL." Select ***Next***.
13.	Change the destination to "D:\informix." Select ***Next***.
14.	Select "Yes" to create the directory.
15.	Deselect "Database Developers Kit." Select ***Next***. Select ***Next***. Select ***Next***.
16.	Select "Typical" and select ***Next***. Do not check "Enable Role Separation."
17.	Select ***Next***.
18.	Enter password "informix123" and confirm. Select ***Next***.
19.	Select ***Next*** to start copying files.
20.	Select ***Finish***.
21.	Select ***Next*** to leave the default Server Number.
22.	Change Dynamic Server Name to "ol_dtss."
23.	Select ***Next***. Select ***Next***.
24.	Select ***Next*** to accept machine setting.
25.	Select "Yes" to initialize Dynamic Server.
26.	Select ***OK*** on Installation message.
27.	Select ***OK*** on Server Installed message.
28.	Select ***OK*** on the installation message.
29.	Select "Typical" and select ***Next***.
30.	Select ***Next*** to keep the default folder.
31.	Select ***Next***.
32.	Select ***Next***.
33.	Enter Name "DTSS."
34.	Enter Company "US ARMY TEC."
35.	Select ***Next***.
36.	Select ***Next***.
37.	Select ***Finish*** to complete setup.
38.	Select ***Next***.
39.	Select "Yes" to accept the license agreement.
40.	Select ***Next***.
41.	Select "Typical" and select ***Next***. Select ***Next***.
42.	Select "Yes" to accept the license.
43.	Select "Continue." Select "Complete." Select ***OK*** to finish.
44.	Select ***OK*** to install Text Datablade.
45.	Select "Typical" and select ***Next***.

INFORMIX	
Step	Procedure
46.	Select ***Finish*** to complete.
47.	Select "Typical" and select ***Next***.
48.	Select ***Finish*** to complete.
49.	Select "Typical" and select ***Next***.
50.	Select ***Finish*** to complete.
51.	Select ***Next***.
52.	Select "Typical" and select ***Next***.
53.	Select ***Next*** to choose the default selections.
54.	Select ***Next*** to create the program folder.
55.	Select ***OK***.
56.	Select "Postpone" and select ***Next***.
57.	Select "No. Do Not Restart computer."
58.	Select ***Finish***.
59.	Select ***OK*** to complete install.
60.	Select ***OK*** after install has finished.
61.	Select "Data Director Web" from the COE Installer.
62.	Select ***Available Software/Install***.
63.	Select ***Next***.
64.	Select ***Next***.
65.	Enter Serial Number: "AAC#J916508."
66.	Enter Key: "FUXXKS."
67.	Select ***Next***.
68.	Enter Name: "DTSS."
69.	Enter Company: "US ARMY TEC."
70.	Select ***Next***.
71.	Select "Yes" to accept the license agreement.
72.	Select ***Next*** to keep the destination directory.
73.	Select "Typical" and select ***Next***.
74.	Select ***Next*** to create a program folder.
75.	Select ***Next***.
76.	Select "No. Do Not restart computer."
77.	Select ***Finish***.
78.	Select ***OK*** to complete install.
79.	Select ***OK*** after install.
80.	Select ***OK*** for "Install was successful."
81.	Select "No" to Reboot.
82.	Remove all media.
83.	To eject the CD-ROM, navigate to drive "J," right-click, and select ***Eject***.
84.	Close the Windows Explorer.
85.	Select ***Start/Shutdown***. Select "Restart Computer" and select "Yes."
86.	Log into the system as Administrator and enter the Administrator's password. The **COE login Complete** window appears.

INFORMIX	
Step	Procedure
87.	Open Windows Explorer.
88.	Navigate to “d\Informix\etc\.”
89.	Open “ONCONFIG.ol_dtss” from Notepad.
90.	Navigate to “TAPEDEV.”
91.	Replace “\\.\TAPE0” with “NUL.”
92.	Navigate to “LTAPEDEV.”
93.	Replace “\\.\TAPE1” with “NUL.”
94.	Select ***File/Save***.
95.	Select ***File/Exit***.
96.	Navigate to ***Start/Settings***.
97.	Select “Control Panel.”
98.	Double click on “Services.”
99.	Scroll down to “Informix IDS 2000-ol_dtss” and select it.
100.	Select “Startup.”
101.	Select “Automatic.”
102.	Select ***Close***.
103.	Select ***Start***. Select ***Close***.
104.	Navigate to Start\Programs\Informix Connect.
105.	Select “Informix SetNet32.”
106.	Under the **SetNet32 Environment** tab, select the following: Set INFORMIXDIR = D:\Informix Set INFORMIXSERVER = ol_dtss Set INFORMIXSQLHOSTS = \\<hostname>
107.	Under the **SetNet32 Server Information** tab, select the following: Set Informix Server = ol_dtss Set Hostname = <hostname> Set Protocolname = olsoctcp Set Service Name = dtssweb
108.	Under the **SetNet32 Host Information** tab, select the following: Set CurrentHost = <hostname> Set Username = informix Set Password = informix123
DTSS	
1.	Insert DTSS Install Disk #9.
2.	Select ***Start/DII Installer***.
3.	Enter APM Authentication Password “monkey123.”
4.	Select ***File/Select Source Drive***. Browse to the CD-ROM folder. Select folder “odbc.”
5.	Select ***OK***.
6.	Select ***File/Read Table of Contents***.
7.	Select “ESRI ODBC Drivers.”
8.	Select ***Available Software/Install***.

DTSS	
Step	Procedure
9.	Select “Continue.”
10.	Hold down the ***[Shift]*** key and select all items in the list.
11.	Select ***OK***. Select ***Close***. Select ***OK***.
12.	Select ***OK*** to complete install.
13.	Select ***File/Select Source Drive***. Browse to the CD-ROM folder. Select folder “dtss.”
14.	Select ***OK***.
15.	Select ***File/Read Table of Contents***.
16.	Select DTSS Build 7.0 NT Version.
17.	Select ***Available Software/Install***.
18.	Select ***Next***.
19.	Type the letter “D” for the destination drive.
20.	Select ***Next***.
21.	Type the letter “E” for the data destination directory.
22.	Select ***Next***.
23.	Select ***Finish***.
24.	Select ***OK*** to complete install.
25.	Select ***OK*** after install has finished.
26.	Select ***Start/Windows NT Explorer***.
27.	Navigate to the “c:\Temp” folder.
28.	Right click on the “Temp” folder and select “Properties.”
29.	Select “Security.”
30.	Select “Authenticated Users.”
31.	Select “Propagate Security.”
32.	Select “Full Control” and select ***Apply***.
33.	Close the **Property** screen.
DTSS WEBSITE	
1.	Select ***File/Select Source Drive***. Browse to the CD-ROM folder. Select folder “dtsswebsite.”
2.	Select ***OK***.
3.	Select ***File/Read Table of Contents***.
4.	Select “DTSS Web Site.”
5.	Select ***Available Software/Install***.
6.	Select ***Unzip***.
7.	Select ***OK***.
8.	Select ***Close***.
9.	Wait while the installer creates the database. It takes a while.
10.	Select ***OK*** to complete the install.
11.	Select ***OK*** after install has finished.
12.	Setup Website for Use. Go to http://localhost:8888/ and type in the admin username “admin” and password “admin4Web” Manage the <hostname> Server.

DTSS WEBSITE	
Step	Procedure
13.	Setup the download directory. Select “View Server Settings” on the left pane.
14.	In the right pane, select “Add Additional Directory.”
15.	Type in “/prodcache” for URL.
16.	Type in “D:/Netscape/Server4/prodcache” for local directory.
17.	Select ***Submit***.
18.	Setup the CGI directories. Select the **Programs** tab.
19.	Select “CGI Directory.” URL Prefix = cgi-bin. CGI Directory = D:/Netscape/Server4/cgi-bin.
20.	Select “ShellCGI Directory.” URL Prefix = scripts. CGI Directory = D:/Netscape/Server4/scripts.
21.	Setup the ODBC. Navigate to Start/Settings/Control Panel.
22.	Double click on Data Sources (ODBC).
23.	Select the System DSN tab.
24.	Select ***Add***.
25.	Select “Informix 3.31 32-bit.”
26.	Select ***Finish***.
27.	On the Informix ODBC Driver Setup dialog, select the **General** tab. Data Source Name = DTSSWeb. Description = DTSSWeb.
28.	Select the **Connection** tab Server Name = ol_dtss Host Name = <hostname> Service = dtssweb Protocol = olsoctcp Database Name = dtssdb User ID = informix Password = informix123
29.	Select ***OK***.
30.	Install Perl (TODO).
31.	Install both Web and Database Components.
32.	Select ***Next***.
33.	Select your Informix database server.
34.	Select ***Next***.
35.	Select ***Next*** to accept the default message.
36.	Select your blob (called psblob).
37.	Select ***Next***.
38.	Select your database (dtssdb) and select ***Next***.
39.	Select ***OK*** to accept the information message “Preparing to launch the webcaption creation utility.” This process will take a while.

DTSS WEBSITE	
Step	Procedure
40.	Select ***OK*** to accept the information message "Preaparing to launch the Administration Tool Schema creation utility." This process will take a while.
41.	Select "Yes" to install the APB/DDW 2.0 schema.
42.	Select ***OK*** to accept the information message "Preparing to Launch the AppPageBuilder."
43.	Select "Yes" to load the APB 2.0 application.
44.	Select ***OK*** to launch the AppPageBuilder 2.0 application utility.
45.	Select ***Next*** to the Web Configuration dialog.
46.	Select ***Next*** to accept the web server selected.
47.	Select your localhost server. Select ***Next***.
48.	Select "Yes" to reconfigure the Netscape Server.
49.	Select ***OK***.
50.	Select ***Next*** to accept the default location.
51.	Select "Yes" to reconfigure the web.cnf.
52.	Select ***OK*** to continue.
53.	Type in user "Informix" and password and select ***Next***.
54.	Select ***OK*** to accept the message.
55.	Select ***OK***.
56.	Select ***OK***.
57.	Select ***Finish***.
58.	Postinstall Steps. Setup the WebSite for use. Go to **http://localhost:8888/** and type in the admin username/password. *Manage* the <hostname> Server.
59.	Select ***OK*** on the Load Configuration Files popup dialog.
60.	Select the **Apply** button at the top right.
61.	Select the **Load Configuration Files** button.
62.	Setup the download directory. Select "View Server Settings" on the left pane.
63.	In the right pane, select "Add Additional Directory."
64.	Type in "/prodcache" for URL.
65.	Type in "E:/IFMXDATA/prodcache" for local directory.
66.	Select ***OK***.
67.	Select ***Save*** and ***Apply***.
68.	Select ***OK***.
69.	Setup the CGI directories. Click the **Programs** tab.
70.	Select "CGI Directory." URL Prefix = cgi-bin. CGI Directory = D:/Netscape/Server4/cgi-bin.
71.	Select ***OK***.
72.	Select ***Save*** and ***Apply***.
73.	Select ***OK*** on dialog Success Box.

DTSS WEBSITE	
Step	Procedure
74.	Select ShellCGI Directory. URL Prefix = scripts. Shell CGI Directory = D:/Netscape/Server4/scripts.
75.	Select ***OK***.
76.	Select ***Save*** and ***Apply***.
77.	Select ***OK*** on dialog Success box.
78.	Setup the HTML paths. Select ***Start/Run/Notepad***.
79.	From Notepad, select ***File/Open***.
80.	Navigate to: "D:\Netscape\Server\https-<hostname>\config"
81.	Select File types "*All Files (*.*)*"
82.	Select the File: "Obj.conf."
83.	Select ***Open***.
84.	Find the line that begins with "NameTrans fn=pfx2dir from /dtssdb/admin…"
85.	Highlight the line, and press ***[Ctrl]-C***, and ***[Ctrl]-V*** so that two of these identical lines exists right after each other.
86.	On the second line, change to "/dtssdb/admin to /dtssdb/DTSSWeb."
87.	Select ***File/Save***.
88.	Select ***File/Exit***.
89.	Open Netscape Navigator and go to the URL: **http://localhost:8888/**
90.	Type in (admin/password).
91.	Select the **Manage** button.
92.	Select ***OK*** on the popup dialog.
93.	Select ***Apply***.
94.	Select "Load Configuration Files."
95.	Select ***OK*** on the Success popup dialog.
96.	Setup the ODBC. Select ***Start/Settings/Control Panel/Data Sources (ODBC)***.
97.	Select the System DSN tab.
98.	Select ***Add***.
99.	Select "Informix 3.31 32-bit."
100.	Select ***Finish***.
101.	On the Informix ODBC Driver Setup dialog, select the **General** tab. Data Source Name = DTSSWeb Description = DTSSWeb
102.	Select the **Connection** tab. Server Name = ol_dtss Host Name = <hostname> Service = turbo Protocol = olsoctcp Database Name = dtssdb User ID = informix Password = informix123
103.	Select ***OK***.

DTSS WEBSITE	
Step	Procedure
104.	Reboot the machine and log back in as administrator.
105.	Set up the Database for Viewing Webpage. Select ***Start/Programs/Informix/Data Director for Web/Site Manager***.
106.	Select “ol_dtss” (login if necessary with informix/informix123).
107.	Select the folder “Not In Project.”
108.	Select the folder “images.”
109.	Select all the files in this folder, right click, and select “Check-In.”
110.	Select the folder “text.”
111.	Select all the files in this folder, right click, and select “Check-In.”
112.	Close Site Manager.
113.	From Netscape Navigator, load **http://localhost/dtssdb/admin**
114.	Add a new profile.
115.	Select the Configuration Name: “DTSSWeb”
116.	Select the Base New Config: “DDW.”
117.	Select ***Submit***.
118.	Change the MIval = /DTSSWeb/index.html
119.	Select ***Submit***.
120.	Select the **Mappings** button on the top bar.
121.	Set directory to: “dtssdb/DTSSWeb.”
122.	Select Username = Informix.
123.	Select Password = informix123.
124.	Retype Password = informix123.
125.	Select “DTSSWeb” from the dropdown menu.
126.	Select ***Submit***.
127.	Select ***OK***.
128.	Close Netscape.
129.	Check the URL for products page: **http://localhost/dtssdb/DTSSWeb**

3 LAPTOP SOFTWARE INSTALLATION

NOTE

If at any time during the installation you receive a message related to insufficient memory, change the target drive for the installed software.

LAPTOP WINDOWS NT INSTALL	
Step	Procedure
1.	*** Note: Install the Ethernet/Modem card before installing the Software.***
2.	Insert CD labeled “Bootable – Product Recovery CD-ROM for IBM ThinkPad T20 MT 2647” and power on the laptop by pressing the black power button located at the top center of the keyboard.
3.	After the system boots to the CD, press ***[Enter]***.
4.	Select the option: “Windows NT 4.0: Recover Windows NT 4.0, or change your operating system to Windows NT 4.0.”
5.	Insert IBM Product Recovery CD #2 and press ***[Enter]*** to continue.
6.	At the Main Menu, select “Full Recovery: Reformat your hard disk and restore all files” and press ***[Enter]*** to continue.
7.	Select “Accept” and select **Y** (yes) to continue.
8.	Select **Y** (yes) to continue with program recovery.
9.	Select **Y** (yes) for your hard disk to be reformatted and all files deleted.
10.	Respond **N** (no) to message.
11.	Insert IBM Product Recovery CD #1 and press ***[Enter]*** to continue.
12.	Insert IBM Product Recovery CD #2 and press ***[Enter]*** to continue.
13.	When recovery is complete, eject the CD and press ***[Ctrl]***, ***[Alt]***, and ***[Delete]*** to restart your computer.
14.	Go to NT 4.0 ACCOUNT INSTALLATION.
RECOVERY FROM AN ERROR #4	
1.	Insert the “Bootable Recovery” CD and reboot.
2.	Press ***[F5]*** to get to the A: prompt.
3.	Type “fdisk” and answer **N** (no) to the large disk support message.
4.	Answer **N** (no) to “Should NTFS partitions on all drives be treated as large?”
5.	Select “3” to delete partitions and press ***[Enter]***.
6.	Select “4” to delete Non-DOS Partition and press ***[Enter]***.
7.	Select “3” and press ***[Enter]***. Type **Y** (yes) to the “Do you wish to continue?” message.
8.	Press ***[Enter]***.
9.	Press ***[Esc]***.
10.	Select “4” to Delete Non-DOS Partition and press ***[Enter]***.
11.	Select “3” to delete partition.
12.	Select “2” and press ***[Enter]***.

RECOVERY FROM AN ERROR #4	
Step	Procedure
13.	Type **Y** (yes) to the "Do you wish to continue?" message.
14.	Press ***[Enter]***.
15.	Press ***[Esc]***.
16.	Select "1" and press ***[Enter]***.
17.	Select "1" and press ***[Enter]***.
18.	Press ***[Enter]*** at the "Volume Label" message.
19.	Type **Y** (yes) at the "are you sure" message.
20.	Press ***[Esc]***.
21.	Select "1". Press ***[Enter]***.
22.	Select "1." Select **Y** (yes) for "Maximum Available Size."
23.	Press ***[Esc]*** to exit "fdisk."
24.	Press ***[Ctrl]***, ***[Alt]***, and ***[Delete]*** and go to Step 2.
NT 4.0 ACCOUNT INSTALLATION	
1.	System will reboot into NT 4.0 Workstation and prompt the user for setup variables. At the **Windows NT Setup** window, select ***Next***.
2.	At the **License Agreement** window, select "I accept this Agreement" and select ***Next*** to continue.
3.	At the **Name and Organization** window, type in the following parameters: Name: "DTSS" Organization: "US Army TEC"
4.	Select ***Next*** to continue.
5.	At the **Computer Name** window, type in a name for your laptop that will uniquely identify it on the network (i.e., LAPTOP<system_number>). Select ***Next*** to continue.
6.	At the **Administrator Account** window, set the password to "coconut123" and confirm it. Select ***Next*** to continue.
7.	Setup is now complete. Select ***Finish*** to continue. The system will reboot again.
SERVICE PACK 6A INSTALLATION	
1.	When the system reboots, you will be prompted to logon by pressing ***[Ctrl]***, ***[Alt]***, and ***[Delete]***.
2.	A logon window will appear with the username listed and a blank password window. Hit enter for the administrator account, type in "coconut123" and select ***OK*** to continue.
3.	Insert your Windows NT SP6.a disk; this will ready your system for network setup.
4.	Double click "My Computer." Double click your CD-ROM drive and then double click "sp6i386" to install the service pack.
5.	Select "Accept the License Agreement (must accept before installing the Service Pack and deselect Backup files necessary to uninstall this Service Pack at a later time (requires approximately 60MB additional disk space)." Select ***Install*** to continue.

SERVICE PACK 6A INSTALLATION	
Step	Procedure
6.	Remove the SP6.a CD and select ***Restart*** to continue.
DISK ADMINISTRATION	
1.	Log in as the Administrator.
2.	Select ***Start/Programs/Administrative Tools (Common)/Disk Administrator***.
3.	Right click on the unpartitioned space next to **C:**, and choose "Create." Select "Yes." Select ***OK***, and accept the default parameters for creating a partition. The size of this new partition will include all remaining disk space on the hard drive. Select "Yes."
4.	Right click on the new partition and choose "commit changes now." Select "Yes." Select ***OK***.
5.	Right click on the CD-ROM drive and choose "assign a drive letter." Assign a letter such as "F" or "G" so that the new partition can be set-up as the D:\ drive. Select ***OK***. Select "Yes."
6.	Right click on the new partition and choose "assign drive letter." Assign "D" for this partition. Select ***OK***. Select "Yes."
7.	Right click on the CD-ROM drive again and choose "assign drive letter." This time reset this drive letter to "E" so that all partitions are logically ordered. Select ***OK***. Select "Yes."
8.	Right click on the D:\ drive and choose "format."
9.	Select "NTFS" and accept all other default parameters. Select ***Start*** and then exit Disk Administrator.
10.	Select ***Close***. Select ***File/Exit*** on Disk Administrator.
11.	Select ***Start/Programs/Command Prompt***.
12.	At the prompt type: **"convert c: /FS:NTFS"** and press ***[Enter]***.
13.	Type **Y** (yes) and press ***[Enter]*** when asked. Select ***Exit*** to close.
14.	Go to ***Start/Settings/Control Panel/System*** and select the **Performance** tab.
15.	Within the **Virtual Memory** window, select "Change."
16.	You will need to change the Virtual Memory settings and your C:\ drive and D:\ drive to the following: C:\ = 2MB (min & max), select ***Set***, D:\ = 524MB (min & max), select ***Set***.
17.	In the **Registry Size** window, change the maximum size to "60MB." Select ***OK***, Select ***Close***.
18.	Select ***Restart***. Select "Yes," and select ***OK***.
NETWORKING	
1.	When the computer reboots, you are ready to configure networking components. Log in as Administrator. Right click on "Network Neighborhood."
2.	Select ***Properties*** and a **Network Configuration** window will appear asking you if you would like to install Windows NT Networking. Select "Yes" to continue.
3.	Select "Wired to the Network" and then select ***Next*** to continue.

