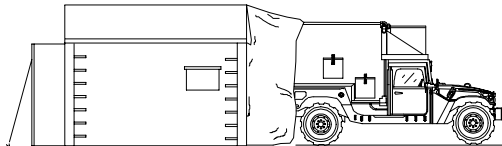
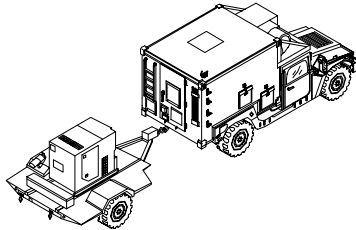


TECHNICAL MANUAL OPERATOR'S MANUAL



DIGITAL TOPOGRAPHIC SUPPORT SYSTEM-LIGHT

(DTSS-L)

AN/TYQ-67 (V) 2

(NSN 6675-01-483-0561)

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HEADQUARTERS, DEPARTMENT OF THE ARMY

1 NOVEMBER 2001



SAFETY STEPS TO FOLLOW IF SOMEONE IS THE VICTIM OF ELECTRICAL SHOCK.

1

**DO NOT TRY TO PULL OR GRAB THE
INDIVIDUAL.**

2

**IF POSSIBLE, TURN OFF THE ELECTRICAL
POWER.**

3

**IF YOU CANNOT TURN OFF THE ELECTRICAL
POWER, PULL, PUSH, OR LIFT THE PERSON TO
SAFETY USING A DRY WOODEN POLE, DRY ROPE
OR SOME OTHER INSULATING MATERIAL.**

4

SEND FOR HELP AS SOON AS POSSIBLE.

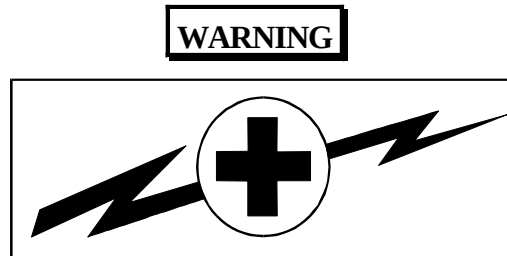
5

**AFTER THE INJURED PERSON IS FREE OF
CONTACT WITH THE SOURCE OF ELECTRICAL
SHOCK, MOVE THE PERSON A SHORT DISTANCE
AWAY. IMMEDIATELY START ARTIFICIAL
RESPIRATION IF NECESSARY.**

WARNINGs indicate there is a danger to personnel.

CAUTIONs indicate there is the potential to damage equipment.

NOTEs indicate information about a procedure or step.



HIGH VOLTAGE

is used in the operation of this equipment.

DEATH ON CONTACT

may result if personnel fail to observe safety precautions.

Never work on electronic equipment unless there is another person nearby who is familiar with the operation and hazards of the equipment and who is competent in administering first aid. Technicians aided by operators must warn them about dangerous areas.

Whenever possible, the power supply to the equipment must be shut off before beginning work on the equipment. Take particular care to ground every potentially dangerous capacitor. When working inside the equipment, after the power has been turned off, always ground every part of the equipment before touching it.

Be careful not to contact high-voltage connections or 115 Vac input connections when installing or operating this equipment.

If the nature of the operation permits, keep one hand away from the equipment to reduce the hazard of current flowing through the body.

WARNING

Do not be misled by the term “low voltage”. Under adverse conditions, potentials as low as 50 volts may cause death.

For Artificial Respiration, refer to FM 21-11.

AIR CONTAMINATION

1. Notify your supervisor if you think you have been exposed to chemical, biological, or radiological contamination. TM 3-220 gives procedures for decontamination.
2. During DTSS-L system operation, turn on shelter Environmental Control Unit (ECU).
3. When vehicle engine is running, do not permit personnel to be in the shelter and do not turn on ECU's.
4. Do not permit smoking in shelter.
5. Maintain strict cleanliness in shelter to keep dust and dirt to a minimum.
6. Park DTSS-L as far as possible from generator.

EMERGENCY CONDITIONS

1. In a fire emergency condition, use fire extinguisher provided in shelter.
2. Make sure that you and all other shelter personnel are familiar with emergency procedures including:
 - Emergency power-down procedure.
 - Keeping aisles clear to allow rapid personnel exit from shelter.

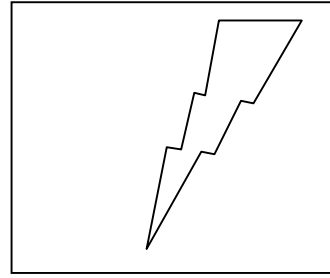
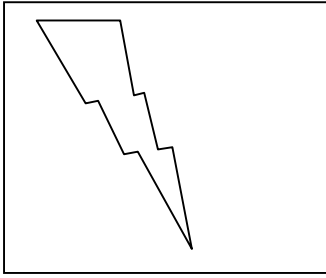
TRANSPORTATION HAZARDS

1. Make sure that the pressure release air knockout panels are removed before air transport of the DTSS-L.
2. Make sure that all support equipment is stowed in storage cabinets and that cabinet doors are securely latched.
3. Make sure that all loose gear such as tools and chairs are secured.
4. Check that fire extinguisher is secure in wall bracket.

CIRCUIT BREAKERS

If a circuit breaker does not stay in the ON position when closed, DO NOT attempt to close it repeatedly. This could create an overload situation hazardous to personnel and equipment. Instead, investigate cause of problem. Correct the situation before attempting to close the breaker again.

WARNING



ELECTRICAL HAZARD

Under adverse conditions, the voltage used in this equipment may cause serious injury or death. Observe the following safety precautions.

GROUND THE EQUIPMENT Before connecting primary power cables, connect the grounding cable from the ground lug on the power control box to earth ground. Do not remove the grounding cable until the signal cables and primary power cables have been disconnected and the generator has been shut down.

AVOID THE POWER INPUT Be careful not to contact the Vac input connections when installing or servicing the equipment.

DO NOT SERVICE ALONE Never work on the equipment unless there is another person nearby who is familiar with the operation and hazards of the equipment and who can administer first aid.

USE ONLY ONE HAND Whenever possible, use only one hand to service the equipment. Keep the other hand away to reduce the hazard of current flowing through the vital organs of the body.

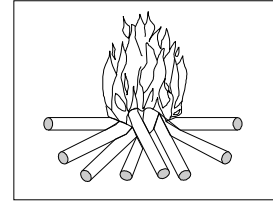
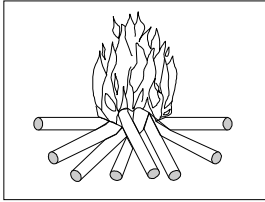
WARNING**CARBON MONOXIDE (EXHAUST GAS) CAN KILL YOU**

Carbon monoxide does not have color or smell, but it can kill you. Breathing carbon monoxide produces symptoms of headache, dizziness, loss of muscular control, a sleepy feeling, and coma. Brain damage or death can result from heavy exposure. Carbon monoxide occurs in the exhaust fumes of fuel-burning heaters and internal combustion engines. When there is no air movement, carbon monoxide can become dangerously concentrated. Precautions must be followed to ensure crew safety when the ECU, truck engine, or any other vehicle is operated near the shelter.

1. **DO NOT** operate engine of vehicle or generators in a closed area unless exhaust ducts are connected and extended out of the closed area.
2. **DO NOT** idle engine for long periods without operating the ventilator blower. If tactical situation permits, open door.
3. **DO NOT** drive any vehicle with inspection plates, cover plates, or engine compartment doors removed unless necessary for maintenance purposes.
4. **BE ALERT** at all times during vehicle operation for exhaust odors and exposure symptoms. If either is present, **IMMEDIATELY VENTILATE** personnel compartments. If symptoms persist, remove affected crew to fresh air; keep warm. **DO NOT PERMIT PHYSICAL EXERCISE**; if necessary, give artificial respiration.
5. **BE AWARE** The field protective mask for Chemical, Biological, Radiological (CBR) protection will not protect you from carbon monoxide poisoning.

FOR ARTIFICIAL RESPIRATION, REFER TO FM 21-11.

WARNING



BURN HAZARD

If the generator has been running for any length of time, the exhaust hoses and connections will be very hot and can cause severe burns. Use gloves and exercise extreme care when disconnecting exhaust hoses or working around the generator exhaust

WARNING

system.

HEAVY EQUIPMENT

Improperly lifting or carrying heavy equipment can result in serious injury or death.

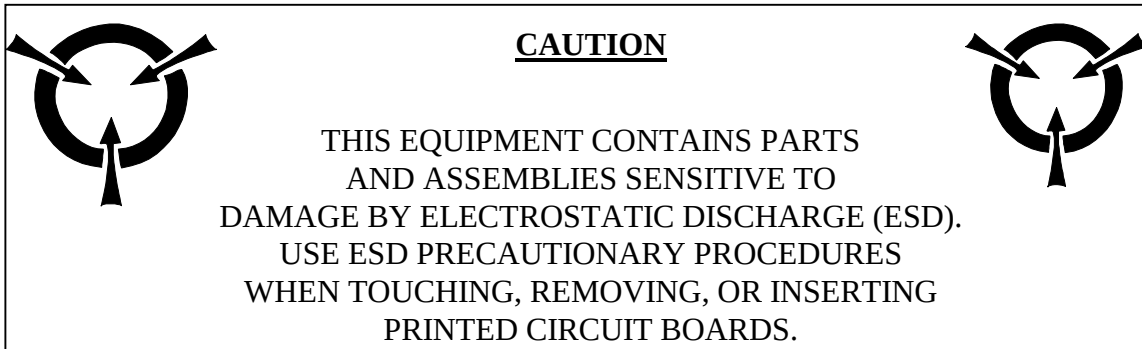
DO NOT LIFT OR CARRY ALONE

Do not attempt to lift, carry or move the equipment by yourself. Get help. Observe the decals on equipment that identify the weight.

Maximum weight for one person to lift is 37 pounds for female and 56 pounds for male.

CAUTION

The Tactical Quiet Generators (TQGs) used to provide power to your system may experience wet stacking if they are run for long periods at less than 25 percent load. Wet stacking is caused by the generator operating at less than 80% of rated capacity. Wet stacking is detected by fuel seeps around the exhaust system and in poor performance (extreme cases). Refer to the generator technical manuals for information concerning preventing and/or correcting wet stacking problems.



ELECTROSTATIC DISCHARGE (ESD) CLASS 1

GENERAL HANDLING PROCEDURES FOR ESD ITEMS:

- USE WRIST GROUND STRAPS OR MANUAL GROUNDING PROCEDURES.
- CHECK CONTINUITY AND RESISTANCE OF SYSTEM PERIODICALLY.
- KEEP ESD ITEMS IN PROTECTIVE COVERING WHEN NOT IN USE.
- USE ONLY METALIZED SOLDER SUCKERS.
- GROUND ALL ELECTRICAL TOOLS AND TEST EQUIPMENT.
- HANDLE ESD ITEMS ONLY IN PROTECTED AREAS.

MANUAL GROUND PROCEDURES

- MAKE SURE EQUIPMENT IS POWERED DOWN.
- TOUCH PACKAGE OR REPLACEMENT ESD ITEM TO GROUNDING POINT BEFORE OPENING.
- HOLD KNOWN GROUNDING POINT PRIOR TO AND WHILE REMOVING ESD ITEMS.
- TOUCH GROUND PRIOR TO INSERTING REPLACEMENT ESD ITEMS.

ESD PROTECTIVE PACKAGING AND LABELING

- INTIMATE COVERING OF ANTISTATIC MATERIAL WITH AN OUTER WRAP OF EITHER TYPE 1 ALUMINIZED MATERIAL OR CONDUCTIVE PLASTIC FILM, OR HYBRID LAMINATED BAGS HAVING AN INTERIOR OF ANTISTATIC MATERIAL WITH AN OUTER METALIZED LAYER.
- LABEL WITH SENSITIVE ELECTRONIC SYMBOL AND CAUTION NOTE.

WARNING

BATTERY

Several pieces of the DTSS-L contain batteries. Batteries are potentially hazardous if misused or tampered with before, during or after discharge.

- The Emergency light contains a battery.
- The smoke detector contains a battery.
- The flashlight contains batteries.
- The clock contains a battery.
- Each of the Uninterruptible Power Supplies (UPS) contains sealed, maintenance-free, lead-acid battery pack.
- The RAID contains a battery module.
- The workstation contains a battery.
- The laptop computer contains a battery.

Failure to observe this warning may result in injury to personnel or damage to equipment.

The following precautions must be strictly observed to prevent possible injury to personnel or equipment damage:

DO NOT short circuit - may cause fire or explosion.

DO NOT dispose of in ordinary trash.

DO NOT incinerate - may cause an explosion.

DO NOT heat, incinerate, crush, puncture, disassemble, or otherwise mutilate the battery.

DO NOT store equipment with battery installed during periods of non-use in excess of 30 days.

DO NOT leave batteries unstored; use designated storage containers.

DO NOT remove battery from workstation or laptop computer.

Carefully read all safety instructions attached to the original battery's package.

Turn OFF the equipment immediately if you detect the battery compartment becoming unduly hot, hear battery cells venting (hissing sound), or smell irritating sulphur dioxide gas. Remove and dispose of the battery only after it is cool (30-60 minutes).

In case of venting, clear the immediate area. Usually, venting will last only a few seconds.

Dispose of batteries according to local, state, and federal regulations.

WARNING

DANGEROUS NOISE LEVEL

Permanent ear damage may occur if you are exposed to noise beyond the safe limit without approved ear protection. Wear approved ear protection when any access door on the generator set is open and the generator is running.

WARNING

LASER TECHNOLOGY

On the CD-recorder, use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

WARNING

EYE HAZARD

Never look into the end of fiber-optic cable or connector infrared (IR) signals. this could cause eye damage.

WARNING

COLD WEATHER

Wear arctic clothing when cab temperatures fall to and remain below 30 F (-1 C). Cold stress preventive measures in FM 31-70 should be applied when ambient temperatures fall to and remain below 30 F (-1 C). Failure to comply may result in cold weather injury.

WARNING

NOISE HAZARD

When operating the HMMWV-ECV for extended periods (greater than 30 minutes) at speeds above 37 miles per hour (60 kilometers per hour), the crew is required to wear properly fitted, approved ear protective devices. Failure to comply may result in loss of hearing.

WARNING

ELECTRICAL HAZARD

Be sure to install the ground cable between the generator and shelter for proper grounding of the system. Loose or broken ground and power connections can cause electrical shock or death. Serious personal injury or death may result from failure to observe this warning.

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TECHNICAL MANUAL

NO. 11-6675-295-10

**HEADQUARTERS,
DEPARTMENT OF THE ARMY
Washington, D.C. 1 November 2001**

**OPERATOR'S MANUAL
DIGITAL TOPOGRAPHIC SUPPORT SYSTEM-LIGHT (DTSS-L)
AN/TYQ-67 (V)2
(NSN 6675-01-483-0561)**

REPORTING 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, DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in back of this manual directly to: Commander, U.S. Army Communications-Electronics Command and Fort Monmouth, ATTN: AMSEL-LC-LEO-D-CS-CFO, Fort Monmouth, New Jersey 07703-5006. 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.

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HOW TO USE THIS MANUAL

To become familiar with this manual, spend some time looking through it to see what it contains. Once you are familiar with it, you will know three ways to find information:

- Use the front cover
- Use the table of contents
- Use the index at the rear of this manual

1. Suppose the DTSS-L (V) 2 must be prepared for operation. The best way to find what you want depends on how familiar you are with this manual and with the equipment. The fastest way is to use the front cover index.
2. Look at the cover of the manual. Black bars at the right-hand edge of the cover have boxed titles next to them. Find “OPERATION UNDER USUAL CONDITIONS (pg. 2-119).” This is the section used to prepare the DTSS-L (V) 2 shelter for operation.

OR

3. The black bars can be used to find a section quickly. Bend the pages a little, and notice that the pages have black bars on them. These black bars line up with the associated black bars on the cover.

[illegible]

HOW TO USE THIS MANUAL (Cont'd)

4. Place a thumbnail on the first page with the black bar that lines up with the black bar on the cover for "OPERATION UNDER USUAL CONDITIONS." The thumbnail should be on page 2-119.
5. The example on the previous page shows that page 2-119 has an index of the paragraphs in section III.

The table of contents shows that "Emplacement" is in Paragraph 2-7 on page 2-119.

6. To the right is a reproduction of page 2-119. The page has an "INITIAL SETUP."

SECTION III OPERATION UNDER USUAL CONDITIONS	
Para/Subject	Page
2-3 Scope	2-120
2-4 General Operating Overview	2-120
2-5 Emplacement	2-120
2-6 Equipment Interconnection	2-142
2-7 (a) Starter Equipment Power-Up	2-147
2-7 (b) Computer Equipment Power-Up	2-154
2-11 Operations	2-157
2-12 Computer and Starter Equipment Power Down	2-165
2-13 Repositionable Displacement	2-167
2-6 INITIAL SETUP	
This section contains information for operating the DTSS-L under usual conditions. Overview operating information is presented in the following paragraphs.	
2-6 GENERAL OPERATING OVERVIEW	
The following lists summarizes the major tasks required to operate the DTSS-L under usual conditions. Your Unit Standard Operating Procedures (USOP) establish the exact sequence in which these tasks are performed. However, the following will generally follow the sequence shown in the operations checklist. Special procedures for operating under unusual conditions are provided in Section IV of this chapter.	
2-7 EMPLACEMENT	
The emplacement procedure is based upon one option, consisting of one HMMWV/DCU with one LMG (5-TM/70) cluster, one generator, and one Standardized Integrated Command Post System (SICPS) mounted with/without well. Procedure are provided for:	
• Site Selection	• Operating the cluster entry door
• Positioning and disconnecting the generator	• Preparing the DTSS-L cluster
• Positioning the HMMWV/DCU	• Connecting the DTSS-L cluster
• Connecting power cables between generator and cluster	• Connecting the DTSS-L
• Securing the DTSS-L	
INITIAL SETUP (CONTINUED)	
Personal Required: two (per vehicle)	
References:	
TM 9-5115-642-10	
TM 9-5115-600-11B	
TM 11-6675-295-20 App. B	

2-119

This lists the things needed to complete the procedure.

7. Now, locate Paragraph 2-7.3.1, page 2-124. Notice Figure 2-64, which is an illustration of the procedures called out with numbered arrows, called index numbers, in circles.
8. The illustrations identify the equipment being used. The numbered arrows appear in the procedural steps (in parentheses) after the name of each item called out.

EXAMPLE

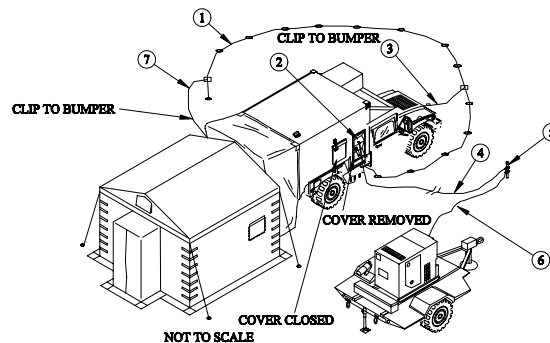


Figure 2-64 Grounding a DTSS-L (V) 2 Deployed (Sheet 1 of 2)

HOW TO USE THIS MANUAL (Cont'd)

Use The Table of Contents

1. The Table of Contents contains a list of all the chapters, sections, and appendixes in this manual.
2. To prepare the DTSS-L (V) 2 shelter for operation, the Table of Contents can be used to find "Section III OPERATION UNDER USUAL CONDITIONS (page 2-119)."
3. Turning to page 2-119 takes you to the same place in the manual as if you had used the front cover index.
4. Notice that some of the titles in the Table of Contents have boxes around them. These boxes match the boxed titles on the front cover index. The black tab can be used to find the right page.

Use The Index at The Rear of the Manual

1. The Index lists all of the subjects that are in this manual, in alphabetical order.
2. Each subject is listed under two or three topics so that you can easily find what you are seeking.
3. This Index is most useful when the name of the equipment or item being located is known.

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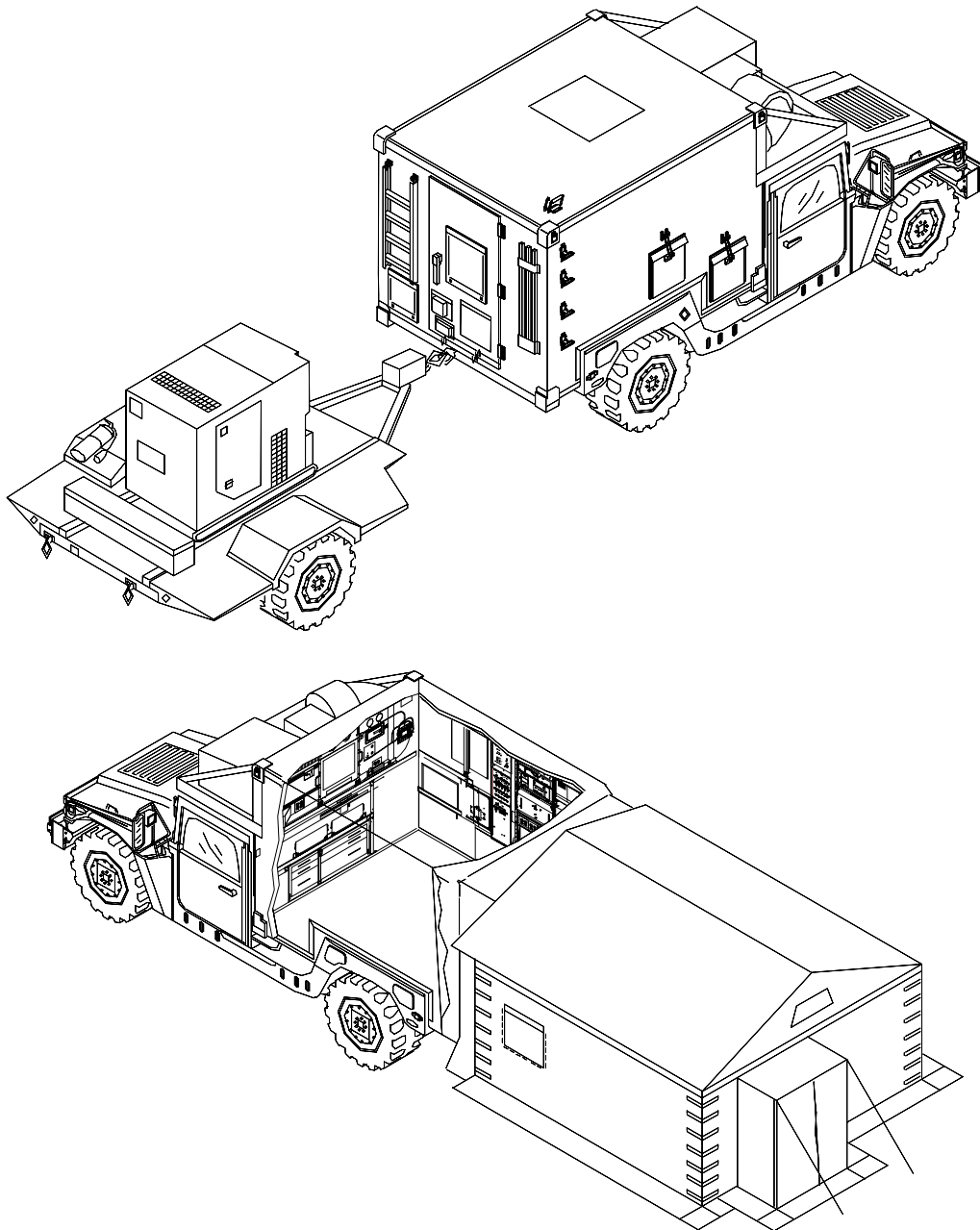


Figure 1-0 Digital Topographic Support System-Light

CHAPTER 1 INTRODUCTION

Section/Subject	Page
I General Information	1-1
II Equipment Description and Data	1-9
III Principles of Operation	1-41

SECTION I GENERAL INFORMATION

Para/Subject	Page
1-1 Scope.....	1-1
1-2 Consolidated Index of Army Publications and Blank Forms	1-3
1-3 Maintenance Forms, Records, and Reports	1-3
1-4 Destruction of Army Electronics Material	1-3
1-5 Administrative Storage	1-3
1-6 Official Nomenclature, Names, and Designations	1-3
1-7 Reporting Equipment Improvement Recommendation (EIR)	1-5
1-8 Abbreviations/Acronyms	1-5

1-1 SCOPE

1-1.1 Type of Manual

This manual contains instructions for operating and maintaining the Digital Topographic Support System-Light (V) 2 (DTSS-L (V) 2).

1-1.2 Model Number and Equipment Name

The model number is AN/TYQ-67 (V) 2. The equipment name is the DTSS-L (V) 2.

1-1.3 Purpose of Equipment

The DTSS-L (V) 2 provides digital terrain and analysis products for the Intelligence Preparation of the Battlefield (IPB) to support operations at Division, Corps, and Echelons Above Corps (EAC). The system uses the Army's Common Hardware Software-2 (CHS-2) suite of equipment and Commercial Off-The-Shelf (COTS) equipment for scanning and plotting. The software tools are used to generate digital and hard copy terrain information and products.

1-1.3 Purpose of Equipment (Cont'd)

The DTSS functions are performed in three deployable configurations (Figure 1-1):

DTSS-Heavy (H) configured in a 20-ft International Standards Organization (ISO) shelter mounted on an M1096 or M942A2 5-ton truck.

DTSS-Light (V) 2 configured in a lightweight multipurpose shelter mounted on a High Mobility Multipurpose Wheeled Vehicle-Expanded Capacity Vehicle (HMMWV-ECV).

DTSS-Deployable (D) configured in transit cases for deployment as required.

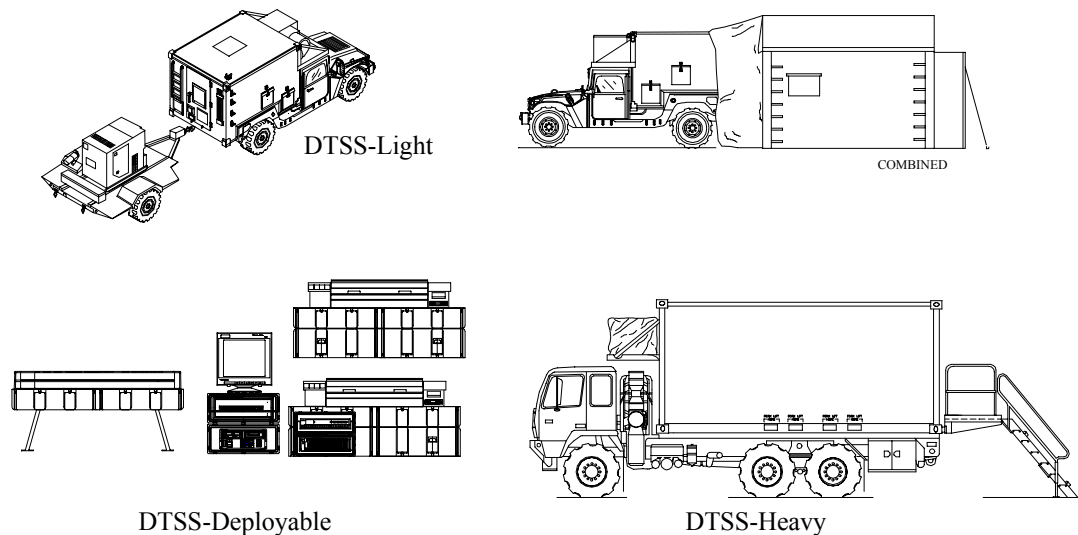


Figure 1-1 The DTSS Configurations

Major functions of the DTSS-L (V) 2 include the following:

- To accept data from the National Imagery and Mapping Agency (NIMA), formerly Defense Mapping Agency (DMA), and other sources in a variety of sources and formats; e.g., maps, charts, weather forecasts or reports, climate summaries, gazetteer data, terrain studies, photography.
- To process data into usable terrain products from storage, retrieval, and updates of the data files.
- To produce low-volume reproduction of large-format, multicolor terrain products and graphic/non-graphic battlefield terrain products.

1-2 CONSOLIDATED INDEX OF ARMY PUBLICATIONS AND BLANK FORMS

Refer to the latest issue of DA PAM 25-30 to determine whether there are new editions, changes, or additional publications pertaining to the DTSS-L (V) 2 equipment.

1-3 MAINTENANCE FORMS, RECORDS, AND REPORTS

1-3.1 Reports of Maintenance and Unsatisfactory Equipment

The Department of the Army forms and procedures used for equipment will be those prescribed by DA PAM 738-750, The Army Maintenance Management System (TAMMS).

1-3.2 Reporting of Item and Packaging Discrepancies

Fill out and forward SF 364 (Report of Discrepancy (ROD)) as prescribed in AR 735-11-2/DLAR 4140.55/SECNAVINST 4355.18/AFR 400-54/MCO 4430.3J.

1-3.3 Transportation Discrepancy Report

Fill out and forward Transportation Discrepancy Report (TDR) (SF 361) as prescribed in AR 55-38/NAVSUPINST 4610.33C/AFR 75-18/MCO P4610.19D/DLAR 4500.15.

1-4 DESTRUCTION OF ARMY ELECTRONICS MATERIAL

Destruction of Army electronics material to prevent enemy use shall be in accordance with Technical Manual (TM) 750-244-2 and Unit Standard Operating Procedure (USOP) for destruction of the HMMWV-ECV, (M1113), see TM 750-244-6. For destruction of the 10-kilowatt (kW) generator, see TM 750-244-3.

1-5 ADMINISTRATIVE STORAGE

Administrative storage of equipment issued to and used by Army activities will have Preventive Maintenance Checks and Services (PMCS) performed before storage. When removing the equipment from administrative storage, PMCS checks should be performed to maintain operational readiness.

1-6 OFFICIAL NOMENCLATURE, NAMES, AND DESIGNATIONS

Shortened nomenclature is used in this manual to make procedures easier to read. A cross-reference between the shortened, common name used in this manual and the official nomenclature is provided in Table 1-1.

Table 1-1 Nomenclature Cross Reference

Common Name	Official Nomenclature
CD–RW	CRW8424SXZ or CRW8824SXZ Compact Disk–ReWriter (CD–RW) Yamaha
CFPD	CHS-2, Color Flat Panel Display (CFPD), 20-inch (in)
DLT autoloader	Digital Linear Tape (DLT) Overland/Loader Express 710 storage device
DTSS-L (V) 2	Digital Topographic Support System-Light (V) 2
DVD–RAM drive (part of workstation)	CHS-2, Digital Video Disk–Random Access Memory (DVD–RAM) Panasonic LFD103U
ECU	Environmental Control Unit (ECU) TB# 9-4125-401-24 model # F18-MP1
Ethernet switch	Cisco WS-C2924M XL-EN
Generator	Model PU-798 or Model PU-753
GPFU	Gas Particulate Filter Unit (GPFU) TM 3-4240-325-20&P
RHDD (part of workstation)	CHS-2, (V) 2, 25 Gigabyte (GB) Removable Hard Disk Drive (RHDD)
HMMWV-ECV	High Mobility Multipurpose Wheeled Vehicle-Expanded Capacity Vehicle, M1113
JAZ (part of workstation)	CHS-2, 2.0 GB JAZ drive
KVM switch	Keyboard-Video-Mouse (KVM) Raritan CompuSwitch CS4
Laptop computer	IBM ThinkPad T21 laptop computer
LMS	Lightweight Multipurpose Shelter, Model #S788 Type 1 Modified.
LS120 drive (part of workstation)	CHS-2, LS-Superdisk
Media converter	Transition Ntwrks E-CX-TBT-04
Netra server	SUN Netra T1-105 N06-UKC1-9S512ATI
PCMCIA slot	Storage media (2 slots for different size cards.)
Plotter	Hewlett Packard (HP) DesignJet 36-inch 1055CM Plotter
Printer	HP DeskJet 952C C6428B-ABA
RAID	CHS-2, Redundant Array of Independent Disks (RAID) Winchester Flashdisk
Scanner	Ideal SSC 8010 color scanner
STE	Secure Terminal Equipment (STE)

Table 1-1 Nomenclature Cross Reference (Cont'd)

Common Name	Official Nomenclature
SCSI booster	Small Computer System Interface (SCSI) Booster Apcon ACI-2016
SCSI switch	SCSI Apcon switch ACI-2112-CLW
Emulator	Keyboard and Mouse Emulator, Guardian for PS/2 Model APKME
Print server	Hewlett Packard JETDIRECT 300X
Transit Heater	CHS-2, Dc heater PN # C300LD-24 0.50DC-NM
UPS	CHS-2, Uninterruptible Power Supply (UPS), Model # APS 14B, PN # 28-2771218-1
Workstation	CHS-2 Versatile Computer Unit (VCU)-1
8-mm tape drive (part of workstation)	CHS-2, 8- millimeter (mm) tape drive

1-7 REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR)

If your equipment needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you don't like about the equipment. Let us know why you don't like the design or performance. Put it on a SF 368 (Product Quality Deficiency Report). Mail it to Commander, US Army Communications-Electronics Command and Fort Monmouth, ATTN: AMSEL-LC-LEO- CFO, Fort Monmouth, New Jersey 07703-5023. We'll send you a reply.

1-8 ABBREVIATIONS/ACRONYMS

Special or unusual acronyms and abbreviations used in this manual are provided and defined below.

Table 1-2 Abbreviations/Acronyms

Abbreviation/Acronym	Term
A	Ampere
Ac	Alternating current
ADPCM	Adaptive Differential Pulse-Code Modulation
BNC	Bayonet Nipple Connector
Btu	British thermal unit
°C	Degree Celsius
CAGE	Commercial And Government Entity
CAPE	Chemical Agent Protective Entry
CB	Circuit Breaker
CCI	Controlled Cryptographic Item

Table 1-2 Abbreviations/Acronyms (Cont'd)

Abbreviation/Acronym	Term
CDP	Cisco Discovery Protocol
CD-R	Compact Disk-Recorder
CD-ROM	Compact Disk-Read Only Memory
CD-RW	Compact Disk-Rewriter
CECOM	Communications Electronic Command
CELP	Codebook Excited Linear Prediction
CFPD	Color Flat Panel Display
CGMP	Cisco Group Management Protocol
CHS-2	Common Hardware Software-2
cm	centimeter
COMSEC	Communications Security
COTS	Commercial Off-The-Shelf
CP LAN	Command Post LAN
CPU	Central Processing Unit
CVSD	Continuously Variable Slope Delta Modulation
dBm	Decibel per meter
Dc	Direct current
DDN	Defense Data Network
DLT	Digital Linear Tape
DMA	Defense Mapping Agency (see NIMA)
DNVT	Digital Non-secure Voice Terminal
dpi	dots per inch
DTSS	Digital Topographic Support System
DTSS-D	Digital Topographic Support System-Deployable
DTSS-H	Digital Topographic Support System-Heavy
DTSS-L (V) 2	Digital Topographic Support System-Light (V) 2
DVD-RAM	Digital Video Disk-Random Access Memory
DVD-ROM	Digital Video Disk-Read Only Memory
EAC	Echelons Above Corps
ECU	Environmental Control Unit
EIA	Electronics Industries Association
EIR	Equipment Improvement Recommendation
EMI	Electromagnetic Interference
EMP	Electromagnetic Pulse
°F	degree Fahrenheit
FDD	Floppy Disk Drive
FDDI	Fiber Data Distributed Interface
ft	Foot/feet
GB	Gigabyte
GFCI	Ground Fault Circuit Interrupt
GIS	Geographic Information System
GPFU	Gas Particulate Filter Unit
GSA	General Services Administration

Table 1-2 Abbreviations/Acronyms (Cont'd)

Abbreviation/Acronym	Term
GUI	Graphical User Interface
h	hour
HDD	Hard Disk Drive
HMMWV – ECV	High Mobility Multipurpose Wheeled Vehicle – Expanded Capacity Vehicle
HP	Hewlett Packard
Hz	Hertz (frequency)
ID	Identification
IDE	Integrated Drive Electronics
in	inch
IP	Internet Protocol
IPB	Intelligence Preparation of the Battlefield
IR	Infrared
I/O	In/Out
ISDN	Integrated Services Digital Network
ISO	International Standards Organization
kbps	kilobits per second
kg	kilogram
kPa	kilopascal
Kph	Kilometers per hour
KVM	Keyboard-Video-Mouse
kW	kilowatt
LAN	Local Area Network
lb	pound
LCD	Liquid Crystal Display
LED	Light Emitting Diode
LMS	Lightweight Multipurpose Shelter
LRU	Line Replaceable Unit
LVD	Low Voltage Differential
MB	Megabyte
MHz	Megahertz
min	Minute
mm	millimeter
MOS	Military Occupational Specialty
MSE	Mobile Subscriber Equipment
Mph	Miles per hour
NBC	Nuclear Biological Chemical
NIC	Net Interface Card
NIMA	National Imagery and Mapping Agency
PCI	Peripheral Component Interconnect
PCM	Pulse Code Modulation
PCMCIA	Personal Computer Memory Card Interface Association

Table 1-2 Abbreviations/Acronyms (Cont'd)

Abbreviation/Acronym	Term
PDU	Power Distribution Unit
PEP	Power Entry Panel
PMCS	Preventive Maintenance Checks and Services
PSTN	Public Switched Telephone Network
RAID	Redundant Array of Independent Disks
RAM	Random Access Memory
RFI	Radio Frequency Interference
RGB	Red Green Blue
RHDD	Removable Hard Disk Drive
ROD	Report of Discrepancy
Sbus	SUN architecture bus
SCSI	Small Computer System Interface
SEP	Signal Entry Panel
SICPS	Standard Integrated Command Post System
SPPB	Special-Purpose Product Builder
STE	Secure Terminal Equipment
STU III	Secure Telephone Unit III
SUM	Software User's Manual TB 11-6675-295-10
SWGS	Surface Wire Grounding System
TAMMS	The Army Maintenance Management System
TDA	Tactical Decisions Aids
TDR	Transportation Discrepancy Report
TFOCA	Tactical Fiber Optic Cable Assembly
TFTP	Trivial File Transfer Protocol
TIP	Tent Interface Panel
TM	Technical Manual
TOE	Table of Organizational and Equipment
TQG	Tactical Quiet Generator
TRI-TAC	TRI-Service Tactical Communications
UPS	Uninterruptible Power Supply
USM	User Security manual
USOP	Unit Standard Operating Procedure
Vac	Volts alternating current
VCU	Versatile Computer Unit
Vdc	Volts direct current

SECTION II EQUIPMENT DESCRIPTION AND DATA

Para/Subject	Page
1-9 Introduction.....	1-9
1-10 Location And Description Of Major Components	1-15
1-11 Equipment Data	1-27

1-9 INTRODUCTION

This section contains operator information on the characteristics, capabilities, and features of the DTSS-L (V) 2. A single DTSS-L (V) 2 system is composed of an HMMWV-ECV with Lightweight Multipurpose Shelter (LMS) (S-788/G) containing all of the digital terrain analysis processing, production, and communications equipment, and each towing a 10-kW Tactical Quiet Generator (TQG). Some equipment, Standard Integrated Command Post System (SICPS) tent, poles, tables, chairs, and map display boards, camouflage nets, poles and personal gear would be carried in the additional Table of Organizational Equipment (TOE) vehicle.