NETWORKING	
Step	Procedure
4.	Insert the disk labeled “IBM CD-ROM for 10/100 EtherJet Mini-PCI Adapter with 56K Modem.”
5.	Select the “Select from List” option and then select ***OK***.
6.	Select “Have disk,” and then select ***OK***.
7.	Type “E:\Ethernet” for the path and then select ***OK***.
8.	Select ***OK***.
9.	Select ***Next*** to continue.
10.	In the **Network Protocols** window, make sure “TCP/IP” and “NetBEUI” are checked. Select ***Next*** to continue.
11.	Make sure all Network Services are selected. Select ***Next*** to continue.
12.	Select ***Next*** to install selected components.
13.	At the **Setup Needs to Copy Some Windows NT Files** window, type the path “c:\i386.” Select ***Continue***.
14.	Select “No.”
15.	At the **Microsoft TCP/IP Properties** window enter the following information in the tabs to configure a static IP address: **IP ADDRESS** Adapter should read [1] Intel® PRO/100+ MiniPCI. Make sure “Specify” on IP Address is selected. Type in your appropriate IP address, subnet mask and default gateway. IP address: *192.168.<system_number>.3* Subnet Mask: *255.255.255.0* Default Gateway: *192.168.<system_number>.1* **DNS** No configuration needed. **WINS ADDRESS** No configuration needed. **ROUTING** No configuration needed. Select ***OK***. Select “Yes” on the **WINS** screen.
16.	At the **Services** window, all services will be enabled. Select ***Next*** to continue.
17.	Select ***Next*** to continue and start the network.
18.	Select and identify the name of your workgroup (ex: dtssd). Select ***Next*** to continue.
19.	Networking has been installed on your computer. Select ***Finish*** to continue.
20.	At the message “Do you want to restart your computer?” select “No.”
21.	Return to SERVICE PACK 6A INSTALLATION and reinstall Service Pack 6.a.
PORT/MODEM CONFIGURATION	
1.	Log in as Administrator.
2.	First you will need to configure a port for the modem. Select ***Start/Settings/Control Panel/Ports***.

PORT/MODEM CONFIGURATION	
Step	Procedure
3.	Delete any “com” ports that appear.
4.	Select ***Add*** and choose an available port number.
5.	The base I/O address will remain the same for each port. Set the following ports: **COM 1** should be set at **IRQ = 3** **COM 2** should be set at **IRQ = 4**.
6.	Restart the computer only after both ports are created.
7.	Log in as administrator.
8.	To configure the modem, select Start->Settings->Control Panel->Modems.
9.	If **Modem Xircom MPCI Mode 56** is not present, insert the “IBM CD-ROM for 10/100 Ether Jet Mini-PCI Adapter with 56K Modem” in the CD-ROM drive.
10.	Select ***Add*** and make sure to check “don’t detect my modem, select from a list.” Select ***Next***. Select “have disk.”
11.	For the path, type: “e:\modem.” Select ***Browse***.
12.	Double click “W9x&NT4.” Double click “Ltc000c0” to install modem drivers. Select ***OK***.
13.	Highlight **Xircom MPCI+ Modem 56 WinGlobal** and select ***Next*** to continue.
14.	Make sure “selected ports” is checked and select the “COM2” port to configure for the modem. Select ***Next*** to continue. Select ***OK*** on the Insert Disk message. Select ***Browse*** and select “Tpmdmxi.cab” in the in E:\Modem\W9X&NT4 directory.
15.	The **Xircom MPCI+ Modem 56 WinGlobal** should be listed in the modem window. Select ***OK***. Select ***Finish***. Select ***Close*** to continue.
16.	Go to ***Start/Settings/Control Panel/Devices*** and find the Lucent Modem device.
17.	Select ***Start/Shut Down*** and select “Shut Down the computer.”
18.	Power on the laptop. When the machine reboots, press ***[F1]*** to enter BIOS setup. Select “Config,” and then “Serial Port.” Make sure the serial port configuration is set to “Enabled” and press ***[F10]*** to save and exit. Select “Yes.”
DTSS LOGO SETUP	
1.	Insert DTSS Install Disk #9.
2.	Double click “My Computer” and the CD-ROM drive.
3.	Right click on “DTSSlogo7a” and select ***Copy***.
4.	Double click “My Computer,” “C:,” and “Winnt40 directory.”
5.	Right click in the Winnt40 directory and select ***Paste*** to copy in the logo. Select ***File/Close*** on “My Computer.”
6.	Go to ***Start/Settings/Control Panel/Display***.
7.	Click on the **Background** tab and select “DTSSlogo7a” in the wallpaper menu. Then select ***Center*** and ***Apply*** to continue.

DTSS LOGO SETUP	
Step	Procedure
8.	Click on the **Appearance** tab and change the color setting to "black." Select ***OK*** to continue and confirm settings. Swap out the CD-ROM drive for the floppy drive and reboot.
EMERGENCY REPAIR DISK	
1.	Log on as Administrator select ***Start/Programs/Command Prompt***. At the command line type "rdisk /s."
2.	Insert a 3.5 disk into the floppy drive to create an Emergency Repair Disk, and select "Yes" to continue. Select ***OK*** on the ***NT Security*** window.
DII COE INSTALL	
1.	Log into the system as Administrator and enter the administrator's password.
2.	From the **Start** menu, select ***Programs/Administrative Tools(Common)/Event Viewer***.
3.	Select the application option from the log menu. A log appears showing Application events.
4.	Select the "Clear All Events" option from the log menu. A window opens to provide a chance to save the event log.
5.	Click on the "No" button to continue without saving the event log.
6.	Click on the "Yes" button on the confirmation window to clear all events from the events log.
7.	Close the **Event Viewer** window by selecting ***Exit*** from the Log menu.
8.	Insert the DTSS Install Disk #1 CD-ROM for the DII COE Kernel Version 4.2.0.0 into the CD-ROM drive.
9.	Select ***Run*** from the **Start** menu.
10.	In the box labeled "Open," type "cd rom letter:\setup." (e.g. I:\setup)
11.	Select ***OK***. The **Welcome** window appears.
12.	Select ***Next***. Select "Yes" Several InstallShield progress bars appear as files copy to the system.
13.	Check the "APM Authenticate" check box to enable it.
14.	Select ***Next***. The **Enter Information** window appears.
15.	In the text box, type the hostname of the machine on which you are now installing the Kernel, if not already displayed.
16.	Select ***Next***. The **secman password** window appears.
17.	Type a password of at least 8 characters for the Security Administration (secman) account in the "Password:" and "Confirm Password:" text boxes. (use "buildnt7.0") Ensure that the same password is entered in both text boxes, as no text is echoed to the screen.
18.	Select ***OK***. The **Enter APM Authentication Key** window appears.

DII COE INSTALL	
Step	Procedure
19.	Type an authentication key (password) containing between 6 and 16 characters in the "Password:" and "Confirm Password:" text boxes. (use "monkey123") Ensure that the same key is entered in both text boxes, as no text is echoed to the screen.
20.	Select ***OK***. The loaded kernel window appears.
21.	Select the "Yes, I want to Restart" option.
22.	Remove all disks from all disk drives.
23.	Select ***Finish*** and wait for the workstation to restart. After the workstation has restarted, the Defense Information Systems Agency (DISA) Security banner appears.
24.	Hold down the ***[Ctrl]*** and ***[Alt]*** keys, and press the ***[Delete]*** key. The security warning is displayed.
25.	Select ***OK*** from the security warning. The **Logon Information** window appears.
26.	Log into the system as Administrator and enter the Administrator's password. The **COE login Complete** window appears.
27.	Select ***OK***.
28.	Log out.
29.	Log into the system as Secman and enter password " buildnt7.0." You will be asked to change your password. Enter new password "Security123" and retype it to confirm. Select ***OK***. Select ***OK*** again. Select ***OK*** on the COE login message.
30.	Select ***Start/Programs/COE Profile Selector***.
31.	Choose SSO default in the available profiles. Select ">>Add" Select ***OK***. Select ***Done*** Select ***Start/Programs/DII Applications/SecAdmin/Edit APM Configuration***. Deselect "Enable Authentication." Select "Submit" and select ***OK***.
32.	Log out.
33.	Log into the system as Administrator and enter the Administrator's password. The **COE login Complete** window appears. Select ***OK***.
34.	Insert the DII COE 4.2 CD #1.
35.	Select ***DII Installer*** from the **Start** menu.
36.	Select ***File/Select Source Drive***. Browse to the CD-ROM folder. Select ***OK***.

DII COE INSTALL	
Step	Procedure
37.	Select ***File/Read Table of Contents***. Scroll down. Select "DII COE 4.2.0.0 Kernel Patch 1." Select ***Available Software/Install***. Select ***OK*** Remove all media. Select "Yes" to reboot.
38.	Log into the system as Administrator and enter the Administrator's password. The **COE login Complete** window appears. Select ***OK*** on the message.
39.	Insert the DTSS Install Disk #1.
40.	Select ***DII Installer*** from the **Start** menu.
41.	Select ***File/Select Source Drive***. Browse to the CD-ROM folder. Select "KP2" folder. Select ***OK***.
42.	Select ***File/Read Table of Contents***. Select "DII COE 4.2.0.0 Kernel Patch 2." **Select** *Available Software/Install***.** Select ***OK***. Remove all media. Select "Yes" to reboot.
43.	Select ***Finish*** and wait for the workstation to restart. After the workstation has restarted, the Defense Information Systems Agency (DISA) Security banner appears.
44.	Hold down the ***[Ctrl]*** and ***[Alt]*** keys, and press the ***[Delete]*** key. The security warning is displayed.
45.	Select ***OK*** from the security warning. The **Logon Information** window appears.
46.	Log into the system as Administrator and enter the Administrator's password. The **COE login Complete** window appears.
47.	Select ***OK***.
JAVA2	
1.	Insert DTSS Install Disk #1.
2.	Select ***Start/DII Installer***.
3.	Select ***File/Select Source Drive***. Browse to the CD-ROM folder. Select folder "java2." Select ***OK***.
4.	Select ***File/Read Table of Contents***.
5.	Select "Java Platform 2."
6.	Select ***Available Software/Install***.
7.	Select ***OK***.
8.	Select ***OK*** on the COE Message.
9.	Click "Yes" to accept the license agreement.

JAVA2	
Step	Procedure
10.	Select ***Browse*** and change destination drive letter to "D" keeping the same path.
11.	Select ***OK***.
12.	Select "Yes" to create the folder.
13.	Select ***Next*** to proceed.
14.	Select "No – Do Not restart the computer." Select ***Finish***.
15.	Select ***OK*** to complete install. Select ***OK*** for "install was successful."
16.	Now select "JAVA Platform 2" from the **Installed Software** window in COE Installer.
17.	Select ***Installed Software/Uninstall***.
18.	Select "Yes" to uninstall.
19.	Select ***OK***. Select ***OK*** on "Add/Remove programs."
20.	DO NOT uninstall Java Platform 2 from the NT system.
21.	Select ***OK*** again.
22.	Select ***File/Select Source Drive***.
23.	Select "Yes" on the message to changing drives.
24.	Browse to the CD-ROM folder. Select folder "java2 blank." Select ***OK***.
25.	Select ***File/Read Table of Contents***.
26.	Select "Java Platform2."
27.	Select ***Available Software/Install***.
28.	Select ***OK***.
29.	Select ***OK*** to complete install.
30.	Select ***OK*** after install has finished.
31.	Bring up Windows Explorer by selecting ***Start/Programs/Windows NT Explorer***.
32.	Navigate to "c:\WINNT\system32."
33.	Select "java.exe or java" and select ***Edit/Copy***.
34.	Navigate to "c:/h/COTS/Java2/bin."
35.	Select ***Edit/Paste***.
36.	Close the Windows Explorer.
37.	Right click on "My Computer." Select ***Properties***. Select the **Environment** tab.
38.	Select "Path" in the **System Variables** window. Add "D:\Program Files\JavaSoft\JRE\1.2\bin\classic" in the Value Edit box. Select ***Set***. Select ***OK***.
JMTK VISUALIZATION AND MAP DATA	
1.	DTSS Install Disk #1 should already be in the drive.

JMTK VISUALIZATION AND MAP DATA	
Step	Procedure
2.	Select ***File/Select Source Drive***. Select "Yes" to change the source drive. Select the CD-ROM folder. Select ***OK***.
3.	Select ***File/Read Table of Contents***. Select "Integrated Foundation Library" in the **Available Software** window. Select ***Available Software/Install***. Select ***OK*** to complete install.
4.	Select "JMTK-Visualization" in the **Available Software** window Select ***Available Software/Install***. Select ***OK*** to "install was successful."
5.	Select "JMTK-V Map Data." Select ***Available Software/Install***. Select ***OK*** to "install was successful." Eject the CD.
NETSCAPE WEB BROWSER	
1.	Insert Install Disk #1.
2.	Select ***File/Source Drive***.
3.	Select "Yes" to change the drive.
4.	Select the "cd rom" drive and select the "webbr" folder.
5.	Select ***OK***.
6.	Select ***File/Read Table of Contents***.
7.	Select "Netscape Web browser." Select ***Available/Software Install***.
8.	Select ***OK*** for the message
9.	Files will extract.
10.	Select ***Next***.
11.	Select "Yes" to accept the license agreement.
12.	Select "custom" and change the destination directory from c: to d:
13.	Select ***Next***.
14.	Select "Yes" to create.
15.	Deselect all but "Communicator 4.75" and "multimedia support."
16.	Select ***Next***. Select ***Next*** to accept the default selections.
17.	Deselect all but the first entry.
18.	Select ***Next***.
19.	Select ***Next*** to create program folders.
20.	Select ***Install***.
21.	A status bar will appear.
22.	Select "No" to read the readme file.
23.	Select ***OK*** for netscape message.
24.	Select ***OK*** for COE message.

NETSCAPE WEB BROWSER	
Step	Procedure
25.	Select ***OK*** for "install was successful."
26.	Select "No" to reboot.
27.	Eject the CD.
28.	On the desktop select "aol instant messenger" and "free aol unlimited" by holding the ***[Shift]*** key and clicking on both of them.
29.	Press ***[Delete]*** on the keyboard.
MICROSOFT FRONT PAGE	
1.	Insert Install Disk #3.
2.	Select ***File/Source Drive***.
3.	Select "Yes" to change the drive.
4.	Select the CD-ROM drive and select the "front" folder.
5.	Select ***OK***.
6.	Select ***File/Read Table of Contents***.
7.	Select "Microsoft Front Page."
8.	Select ***Available Software/Install***.
9.	Type in the user name and organization, if not already there.
10.	Type the CD-key located on the back of your CD-ROM jewel case that came with your system
11.	Select ***Next***.
12.	Select "I accept the terms in the license agreement."
13.	Select ***Next***.
14.	Select the "customize" button.
15.	Change the install for frontpage2000 from c: to d: keeping the same path.
16.	Select ***Next***.
17.	Select ***Install***.
18.	A status bar appears.
19.	Select "No" to reboot.
20.	Select ***OK*** to complete install.
21.	Select ***OK*** for "install was successful."
22.	Select "Yes" to reboot.
23.	Eject the CD.
NT PATCH	
1.	Insert DTSS Install Disk #1.
2.	Select ***File/Select Source Drive***.
3.	Select "Yes' to change the directory.
4.	Browse to the CD-ROM folder.
5.	Select folder "ntpth."
6.	Select ***OK***.
7.	Select ***File/Read Table of Contents***.
8.	Select "NT Patch Update."
9.	Select ***Available Software/Install***.
10.	Select "Yes" to proceed.

NT PATCH	
Step	Procedure
11.	Select ***File/Read Table of Contents***.
12.	Select ***OK*** for "Install was successful."
13.	Select "No" to Reboot.
MICROSOFT SECURITY EDITOR	
1.	Select ***File/Select Source Drive***.
2.	Select "Yes" to change the source drive.
3.	Browse to the CD-ROM folder.
4.	Select folder "Mssce."
5.	Select ***OK***.
6.	Select ***File/Read Table of Contents***.
7.	Select "MS Security Configuration Editor."
8.	Select ***Available Software/Install***.
9.	Select ***OK*** for installing message.
10.	Select ***OK*** for Service Pack Reinstall.
11.	Select ***OK*** to complete install.
12.	Select "Yes" to Reboot.
13.	After the workstation has restarted, the Defense Information Systems Agency (DISA) Security banner appears.
14.	Hold down the ***[Ctrl]*** and ***[Alt]*** keys, and press the ***[Delete]*** key. The security warning is displayed.
15.	Select ***OK*** from the security warning. The **Logon Information** window appears.
16.	Log into the system as Administrator and enter the Administrator's password. The **COE login Complete** window appears.
17.	Select ***OK***.
MICROSOFT SECURITY EDITOR TEMPLATES	
1.	Select ***Start/DII Installer***.
2.	Select ***File/Select Source Drive***.
3.	Browse to the CD-ROM folder. Select folder "Msscet."
4.	Select ***OK***.
5.	Select ***File/Read Table of Contents***.
6.	Select "MS Security Config Templates."
7.	Select ***Available Software/Install***.
8.	Select "Configure." Enter "WKSTN." Select ***OK***.
9.	Select ***Analyze/Config***.
10.	Select ***OK*** for registry editor message. Select ***OK*** again. Select ***OK*** again. Select ***OK*** again. Select ***OK*** again.

MICROSOFT SECURITY EDITOR TEMPLATES	
Step	Procedure
11.	Select ***OK*** to install was successful.
12.	Select "Yes" to Reboot.
13.	After the workstation has restarted, the Defense Information Systems Agency (DISA) Security banner appears.
14.	Hold down the ***[Ctrl]*** and ***[Alt]*** keys, and press the ***[Delete]*** key. The security warning is displayed.
15.	Select ***OK*** from the security warning. The **Logon Information** window appears.
16.	Log into the system as Administrator and enter the Administrator's password. The **COE login Complete** window appears.
17.	Select ***OK***.
18.	Double click the **Microsoft Management** icon on the desktop.
19.	Select ***Console/Add/Remove Snap-in***.
20.	Select ***Add***. Select "Security Configuration Manager."
21.	Select ***Add***. Select ***Close***. Select ***OK***.
22.	Right click on "Console Root" and select ***Security Configuration Manager/Database: Not Loaded***.
23.	Select "Analyze system now." Select ***OK*** for log file.
24.	Close log file.
25.	Expand "Local Policies" under Database. Select "Security Options."
26.	Right click on "Restrict CD-ROM Access." Select "Security." Select "Disable." Select ***OK***.
27.	Right click on "Database" and select ***Configure System Now***.
28.	Select ***OK*** to generate log file.
29.	Select ***Console/Exit***. Select "No." Do not save settings.
UPDATE SYSTEM SECURITY LEVEL	
1.	Insert DTSS Install Disk #1.
2.	Select ***File/Select Source Drive***. Select "Yes" to change the drive.
3.	Browse to the CD-ROM folder.
4.	Select folder "updtsl."
5.	Select ***OK***.
6.	Select ***File/Read Table of Contents***.
7.	Select "COE Update System Security Level."
8.	Select ***Available Software/Install***.
9.	Select ***OK*** to configure the security banner.
10.	Minimize the COE Installer Console to see install dialog box.
11.	Select "Server Type Network." Select ***File/Close***.

UPDATE SYSTEM SECURITY LEVEL	
Step	Procedure
12.	Select “Yes” to save before exit.
13.	Enter “DII COE 4.2” for System Information. Change the Classification Level to “UNCLASS.”
14.	Select ***File/Close***. Select “Yes” to save before exit.
15.	Select ***OK*** to complete install.
SECURITY BANNER	
1.	Select ***File/Select Source Drive***.
2.	Browse to the CD-ROM folder. Select “Yes” to change the drive.
3.	Select folder “Security Banner.”
4.	Select ***OK***.
5.	Select ***File/Read Table of Contents***.
6.	Select “COE Security Banner.”
7.	Select ***Available Software/Install***.
8.	Select ***OK*** to complete install.
9.	Exit COE Installer.
10.	Open Windows Explorer.
11.	Navigate to c:\h\Secbnr\bin.
12.	Right click on “SECBNR_Service.exe” and select ***Create Shortcut***.
13.	Select the shortcut and select ***Cut***.
14.	Navigate to c:\WINNT\Profiles\All Users\Start Menu\Programs\Startup and Paste the shortcut.
MICROSOFT OFFICE	
1.	Insert DTSS Install Disk #3.
2.	Select ***Start/DII Installer***.
3.	Select ***File/Select Source Drive***. Select “Yes” to change the drive.
4.	Browse to the CD-ROM folder.
5.	Select folder “office.”
6.	Select ***OK***.
7.	Select ***File/Read Table of Contents***.
8.	Select “Microsoft Office 2000 Pro.”
9.	Select ***Available Software/Install***.
10.	Eject the DTSS Install CD and insert MS Office 2000 CD.
11.	Wait for the Office CD to auto-run.
12.	Enter User Name: “DTSS.”
13.	Enter Organization: “US ARMY TEC.”
14.	Enter CD Key “CGF2J-GW77R-6CJGJ-9DVTQ-6GRMM” or use the key from the Office CD case.
15.	Select ***Next***.
16.	Select “I accept the terms of the License agreement” and select ***Next***.
17.	Select the “Customize” icon.
18.	Change the destination directory from C: to D: keeping the same path.
19.	If the **Files In Use** window appears, click “Ignore.”

MICROSOFT OFFICE	
Step	Procedure
20.	Select “No, Do Not Restart Computer.”
21.	Select ***OK*** to complete install.
22.	Select ***OK*** after install has been successful.
23.	Select **OK** for “Install was successful.” Select “No” to Reboot.
24.	Eject the CD.
25.	Close the Windows Explorer.
26.	Select ***Start/Shutdown***. Select “Restart Computer” and select “Yes.”
27.	After the workstation has restarted, the Defense Information Systems Agency (DISA) Security banner appears.
28.	Hold down the ***[Ctrl]*** and ***[Alt]*** keys, and press the ***[Delete]*** key. The security warning is displayed.
29.	Select ***OK*** from the security warning. The **Logon Information** window appears.
30.	Log into the system as Administrator and enter the Administrator’s password. The **COE login Complete** window appears.
31.	Select ***OK***.
CMP	
1.	Insert DTSS Install Disk #1.
2.	Select ***Start/DII Installer***.
3.	Select ***File/Select Source Drive***.
4.	Browse to the CD-ROM folder.
5.	Select folder “CMP.”
6.	Select ***OK***.
7.	Select ***File/Read Table of Contents***.
8.	Select “CMP.”
9.	Select ***Available Software/Install***.
10.	Select ***Next***.
11.	Enter Name: “DTSS.” Enter Company: “US ARMY TEC.”
12.	Select ***Next***.
13.	Select ***Browse*** and change the destination drive letter to “D.”
14.	Select ***OK*** and select “Yes” to create the directory.
15.	Select ***Next***. Select “Client.” Select ***Next***.
16.	Enter Number “8.”
17.	Select ***Next***.
18.	Select ***Next***.
19.	Select ***Next***.
20.	Select “No. Do Not Restart Computer.”
21.	Select ***Finish***.
22.	Select ***OK*** for “Install was successful.”
23.	Eject the CD.

ADOBE PHOTOSHOP	
Step	Procedure
1.	Insert DTSS Install Disk #2.
2.	After the workstation has restarted, the Defense Information Systems Agency (DISA) Security banner appears.
3.	Hold down the ***[Ctrl]*** and ***[Alt]*** keys, and press the ***[Delete]*** key. The security warning is displayed.
4.	Select ***OK*** from the security warning. The Logon Information window appears.
5.	Log into the system as Administrator and enter the Administrator's password. The **COE login Complete** window appears.
6.	Select ***OK***.
7.	Select ***Start/DII Installer***.
8.	Select ***File/Select Source Drive***. Browse to the CD-ROM folder. Select folder "adobe." Select ***OK***.
9.	Select ***File/Read Table of Contents***.
10.	Select "Adobe Photoshop 5.5."
11.	Select ***Available Software/Install***.
12.	Select ***Next***. Select "United States."
13.	Select ***Next***.
14.	Select ***Accept*** to accept the license agreement.
15.	Select "Typical."
16.	Select ***Browse*** and change the drive letter to "D" keeping the same path.
17.	Select ***OK***.
18.	Select ***Next***.
19.	Select ***Next***.
20.	Type in Last Name: "DTSS."
21.	Enter in Company: "US Army TEC."
22.	Enter Serial Number off of the Adobe Photoshop CD (use "PWW550R7263103-727"). Select ***Next***.
23.	Select ***Next***.
24.	Uncheck the check boxes.
25.	Select ***Finish***.
26.	Select ***OK***.
27.	Select ***OK*** to complete install.
28.	Select ***OK*** to the reboot message.
29.	Select ***OK*** after install was successful.
30.	Eject the CD.
31.	Right click on the **Start** button. Select "Explore All Users."

ADOBE PHOTOSHOP	
Step	Procedure
32.	Navigate to \Profiles\Administrator\Start Menu\Programs. Select "Adobe." Press ***[Ctrl]*** and "X." Navigate to \Profiles\All Users\Start Menu\Programs. Press ***[Crtl]*** and "V."
33.	Select ***Start/Shut Down***.
ARCVIEW	
1.	Insert DTSS Install Disk #6.
2.	Select ***File/Select Source Drive***.
3.	Select "Yes" to change the drive.
4.	Browse to the CD-ROM folder.
5.	Select folder "arcview."
6.	Select ***OK***.
7.	Select ***File/Read Table of Contents***.
8.	Select "ArcView 3.2."
9.	Select ***Available Software/Install***.
10.	Select ***Next***.
11.	Select "Yes" to accept license agreement.
12.	Select "Local Install."
13.	Select ***Next***.
14.	Select "Typical."
15.	Select ***Browse*** to change destination directory to "D" and keep the same path.
16.	Select ***OK***. Select ***Next***.
17.	Select ***Next*** to use the default program folder.
18.	Select ***Install***.
19.	Select "No" to install crystal reports.
20.	Select "No. Do Not restart the computer."
21.	Select ***Finish***.
22.	Select ***OK*** to complete install.
23.	Select ***OK*** after install was successful.
24.	Select "Yes" to Reboot.
25.	Eject the CD.
26.	After the workstation has restarted, the Defense Information Systems Agency (DISA) Security banner appears.
27.	Hold down the ***[Ctrl]*** and ***[Alt]*** keys, and press the ***[Delete]*** key. The security warning is displayed.
28.	Select ***OK*** from the security warning. The Logon Information window appears.
29.	Log into the system as Administrator and enter the Administrator's password. The **COE login Complete** window appears.
30.	Select ***OK***.

ARCVIEW	
Step	Procedure
31.	Click to ***Start/Programs/ESRI/ArcView GIS 3.2a***.
32.	Select "ArcView GIS 3.2a." Enter name: "DTSS." Enter Organization: "US Army TEC."
33.	Enter the registration number from the ArcView Documentation Box. (Use 798481123680)
34.	Select ***OK***.
35.	Select ***OK***.
36.	Select "No."
37.	Select ***File/Exit***.
38.	Select "No" to save.
ARCVIEW SPATIAL ANALYST	
1.	Insert DTSS Install Disk #6, if not already in the drive.
2.	Select **Start/DII Installer**.
3.	Select ***File/Select Target Drive***. Select drive D, if not already set.
4.	Select ***File/Select Source Drive***. Double click on the CD-ROM folder.
5.	Select folder "Spatial Analyst."
6.	Select ***OK***.
7.	Select ***File/Read Table of Contents***.
8.	Select "ArcView Spatial Analyst" in the **Available Software** window.
9.	Select ***Available Software/Install***.
10.	Select ***Next***.
11.	Select "Yes" to accept the license agreement.
12.	Select "Local Install."
13.	Select ***Next***.
14.	Select "Typical."
15.	Select ***Browse*** to change destination directory to D, if it is not already set.
16.	Select ***Next***.
17.	Select ***Next*** to use default program folder.
18.	Select ***Install***.
19.	Select "No. Do Not restart the computer."
20.	Select ***Finish***.
21.	Uncheck Readme. Select ***Finish***.
22.	Select ***OK*** to complete install.
23.	Select ***OK*** after install has finished.
24.	Select ***OK*** for "Install was successful."
25.	Select "Yes" to Reboot.
26.	Log into the system as Administrator and enter the Administrator's password. The **COE login Complete** window appears.
27.	Right click on the **Start** button. Select "Explore All Users."

ARCVIEW SPATIAL ANALYST	
Step	Procedure
28.	Navigate to ..\Profiles\Administrator\Start Menu\Programs. Select "Esri." Select ***[Crtl]*** and "X." Navigate to ..\Profiles\All Users\Start Menu\Programs. Select [Crtl] and "V."
29.	Select ***Start/Shutdown***.
IMAGINE 8.4	
1.	Insert DTSS Install Disk #4.
2.	Select ***File/Soucre Drive***.
3.	Select "Yes" to change the drive.
4.	Browse to the CD-ROM folder.
5.	Select folder "Imagine 8.4."
6.	Select ***OK***.
7.	Select ***File/Read Table of Contents***.
8.	Select "ERDAS Imagine."
9.	Select ***Available Software/Install***.
10.	Select ***Next***.
11.	Select "Yes to accept the license agreement." Select "Next." Enter Name: "DTSS." Enter Company: "US ARMY TEC."
12.	Select ***Next***.
13.	Select "Server/Local."
14.	Select ***Next***.
15.	Select ***Browse*** and change the destination directory to "D" and keep the same path.
16.	Select ***OK***.
17.	Select ***Next***.
18.	Select "No."
19.	Select ***Next***.
20.	Deselect all the items except essentials and advantage.
21.	Select ***Next***. Select ***Next***. Select ***Next***.
22.	Select ***Finish***.
23.	Select ***Cancel***.
24.	Select ***OK*** to complete install.
25.	Select ***OK*** after install has finished.
26.	Select "Yes" to Reboot.
27.	Eject the CD.
NORTON ANTIVIRUS	
1.	Select ***File/Source Drive***. Select "Yes" to change the source drive. Select the "cd rom" folder and choose the "NAV" folder.
2.	Select ***OK***.

NORTON ANTIVIRUS	
Step	Procedure
3.	Select ***File/Read Table of Contents***.
4.	Select "Norton antivirus."
5.	Select ***Available Software/Install***.
6.	Select ***Next*** to start install.
7.	Select "Yes" to accept the license agreement.
8.	Select ***Browse*** and change the destination drive letter to "D" keeping the same path.
9.	Select ***OK***.
10.	Select "Yes" to create the directory.
11.	Select ***Next***.
12.	Select "Unmanaged" and select ***Next***.
13.	Select "File System Real-time Protection" and select ***Next***.
14.	Select ***Next***.
15.	Select the box that says "Don't remind me" and select close for old virus definition file.
16.	Select ***Next***. Select ***Next*** again.
17.	Deselect "Run LiveUpdate" after installation.
18.	Select ***Next***. Select ***Finish***.
19.	Select ***OK*** to complete install.
20.	Select ***OK*** about default scan options.
21.	Select ***OK*** for "Install was successful."
22.	Select ***Start/Programs/Norton Antivirus Corporate Edition***.
23.	Expand "Scheduled Scans." Select "New Scheduled Scan."
24.	Type in name: "Daily Scan."
25.	Type in description: "Daily Scan of C & D."
26.	Select ***Next***. Select "Enable Scan."
27.	Select "Daily." Select Time: "10:30 PM" from the dropdown menu.
28.	Select ***Next***.
29.	Select the C drive and the D drive. Select ***Save***.
30.	Expand "Configure."
31.	Select "File System Realtime Protection."
32.	Select "All Types."
33.	Select ***Close***. Select ***Exit***.
34.	Eject the CD.

APPENDIX B: SECURITY

1 INTRODUCTION

This User's Security Manual/Standing Operating Procedure (USM/SOP) is a primary component of the Digital Topographic Support System (DTSS) System Security Authorization Agreement (SSAA). The Program Executive Officer for Command, Control, and Communications Systems (PEO C3S) serves as the Designated Approving Authority (DAA) for the DTSS generic accreditation. This USM/SOP was developed using the guidance contained in the PEO C3S Security Accreditation Management Plan (SAMP).

This USM/SOP provides guidelines and procedures for System Administrators and system operators who are responsible for the system security of the DTSS. The procedural security measures contained in this USM/SOP provide cost-effective countermeasures to system vulnerabilities not addressed by the system itself. Implementation of this USM/SOP is essential to safeguarding the Classified and Sensitive But Unclassified (SBU) information contained in the DTSS from unauthorized access, use, alteration, or destruction. The DTSS Build 7 software baseline serves as the basis for this USM/SOP.

This USM/SOP is issued for use by units with DTSS configurations, designated the AN/TYQ-48A and AN/TYQ-67, and should be incorporated in the units' tactical Standing Operating Procedure (SOP). It applies to all units operating the DTSS and all elements assigned, attached, or under the operational control of those units. A copy of the DTSS accreditation statement and this USM/SOP should be maintained by the installation Information Systems Security Manager (ISSM) and/or the unit Information Systems Security Officer (ISSO).

This USM/SOP is not intended to replace Department of Defense (DoD), U.S. Army, or unit security directives. If any procedures within this manual conflict with the above directives, the most stringent directive takes precedence and should be followed. Obtain clarification from the ISSO to resolve any conflicts.

2 PURPOSE

This USM/SOP provides the minimum set of security controls and activities to operate the DTSS at the Class C2 (Controlled Access Protection) security level in a SECRET System High Mode of Operation. In this mode, all users must possess, at a minimum, a DoD SECRET security clearance, and specific access to data is determined on a need-to-know basis. This requirement applies to all users of the DTSS. Adherence to the provisions of this USM/SOP will safeguard system hardware and software from compromise, theft, and destruction in its operational environments (deployment, employment, and training). This document is also intended to be used as security training resource material.

3 SCOPE

This USM/SOP addresses the actions and countermeasures appropriate for the DTSS and addresses the Operations Security (OPSEC), Communications Security (COMSEC), personnel, procedural, hardware, and software security upon which the accreditation of the AN/TYQ-48A and AN/TYQ-67 is based. It also defines the security responsibilities of the personnel assigned to operate and control the system. Administrative controls have been established to segregate key duties that will preclude any one individual from adversely affecting the system; provide a division of responsibility for system security functions; and support system staff duties and responsibilities.

The DTSS incorporates a minimum level of Command and Control (C2) protection by the use of several commercial-off-the-shelf (COTS) packages, including Norton Antivirus Corporate Edition. Norton Antivirus is a tool that scans for viruses resident on DOS-based media. NoTrace is a tool that performs system sanitization in accordance with the requirements contained in AR 380-19. Additional protection of data and of messages that are transmitted and received by the DTSS is provided through the Distributed Computing Environment (DCE), which performs data encryption and decryption. Tripwire detects any change (authorized or unauthorized) to system critical files and sends an alert to the system administrator.

This USM/SOP is intended to provide the user with a single point of reference for guidance concerning the security of the system. This manual is a reference for all security-relevant software features. The manual is structured to support the security training and awareness program for all DTSS personnel. Each system analyst is assumed to have received prior training in system operations and to have obtained basic expertise in the functional aspects of their intelligence specialties.

4 REFERENCES

This USM/SOP complies with the requirements, specifications, and/or guidance contained in the following regulations, manuals, and publications. These documents serve as the basis for the responsibilities and procedures listed in this USM/SOP.

4.1 Government Documents

DoD 5200.28-STD
Department of Defense (DoD)
Trusted Computer System Evaluation Criteria (TCSEC)
1 December 1985

DoD 8510.1-M
Department of Defense (DoD)
Information Technology Security Certification and Accreditation Process (DITSCAP)
20 July 2000

DoD 5200.40-M SSAA Supplement
Department of Defense (DoD)
Information Technology Security Certification and Accreditation Process (DITSCAP)
18 May 1999

DII COE
Integration and Run Time Specification
Version 4.0
25 October 1999

DII COE
Security Administrators Manual
Version 4.2.0.0
4 February 2000

NSTISSI No. 4009
National Security Agency (NSA)
National Information Systems Security (INFOSEC) Glossary,
January 1999

NCSC-TG-027
National Computer Security Center (NCSC)
Guide to Understanding Information System Security Officer Responsibilities
for Automated Information Systems
May 1992

AR 190-13
Department of Army (DA)
Army Physical Security Program
September 1993

AR 190-51
Department of Army (DA)
Security of Army Property at Unit and Installation Level
30 September 1993

AR 380-5
Department of Army (DA)
Information Security Program
25 February 1988

AR 380-19
Department of Army (DA)
Information Systems Security
27 February 1998

AR 380-19-1
Department of Army (DA)
Control of Compromising Emanations (U)
1990

AR 380-67
Department of Army (DA)
Personal Security Program
9 September 1988

AR 530-1
Department of Army (DA)
Operations Security (OPSEC)

AR 710-2
Department of Army (DA)
Supply Policy Below the Wholesale Level
31 September 1997

PEO CS SP
Program Executive Office Command and Control Systems (PEO CCS)
Security Policy (SP)
17 August 1993

PEO C3S
Program Executive Office Command, Control and Communications System (PEO C3S)
Secure Configuration Policy (SCP)
For Windows NT Hosts
7 July 2000

ACCS-A1-100-006A
PEO CCS
ATTCS System Specification (SSA)
31 May 1994

ACCS-A1-100-007A
U.S. Army Tactical C3I System of Systems
Program Executive Office Command and Control Systems (PEO CCS)
Security Accreditation Management Plan (SAMP)
31 May 1994

TM-11-6675-292-10
Department of Army (DA)
DTSS, AN/TYQ-48A Operator's Manual
November 1997

FM 19-30
Department of Army (DA)
Physical Security
March 1979

4.2 Non-Government Documents

The following non-Government publications have been used for information and guidance in the development of this USM/SOP:

- Microsoft Technet Publications available at www.microsoft.com/technet/ security.
- STU III/SECTEL Secure Voice & Data Telephone User's Guide, 68-P25439J002, February 1998, Motorola Inc.
- Secure Terminal Equipment User's Manual, K10047662 (Draft), December 1998, L-3 Communications.
- Windows NT Security Guidelines, NSA, written by written by Trusted Systems Services, 03 June 1999.

4.3 Availability of Documents

Documents not available through normal Government stocking channels may be obtained by calling commercial (520) 538-6188 or DSN 879-6188, or by writing to the Software Engineering Center at the address below:

Software Engineering Center
Intelligence Fusion Systems
ATTN: AMSEL-SE-WS- U.S. Army Communications-Electronics Command
AI-H (William Walker)
Fort Huachuca, AZ 85613-5000

5 GENERAL

The DTSS supports the collection, extraction, and exploitation of information about the physical characteristics of the earth's surface in order to build a foundation for the common knowledge of the battlespace. The DTSS provides benefits to the commander to enhance battle management capabilities (battle visualization). These benefits contribute to the commander's dominant situational awareness, allowing battlespace visualization never before possible. As a command and control enabler for tactical decision making, the DTSS is the commander's "dominant eye" that allows him/her to shape the Army XXI battlefield to ensure mission success.

5.1 System Accreditation

The DTSS has been approved by the PEO C3S to process classified information up to the level of SECRET in a System High Mode of Operation. The commander and all DTSS personnel are responsible to ensure that the system is operated in compliance with the terms of this accreditation.

5.2 System Description

The DTSS is an Automated Information System (AIS) designed to provide digital terrain analysis information and products to the Engineer Terrain Team and the various battlefield users within the battlefield functional mission areas. The system consists of state-of-the-art automation software and hardware products capable of providing timely and accurate digital terrain analysis information to battlefield commanders and their staffs. Security features built into the system allow for the storage and processing of classified and unclassified information. The DTSS will be employed at Theatre, Corps, Division, and Brigade, and it is strategically transportable as well as tactically mobile.

The DTSS is an automated tactical combat support system capable of receiving, (re)formatting, creating, manipulating, merging, updating, storing, and retrieving digital topographic data, then reproducing this data into hardcopy and digital topographic products. The DTSS will accept topographic and multispectral imagery data from National Imagery and Mapping Agency (NIMA)-standard digital databases and from other sources. Communications and interoperability with the Army Battle Command System (ABCS) components are accomplished through the transmission and receipt of database updates, Tactical Decision Aids (TDA), and message traffic from the battlefield using Remote Procedure Calls (RPC), National Imagery Transmission Format (NITF)

data, File Transfer Protocol (FTP) services, and United States Message Text Format (USMTF) and Joint Variable Message Format (JVMF) messages.

The DTSS extracts and processes data from maps, charts, weather forecasts or reports, climatic summaries, gazetteer data, terrain studies, photography, and other data sources. It processes the data into a usable format; stores, sorts, and retrieves information; and produces digital graphics and non-graphic products on a variety of media, using both COTS and government-off-the-shelf (GOTS) software. It provides engineer topographic units the capability to rapidly produce low volumes of large-format multicolor topographic products. The system will provide automated terrain analysis and Digital Topographic Data (DTOP) hardcopy graphic overlays produced by a DTSS printer, hardcopy alphanumeric output, and visual displays on a terminal monitor display.

6 RESPONSIBILITIES

The DTSS is subject to the provisions of Army Regulation (AR) 380-19, Information Systems Security. Within AR 380-19, specific personnel responsibilities are defined to assist commanders to implement the requirements of the U.S. Army Information Systems Security Program (AISSP). These personnel will have the authority to enforce security policy and safeguards for the DTSS, to include stopping system operations if warranted by the severity of a security violation.

The following subparagraphs list the individual responsibilities specified in AR 380-19 for the security of the DTSS at the Theater, Corps, Division, or Brigade level. Other organizations, which may have authorized access to the DTSS, will assign these responsibilities at comparable levels within their organizations.