1-9.1 Equipment Characteristics, Capabilities and Features

The DTSS-L (V) 2 system consists of image editing and processing hardware and software, communications equipment, printers, plotters, and a scanner rack mounted in an environmentally controlled LMS (S-788/G) Type 1. The DTSS-L (V) 2 supports battlefield operations at the Division, Corps, and EAC levels. It is mounted on a HMMWV-ECV, (M1113) towing a 10-kW generator (PU-798 or PU-753) to provide power to the DTSS-L (V) 2 equipment. A SICPS tent is provided as an alternative work area for one of the operators using the laptop computer.

1-9.1.1 Characteristics

- a. HMMWV-ECV M1113
 1. The HMMWV-ECV's are equipped with a 200-ampere (A) alternator kit.
 2. The shelters are equipped with adapter kits for securing the shelter to the bed of the truck, shelter tie-downs, and a ladder.
- b. Shelter, LMS (S-788/G) Type 1
 1. Each LMS (S-788/G) Type 1 houses computer equipment and peripherals, communications equipment, and transit heater.
 2. An extension tent can be connected to the shelter.
 3. Power and grounding equipment consists of the following:
 - (a) Power Entry Panel (PEP) imports external power into shelter.
 - (b) Power Distribution Unit (PDU), (consisting of a power monitor panel, main breaker panel, and a circuit breaker panel), distributes power to these panels.
 - (c) Uninterruptible Power Supply (UPS) (2 each) supplies emergency power for equipment.
 - (d) Surface Wire Grounding System (SWGS) grounds the DTSS-L (V) 2 and generator.
 - (e) Grounding rods are used in conjunction with the SWGS for grounding the DTSS-L (V) 2 and the generator.
 4. The LMS (S-788/G) uses an 18,000 British thermal unit (Btu) ECU model F18H-MPI for cooling and heating.
- c. Computer equipment
 1. The NT Workstation consists of the following equipment:
 - CHS-2 VCU-1
 - E&S Toronado 3000 graphics board, 404003 (2 slots) or 3-D Labs Oxygen dual graphics board.
 - Audio Peripheral Component Interconnect (PCI) board
 - PCI Net Interface Card (NIC)
 - PCI Adaptec 29160 SCSI Controller (2)
 - SCSI Personal Computer Memory Card Interface Association (PCMCIA) card reader
 - 8-mm tape drive
 - DVD-RAM
 - JAZ drive
 - LS-120 Superdisk Floppy Disk Drive (FDD)
 2. Workstation keyboard with pointing device

1-9.1.1 Characteristics (Cont'd)

3. CHS-2, CFPD: The CFPD is a compact, lightweight, energy-efficient monitor. It offers a maximum resolution that provides a crisp accurate image for a variety of applications with superior quality and a high level of reliability.

d. Peripherals

1. HP DeskJet 952C printer: The printer can print on various sizes and weights of paper as well as envelopes, labels, and transparencies.
2. RAID (A system RAID and a Netra Server RAID): Each RAID is composed of eight 73-GB hard drives for a storage capacity of 584-GB (480-GB after configuration).
3. CD-RW is a multifunction drive. It is capable of being used as a Compact Disk-Recorder (CD-R) (to write once on CD-R media) or a CD-RW drive (to rewrite up to 999 times on CD-RW media).
4. Scanner: The color scanner provides 8-bit and 24-bit color image scanning at up to 400 dots per inch (dpi). It can scan in monochrome (bi-level), grayscale, and color (in up to 24-bit depth). The scanner can accept media up to 41 in wide and has an active scan area of up to 36 in.
5. Netra server: The Netra server is a centralized storage and distribution facility for providing common geospatial data to the war fighter at all echelons.
6. KVM switch: The KVM switch allows for multiple computers to use the peripherals.
7. SCSI switch: The SCSI switch allows the system to access more than one SCSI chain device.
8. DLT Autoloader: The DLT Autoloader provides for archiving of information.
9. Plotter: One full-color, 36-inch plotter is used in a DTSS-L (V) 2. The plotter provides an output of 300 x 360 dpi resolution, 8-bit color (16-shade gray-scale), and media widths up to 36 inches (in.). The plotter is capable of producing a quality D-size color drawing on special paper in approximately 4 1/2 minutes (min). Additional printing options (enhanced, draft quality, and monochrome) will affect print quality and times.

1-9.1.1 Characteristics (Cont'd)

10. Communications: The STE is a secure terminal that is securely interoperable (voice and data) with other STE terminals and Secure Telephone Unit III (STU-III) telephones. The STE provides nonsecure (clear) voice that is interoperable with conventional Integrated Services Digital Network (ISDN) and Public Switched Telephone Network (PSTN) telephones, STU-III terminals, and Mobile Subscriber Equipment (MSE). The STE is a Controlled Cryptographic Item (CCI). Special handling procedures are required for this item.
11. The auto-sensing network switch used in the DTSS-L (V) 2 system is a fast 24-port Ethernet switch with a 100 base-FX module. The protocols supported are Trivial File Transfer Protocol (TFTP), Cisco Group Management Protocol (CGMP), Cisco Discovery Protocol (CDP), and Internet Protocol (IP).
12. Laptop Computer: The laptop computer has a single Pentium III processor (Intel 440BNX chip set) operating at 850-Megahertz (MHz) with 512-Megabyte (MB) of installed RAM. Other components include:
 - (a) 13.3-inch Liquid Crystal Display (LCD) color flat-panel display with a screen resolution of 1,024 x 768
 - (b) 32-GB Hard Disk Drive (HDD)
 - (c) Removable FDD
 - (d) Removable Digital Video Disk–Read Only Memory (DVD–ROM) drive
 - (e) Internal speakers
 - (f) Internal battery backup operable for approximately one hour
 - (g) Built-in pointing device
 - (h) Local Area Network (LAN)/Modem adapter
- e. Generator set, model PU-798 TQG or PU-753.
 1. Power unit, diesel engine driven, 1-ton trailer mounted, 10-kW, 60-Hertz (Hz). For further information, see TM 9-6115-642-10 or TM 9-6115-660-13&P
 2. The generator is mounted on a modified 2-wheel, 1-ton trailer, model M116A3, and towed behind the HMMWV-ECV during transport.
- f. GPFU: M93-100 CFM GPFU consists of M48 gas-particulate filter canister, a system control module, and a centrifugal fan. For further information, see TM 3-4240- 325-10.

1-9.1.1 Characteristics (Cont'd)

g. Miscellaneous Items:

Emergency light	Fire alarm
Smoke detector	Fire extinguisher
Secondary exit	First aid kit
Flashlight	Temperature indicator
Clock	Map board
Humidity indicator	Work lights
Work table	Tie-down storage
1-Drawer Mosler safe	Flat file storage
Chairs	Plotter paper storage
Storage cabinets	Storage drawers
Map/Large-sheet storage	100-ft ThinLAN cables
50-ft power cable	WF-16/U field wire
50-ft ThinLAN cables	Fiber optic cable

1-9.1.2 Capabilities

a. HMMWV-ECV M1113

1. Transportable using rail, ship, or air transport
2. Tactically mobile on and off road
3. Meets public-road travel requirements

b. DTSS-L (V) 2 Shelter, LMS (S-788/G) Type 1

1. Can operate in a variety of climates--basic hot, basic cold, dry, and humid--with an 18,000-Btu/hour (h), horizontal, compact ECU.
2. Uses two UPS to provide filtered Volts alternating current (Vac) power and backup capability for the DTSS-L (V) 2 computer components.
3. Produces maps using both plotters.
4. Uses currently available NIMA data and other available data as input to analysis models such as the following:
 - (a) Intervisibility
 - (b) Mobility
 - (c) Environmental
 - (d) Special-Purpose Product Builder (SPPB)
5. The analysis products generated by the DTSS-L (V) 2 support battlefield areas such as the following:
 - (a) Maneuver control
 - (b) Air defense
 - (c) Combat service support
 - (d) Intelligence and electronic warfare
 - (e) Fire support.

1-9.1.2 Capabilities (Cont'd)

6. The scanner is used to scan images for creating and updating terrain databases. To create or update a database, a map or other geographic medium is entered into the database by scanning the image. This electronic data is sent to the workstation and stored.
7. Encrypted voice communications for communications external to the DTSS-L (V) 2 are provided by the STE.
8. Encrypted data communications for transfer of electronic data are provided by the STE.
9. Connections to MSE Packet Network via X.25 (4 wire).
10. Connections via ThinLAN or fiberoptic LAN to the Command Post LAN (CP LAN).

c. Generator

1. Provides 3-phase 120/208 Vac at 60 Hz.
2. Load capacity: 10 kW.

1-9.1.3 Features

a. HMMWV-ECV M1113

1. The M1113 has a gross vehicular weight capacity of 11,500 pounds (lbs).
2. The DTSS-L (V) 2 has a 50-ft power cable. The cable is stored in the storage compartment curbside of HMMWV-ECV.
3. The HMMWV-ECV provides direct current (Dc) power to the shelter.

b. Shelter

1. Air conditioning, heating/ventilation system for operators and equipment.
2. In the blackout mode, when the shelter entry door is opened, overhead lights go out and the blackout light comes on to prevent light detection during night operations.
3. Ground and power distribution equipment is an integral part of the shelter; external connectors are provided for ground and power connection to the generator or commercial power.
4. The shelter consists of a workstation, a plotter, a scanner, full data and voice communication capability, and other equipment to support a variety of terrain analysis functions in the field.
5. The primary workstation mounted in the shelter.
6. The laptop computer may be used in either the SICPS tent or shelter.

1-9.1.3 Features (Cont'd)

c. Generator

1. Generator accessories can be carried in storage compartments on the trailer.
2. The 10-kW PU-798 TQG or PU-753 generator is a 3-phase 120/208-Vac power system mounted on a modified M116 A3 1-ton, 2-wheeled trailer. The generator supplies all of the alternating current (Ac) power required to operate the shelter.

1-10 LOCATION AND DESCRIPTION OF MAJOR COMPONENTS

The following section contains illustrations that show the location of major DTSS-L (V) 2 shelter components.

1-10.1 DTSS-L (V) 2 Overview

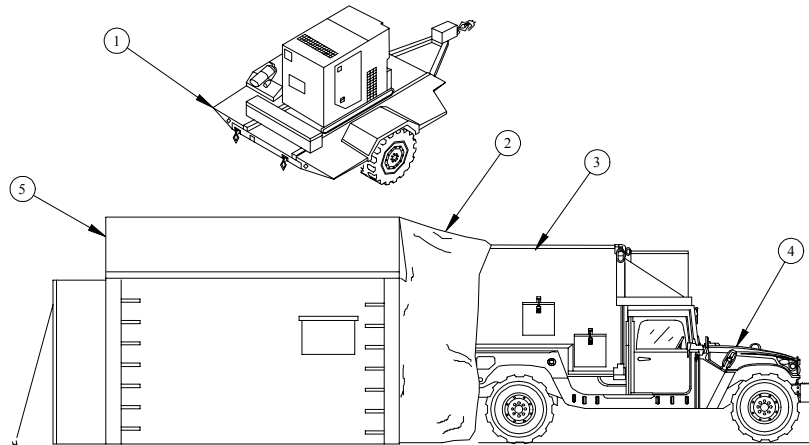


Figure 1-2 DTSS-L (V) 2 Overall View

1. Generator Set: A PU-798 TQG or PU-753; standard U.S. Army 10-kW generator mounted on a modified M116A3, 1-ton, 2-wheeled trailer provides power for the systems.
2. Bootwall: Used to connect shelter to tent.
3. LMS (S-788/G): A lightweight shelter provides an environmentally controlled housing for power, control, communications, computer equipment, and operators.
4. HMMWV-ECV: A M1113 expanded-capacity vehicle troop/cargo variant of the HMMWV provides mobility.
5. SICPS tent: A modular, transportable shelter, 11 ft square by 9.5 ft high attaches to the rear of the HMMWV-ECV and shelter.

1-10.2 DTSS-L (V) 2 Exterior Roadside

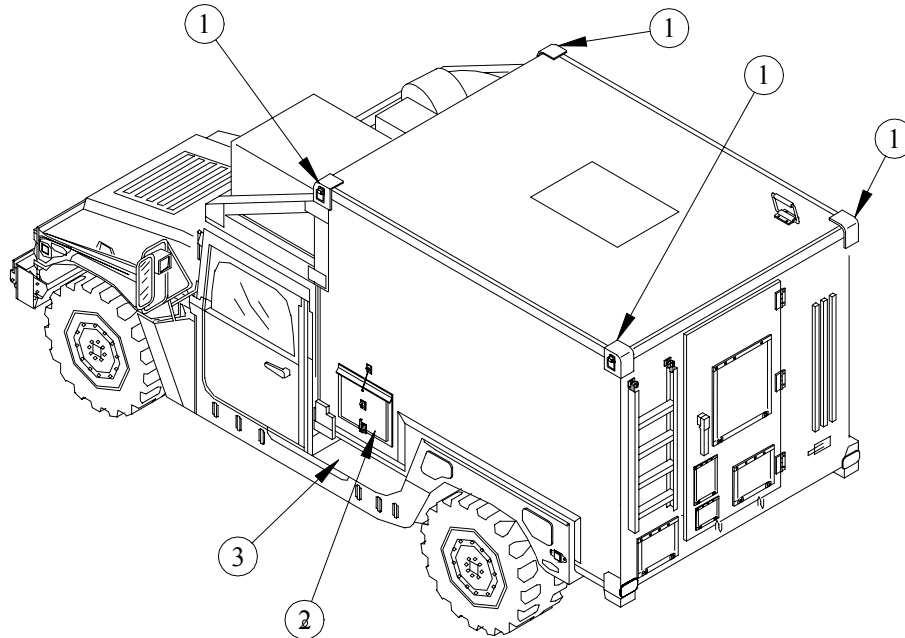
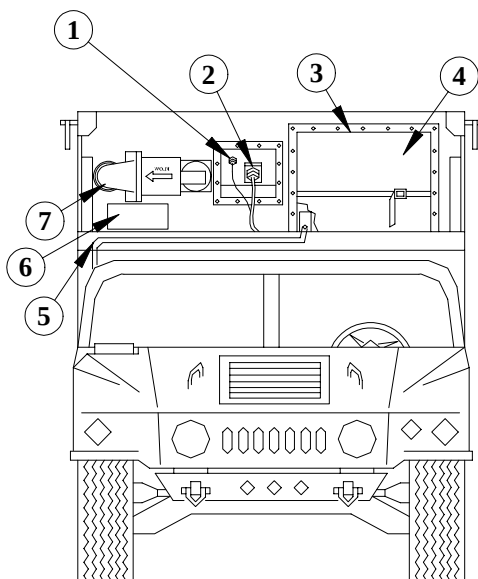


Figure 1-3 DTSS-L (V) 2 Exterior Roadside

1. Shelter lifting ring assembly: Attachment points for lift cables located in each corner of the LMS (S-788/G) used for lifting and/or tying down for air and land transport.
2. Storage compartment: Located above the open storage area, used for miscellaneous small storage.
3. External access storage compartment: Located on the lower roadside just behind the vehicle door provides storage space for miscellaneous small equipment.

1-10.3 DTSS-L (V) 2 Exterior Forward View

**Figure 1-4 DTSS-L (V) 2 Exterior Forward View**

1. Ground connector: Located next to the power connector, provides ground connection for the ECU.
2. Power/signal connector: Obtains Vac power and control signals from the control module panel inside the LMS (S-788/G).
3. ECU: Shock-mounted on the front roadside of the shelter, provides for heating and cooling. (ECU controls are located inside the shelter.)
4. ECU fabric cover: Protects ECU during travel and during extreme weather conditions.
5. Over cab rack and condenser drain: Located on the top front of the shelter, the cab rack contains the ECU and the condenser drain which removes water from the ECU and directs it to ground.
6. GPFU Air Blower: Provides fresh air to the shelter.
7. GPFU: Provides filtered air and over-pressurization inside the shelter to stop chemical/biological infiltration. The GPFU itself is located outside the shelter and consists of a Dc powered fan and an air filter.

1-10.4 DTSS-L (V) 2 Exterior Curbside

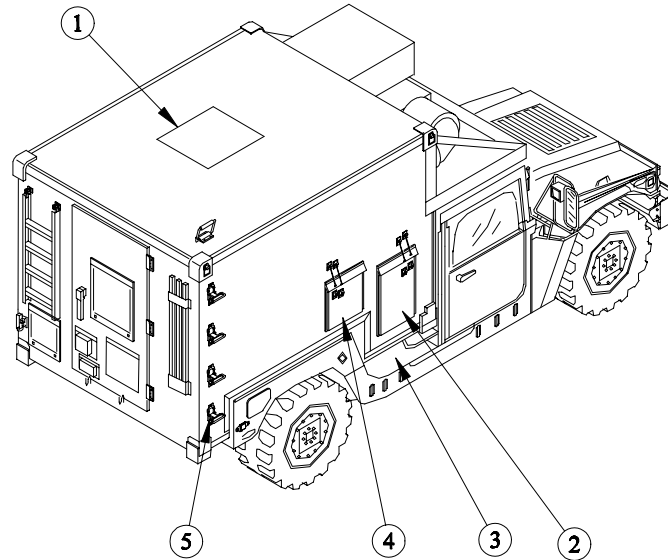
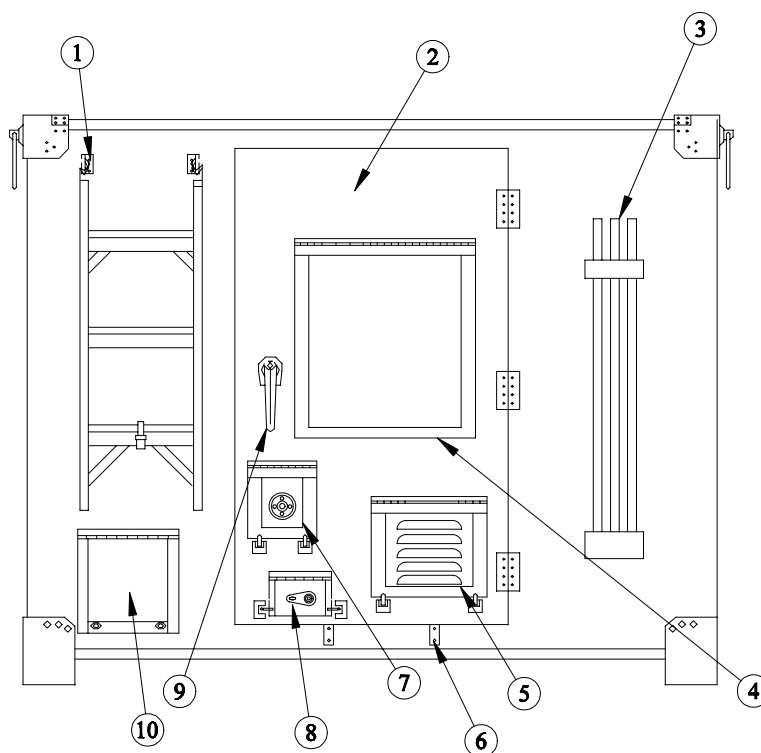


Figure 1-5 DTSS-L (V) 2 Exterior Curbside

1. Secondary exit: Located on the top of the shelter to allow escape in an emergency. Handles to unlatch the roof hatch are located inside the shelter. The entry door is Electromagnetic Interference (EMI), Radio Frequency Interference (RFI), and Electromagnetic Pulse (EMP) protected.
2. PEP: Located on the lower curbside just behind the vehicle door and above the external access storage vault contains connectors for the 115-Vac, 60-Hz main power input connector; Ground Fault Circuit Interrupt (GFCI) connector; and a 15-A fuse for protection of the receptacle. The PEP has a weather cover that can be latched open.
3. External storage compartment: Located on the lower curbside just behind the vehicle door and below the power entry vault. Provides storage space for the 50-ft power cable and contains the cable that provides Volts direct current (Vdc) from the HMMWV-ECV batteries to the shelter PDU for the transit heater.
4. Signal Entry Panel (SEP): Located curbside center, just above the wheel well providing communications connectors for LAN, wire, and fiberoptic cables. The SEP has a weather cover that can be latched open.
5. Collapsible steps: Provides access to the DTSS-L (V) 2 shelter roof.

1-10.5 DTSS-L (V) 2 Exterior Rear View

**Figure 1-6 DTSS-L (V) 2 Exterior Rear View**

1. Ladder: Stored on the rear door, used for entry into shelter during operations.
2. Entry door: Located in the rear center of the shelter, EMI, RFI, and EMP protected.
3. Ground rod assembly: Located to the curbside of the entry door, used in grounding the generator or the truck. The ground rod assembly includes a drive stud, a ground clamp, and three ground rods, each with couplings on the top.
4. Rapid decompression panel: Located in the entry door, provides rapid decompression capability, and reduces the possibility of condensation in the shelter. The panel must be opened before air transport of the shelter.
5. Vent: Located in entry door, provides over pressure vent for the GPFU.
6. Ladder mounting hooks: Located beneath the entry door, allows attachment of ladder for entry.
7. Dial lock: Located below handle of entry door used as the prime lock (MAS-Hamilton Group 1 electronic model) when shelter is unoccupied.
8. Cipher Lock: Located below dial lock restricts entry to the shelter.
9. Entry door handle: Located on the roadside of the shelter entry door enables the door to be sealed tightly and locked.
10. Tent Interface Panel (TIP): Located on the lower roadside rear of the shelter contains connections for power, data, and communications equipment.

1-10.6 DTSS-L (V) 2 Interior Roadside

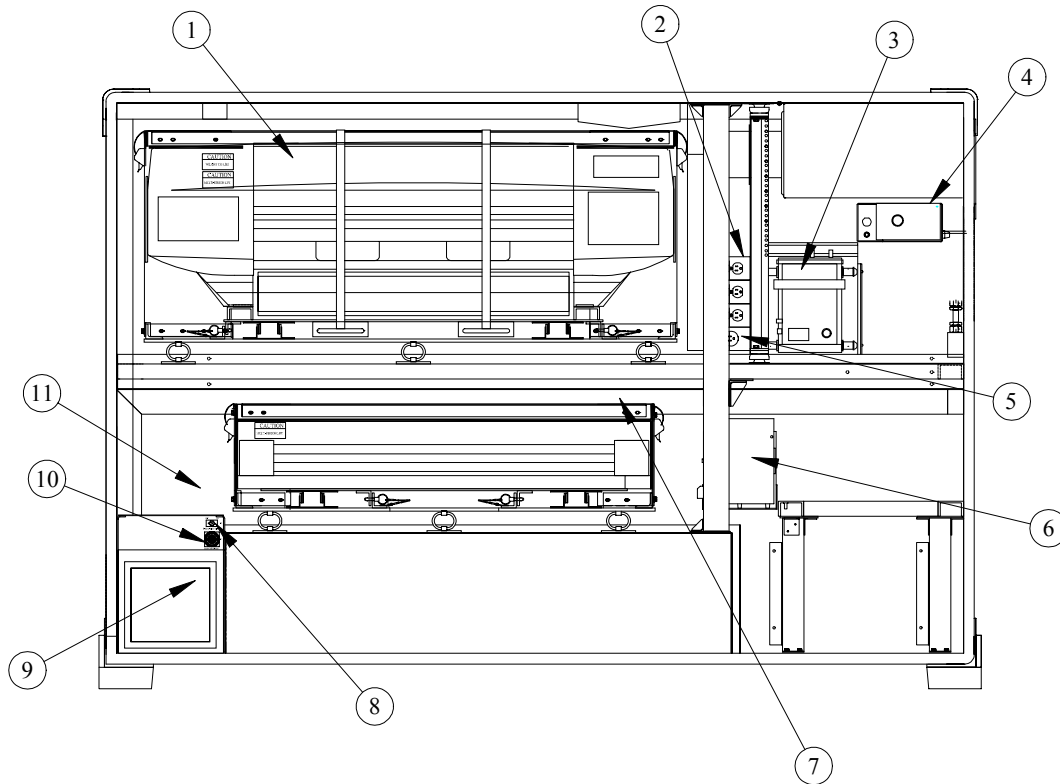
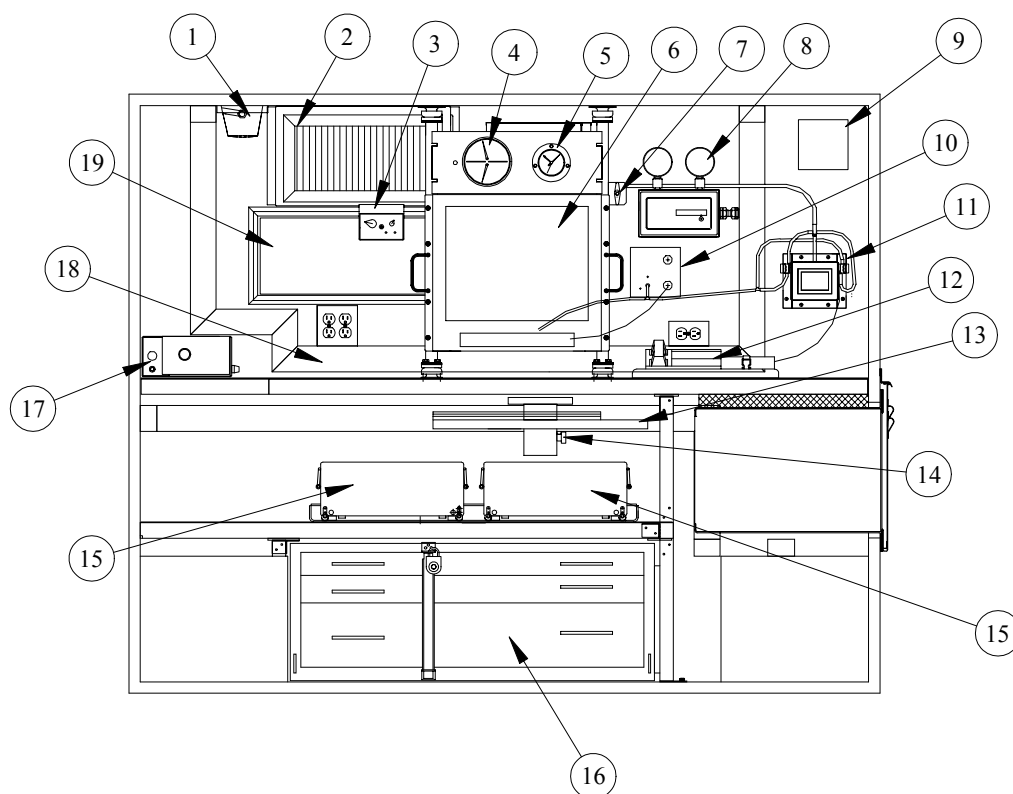


Figure 1-7 DTSS-L (V) 2 Interior Roadside

1. Plotter: Mounted on the upper left of wall, prints various size maps, pulls away from wall for service.
2. Utility outlets and Dc outlet: Located on wall next to plotter, provides access to Vac power.
3. Chemical alarm: Provides alarm in case of chemical contamination.
4. GPFU control: Located at top right corner of wall, controls GPFU operations.
5. Heater receptacle: Located to the left of the scanner, provides Vdc power for the transit heater.
6. Transit heater: Located next to the scanner on the roadside wall, provides heat for the equipment in the shelter when in transit.
7. Scanner: Located just inside the door, mounted on wall below the plotter, pulls away from wall for service.
8. Emergency light switch: Used to shut off emergency lights when exiting shelter.
9. TIP In/Out (I/O) Panel: Access panel for TIP connections.
10. Emergency power switch: Used to shut off all power to the shelter in case of emergency.
11. Military Operational Protective Posture (MOPP) gear area: Open storage for special equipment.

1-10.7 DTSS-L (V) 2 Interior Front-End Wall Panel Assembly

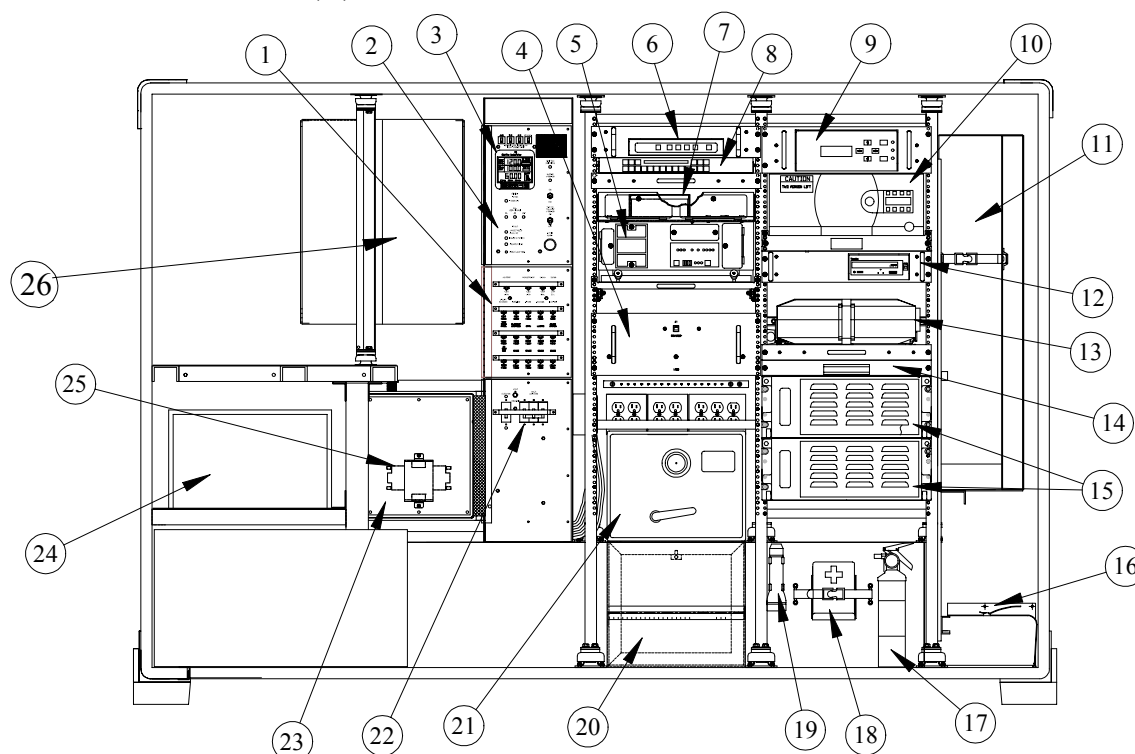
**Figure 1-8 DTSS-L (V) 2 Interior Front-End Wall Panel Assembly**

1. Smoke detector: Located in upper left corner, warning device for smoke detection.
2. ECU supply air duct: Located in the upper left, supplies heated or cooled air to the shelter.
3. ECU control panel: Located in front of the ECU cold air return, controls operation of the ECU for heating, cooling, and venting of the shelter.
4. Temperature and humidity indicator: Located next to the ECU air duct used to monitor temperature and humidity.
5. Clock: Located to the right of the temperature/humidity gauge, centered on wall, used to monitor time.
6. CFPD: Located in center of wall, used in conjunction with the workstation for viewing information.

1-10.7 DTSS-L (V) 2 Interior Front-End Wall Panel Assembly (Cont'd)

7. GPFU release handle: Handle attached to CFPD housing, used to open and close GPFU vent.
8. Emergency lighting; Located to the right of the clock, used when power failure occurs.
9. GPFU air inlet: Located in upper right corner, allows clean, filtered air into shelter
10. I/O Panel: Houses connections for GPFU.
11. GPFU fan: Located below the GPFU air inlet, allows fresh air into shelter.
12. STE equipment: Provides secure communications.
13. Keyboard tray: Located below the CFPD, the tray slides out for access to the keyboard.
14. Keyboard tray release latch: Located beneath the keyboard tray at the back left side, release tray from closed position.
15. UPS: Supplies power to the DTSS-L (V) 2 computer equipment in case of power loss, allowing for orderly shutdown of equipment.
16. Map/large sheet cabinet: Located at the lower center of the front wall, provides flat storage for D-sized (22 in. by 34 in.) maps.
17. GPFU alarm: Warning alarm in case of Nuclear, Biological, Chemical, (NBC) contamination.
18. Desk area: Located to the left of the CFPD.
19. ECU return air grill and noise control hood: Located below the air supply duct, evacuates air.

1-10.8 DTSS-L (V) 2 Interior Curbside

**Figure 1-9 DTSS-L (V) 2 Interior Curbside**

1. Circuit breaker panel: Located in the center of the wall below the power monitor panel, accepts Vac power from the main breaker panel and provides overload protection and power distribution to the shelter equipment.
2. Power monitor panel: Located at the top of the power distribution unit, provides control of the power system.
3. Digital power meter: Located on power monitor panel, used to monitor source power applied to the shelter.
4. Ethernet switch: Located below the workstation, provides connectivity for the computer components.
5. Workstation: Located below the Netra server, provides central processing for all computer equipment and peripherals.
6. KVM switch: Located at center top of wall, provides central control of multiple computers.
7. SCSI booster power supply: Located on a rack behind the workstation, provides power for the SCSI boosters.

1-10.8 DTSS-L (V) 2 Interior Curbside (Cont'd)

8. Netra server: Located below KVM switch, receives stores, manages, and distributes data received from the NIMA.
9. Apcon SCSI switch: Located on top right of wall, allows multiple SCSI buses to be electronically connected providing easy access to peripherals.
10. DLT autoloader: Located below the Apcon switch, provides a look up capability of information for map making. It provides for storage and back up of the RAID.
11. Plotter paper storage area: used to store paper supply for the plotter.
12. CD-RW: Located below the DLT autoloader, provides for storage of information on CDs.
13. Laptop computer: Stored below the CD-RW, used separately or in conjunction with main workstation.
14. Pull out table: Used as desk space for writing notes with pen/paper storage.
15. RAID's: Located below the laptop computer, provides for additional disk storage of information. The top RAID is connected to the workstation; the bottom RAID is connected to the Netra server.
16. SWGS: Located at the bottom, far right of the wall used for grounding the shelter and equipment.
17. Fire extinguisher: Located below the RAID units, provides for use in case of fire.
18. First aid kit: Located to the left of the fire extinguisher, provides first aid materials in case of accident.
19. Flashlight: Provides light in case of power failure or emergency.
20. Storage drawer: Used to store cables and ship loose items.
21. Safe: Located to the right of the RAID units, provides security for documents and removable disk drives.
22. Main breaker panel: Located below the circuit breaker panel, contains the main Ac power circuit breaker, the Dc power circuit breaker, and the load connect button.
23. Signal I/O panel: Allows access to Signal equipment connections.
24. Power I/O panel: Allows access to Power Entry Panel connections.
25. SCSI booster: Located on the back of the door of the Signal I/O panel, (other boosters are on the CD-RW tray, and on the SCSI switch tray), the boosters regenerate and boost the data signal from the various SCSI devices.
26. Storage Cabinet: Used to store loose items.

1-10.9 DTSS-L (V) 2 Interior Rear-End Wall Panel Assembly

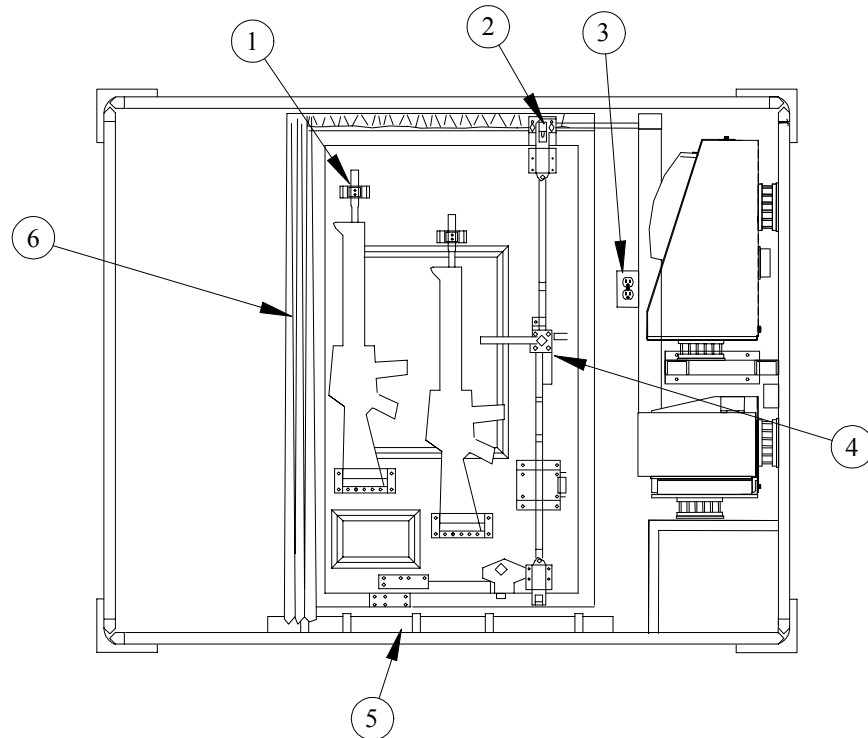


Figure 1-10 DTSS-L (V) 2 Interior Rear-End Wall Panel Assembly

1. Weapon rack: Located on the rear door, provides storage for weapons.
2. Door switch: Located at top of door, changes normal lighting to blackout lighting when door is open. (An override switch is located on the PDU circuit breaker panel to enable normal lighting when blackout is not required.)
3. Utility outlet: Located midway on rear wall to right of door, provides Ac power.
4. Entry door handle: Located on right side of door, used to open or close door.
5. Nuclear Biological Chemical (NBC) barrier: Located to the left of the door near the plotter paper storage area, provides protection from NBC elements.
6. Black-out curtain: Located below the door, provides for black out conditions when needed.

1-10.10 DTSS-L (V) 2 Lighting

The DTSS-L (V) 2 lighting system and its components are shown in Figure 1-11.