6.1 Information Systems Security Manager

At appropriate levels of command below the Major Command (MACOM), an Information Systems Security Manager (ISSM) will be appointed to establish and implement the AISSP for all Tactical Automated Information Systems (TAIS), including the DTSS. The ISSM duties include the following:

- Oversee the execution of the MACOM‘s Information System Security (ISS) training and awareness program to include security training and awareness for the DTSS.
- Interface with the various units’ ISSMs to ensure that the DTSS is operated and maintained in a secure manner.
- Periodically review the threat and vulnerability posture of the DTSS systems within their purview and report to the commander with status and recommendations as appropriate.
- Comply with and enforce the policy and guidance provided in AR 380-19, paragraph 1-6.d.(2).

6.2 Commander

Unit commanders have the overall responsibility for the security of the DTSS. They will execute the following responsibilities:

- Appoint an ISSO and an alternate whose duties include the security management of the DTSS. Forward a copy of the appointment orders to the next higher headquarters, as well as the installation ISSM.

- Establish and enforce reasonable procedures to protect the DTSS from theft, damage, or compromise.

- Ensure that the DTSS is used for its intended purpose within the boundary of its accreditation.

6.3 Information Systems Security Officer

The commander responsible for each DTSS will appoint an Information Systems Security Officer (ISSO). The ISSO should be familiar with the specific duties defined in AR 380-19, as well as the guidance contained in NCSC-TG-027. The ISSO will perform the following duties:

- Ensure the DTSS is operated and maintained in a secure manner in accordance with the guidelines and requirements contained in AR 380-19 and this USM/SOP.

- Serve as the staff focal point for DTSS security issues at the unit level.

- Ensure that all DTSS equipment is operated in accordance with the generic and/or site accreditation.

- Maintain a file copy of the current generic accreditation statement and prepare unit-specific guidance pertaining to the accreditation, as required.

- Coordinate all changes in the system configuration or the security environment with the ISSM.

- Recommend reaccreditation through the appropriate chain of command, as necessary.

- Incorporate DTSS system security awareness in the overall unit security and training programs.

- Ensure that the unit's contingency plans incorporate DTSS requirements.

- Review the DTSS security audit trail on a daily basis if tactical operations permit. This review will be conducted once a week at a minimum. Audit trail information will be maintained and protected for a period of 30 days.

- Report all security incidents regarding the DTSS as specified by unit security directives. These include any attempt to gain unauthorized access to information, a system failure or defect that could lead to an unauthorized disclosure, a loss of integrity, or the unavailability of system information. Incidents involving criminal activity or foreign intelligence services will also

be reported to the local Criminal Investigation Division (CID) or supporting Counter-Intelligence (CI) field office.

- Report any technical/security vulnerabilities discovered regarding the DTSS through the chain of command with an informational copy to the Commander, U.S. Army Communications-Electronics Command (CECOM), Software Engineering Center (SEC), Intelligence Fusion Systems (IFS) ATTN: AMSEL-SE-WS-AI-H Fort Huachuca, AZ 85613-5000, through the appropriate chain of command.

- Conduct threat and vulnerability assessments of potential risks for the commander, so appropriate countermeasures can be implemented to mitigate those risks.

- Report all attempts and actual penetrations of the DTSS immediately to the unit security manager. The ISSM will, in turn, notify the Land Information Warfare Activity (LIWA) Army Computer Emergency Response Team (ACERT). Any successful penetrations will be reported by the ACERT to CID and the Army Case Control Office (ACCO) at Intelligence and Security Command (INSCOM).

NOTE

Although an ISSO may be appointed at the Engineer Battalion level, it is recommended that an individual also be appointed who is physically located with the DTSS and who is responsible for DTSS security during day-to-day operations.

6.4 System Administrator

Various System Administrators will be appointed by the commander for each DTSS not under the direct control of an ISSO. The System Administrator is responsible for the following functions:

- Ensure that no information classified higher than SECRET is loaded or processed in the DTSS.

- Prevent unauthorized transmission of classified information or products by the system.

- Suspend access to the DTSS to personnel who do not adhere to system security policy and procedures. Report such actions to the ISSO and the commander.

- Install and check out new releases of software, if required. Set and configure the DTSS system (data, databases, tables, etc.) in an appropriate secure state.

- Troubleshoot reported software problems, as necessary. Exercise caution so as not to impair the integrity of the system security controls.

- Perform a complete DTSS system backup on a periodic basis.

- Assist the commander with the preparation and delivery of Software Problem Reports (SPR) written against the system to CECOM SEC IFS, Fort Huachuca, AZ.

- Perform account maintenance functions, monitor and control remote access, execute security tools, and maintain the system security audit reports.

- Review messages for security content and format prior to their transmission.

- Ensure that only approved, authorized software is loaded and installed on the DTSS.

- Ensure that personnel who use or have access to the DTSS have the required security clearance in accordance with AR 380-67, possess authorization, have been indoctrinated, and are familiar with unit security policies before access is granted.

- Maintain a record of valid security clearances, physical access authorizations, and AIS access authorizations for all personnel using or having access to the DTSS.

6.5 Operators

DTSS operators will do the following:

- Comply with the security provisions set forth in this USM/SOP and the applicable unit directives for the safe and secure operation of the DTSS.

- Maintain positive physical control of the DTSS during system operations. Safeguard the DTSS from unauthorized tampering with the system hardware or from manipulation of the resident software/firmware.

- Handle and secure DTSS system data and information, media, and printed output and products commensurate with the security classification level of operations.

- Report immediately to the System Administrator, or to the ISSO, any attempt to gain unauthorized access to sensitive information, any system failure, or any

suspected defect that might lead to the unauthorized disclosure of classified or unclassified information.

- Identify, document, and report any system (or software) deficiency related to the normal or secure operation of the DTSS on the CECOM SEC IFS SPR Form. Forward this form to CECOM SEC IFS either directly or through the (local or regional) Field Software Services Support (FSSS) representative. Instructions and the appropriate address are contained on the back of the SPR Form.

- Access only those files and data for which they are authorized.

6.6 COMSEC Custodian

The COMSEC custodian is responsible to the commander for access to and control of accountable COMSEC material and equipment. The custodian will do the following:

- Manage the receipt, distribution, handling, and storage of all Controlled Cryptographic Items (CCI) related to DTSS operations. Issue cryptographic keying material for the Strategic/Tactical Secure Voice Terminal (STSVT) or Secure Telephone Unit (STU) Strategic/Tactical Secure Voice Terminal (STSVT) .

- Incorporate procedures for operating, handling, and securing DTSS COMSEC material into unit training and operations. Conduct periodic inspections to verify the latter.

7 GUIDELINES AND PROCEDURES

The procedures contained in the following sections constitute a minimum set of security practices that will be implemented under the terms of the DTSS generic accreditation. The ISSO may prescribe additional measures or procedures to be implemented if additional security measures are necessary due to the nature of the operating environment. The information described below applies to all levels of operations. These guidelines and procedures should be incorporated in existing unit SOPs.

7.1 Operations Security

The Operations Security (OPSEC) is driven by the need to deny the enemy information about friendly capabilities and intentions. The commander will ensure that all personnel associated with the DTSS observe the following procedures:

1. Comply with existing AR 530-1 and unit OPSEC policies and procedures and with related security procedures addressed in this USM/SOP.

2. Incorporate planning and operations information regarding the DTSS in the unit's Essential Elements of Friendly Information (EEFI). A good example of EEFI is the number of vehicles and personnel in a unit.

3. Control, protect, and dispose of classified materials generated and/or maintained by the DTSS, according to AR 380-5.

4. Ensure all personnel having access to the DTSS are identified, cleared, and have a legitimate need to know. Do not share information obtained from the DTSS with other individuals unless their position requires them to know that information.

7.2 Physical Security

Physical security requirements address physical barriers and protections, facility access controls, and the protection of vehicles and structures that house the DTSS and its components. It is one of the primary means used to secure the DTSS from unauthorized access, theft, damage, or destruction, and to reduce the exposure to external threats. Personnel will comply with specific requirements contained in the following documents:

- AR 190-13, Army Physical Security Program
- AR 190-51, Security of Army Property at Unit and Installation Level
- FM 19-30, Physical Security

- Local unit security policies
- Guidance contained in the SSAA

7.2.1 Tactical Operations

The DTSS will be deployed at the Brigade, Division, Corps, and Theater level. It will normally be located at the Tactical Operations Center (TOC) or be part of the TOC Support Element (TOCSE). While security for the TOC may be handled and controlled through an entry control point, it is still the responsibility of the individual to verify the identity and need to now of any individual seeking access to the system. Any change to the established unit security SOP, as it applies to the DTSS during tactical operations, will be directed by the commander.

Mission requirements may dictate that the DTSS operate 24 hours a day, 7 days a week. Thus, all disk drives, media, printed material, and other software components (classified or unclassified) will be maintained under positive control at all times. The interior of the shelter is considered open storage for SECRET and below because of the continual staffing. Processing at a classified level will not be performed if uncleared personnel are present. When within the proximity of the DTSS, uncleared personnel will be escorted by a cleared individual at all times.

7.2.2 Garrison Operations

The DTSS will be afforded the same level of protection and security as during tactical operations. All disk drives, media, printed material, and other software components (classified or unclassified) will be maintained under positive control at all times during normal operations. Because there may not be a requirement to maintain around-the-clock operations, unattended open storage will not be authorized. Classified materials must be properly secured within the appropriate containers whenever personnel exit the shelter.

The destruction of classified or sensitive material will comply with Appendix K, Classified Material Destruction Standards, contained in AR 380-5, AR 380-19, and the unit SOP.

7.2.3 Transit

The DTSS is tactically mobile and strategically transportable. During transit, equipment and components will be secured as directed in Technical Manual TM 11-6675-292-10, or TM 11-6675-291-10, Operator’s Manual. If not removed for transit, all disk drives, media, printed material, and other software components (classified or unclassified) will

be maintained under positive control for the duration of the movement. If removed for transit, all classified components, media, and products will be properly safeguarded as directed in AR 380-5 and unit policy. The DTSS will be powered down; data, media, and hardcopy products will be secured; and the shelter locked.

7.2.4 Storage

Classified media, products, or materials will be removed from the DTSS while the unit is placed in storage. The media, products, or materials will be maintained in an authorized, secure container separate from the system. Encryption devices and encryption key material will also be removed prior to placing the system in storage. The shelter must be secured and locked. Under these conditions, uncleared personnel may guard the equipment.

Prior to storage, the following procedures will be used to ensure that the plotter (for DTSS-D) or deskjet printer (for DTSS-L) is sanitized:

1. Clear Random Access Memory (RAM) from the printer/plotter:
    a. Cycle the power switch to the printer “On/Off” three times. Each cycle will consist of a minimum of 60 seconds on and 60 seconds off.
    b. Print three font test pages.
2. Remove the print/ink cartridge from the printer/plotter.

The DTSS workstation and its components can be placed in storage when all media, disks, and encryption key material are removed from the system and are placed in appropriate secure storage containers.

NOTE

The RAM in the DTSS is dynamic. It is cleared when power to the system is removed or if the system is powered off. There is no residual memory.

7.2.5 Imminent Overrun Procedures

Protection of the DTSS and terrain products from hostile forces is a reality that must be considered during wartime operation. Strictly follow unit directives for destruction of

classified materials to render the DTSS inoperable in the case of imminent overrun by enemy forces. Priority will be given first to SECRET, then CONFIDENTIAL, then SBU information. Since the DTSS is operating at the System High SECRET classification level, it should be assigned a Priority Two for destruction.

7.2.5.1 Emergency Destruction Procedures

In the case of imminent overrun, information produced or contained in the DTSS must be destroyed. The following steps should be taken in this event:

1. Destroy the processor by using a thermite grenade or similar device.
2. Destroy Compact Disks (CDs) not in security containers by burning.
3. Destroy CDs in security containers using a thermite grenade or similar device.
4. Destroy hard copy files not in security containers by burning.
5. Destroy hard copy files in security containers using a thermite grenade or similar device.

7.2.5.2 Emergency Removal Procedures

If time permits evacuation of the system, follow the steps below.

1. Purge the system RAM.
2. Reformat the system hard drive.
3. Box all loose CDs and remove them from the shelter and place them in a security container.
4. Box all loose hardcopy files and remove them and place them in a security container.
5. Remove the security containers containing the CDs and hardcopy files.

7.3 Software Security

The DTSS operating system and associated applications operate as part of the Trusted Computer Base (TCB). All personnel associated with DTSS will comply with the following general security procedures to protect the system against compromise, subversion, or unauthorized manipulation.

- Do not use or load privately acquired or personal software on the DTSS.

- Make modifications to the software (or hardware) configuration only as authorized by the ISSO or commander, and document all changes.
- Allow only personnel performing official duties access to the DTSS.
- Use the DTSS in accordance with documented procedures described in this USM/SOP and the Software User's Manual (SUM). Immediately report any illegal or unauthorized usage of the DTSS to the ISSO.

There are three classes of users of the Combat Terrain Information System (CTIS) software. Each class is designed to allow the user to perform specific system or application functions.

- **Administrator**—Used during the installation of application segments. The user of the DII COE installer software is required to be Administrator.
- **Secman**—Used to set up the user accounts. The Secman user will assign the user name and access to the required functionality for new DTSS users.
- **Dtssuser**—The terrain analysts (users) are in this class, and generate products. A Dtssuser is set up to run CTIS and other common Maneuver Control System (MCS) applications.

This USM/SOP addresses those functions and procedures applicable to the Dtssuser. Those functions specific to the Administrator are documented in the DTSS Trusted Facility Manual.

7.3.1 System Startup and Initialization

Power up the DTSS system following the steps contained in TM 11-6675-292-10, or TM 11-6675-291-10, Operator's Manual, Section 2-10. A successful system power-up and initialization will result in the terminal screen showing the standard DoD warning banner and displaying the *login* prompt.

7.3.2 Login

All individuals who access the DTSS must log in prior to access being granted. Each user is assigned a user name and password by the System Administrator.

1. At the *username* prompt, enter the assigned user name. The *password* prompt will be displayed.
2. Enter the assigned password. If an incorrect user name or password is entered, the following warning message is displayed:

"Logon failed."

NOTE

If the password is entered incorrectly three consecutive times, the account is locked, and the System Administrator must unlock it.

3. Hit **OK**. Re-enter the proper user name and password combination. See the System Administrator obtain the correct password. Never share password information with other users. Do not write it down or store it where others can find it.

WARNING

It is important that all DTSS users read, understand, and comply with the DoD warning notice displayed on the Logon screen.

7.3.3 Changing Password

Each analyst is required to reset his password upon initial login to the system or upon its expiration. The user must also change the password at a minimum quarterly, in accordance with AR 380-19, whenever it is suspected that the password may have been compromised, or if so desired. The frequency of changing a password of an individual's account must comply with any restrictions or limitations to that password set by the System Administrator.

7.3.3.1 Password Construction

Passwords are the primary method for user identification and authentication (I&A). Bad passwords are one of the principal means that a hacker will use to break into systems. Therefore, properly constructed passwords are an essential aspect of maintaining system security. The password rules outlined below comply with DII COE requirements, thus they exceed those listed in AR 380-19.

The following general rules apply to constructing a password:

1. Users are responsible for protecting their secret passwords against loss or disclosure and will be held liable for any improper use of the password.

2. User-generated passwords are required to have the following characteristics:

    a. Be at least eight characters in length.

    b. Contain at least two numbers, change cases, or special characters.

    c. May not be a password that was used previously.

    d. May not be a word found in a dictionary or a name, spelled forwards or backwards.

    e. May not be a simple keyboard sequence, such as asdfghjkl, strings of repeating characters, or repetitions of the user ID (e.g., user ID is ann; password is annann12).

In addition to the required minimum characteristics, the user may also choose to include upper- and lower-case letters in the password. The best way to create passwords is through word links. To choose a good password, try one of the following techniques:

1. Combine several short words with numbers or special characters; for example, jumP;0ut. (Notice that the last half of the sample password is composed with a zero in “out”.)

2. Use an acronym derived from an easily remembered phrase. For example, the phrase “The first house on the corner is well maintained” translates to the acronym T1hotciwm. Try to use phrases that are not well known or famous quotes.

3. Use a nonsense word that is pronounceable. Be sure to include a numeric or special character; i.e., Gr8terss

7.3.3.2 Changing Password Upon Initial Login

1. Log in normally to the system.

2. Upon initial login, a message box will be displayed, prompting to change the password.

3. Hit **OK**.

4. The password change window is displayed. Enter your current password in the **Old Password:** box.

5. Choose a new password and enter it twice: once in the **New Password:** box, and again in the **Password Confirm:** box.

6. If the password does not conform to the system password rules, the system generates an error message. Select **OK**, and enter a valid password.

7. If the password is acceptable, a Windows Dialog Box appears, stating that the password has been changed. To continue, select **OK**.

NOTE

Passwords will not be echoed to the screen when entered. For this reason, exercise care when typing your password.

8. The current default setting for the minimum password change is seven days. Any attempt to change the password prior to this time results in a message stating not to change the password at this time. Select **OK** and wait until the password is at least seven days old to change it.

7.3.4 Printed/Plotted Output

The DTSS will default to print the current System High Water Mark (SHWM) classification on image products generated on the plotter. If the product is of a lower classification, the user will be required to enter the appropriate security classification during the product generation, prior to plotting. An authorized individual must review all printed output for appropriate security classification prior to the output's release to any external subscriber.

1. Hand stamp all hardcopy output with the appropriate classification marking, in accordance with AR 380-5 and/or unit security directives.

2. If immediate review and marking is not practical, handle and store all hardcopy output as SECRET until such time as it can be reviewed, appropriately marked, or destroyed.

CAUTION

All printed material from the DTSS must be manually reviewed for appropriate classification markings. If the output is not marked automatically by the DTSS, the operator must properly mark the output (top and bottom) with a security classification label commensurate with the security level of the information contained in the output. The DTSS is not authorized to process or print any material above the classification level of SECRET.

3. Affix declassification directions, downgrading instructions, and other protective markings to printed/plotted material in accordance with Chapter 4 of AR 380-5 and/or unit security directives.

4. When removing classified material from storage or manually transferring it to a location external to the DTSS, cover the classified material with an appropriate cover sheet (SF 707, SECRET [Red Cover]; SF 708, Confidential [Blue Cover]; SF 710, Unclassified [Green Cover]).

5. If classified working papers are generated or used, mark each page as "Working Papers" and stamp with the date of origin. Handle and protect them in the same manner as other classified material. Classified "Working Papers" must either be brought under control or destroyed within 90 days.

7.3.5 Message Processing

Consult the ABCS Common Message Processor (CMP) documentation for proper methods of sending and receiving messages and checking classification markings.

7.3.6 Log Off

Each DTSS user is required to log off the system upon completion of the shift or processing session. It is advisable to terminate/close any programs, processes, windows, or forms which may be active. Log off by selecting ***Start/Shut Down***. The **Shut Down** window is displayed. Select the **Close all programs and Logon as a different user** radio button, and click **Yes**. The system logs off and returns to the NT Logon Screen.

7.4 Hardware Security

The hardware used for the AN/TYQ-48A and AN/TYQ-67 has undergone testing and evaluation to ensure its reliability and integrity. The following guidelines and procedures are intended to minimize the likelihood that the DTSS is inadvertently compromised during normal use of the system hardware.

7.4.1 Control

The unit shall conduct periodic inventories of the DTSS equipment, in accordance with AR 710-2 and unit inventory requirements. If the system or its components are held via a hand receipt, the holder(s) will comply with inventory reconciliation procedures directed by the responsible Property Book Officer (PBO).

The DTSS hardware components, peripherals, and devices shall be set up, configured, and operated in accordance with that specified in TM 11-6675-292-10 or TM

11-6675-291-10. Proper configuration management practices play a significant role in preserving the DTSS system security and in ensuring the continued proper performance of the system.

Unit personnel shall conduct regular inventories of DTSS components. Periodic inspections shall also be conducted to verify the integrity of the hardware configuration.

An accurate accounting of all DTSS hardware shall be maintained. This inventory will reflect any authorized equipment replacements, upgrades, modifications, or additions that have been approved.

7.4.2 Hardware Malfunctions

Equipment problems shall be identified and corrected as quickly as practical. Hardware malfunctions may negate or undermine the security features of the DTSS. In the case of a suspected problem, the analyst will conduct basic troubleshooting, investigation, and diagnostic procedures in order to identify the problem and to determine the probable cause. The analyst will perform the following steps:

1. Verify that power is available to the device in question and that cables, power cords, and Local Area Networks (LANs) are properly connected and in working condition.

2. Verify that data has been correctly input to the DTSS.

3. Monitor the performance of the power-on self test and note any errors that the system reports.

4. Report equipment failures or problems to unit maintenance personnel using the standard Maintenance Request, DA Form 2404. Report all maintenance requests and actions to the System Administrator.

CAUTION

Any equipment malfunction or problem that appears to be the result of a deliberate attempt to damage or sabotage the DTSS shall be reported immediately to the System Administrator or the ISSO.