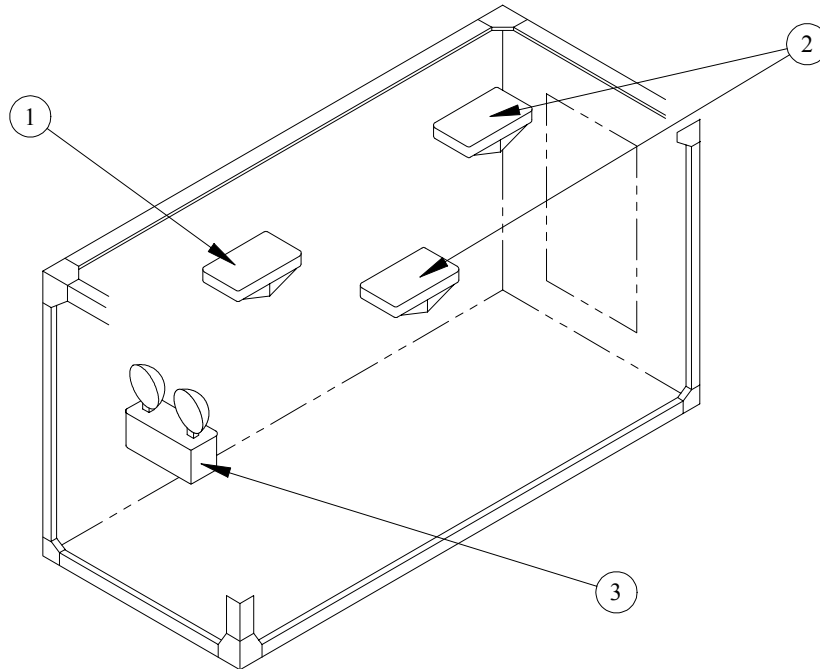


Figure 1-11 DTSS-L (V) 2 Lighting

1. Blackout lighting: Located on the ceiling Ac-operated blackout lights are used when blackout lighting is required. A door switch activates the blackout light when the door is opened. There is an override switch that allows the blackout switch to be shut off.
2. Overhead lighting fixtures: Located on the ceiling provides light during normal, non-blackout operations in the shelter. A knob on each unit controls the light level.
3. Emergency lighting: Located on the front wall, rechargeable battery-operated lights are automatically activated when the Ac power is lost.

1-11 EQUIPMENT DATA

Equipment data for the DTSS-L (V) 2 are listed below. The list includes capabilities, specifications, and relevant information required to operate the DTSS-L (V) 2 shelter.

Table 1-3 Equipment Data

Equipment	Data	Specifications
DTSS-L (V) 2	Dimensions: Height Length Width Weight Power Phase A Phase B Phase C	104 in. 208 in. 89 in. 6,100 lbs 16 A 15 A 12 A
HMMWV-ECV M1113	Dimensions: Height: Without shelter With shelter Length: Width: Curb weight:	 69 in (175.2 centimeters (cm)) 101.6 in (260.6 cm) 221 in (561.34 cm) 85 in (215.9 cm) 6,100 lbs (2858 kilograms (kg.))
Generator, Trailer Mounted PU-798 or PU- 753	Dimensions: Height Length	76.0 in (193.04 cm) 147. in (373.9 cm)
(Trailer Chassis, 1 Ton, 2-Wheel)	Width Weight Weight on Lunette	83.5 in (212.09 cm) 2,164 lbs (983.6 kg.) 181 lbs (82.3 cm)
	Frequency power Power Voltage	47 to 63 Hz 10 kW 120 to 208 Vac
LMS (S-788/G)	Dimensions: Height Length Width Weight (empty)	67.0 in (170.0 cm) 102.0 in (259.0 cm) 84.0 in (213.0 cm) 565 lbs (257 kg)
UPS	Dimensions Height Length Width Weight (with cables)	6.4 in (16.26 mm) 17.4 in (44.20 mm) 17.1 in (43.43 mm) 97 lbs (44.1 kg)

1-11 EQUIPMENT DATA (Cont'd)

Table 1-3 Equipment Data (Cont'd)

Equipment	Data	Specifications
UPS Cont'd	Temperature range Operating Nonoperating	-0°F to +120° Fahrenheit (°F) (-17.8°Celsius (°C) to +50°C) -25°F to +150°F (-31.7°C to +65.5°C)
	Relative humidity Operating	10% to 95% and conditions of mist/fog
	Altitude: Operating Nonoperating	0 to 15,000 ft (0 to 4,575 meters (m)) 0 to 40,000 ft (0 to 12,192 m)
	Environmental requirements: Sand and dust Rain	Blown at 3.5 miles per hour (mph) (5.6 kilometers (kph)) for 20 minutes (min). Precipitation blown onto system components or subject to spillage of droplets from clothing or other equipment.
	Electrical: Ac input voltage Ac input frequency Ac output voltage Ac output frequency Dc input voltage Power	80 Vac to 264 Vac 47 to 63 Hz 115 Vac $\pm 5\%$ 60 Hz $\pm 0.5\%$ 22 to 32 Vdc 1000W/250 Vac output
ECU	Dimensions: Height Depth Length Width	20.1 in (51.04 cm) 28.89 in (73.38 cm) 28 in (71.12 cm) 30 in (76.2 cm)
	Performance: Cooling capacity Heating capacity	18,000 Btu/hr 12,000 Btu/hr
	Weight	282 lbs (127.9 kg)
Workstation CHS-2 VCU-1	Dimensions: Height Depth Width Weight	5.5 in (13.97 cm) 15.5 in (39.37 cm) 17.4 in (44.2 cm) 31.0 lbs (14.1 g)
	Temperature: Operating Nonoperating	0°F to 120°F -25°F to 150°F
	Relative Humidity Operating	10% to 95% (mist and fog)

1-11 EQUIPMENT DATA (Cont'd)

Table 1-3 Equipment Data (Cont'd)

Equipment	Data	Specifications
Workstation Cont'd	Altitude: Operating Nonoperating	15,000 ft operating (4,575m) 40,000 ft (12,192m)
	Extreme Environmental Conditions: Rain Sand and dust Vibration Shock	Operates in conditions of blown precipitation. 3.5 mph for 20 min. Transport in wheeled and tracked vehicles. 0°F to 70°F and 120°F to 70°F in 10 min.
	Electrical: Ac input voltage and frequency	90 to 264 Vac @ 47 to 66 Hz or 22 to 33 Volts direct current (Vdc) with internal UPS and lithium ion battery backup.
Workstation keyboard	Dimensions: Height Depth Width Weight	1.98 in. (5.07 cm) 8.54 in. (21.7 cm) 16.92 in. (42.9 cm) 4.2 lbs (1.9 kg)
	Relative humidity: Operating	10% to 95% mist and fog
	Altitude: Operating Nonoperating	-1,300 ft to 15,000 ft (-396 m to 4,572 m) -1,300 ft to 40,000 ft (-396 m to 12,192 m)
Color Flat Panel Display	Dimensions: Depth Height Width Weight	4 in. (10.54 cm) 15.5 in. (39.4 cm) 17 in. (43.2 cm) 18 lbs (8.2 kg)
	Power Input: Voltage Frequency Power	88 to 264 Vac (auto ranging) 45 to 66 Hz 78 W nominal
	Display: Resolution Pixel Pitch Size:	Up to 1280 x 1024 0.249 mm (H) x 0.249 mm (V) trio dot patch 16.1 in diagonal viewable

1-11 EQUIPMENT DATA (Cont'd)

Table 1-3 Equipment Data (Cont'd)

Equipment	Data	Specifications
Color Flat Panel Display Cont	Active Display Area: Colors:	318.7 mm (H) x 255.0 mm (V) 262 K
	Video: Input Pixel Frequency	Analog Red Green Blue (RGB) 25 to 135 MHz
	Sync signal Temperature: Operating Storage Humidity Altitude	Separate, composite, sync on green 0° to 120°F -25° to +150°F 10% to 95% (non-condensing) Operating—15,000 ft Nonoperating—40,000 ft
8-mm tape drive (part of workstation)	Dimensions: Height Depth Width Weight	 3 in (17.6 cm) 11 in (27.4 cm) 9 in (22.9 mm) 8 lbs with drive installed (6.9 kg)
	Temperature: Operating Nonoperating	+41°F to +104°F (+5°C to +40°C) -31°F to +140°F (-40°C to +60°C)
	Relative Humidity: Operating Nonoperating	20 to 80% noncondensing 10 to 90% noncondensing
	Altitude: Operating Nonoperating	-1,200 ft to 15,000 ft (-396 m to 4,575 m) -1,300 ft to 40,000 ft (-396 m to 12,192 m)
	Power input: Ac input voltage	100 to 240 Vac
	Operating power: Consumption	Operational 11 W
Media converter	Dimensions Height Width Depth Weight	1.0 in. (2.54 cm) 3.0 in. (7.6 cm) 3.9 in. (9.9 cm) 8 ounces (.23 kg)
	Relative humidity Altitude	5% to 90% humidity 0 to 10,000 ft

1-11 EQUIPMENT DATA (Cont'd)

Table 1-3 Equipment Data (Cont'd)

Equipment	Data	Specifications
Color plotter	Dimensions:	
	Height	51 in. (129.5 cm)
	Depth	27 in. (68.6 cm)
	Width	62 in. (157.5 cm)
	Weight	160 lbs (72.64 kg)
	Voltage	120 Vac
	Frequency	47/63 Hz, single phase
	Memory	32 MB (upgradeable to 128 MB) 2 GB hard disk
	Print colors	Up to 16.7 million colors
	Resolution (maximum):	
	Black	Addressable 1200 dpi (line drawings)
	Color	600 dpi
	Minimum line width	0.011 mm
	Accuracy	±0.2% of specified length
	Media size	8.3-in to 36-in (91 cm) wide sheets – 24 in and 36 in rolls
	Print technology	HP color thermal Inkjet
Color scanner	Dimensions:	
	Width	49.25 in (1200 mm)
	Depth	15.0 in (380 mm)
	Height	7.9 in (200 mm)
	Weight	101 lbs (46 kg)
	Sensors (tri-linear color)	Triple CCDs, 15,000 pixels, 30 bits color capture
	Image resolution (dpi)	Set-able in 1 dpi increments from 50 dpi to 800 dpi
	Scan modes	24-bit RGB color mode (16.8 million colors) 4-bit and 8 bit indexed color mode 4-bit and 8 bit feature extraction color mode 8-bit graytone mode B/W: line, 2D adaptive and advance ADL photo, B/W dithered mode
	Color adjustments	3x3 matrix multiplier RGB tone curves (Gamma) Independent white and black point settings

1-11 EQUIPMENT DATA (Cont'd)

Table 1-3 Equipment Data (Cont'd)

Equipment	Data	Specifications
Color Scanner Cont'd	Image size	
	Media Width	6.0 to 40.0 in (15 cm to 100 cm)
	Scan Width (max.)	36 in (90 cm)
	Power Consumption	180 W
	Power Voltage	100/115/220/240V – 50/50HZ
Laptop computer	Dimensions	
	Height	1.3 in. (3.3 cm)
	Depth	12.0 in. (30.5 cm)
	Width	9.4 in. (23.9 cm)
	Weight	5.4 lbs (system), 6.1 lbs (travel) (2.7 kg)
	Processor type	Intel Mobile Pentium III with SpeedStep technology and 100 MHz bus
	Processor speed	500 MHz
	Motherboard	Intel 440 BX AGP set
	Cache	256 K
	Graphic chip set	NeoMagic MagicMedia 256 2x
	System RAM included	128 MB
	Hard disk model	Hitachi DK23AA-12
	Hard disk size	11.50 GB
	Floppy disk drive type	Swappable
	Floppy disk option	SuperDisk
	DVD-ROM drive speed	6X
	DVD-ROM drive type	Toshiba SD-C2303
	Universal Serial Bus (USB) Ports	One (version 1.1)
	Serial ports	One 9 P
	Parallel ports	One/keyboard/mouse/external DB-15 monitor/infrared (4 Mbps/RJ-11 modem /RJ-45 Ethernet).
	Modem	Personal Computer (PC) Card 56K
	LCD display	13.3 in (337.8 mm) XGA (1,024 x 768) thin film transistor color/Active Matrix
	Battery type	Lithium Ion 6-cell
	Battery life	4 hr (3.75 for Pentium III 750 MHz models)
	PC card slot	2 type I, 2 type II, or 1 type III

1-11 EQUIPMENT DATA (Cont'd)

Table 1-3 Equipment Data (Cont'd)

Equipment	Data	Specifications
Printer	Deployed:	
	Depth	17 in. (4.3 cm)
	Width	8 in. (20.3 cm)
	Height	15 in. (38.1 cm)
	Weight	13.1 lbs (5.9 kg)
	Input voltage	
	Power consumption	
	Non-printing	4 W average
	Printing	40 W average
	Temperature	41°F to 104°F (5°C to 40°C)
	Humidity (operating)	15% to 80% no condensation
CD-RW	Dimensions:	
	Length	7.72 in (193.1 mm))
	Height	1.65 in (41.3 mm)
	Width	5.84 in (146.0 mm)
	Weight	2.10 lbs (0.95 kg)
	Power supply	110 Vac 60 Hz
	Power consumption	11 W maximum (read/write)
	Temperature:	
	Operating	+41°F to 104°F (+5°C to +40°C)
	Humidity:	
	Operating	25% to 80% no condensation
	Interface	SCSI-2
	Data capacity	650 MB (74-min disk)
	Read speeds	550 MB (63-min disk)
	Record speeds	4X, 2X, 1X
	Rewrite speeds	4X, 2X
	Data transfer rates	1X: 150 kB/sec.; 16X: 2400KB/sec.
	Data buffer size	1 MB
	Access speed	160 ms
	Recording modes supported	Session-at-once, packet writing, disk-at-once, track-at-once, and multi-session
	Formats supported	Compact Disk-Read Only Memory (CD-ROM), CD-ROMXA, (both photo CD and video CD), CD-I, CD-digital audio, CD extra and video CD
	Power requirement	100 to 240 Vac, 46 to 63 Hz, 690 W
	Storage capacity	1.092 Terminal Board

1-11 EQUIPMENT DATA (Cont'd)

Table 1-3 Equipment Data (Cont'd)

Equipment	Data	Specifications
RAID	Dimensions: Height Depth Width Weight	7 in (17.8 cm) 20.5 in (52.1 cm) 19.46 in (49.43 cm) 76.0 lbs (29.55 kg)
	Performance (10 complete raid arrays): Individual array performance Total performance	9,779 Input/Output (I/O) per second, 50-MB per second data transfer 97,790 I/O per second, 500-MB per second data transfer
DVD-RAM drive (part of workstation)	Dimensions: Height Width Depth Weight	1.6 in. (41.3 mm) 6 in. (146 mm) 8 in. (20.3 cm) 2.5 lbs (1.14 kg)
	Average Seek Time: DVD-RAM DVD-ROM CD-ROM	120 ms 210 ms 140 ms
	Memory capacity	2 kilobytes (kB)
	Drive interface	SCSI-2
	Drive read speed	20X (CD), 2X (DVD)
	Data transfer rate: Synchronous Asynchronous	10 MB/sec maximum 5 MB/sec maximum
	Sustained data transfer rates: DVD-RAM DVD-ROM CD-ROM	1,350 kB/sec (1X DVD-RAM) 2,700 kB/sec (2X DVD-ROM) 2,400 kB/sec (16X CD-ROM)
	Power supply	5 V Direct Current (Dc) ($\pm 5\%$), 3.0 A maximum
	Disk/file standards and formats	CD-Recordable, DVD-RAM, PD, DVD-ROM, CD-Extra, CD-ROMXA, Photo-CD (Single and Multi-session), Video CD 1.0 and 2.0, CD-DA, DVD-R

1-11 EQUIPMENT DATA (Cont'd)

Table 1-3 Equipment Data (Cont'd)

Equipment	Data	Specifications
JAZ drive (part of workstation)	Dimensions:	
	Length	8 in. (20.3 cm)
	Height	1.5 in. (3.8 cm)
	Width	5.33 in. (13.5)
	Weight	2.0 lbs (.9 kg)
	Power requirements	1 V, 100 to 240 Vac
	Storage capacity (each removable disk)	2 GB
	Average seek time	10 ms read, 12 ms write
	Read/write access time	15.5 to 17.5 ms
	Sustained transfer rate	8.7 MB/sec
LS-120 Drive (part of workstation)	Rotational speed	5394 revolutions per minute
	Buffer size	512 k
	Ultra SCSI connections	Two 50-pin high density Ultra ESCI
	Dimensions:	
	Height	4.1 in. (10.16 cm)
	Depth	5 in. (12.54 cm)
	Width	0.6 in. (1.50 cm)
	Weight	1.05 lbs (475 g (typical))
	Disk capacity (formatted)	120 Mb (Ultra High Density Mode) 720 kB (Double Density Mode) 1.44 Mb (High Density Mode)
	Buffer memory	9 kB
	Data transfer rate	531 to 958 kbps (Ultra High Density mode) 37 kB/sec (Write) (Double Density mode) 65 kB/sec (Write) (High Density mode) 258 kB/sec (Read Only)(DMF mode)
	Seek time	Average Access: 86 ms (Ultra High Density mode)
	Interface	Integrated Drive Electronics (IDE)/ATAPI
	MTBF	15,000 POH (@duty 25%)
	Power Requirements	
	Voltage	+5VDC (+/-5%)
	Power dissipation	1.5 W
	Temperature	
	Operating	+5 ~ +45°C
	Storage	-30 ~ 60°C
	Humidity	
	Operating	20% ~ 80% (noncondensing)
	Storage	5% ~ 90% (noncondensing)

1-11 EQUIPMENT DATA (Cont'd)

Table 1-3 Equipment Data (Cont'd)

Equipment	Data	Specifications
Ethernet Switch	Dimensions Height Width Depth Weight	3.46 in (8.8 cm) 17.5 in (44.5 cm) 12 in (30.5 cm) 15 lbs (6.8 kg with two modules installed)
	Environmental operating Ranges Operating Temperature Storage temperature Operating humidity Operating altitude Storage altitude	32°F to 113°F (0°C to 45°C) -4°F to 149°F (-10°C to 65°C) 10% to 85% (noncondensing) Up to 10,000 ft (3,000 m)
	Power requirements: Ac input voltage	100 to 127/200 to 240 Vac
	Power consumption	90 W maximum 307 Btus/hr 170 W (two modules) 580 Btus/hr
Netra Server	Dimensions Height Width Depth Weight	1.73 in. (44mm) 17.3 in. (440 mm) 19.25 in. (488.95 mm) 22 lbs (10 kg)
	Environmental operating Ranges Operating Temperature Storage temperature Operating humidity Operating altitude Storage altitude	32°F to 113°F (0°C to 40°C) -4°F to 149°F (-10°C to 70°C) 10% to 85% (noncondensing) Up to -300m to +3000m -300m to +12000m
	Power requirements: Ac input voltage	4A @ -40Vdc or 2A @ 90 Vac
KVM Switch	Dimensions: Width Depth Height Weight	10.55 in (268 mm) 7.87 in (200 mm) 1.75 in (44 mm) 3.6 lbs (1.62 kg)
	Environmental operating Ranges Operating Temperature Storage temperature Operating humidity	0°C to 55°C (32° to 149°F) 0°C to 55°C (32° to 149°F) 0% to 90% relative humidity (non-condensing)
	Power requirements:	No external power required

1-11 EQUIPMENT DATA (Cont'd)

Table 1-3 Equipment Data (Cont'd)

Equipment	Data	Specifications
SCSI Switch	Dimensions: Width Depth Height Weight	11.3 in (28.7cm) 9.7 in (24.6 cm) 4.5 in (11.4 cm) 5.1 lbs (2.3 kg)
	Environmental operating Ranges Operating Temperature Storage temperature Operating humidity	0°C to 55°C (32° to 149°F) 0°C to 55°C (32° to 149°F) 0% to 90% relative humidity (non-condensing)
	Power requirements: Ac input voltage	100 to 250 Vac $\pm$ 10%, 48 to 65 Hz
	Power consumption	20W
DLT Autoloader	Dimensions: Width Depth Height Weight	17.5 in. (44.45 cm) 20 in. (50.8 cm) 08 in. (20.32 cm) 34 lbs (15.4 kg)
	Host interface	Fast/wide SCSI, single-ended
	Number of cartridges, full magazine	10
	Media type	DLT tape IV
	Number of drives	1
	Tape speed	110 in/sec read/write, 150 in/sec search
	Load time	15 sec (max.), including picking from slot
	Unload time	15 sec (max.), including returning to slot
	Rewind time	68 sec (avg.)
	Sustained native data transfer rate, maximum	18 GB/hr
	Compressed data transfer rate, assuming 22:1 compression	36.0 GB/hr
	Native data capacity (full magazine)	350 GB
	Compressed data capacity (full magazine, 2:1 compression)	700 GB
	Power consumption	207W

Table 1-3 Equipment Data (Cont'd)

Equipment	Data	Specifications
SCSI Booster	Dimensions: Width Depth Height Weight	4 in (8.6cm) 1.1 in (2.8 cm) 4.7 in (11.9 cm) 1 lb (.45 kg)
	Environmental operating Ranges Operating Temperature Storage temperature Operating humidity	0°C to 55°C (32° to 149°F) 0°C to 55°C (32° to 149°F) 0% to 90% relative humidity (non-condensing)
	Power requirements: Ac input voltage	115 Vac $\pm$ 10%, 48 to 65 Hz
	Input power	12 Vdc @1.0A
	Power consumption	4 W
Emulator	Dimensions: Width Depth Height Weight	2 in (5.08 cm) 4.5 in (11.45 cm) 1 in (2.45 cm) 4 oz (113.4 gm)
Print server	Dimensions: Width Depth Height Weight	7 in (17.78 cm) 4.5 in (11.45 cm) 1.5 in (3.81 cm) 10 oz (283.5 gm)
Transit heater	Dimensions: Width Depth Height Weight	12.5 in 12.25 in 9.5 in 20 lb
	Power requirements: Ac input voltage Wattage	24 Vdc 500W

1-11 EQUIPMENT DATA (Cont'd)

Table 1-3 Equipment Data (Cont'd)

Equipment	Data	Specifications
STE	Dimensions: Height Width Depth Weight	5.25 in. (13.3 cm) 10.0 in. (25.4 cm) 9.5 in. (24.13 cm) 7.0 lbs (3.3 kg)
	Input voltage Power: External supply Consumption	115 Vac, 50/60 Hz or 230 Vac, 50/60 Hz Autoranging 90 to 253 Vac, 47-63 Hz 20 W
	Operating temperature Storage temperature	0° to 40° C -20° to 60° C
	Humidity	10% to 90% noncondensing
	Voice applications: Secure voice Nonsecure voice	ADPCM @ 32 kilobits per second (kbps) CELP @ 4.8 kbps LPC-10e @ 2.4 kbps PCM CVSD (Tactical STE only)
	Secure data Applications: Synchronous data Asynchronous data Interfaces: Network	@ 128, 64, 56, 38.4, 19.2, 9.6, 4.8, 2.4 kbps @ 19.2, 9.6, 4.8, 2.4 kbps ISDN (S/T), BRI, 1B+D/2B+D, RJ-45 PSTN, RJ-11C, 2-wire Tri Service- Tactical Communications (TRI-TAC) /MSE wire line modem, 4-wire (Tactical STE, only) Electronics Industries Association (EIA)-232 or EIA-50A
	Host data Interoperability	EIA-232 or EIA-530A STU-III, Digital Non-secure Voice Terminal (DNVT) (Tactical STE only), ISDN: NI-1, N1-2, 5ESS, DMS-100 DEFINITY
	Modem: Bit rate Input level Output level Data transmission	2400 bits per second with echo canceling 0 to -43 dBm 0 to -12 dBm (adjustable) 300, 1200, 2400 bits per second asynchronous or 2400 bits per second synchronous

1-11 EQUIPMENT DATA (Cont'd)

Table 1-3 Equipment Data (Cont'd)

Equipment	Data	Specifications
GPFU		For information on equipment and data, refer to TM 3-4240-325-10
Gas-Particulate Filter Unit M93-100 CFM	Dimensions: Height Width Length Weight Input voltage Power requirements Airflow (standard cubic ft per minute) (SCFM) Power consumption	27.81 in (70.64 cm) 13.50 in (34.29 cm) 13.50 in (34.29 cm) 61 lbs (26.66 kg) 120 Vac, 50/60 or 400 Hz, 1 Phase 510 W, Max Rated 100 (actual may be higher) 400 W
GPFU System Control Module	Dimensions: Height Width Length Weight Input voltage: Power requirements:	5.44 in (13.82 cm) 5.94 in (15.09 cm) 9.00 in (22.86 cm) 4.00 lbs (1.81 kg) 28 Vdc 250 A at 28 Vdc
GPFU Centrifugal Fan	Dimensions: Height Width Length Weight Input voltage: Power requirements: Airflow (SCFM)	10.00 in (25.40 cm) 9.00 in (22.86 cm) 10.37 in (26.34 cm) 17.00 lbs (7.71 kg) 120 Vac, 50/60 or 400 Hz, 1 Phase 480 W, max 20 to 100 (rated range)
GPFU Gas-Particulate Filter Canister M48 (outer diameter)	Dimensions: Height Length Weight Airflow	12.63 in (32.08 cm) 12.00 in (30.48 cm) 28.50 lbs (12.93 kg) Rated 100 SCFM

SECTION III PRINCIPLES OF OPERATION

Para/Subject	Page
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1-13 DTSS-L (V) 2 Ground and Power Functional Description	1-44
1-14 DTSS-L (V) 2 Data/Signal Functional Description.....	1-46

1-12 DTSS-L (V) 2 FUNCTIONAL DESCRIPTION

The DTSS-L (V) 2 is composed of an HMMWV-ECV with LMS (S-788/G) shelter, mounted on the HMMWV-ECV pulling a 10-kW generator. A functional description of one shelter is shown in Figure 1-12. The system contains all the equipment necessary to support the topographic unit mission. Many of the computer components in the shelter are COTS units that have been ruggedized for use in the military. The remainder of the equipment is part of the U.S. Army CHS-2. Both workstations can be used to perform all terrain analysis functions. In addition, a subset of the communication functions, and other tasks performed by the Army Topographic Analyst (Military Occupational Specialty (MOS) 81T), can be performed on both the workstation and the laptop computer. Internally, the main workstation can be networked to the laptop computer via the Ethernet switch

1-12.1 Power Distribution

A standard issue generator set, 10-kW, supplies 120/208 Vac 60 Hz, 3-phase power to the shelter. Commercial power, 120/208 Vac, 60-Hz, three-phase power, can be used if available. A power cable connects the generator power to the DTSS-L (V) 2 PEP on the forward curbside of the shelter. Power is filtered and surge-protected during input into the PDU. The PDU distributes power to the shelter and computer equipment via switches and circuit breakers. Computer equipment power is provided from the PDU to two UPSs that allow a ten-minute period for saving data and orderly shutdown if power is lost. Non-UPS power is provided for lights, alarm system, CD-RW, DLT Autoloader, SCSI switch, SCSI booster, plotter, scanner, printer, heater, and utility outlets. The TIP has four Vac outlets for use outside the shelter. Vdc power is provided for the Transit Heater from the HMMWV-ECV batteries through the PDU via a circuit breaker. The ECU is provided with 208 Vac power from the PDU.

1-12.2 Data/Signal

The workstation is the center of all data/signal activities. The workstation includes a CFPD, RAID unit, 8-mm tape drive, CD-RW, LS 120 FDD, scanner, printer, and plotter. The workstation is the communications processor in the shelter. All communications functions can be accessed from the workstation.

1-12.2 Data/Signal (Cont'd)

- a. The CHS-2 computer with dual Pentium III workstation module operating at 933 MHz with 2 GB of Random Access Memory (RAM), a 25-GB VCU RHDD, and four plug-in boards. The 8-mm tape drive, LS-120 drive, JAZ drive, and the DVD-RAM are part of the workstation providing for storage and import of data.
- b. The display is a 20-inch CFPD.
- c. The RAID consisting of eight hard drive packs at 73 GB each for a total storage capacity of 584 GB (480 GB after configuration)
- d. The laptop computer provides for workstation redundancy. It is configured with much of the DTSS-D software. It includes an 850 MHz Pentium III processor with 512 MB of installed RAM, a 13-inch display, a 32-GB hard disk drive, and a removable DVD drive, which can be replaced with a floppy disk drive. The laptop computer has access to the RAID. When in operation, the laptop computer has full access to any devices associated with the main workstation. Access to these devices is granted through NT sharing capabilities.
- e. The STE provides secure and non-secure voice and data communications access to the MSE circuit switched network.
- f. External peripherals include: a DLT autoloader for storage and import of data; a 36-inch sheet-feed color scanner; a printer; CD-RW; an SCSI regenerator for data transfer in the shelter.
- g. The Ethernet switch is a 24-port Ethernet switch with expansion slots for peripheral connections and four media converters for converting two-wire ThinLan to RJ45 connection.

When in operation in the shelter or the SICPS tent, the laptop computer is on the internal LAN to provide full access to all mass storage devices connected to the workstation.

Communications via LAN include connections to CP LAN, Defense Data Network (DDN), LAN Fiber Data Distributed Interface (FDDI), and MSE. Access to the commercial phone network is made through the SEP and TIP for both voice and data communications. The STE includes the tactical wedge and has ports for PSTN, TRI-TAC, and also supports EIA-530/EIA 232 network. The tactical wedge supports connection to the MSE circuit switch.

1-12.3 Tent When Deployed

The SICPS tent is an alternative work area for the operators using the laptop computer. The connections from the TIP provide power and signal connections to the equipment in the tent. The laptop computer and STE can be used in the shelter or tent. The tent is connected to the shelter and has lighting, tables, and a tent floor.

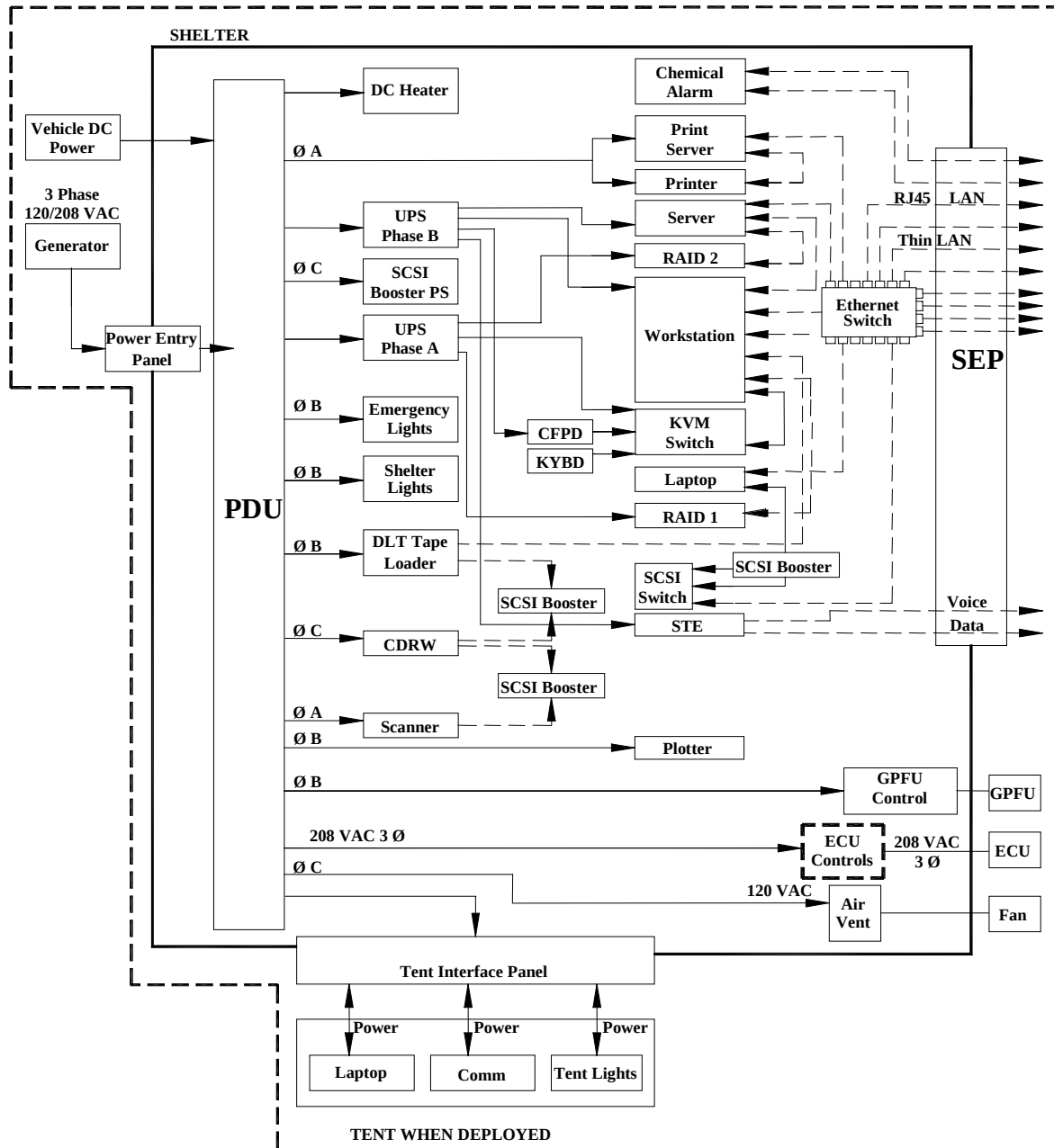


Figure 1-12 DTSS-L (V) 2 Functional Diagram

1-13 DTSS-L (V) 2 GROUND AND POWER FUNCTIONAL DESCRIPTION

The DTSS-L (V) 2 ground and power functional description is provided in Figure 1-13. The description is explained in four parts, as defined in the figure.

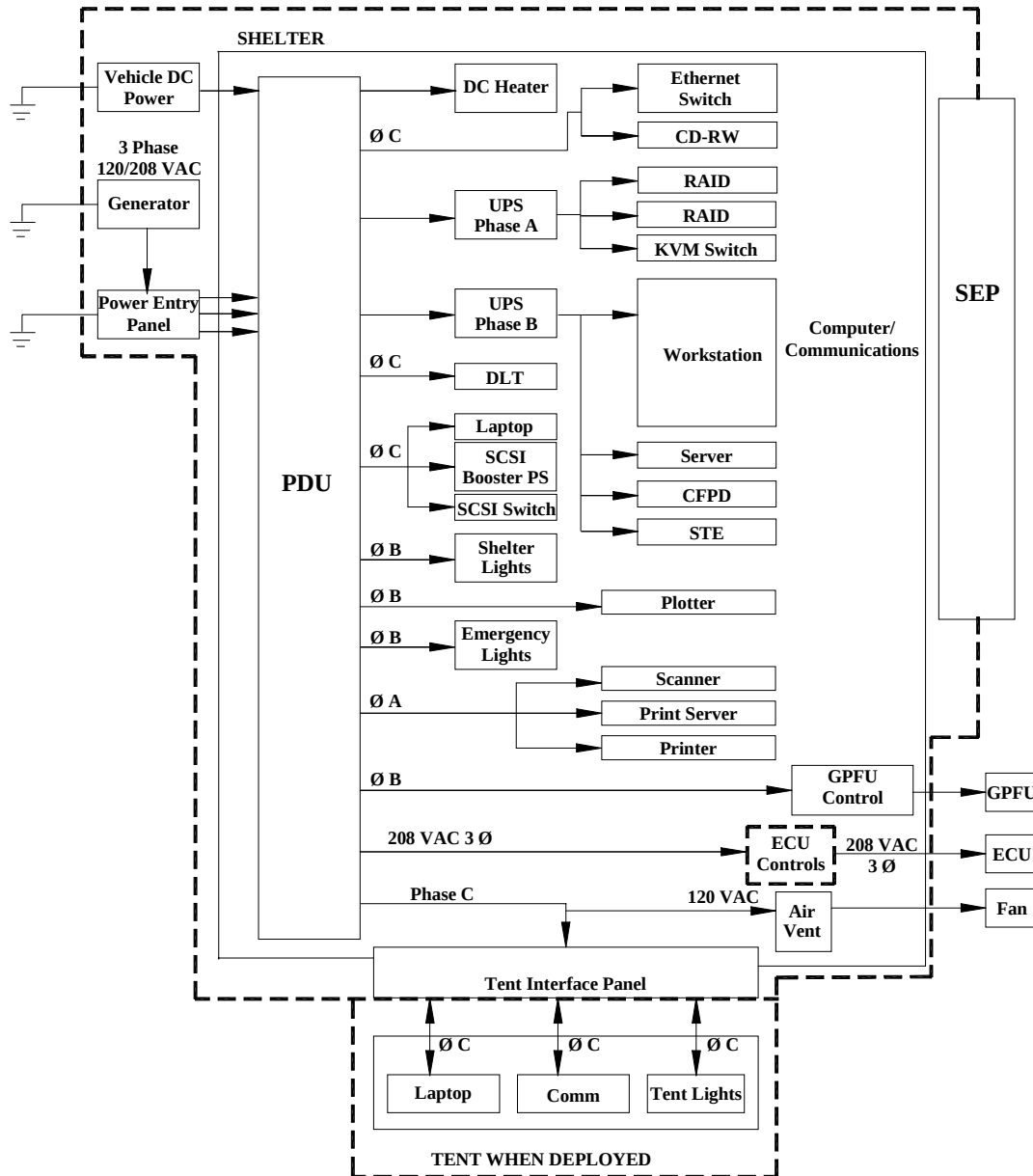


Figure 1-13 DTSS-L (V) 2 Ground and Power Functional Description

1-13.1 Shelter

Grounding for equipment is built into the DTSS-L (V) 2 connecting the equipment to the racks, the vehicle, and an earth ground through the PEP to the outside of the shelter. The external ground point for the system is located on the PEP. Grounding is provided through the use of the SWGS and/or ground rods in various configurations.

- a. The 3-phase, 60-Hz, 120/208 Vac power is provided to the shelter either by a commercial source or from a tactical quiet generator, 10-kW generator (PU-798 or PU-753). The power connection is made to the PEP receptacle. The power is filtered and provided to the main Ac power circuit breakers panel for distribution. A single GFCI receptacle on the PEP provides an external Ac connection on the curbside. Four external Ac connections are on the rear TIP with a GFCI reset button for all four receptacles if power is lost.
- b. The PDU provides voltage, current, and frequency monitoring during operations. Control of power to the shelter receptacles is done through a main breaker panel and a circuit breaker panel.
- c. Two UPSs, Phase A and Phase B, are used to protect the workstation-critical computer equipment during power loss. Other computer equipment uses non-UPS protected power. Shelter lighting and the alarm system power are controlled from the PDU.
- d. The ECU is provided with 208 Vac via the PDU and is controlled by a circuit breaker as well as an in-line circuit breaker. Dc power is provided from the vehicle batteries through the PDU and is controlled by a circuit breaker on the main breaker panel.
- e. Only the transit heater uses the Dc power. The fan/vent unit is Ac powered and is controlled by micro-switch, which is required to be opened to function. The fan/vent is on the ECU circuit.

1-13.2 Backup Power

Two Uninterruptible Power Supplies provide backup power for selected computer equipment for approximately ten minutes. One UPS is connected to Phase A and one is connected to phase B. The UPS outputs are connected to the receptacles mounted on the curbside wall. The phase A UPS provides backup power to receptacles for the two RAIDs and the KVM switch. The Phase B UPS provides backup power to receptacles for the Netra server, the Workstation, the CPFD, and the STE. All other equipment is connected to the workstations receptacles that receive power from Phase C. The laptop computer is connected to one of the phase C receptacles and has its own batteries that supply sufficient power for approximately ten minutes of operation.

1-13.3 Tent When Deployed

Four external Ac receptacles in the TIP provide non-UPS power for use in the SICPS tent. The TIP receptacles have circuit breaker and are GFCI protected. Connections to the laptop computer, communications equipment, and SICPS tent lighting are made to the TIP Ac outlets.

1-14 DTSS-L (V) 2 DATA/SIGNAL FUNCTIONAL DESCRIPTION

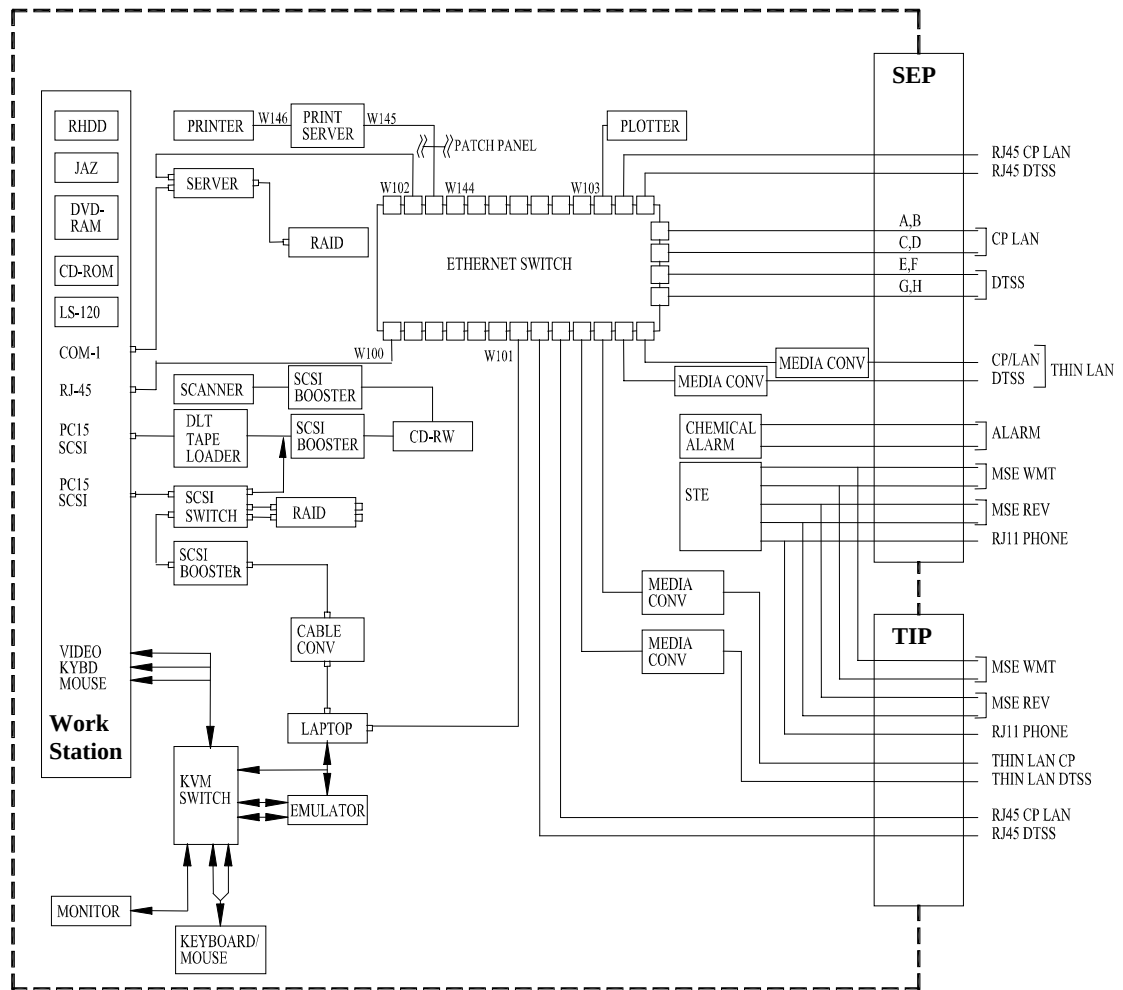


Figure 1-14 DTSS-L (V) 2 Data/Signal Functional Description

1-14.1 Workstation

The main workstation (Figure 1-14) for the DTSS-L (V) 2 is the Common Hardware/Software VCU-1. The workstation provides the capability to produce Tactical Decision Aids (TDA) using hardware and software. The shelter equipment is used in field and garrison environments to fulfill unit mission requirements to produce TDA. The operating software environment for the system is an NT-based operating system. It is integrated with a custom Graphical User Interface (GUI) that allows commercial Geographic Information System (GIS) image processing software to be used in terrain analysis operational tools. Software details (procedures and product production operations) are covered in the Technical Bulletin (TB) 11-6675-295-10.

The workstation has one processor operating at 300-MHz clock speed and 1024 MB of RAM. Additional components include: one Ls 120 Superdisk Drive, 25-GB RHDD, 8-mm tape drive, 2.0-GB JAZ drive, SCSI PCMCIA Card Reader, and DVD-RAM.

The workstation is equipped with the following S-Bus cards: FDDI, a combined 802.3, and Fast Differential SCSI-3 Interface card. All external connections from DTSS-L (V) 2 workstation in the shelter are connected to the SEP for connectivity to other units.

The 20-inch color flat panel CHS-2 display supports up to 1280 x 1024. The keyboard and built-in trackball provide the access to the system for the operator.

1-14.2 Data/Signal

The Data/Signal diagram, Figure 1-14, depicts the flow of data into and out of the workstation and the shelter SEP. Internal computer peripherals in the workstation can be made available via the LAN to the laptop computer.

- a. In addition to the storage capability in the workstation and internal peripherals, more data and graphic storage are available on the CD-RW and the DLT Autoloader.
- b. The CD-RW allows the operator to create a CD-ROM.
- c. Data and graphics printing and plotting can be accommodated by the color plotters and the printer, which are connected via LAN.
- d. Scanning of images and maps can be accomplished using the scanner. The SCSI cable to the scanner requires an SCSI booster due to excess cable-length requirements. The laptop computer and the STE can be operated from inside the shelter, and provisions for connection to the system are in place as noted in Figure 1-14.

1-14.3 Tent When Deployed

The SICPS tent is deployed as required by mission requirements. The laptop computer can be operated on one of the folding tables connected to the shelter for power and data/signal connections via the TIP. Additional cables are provided for both pieces of equipment and stored in the shelter when not used. See para.2-7.7 for setting up laptop in tent.

CHAPTER 2 OPERATING INSTRUCTIONS

Section/Subject	Page
I Description and Use of Controls and Indicators	2-1
II Operator Preventive Maintenance Checks and Services	2-89
III Operation Under Usual Conditions	2-119
IV Operation Under Unusual Conditions	2-177

SECTION I DESCRIPTION AND USE OF CONTROLS AND INDICATORS

Para/Subject	Page
2-1 Introduction	2-1
2-2 Controls and Indicators	2-1

2-1 INTRODUCTION

This section illustrates and describes the controls, indicators, and connectors required to operate the DTSS-L (V) 2. Study the pictures and descriptions of the controls, indicators, and connectors before operating the DTSS-L (V) 2.

2-2 CONTROLS AND INDICATORS

2-2.1 DTSS-L (V) 2 Power Equipment

The power and grounding equipment consists of the following:

- DTSS-L (V) 2 Generator Power Panel
- DTSS-L (V) 2 PEP
- DTSS-L (V) 2 TIP
- PDU
- Power Monitor Panel
- Circuit Breaker (CB) Panel
- Main Breaker Panel
- UPS
- GPFU

2-2.1.1 Introduction to Generators

There are two different models of generators to provide power for the DTSS-L (V) 2. The two types are the PU-798 TQG and the PU-753. Paragraph 2-2.1.2 describes the generator power panels.

2-2.1.2 DTSS-L (V) 2 Generator Power Panel (Model PU-798)

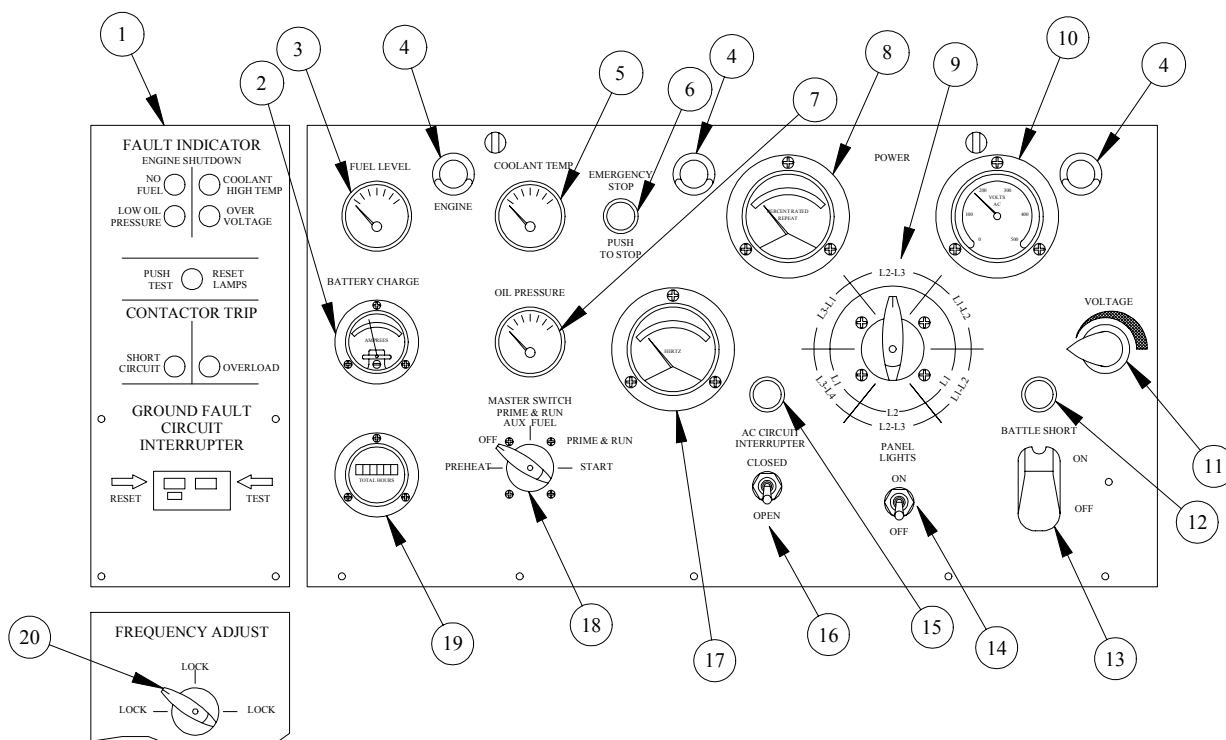


Figure 2-1 Generator Power Panel Controls and Indicators (1 of 2)

Table 2-1 Generator Power Panel Controls and Indicators (1 of 2)

Item	Controls and Indicators	Function
1.	FAULT INDICATOR Panel	Indicates generator set failure or abnormal operating condition (see Figure 2-1 (2 of 2)).
2.	BATTERY CHARGE	Indicates charge/discharge rate of batteries.
3.	FUEL LEVEL	Indicates fuel level.
4.	PANEL LIGHTS	Illuminate control panel.
5.	COOLANT TEMP	Indicates engine coolant temperature.
6.	EMERGENCY STOP	Shuts down generator set.
7.	OIL PRESSURE	Indicates oil pressure.
8.	PERCENT RATED REPEAT	Indicates generator set load current as a percent of rated current.

2-2.1.2 DTSS-L (V) 2 Generator Power Panel (Model PU-798) (Cont'd)

Table 2-1 Generator Power Panel Controls and Indicators (1 of 2) (Cont'd)

Item	Controls and Indicators	Function																					
9.	AM-VM transfer switch	Enables selection of current and voltage readings between output load terminals as follows: Switch <table> <tr> <th><u>Position</u></th><th><u>Voltage</u></th><th><u>Amps</u></th></tr> <tr> <td>L1-L2 (3-Phase)</td><td>L1-L2</td><td>L1</td></tr> <tr> <td>L2-L3 (3-Phase)</td><td>L2-L3</td><td>L2</td></tr> <tr> <td>L3-L1 (3-Phase)</td><td>L3-L1</td><td>L3</td></tr> <tr> <td>L3-L0 (3-Phase)</td><td>L3-L0</td><td>L3</td></tr> <tr> <td>L3-L1 (1-Phase)</td><td>L3-L0</td><td>L3</td></tr> <tr> <td>L3-L0 (1-Phase)</td><td>L3-L0</td><td>L3</td></tr> </table>	<u>Position</u>	<u>Voltage</u>	<u>Amps</u>	L1-L2 (3-Phase)	L1-L2	L1	L2-L3 (3-Phase)	L2-L3	L2	L3-L1 (3-Phase)	L3-L1	L3	L3-L0 (3-Phase)	L3-L0	L3	L3-L1 (1-Phase)	L3-L0	L3	L3-L0 (1-Phase)	L3-L0	L3
<u>Position</u>	<u>Voltage</u>	<u>Amps</u>																					
L1-L2 (3-Phase)	L1-L2	L1																					
L2-L3 (3-Phase)	L2-L3	L2																					
L3-L1 (3-Phase)	L3-L1	L3																					
L3-L0 (3-Phase)	L3-L0	L3																					
L3-L1 (1-Phase)	L3-L0	L3																					
L3-L0 (1-Phase)	L3-L0	L3																					
10.	AC VOLTS	Indicates output voltage of generator set.																					
11.	VOLTAGE	Voltage potentiometer adjusts generator set voltage.																					
12.	BATTLE SHORT Light Emitting Diode (LED)	Amber light indicates battle short switch on.																					
13.	BATTLE SHORT ON/OFF	Bypasses protective devices.																					
14.	PANEL LIGHTS ON/OFF	Activates or deactivates panel lights.																					
15.	AC CIRCUIT INTERRUPTER CLOSED/OPEN	Green light indicates Ac circuit interrupter relay is closed.																					
16.	AC CIRCUIT INTERRUPTER	Opens and closes Ac circuit interrupter relay.																					
17.	HERTZ	Indicates generator set frequency.																					
18.	MASTER SWITCH	PREHEAT—Energizes heater plugs. OFF—De-energizes all circuits, except panel lights. PRIME & RUN AUX FUEL—Energizes generator set run circuits with fuel pump operating and auxiliary fuel system de-energized. START—Energizes starter.																					
19.	Time meter (TOTAL HRS)	Indicates total engine operating hours.																					
20.	FREQUENCY ADJUST	Knob used to adjust frequency.																					

2-2.1.2 DTSS-L (V) 2 Generator Power Panel (Model PU-798) (Cont'd)

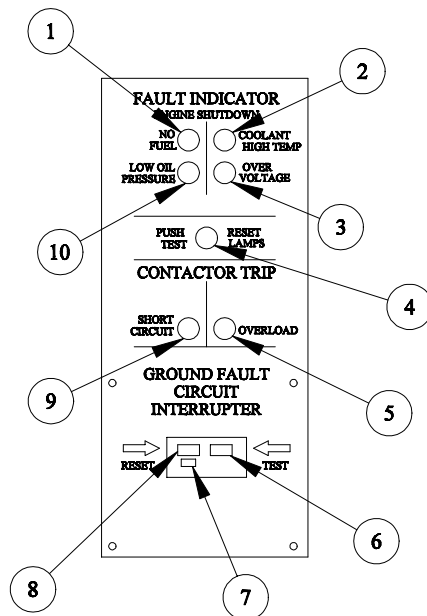


Figure 2-1 Generator Power Panel Controls and Indicators (2 of 2)

Table 2-1 Generator Power Panel Controls and Indicators (2 of 2)

Item	Controls and Indicators	Function
1.	NO FUEL	Lights when fuel level in fuel tank is below preset level.
2.	COOLANT HIGH TEMP	Lights when engine coolant temperature exceeds 225° +5°F (107° +- 3°C).
3.	OVERVOLTAGE	Lights when voltage in 120-volt generator coil winding exceeds 153 + or - 3 volts.
4.	PUSH TEST RESET LAMPS	Test and reset fault indicator lamps.
5.	OVERLOAD	Lights when current in any phase exceeds 110 percent of rated current.
6.	TEST	Tests GROUND FAULT CIRCUIT INTERRUPTER.

2-2.1.2 DTSS-L (V) 2 Generator Power Panel (Model PU-798) (2 of 2) (Cont'd)

Table 2-1 Generator Power Panel Controls and Indicators (2 of 2) (Cont'd)

Item	Controls and Indicators	Function
7.	GROUND FAULT CIRCUIT INTERRUPT (GFCI)	Mechanically trips lights on, at ground fault condition, in circuit of convenience receptacle.
8.	RESET	Depress to reset ground fault circuit interrupter after test or ground fault has occurred.
9.	SHORT CIRCUIT	Lights when generator set output in any phase exceeds 425 ± 25 percent of rated current.
10.	LOW OIL PRESSURE	Lights when engine lubrication system pressure is less than 15 ± 3 psi (103.4 ± 20.7 kilopascal (kPa)) during engine operation (metric unit of pressure measurement).

2-2.1.3 DTSS-L (V) 2 Generator Power Panel (Model PU-753)

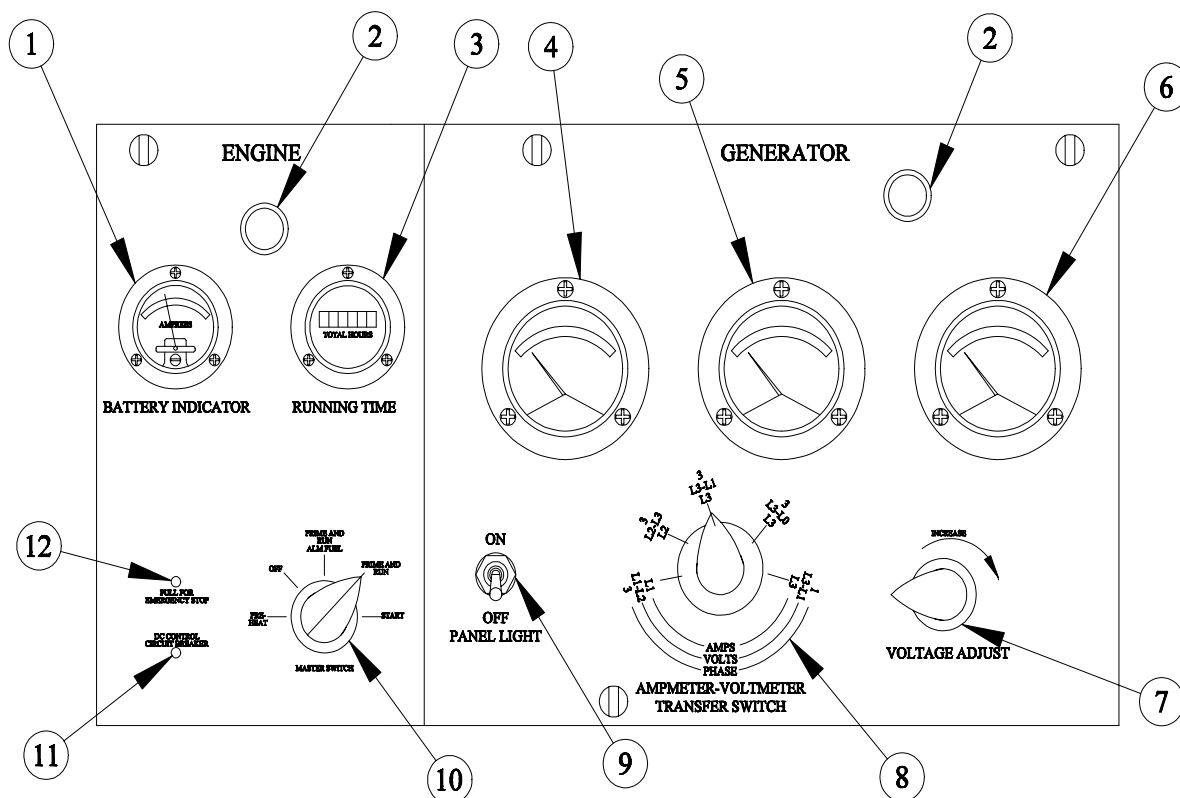


Figure 2-2 Generator Malfunction Indicator Panel Controls and Indicators

Table 2-2 Generator Malfunction Indicator Panel Controls and Indicators

Item	Controls and Indicators	Function
1.	BATTERY INDICATOR	Green –fully charged Yellow –needs charging Red –undercharged
2.	PANEL LIGHTS	Shielded bulb type (2 used)
3.	RUNNING TIME	Hour meter 0 to 9,999.9 hours
4.	Frequency meter	Range 55 to 65 Hz; 1-Hz scale divisions; red mark at 400 scale
5.	% current meter	0 to 133 % range; red line = 100 percent, green line = 0 %

2-2.1.3 DTSS-L (V) 2 Generator Power Panel (Model PU-753) (Cont'd)

Table 2-2 Generator Malfunction Indicator Panel Controls and Indicators (Cont'd)

Item	Controls and Indicators	Function
6.	Voltmeter, Ac	0 to 300 V scale; suppressed from 0 to 100 V and linear from 100 to 300 V. Red marks at 120, 208, and 240 V points.
7.	VOLTAGE ADJUST	Adjusts generator set output voltage (clockwise to increase and counterclockwise to decrease).
8.	AMPMETER-VOLTMETER TRANSFER SWITCH	Used to select phase, voltage, and current combination for reading on amp meter and voltmeter.
9.	ON/OFF PANEL LIGHT	ON-OFF controls panel lights.
10.	MASTER SWITCH	When placed in PREHEAT position, electrical power is applied to glow plugs and pre-heater on the engine to aid in cold engine starting. In OFF position, all Dc circuits are de-energized except panel lights, and battery charging system. This position is used to stop the unit under normal operation. The PRIME & RUN AUX. FUEL position is used when set is running and auxiliary fuel system is being used and also to prime entire fuel system before starting if required. The PRIME & RUN position is used when set is running and auxiliary fuel system is not used and also to prime engine fuel system only before starting if required. When placed in START position, energizes engine cranking system for engine starting, activates glow plugs and air heaters, and by-passes protective devices.
11.	DC CONTROL CB	Used for protecting Dc circuit in case of short and also CIRCUIT for emergency stopping; pull out to activate.
12.	EMERGENCY STOP	Pull for emergency stop.

2-2.1.4 DTSS-L (V) 2 Power Entry Panel

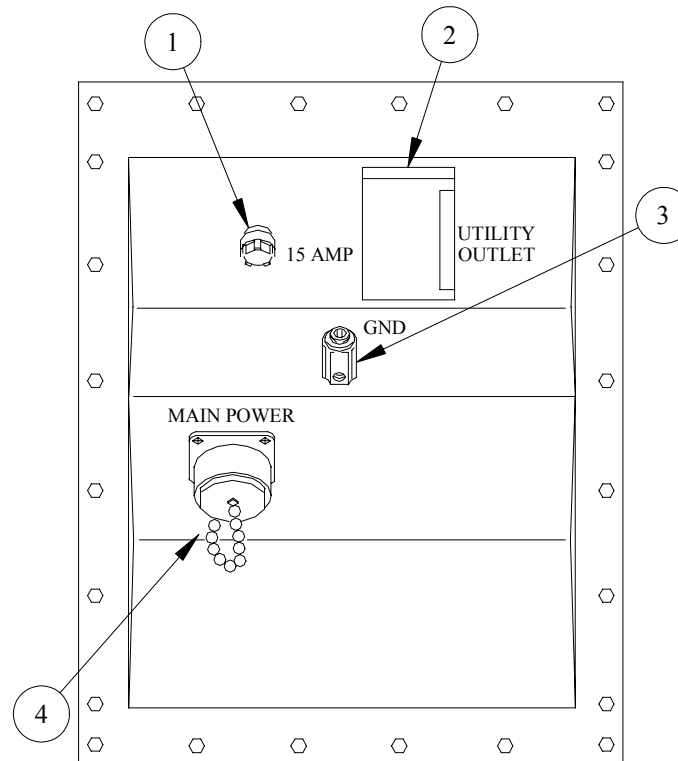
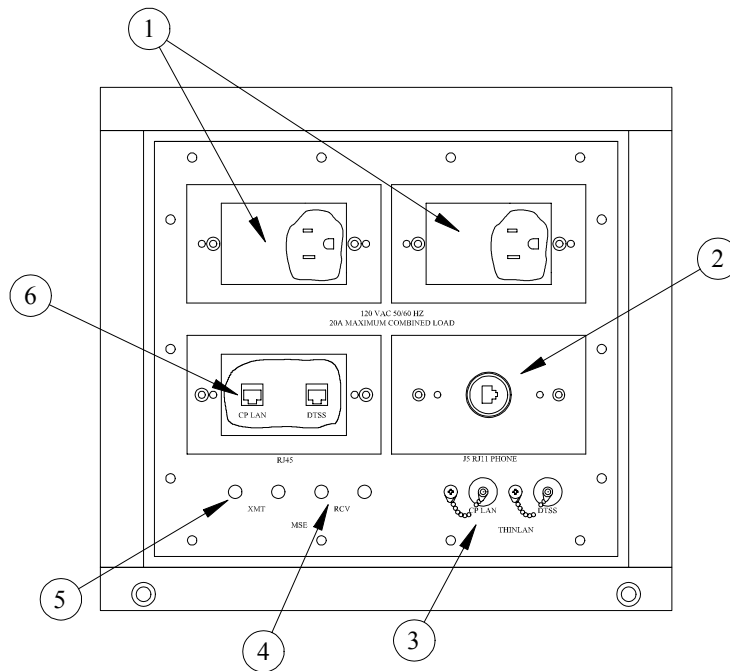


Figure 2-3 Power Entry Panel Connectors and Indicators

Table 2-3 Power Entry Panel Connectors and Indicators

Item	Connector or Indicator	Function
1.	15 AMP	15-A fuse for GFCI outlet.
2.	UTILITY OUTLET	Covered weatherproof outlet provides ground fault protection and access to 120-Vac outside shelter.
3.	GND	Hex clamp connection for earth ground.
4.	MAIN POWER	Connection for Ac generator or commercial power (3-phase, 120/208 Vac).

2-2.1.5 DTSS-L (V) 2 Tent Interface Panel

**Figure 2-4 Tent Interface Panel Controls and Connectors****Table 2-4 Tent Interface Panel Controls and Connectors**

Item	Controls and Connectors	Function
1.	Ac receptacle	A GFCI protected receptacle used to provide power to external equipment.
2.	Phone	Used to connect 2-wire phone to the STE. RJ11 (J5)
3.	ThinLan	Used for connection to the panel to provide interface with the Ethernet switch. CPLAN (J6) DTSS (J7)
4.	MSE RCV binding posts	Used for connection of 4-wire from MSE to STE. RCV (E3) RCV (E4)
5.	MSE XMT binding post	Used for connection of 4-wire from MSE to STE. XMT (E1) XMT (E2)
6.	RJ45 connections.	To provide interface with the Ethernet switch. CPLAN (J3) DTSS (J4)

2-2.1.6 Power Distribution Unit

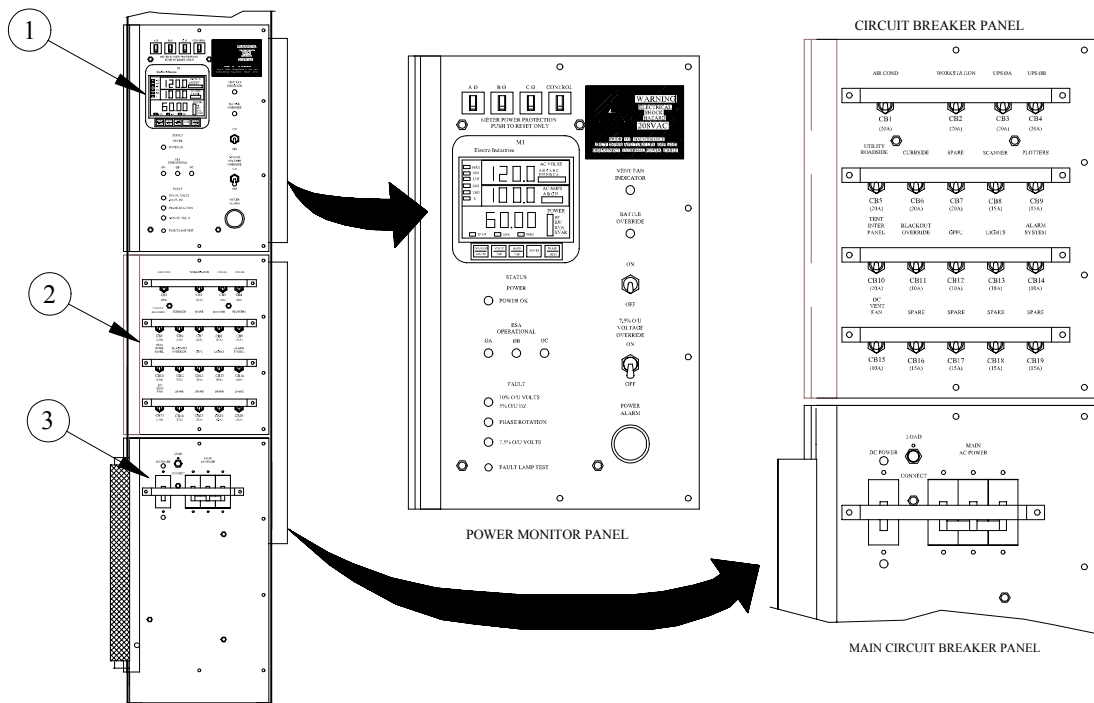


Figure 2-5 Power Distribution Unit Controls and Indicators

Table 2-5 Power Distribution Unit Controls and Indicators

Item	Controls and Indicators	Function
1.	Digital power monitor meter and alarm panel	A digital power meter provides for operator monitoring of the source power applied to the shelter and the shelter power loading on the generator set. Alarm indicator provides operator with status and fault indicators for power, vent fan indicator, battle override switch, 7.5% Over/Under (O/U) voltage override switch, and power alarm.
2.	CB PANEL	Accepts Vac power from the MAIN breaker panel and provides overload protection and power distribution to the shelter equipment.
3.	MAIN BREAKER PANEL	Accepts Vac power from the external source and provides single-point overload protection for the shelter power.

2-2.1.6.1 Power Monitor Panel

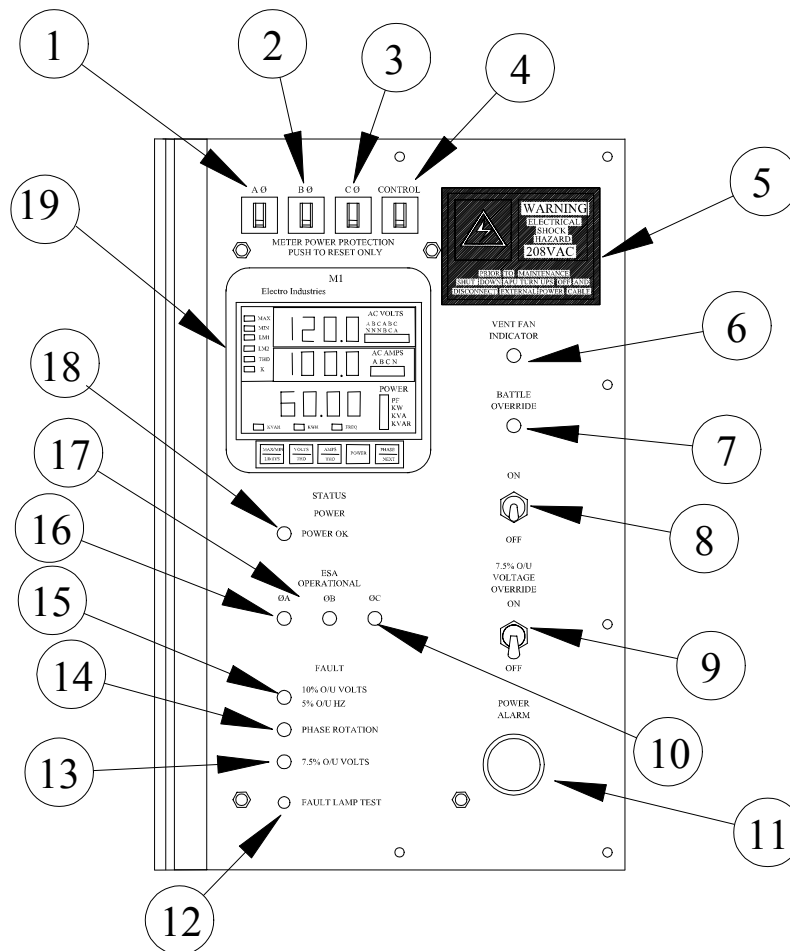


Figure 2-6 Power Monitor Panel Controls and Indicators (1 of 2)

Table 2-6 Power Monitor Panel Controls and Indicators (1 of 2)

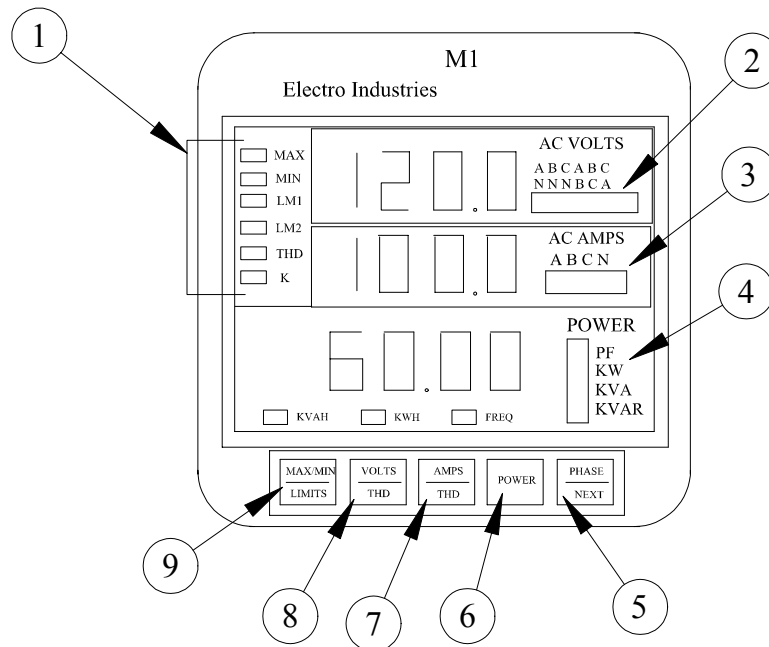
Item	Controls or Indicators	Function
1.	AØ Reset Button	Used to reset power to A phase after power interruption.
2.	BØ Reset Button	Used to reset power to B phase after power interruption.
3.	CØ Reset button	Used to reset power to C phase after power interruption.
4.	CONTROL Button	Used to reset power to the meter after power interruption.
5.	WARNINGS	Label telling of shock hazard.

2-2.1.6.1 Power Monitor Panel (Cont'd)

Table 2-6 Power Monitor Panel Controls and Indicators (Cont'd)

Item	Controls or Indicators	Function
6.	VENT FAN INDICATOR	Lights green to indicate GPFU fan is operating.
7.	BATTLE OVERRIDE LED	Lights red when in operation.
8.	Battle override switch	Used to turn battle override ON and OFF.
9.	7.5% O/U Voltage override	Allows for override of the 7.5% over/under voltage limits.
10.	C Ø LED	Lights green to indicate PHASE C voltage, frequency, or current is available.
11.	POWER ALARM	Sounds alarm when voltage is over/under 7.5% or when frequency is over/under 5.0%.
12.	FAULT LAMP TEST	Used to ensure LEDs are functioning properly.
13.	7.5% O/U VOLTS LED	Lights red to indicate voltage (any phase) is out of tolerance.
14.	PHASE ROTATION LED	Lights red to indicate phase out of tolerance.
15.	10% O/U VOLTS 5% O/U HZ LED	Lights red to indicate voltage or frequency (any phase) is out of tolerance.
16.	B Ø LED	Lights green to indicate PHASE B voltage, frequency, or current is available.
17.	A Ø LED	Lights green to indicate PHASE A voltage, frequency, or current is available.
18.	Power OK LED	Lights green to indicate power status is operating properly.
19.	Digital power meter	Monitors electrical input voltage, frequency and current.

2-2.1.6.1 Power Monitor Panel (Cont'd)

**Figure 2-6 Power Monitor Panel Controls and Indicators (2 of 2)****Table 2-6 Power Monitor Panel Controls and Indicators (2 of 2)**

Item	Controls or Indicators	Function
1.	MAX/MIN LIMITS LEDs	Pressed to display and access MAX//MIN/LM1 or LM2 values.
2.	AC VOLTS LEDs	A glowing annunciator indicates the value currently displayed.
3.	AC AMPS LEDs	A glowing annunciator indicates the value currently displayed.
4.	POWER LEDs	Press POWER to select the power category.
5.	PHASE/NEXT	When the desired parameters are chosen, PHASE/NEXT selects the voltage and amperage phases, as well as the power functions.
6.	POWER	Press POWER to select the power category.
7.	AMPS	Press AMPS to select the amps category.
8.	VOLTS	Press VOLTS to select the volts category.
9.	MAX/MIN LIMITS	Press MAX/MIN/LIMITS once for max value and twice for the min value.