7.4.3 Maintenance Requirements

Hardware maintenance will be performed by personnel who are appropriately cleared, but who may not have a need to know. Maintenance personnel must be escorted at all times

by an individual who is cleared and has a need to know. The equipment undergoing maintenance must be removed from, or at least isolated from, the LAN. All maintenance activities on the system equipment will be logged.

Direct support maintenance of the DTSS equipment will be performed using standard Army maintenance procedures. Unit personnel will perform Preventive Maintenance Checks and Services (PMCS) such as inspections, cleaning, and minor maintenance services. This includes replacing pens and inks, cleaning disk heads, maintaining paper supplies, etc. Any failure of the unique electronics equipment will be reported to the maintenance section assigned to support the DTSS in the mission support plan. For continuity of service, in the event of the system is malfunctioning, ManTech representatives shall be called. ManTech representatives shall provide service to the unit such as reconfiguration, maintenance, diagnostics, and system replacement, in order to minimize equipment downtime.

WARNING

Do not connect any personal, non-issued/non-system, or unauthorized software, equipment, devices, or interfaces to the DTSS. Failure to comply with this directive may jeopardize the secure operation of the system and its accreditation and is a UCMJ offense.

7.5 Personnel Security

The security of the DTSS depends, in part, upon the personnel who manage, operate, and access the system. Although most of the security features and precautions described in this USM/SOP address preventing unauthorized access, personnel security is specifically directed at those individuals authorized to access the DTSS. The following subparagraphs discuss the security issues and procedures that apply to unit personnel with access to the DTSS.

CAUTION

The DTSS is not authorized or accredited to process any information classified higher than SECRET. All DTSS users must possess a minimum of a SECRET clearance, regardless of whether or not the system is processing classified data.

There are three classes of CTIS users: Sysadmin, Secman, and Dtssuser. Individual analysts will be given a unique account on the system. Each analyst will also be assigned as a member of the same user group. Each analyst will have a unique user number within the group. Users serving as Supervisors will be assigned to a different group. Each account within this group will also be given a different number.

7.5.1 Clearances

Each individual operating or accessing the DTSS must have a minimum of an active SECRET security clearance, as well as a formal access approval verified by the unit security manager. The SSO shall maintain a current roster of those personnel and their respective clearances and accesses. Access to the DTSS, based upon enforcement of this roster, shall constitute Discretionary Access Control (DAC) to the DTSS.

1. Although each DTSS user requires a minimum of a SECRET security clearance, a user's right to access data on the DTSS may be further restricted by the need to know. An individual's appropriate need to know will be determined by the commander or a designated representative (i.e., ISSO or System Administrator). See paragraph 7.5.2 of this USM/SOP for specific guidance.

2. Hardware and software maintenance personnel requiring access to the DTSS (government or contractor) shall possess a security clearance consistent with the level of access required to perform the task. Maintenance personnel who do not possess the required SECRET clearance, but who are required to work on the DTSS, may be allowed to do so with the approval of the unit commander. The ISSO shall be notified prior to any uncleared maintenance personnel being granted access to the equipment. During maintenance operations, maintenance personnel must be accompanied and observed by someone with the technical expertise to detect obvious unauthorized modifications. Uncleared personnel will not remove classified components from the DTSS.

3. If a user's security clearance has been revoked, or the individual has been transferred to other duties, reassigned, retired, or discharged, the ISSO shall immediately direct the DTSS supervisor to deny that user further access to the system and its data.

7.5.2 Need-to-Know

Need-to-know is the necessity for access to, knowledge of, or possession of specific information required to perform official duties. This concept of need-to-know is implemented through the use of DAC.

1. DTSS operators will only have access to the information, tools, and products required to perform assigned tasks. The Systems High Security Mode of Operation, under which the DTSS is operated, implies that all personnel who have been granted access to the DTSS have the requisite SECRET security clearance but not necessarily a need-to-know for all data, files, or features on the system.

2. Commanders, assisted by the unit ISSO and/or System Administrator, shall determine the maximum information access requirements of each DTSS user prior to the establishment of the user's account.

CAUTION

Due to the operational and organizational independence of Terrain Teams from their parent organizations, the Officer-in-Charge (OIC) or Non-Commissioned Officer-in-Charge (NCOIC) must balance security protection and operational need-to-know to ensure mission accomplishment without sacrificing security.

7.5.3 Training

All system users, including maintenance personnel, must receive Information Systems security awareness training from their unit, in accordance with AR 380-19, paragraph 2-15. Training should be tailored by the ISSO to ensure DTSS-specific security issues such as threats, risks, and vulnerabilities and the secure configuration and operation of the system.

7.6 Communications Security

The DTSS maintains both secure voice and data, as well as non-secure voice communications capabilities. It can connect with other systems via commercial telephone lines or Mobile Subscriber Equipment (MSE) using the STSVT or STE. It can connect to other tactical networks and to Theater strategic communications through the STU-III.

The DTSS uses the Fiber Data Distributed Interface (FDDI) output for its secure connection to the MSE.

The DTSS connects directly to the TOC LAN. It also connects to the Tactical Packet Network (TPN) via the TOC LAN. The DTSS will connect to the TPN utilizing ThinLan or x.25. When employed in this manner, the physical LAN media will be subject to protected distribution systems safeguards, as defined in AR 380-19, Information Systems Security.

For the specific steps and procedures to connect the DTSS to these external interfaces, refer to TM 11-6675-292-10, AN/TYQ-48A, or TM 11-6675-291-10, AN/TYQ-67, Operator's Manual.

7.6.1 COMSEC Considerations

All DTSS operators must maintain awareness of the COMSEC environment in which they operate. The user is responsible to know and follow all local unit security directives. The following basic procedures will be followed:

1. Do not transmit classified data or material without COMSEC protection.
2. Identify and avoid the use of communications practices that result in prolonged transmission times.
3. The unkeyed STSVT or STE is considered a CCI. Handle all CCI equipment according to DA Pamphlet 25-380-2. Coordinate the transfer or movement of COMSEC equipment through the unit COMSEC custodian.
4. The COMSEC custodian must provide for the STSVT or STE and is accountable for all key material and Cryptographic Ignition Keys (CIK).
5. Immediately report any lost CIK, CCI, or other COMSEC equipment to the COMSEC custodian.
6. Do not use the STSVT or STE for secure communications if it is malfunctioning.
7. The STSVT or STE will be used by authorized personnel with a security clearance equivalent to, or higher than the security level of the CIK. The information available from the STSVT or STE (voice, data, displays) shall be restricted on a need-to-know basis.

7.6.2 STSVT and STE Operation

The operator should follow the procedures in the DTSS Operator's Manual to operate the STSVT or STE.

7.6.3 TEMPEST Considerations

Based upon the guidance contained in AR 380-19-1, the TEMPEST level for non-special category information, SECRET and below, in the United States and in low-opportunity areas, is determined to be Level VI. The need for a Facility TEMPEST Assessment/Risk

Analysis (FTA/RA) shall be determined on a site-by-site basis. The FTA/RAs are a local unit responsibility and should be coordinated with the TEMPEST Control Officer.

NOTE

When the DTSS is used in a fixed site (e.g., garrison) for longer than 90 days, the commander should review the regulatory and MACOM requirements for an FTA/RA.

7.7 Security Incidents and Violations

A security incident occurs whenever sensitive or classified information is compromised, there is a risk of compromise, recurring or unsuccessful attempts to obtain unauthorized system access are detected, misuse of the system is suspected, or loss of a controlled item occurs. Any security incident or violation, whether intentional or unintentional, may result in the compromise of any information that could threaten national security.

1. All DTSS personnel are responsible to comply with provisions of AR 380-5, unit directives, and security practices to ensure the proper handling and control of classified data.

2. Incidents that may signal the beginning or presence of a possible security violation include the following:

   - Unexplained output received at a workstation, printer, or plotter
   - Extraneous data
   - Abnormal system responses (such as very long system response times)
   - Any indication of media manipulation, modification, or corruption of files and data

NOTE

All security incidents and possible violations should be reported as soon as possible to the ISSO and the unit Security Manager. Immediate measures will be taken to minimize, control, or eliminate the circumstances of the security incident. Situations involving known or suspected loss of classified information will be investigated thoroughly to determine their cause, and corrective measures will be implemented to prevent a recurrence.

7.7.1 Intrusion Detection and Reporting

The DTSS uses the DII COE C2P Tool Tripwire to monitor critical system files to guard against changes to those files by either authorized or unauthorized users. This tool is maintained by the System Administrator.

7.8 Contingency Planning

The DTSS will be capable of performing its assigned mission even in a degraded mode of operations. In the event that a workstation is damaged or otherwise disabled, critical mission functions are maintained. Full system functionality is resident within each workstation. In the event that a workstation is inoperable, the user will be able to continue functioning by utilizing the other workstation. Maintenance personnel should be contacted to get a replacement workstation.

In the case of loss of power, the Uninterruptible Power Supply (UPS) will maintain power for a short amount of time. Maintenance personnel should be contacted ASAP to resolve the power problem.

Periodic backup of the system software and daily backup of the data files will minimize the loss of products and analysis information. A loss of or break in the communication links between the DTSS and external sources would limit the message and voice capability of the site. However, a hardcopy of products or data loaded to disk or tape could still be transferred securely and safely between sites via courier.

The reconfiguration of components enables full or almost full functionality in the event of any single component failure. Auxiliary cables and incidental equipment that support redundancy are contained in Technical Manual, TM 11-6675-292-10, AN/TYQ-48A Operator’s Manual.

Specific procedures for the recovery of the DTSS workstation are addressed in the Operator’s Manuals. In addition, unit directives for system restoral priorities must be followed. The DTSS must be included in the unit’s system restoral priority schedule by comparing its mission criticality to that of other unit systems. Disaster Recovery/Equipment Restoral procedures for the DTSS should be routinely exercised along with other unit system restoral procedures.

8 SECURITY TRAINING

8.1 Security Training Overview

All personnel who manage, operate, and maintain the DTSS shall participate in a security awareness training program. This program shall consist of initial training requirements, which must be completed prior to being granted access to the DTSS, and refresher training, which shall emphasize security fundamentals and address any new security issues. This training may be incorporated in existing general training modules but must also address the specific policies, procedures, and threats unique to the DTSS. Security training requirements shall be incorporated in the unit's overall training schedule.

8.1.1 Operators, Supervisors, and Personnel having Access

Initial security training for system personnel will address, at a minimum, the following:

- DTSS system security objectives (i.e., what needs to be protected and why) and associated responsibilities
- System threats, vulnerabilities, and associated risks
- Any physical and environmental considerations necessary to protect the system
- System security policy, operations security procedures, and recommended unit practices
- Emergency and disaster plans
- Authorized system configuration(s) and associated configuration management requirements
- Reporting procedures for abnormal system behavior or unauthorized system access

8.1.2 Emergency Deployment Readiness Exercises and Alerts

Training issues, specific to or related to additional security measures for an exercise or an alert, will be addressed on a case-by-case basis. The training scope and content will be at the discretion and direction of the commander.

8.1.3 Exercises

This USM/SOP applies in all exercise and training situations as well as actual deployments. The security practices and procedures contained in this USM/SOP and the existing unit SP remain in effect unless otherwise directed by the commander.

APPENDIX C: REFERENCES

I. Government Documents C-1
II. Non-Government Documents and Sources.....C-3

SECTION I. GOVERNMENT DOCUMENTS

Section/Subject **Page**
Government Documents. C-1

Government Documents

Table C-1 lists government documents that are referenced in the manual or that are related to the software information in this manual.

Table C-1 Listing of Government Documents

Item	Document	Description
1.	MIL-HDBK-1300 18 June 1993	Military Handbook, National Imagery Transmission Format Standard (NITFS)
2.	MIL-I-89014, AMENDMENT 5 22 April 1994	Military Specification for Interim Terrain Data (ITD)/Planning Interim Terrain Data (PITD)
3.	MIL-V-89040 8 May 1995	Military Specification for Vector Product Interim Terrain Data (VITD)
4.	MIL-STD-2500A 12 October 1994	Military Standard for the National Imagery Transmission Format Standard (Version 2.0)
5.	MIL-STD-SSD	System Software Development
6.	DI-MCCR-80018A 28 February 1988	Data Item Description (DID) Computer System Operator's Manual (CSOM)
7.	No document reference number, 07 May 1998, Department of the Army, US Army Communications, Ft Monmouth	Software User's Manual for Army COMCMP Glue Code Software of the Common Operating Environment (COE)

Table C-1 Listing of Government Documents (Cont'd)

Item	Document	Description
8.	ADB170301 From Defense Technical Information Center	NATO Reference Mobility Model Edition II, NRMM II User's Guide
9.	MIL-A-89007 22 February 1990	Military Specification, ARC Digitized Raster Graphics (ADRG).
10.	MIL-C-89038 6 October 1994	Military Specification, Compressed ARC Digitized Raster Graphics (CADRG)
11.	MIL-PRF-89041 15 May 1995	Performance Specification, Controlled Image Base (CIB)
12.	MIL-PRF-0089037 25 May 1999	Performance Specification, Digital Topographic Data (DTOP)
13.	MIL-PRF-89049/1 30 November 1998	Associated Performance Specification, Foundation Feature Data (FFD)
14.	MIL-STD-2413(DMA) 16 August 1995	Standard Practice for Standard Linear Format (SLF) for Digital Cartographic Feature Data
15.	MIL-PRF-89040A 8 May 1996	Performance Specification, Vector Product Interim Terrain Data (VITD)
16.	MIL-PRF-0089049 24 November 1998	Performance Specification, Vector Product Format (VPF) Products
17.	TM 11-6675-294-10 March 2001	Operator's Manual, Digital Topographic Support System - Deployable
18.	TM 11-6675-292-10 May 1999	Operator's Manual, Digital Topographic Support System - Heavy
19.	TM 11-6675-291-10 July 2000	Operator's Manual, Digital Topographic Support System - Light
20.	DIAM 65-18 December 1994	Geopolitical Data Elements and Related Features, Data Standard No. 4, Defense Intelligence Agency Manual 65-18, published by the Defense Intelligence Agency

SECTION II. NON-GOVERNMENT DOCUMENTS AND SOURCES

Subject **Page**
COTS Documents C-3
Software Sources C-8

COTS Documents

Table C-2 lists COTS documents that contain descriptions and operating procedures for the COTS software included in the DTSS.

Table C-2 Listing of COTS Software Documents

Item	Document	Description
1.	Adobe Photoshop 5.0, User Guide, # 90017383, June 1999	User's manual for using Adobe Photoshop software
2.	Adobe Photoshop 5.5, User Guide Supplement, # 90017399, June 1999	User's manual for using Adobe Photoshop software, containing added information for version 5.5
3.	Adaptec Easy CD Creator	User's manual for using Adaptec Easy CD Creator software
4.	CTIS, SDD, 21 September 1994 UPDATE	High-level software design document for the DTSS/QRMP Software Development (draft)
5.	CTIS, SDP, 21 September 1994 UPDATE	DTSS/QRMP Software Development Plan (SDP)
6.	DQSS, SS, 28 November 1995, UPDATE	DTSS/QRMP System Specification
7.	ERDAS, Field Guide, Fifth Edition, 1999 (part no. 27)	A reference to basic GIS and image processing principles targeted to Imagine users
8.	ERDAS, Imagine 8.4, Tour Guides, 1999 (part no. 28)	Tutorials on Imagine Version 8.4 functions
9.	ERDAS, Imagine 8.4, Installation Guide, 1999 (part no. 29)	Instructions on installing Imagine Version 8.4 software

Table C-2 Listing of COTS Software Documents (Cont'd)

Item	Document	Description
10.	ERDAS, Imagine Virtual GIS, Tour Guide, 1998 (part no. VGTG-8.4.0-mux)	Tutorials on Imagine Virtual GIS functions
11.	ERDAS, Imagine Orthobase 8.4, Tour Guide, 1999 (part no. 48)	Tutorials on Imagine Orthobase 8.4 functions
12.	ERDAS, Imagine Orthobase 8.4, User's Guide, 1999 (part no. 49)	Instructions on using Imagine Orthobase 8.4 software
13.	ERDAS, Imagine Radar Mapping Suite, Tour Guide, 1999 (part no. 51)	Tutorials on Imagine Radar Mapping Suite functions
14.	ERDAS, Imagine Sub Pixel Classifier Users Guide	Instructions on using Imagine Sub Pixel Classifier software
15.	ERDAS, Stereo Analyst User's Guide	Instructions on using Stereo Analyst software
16.	ESRI, ArcView GIS Installation Guide	Instructions on installing ArcView GIS 3.1 software
17.	ESRI, What's New in ArcView GIS Version 3.1	Overview of new features in ArcView GIS Version 3.1
18.	ESRI, ArcView Dialog Designer	Instructions on customizing ArcView's user interface
19.	ESRI, Avenue Customization and Application Development for ArcView GIS	Information on the programming language for ArcView's customization and development environment
20.	ESRI, ArcView GIS, The Geographic Information System For Everyone	Overview of ArcView GIS functions.
21.	ESRI, ArcView Spatial Analyst 2.0 (Advanced Spatial Analysis Using Raster And Vector Data)	Instructions for using ArcView Spatial Analyst functions

Table C-2 Listing of COTS Software Documents (Cont'd)

Item	Document	Description
22.	ESRI, Model Builder For ArcView Spatial Analyst 2.0	Instructions on using the Model Builder for ArcView Spatial Analyst
23.	ESRI, ArcInfo 8.0, Understanding ArcSDE	Instructions on using ArcSDE functions
24.	ESRI, ArcInfo 8.0, The ESRI Guide to GIS	Information on developing a geographic information system project using ArcInfo
25.	ESRI, ArcInfo 8.0, Modeling Our World, 1999	A reference guide to ESRI geodatabase design
26.	ESRI, ArcInfo 8.0, ArcSDE Administration Guide, 1999	Provides information on administration commands and utilities
27.	ESRI, ArcInfo 8.0, Arc Objects Developers Guide, 1999	Introduces tools to customize and develop the ESRI applications
28.	ESRI, ArcInfo 8.0, Getting Started With ArcInfo, 1999	An introduction to ArcInfo's software architecture, user documentation, commands, and ArcTools
29.	ESRI, ArcInfo 8.0, Using ArcCatalog, 1999	Instructions on using the ArcCatalog application
30.	ESRI, ArcInfo 8.0, Using ArcMap, 1999	Instructions on using the ArcMap application
31.	ESRI, ArcInfo 8.0, Using ArcToolbox, 1999	Instructions on using the ArcToolbox application
32.	ESRI, ArcInfo 8.0, Building a Geodatabase, 1999	Provides instructions for designing and implementing geodatabases in ArcInfo
33.	HP, DesignJet Software Setup, (Part # C6074-90121) March, 2000	Instructions for installing the DesignJet software

Table C-2 Listing of COTS Software Documents (Cont'd)

Item	Document	Description
34.	HP, DesignJet 1050C/ 1055CM, Regulatory Notices, (Part # C6074-9001) April, 1999	Provides list of regulatory notices
35.	HP, DesignJet 1050C/ 1055CM, Software Application Notes, (Part # C6074-90021) Dec. 1998	Contains information needed to set up the application software to use PostScript and HP-GL/2 drivers with HP DesignJet 1055CM printers
36.	HP, DesignJet 1050C/ 1055CM, Quick Reference Guide, (Part # C6071-90141) November 1998	Summary of information on using the plotter
37.	HP, JetDirect Print Servers, Quick Start Guide, (Part # 5969-3479) August 1999	Guide for installing and using the software included with the HP JetDirect print server
38.	HP, DesignJet 1050C/ 1055CM, Customer Care Support Information, (Part # C6072-90111) March 1999	Contains HP contact and support information
39.	HP, DesignJet 1050C/ 1055CM, Assembly Instructions, (Part # C6071-90161) November 1998	Instructions on loading plotter media and pens and connecting the plotter to the computer.
40.	HP, DesignJet 1050C/ 1055CM, Setup Guide, (Part # C6071-90121) Nov. 1998	Guide for setting up the plotter
41.	Microsoft Windows NT Workstation 4.0, Start Here, Basics and Installation	Overview of basic features, system requirements, and installation procedures
42.	Microsoft Office 2000, Discovering Microsoft Office Premium and Professional	Contains information on the various Microsoft applications (Word, Excel, Outlook, PowerPoint, Access, Publisher)

Table C-2 Listing of COTS Software Documents (Cont'd)

Item	Document	Description
43.	Microsoft Frontpage 2000, Getting Started with Microsoft Frontpage 2000	User's manual for using Microsoft Frontpage 2000 web design software
44.	WIDEimage For Windows 95, 98, NT User's Guide, November 1999	User's manual for using WIDEimage scanning software

Software Sources-
Suppliers of non-government software used in the DTSS are listed below.

Adaptec, Inc.
691 South Milpitas Boulevard
Milpitas, CA 95035
Phone (408) 945-8600
Fax (408) 262-2533
www.adaptec.com

Adobe Systems Incorporated
345 Park Avenue
San Jose, CA 95110-2704
Phone (800) 49-ADOBE
www.adobe.com

Environmental Systems Research Institute (ESRI)
380 New York Street
Redlands, CA 92373
(909) 793-2853
Desktop Order Center (800) 447-9778
www.esri.com

ERDAS, Inc.
2801 Buford Highway, NE, Suite 300
Atlanta, GA 30329-2137
Corporate (404) 248-9000
User Support (404) 248-9777
Military Systems (703) 354-7415
www.erdas.com

Hewlett Packard
20BO
3000 Hanover ST.
Palo Alto, CA 94304
Phone (208) 323-2551
www.hp.com

Microsoft Sales Information Center
One Microsoft Way
Redmond, WA 98052-6393
1-800-426-9400
www.microsoft.com

APPENDIX D: GLOSSARY

I. Acronyms and Abbreviations D-1

SECTION I. ACRONYMS AND ABBREVIATIONS

The following glossary contains acronyms and abbreviations that are used in the SUM.

Term	Definition
AASHO	American Association of State Highway Officials
ABCS	Army Battle Command System
ADRG	Arc Digitized Raster Graphic
ADRI	Arc Digitized Raster Imagery
AML	Arc Macro Language
AOI	Area Of Interest
API	Application Programmer's Interface
ASCII	American Standard Code for Information Interchange
AVHRR	Advanced Very High Resolution Radiometer
BDI	Black Digital Interface
BSM	Basic Security Module
CAC	Compressed Aeronautical Chart
CARDG	Compressed Arc Digitized Raster Graphic
CCM	Cross Country Movement
CD	Compact Disc
CD-DA	Compact Disc-Digital Audio
CDE	Common Desktop Environment
CD-I	Compact Disc-Interactive
CD-R	Compact Disc-Recordable
CD-RW	Compact Disc-Rewritable
CDRL	Contract Data Requirements List
CD-ROM	Compact Disc - Read Only Memory
CD-ROM XA	Compact Disc - Read Only Memory Extended Architecture
CECOM SEC IFS	Communication and Electronics Command Software Engineering Center Intelligence Fusion Systems
CGM	Computer Graphics Metafile
CHS	Common Hardware and Software
CIB	Controlled Image Base
CIK	Crypto-Ignition Key
CLF	Common Look and Feel
CMP	Common Message Processor
CMYK	Cyan, Magenta, Yellow, Black
COE	Common Operating Environment

Term	Definition
COM	Component Object Model
COMSEC	Communications Security
COTS	Commercial Off-the-Shelf
CP	Command Post
CPG	Common Product Generation
CPU	Central Processing Unit
CRT	Cathode Ray Tube
CSOM	Computer System Operator's Manual
CTIS	Combat Terrain Information System
CTP	Common Tactical Picture
CTS	Cartridge Tape System
CUI	CMP User Interface
CW	Clockwise
DAT	Digital Audio Tape
DBMS	Database Management System
DC	Direct Current
DCE	Distributed Computing Environment
DCW	Digital Chart of the World
DDN/MPN	Defense Data Network/Mobile Subscriber Equipment Packet Network
DEM	Digital Elevation Model
DFAD	Digital Feature Analysis Data Vector Format
DID	Data Item Description
DII	Defense Information Infrastructure
DISA	Defense Information Systems Agency
DLG	Digital Line Graph
DMA	Defense Mapping Agency
DMAFF	Defense Mapping Agency Feature File
DMS	Defense Mapping School
DNC	Digital Nautical Chart
DNVT	Digital Nonsecure Voice Terminal
DOD	Department of Defense
DOP	DTSS Overlay Provider
DOQ	Digital Ortho Quadrangle
DPI	Dots Per Inch
DTD	Digital Topographic Data
DTE	Data Terminal Equipment
DTED	Digital Terrain Elevation Data
DTOP	Digital Topographic
DTSS	Digital Topographic Support System
DTSS-B	DTSS-Base
DTSS-D	DTSS-Deployable
DTSS-H	DTSS-Heavy

Term	Definition
DTSS-L	DTSS-Light
DTSS-HVMP	DTSS High Volume Map Production
DTSS-S	DTSS Survey
DTSS-M	DTSS Mobile
DTSS-T	DTSS Transportable
DXF	Data Exchange File
EAC	Echelons Above Corps
EISA	Extended Industry Standard Architecture
EML	ERDAS Macro Language
ESRI	Environmental Systems Research Institute
ETAK	COTS, ASCII, digital, street centerline map product available from ETAK, Inc.
FACC	Feature Attribute Coding Catalog
FAT	File Allocation Table
FFD	Foundation Feature Data
FGDC	Federal Geographic Data Committee
FPR	Final Product Review
FTP	File Transfer Protocol
GB	Gigabyte
GCP	Ground Control Points
GIS	Geographic Information System
GOTS	Government Off-the-Shelf
GSA	General Services Administration
GSC	Ground Slope Code
GTL	Graphic Topographic Library
GUI	Graphical User Interface
HCU	High-Capacity Computer Unit
HDD	Hard Disk Drive
HFA	Hierarchical File Architecture
HSV	Hue-Saturation-Value
ID	Identification
IFS	Information Fusion Systems
IFSAR	Interferometric Synthetic Aperture Radar
IGES	Initial Graphic Exchange Standard
IMCS	International Station Meteorological Climate Summary
IMETS	Integrated Meteorological System
IP	Image Processing
ISO	International Standards Organization
ISSO	Information Systems Security Officer
ITD	Interim Terrain Data
JMPS	Joint Message Preparation System
JMTK	Joint Mapping Tool Kit
JMV	Joint Mapping Viewer
JPEG	Joint Photographic Experts Group

Term	Definition
KBPS	Kilobits Per Second
LAN	Local Area Network
LLNL XFTP	Lawrence Livermore National Laboratory X-based Interface to File Transfer Protocol
LOS	Line of Sight
LUT	Lookup Table
MANSCEN	Maneuver Support Center
MB	Megabyte
MC	Map Composer
MC&G	Mapping, Charting and Geodesy
MGRS	Military Grid Reference System
MHZ	Megahertz
MM	Millimeter
M-O	Magneto Optical (drive)
MCS	Maneuver Control System
MSDS	Mission Specific Data Sets
MSE	Mobile Subscriber Equipment
NRMM	North Atlantic Treaty Organization Reference Mobility Model
NIMA	National Imagery and Mapping Agency
NITF	National Imagery Transmission Format
NTFS	Windows NT File System
ORD	Operational Requirements Document
OS	Operating System
PBX	Private Branch Exchange
PCMIA	Personal Computer Memory Card Interface Association
PCX	PC Paintbrush File
PDF	Portable Document Format
PEO	Program Executive Office
PEO C3S	Program Executive Office Command, Control, and Communications Systems
PID	Process ID
PPID	Parent Process ID
PTADB	Planning Terrain Analysis Data Base
RAID	Redundant Array of Independent Disks
RAM	Random Access Memory
RDBMS	Relational Database Management System
RESPO	Remote Earth Sensing Program Office
RFI	Radio Frequency Interference
RGB	Red Green Blue
RISC	Reduced Instruction Set Computer
RPC	Remote Procedure Call
RPF	Raster Product Format
RWS	Remote Work Station

Term	Definition
SAR	Synthetic Aperture Radar
SCSI	Small Computer System Interface
SDE	Spatial Database Engine
SEC	Software Engineering Systems
SHWM	SECRET System High Water Mark
SLF	Standard Linear Format
SM	Spatial Modeler
SML	Spatial Modeler Language
SOP	Standard Operating Procedure
SPOT	Series of earth-orbiting satellites operated by the Centre National d'Etudes Spatiales (CNES) of France
SPPB	Special Purpose Product Builder
STSVT	Strategic/Tactical Secure Voice Terminal
STU-III	Secure Telephone Unit III
SUM	Software User Manual
TACDAM	Tactical Dam Analysis Model
TAR	Tape Archive
TB	Technical Bulletin
TCP/IP	Transmission Control Protocol/Internet Protocol
TDA	Tactical Decision Aids
TERCAT	Terrain Categorization
TEC	Topographic Engineering Center
TET	Task Embedded Training
TIFF	Tagged Image File Format
TIGER	Topographically Integrated Geographic Encoding and Referencing System
TIN	Triangulated Irregular Network
TRAC-WSMR	U.S. Army Training and Doctrine Command Analysis Center – White Sands Missile Range
TTADB	Tactical Terrain Analysis Data Base
TTD MEDS	Terrain Data Minimal Essential Data Set
TTEP	Training and Training Equipment Plan
UPS	Universal Polar Stereographic
USGS	United States Geologic Survey
USMTF	United States Message Text Format
UTM	Universal Transverse Mercator
VCU	Versatile Computer Unit
VITD	Vector Product Format Interim Terrain Data
VMAP	Vector Map
VPF	Vector Product Format
WABI	Windows Application Binary Interface
WAIS	Wide Area Information Servers
WGS	World Geodetic System
WWW	World Wide Web

Term	Definition
XA	Extended Architecture
XFTP	X-based interface to File Transfer Protocol
XML	eXtensible Markup Language
ZDR	Zone Distribution Rectangle
100k SQR	100 kilometer Square

APPENDIX E:
TROUBLESHOOTING GUIDE

'Server Busy' Error Message *(Build 7.0)* This error message indicates that ArcMap was shutdown, but did not exit completely. To fix this problem, bring up the Windows NT Task Manager and kill the *'ArcMap.exe'* process.
I get a "Geodatabase in use" error when I run the importer. What should I do? *(Build 7.0)* Make sure ArcCatalog is not running. ArcCatalog will not release a geodatabase that has been examined until it is shut down. Also make sure that the geodatabase isn't open in a map document. If all else fails, restart ArcMap and try again.
The ITD Importer freezes up when I choose a source directory on certain CD's. What is wrong? *(Build 7.0)* The ITD Importer scans all files in a directory to see which are in ITD format. First, check to see if files are still being scanned. A message just above the refresh button will tell you what file is being processed. If this message hangs up on one file for an excessive amount of time, you may have a damaged CD. Unfortunately, if any files in the directory are unreadable, the importer will hang up. One possible way to recover is to attempt to eject the CD from the drive. If the drive does not respond to this, kill ArcMap from the task manager. To avoid having the problem again, try copying the ITD files you want from the CD to the hard drive in Explorer. If the data is still inaccessible, get another copy of the disc. CD's and especially writeable CD's are very sensitive to scratches.
Why are all of the nodes, bridges, and railroads red in the NRMM II results? *(Build 7.0)* The current version of NRMM II does not make predictions for on-road nodes, rail lines, and bridges.
On the Query Manager Import From E-Mail screen, the attachment name has been truncated. *(Build 7.0)* This is a limitation with Microsoft's MAPI control. It can only handle file names in 8.3 format. However, the user can change the name of the attachment in the "Filename" text box before it is imported.
In the Data Query Wizard, when attempting to remove a data source, the message "There are still filters linked to this geodatabase" appears. What does this mean? *(Build 7.0)* This means that there are legend categories that contain attributes from the selected geodatabase. Therefore, the geodatabase cannot be removed until the user removes all references to the selected geodatabase.
LOS Target Profile with IFSARE data *(Build 7.0)* When creating a LOS Target Profile product from an IFSARE image, always load a shaded relief image as a background and select the observer and target within the shaded relief image. Since the IFSARE image covers a very large area, selecting two points from the IFSARE image alone will be too big for the LOS engine to handle. The shaded relief image will help the user zoom into a smaller area, which is manageable by the LOS engine.
When rebooting the computer gets caught in a hardware search *(Build 7.0)* When you reboot, make sure all the SCSI devices are attached. Sometimes the scanner doesn't warm up properly or is in diagnostic mode and you have to wait for it to be in READY mode in order to boot properly.

Problem exporting from Map Production *(Build 7.0)* Only a JPEG can be exported from Map Production.
Problem exporting files to the website *(Build 7.0)* Only one file can be exported to the website at a time. If the file does not appear on the website after the export, make sure you click the Refresh button. Also, make sure that you are putting the file on the correct web server, the browser is pointing to that web server, and you are checking the correct folder.
Raid and/or scanner are not working *(Build 7.0)* When booting up the system, make sure that the raid and scanner are finished with their diagnostic warm-up process before turning on the CPU.
System takes a long time to shutdown *(Build 7.0)* This is due to the shutdown of DII COE. This has been reported to DISA.
System login window is displayed twice *(Build 7.0)* This is a known bug. When this happens just press the "OK" button. Another related issue is that the startup script will run twice, and doesn't disappear after you click "OK" twice, so you have to manually close the windows by hitting the "X" in the upper right corner of the windows.
Logging onto the deployable *(Build 7.0)* When logging onto the deployable, make sure to wait for the "Logon Complete" message to display before proceeding. Not waiting for the message to come up may cause problems, including ArcMap slowing down or not working properly. If this happens, you may have to log out and log back in.
When using the File Menu in ArcCatalog, if New is selected the resulting menu is blank *(Build 7.0)* When using the File menu, if New is selected the resulting menu will be blank unless an item that supports the New option is selected in the catalog. For example, if a geodatabase feature class is selected in the catalog, there is no new option and the menu will be blank. If, however, a feature datatset is selected in the catalog, the menu will contain options for new feature class, new relationship class, or new geometric network.
In Map Production, Scale text elements (for example 1:50,000) are not correct when map is printed, but they are correct when viewing the map on screen. *(Build 7.0)* This is a known problem that ESRI will be correcting in future builds. For now, make sure the layout view is zoomed to full page before printing. In most cases, this will cause the map to be printed with the correct scale text
ArcMap crashes when trying to export map layout to JPEG *(Build 7.0)* This problem has been reported to ESRI, but they have not been able to duplicate the correct set of circumstances that cause this to happen. The problem seems to be associated with the zoom level of the layout. If this problem is encountered make sure the layout is zoomed to full page before exporting. In most cases the map will then export properly.

If the map scale is set to a specific value, such as 1:50,000, and print preview is selected, the scale is no longer that specific value when print preview is closed. It varies by some small amount. *(Build 7.0)*

This is a known problem that ESRI will be correcting in future builds. For now, it is important to check the map scale after closing print preview to be sure it is the desired scale before printing. The scale can be corrected by entering the desired scale in the map scale text box.

THIS PAGE INTENTIONALLY LEFT BLANK

APPENDIX F:
FREQUENTLY ASKED QUESTIONS

1. What is the DTSS?

DTSS is the Digital Topographic Support System and its purpose is to provide the capability to collect, extract, and exploit geospatial data.

2. What government agencies are responsible for managing the DTSS program?

U.S. Army Program Executive Office (PEO) provides management for the Command, Control, and Communications Systems (PEO C3S).

The Materiel Developer, the Project Director for Combat Terrain Information Systems, and the U.S. Army Topographic Engineering Center (TEC) provide project management.

The Maneuver Support Center (MANSCEN) is the Combat and Terrain Developer.

The Defense Mapping School (DMS) provides the training

3. What are the different configurations of the DTSS?

DTSS-Base (DTSS-B)
DTSS-Deployable (DTSS-D)
DTSS-Heavy (DTSS-H)
DTSS-Light (DTSS-L)
DTSS-High-Volume Map Production (DTSS-HVMP)
DTSS-Survey (DTSS-S)

4. What version of Windows NT is installed?

Windows NT 4.0 Service Pack 6a

5. What version of DII COE is installed?

Version 4.2

6. What version of ArcInfo is installed?

Version 8.0.2

7. What version of ERDAS Imagine is installed?

Version 8.4

8. What is the address of the DTSS support web page?

http://www.gsd.tasc.com/ctis

9. What is the DTSS support e-mail address?

ctissupport@tasc.com

10. What is the phone number for the help desk?

1-866-ASK-CTIS (275-2847)

11. What information is needed by the support desk?

Name
Phone number
Fax number
E-mail address
Location
Unit
Rank
System (DTSS 7.0, DTSS 6.2, MapServer)
Description of problem

You will be given a problem ID and later a member of the support staff who can help solve your problem will contact you.

12. What is the highest security level the system can operate at?

Secret

13. How often do I need to change my DTSS password?

Every 90 days

14. Where is the DTSS data directory located on my system?

\h\data\local\dtss\data

15. Where are the common queries stored on my system?

\h\data\local\dtss\data\dataquery

16. Where are my personal queries stored on my system?

\winnt\profiles\user name\application data\dtss\dataquery

17. Where are the blank geodatabase templates stored on my system?

\h\dtss\datamodels

18. Where is the Website directory located on my system?

\netscape\server4\docs

19. What is a geodatabase?

A geodatabase is a relational database that stores geographical information.

20. What is a feature dataset?

A feature dataset is a collection of feature classes that contain a common coordinate system.

21. What is a feature class?

A feature class is a collection of features with the same type of geometry: point, line or polygon.

22. What types of data can be imported using the VPF Importer?

VPF stands for Vector Product Format. The VPF Importer can import the following: VPF Interim Terrain Data (VITD), Foundation Feature Data (FFD), and Digital Topographic Data (DTOP). Other VPF data can be imported into the system, but the geodatabases created for them will not include the attribute domains. This means that attribute code descriptions are not available. Also, on these generic VPF database, the attributes are not limited to valid values.

23. What types of data can be imported using the ITD Importer?

ITD stands for Interim Terrain Data. The ITD importer can only import Standard Linear Format data.

24. Can the VPF Importer handle tiled data?

Specific tiles in VPF data can be selected graphically, however the number of tiles imported is directly proportional to the processing time. Selecting three tiles will take almost three times as long as one. Not selecting tiles only requires one pass through of the data and takes about as long as if you select one or two tiles.

25. Can I import data into a geodatabase that already exists?

Yes, the importers can add to an existing geodatabase provided that it is VITD, FFD, or DTOP.

26. Why does the geometric network have to be deleted before importing additional data to a geodatabase? How do I do this?

The geometric network has to be deleted before more features can be loaded into the geodatabase, otherwise it will become corrupt. If you attempt to import to a geodatabase that has a geometric network, the importers will display a message telling you to delete the network in ArcCatalog. Currently, a limitation in ArcMap prevents the importers from automatically deleting the network.

To delete the network in ArcCatalog, navigate to the geodatabase and expand to the feature class level. Right click on "network" and select "Delete." Confirm the deletion. Data can now be added to the geodatabase. Be sure to close ArcCatalog before attempting this.

27. How do I know exactly what I'm importing without actually going through the import process? Where in the world am I?

The VPF Importer allows you to preview data graphically or in table form before the import is done. Expand the library tree view down to the feature table you want to preview and then select the table view or map view tabs to see the data. In the map view, clicking and dragging will zoom into a specific area. Right clicking will zoom to the full extent. To pan, hold down shift while clicking and dragging the mouse in the map (this will not work when zoomed at the full extent). Also note that the latitude and longitude of the cursor is displayed as a tool tip. Note: Previewing data is not available in the ITD Importer.

If the library is tiled and has a reference database, you can view where it is in relation to the region. In order to do this, expand the library view by selecting "Tile Reference" and then "TILEREF.AFT." The VPF Importer will ask if you want to view the reference database. Select “Yes.” A map of the region will be shown along with the tile reference for that geodatabase. Zoom in to get a closer look at where the tiles are in relation to the region.

28. What mobility model is used by DTSS?

The North Atlantic Treaty Organization (NATO) Reference Mobility Model II (NRMM-II) developed by the U.S. Army Waterways Experiment Station (WES).

29. What types of data can be used to generate mobility products?

Mobility products can be generated using Interim Terrain Data (ITD) and Vector Interim Terrain Data (VITD).

30. What mobility products are generated using NRMM-II?

Off-Road Speed
On-Road Speed
Gap Crossing

31. What types of data can be used to generate line of sight (intervisibility) products?

An elevation file in ERDAS Imagine (.img) format is required. If feature information is desired, an optional VITD geodatabase can also be used.

32. What line of sight (intervisibility) products can be generated?

Two line of sight products can be generated:

- Visibility Plot: Creates a two-dimensional vector product that displays the areas around a selected site in which a target, at a specified altitude, is shielded from the site.

- Target Profile: Calculates a line of sight between two points.

33. Can the profile information used to generate one line of sight product be saved and used to generate another line of sight product?

Yes, the interface allows the user load an existing profile. This profile would have been generated during the creation of a previous line of sight product.

34. What types of products can be queried using the Data Query Wizard?

Currently only geodatabases (.mdb) can be queried, but shapefiles and coverages can be imported into a geodatabase using the wizards in ArcToolbox.

35. Are any queries supplied with the system?

Yes, there are 36 common queries that come with the system (18 VITD queries and 18 ITD queries). These 36 queries cannot be deleted, moved, or renamed. These can be modified and saved as either personal or common queries.

36. What is the difference between a common query and a personal query?

A common query is a query that can be used by anyone who has access to the system. A personal query can only be used by the user who created it.

37. Can I query multiple geodatabases within the same query?

Yes.

38. Can I save a query I created so I can use it to query other geodatabases?

Yes, the interface allows the user to load an existing query. This query would have been generated during the creation of a previous data query product.

39. In the Query Wizard, why do I get a "?" in the number column on the "Data Source Selection" screen?

The "?" means the geodatabase does not exist. You must replace that geodatabase with another geodatabase of the same type.