2-2.1.6.2 Circuit Breaker Panel

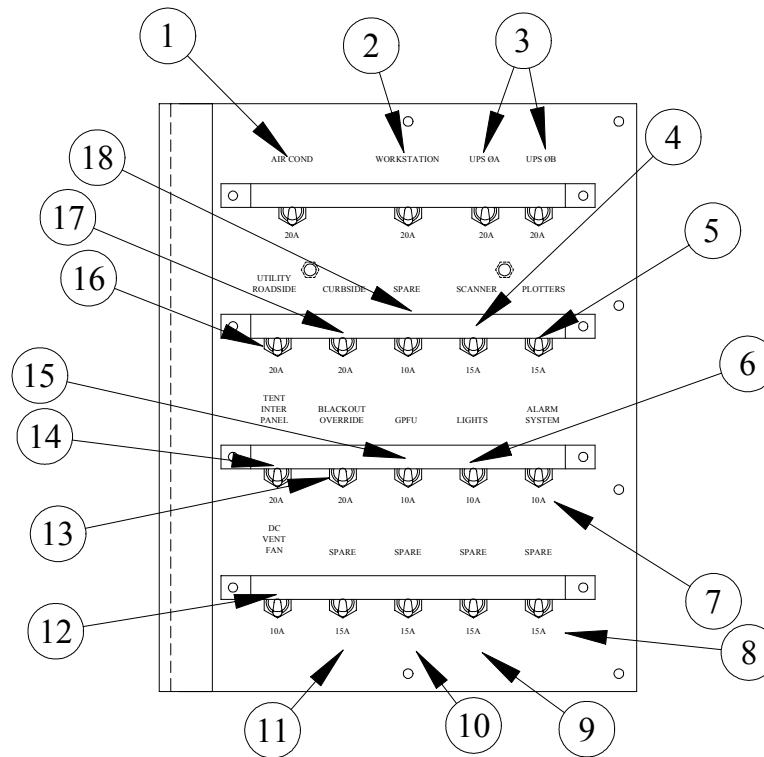


Figure 2-7 Circuit Breaker Panel Controls

Table 2-7 Circuit Breaker Panel Controls

Item	Controls	Function
1.	AIR COND (20A)	This CB provides hardwired overload protection for ECU.
2.	WORKSTATION (20A)	This CB provides overload protection to the workstation.
3.	UPS ØA (20A)	This CB provides hardwired overload protection for UPS Phase A.
	UPS ØB (20A)	This CB provides overload protection for UPS Phase B and powers the workstation power on/off switch.

2-2.1.6.2 Circuit Breaker Panel (Cont'd)

Table 2-7 Circuit Breaker Panel Controls (Cont'd)

Item	Controls	Function
4.	SCANNER (15A)	This CB provides hardwired overload protection for the scanner.
5.	PLOTTER (15A)	This CB provides hardwired overload protection for the plotter.
6.	LIGHTS (10A)	This CB provides hardwired overload protection for the interior lights.
7.	ALARM (10A)	This CB provides hardwired overload protection for the alarm system.
8.	SPARE (15A)	Spare 15A CB for future use.
9.	SPARE (15A)	Spare 15A CB for future use.
10.	SPARE (15A)	Spare 15A CB for future use.
11.	SPARE (15A)	Spare 15A CB for future use.
12.	DC VENT FAN (10A)	CB provides power to VENT FAN and GPFU.
13.	BLACKOUT OVERRIDE (20A)	This CB provides hardwired overload protection for the BLACKOUT OVERRIDE.
14.	TENT INTER PANEL (20A)	This CB provides hardwired overload protection for the TIP.
15.	GPFU (10A)	Circuit provides power to GPFU.
16.	UTILITY ROADSIDE (20A)	This CB provides hardwired overload protection for UPS Phase C.
17.	UTILITY CURBSIDE (20A)	This CB provides hardwired overload protection for UPS Phase A.
18.	SPARE (10A)	Middle CB in the second row is a 10A spare, (all others spares are 15A) for future use.

2-2.1.6.3 Main Breaker Panel

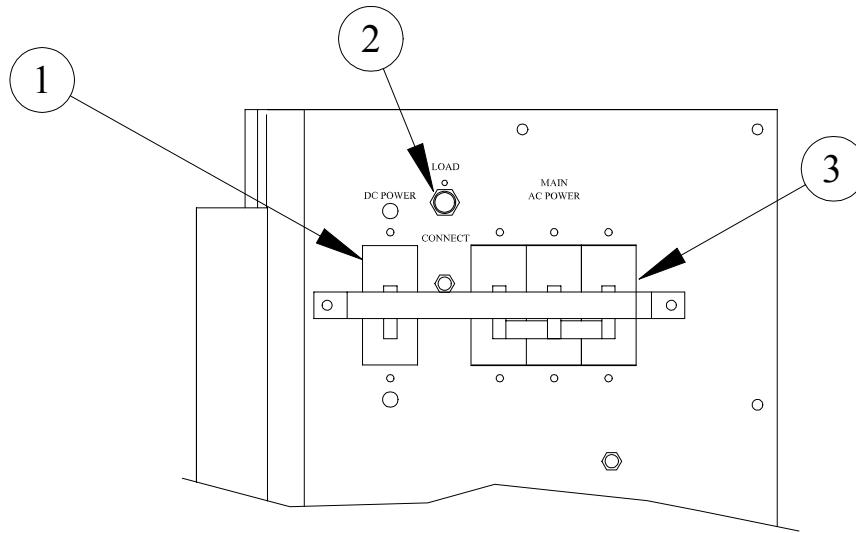


Figure 2-8 Main Breaker Panel Controls

Table 2-8 Main Breaker Panel Controls

Item	Controls	Function
1.	DC POWER (50A)	This CB provides hardwired overload protection for the Dc power CB to the transit heater. The Dc power is provided for the heater from the vehicle batteries.
2.	LOAD CONNECT	When pressed, the LOAD CONNECT switch allows connection of external power.
3.	MAIN AC POWER (60A)	This CB provides hardwired overload protection for the main Ac power CB.

2-2.1.6.5 Uninterruptible Power Supply

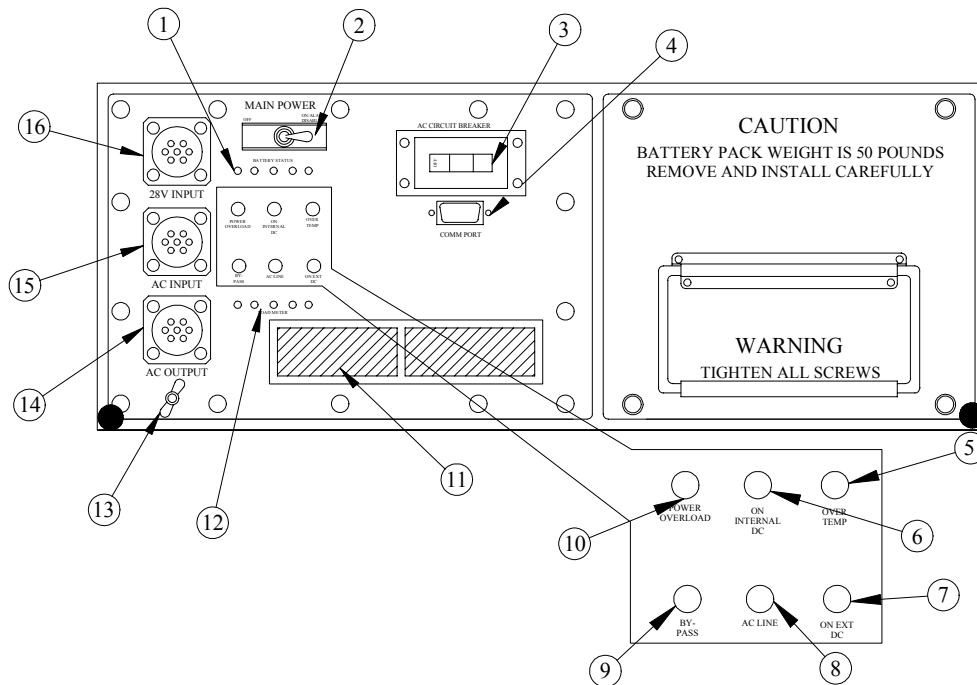


Figure 2-9 UPS Front Panel Controls and Indicators

Table 2-9 UPS Front Panel Control and Indicators

Item	Control and Indicators	Function
1.	BATTERY STATUS	Five green LEDs indicate charge level of battery pack. All LEDs lit indicate a fully charged battery. No LEDs lit indicate a fully discharged battery.
2.	MAIN POWER OFF/ON ALARM DISABLE	Momentarily hold to ON: Starts UPS and enables audible alarm. Momentarily hold to ON: When UPS is running disables audible alarm.
3.	AC CIRCUIT BREAKER	Provides short circuit and provides overload protection Ac.
4.	COMM PORT	The communication port provides alarm control signal on a serial interface.

2-2.1.6.5 UPS Front Panel (Cont'd)

Table 2-9 UPS Front Panel Control and Indicators (Cont'd)

Item	Control and Indicators	Function
5.	OVER TEMP	Continuous red if UPS internal temperature is above safe operating limits. Audible alarm sounds. UPS will shut down if condition is not corrected.
6.	ON INTERNAL DC	Lights green when internal Dc power source is on.
7.	ON EXT DC	Lights green when Ac is off. Indicates external Dc source supplies power.
8.	AC LINE	Lights green when on external Ac power source.
9.	BY-PASS	Not used.
10.	OVER LOAD	Continuous red if overload greater than the unit's continuous rating output exceeds 1000 watts at 0.8 power factor. Audible alarm sounds.
11.	Intake Air filter	Removable air filters to keep dirt and dust from entering the internal parts of the unit.
12.	LOAD METER	Five green LEDs indicate load is being applied to UPS. All LEDs lit indicates full load. No lights on indicates no load.
13.	GND (Chassis ground)	Ground connection for grounding UPS to shelter.
14.	AC OUTPUT	Provides condition power from the UPS for designated components.
15.	AC INPUT	Ac power connection from power source.
16.	28V INPUT	Not used.

2-2.2 Environmental Equipment

The environmental equipment consists of:

- ECU
- Shelter Lighting
- Dc Heater
- GPFU

2-2.2.1 ECU External Front View

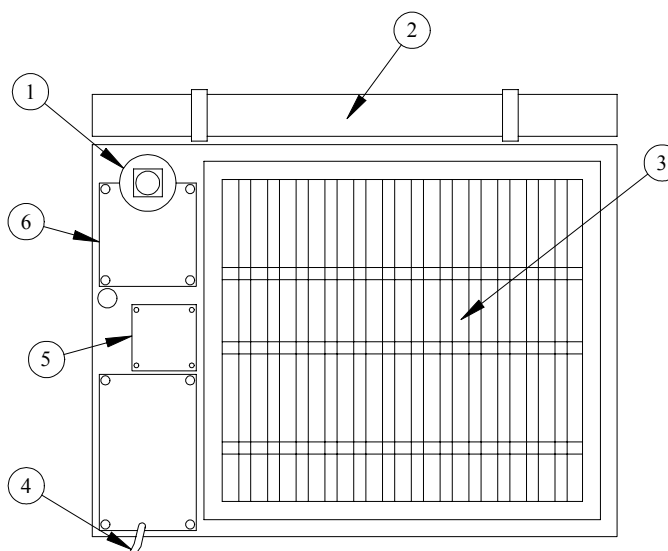


Figure 2-10 ECU External Front Controls and Indicators

Table 2-10 ECU External Front Controls and Indicators

Item	Connector, Control and Indicator	Function
1.	Input power receptacle	Alternative power connector (not used).
2.	Fabric cover (front rolled up for operation)	Protects three sides of unit during travel and in storage or heavy weather. Front cover is rolled up for operation.
3.	EMI screen	Electromagnetic interference screen.
4.	Water evacuation tube.	Discharges condensed water from the unit away from the ECU and the vehicle.
5.	Refrigerant sight glass cover plate	Removable cover for sight glass for checking quality of refrigerant fluid. For models with EMP covers.
6.	CB/high pressure cutout switch cover plate	Removable cover for access to high-pressure switch.

2-2.2.1.1 ECU Control Panel Module

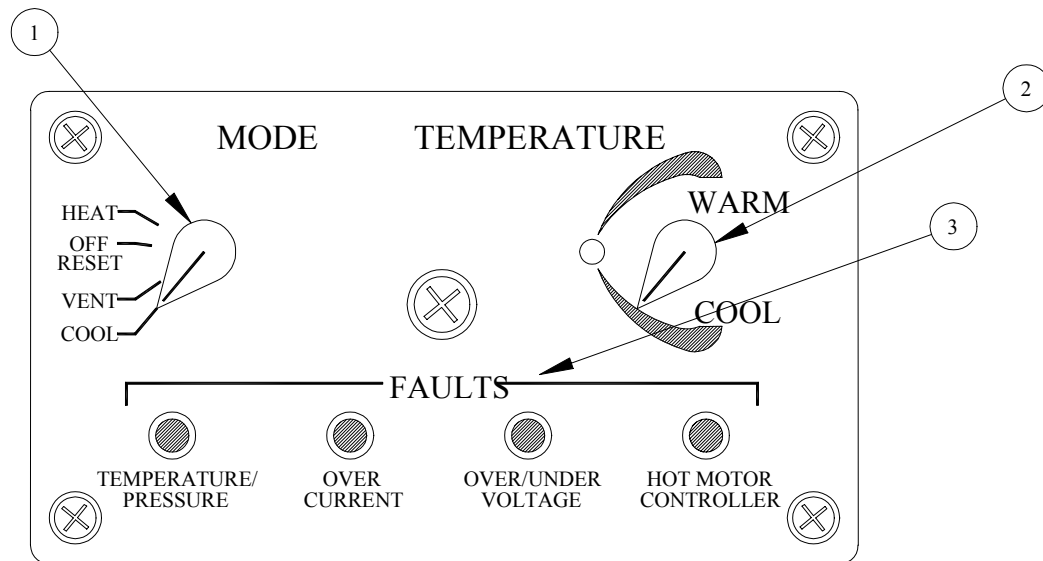


Figure 2-11 ECU Control Panel Module Controls and Indicators

Table 2-11 ECU Control Panel Module Controls and Indicators

Item	Controls and Indicators	Function
1.	MODE selector switch	Enables selection of ECU operating mode (HEAT, OFF/RESET, VENT, COOL).
2.	TEMPERATURE WARM/COOL	Temperature control potentiometer enables selection of desired temperature from operating ECU in mode.
3.	FAULTS (LEDs)	Four fault-indicating LEDs: HOT MOTOR CONTROLLER indicates if the motor controller overheats. OVER/UNDER VOLTAGE indicates if the motor controller is operating outside its voltage range. This could indicate controller failure or a problem with input power.

2-2.2.1.1 ECU Control Panel Module (Cont'd)

Table 2-11 ECU Control Panel Module and Indicators (Cont'd)

Item	Controls and Indicators	Function
3.	FAULTS (LEDs) (Cont'd)	OVER CURRENT indicates if the motor controller is operating with too high amp draw. This can be an indication of a component failure or wiring problem. TEMPERATURE PRESSURE LED indicates if the high-pressure cutout, low-pressure cutout, coil frost, heater thermostatic switch opens. The switches are associated with the unit's cooling and heating operation and can be an indication of obstructed airflow across the evaporator or condenser coil or improper refrigerant charge.

2-2.2.2 Dc Heater Controls

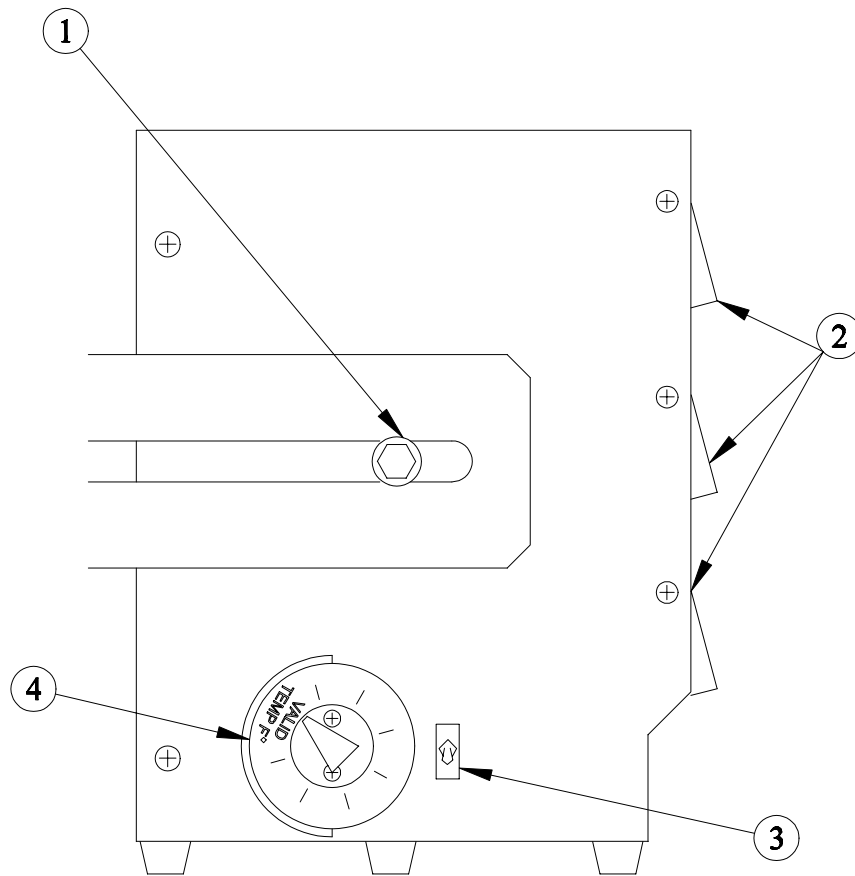
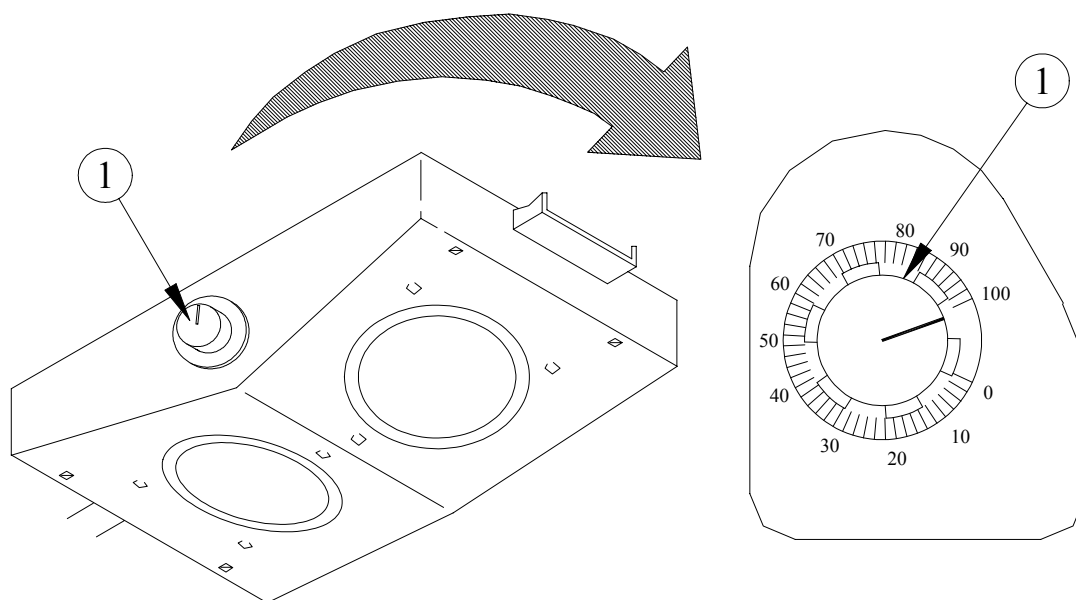


Figure 2-12 Dc Heater Controls

Table 2-12 Dc Heater Controls

Item	Controls	Function
1.	Lock nut	Used to hold the heater in the rack.
2.	Louvers	Used to control the direction of the heat from the unit.
3.	On/Off switch	Used to turn the unit on or off.
4.	Heater control dial	Used to set the temperature of the heater.

2-2.2.3 Shelter Lighting

**Figure 2-13 Shelter Lighting Controls****Table 2-13 Shelter Lighting Controls**

Item	Control or Indicator	Function
1.	Light Switch	Used to turn on the light and adjust the brightness. Lights are controlled by the LIGHT CB on the CB panel.

2-2.2.3.1 Emergency Light

The shelter has one emergency light, which is mounted on the left side of the front wall.

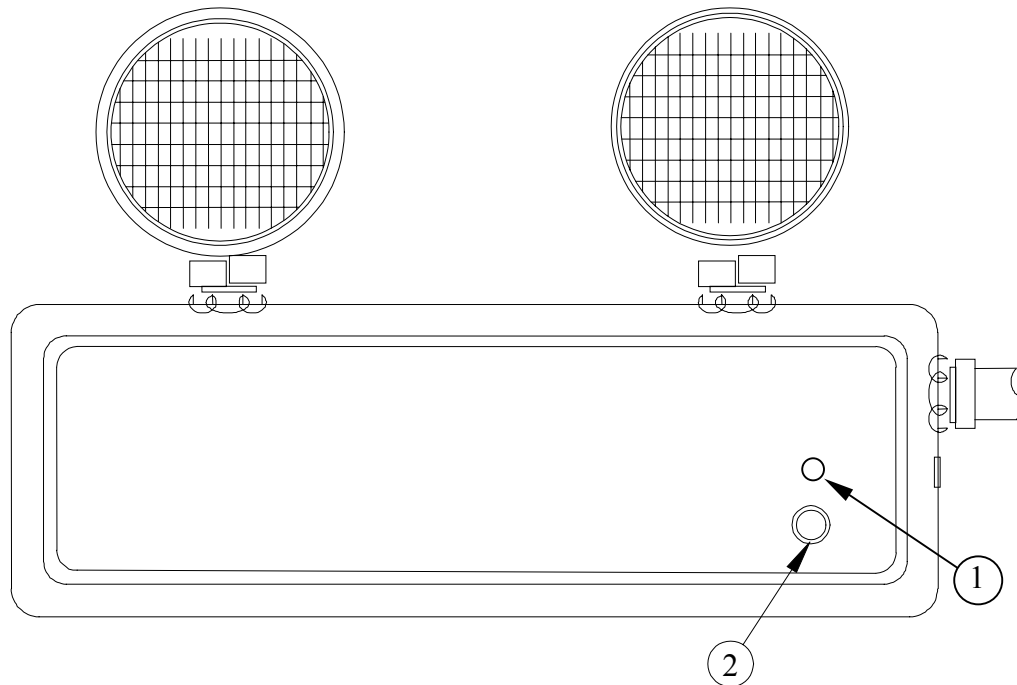


Figure 2-14 Emergency Light Control and Indicator

Table 2-14 Emergency Light Control and Indicator

Item	Control or Indicator	Function
1.	READY	Indicates power is supplied to lighting unit.
2.	TEST	Operates only when the ON/OFF switch is in the ON position. Momentary switch used to test emergency light, push, hold and look for light to go on.

2-2.2.4 GPFU Control Panel

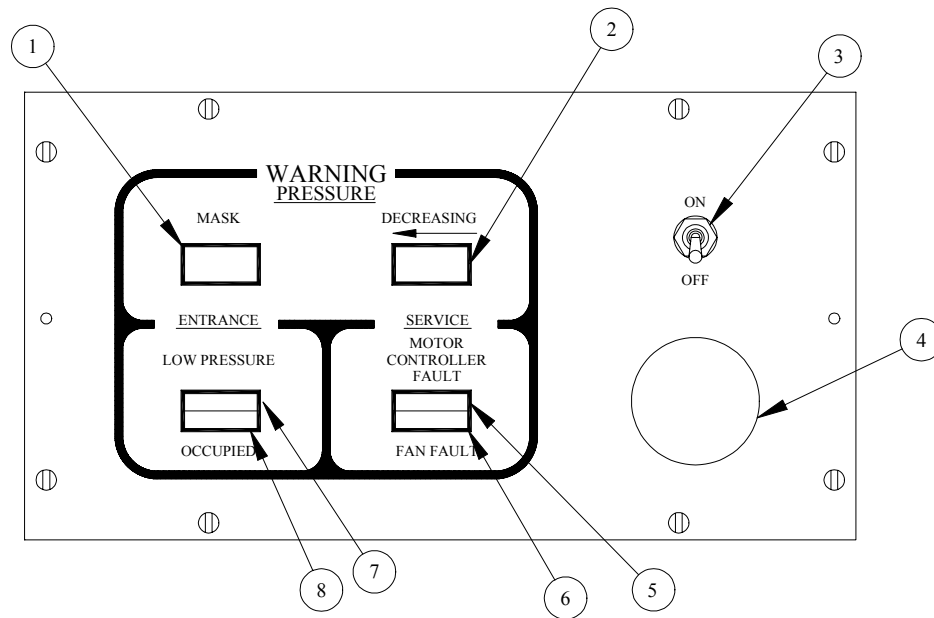


Figure 2-15 GPFU Control Panel Indicators

Table 2-15 GPFU Control Panel Indicators

Item	Control or Indicator	Function
1.	MASK	LED lights up when masks are required.
2.	DECREASING	LED indicates decrease in over-pressure.
3.	ON/OFF	Switch controls power to the unit.
4.	Horn	Sounds alarm when operating over-pressure not achieved
5.	MOTOR CONTROLLER FAULT	LED lights up when motor not operational.
6.	FAN FAULT	LED lights up when fan not operational.
7.	LOW PRESSURE	LED lights up when operating over-pressure not achieved.
8.	OCCUPIED	LED lights up when operating over-pressure is achieved.

2-2.2.6 Miscellaneous Equipment

2-2.2.5.1 Fire Extinguisher

The fire extinguisher is a stand type 2.5-lb dry chemical used on class A, B, and C type fires.

2-2.2.5.2 Smoke Detector

The smoke detector sounds an audible alarm in the event of fire detection.

2-2.2.5.3 Chair

The chair is of the variety that allows the user to raise or lower the height of the seat. There are separate adjustments for raising and lowering the armrest, adjusting the width of the armrest, and a knob to adjust the backrest.

2-2.2.5.4 Safe

The safe is a General Services Administration (GSA) approved security container. The security container has one drawer and is equipped with a digital electronic dial.

2-2.3 Computer and Peripheral Equipment

The Computer and Peripheral equipment consists of the following items:

Workstation	KVM switch
DVD-RAM drive	Netra server
8-mm tape drive	SCSI switch
RHDD	DLT autoloader
LS-120 FDD drive	Laptop computer
2 GB JAZ drive	RAID
PCMCIA drive slots	Plotter
CFPD	Scanner
Keyboard	DesignJet printer
	CD-RW

2-2.3.1 Workstation

The workstation is the main component of the system.

2-2.3.1.1

Workstation Front Panel

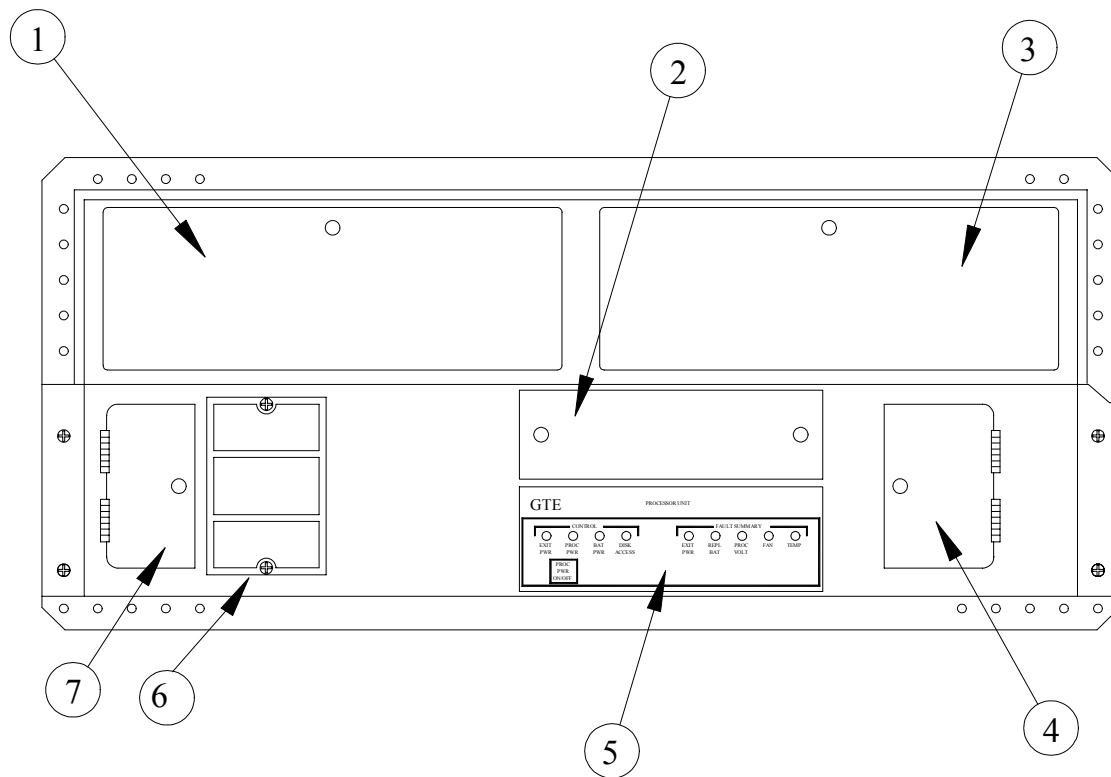


Figure 2-16 Workstation Front Panel (1 of 3)

Table 2-16 Workstation Front Panel (1 of 3)

Item	Workstation and Drive Compartments	Function
1.	DVD-RAM compartment (closed)	Houses DVD-RAM drive.
2.	Hard drive compartment (closed)	Houses 25-GB RHDD.
3.	8-mm tape drive compartment (closed)	Houses 8-mm tape drive.
4.	JAZ drive and PC card reader compartment (closed)	Houses JAZ drive and PC card reader.
5.	Display panel	Contains control and fault LEDs.
6.	Air vent	Houses air filter.
7.	LS 120 drive compartment (closed)	Houses LS-120 drive.

2-2.3.1.1 Workstation Front Panel (Cont'd)

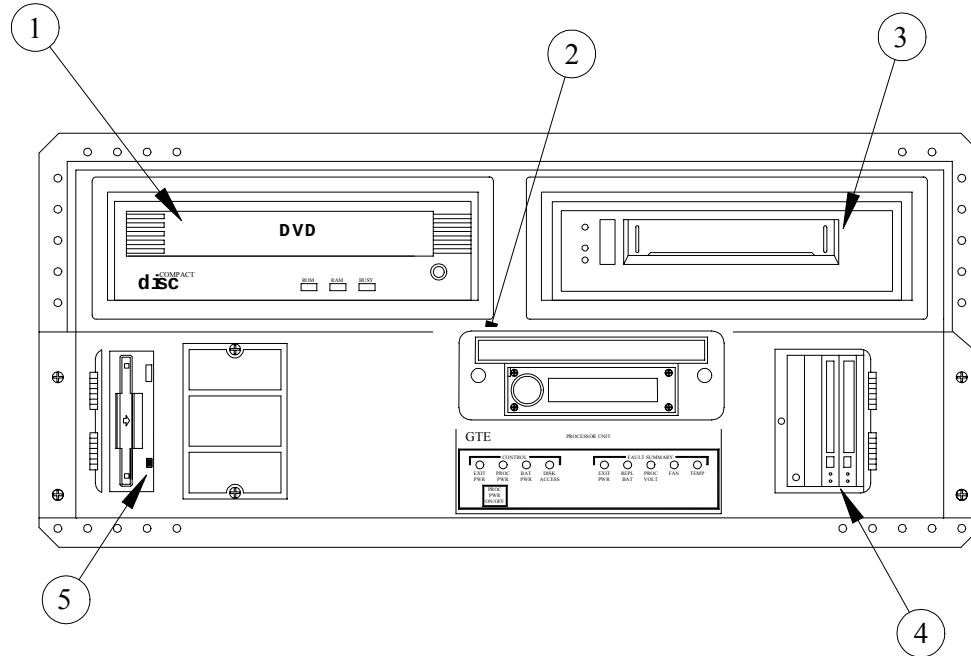


Table 2-16 Workstation Front Panel (2 of 3)

Item	Workstation and Drive Compartments	Function
1.	DVD-RAM compartment (open)	DVD-RAM drive.
2.	RHDD compartment (open)	25-GB RHDD.
3.	8-mm tape drive compartment (open)	8-mm tape drive
4.	JAZ drive and PC card reader compartment (open)	JAZ drive and PC card reader.
5.	LS-120 drive compartment (open)	LS-120 drive

2-2.3.1.1 Workstation Front Panel (Cont'd)

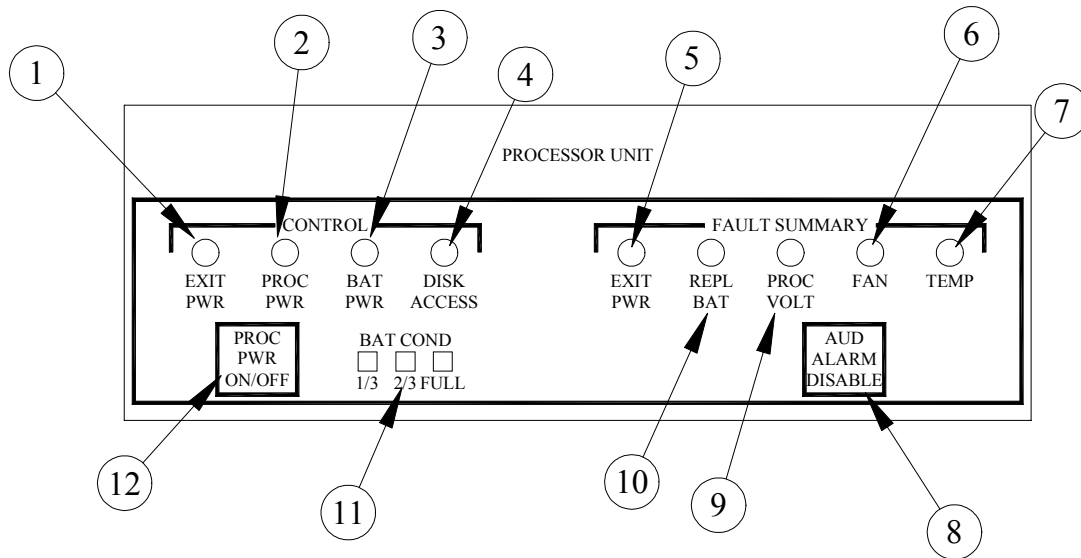


Figure 2-16 Workstation Front Panel (3 of 3)

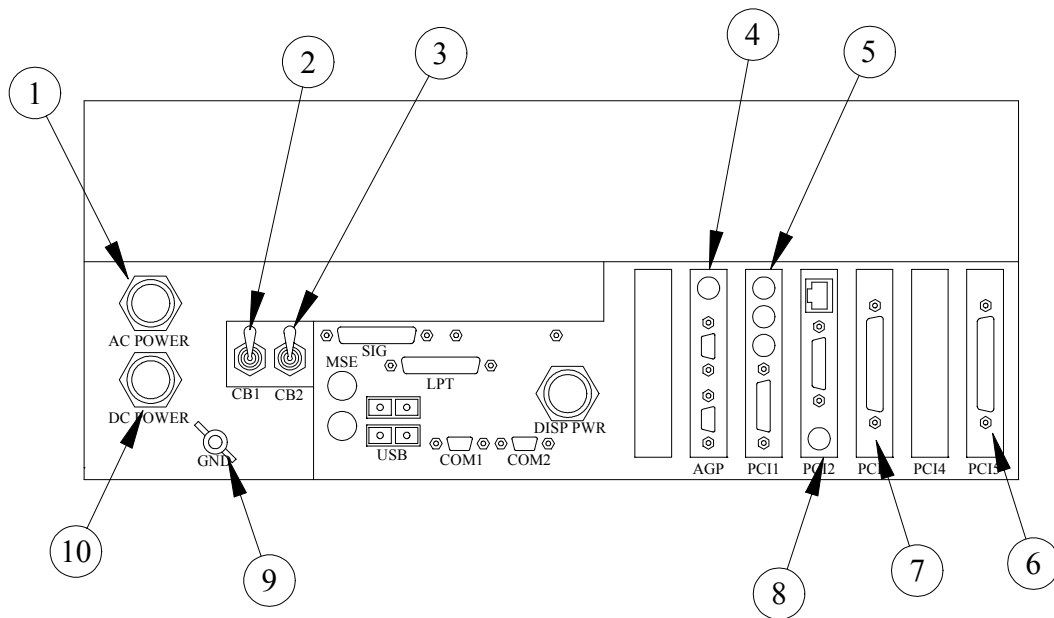
Table 2-16 Workstation Front Panel (3 of 3)

Item	Controls and Indicators	Function
1.	EXT PWR	LED lights green to indicate workstation is receiving power from external source.
2.	PROC PWR	LED lights green to indicate central processing unit (CPU) is receiving power.
3.	BAT PWR	LED lights green to indicate battery is receiving power.
4.	DISK ACCESS	LED lights green to indicate disk access by CPU.
5.	EXT PWR	LED lights red to indicate an external power source failure. Audible alarm is sounded.
6.	FAN	LED lights red to indicate workstation internal fan failure. Audible alarm is sounded.

Table 2-16 Workstation Front Panel (3 of 3) (Cont'd)

Item	Controls and Indicators	Function
7.	TEMP	LED lights red to indicate temperature inside processor unit has exceeded the maximum safe operating temperature. Audible alarm is sounded.
8.	AUDIBLE ALARM DISABLE	Press button to disable audible alarm.
9.	PROC VOLT	LED lights red when voltage to processor unit drops below minimum required for safe operation. Audible alarm is sounded.
10.	REPL BAT	LED lights red to indicate battery needs replacement.
11.	BAT COND	Three LEDs used to indicate the charge condition of the battery (1/3, 2/3, Full).
12.	PROC PWR ON/OFF	Press button to turn processor unit on or off.

2-2.3.1.2 Workstation Rear Panel

**Figure 2-17 Workstation Rear Panel Controls and Connectors (1 of 2)****Table 2-17 Workstation Rear Panel Controls and Connectors (1 of 2)**

Item	Controls and Indicators	Function
1.	AC POWER	Ac power source input connection with cable W312.
2.	CB1 switch	Circuit breaker switch 1 controls Ac power.
3.	CB2 switch	Circuit breaker switch 2 controls Dc power (Not used in this configuration.).
4.	Video connector; 15-pin D connector	Connect the color monitor to the workstation with cable W127.
5.	Audio port	Used to connect the workstation to speakers/head phones.
6.	SCSI 68-pin connector (PCI5)	Connect the workstation to the SCSI chain devices (CD-RW and scanner) with cable W121.
7.	SCSI 68-pin connector (PCI3)	Connect the workstation to the RAID with cable W116.
8.	Network port	Connects the workstation NIC card to a network via the Ethernet switch with cable W100.
9.	GND	Used to ground the workstation.
10.	DC POWER	Dc power source input connection.

2-2.3.1.2 Workstation Rear Panel (Cont'd)

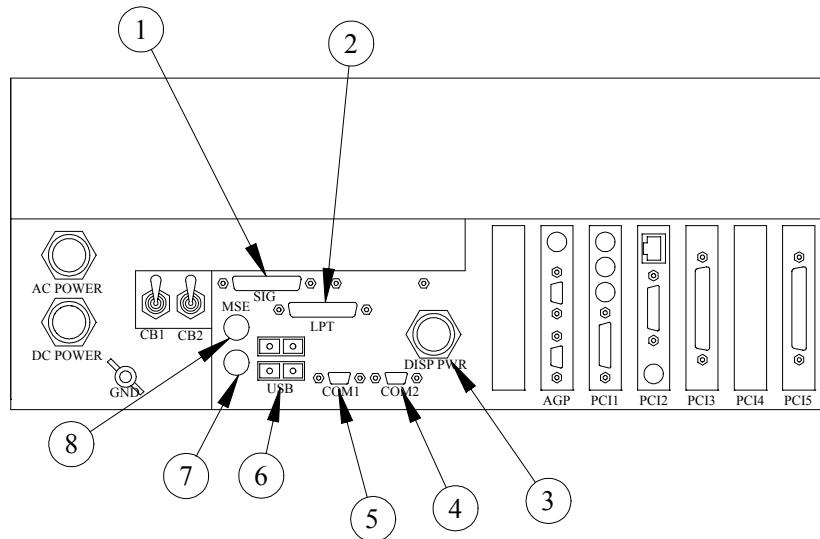


Figure 2-17 Workstation Rear Panel Controls and Connectors (2 of 2)

Table 2-17 Workstation Rear Panel Controls and Connectors (2 of 2)

Item	Controls and Indicators	Function
1.	Signal port	Used to connect to signal/telephone devices.
2.	LPT	Parallel port connection.
3.	DISP PWR	Not used in this application.
4.	COM 2	9-pin male serial port.
5.	COM 1	9-pin male serial port (cable W147).
6.	USB	USB port connection.
7.	KBD	Keyboard port connection.
8.	MSE	Mouse port connection.

2-2.3.2 DVD-RAM Drive

2-2.3.2.1 DVD-RAM Front Panel Controls and Indicators

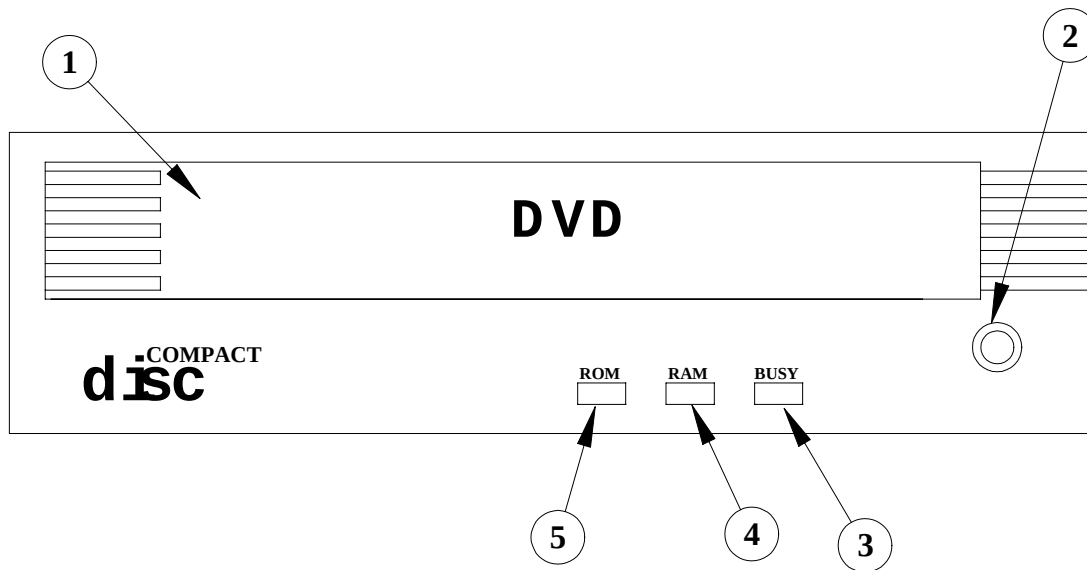


Figure 2-18 DVD-RAM Drive Front Panel Controls and Indicators

Table 2-18 DVD-RAM Drive Front Panel Controls and Indicators

Item	Controls and Indicators	Function
1.	Disk tray	Receptacle for a DVD-RAM cartridge, DVD-ROM disk, or CD.
2.	Eject button	Used to eject or close the disk tray.
3.	BUSY indicator	Lights up when data are being read.
4.	RAM indicator	Lights up when a DVD-RAM disk is in the drive.
5.	ROM indicator	Lights up when a DVD-ROM, DVD-R, or CD-ROM/R/RW disk is in the drive.

2-2.3.3 8-mm Tape Drive

2-2.3.3.1 8-mm Tape Drive Front Panel

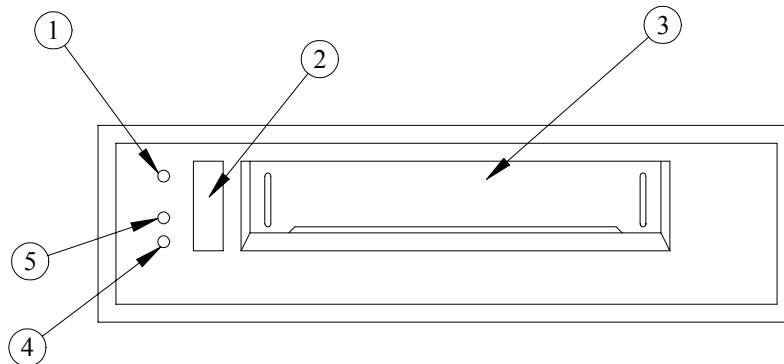


Figure 2-19 8-mm Tape Drive Front Panel Controls and Indicators

Table 2-19 8-mm Tape Drive Front Panel Controls and Indicators

Item	Controls and Indicators	Function
1.	Amber (warnings) LED	Flashes amber to indicate whether an error condition exists or tape drive needs to be cleaned. See Note below this table.
2.	Unload button	Rewinds and then ejects the tape. See Note below this table.
3.	Tape access door	Tape or cleaning cartridge insert door.
4.	Green LED	When lit green a tape is loaded, flashes green to indicate tape motion. See Note below this table.
5.	Green/Amber (activity/compression) LED	Lights green or amber to indicate SCSI activity. See Note below this table.

2-2.3.3.1 8-mm Tape Drive Front Panel (Cont'd)

Description	Amber (Top)	Green/ Amber (Middle) ¹	Green (Bottom)
Self-test Status			
In progress; no tape in drive	On	Off	On
Successful; no tape in drive	Off	Off	Off
In progress; tape in drive	Off	Off	Slow/Fast
Successful; tape in drive	Off	Off	On
Hardware error or detection failure	Fast	Off	Off
Operational Status			
No tape loaded	Off	Off	Off
Tape loaded, drive ready	Off	Off	On
SCSI or tape activity	Off	Blinking	Slow
High-speed tape motion	Off	Blinking/Off	Fast
Error	Slow	Off	Off
Unload in progress	Fast	Off	Slow
Cleaning Status			
Time to clean	Fast	Off	Fast
Cleaning in progress	Off/Fast	Off	Slow

NOTE

1. When the middle LED is green, the drive is in uncompressed mode. When it is amber, the drive is in compressed mode.
2. A fast flash is approximately four flashes per second.
3. The blinking rate depends on the SCSI activity.
4. A slow flash is approximately one flash per second.

2-2.3.4 RHDD

2-2.3.4.1 RHDD Front Panel

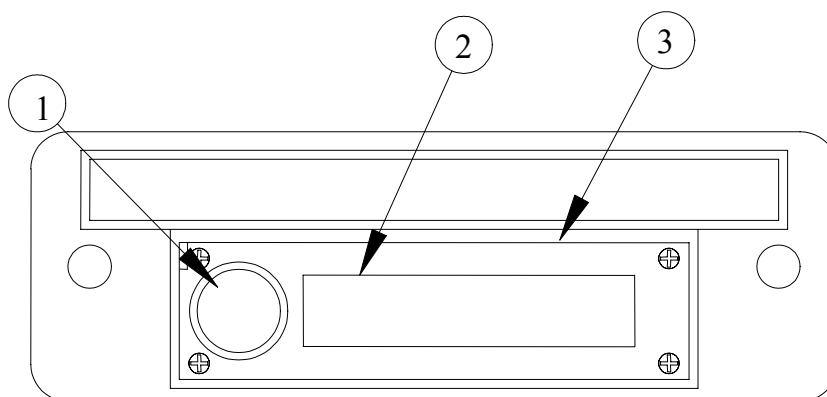


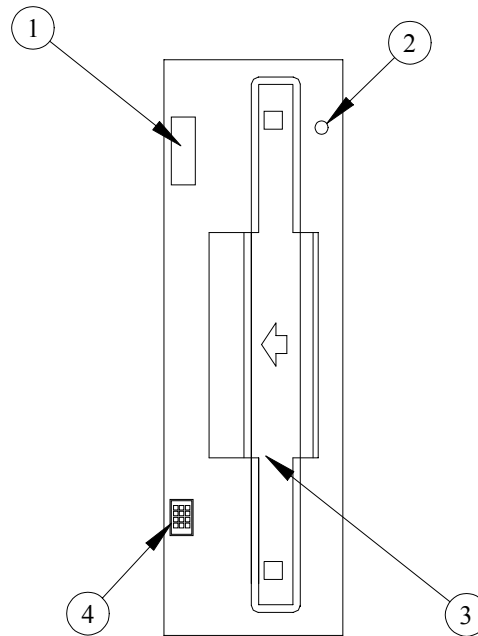
Figure 2-20 RHDD Front Panel

Table 2-20 RHDD Front Panel

Item	Connections	Function
1.	Release knob	Used to allow removal of hard drive.
2.	Handle	Used to remove hard drive for storage or replacement.
3.	RHDD	Houses internal connections for RHDD.

2-2.3.5 LS-120 Drive

2-2.3.5.1 LS-120 Drive Front Panel Controls and Indicators

**Figure 2-21 LS-120 Drive Front Panel Controls and Indicators****Table 2-21 LS-120 Drive Front Panel Controls and Indicators**

Item	Controls and Indicators	Function
1.	Busy indicator	Lights when a command from host is executed (including read/write operations).
2.	Emergency eject hole	Used to manually eject a disk by inserting a straightened paper clip, pin, or a metal item of similar dimension.
3.	Disk slot	Opening for inserting a disk.
4.	Eject button	Ejects disk.

2-2.3.6 JAZ Drive

2-2.3.6.1 JAZ Drive Controls and Indicators

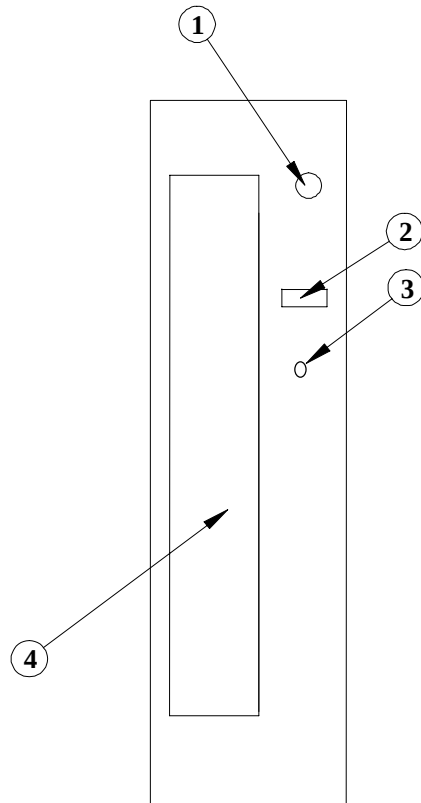
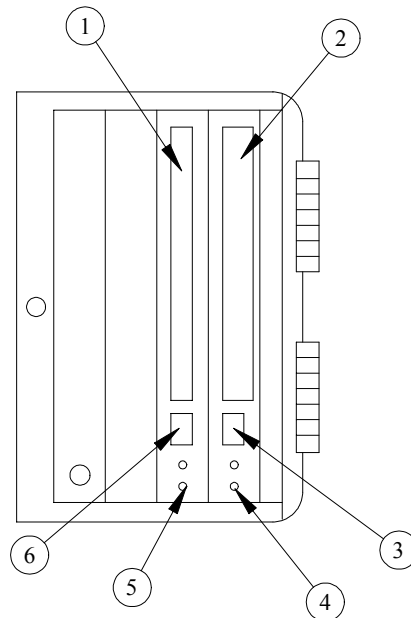


Figure 2-22 JAZ Drive Controls and Indicators

Table 2-22 JAZ Drive Controls and Indicators

Item	Controls and Indicators	Function
1.	Disk eject button	Used to automatically eject the JAZ disk from the JAZ drive.
2.	Drive status light	Flashes as the JAZ disk spins up, and glows steadily while it runs. When the light goes out, the JAZ drive is ready to use.
3.	Emergency disk ejection hole	Used to manually eject the JAZ disk by inserting a narrow object, such as a paper clip or thin metal file into the hole.
4.	JAZ disk drive opening	Used to insert the JAZ disk into the JAZ drive.

2-2.3.7 PCMCIA Card Drive (Not used in this configuration.)

**Figure 2-23 PCMCIA Front Controls and Indicators****Table 2-23 PCMCIA Front controls and Indicators**

Item	Connections	Function
1.	Slot 1	Used for narrow PCMCIA card.
2.	Slot 2	Used for wide PCMCIA card.
3.	Eject button slot 2	Used to eject card from slot.
4.	Slot 2 LED	LED lights to show card activity.
5.	Eject button slot 1	Used to eject card from slot.
6.	Slot 1 LED	LED lights to show card activity.

2-2.3.8 Workstation Keyboard

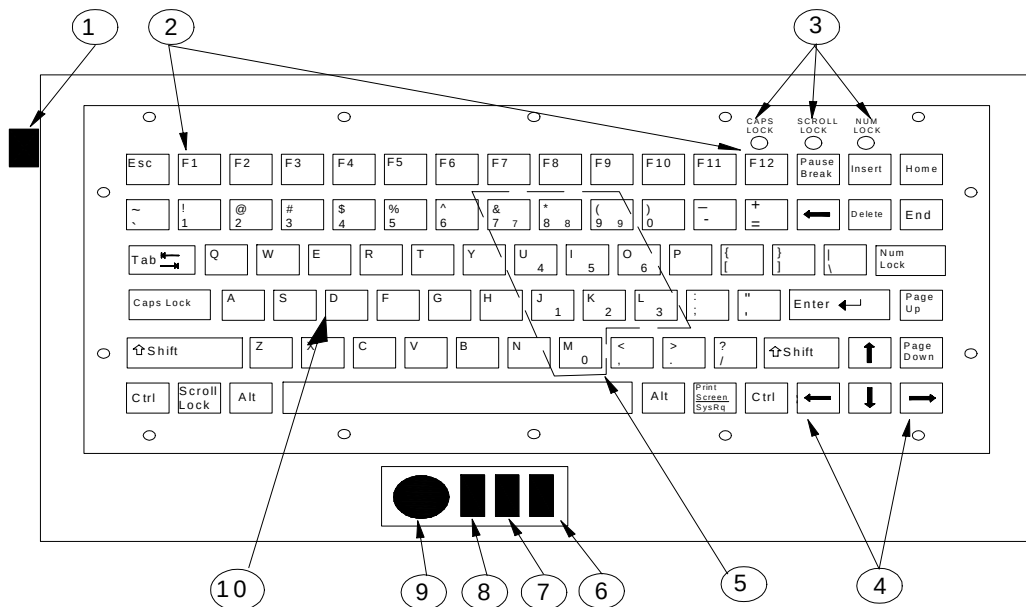


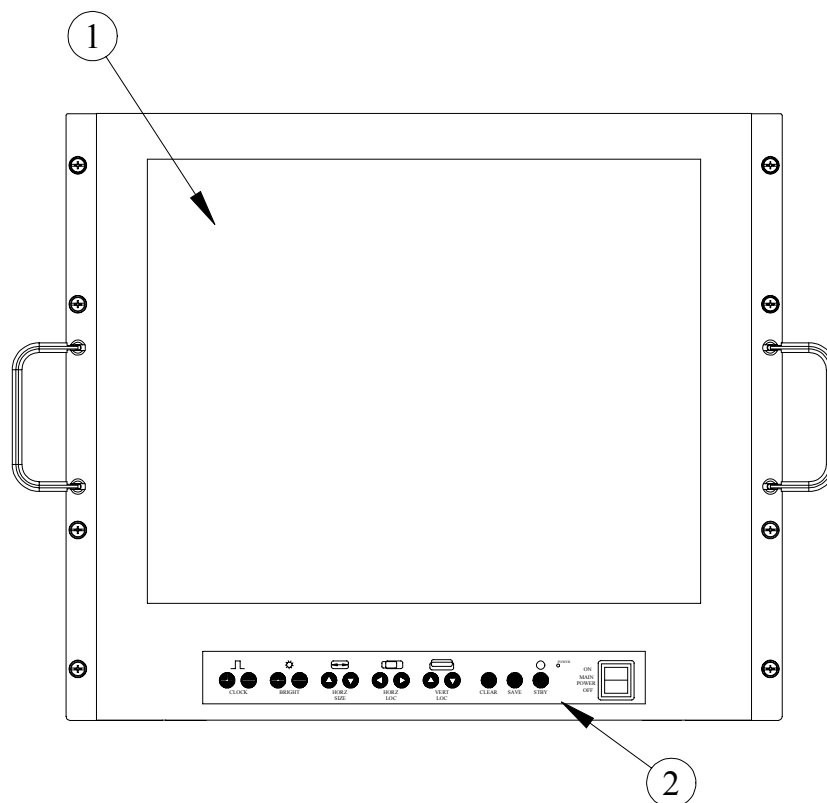
Figure 2-24 Workstation Keyboard Controls

Table 2-24 Workstation Keyboard Controls

Item	Control, Indicator, or Connector	Function
1.	Keyboard connector	Connects to keyboard cable.
2.	Function keys (F1 to F12)	Software dependent.
3.	CAPS LOCK, SCROLL LOCK, and NUM LOCK Indicator Lights	These indicator lights are lit when the labeled function is activated.
4.	Arrow/Cursor keys	When pressed, moves cursor in direction indicated by arrow.
5.	Numeric key pad	When "Num Lock" is activated, used to input numeric data.
6.	Right Mouse Button	MENU – Used to open menus or choose options from menus.
7.	Middle Mouse Button	ADJUST – Used to extend or reduce selected objects.
8.	Left Mouse Button (LMB)	SELECT – Used to highlight and manipulate objects, activate buttons and choose settings.
9.	Roller Ball	Provides quick and easy movement of the cursor on the monitor screen.
10.	Standard QWERTY keyboard	Comprise the characters of a standard typewriter. Used for data input.

2-2.3.9 Color Flat Panel Display

2-2.3.9.1 Color Flat Panel Display Front Panel

**Figure 2-25 Color Flat Panel Display Front Panel Controls and Indicators (1 of 2)****Table 2-25 Color Flat Panel Display Front Panel Controls and Indicators (1 of 2)**

Item	Controls and Indicators	Function
1.	Color flat panel display	20-in active matrix color CFPD.
2.	Front panel controls	Front panel controls allow operator to control image positions, clarity and back light operation, and to store these settings, or to recall previously saved or factory saved settings.

2-2.3.9.1 Color Flat Panel Display Front Panel (Cont'd)

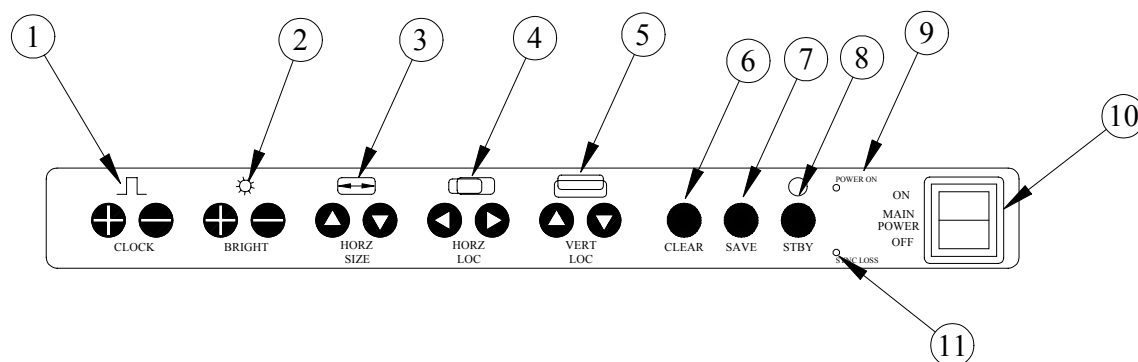
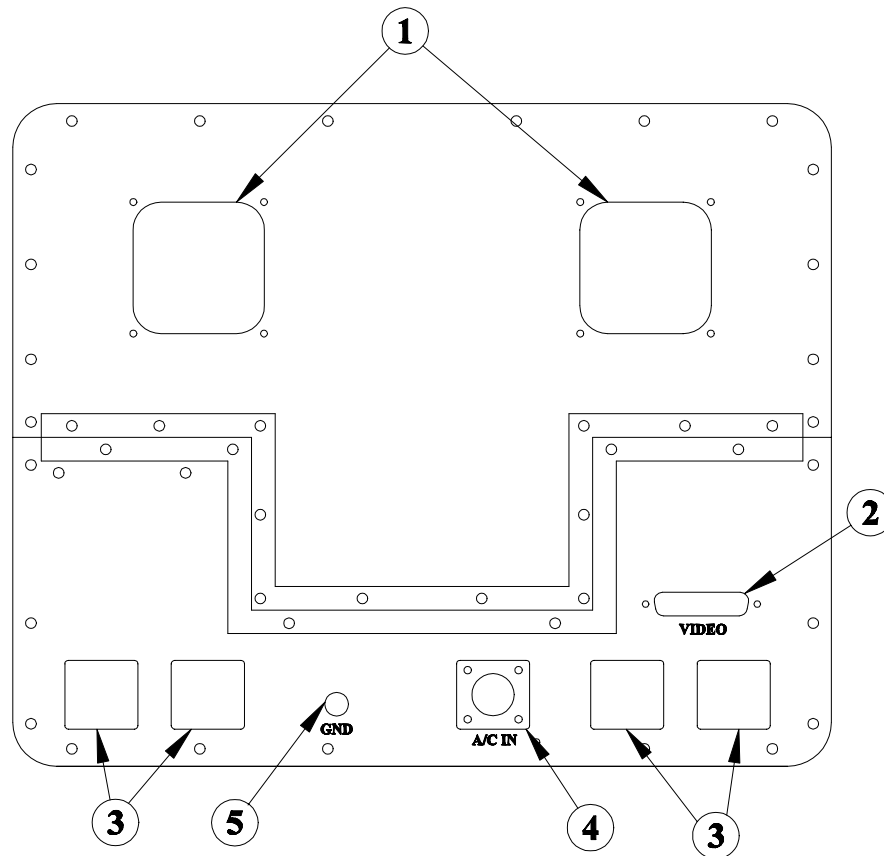


Figure 2-25 Color Flat Panel Display Front Panel Controls and Indicators (2 of 2)

Table 2-25 Color Flat Panel Display Front Panel Controls and Indicators (2 of 2)

Item	Controls and Indicators	Function
1.	Clock	Sets clock speed.
2.	BRIGHT (button)	Used to adjust the intensity of the display. “Plus (+)” increases brightness and “minus (-)” decreases brightness.
3.	HORZ SIZE (button)	Adjusts Horizontal size.
4.	HORZ LOC (button)	Centers image horizontally on CFPD.
5.	VERT LOC (button)	Centers image vertically on CFPD.
6.	CLEAR (button)	Used to clear previously saved user configurations.
7.	SAVE (button)	Used to save user configurations.
8.	STBY (button)	Returns CFPD from power saver mode.
9.	POWER ON (LED)	Indicates power status (green = ON).
10.	MAIN POWER (switch)	Used to turn power ON or OFF.
11.	SYNC LOSS (LED)	Orange indicates that the CFPD has loss of a synch signal into the video/sync connector.

2-2.3.9.2 Color Flat Panel Display Rear Panel

**Figure 2-26 Color Flat Panel Display Rear Panel Controls and Connectors****Table 2-26 Color Flat Panel Display Rear Panel Controls and Connectors**

Item	Controls and Connectors	Function
1.	Exhaust fans	Draws hot air from the unit for chassis cooling.
2.	Video connector	Used to connect a removable video cable.
3.	Filters non-recoverable	Filters air.
4.	Ac IN Connector	Used to connect Ac power to the CFPD.
5.	Chassis Ground	Used to ground the CFPD chassis.

2-2.3.10 KVM Switch

2-2.3.10.1 KVM Switch Front Controls and Indicators

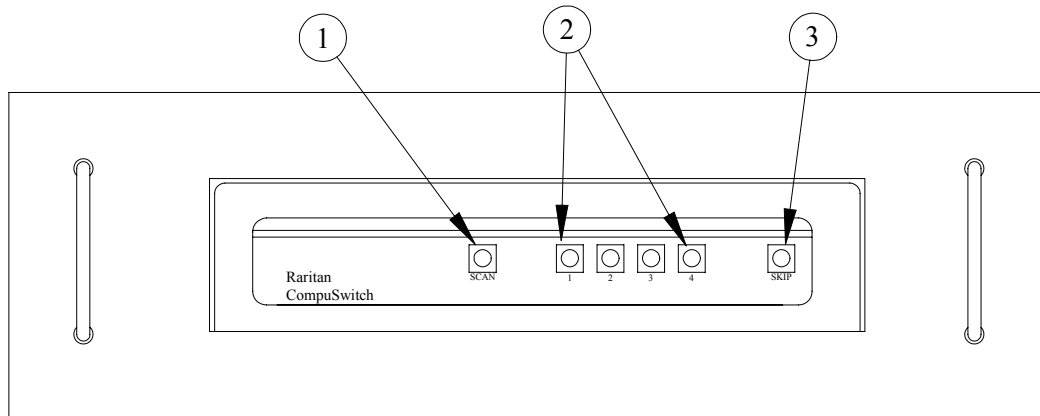
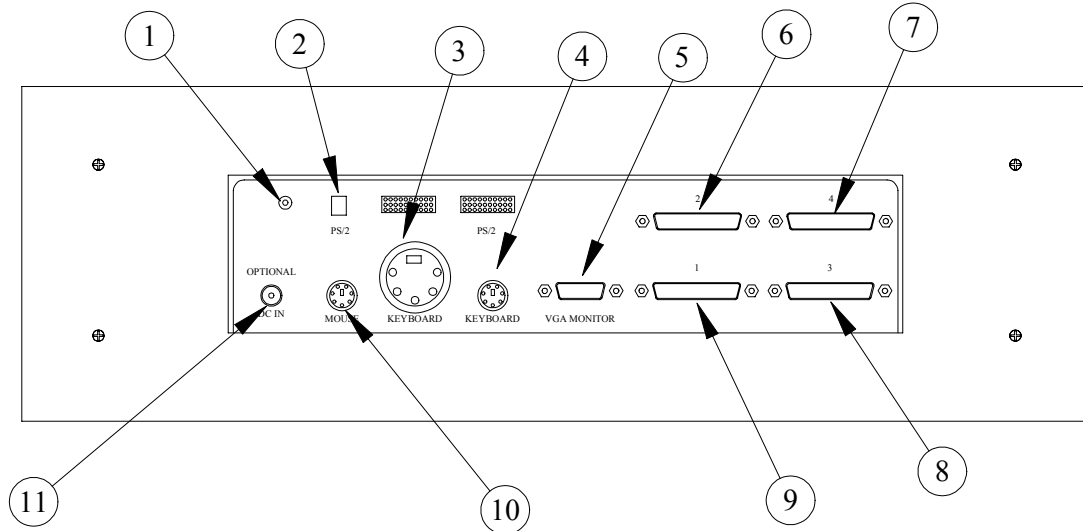


Figure 2-27 KVM Switch Front Controls and Indicators

Table 2-27 KVM Switch Front Controls and Indicators

Item	Connections	Function
1.	SCAN LED	When active, allows the viewing of each active channel for a set interval (scan rate).
2.	1 through 4 LEDs	Lights to indicate which computer is currently in use.
3.	SKIP LED	When SKIP is activated, the light above the SKIP button will be ON and only active channels will be selected.

2-2.3.10.2 KVM Switch Rear Connections

**Figure 2-28 KVM Switch Rear Connections****Table 2-28 KVM Switch Rear Connections**

Item	Connections	Function
1.	Power LED	Indicates power status.
2.	PS/2	Mouse for PS/2 connection
3.	KEYBOARD	Alternate keyboard connection.
4.	KEYBOARD	Standard keyboard connection.
5.	VGA MONITOR	Video cable connection.
6.	SCSI 2	Cable connected to the laptop computer.
7.	SCSI 4	Not used in this configuration.
8.	SCSI 3	Not used in this configuration.
9.	SCSI 1	Cable connected to the workstation.
10.	MOUSE	Mouse connection.
11.	Dc IN	Connection for Dc power cable.

2-2.3.11 Netra Server

2-2.3.11.1 Netra Server Front View

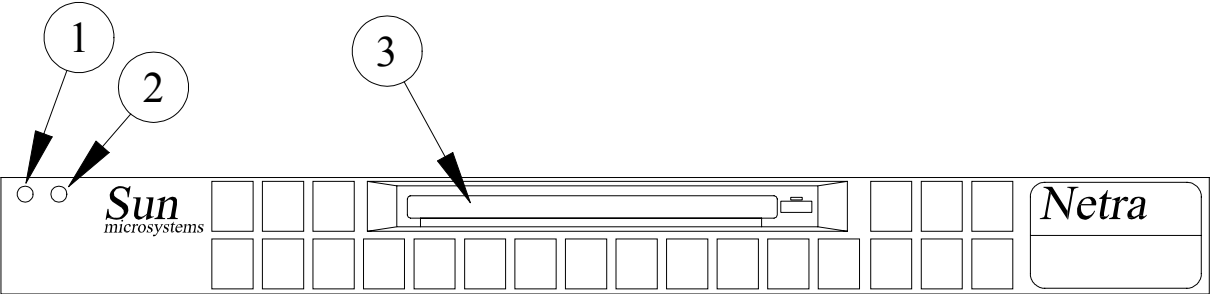
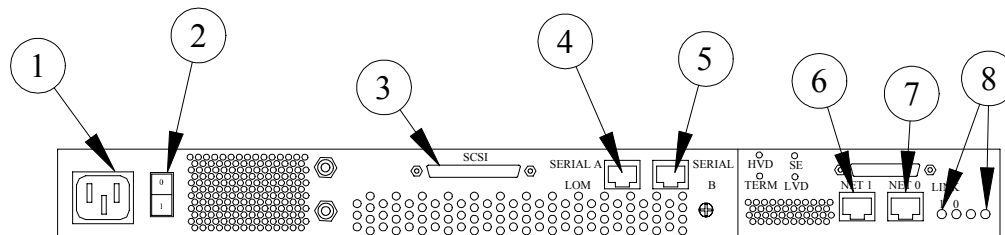


Figure 2-29 Netra Server Front View Controls and Indicators

Table 2-29 Netra Server Front View Controls and Indicators

Item	Controls and Indicators	Function
1.	LED	Lights to indicate that the system is operating.
2.	LED	Lights to indicate a malfunction in the system.
3.	CD-ROM	CD-ROM disk bay.

2-2.3.11.2 Netra Server Back View

**Figure 2-30 Netra Server Back View Connectors and Indicators****Table 2-30 Netra Server Back View Connectors and Indicators**

Item	Controls and Indicators	Function
1.	Ac power input	Used to attach power cable.
2.	Power switch	Used to turn power ON or OFF.
3.	SCSI (LVD) connector	Not used in this configuration.
4.	Serial port A	Interface serial port for Lights Out Management.
5.	Serial port B	Serial interface.
6.	Net 1	Not used in this configuration.
7.	Net 0	RJ45 connection port used to connect to the Ethernet switch.
8.	Active Link LED indicators	LEDs light green when Netra server is active.

2-2.3.12 SCSI SWITCH

2-2.3.12.1 SCSI Switch Front Controls and Indicators

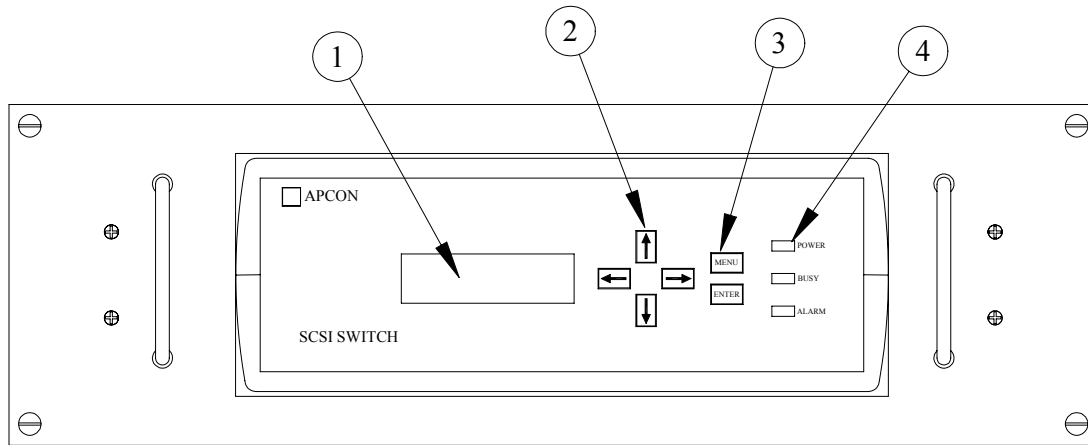
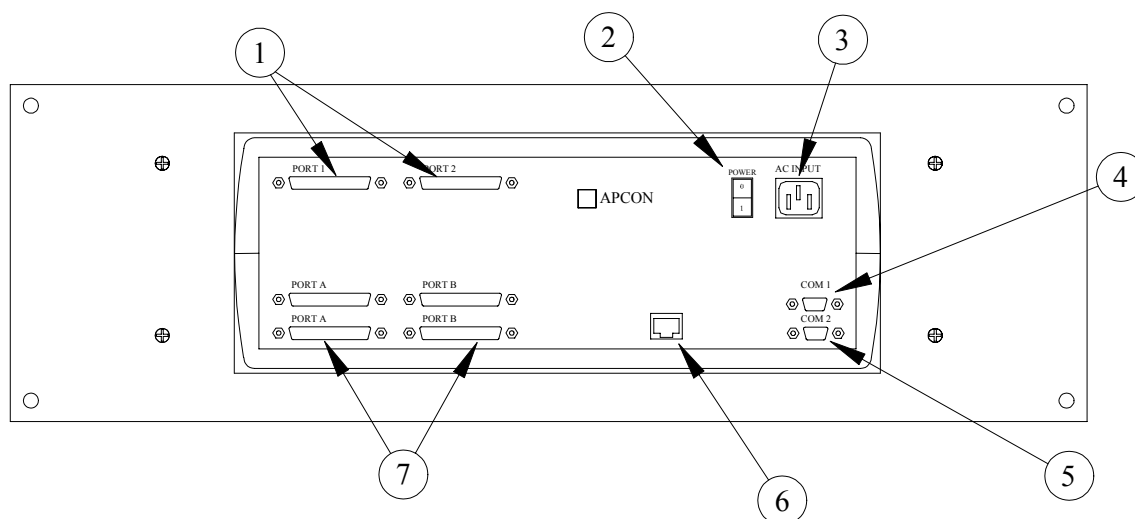


Figure 2-31 SCSI Switch Front Controls and Indicators

Table 2-31 SCSI Switch Front Controls and Indicators

Item	Controls and Indicators	Function
1.	LCD Display	Used to display menu items for setting ports, displaying ports, displaying activity, setting termination, etc.
2.	Directional keys	Used to negotiate through the menu.
3.	MENU and ENTER buttons	Used to select and accept menu items.
4.	Operational LEDs	LEDs indicators for status: Power, Busy and Alarm.

2-2.3.12.2 SCSI Switch Rear Connections

**Figure 2-32 SCSI Switch Rear Connections****Table 2-32 SCSI Switch Rear Connections**

Item	Connections	Function
1.	SCSI connectors	LVD and HVD differential connections.
2.	Power switch	Used to turn power On and Off.
3.	Ac power connection	Receives Ac power cable.
4.	Com 1	Not used in this application
5.	Com 2	Not used in this application
6.	RJ45	Not used in this application.
7.	SCSI connectors	Used to connect to the SCSI boosters.

2-2.3.13 DLT Autoloader

2-2.3.13.1 DLT Autoloader Front View

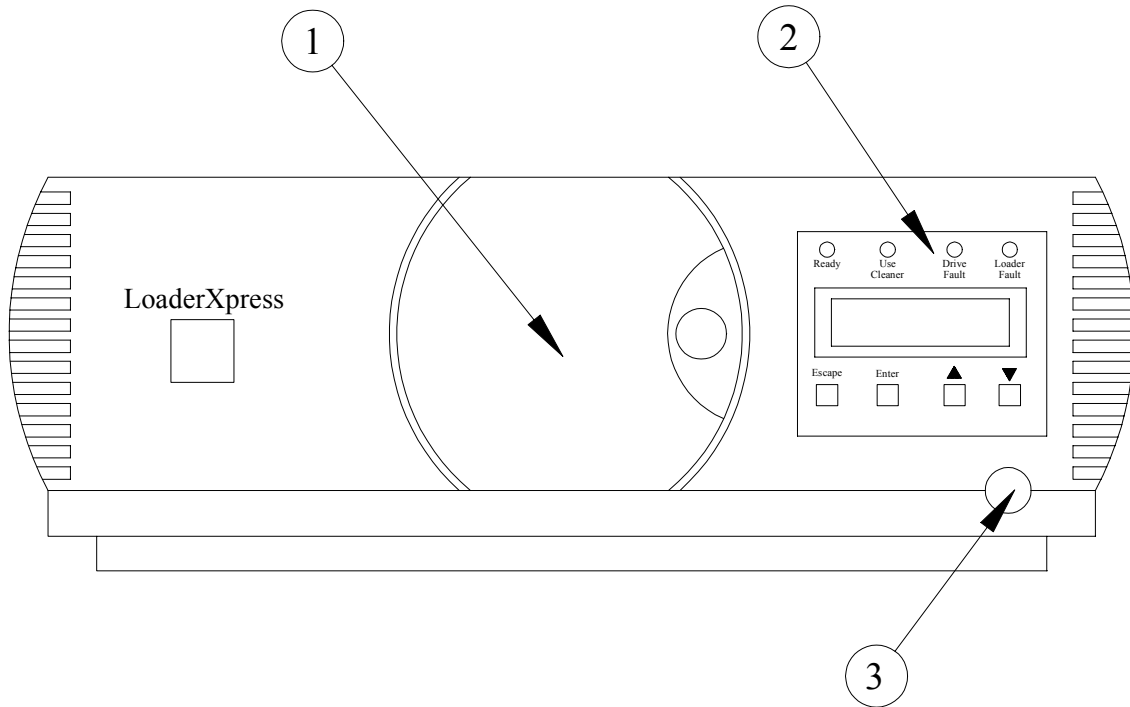
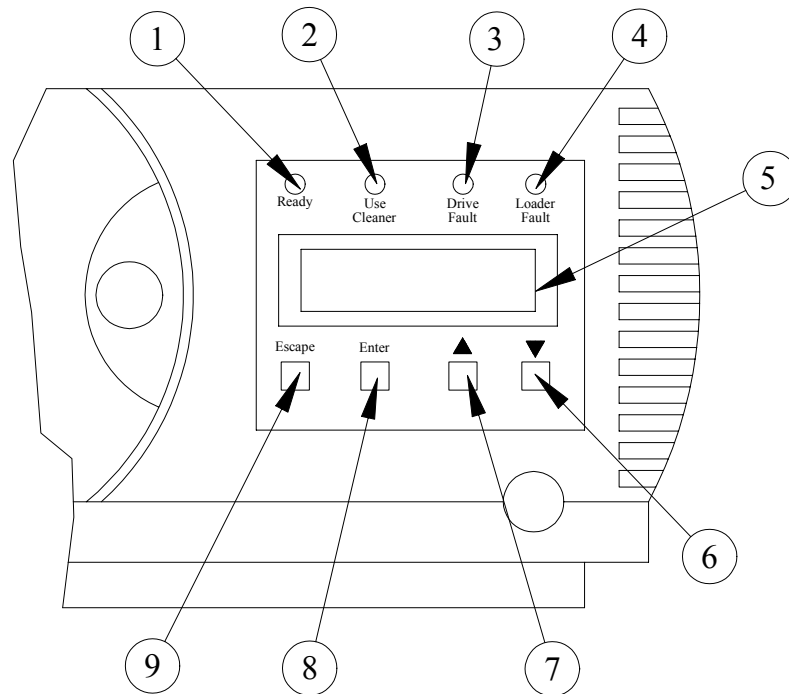


Figure 2-33 DLT Autoloader Front View

Table 2-33 DLT Autoloader Front View

Item	Controls and Indicators	Function
1.	Magazine door	Provides access for insertion and removal of the tape magazine.
2.	Control panel	4-line by 20-character backlit LCD, four LED indicators, and four buttons.
3.	Power switch	Ac power switch.