40. Can a legend category contain attributes from multiple geodatabases?

Yes, any geodatabase located in the "Data Source" pulldown menu can be used to construct a legend category.

41. Can a query created on one system be used on anther system?

Yes, this can be done using the "Export" option in the Query Manager. There are two ways to export queries:

- "To E-mail" option: The query can be exported to an e-mail message that can then be sent to a user on another system. The user on that system can then use the "Import/From E-mail" option to load the query onto their system.

- "To Directory" option: The query can be exported to a drive/directory that is accessible to another system. The user on that system can then use the "Import/From Directory" option to load the query onto their system.

42. Can I find out what queries contain information about a specific word or phrase?

Yes, the Query Manager has a search capability.

43. How do I generate a map?

Use the map production tool from the DTSS toolbar in ArcMap. This will generate a map layout for any DTSS custom product and any NIMA data that has been imported using the custom DTSS importers. The paper size must be set to 25 x 33 inches, otherwise a dialog will appear reminding the user to set the page size. The Map Production icon must be clicked again after setting page size.

44. How do I get the Map Production Tool icon on my ArcMap toolbar?

In ArcMap, select Tools/Customize. A new window titled "Customize" will appear. Select the "Toolbars" tab and select "DTSS."

45. Why is my Map Production Tool icon not enabled?

The Map Production tool will be disabled if there are no layers present in the map or if the user is in edit session.

46. What coordinate system does the Map Production Tool support?

All layers must be in the geographic coordinate system. Layers in different coordinate systems can be added to the map after the Map Production tool has been run.

47. What data is required to produce a Slope Generator product?

A slope generator product requires an ERDAS Imagine (.img) file.

48. What is the format of the Slope Generator product?

VITD or ITD format.

49. Can I view products created on my NT system on a UNIX System?

Yes, use the DTSS Overlay Provider (DOP) Exporter. The product being exported must be an ArcMap map document (.mxd). The DOP Exporter product can then be imported in the Joint Mapping Toolkit Viewer (JMV).

50. Can I share a product I created on my system with another DTSS system?

To share a product, use the DTSS Web Exporter.

51. Can a geodatabase produced by DTSS be used by non-DTSS systems?

The geodatabase exporter tool can be used to prepare a DTSS geodatabase for use outside the DTSS environment.

52. Why is my view sometimes zoomed to the extent of the world after adding layers to ArcMap?

This will happen if some of the layers added contain no data. In this case, you will see that such layers have no symbols showing in the legend. If these layers are removed, then zooming to full extent will bring you to the proper location.

53. What is the purpose of the DTSS Website?

The Website allows a user to export, store, view, and download DTSS products.

54. What is the address of the DTSS Website?

The address is http://machine name. Then click the “DTSS Products” link to take you to the DTSS Products page.

55. How can I find a specific product on the DTSS Website?

The DTSS Website has a search capability. Just enter the product name in the “Search” field and select the “Search” button.

56. Are there any naming conventions for queries, file names, etc?

Geodatabases have the extension .mdb
Data queries have the extension .ddq
Visibility plot profiles have the extension .vlp
Target profiles have the extensions .tlp
ERDAS Imagine files have the extension .img
ArcInfo map documents have the extension .mxd

INDEX

3-D Anaglyph
VirtualGIS, 10-59
3-D feature extraction, 7-53
3-D Perspective Views
in Imagine, 10-51–10-59

A

Adaptec Easy CD Creator, 11-44–11-58
create new CD, 11-55
main window, 11-46
media types, 11-45
menu bar, 11-46
overview, 11-44
supported CD formats, 11-44
toolbar, 11-50
Adding Layers
ArcMap, 10-4
Adjusting Raster Layer Transparency, 10-17
Adjusting Vector Layer Transparency, 10-16
Align/Group Functions
ArcMap, 10-40
anaglyph, 10-59
Annotating Imagery
ArcMap, 10-41
Annotation, 10-41, 10-43
Converting Labels to, 10-43
Append Wizard, 9-37
ArcCatalog, 6-68
Connecting to Data, 6-69–6-70
contents tab, 4-11, 6-71, 7-27, 7-39
Data Conversion, 6-9
Help, 12-2
menu bar, 4-11
metadata editor, 7-64
open program, 4-10
overview, 4-10
tabs, 4-10, 6-71–6-72
toolbars, 4-12
ARC Digitized Raster Graphics (ADRG), 6-75
Exporting, 11-5–11-8
Importing, 5-37
ArcInfo
Exporting Data, 11-4
Importing, 5-36–5-37
Overview, 4-2
Raster-to-Vector Conversion, 6-16
Workstation, 4-17–4-19
ArcMap
Adding Layers, 10-4
Align/Group Functions, 10-40
Annotating Imagery, 10-41
Buffer Wizard, 9-23
Converting Labels to Annotation, 10-43
Copying Layers, 10-7
Data Frames, 10-22
Data Layers, 10-4
Data Links, 10-21
Displaying Data in, 10-3–10-18
Dissolve Wizard, 9-27
Dynamic Labeling, 10-41
Editor toolbar, 7-3–7-15
Group Layers, 10-8–10-12
Help, 12-2
Layout View, 10-21
Legend, 10-35
main menu, 4-5
Map Composition, 10-19–10-51
map document, 8-20, 8-72, 10-19, 11-21
map templates, 10-19
Map Tips, 9-3
Multiple Layers, 10-8
North Arrow, 10-38
overview, 4-3
Page Setup, 10-28, 10-46
Printing, 10-46
Scale Bar, 10-29
Symbology, 10-13–10-18

Text Fields, 10-37
toolbars, 4-5
ArcToolbox
Analysis Tools, 9-28–9-37
Append Wizard, 9-37
Buffer Wizard, 9-36
Coverage to Geodatabase Wizard, 6-4
Data Management, 9-37–9-44
Erase Tool, 9-29
Help, 12-2
open program, 4-15
Overlay Wizard, 9-31
overview, 4-15
Projection conversion, 6-22–6-46
Proximity Directory, 9-35
Statistics Directory, 9-36
Surface Tools, 9-37
tools, 4-15, 9-23
Transform Tool, 6-45
ArcTools, 4-17
attribute table, 7-12, 7-15
attributes, 7-40, 9-11
add new, 7-16
create, 7-40
delete, 7-16
edit, 7-12, 7-23
find, 9-17, 9-20
modifying, 7-11
query, 9-13
search, 9-20
select, 9-11
viewing, 7-10, 9-3

B

Backup
disk files to tape, 11-63
maintain tapes, 11-68
menu bar, 11-59
overview, 11-59
restore tape files to disk, 11-65
toolbar, 11-62
Backup main window, 11-59
bookmark, 9-21, 9-22
buffer, 9-23
Buffer Wizard, 9-23
ArcToolbox, 9-36

C

Catalog Tree Structure, 6-63–6-69
Catalog Tree View panel, 10-4
CD Creator
Adaptec Easy, 11-44–11-58
CD Layout, 11-51
CD recording, 11-44–11-58
CD-RW, 1-10
Changing the Password, 2-6
Chart Series field, 11-7
Classification, 7-44–7-52
Commercial off-the-shelf (COTS), 1-2, 1-3, 1-7, 1-9, 9-1, 12-2, C-3–C-8
Common Look and Feel (CLF), 2-5, 3-2
Common Message Processor (CMP), 11-4, 11-79
Compressed ADRG (CADRG), 6-75, 11-8
Connecting to Data, 6-69
Controlled Image Base (CIB), 6-75, 11-8
Converting Geodatabase to Coverage, 6-9–6-13
Converting .img files to .wrk Files, 11-16
Converting Labels to Annotation
ArcMap, 10-43
coordinate system, 6-16–6-46, 6-68, 7-9, 7-26
geographic, 7-29
projected, 7-29
Copying Layers
ArcMap, 10-7
Country Code field, 11-8
coverages, 5-4, 6-3–6-16, 7-11, 7-19, 10-4, 10-22
append, 9-37
erase, 9-29
Creating New Query, 8-55–8-63
Cross-Country Movement (CCM), 8-5, 8-8, 8-14

D

Data
Displaying in ArcMap, 10-3–10-18
geographic, 5-3
Importing, 5-6–5-51

Layers, 10-4
Links, 10-21
Models, 5-3, 12-7
output, 11-4–11-27
Presentation, 10-3–10-66
Specifications, 9-20, 12-7, C-1
Vector Models, 5-4
Data Collection, 5-3–5-80
Data Conversion, 6-3–6-63
ArcCatalog, 6-9
Coverage to Geodatabase, 6-3
Geodatabase to Coverage, 6-9
Orthorectification, 6-63
Projections and Datums, 6-16–6-62
Raster to Vector, 6-13–6-16
using ArcToolbox, 6-3
Vector, 6-3
Data Dissemination, 11-27–11-79
CD Creator, 11-44–11-58
Data Editing, 7-3–7-69
Data Exploitation-COTS, 9-1–9-44
Feature Query and Selection, 9-3–9-23
Geoprocessing Tools, 9-23–9-44
Data Exploitation-Custom, 8-1–8-87
data frame, 7-10, 9-21, 10-21, 10-22
Data Layers
ArcMap, 10-4
Data Management, 6-1–6-76
ArcToolbox, 9-37–9-44
Data Models, 5-3, 12-7
Coverages, 5-4
Geodatabases, 5-4
Raster, 5-6
Shapefiles, 5-4
Vector, 5-4
Data Organization and Access, 6-63–6-73
Catalog Tree Structure, 6-63
Coordinate System Folders, 6-68
Data Output and Dissemination, 11-1–11-78
Data Presentation, 10-1–10-66
Data Query, 8-52–8-80
Categories, 8-53
Creating New Query, 8-55–8-63
Exporting Queries, 8-76
Importing Queries, 8-78
Loading and Modifying, 8-63–8-69
Output, 8-72
Query Manager, 8-72–8-80
Searching Queries, 8-74
Selections, 8-53
Structure, 8-53
Wizard, 8-55
Data View, 7-10, 10-3, 10-13
Defense Mapping Agency Feature File (DMAFF), 5-7
Desktop, 3-2
Desktop Icons, 3-2, 3-4
digital elevation data, 7-55, 10-61
digital elevation models, 7-55, 10-63
Digital feature data, 7-3
Digital Terrain Elevation Data (DTED), 6-75
Importing, 5-42–5-46
Digital Topographic Data (DTOP), 5-7, 5-18, 8-80
Digital Topographic Support System (DTSS), 1-2
Contact Information Editor, 7-67–7-69
configurations, 1-5, 1-6
Creating New Query, 8-55–8-63
Data Exploitation-Custom, 8-1–8-87
Data Query, 8-52–8-80
Directory Structure, 4-20–4-21
DOP Exporter, 11-21–11-24
equipment, 1-6
Existing Queries, 8-63–8-69
Exporting Queries, 8-76
Geodatabase Exporter, 11-24
Help, 1-10, 12-7
Help desk, 1-10
Importing Queries, 8-78
Line of Sight, 8-20–8-52
Map Elements, 10-49
Map Production Tool, 8-20, 8-52, 8-72, 10-23, 10-24, 10-29, 10-40, 10-46, 10-47, 10-48, 10-49, 10-50, 11-74
Map Template, 10-47

media, 1-10
Metadata Editor, 7-64
Mobility wizard, 8-3, 8-5, 8-8–8-14
Query Manager, 8-72–8-80
Searching Queries, 8-74
Slope Generator, 8-80–8-87
software overview, 1-7
system overview, 1-4
system purpose, 1-4
Target Profile, 8-40–8-52
Utilities
Slope Generator, 8-80–8-87
Visibility Plot, 8-27–8-40
Web Exporter, 11-28–11-42
Website, 11-28, 11-31, 11-34, 11-36, 11-40–11-44
digitize new features, 7-5, 7-19, 7-21
data creation, 7-54
DII COE Kernel 4.2, 1-7
Display Area, 3-8
Display panel, 7-12, 7-14, 7-22, 7-23, 9-9, 9-11, 9-22, 10-3, 10-4, 10-8, 10-13, 10-18, 10-20, 10-21, 10-22, 10-31
Displaying Data
in ArcMap, 10-3–10-18
Dissolve Wizard, 9-27
Dongles, A-16
DOP Exporter, 11-21
Downloading
Adobe Acrobat Reader, 9-20
NIMAMUSE, 6-75
product from DTSS Website, 11-40–11-44
DTSS Directory Structure, 4-20–4-21
DTSS Geodatabase Exporter, 11-24
DTSS Help desk, 1-10
DTSS Map Elements
in ArcMap, 10-49
DTSS Map Production
in ArcMap, 10-46
DTSS Map Template, 10-47
in ArcMap, 10-47
DTSS Website, 11-27–11-44
DVD-RAM, 11-58
Dynamic labels, 10-41

E

Editor toolbar, 7-3, 7-4, 7-5, 7-6, 7-7, 7-8, 7-9, 7-10, 7-12, 7-13, 7-14, 7-15, 7-16, 7-22, 7-23, 7-24, 7-40
Erase Tool
ArcToolbox, 9-29
ERDAS Imagine
exporting data with, 11-4–11-21
feature extraction, 7-44–7-52
generate digital elevation models, 7-55–7-64
Help, 4-19, 12-6, 12-7
icon panel, 4-19
importing data in, 5-37–5-51
open program, 4-18
overview, 4-18
viewer window, 4-19
VirtualGIS, 10-51–10-61
Ethernet Switch, A-1
Existing Queries
Loading and Modifying, 8-63–8-69
Reassigning Data, 8-69
Expert Classification, 7-52
Exporting Queries, 8-76
Exporting
ADRG, 11-5–11-8
ArcInfo, 11-4
Imagine, 11-4
Map Image, 10-46
NITF, 11-15–11-21
RPF, 11-8–11-15

F

Feature, 9-23, 9-30
add, 7-40
add buffers, 9-23
attributes, 7-10–7-18, 7-36
class, 5-5, 7-18
create, 7-4, 7-21
dataset, 5-5, 6-65, 10-6
display color, 9-7
editing, 7-10, 7-11
find, 9-17, 9-20
identify, 9-3
label, 10-41
merge, 9-37

search, 9-20
select, 9-7
select by attributes, 9-13
select by location, 9-11
select from attributes table, 9-11
select graphically, 9-8, 9-9
selection, 7-10
selection color, 9-5
Feature Attributes, 7-10–7-18, 7-36, 9-40
feature attribute tables, 9-42
feature classes, 7-26, 7-36, 7-53, 9-27, 9-29, 9-33, 9-37, 9-41, 10-4
add fields, 7-38
adding new, 7-17
create, 7-34
creating, 7-17
export, 11-21, 11-24
Output, 6-12
properties, 7-41
feature classification, 7-44, 7-52
feature construction tools, 7-7
feature dataset, 6-65, 7-26, 7-28, 7-36, 10-6
Adding, 10-6
feature extraction, 7-44
using scanner, 5-73–5-77
Feature Geometry, 7-4
Feature Queries, 8-53, 8-54
Attribute, 8-53, 8-54
Feature, 8-53, 8-54, 8-55
Layer, 8-53, 8-54
Value, 8-53, 8-54, 8-55
Feature Query and Selection, 9-3–9-23
Additional Operations, 9-16
Attribute Table, 9-10
Deselect Features, 9-17
Export Selected Features, 9-17
Find Features, 9-17
Geoprocessing Tools, 9-23–9-44
Graphical, 9-8
Identifying Features, 9-3
Map Tips, 9-3
Select by Attributes, 9-13
Select by Location, 9-11
Selecting Features, 9-5
Setting Selectable Layers, 9-7
Spatial Bookmarks, 9-21
Find tool, 9-17
Flight Path Elevation, 10-59
flight paths, 10-56
Fly Through, 10-54
Foundation Feature Data (FFD), 5-7, 5-18

G

Gap Crossing, 8-6
Geodatabase, 5-4, 6-65, 7-40
Adding features from, 10-4, 10-6
convert to, 7-52
copy blank template, 7-19
create, 7-26
create new feature dataset, 7-28
Defining projection, 6-17
export, 11-21
Feature class, 5-5, 9-27, 10-4
Feature dataset, 5-5, 10-6
Object class, 5-5
Relationship class, 5-5
template, 5-5, 7-19, 7-21, 7-25
Geoprocessing Tools, 9-23–9-44
ArcMap, 9-23
ArcMap Buffer Wizard, 9-23
ArcMap Dissolve Wizard, 9-27
ArcToolbox Analysis Tools, 9-28–9-37
ArcToolbox Append Wizard, 9-37
ArcToolbox Buffer Wizard, 9-36
ArcToolbox Overlay Wizard, 9-31
GEOTRANS, 6-74–6-75
Government Off-the-Shelf (GOTS), 1-7, 1-8
Graphical User Interface (GUI), 3-2
graticules, 10-31
grids, 10-31–10-35, 10-50, 10-51
Layout View, 10-31
Map Composition, 10-31
ground control points (GCPs), 6-51
Group function, 10-40
Group Layers
Adding layers, 10-10
ArcCatalog, 6-67

ArcMap, 10-8–10-12
Change layer order, 10-12
creating, 10-8
Remove layers, 10-12

H

Help, 1-10, 12-2–12-8
Historical Rain Information, 8-7
HP Design Jet 1055CM, 11-71, 11-74, 11-78

I

IFSAR DEM, 7-55
image classification, 7-52
Imagine
Classifier, 7-44
Exporting Data, 11-4
Importing, 5-37–5-51
Polynomial Rectification, 6-51
Raster Projections, 6-46–6-62
Raster-to-Vector Conversion, 6-13
Importing
ADRG, 5-37
DTED, 5-42
ITD, 5-7–5-18
Queries, 8-78
RPF, 5-47
VPF, 5-18–5-36
with ArcInfo, 5-36–5-37
with Imagine, 5-37–5-51
Iomega
Jaz Drive, 11-69
Interim Terrain Data (ITD), 5-6, 5-7, 8-6, 8-8, 8-52, 8-80, 8-81, 8-83
Intervisibility, 8-20–8-52
ITD import functions, 5-7
ITD Importer, 5-7–5-18

J

Jaz Drive, 11-69
Joint Mapping Toolkit Viewer (JMV), 11-21

L

labeling, 10-41
Labels
change for features/layers, 10-15
Converting to Annotation, 10-43
Adding Layers, 10-4, 10-22
changing symbology, 10-13
Copying, 10-7
Data Layers, 10-4
display order, 10-22
group layer, 10-9, 10-10
group layers, 10-8
label, 10-41
Layer properties, 10-9, 10-10, 10-11, 10-12, 10-13
multiple, 10-8
remove, 10-22
Remove layers, 10-12
Working with multiple layers, 10-8
Laptop
operations, 1-10
layer, 9-13, 9-23
attribute table, 7-12
buffer, 9-26
change color, 9-5
coordinate system, 7-9
display map tips, 9-4
edit, 7-10
export, 11-21
identify, 9-3
properties, 9-6, 9-19
search, 9-18
select, 9-7
select by location, 9-11
selection highlight color, 9-6
set selectable, 9-7
Layout View, 7-10, 9-21, 10-3, 10-21, 10-25, 10-30, 10-31, 10-41, 10-42
Align/Group Functions, 10-40
Annotating Imagery, 10-41
ArcMap, 10-21
Data Frames, 10-22
Dynamic Labeling, 10-41
Grids, 10-31
Legend, 10-35
North Arrow, 10-38
Page Setup, 10-28
Scale Bar, 10-29

Text Fields, 10-37
legend, 10-35, 10-36
Line of Sight (LOS), 8-20–8-52
Parameters, 8-21
Products, 8-21
Target Profile, 8-40–8-52
Visibility Plot, 8-27–8-40
Locator, 10-23, 10-49
Logging On After the First Time, 2-5
Logging On for the First Time, 2-3
Logoff Procedures, 2-6
Logon and Logoff Procedures, 2-2

M

Main Header Editor, 11-20
map
add text, 10-37
document, 6-67, 8-20, 8-72, 10-19, 10-46, 11-21, 11-71
elements, 10-19, 10-21, 10-49
export image, 10-46
grids/graticules, 10-31
label, 10-41
labels, 10-45
legend, 10-35, 10-50
north arrow, 10-38, 10-49
page setup, 10-28, 10-47
print, 10-46, 11-71
publish, 11-28, 11-31, 11-34
scale, 10-24
scale bar, 10-29, 10-49
setup, 10-29
size, 10-29
template, 6-67
Map Composition, 10-19–10-51, 11-16
Align/Group Functions, 10-40
Annotating Imagery, 10-41
ArcMap, 10-19–10-51
Data Frames, 10-22
Data Links, 10-21
Dynamic Labeling, 10-41
Grids, 10-31, 10-50
Layout View, 10-21
Legend, 10-35, 10-50
North Arrow, 10-38, 10-49
Page Setup, 10-28
Saving in ArcMap, 10-46
Scale Bar, 10-29, 10-50
Text Fields, 10-37
Map Image
Exporting, 10-46
Map Production Tool
DTSS, 8-20, 8-52, 8-72, 10-23, 10-24, 10-29, 10-40, 10-46–10-50, 11-73
Map Template
Choosing, 10-19
Custom, DTSS, 10-47
Saving, 10-21
map tips, 9-3
mapping a network drive, A-10
Menu Bar, 3-8
metadata, 6-72–6-73, 7-64, 11-23, 11-43
stylesheet, 4-14, 7-66
toolbar, 4-14, 6-73, 7-66
Metadata Editor, 7-64
Mobility
Cross-Country Movement, 8-5, 8-14
Gap Crossing, 8-3, 8-5, 8-6, 8-14, 8-16
Mobility Model, 8-4
Mobility Model Overview, 8-4
NRMM II Output, 8-14
NRMM II Overview, 8-3–8-5
On-Road Speed, 8-6, 8-15–8-16
Parameters, 8-7
Products, 8-5
reason code descriptions, 8-16–8-17
vehicle descriptions, 8-7
Multiple Layers
ArcMap, 10-8