2-2.3.13.2 DLT Autoloader Panel Controls and Indicators

**Figure 2-34 DLT Autoloader Panel Controls and Indicators****Table 2-34 DLT Autoloader Panel Controls and Indicators**

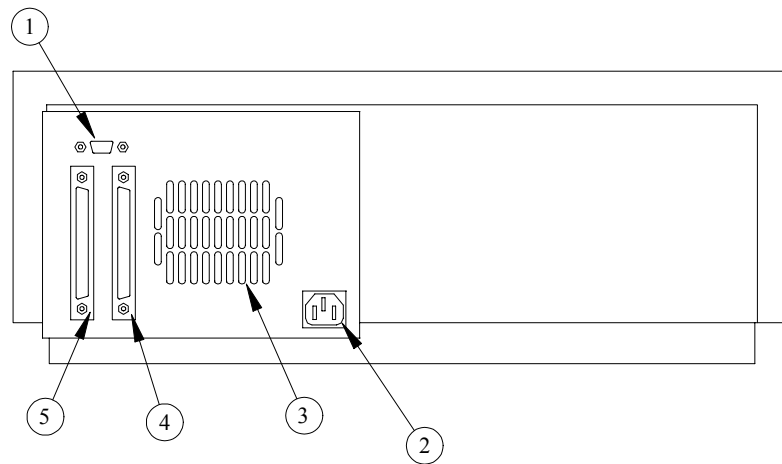
Item	Controls and Indicators	Function
1.	Ready LED	Ready LED (green) is illuminated when the tape library is ready to accept commands either from the control panel or from the host computer. The ready LED goes out when in the menu mode.
2.	Use Cleaner LED	Use cleaner LED (yellow) indicates that the drive requires cleaning.
3.	Drive Fault LED	Drive fault LED (red) illuminates when there is a problem in the system. Fault screen appears on the LCD.
4.	Loader Fault LED	Loader fault LED (red) illuminates when there is a problem in the system. Fault screen appears on the LCD.
5.	LCD display	Displays messages.
6.	Scroll down	Enables the user to scroll down through the options on a menu.

2-2.3.13.2 DLT Autoloader Panel Controls and Indicators (Cont'd)

Table 2-34 DLT Autoloader Panel Controls and Indicators (Cont'd)

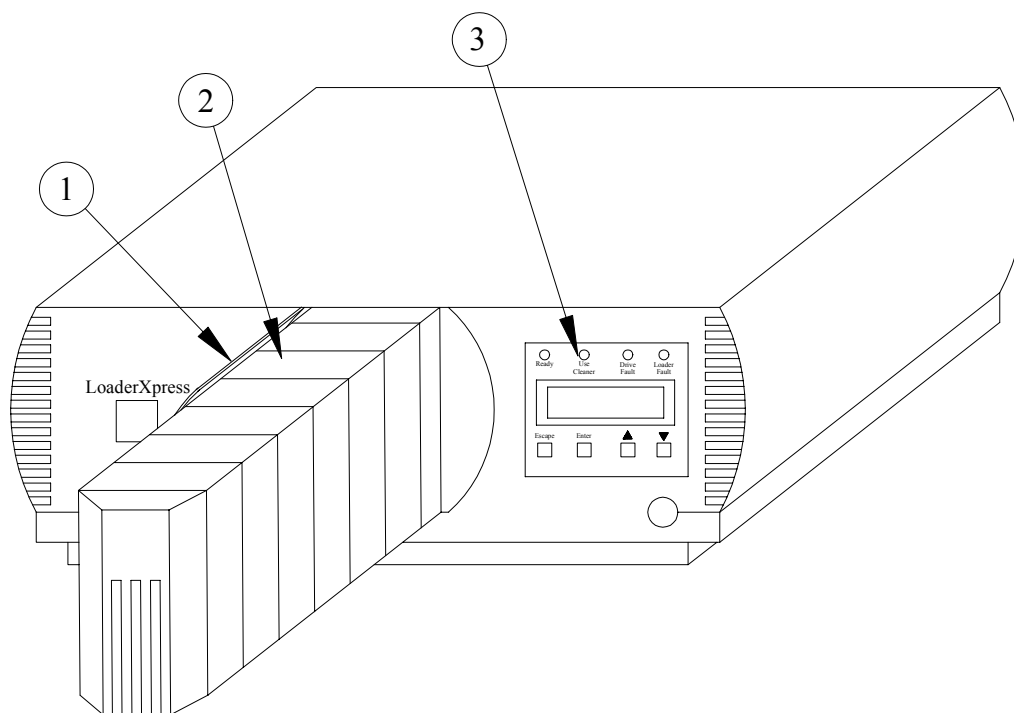
Item	Controls and Indicators	Function
7.	Scroll up	Enables the user to scroll up through the options on a menu.
8.	Enter button`	1. Enters menu mode. 2. Selects the desired option from an appropriate menu.
9.	Escape button	1. Rejects currently displayed choice. 2. Aborts control panel operation in progress. 3. Exits to next higher menu level. 4. Exits menu mode to default screen.

2-2.3.13.3 DLT Autoloader Rear View Connections

**Figure 2-35 DLT Autoloader Rear View Connections****Table 2-35 DLT Autoloader Rear View Connections**

Item	Connections	Function
1.	Flash connector	Serial port connection.
2.	Ac input connector	Connection point for standard grounding Ac cable.
3.	Fan	Provides ventilation to the DLT Autoloader.
4.	SCSI cable connection	SCSI II connection either terminated or daisy-chained to additional device.
5.	SCSI terminator connection	SCSI II connecting device to workstation.

2-2.3.13.4 DLT Autoloader Magazine

**Figure 2-36 DLT Autoloader Magazine Bay****Table 2-36 DLT Autoloader Magazine Bay**

Item	Connections	Function
1.	Magazine door (open)	Allows access to cartridge unit.
2.	Cartridge unit	Receptacle for data tape cartridges.
3.	Control panel	LCD shows current status.

2-2.3.14 CD-RW

2-2.3.14.1 CD-RW Front Panel

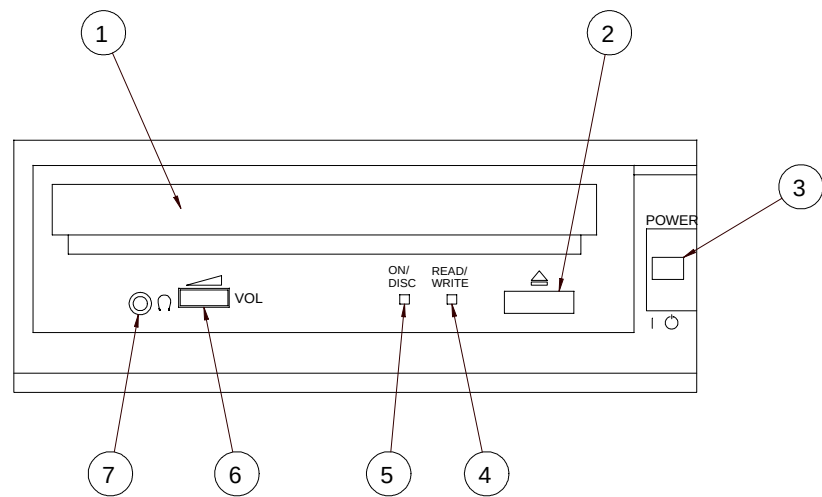
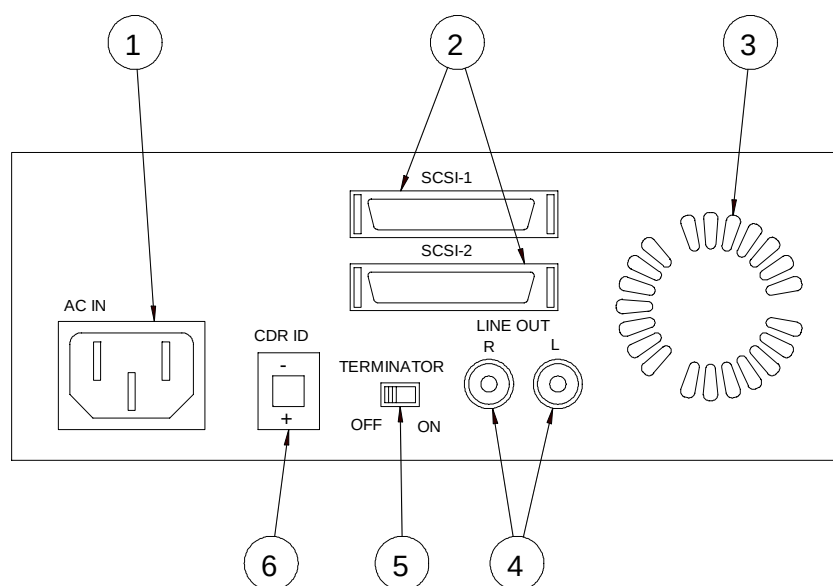


Figure 2-37 CD-RW Front Panel Controls, Indicators and Connectors

Table 2-37 CD-RW Front Panel Controls, Indicators and Connectors

Item	Controls, Connectors and Indicators	Function
1.	CD lid	Opening through which the CD is inserted and ejected.
2.	EJECT button	Pressing this button starts the CD unloading and ejection process. (The CD cannot be removed if the SCSI command prohibits the eject operation).
3.	POWER switch	Turns Rewriter OFF/ON.
4.	READ/WRITE LED	Lights up in green when data is being read, and flashes when data is being accessed. Also lights up in orange when data is being recorded on a disk.
5.	ON/DISC LED	Lights up orange when the recorder is powered on, and lights up green when the recorder contains a disk.
6.	VOL control	Adjusts the volume level of the headphone output. Rotating the control clockwise will increase the volume level.
7.	Headphone jack	This stereo mini-jack allows you to connect headphones and listen to audio.

2-2.3.14.2 CD-RW Rear Panel

**Figure 2-38 CD-RW Rear Panel Controls, Indicators and Connectors****Table 2-38 CD-RW Rear Panel Controls, Indicators and Connectors**

Item	Controls, Connectors and Indicators	Function
1.	AC IN connector	Accepts Ac power cord.
2.	SCSI ports	Connection points for SCSI cable connection.
3.	Fan	The fan provides air circulation through the CD recording system.
4.	LINEOUT R/L connectors	Not used.
5.	TERMINATOR ON/OFF switch	Used to set termination (set to OFF).
6.	CDR ID	Used to set the CD recording system's SCSI device ID from 0 to 7.

2-2.3.15 Laptop Computer

2-2.3.15.1 Laptop Computer Front Panel

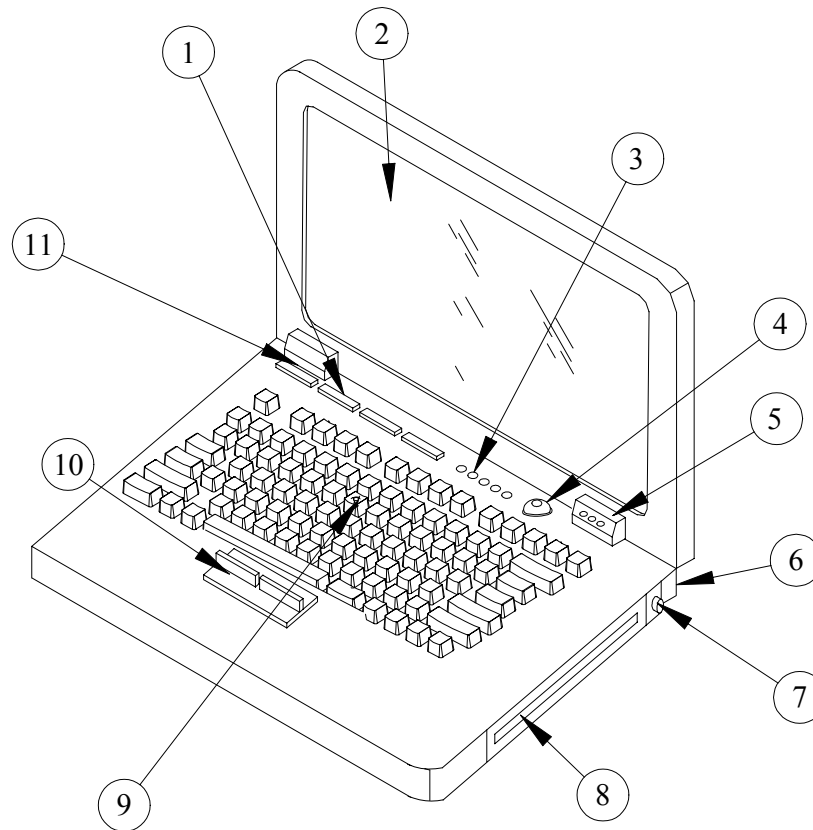


Figure 2-39 Laptop Computer Front View

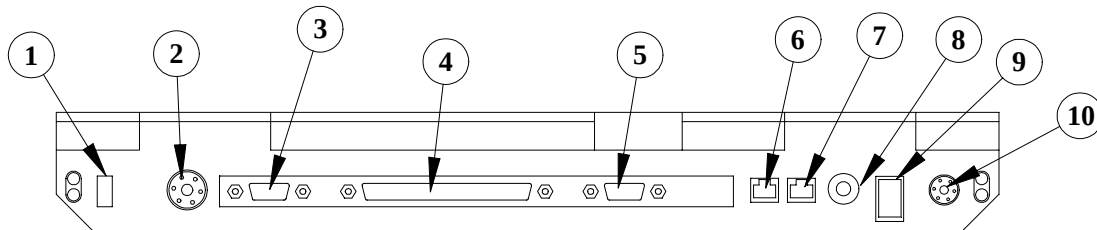
Table 2-39 Laptop Computer Front View Controls and Indicators

Item	Controls and Indicators	Function
1.	Volume and mute buttons	Controls speaker volume. Pressing the Volume Up or Volume Down button turns the sound on and controls its volume. Volume indicator icon appears on LCD screen.
2.	LCD display	13.3 in color flat panel display.

Table 2-39 Laptop Computer Front View Controls and Indicators (Cont'd)

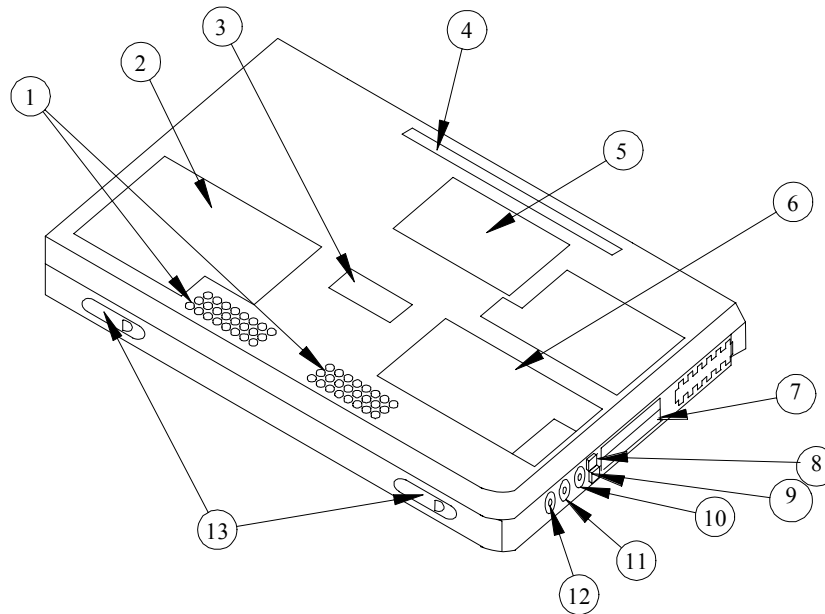
Item	Controls and Indicators	Function
3.	System status indicators	LEDs (green or orange) used to indicate current computer status.
4.	Power switch	Sliding switch, used to switch power ON or OFF.
5.	Battery, standby mode, and storage bay status indicators	LEDs used to indicate current status of battery, computer standby (sleep) mode, and storage bay use.
6.	Bay latch	Locks removable drive in bay.
7.	Eject button	Releases device from storage bay.
		NOTE Drives may only be swapped when computer is turned OFF.
8.	Ultrabay	Storage bay for removable devices such as a DVD drive or a 1.44 MB FDD drive.
9.	TrackPoint pointing stick	Used with the TrackPoint buttons to move the cursor on the display and perform normal computer operations.
10.	TrackPoint click buttons (left click button, center click button, right click button)	Work in conjunction with the pointing stick (Item 9) to provide functions similar to those of the mouse.
11.	ThinkPad button	Provides access to online manual and Help assistance.

2-2.3.15.2 Laptop Computer Rear View

**Figure 2-40 Laptop Computer Rear View Controls and Indicators****Table 2-40 Laptop Computer Rear View Controls and Indicators**

Item	Controls and Indicators	Function
1.	Security keyhole	Used with a mechanical lock and an attached chain. Mechanical lock is attached to the keyhole and the other end of the chain is secured to a stationary object.
2.	S-Video-out connector	Connection point to a TV.
3.	Serial connector port	Connection port for a 9-pin serial-device cable.
4.	Parallel connector port	Connection port for a parallel printer signal cable.
5.	External monitor port	Connection port for an external monitor. The monitor can be operated alone or simultaneously with the laptop computer LCD display.
6.	Modem connector	Not used in this configuration.
7.	Ethernet port	Used to connect to the LAN.
8.	Power jack	Point at which Ac adapter cable is connected.
9.	USB connector	Enables user to connect any device that conforms to the USB interface.
10.	External input device port	Connection port for a mouse, an external numeric keypad, or an external keyboard can be attached to this port through an optional keyboard/mouse cable.

2-2.3.15.3 Laptop Computer Bottom View

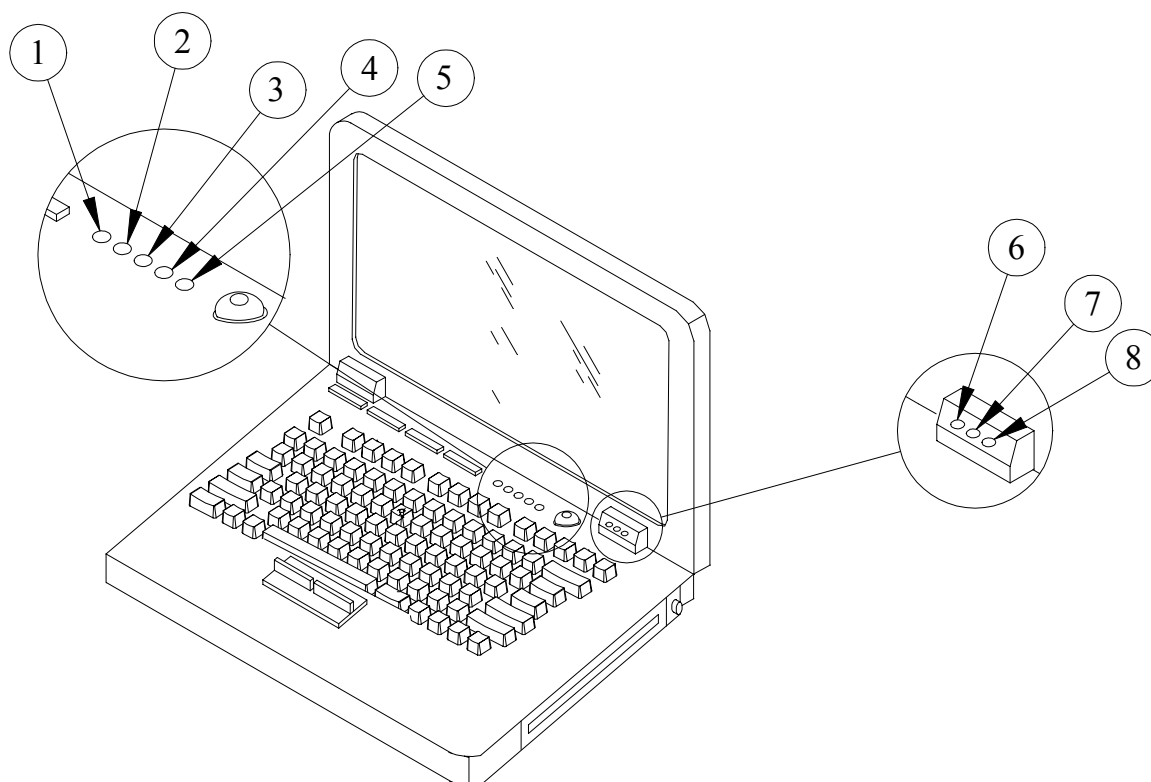
**Figure 2-41 Laptop Computer Bottom View Controls and Indicators****Table 2-41 Laptop Computer Bottom View Controls and Indicators**

Item	Controls and Indicators	Function
1.	Built-in stereo speakers	Two internal speakers.
2.	Battery pack	Built-in power source for the laptop computer.
3.	Battery pack latches	Locks to release the battery pack.
4.	Docking connector	Not used in this configuration.
5.	Mini PC card slot	Modem card slot location.
6.	DIMM slot	Dual inline Memory Module (DIMM) card.
7.	Personal Computer (PC) card slots	Two PC card slots are available. The slots allow the use of one Type III or two Type II cards.
8.	PC card slot eject button	Ejects PC card from the PC card slot.
9.	Infrared port	Enables the computer to communicate with other devices that have infrared data-transfer capability.
10.	Stereo headphone jack	A 1/8-in (3.5 mm) diameter jack used to connect a stereo headphone or external speakers.
11.	Stereo line-in jack	A 1/8-in (3.5 mm) diameter jack used to connect a microphone to the laptop computer.

Table 2-41 Laptop Computer Bottom View Controls and Indicators (Cont'd)

Item	Controls and Indicators	Function
12.	Microphone jack	A 1/8-in (3.5 mm) diameter jack used to connect a microphone to the laptop computer.
13.	LCD latches	Opens the LCD display when pressed.

2-2.3.15.4 Laptop Computer Status Indicators

**Figure 2-42 Laptop Computer Status Indicators****Table 2-42 Laptop Computer Status Indicators**

Item	Indicator	Function
1.	Drive in use	Green LED indicates data is read from or written to the hard disk drive, the diskette drive, or the drive in the UltraBay 2000.
2.	Num lock	Green LED indicates the numeric keypad on the keyboard is enabled.

2-2.3.15.4 Laptop Computer Status Indicators (Cont'd)

Table 2-42 Laptop Computer Status Indicators (Cont'd)

Item	Controls and Indicators	Function
3.	Caps lock	Green LED indicates caps lock is enabled.
4.	Scroll lock	Green LED indicates arrow keys can be used as screen-scroll function keys.
5.	Power on	Green LED indicates the power is on.
6.	Battery	Green LED indicates the battery is fully charged. Blinking green LED indicates the battery has enough power to operate but is charging. Orange LED indicates the battery power is low and the battery is charging. Blinking orange indicates the battery needs charging.
7.	Standby status	Green LED indicates the computer is in standby mode. Blinking green indicates the computer is entering standby or hibernation mode, or is resuming normal operations.
8.	UltraBay status	Green LED indicates an UltraBay 2000 device installed is in use. Blinking green LED indicates an UltraBay 2000 device in the process of being detached. Unlit LED indicates an UltraBay 2000 device is ready to attach or detach.

2-2.3.16 RAID

2-2.3.16.1 RAID Front Panel

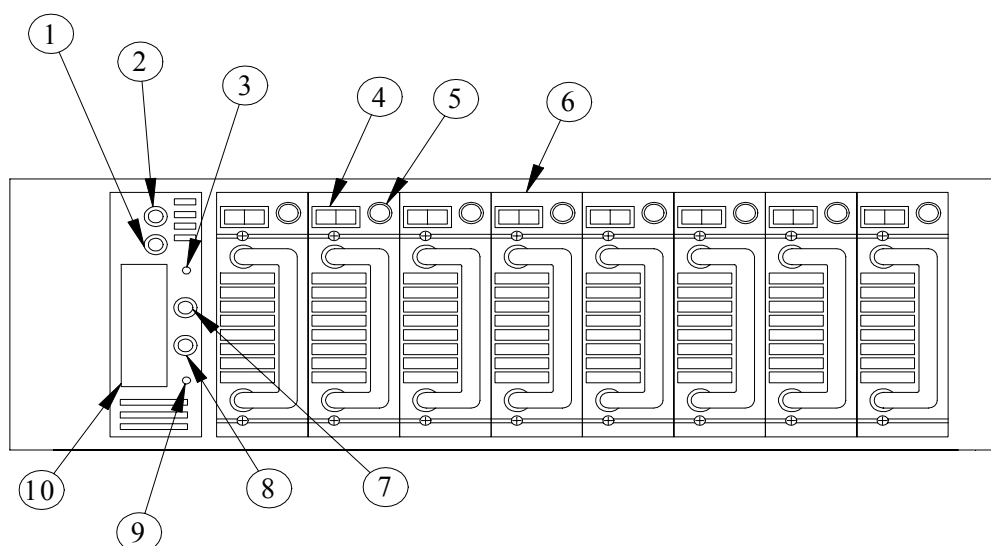


Figure 2-43 RAID Front Panel Controls and Indicators

Table 2-43 RAID Front Panel Controls and Indicators

Item	Indicators	Function
1.	ENTER (button)	Choose or execute an option.
2.	EXIT (button)	Return to previous function or action.
3.	ALERT	Lights up when error appears or service is required.
4.	Unit number indicators	Displays the physical address of disk drive.
5.	Key lock/drive power switch	Turns power on and off to the drive carrier. Assures proper seating of the drive carrier. It prevents unauthorized removal of the disk.
6.	SCSI disk drive and carrier	36-GB removable SCSI disk drive.
7.	Scroll (button)	Used to scroll (down) available menu options.
8.	Scroll (button)	Used to scroll (up) available menu options.
9.	CACHE ACTIVE	Unlit indicates no activity. Blinking indicates data access. Lit indicates data still in memory.
10.	LCD display	Two lines by 16-character controller display. Displays menus and messages for configuration and management.

2-2.3.16.2 RAID Rear Panel

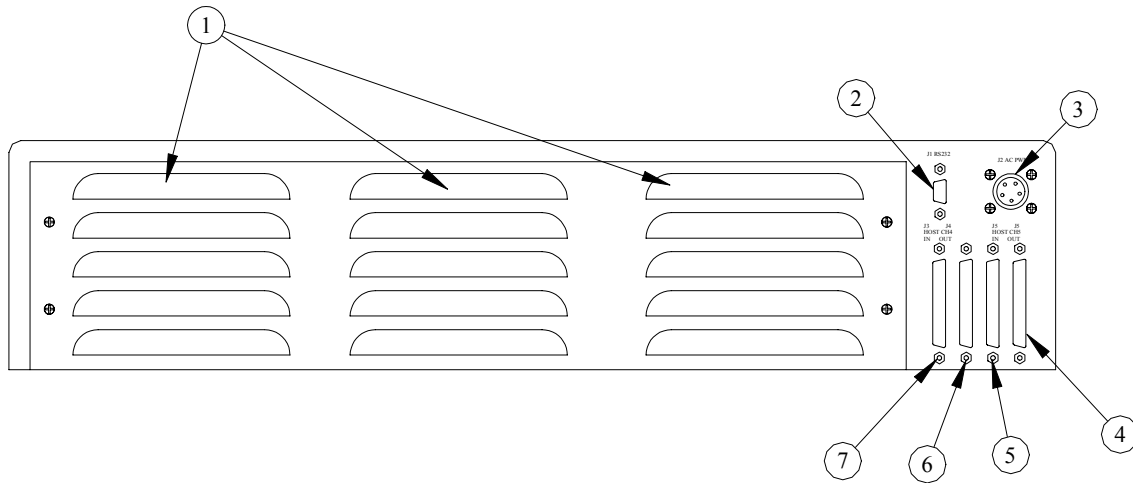


Figure 2-44 RAID Rear Panel Controls and Indicators

Table 2-44 RAID Rear Panel Controls and Indicators

Item	Controls and Indicators	Function
1.	Fan vent grills	Vent grills covering three RAID fans
2.	Serial port	Connects RAID to workstation.
3.	Power cable connector	Connects power cable of RAID the to Ac power supply.
4.	LVD SCSI 4	Used to terminate the chain.
5.	LVD SCSI 3	Connects cable W150 (for use in degraded mode).
6.	LVD SCSI 2	Used in terminate.
7.	LVD SCSI 1	Used to connect to the workstation.

2-2.3.17 HP Deskjet Printer

2-2.3.17.1 HP Deskjet Printer Front Panel

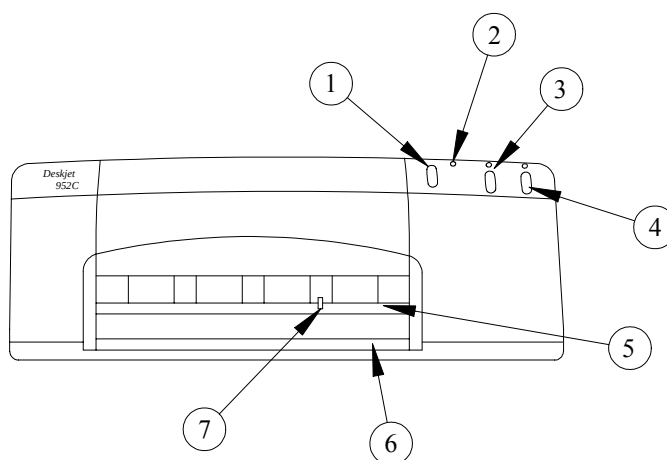
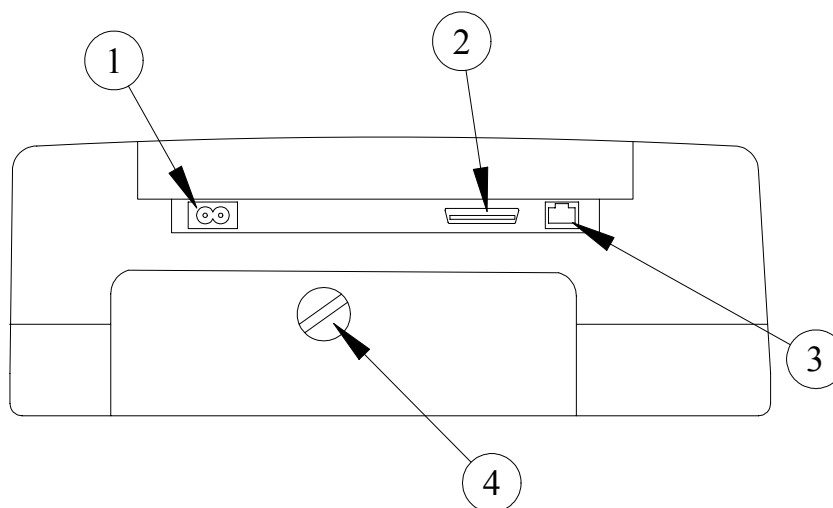


Figure 2-45 HP Deskjet Printer Front Panel Controls and Indicators

Table 2-45 HP Deskjet Printer Front Panel Controls and Indicators

Item	Controls or Indicators	Function
1.	Cancel button	Used to cancel print job.
2.	Print Cartridge status	LED flashes when the print cartridges need to be checked.
3.	Resume light and button	LED flashes when an action is required such as loading paper or clearing a paper jam.
4.	Power button and light	Turns power ON and lights to indicate power is present.
5.	Paper "out" tray	Holds completed document.
6.	Paper "in" tray	Holds blank paper (transparencies) for documents.
7.	Envelop feed	Used when printing envelopes.

2-2.3.17.2 HP Deskjet Printer Rear Panel

**Figure 2-46 HP Deskjet Printer Rear Panel Controls and Connectors****Table 2-46 HP Deskjet Printer Rear Panel Controls and Connectors**

Item	Controls or Connectors	Function
1.	Power connector	Receptacle for Ac power cord.
2.	Parallel port	Connection port for printer cable connects to print server.
3.	USB connector	Not used in this configuration.
4.	Rear access door	Used to clear paper jams.

2-2.3.18 Plotter

2-2.3.18.1 Plotter Front View

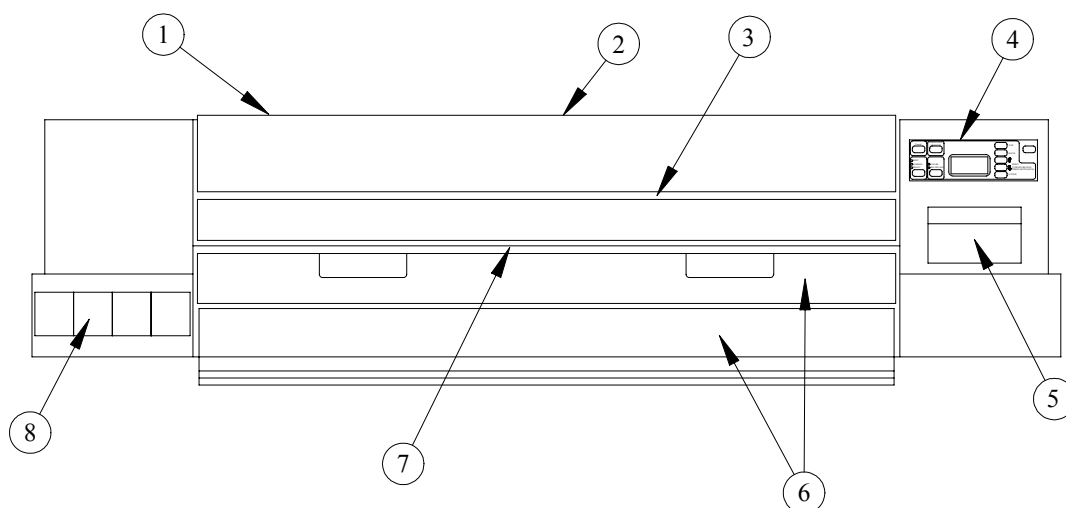
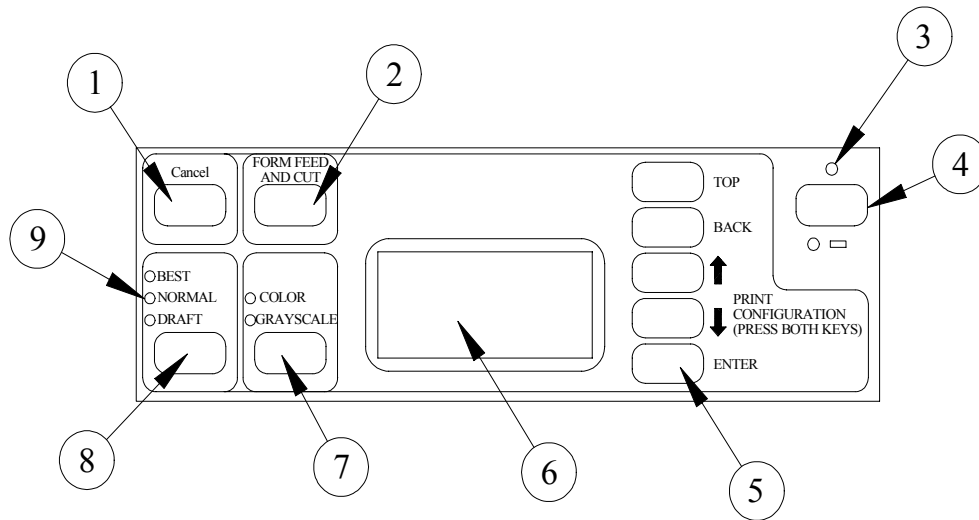


Figure 2-47 Plotter Front Panel View Controls and Indicators (1 of 2)

Table 2-47 Plotter Front Panel View Controls and Indicators (1 of 2)

Item	Control or Indicator	Function
1.	Window and cover	Covers four printheads, pens, and media located below the cover.
2.	Paper cutting slot	Located along top of cover. Use razor in slot to cut roll paper.
3.	Sheet paper slot	Insertion opening for sheet paper
4.	Front control panel and display	Plotter operating controls and indicators.
5.	Printhead service station cover	Provides access to printhead cleaners. Printhead service station contains one printhead cleaner for each of the four printheads.
6.	Paper roll	Blank roll media.
7.	Roll paper entry slot	Insertion opening for roll paper.
8.	Ink cartridges	Four color-coded ink cartridges.

2-2.3.18.1 Plotter Front Panel View Controls and Indicators (Cont'd)

**Figure 2-47 Plotter Front Panel View Controls and Indicators (2 of 2)****Table 2-47 Plotter Front Panel View Controls and Indicators (2 of 2)**

Item	Control or Indicator	Function
1.	Cancel button	Used to cancel printing as though print was finished. Multipage or complex PostScript file may take longer to stop.
2.	FORM FEED AND CUT button	Used to advance the plotter page and cut it (if roll media). Drying time is ignored and the plotter immediately drops the page into the media bin.
3.	ON/OFF power LED	LED is red when power to the plotter is OFF.
4.	ON/OFF push button	Used in conjunction with the power isolator switch located at the back of the plotter to turn the power on and off. See Table 2-48. The button is used only after the LED on the front panel illuminates red.