N

National Imagery & Mapping Agency (NIMA), 1-6, 9-20, 10-46, 11-8, 11-28
National Imagery Transmission Format (NITF), 11-15
Exporting, 11-15–11-21
Netscape Navigator, 11-40
NATO Reference Mobility Model II (NRMM II), 8-3–8-5, 8-6, 8-9, 8-14, 8-15, 8-16, 8-17, 8-18, 8-19
NIMA data types, 5-6

Standard Linear Format, 5-6
NIMAMUSE, 6-75–6-76
north arrow, 10-38
NITF Export
Preparing an Image, 11-16
NITF Security Data, 11-21

O

Object class, 5-5
Obtaining a User Account, 2-2
On-Road Speed, 8-5, 8-6
Orthorectification, 6-63
output directory, 5-7
Overlay Wizard, 9-31

P

Page Setup, 10-28
Layout View, 10-28
Parameters
Coordinate Reference, 8-23
Interpolation Method, 8-22
Line of Sight, 8-21
LOS Mode, 8-26
LOS Range, 8-26
Mobility, 8-7
Observer Height, 8-25
Observer Reference, 8-26
Observer Selection Method, 8-25
Range Bands, 8-23
Sample Spacing, 8-26
Target Altitude, 8-21
Target Height, 8-21
Target Reference, 8-22
password, 2-2, 2-3, 2-4, 2-5, 2-6
permissions, 4-21, A-13
Planning ITD (PITD), 5-6, 5-7
Polynomial Rectification, 6-51
Power-Down Procedures, 2-2
Power-On Procedures, 2-2
printer setup, 10-29, 11-47
Printing
in ArcMap, 10-46, 11-72
in ERDAS Imagine, 11-76–11-78
Program Windows, 3-2
Projections and Datums, 6-16–6-62
ArcToolbox, 6-22–6-46
Geodatabases, 6-17
Raster, 6-46–6-62
Shapefiles, 6-18
Vector, 6-16
Proximity Directory
ArcToolbox, 9-35
publish map, 11-28

Q

Query Manager, 8-72–8-80
Exporting Queries, 8-76
Importing Queries, 8-78
Searching Queries, 8-74

R

radar, 7-55, 7-59
Raster, 5-6, 6-67, 7-3, 7-44, 7-52, 10-17
Data Projection, 6-46–6-62
image, 10-53
Layer, 6-67
Raster-to-Vector Conversion, 6-13–6-16
Reboot Procedures, 2-6
Redundant Array of Independent Disks (RAID), 1-10
Relationship class, 5-5, 6-66
RPF
Exporting, 11-8–11-15
Importing, 5-47

S

Saving a Map Composition
in ArcMap, 10-46
Scale Bar
Map Composition, 10-29
Scan, 5-51–5-80
Adjustments Phase, 5-72
Color Wheel View, 5-60
Extended Thickness Tab, 5-64
Feature Extraction, 5-73–5-77
Feature Task Toolbar, 5-59
Feature Window, 5-58, 5-60
Final Scanning Phase, 5-72
Histogram View, 5-61
Initializing Phase, 5-67
Main Toolbar, 5-53

Media Offsets Tab, 5-63
Menu Bar, 5-52
Overview and Detail Windows, 5-56
Paper Load Tab, 5-62
Paper Size, 5-70
Prescanning Phase, 5-71
Presets, 5-67
Resolution, 5-69
Scan Panel, 5-56
Scan Task Toolbar, 5-55
Scan Window, 5-54
Scanner Calibration, 5-64
Scanner Setup, 5-62
Scanning an Image, 5-66
Scanning Modes, 5-68
Scanning to Printer, 5-77–5-80
User Interface, 5-52
View Task Toolbar, 5-57
View Window, 5-56, 5-58
SECRET, 2-2
Security Officer, 2-3
search
online Help, 12-8
products on DTSS website, 11-41
Searching Queries, 8-74
select, 8-53, 8-54
all elements, 7-10
features, 7-10
features from table, 9-10
features by location, 9-11
features graphically, 9-8
features in a layer, 9-13
group of features, 9-9
Selecting Features, 9-5
Setting Selectable Layers, 9-7
shaded relief, 10-51, 10-61
Shapefile, 5-4, 7-5, 7-6, 7-11, 7-52, 7-53, 9-27, 10-22
Defining projection, 6-18
Sharing Drives Between Computers, A-7
Shutdown Procedures, 2-7
Signature Editor, 7-46
sketch, 7-8
Sketch tool, 7-4–7-8
Slippery Condition, 8-7
Slope Generator, 8-80–8-87
spatial bookmark
create, 9-22
remove, 9-22
using, 9-21
view existing, 9-22
spatial reference, 7-28, 7-36
Standard Linear Format (SLF), 5-6, 5-7
Start button, 3-2
Start menu, 3-2
Statistics Directory
ArcToolbox, 9-36
stereo, 10-59
stereo anaglyph, 10-51
Stereo Analyst, 7-44, 7-53
StereoSAR DEM, 7-59
Stock Number field, 11-8
stylesheet, 4-15, 6-73, 7-66
Sub-Pixel Classifier, 7-44, 7-52
Surface Tools
ArcToolbox, 9-37
Switch Configuration, A-1–A-7
symbol, 9-7
Symbology
ArcMap, 10-13–10-18
saving, 10-18
changing, 8-19, 8-20, 8-38, 8-72, 8-86, 10-13, 10-15
System Administrator, 2-3, 2-4, A-1

T

Table of Contents panel, 7-16, 7-23, 9-4, 9-6, 9-10, 9-19, 9-26, 10-4, 10-5, 10-6, 10-8, 10-9, 10-10, 10-12, 10-13, 10-15, 10-21, 10-22, 10-43
Tactical Decision Aids (TDAs), 1-6, 4-20, 8-3
Tape Archive, 11-59–11-69
target layer, 7-4
Target Profile, 8-40–8-52
Output, 8-51
Taskbar, 3-2
Task Manager, A-15
TERCAT, 7-44
terrain categorization, 7-44
Terrain Visualization
3-D Anaglyph, 10-59

3-D Perspective Views, 10-51–10-59
in Imagine, 10-51–10-65
Shaded Relief, 10-61
Virtual GIS, 10-51–10-59
Text Fields
ArcMap, 10-37
Layout View, 10-37
Map Composition, 10-37
Title Bar, 3-5
tolerances, 7-8
Transportation Line, 8-53
Transparency, 10-16
Adjusting Raster Layer Transparency, 10-17
Adjusting Vector Layer Transparency, 10-16
Tree View panel, 7-28, 7-36, 7-40, 7-65

U

Unix, 6-73
using in NT, 6-73–6-74
User Classes, 1-6
user name, 2-2, 2-3, 2-4, 2-5
User Names and Passwords, 2-2
User Tolerances, 7-8
Utilities
Slope Generator, 8-80–8-87

V

Vector, 7-3, 7-52
Coverages, 5-4
Data Conversion, 6-3
Data Models, 5-4
Geodatabases, 5-4
Projection, 6-16
Shapefiles, 5-4
Vector Product Format (VPF), 5-6, 6-75
Vector Product Format ITD (VITD), 5-6, 5-17, 8-6, 8-8, 8-21, 8-38, 8-52, 8-80, 8-81, 8-83
Versatile Computer Unit (VCU), 1-10
media types, 1-10
software installation procedures, A-18
Vehicle Selection, 8-7
VirtualGIS, 10-59
Virtual Local Area Network (VLAN), A-1
Visibility Plot, 8-27–8-40
VPF Importer, 5-17–5-35, 8-21

W

Water Level, 8-7
Web Exporter, 11-28–11-40
DTSS, 11-28–11-40
Web Metadata Editor, 11-30, 11-31, 11-33, 11-34
Website
DTSS, 11-27–11-44
Window Control buttons, 3-7
Windows NT 4.0, 1-7
wizard interface, 3-10

By Order of the Secretary of the Army:

ERIC K. SHINSEKI
General, United States Army
Chief of Staff

Official:

JOEL B. HUDSON
Administrative Assistant to the
Secretary of the Army
0135202

DISTRIBUTION:

To be distributed in accordance with the initial distribution number (IDN) 361957 requirements for TB 11-6675-294-10.

RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL PUBLICATIONS



SOMETHING WRONG WITH THIS PUBLICATION

THEN ... JOT DOWN THE INFO ABOUT IT ON THIS FORM. CAREFULLY TEAR IT OUT. FOLD IT AND DROP IT IN THE MAIL.

FROM: (PRINT YOUR UNIT'S COMPLETE ADDRESS)
Commander
Stateside Army Depot
ATTN: AMSTA-US
Stateside, N.J. 07703-5007

DATE SENT
10 July 1975

PUBLICATION NUMBER	PUBLICATION DATE	PUBLICATION TITLE
TM 11-5840-340-20	23 Jan 74	Radar Set AN/PRC-76

BE EXACT PIN-POINT WHERE IT IS

PAGE NO	PARA GRAPH	FIGURE NO	TABLE NO	IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:
2-25	2-28			Recommend that the installation antenna alignment procedure be changed throughout to specify a 20 IFF antenna lag rather than 10. REASON: Experience has shown that with only a 10 lag, the antenna servo system is too sensitive to wind gusting in excess of 25 knots, and has a tendency to rapidly accelerate and decelerate as it hunts, causing strain to the drive train. Hunting is minimized by adjusting the lag to 20 without degradation of operation.
3-10	3-3		3-1	Item 5, Functional Column. Change • 2 dB" to • 3 dB". REASON: The adjustment procedure for the TRANS POWER FAULT indicator calls for a 3 dB (500 watts) adjustment to light the TRANS POWER FAULT indicator.
5-6	5-8			Add new step f.1 to read, • Replace cover plate removed in step e.1, above." REASON: To replace the cover plate.
		FO-3		Zone C 3. On J1-2, change • +24 VDC" to • +5 VDC". REASON: This is the output line of the 5 VDC power supply. +24 VDC is the input voltage.

PRINTED NAME, GRADE OR TITLE AND TELEPHONE NUMBER

SSG I. M. DeSpiritof 999-1776

SIGN HERE



SAMPLE

DA FORM 1 JUL 79 2028-2

PREVIOUS EDITIONS ARE OBSOLETE

P.S. - IF YOUR OUTFIT WANTS TO KNOW ABOUT YOUR RECOMMENDATION MAKE A CARBON COPY OF THIS AND GIVE IT TO YOUR HEADQUARTERS.

TEAR ALONG DOTTED LINE

REVERSE OF DA FORM 2028-2

FILL IN YOUR
UNIT'S ADDRESS

FOLD BACK

DEPARTMENT OF THE ARMY

OFFICIAL BUSINESS

PLEASE
AFFIX
STAMP
POSTAGE
REQUIRED

SAMPLE

Commander
U.S. Army Communications-Electronics Command
and Fort Monmouth
ATTN: AMSEL-LC-LEO-D-CS-CFO
Fort Monmouth, New Jersey 07703-5006

TEAR ALONG DOTTED LINE

TEAR ALONG DOTTED LINE

RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL PUBLICATIONS



SOMETHING WRONG WITH THIS PUBLICATION

THEN ... JOT DOWN THE INFO ABOUT IT ON THIS FORM. CAREFULLY TEAR IT OUT. FOLD IT AND DROP IT IN THE MAIL.

FROM: (PRINT YOUR UNIT'S COMPLETE ADDRESS)

DATE SENT

PUBLICATION NUMBER	PUBLICATION DATE	PUBLICATION TITLE

BE EXACT PIN-POINT WHERE IT IS

PAGE NO	PARA GRAPH	FIGURE NO	TABLE NO

IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:

PRINTED NAME, GRADE OR TITLE AND TELEPHONE NUMBER

SIGN HERE

DA FORM 1 JUL 79 **2028-2**

PREVIOUS EDITIONS ARE OBSOLETE

P.S. - IF YOUR OUTFIT WANTS TO KNOW ABOUT YOUR RECOMMENDATION MAKE A CARBON COPY OF THIS AND GIVE IT TO YOUR HEADQUARTERS.

REVERSE OF DA FORM 2028-2

FILL IN YOUR
UNIT'S ADDRESS

FOLD BACK

DEPARTMENT OF THE ARMY

OFFICIAL BUSINESS

PLEASE
AFFIX
STAMP
POSTAGE
REQUIRED

Commander
U.S. Army Communications-Electronics Command
and Fort Monmouth
ATTN: AMSEL-LC-LEO-D-CS-CFO
Fort Monmouth, New Jersey 07703-5006

TEAR ALONG DOTTED LINE

TEAR ALONG DOTTED LINE

RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL PUBLICATIONS



SOMETHING WRONG WITH THIS PUBLICATION

THEN ... JOT DOWN THE INFO ABOUT IT ON THIS FORM. CAREFULLY TEAR IT OUT. FOLD IT AND DROP IT IN THE MAIL.

FROM: (PRINT YOUR UNIT'S COMPLETE ADDRESS)

DATE SENT

PUBLICATION NUMBER	PUBLICATION DATE	PUBLICATION TITLE

BE EXACT PIN-POINT WHERE IT IS

PAGE NO	PARA GRAPH	FIGURE NO	TABLE NO

IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:

PRINTED NAME, GRADE OR TITLE AND TELEPHONE NUMBER

SIGN HERE

DA FORM 1 JUL 79 **2028-2**

PREVIOUS EDITIONS ARE OBSOLETE

P.S. - IF YOUR OUTFIT WANTS TO KNOW ABOUT YOUR RECOMMENDATION MAKE A CARBON COPY OF THIS AND GIVE IT TO YOUR HEADQUARTERS.

REVERSE OF DA FORM 2028-2

FILL IN YOUR
UNIT'S ADDRESS

FOLD BACK

DEPARTMENT OF THE ARMY

OFFICIAL BUSINESS

PLEASE
AFFIX
STAMP
POSTAGE
REQUIRED

Commander
U.S. Army Communications-Electronics Command
and Fort Monmouth
ATTN: AMSEL-LC-LEO-D-CS-CFO
Fort Monmouth, New Jersey 07703-5006

TEAR ALONG DOTTED LINE

TEAR ALONG DOTTED LINE

RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL PUBLICATIONS



SOMETHING WRONG WITH THIS PUBLICATION

THEN ... JOT DOWN THE INFO ABOUT IT ON THIS FORM. CAREFULLY TEAR IT OUT. FOLD IT AND DROP IT IN THE MAIL.

FROM: (PRINT YOUR UNIT'S COMPLETE ADDRESS)

DATE SENT

PUBLICATION NUMBER	PUBLICATION DATE	PUBLICATION TITLE

BE EXACT PIN-POINT WHERE IT IS

PAGE NO	PARA GRAPH	FIGURE NO	TABLE NO

IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:

PRINTED NAME, GRADE OR TITLE AND TELEPHONE NUMBER

SIGN HERE

DA FORM 1 JUL 79 **2028-2**

PREVIOUS EDITIONS ARE OBSOLETE

P.S. - IF YOUR OUTFIT WANTS TO KNOW ABOUT YOUR RECOMMENDATION MAKE A CARBON COPY OF THIS AND GIVE IT TO YOUR HEADQUARTERS.

REVERSE OF DA FORM 2028-2

FILL IN YOUR
UNIT'S ADDRESS

FOLD BACK

DEPARTMENT OF THE ARMY

OFFICIAL BUSINESS

PLEASE
AFFIX
STAMP
POSTAGE
REQUIRED

Commander
U.S. Army Communications-Electronics Command
and Fort Monmouth
ATTN: AMSEL-LC-LEO-D-CS-CFO
Fort Monmouth, New Jersey 07703-5006

TEAR ALONG DOTTED LINE

THE METRIC SYSTEM AND EQUIVALENTS

'NEAR MEASURE

. Centimeter = 10 Millimeters = 0.01 Meters = 0.3937 Inches
1 Meter = 100 Centimeters = 1000 Millimeters = 39.37 Inches
1 Kilometer = 1000 Meters = 0.621 Miles

'VEIGHTS

Gram = 0.001 Kilograms = 1000 Milligrams = 0.035 Ounces
1 Kilogram = 1000 Grams = 2.2 lb.
1 Metric Ton = 1000 Kilograms = 1 Megagram = 1.1 Short Tons

LIQUID MEASURE

1 Milliliter = 0.001 Liters = 0.0338 Fluid Ounces
1 Liter = 1000 Milliliters = 33.82 Fluid Ounces

SQUARE MEASURE

1 Sq. Centimeter = 100 Sq. Millimeters = 0.155 Sq. Inches
1 Sq. Meter = 10,000 Sq. Centimeters = 10.76 Sq. Feet
1 Sq. Kilometer = 1,000,000 Sq. Meters = 0.386 Sq. Miles

CUBIC MEASURE

1 Cu. Centimeter = 1000 Cu. Millimeters = 0.06 Cu. Inches
1 Cu. Meter = 1,000,000 Cu. Centimeters = 35.31 Cu. Feet

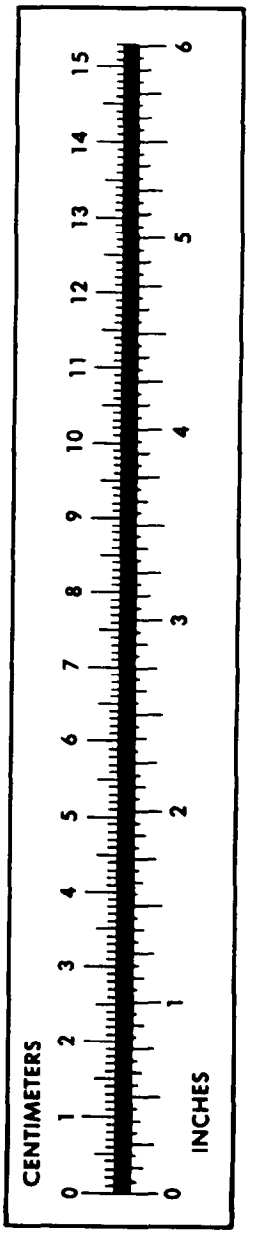
TEMPERATURE

5/9(°F - 32) = °C
212° Fahrenheit is evuivalent to 100° Celsius
90° Fahrenheit is equivalent to 32.2° Celsius
32° Fahrenheit is equivalent to 0° Celsius
9/5C° + 32 =°F

APPROXIMATE CONVERSION FACTORS

TO CHANGE	TO	MULTIPLY BY
Inches	Centimeters	2.540
Feet	Meters	0.305
Yards	Meters	0.914
Miles	Kilometers	1.609
Square Inches	Square Centimeters	6.451
Square Feet	Square Meters	0.093
Square Yards	Square Meters	0.836
Square Miles	Square Kilometers	2.590
Acres	Square Hectometers	0.405
Cubic Feet	Cubic Meters	0.028
Cubic Yards	Cubic Meters	0.765
Fluid Ounces	Milliliters	29.573
ıts	Liters	0.473
arts	Liters	0.946
allons	Liters	3.785
Ounces	Grams	28.349
Pounds	Kilograms	0.454
Short Tons	Metric Tons	0.907
Pound-Feet	Newton-Meters	1.356
Pounds per Square Inch	Kilopascals	6.895
Miles per Gallon	Kilometers per Liter	0.425
Miles per Hour	Kilometers per Hour	1.609

TO CHANGE	TO	MULTIPLY BY
Centimeters	Inches	0.394
Meters	Feet	3.280
Meters	Yards	1.094
Kilometers	Miles	0.621
Square Centimeters	Square Inches	0.155
Square Meters	Square Feet	10.764
Square Meters	Square Yards	1.196
Square Kilometers	Square Miles	0.386
Square Hectometers	Acres	2.471
Cubic Meters	Cubic Feet	35.315
Cubic Meters	Cubic Yards	1.308
Milliliters	Fluid Ounces	0.034
Liters	Pints	2.113
Liters	Quarts	1.057
ers	Gallons	0.264
ms	Ounces	0.035
ograms	Pounds	2.205
Metric Tons	Short Tons	1.102
Newton-Meters	Pounds-Feet	0.738
Kilopascals	Pounds per Square Inch	0.145
lometers per Liter	Miles per Gallon	2.354
meters per Hour	Miles per Hour	0.621



PIN: 079464-000