Table 2-47 Color Plotter Front Panel Controls and Indicators (2 of 2) (Cont'd)

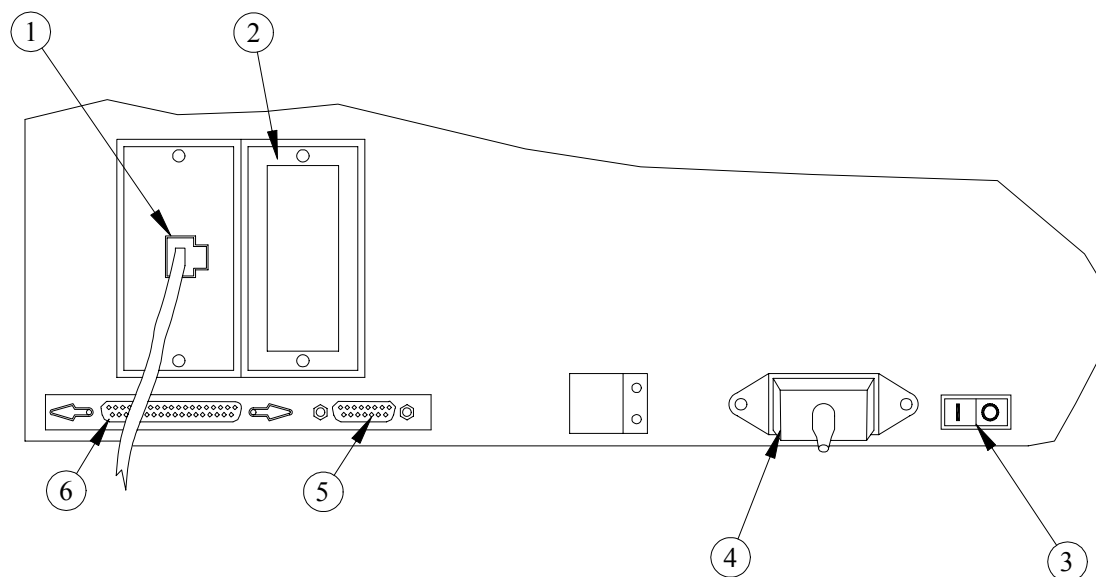
Item	Controls and Indicators	Function
5.	Display keys	The five display keys to the right of the message display screen are used to navigate through the menu system and to select menu icons and menus.
	ENTER key	Used to select an option and move to the next menu level when in the menu system. This action is equivalent to moving one column to the right [→] when in the menu system in the front panel menus. Also used to add to the configuration with displayed selection from the options available in the lowest menu.
	Up ↑ (arrow) key	Used to scroll upward through menu options or to respond to action or error messages. Also used to print current configuration by pressing both ↑ and ↓.
	Down ↓ (arrow) key	Used to scroll downward through menu options or to respond to action or error messages. Also used to print current configuration by pressing both ↑ and ↓.
	BACK key	Used to display previous menu level without changing any menu selections. Equivalent to moving one column to the right [→] in the front panel menus.
	TOP key	Press to go back to the top (first) level without changing any menu selections. This will bring you to the four menu icons.
6.	Message display screen	Displays full or short menus, diagnostics, and error codes.
7.	COLOR/GREYSCALE button	Press button to toggle printer between color or greyscale (black) modes. Green status lights to the left of button indicate mode selected.

2-2.3.18.2 Plotter Front Panel View Controls and Indicators (Cont'd)

Table 2-47 Plotter Front Panel View Controls and Indicators (2 of 2) (Cont'd)

Item	Controls and Indicators	Function
8.	Print quality key	Used to cycle the plotter through the best, normal, or draft printing modes. Changes in print quality will occur <i>only</i> with the next plot. The current print will not be affected. NOTE BEST: Choose to get highest possible image quality. NORMAL: Choose to get a good combination of print quality and productivity. Ideal for line drawings with good print quality and at speed. DRAFT: Choose for maximum productivity. Ideal for checking prints when print quality is not the most important factor.
9.	Status lights	Green status lights (when lit) provide information about the current configuration and state of the printer.

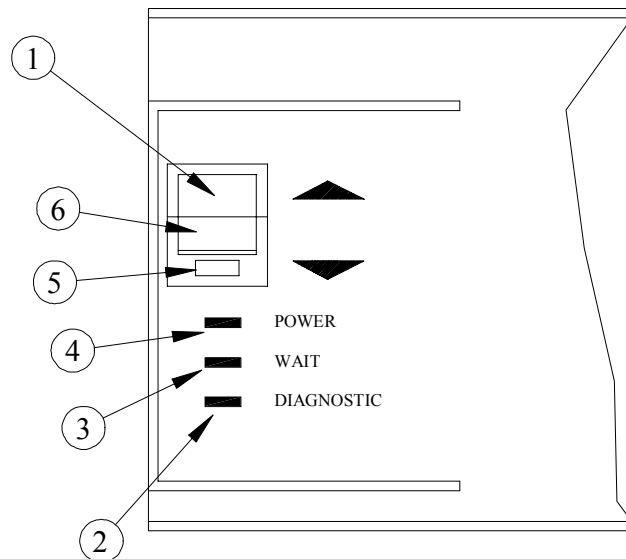
2-2.3.18.2 Plotter Rear View Controls and Connectors

**Figure 2-48 Plotter Rear View Connectors****Table 2-48 Plotter Rear View Connectors**

Item	Connectors	Function
1.	HP JetDirect print server	10/100 Base-TX print server card. Provides interface and buffer between workstations and plotters.
2.	Hard disk drive	Only used on 1055CM plotter.
3.	Power isolator switch	Used in conjunction with ON/OFF power switch on front panel to operate plotter.
4.	Ac power connector	Connection point for Ac power cord.
5.	Serial port	Serial connection.
6.	Parallel port	Parallel interface.

2-2.3.19 Scanner

2-2.3.19.1 Scanner Front Panel Controls and Indicators

**Figure 2-49 Scanner Front Panel Controls and Connector****Table 2-49 Scanner Front Panel Controls and Connector**

Item	Controls and Connector	Function
1.	Paper reverse key	Stops scanning and reverses the original.
2.	DIAGNOSTIC	Flashes if an error is detected by the built-in diagnostics. When both the diagnostic and wait indicator lights are flashing, the scanner cameras have too little light.
3.	WAIT	Lights when the scanner powers up and remains on during the internal diagnostic and stabilization phase. Keyboard input is prevented during this phase.
4.	POWER	Lights when the scanner has powered on.
5.	Ready indicator light	Ready indicator light modes: • Light turns on when paper is correctly loaded. • Light stays on to indicate scanner is ready for control from the computer. • Light flashes during scanning. • Light remains on at the end of scanning to indicate the scanning can be redone.
6.	Paper feed/forward key	Press to move the drawing into -scan position.

2-2.3.19.2 Color Scanner Rear Panel Controls and Connectors

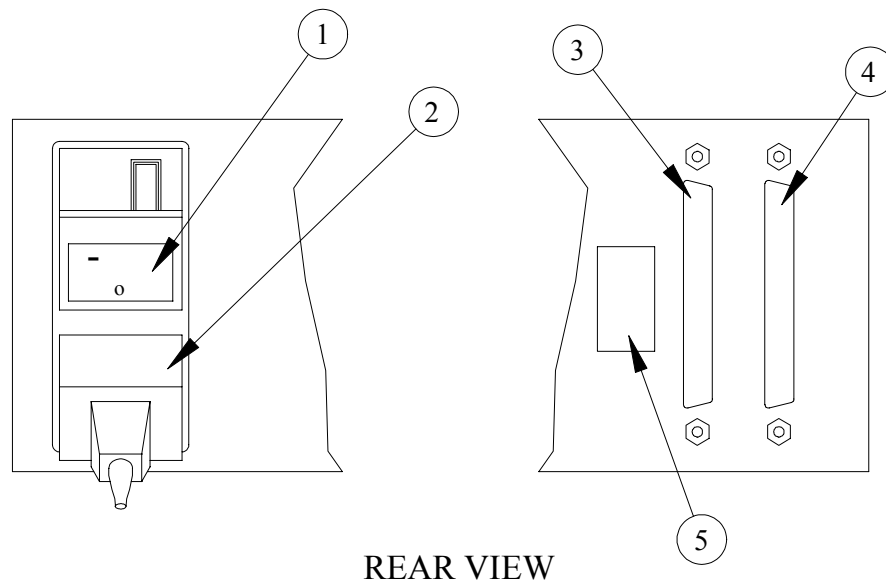


Figure 2-50 Scanner Rear Panel Controls and Connectors

Table 2-50 Scanner Rear Panel Controls and Connectors

Item	Controls and Indicators	Function
1.	Power switch	Power on/off switch. "I" indicates power is on. "O" indicates power is off.
2.	Power plug	Ac power connection to the scanner.
3.	SCSI port	Used to connect workstation to scanner.
4.	SCSI port	Not used in this configuration.
5.	DIP switches	Used to configure system ID and termination.

2-2.4 Signal Equipment

The signal equipment consists of the following items:

- Secure Terminal Equipment
- Ethernet Switch
- Media Converters
- SCSI Booster Power supply
- SCSI Booster
- Signal Entry Panel

2-2.4.1 STE

2-2.4.1.1 STE Front Panel

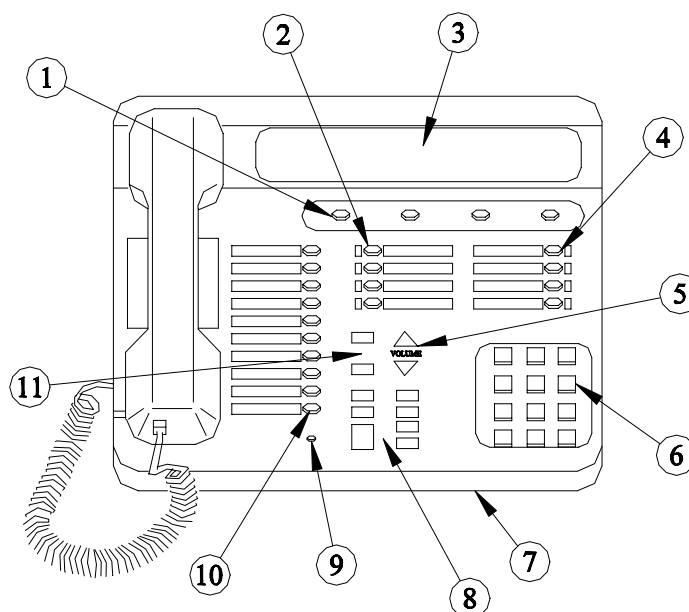


Figure 2-51 STE Front Panel Controls and Indicators

Table 2-51 STE Front Panel Controls and Indicators

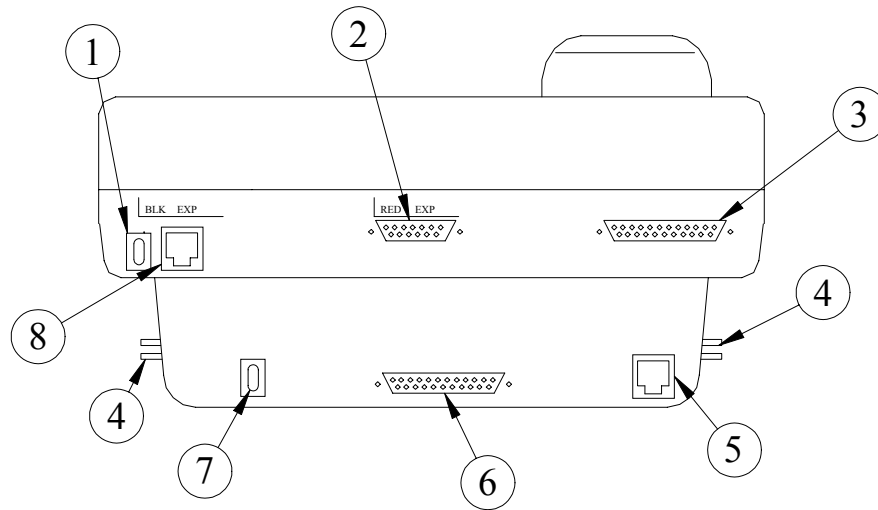
Item	Controls and Indicators	Function
1.	Soft keys	Provide for further enhancement user with interaction with the STE. Whether you are programming the terminal, inserting crypto card, or setting up a call, the functionality of the soft keys is updated.
2.	Call appearance keys	CALL 1 CALL 4 may be used to receive or place calls.

2-2.4.1.1 STE Front Panel (Cont'd)

Table 2-51 STE Front Panel Controls and Indicators (Cont'd)

Item	Controls and Indicators	Function
3.	Alpha-numeric display	3X32 character alphanumeric display to support terminal and card programming and call management.
4.	Precedence key	When connected to and configured for PSTN, and you are set for tone dialing, pressing this button allows you to send AUTOVON precedence tones.
5.	VOLUME keys	Allows the adjustment of the ringer, handset, and speakerphone volume.
6.	Dial keypad	Used to dial digits and to enter information into the terminal and card management menus.
7.	Card insertion	Crypto card slot to insert PCMCIA card.
8.	Call control key	Call control keys MUTE, SPKR (SPEAKERPHONE), REDIAL, DROP, HOLD CONF (Conference, XFER (Transfer)) are used to initiate, control, and terminate calls.
9.	Card inserted indicator	LED indicates that card has been inserted.
10.	Speed dial	The speed dial keys allow you to pre-program 10 frequently called numbers.
11.	Programming Keys	MODE - Enters and exits the menu to configure the voice and data modes of the terminal. MENU - Enters and exits the menu/change the terminal management and card management settings.

2-2.4.1.2 STE Rear Panel

**Figure 2-52 STE Rear Panel Controls and Connectors****Table 2-52 STE Rear Panel Controls and Connectors**

Item	Controls and Connectors	Function
1.	ISDN network termination switch	Used to set Network termination to UP/ON.
2.	Power supply	Connection for power to be applied.
3.	Serial Data Port	Used to synchronous and asynchronous via serial ports.
4.	Binding posts	Used to connect to cable W138.
5.	PST Interface	Used to plug in the PSTN interface jack.
6.	EIA-530A/EIA-232 Interface	Supports synchronous and asynchronous data communications.
7.	Tri-Tac	Not used in this configuration.
8.	ISDN S/T Interface	Used to connect ISDN cable.

2-2.4.2 Ethernet Switch

2-2.4.2.1 Ethernet Switch Front Panel Expansion Slots and Ports

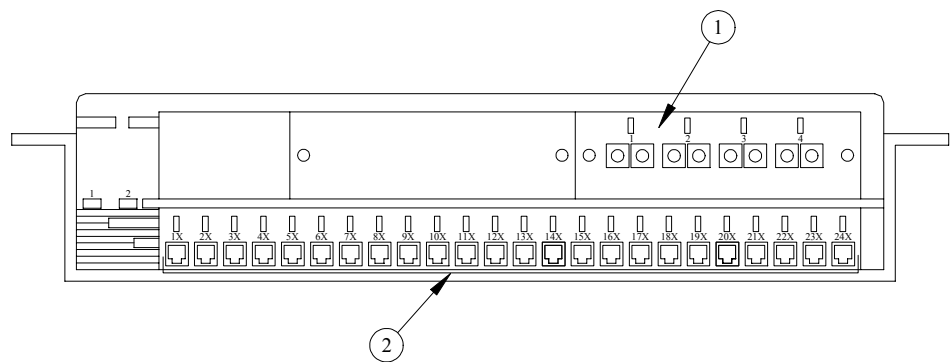
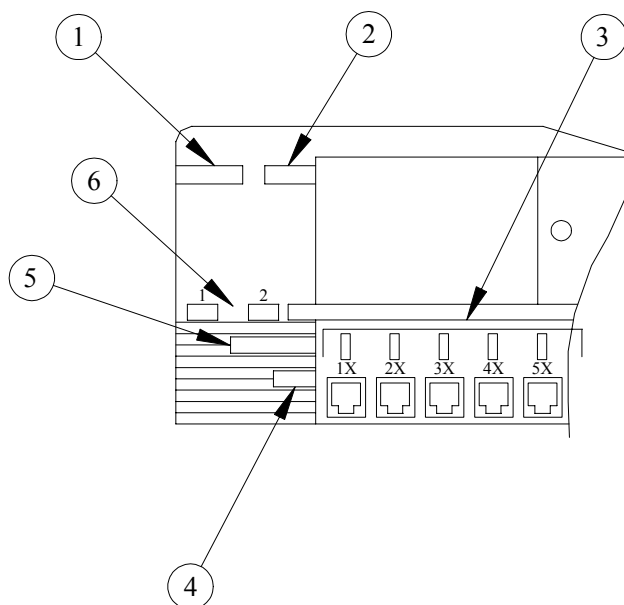


Figure 2-53 Ethernet Switch Front Panel Expansion Slots and Ports

Table 2-53 Ethernet Switch Front Panel Expansion Slots and Ports

Item	Expansion Slots and Ports	Function
1.	Expansion slots	Two high-speed expansion slots for 10BaseT/100Base TX, 100BaseFX, GB Ethernet and ATM modules.
2.	24 fixed autosensing 10/100 Ports	Provides support for up to 64 T-based virtual LANs (VLANs).

2-2.4.2.2 Ethernet Switch Front Panel Controls and Indicators (LEDs)

**Figure 2-54 Ethernet Switch Front Panel Controls and Indicators (LEDs)****Table 2-54 Ethernet Switch Front Panel Controls and Indicators (LEDs)**

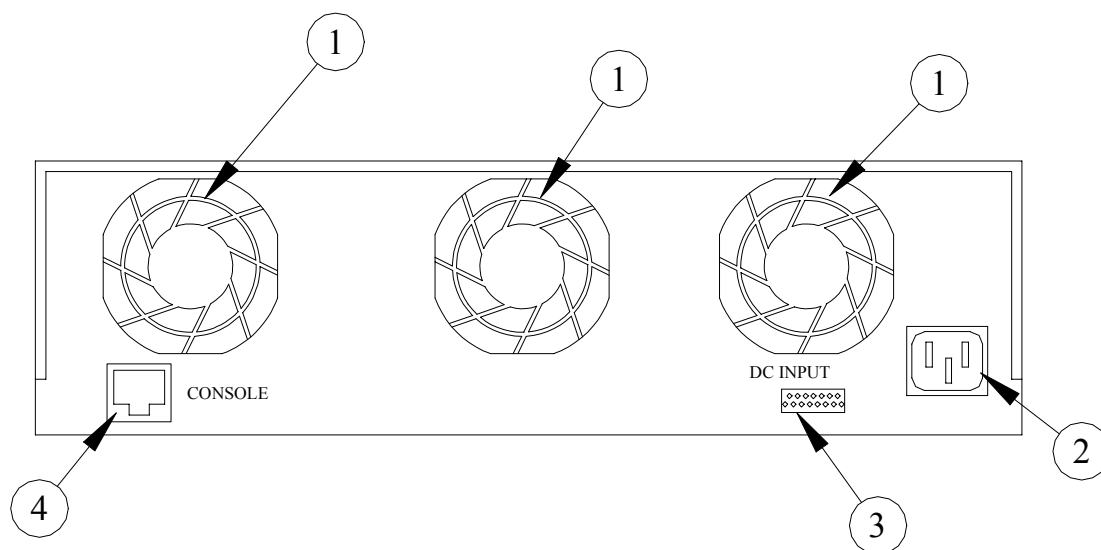
Item	Controls and Indicators	Function
1.	System LED	Indicates whether the system is receiving power and is functioning properly. NOTE Off = System is not powered up. Green = System is operating normally. Amber = System is receiving power but is not functioning properly.

2-2.4.2.2 Ethernet Switch Front Panel Controls and Indicators (LEDs) (Cont'd)

Table 2-54 Ethernet Switch Front Panel Controls and Indicators (LEDs) (Cont'd)

Item	Controls and Indicators	Function
2.	RPS LED	Indicates the RPS status: NOTE Off = RPS is off or not installed. Green = RPS is operational Blinking = RPS and the switch Ac power supply are both powered up. Amber = RPS is connected but not functioning properly.
3.	Port Status LED	Indicates port activity when lit.
4.	Mode button	The mode button highlights each mode in sequence. To change the port mode, press the mode button to highlight the mode that you want. Release the mode button to enable the highlighted function. When you change the port mode, the meaning of the LED colors changes. See Table 2-42 for an explanation of how to interpret LED colors.
5.	Port Mode LED	Used in conjunction with the mode button to indicate port mode changes.
6.	Expansion Slot Status LEDs	Indicate the status of installed modules. The LEDs are numbered 1 (left slot) and 2 (right slot). The LED colors are: NOTE Off = No module is installed. Green = Module is operating normally. Amber = Module failed POST and should be replaced.

2-2.4.2.3 Ethernet Switch Rear Panel Connectors and Fans

**Figure 2-55 Ethernet Switch Rear Panel Connectors and Fans****Table 2-55 Ethernet Switch Rear Panel Connectors and Fans**

Item	Connectors and Fans	Function
1.	Fans	Three cooling fans.
2.	Ac power connector	Used to connect to the external Ac power source.
3.	DC INPUT (redundant power system connector)	Not used in this configuration.
4.	RJ-45 connector	Used in the DTSS-L (V) 2 application as a connection pinout for 10BaseT and 100 Megabits per second (Mbps) connector.

2-2.4.3 Media Converters

2-2.4.3.1 Media Converters Front View

The Media Converters are attached to the bottom of the tray assembly which houses the Ethernet Switch.

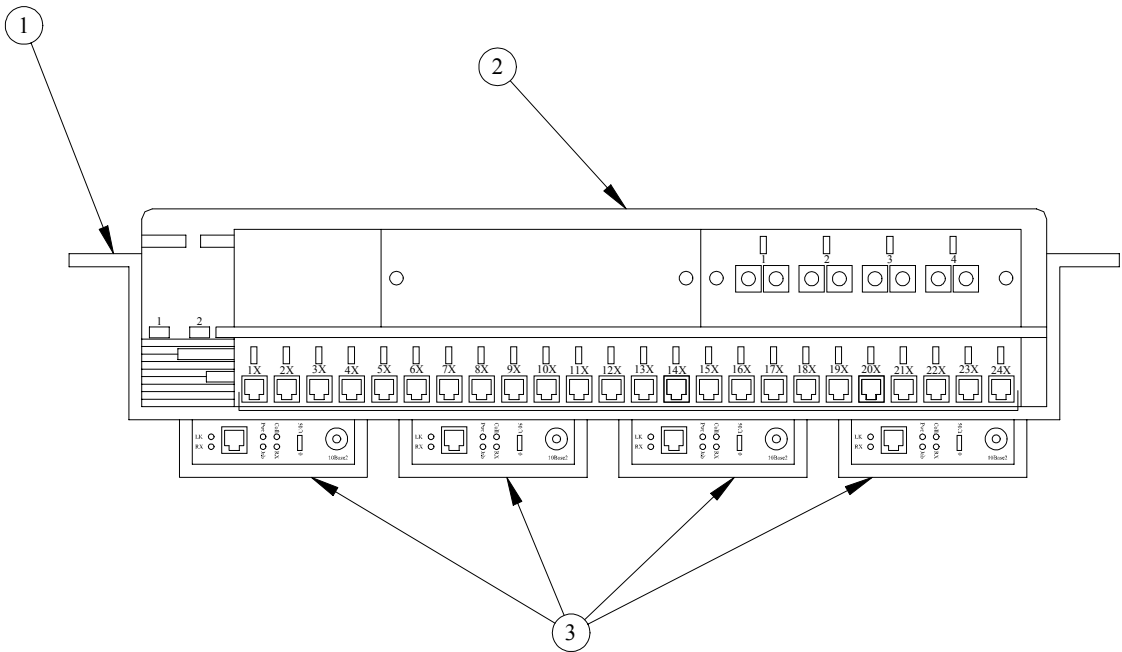
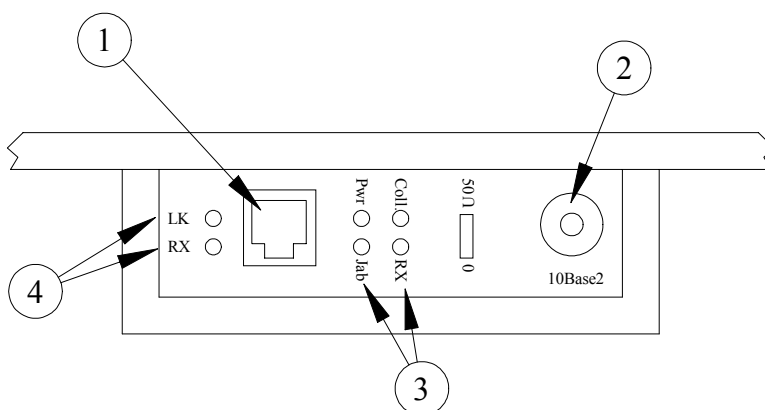


Figure 2-56 Media Converters Front View

Table 2-56 Media Converters Front View

Item	Assembly Parts	Function
1.	Tray	Houses the Ethernet switch and the media converters.
2.	Ethernet switch	Provides collision free full-duplex operation on with up to 200 Mbps of bandwidth to workstations and components of the DTSS-L (V) 2, other servers and between switches.
3.	Media converter	Provide data conversion between 10/100BaseT ports and 10/100BaseT Bayonet Nipple Connector (BNC) ports.

2-2.4.3.2 Media Converter Controls and Connectors

**Figure 2-57 Media Converter Controls and Connectors****Table 2-57 Media Converter Controls and Connectors**

Item	Assembly Parts	Function
1.	10/100BaseT connectors	Connection point for 10 BaseT connectors.
2.	BNC connector	Connection point for ThinLAN coax.
3.	Status LEDs	Pwr: (Power) Steady Green LED indicates normal operation. Coll: (Collision) Flashing green LED Indicates port is in a collision state. Jab: (Jabber) Steady green indicates a jabber condition.
4.	Status LED's	CX RX: Port is receiving Link or Data signal. RX (Receive) Indicates port is receiving data. LK (Link) port is receiving link signal

2-2.4.4 SCSI Booster Power Supply

2-2.4.4.1 SCSI Booster Power Supply Connectors

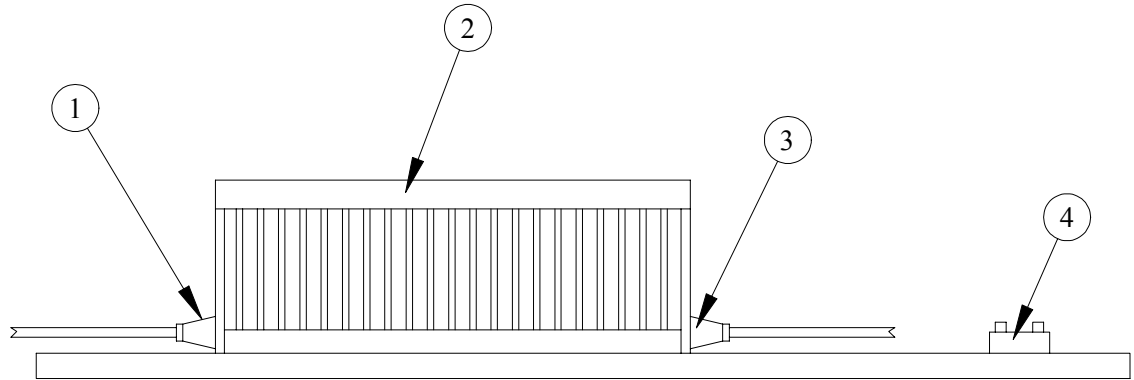


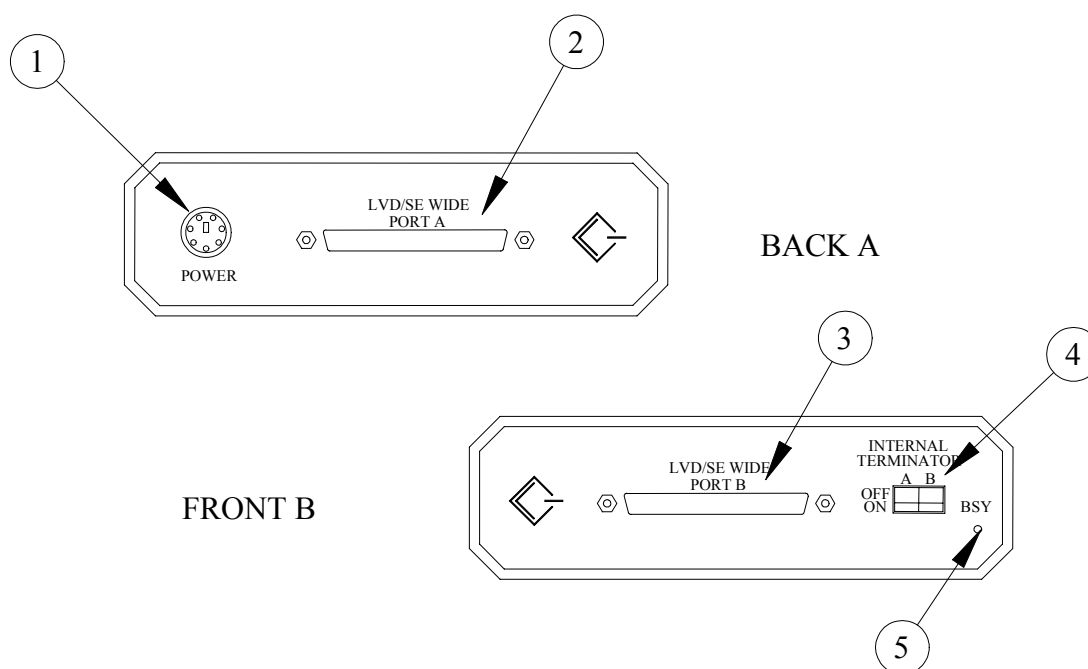
Figure 2-58 SCSI Booster Power Supply Connectors

Table 2-58 SCSI Booster Power Supply Connectors

Item	Controls and Indicators	Function
1.	Power cord	Connects to Ac receptacle.
2.	Power supply	SCSI regenerator boosts signal data.
3.	Power output	Connects power to the terminal board for distribution to SCSI boosters.
4.	Terminal Board	Used for distribution of power.

2-2.4.5 SCSI Booster

2-2.4.5.1 SCSI Booster Connectors

**Figure 2-59 SCSI Booster Connectors****Table 2-59 SCSI Booster Connectors**

Item	Controls and Indicators	Function
1.	Power receptacle	Input for Ac power cord.
2.	SCSI connector	Input for 68-pin SCSI cable.
3.	SCSI connector	Input for 68-pin SCSI cable.
4.	On/OFF Dip Switches	Provide internal termination to ports A and B..
5.	BUSY LED	LED indicator showing booster activity.

2-2.4.6 Emulator

2-2.4.6.1 Emulator Connectors

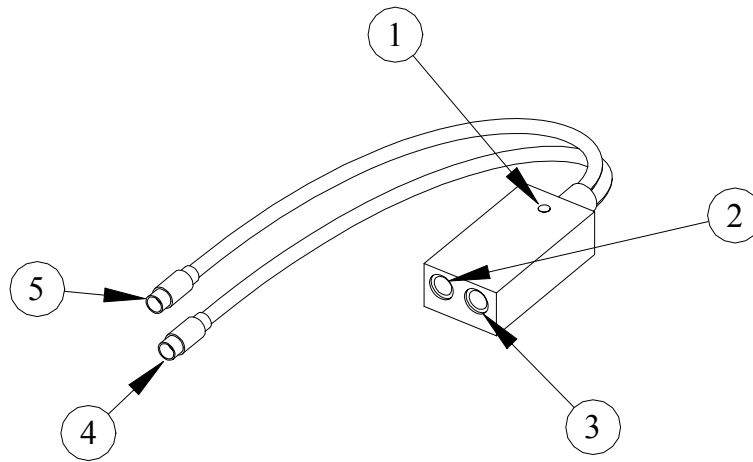


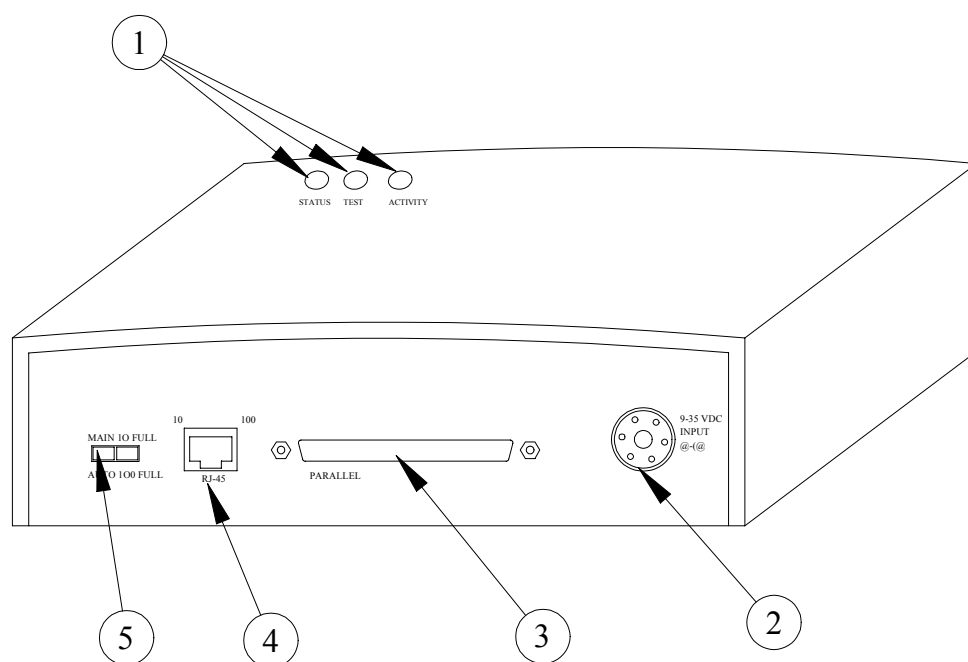
Figure 2-60 Emulator Connectors

Table 2-60 Emulator Connectors

Item	Controls and Indicators	Function
1.	Status LED	Indicates status of Emulator.
2.	Keyboard connector	“IN” connection to the Emulator.
3.	Mouse connector	“IN” connection to the Emulator.
4.	Mouse connection	“OUT” connection to the KVM switch.
5.	Keyboard connection	“OUT” connection to the KVM switch.

2-2.4.7 Print Server

2-2.4.7.1 Printer Server Connectors

**Figure 2-61 Printer Server Connectors****Table 2-61 Print Server Connectors**

Item	Controls and Indicators	Function
1.	Activity status LEDs	Shows ‘status” and “activity.”
2.	Input port	Ac power connection.
3.	Parallel port	Connection to printer.
4.	RJ 45 Connector and LEDs	Shows status of 10 or 100 connection
5.	Auto negotiation switches	Used to configure the print server to the network.

2-2.4.8 Signal Entry Panel

2-2.4.8.1 Signal Entry Panel Faceplate

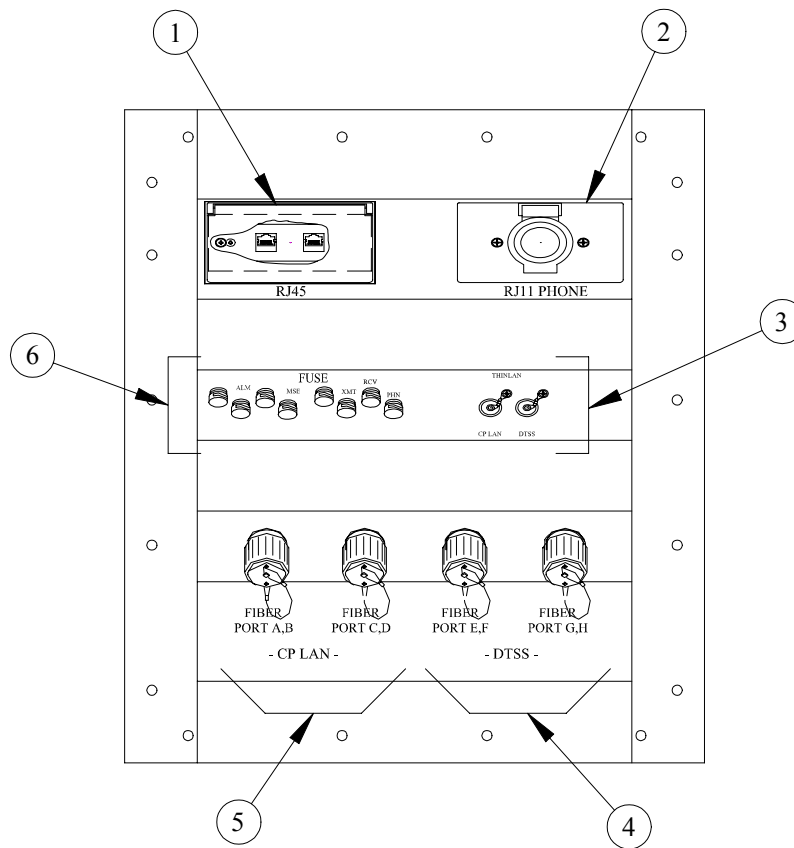


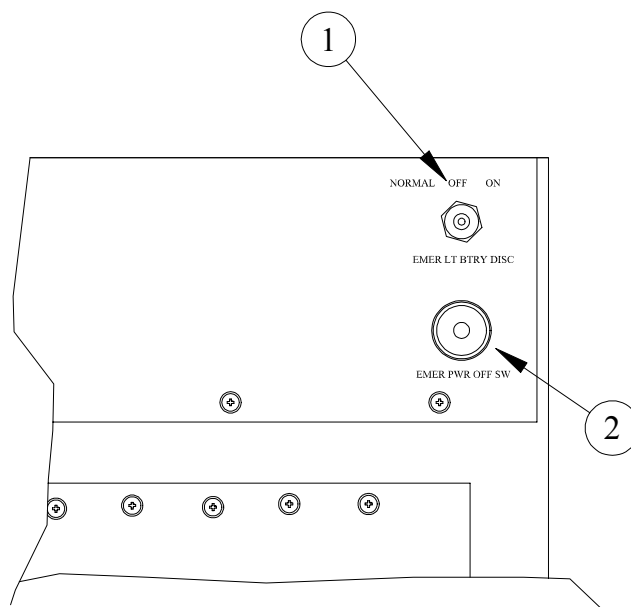
Figure 2-62 Signal Entry Panel Connectors

Table 2-62 Signal Entry Panel Connectors

Item	Connectors	Function
1.	RJ45 Connectors	Used to connect to other systems.
2.	RJ11 Phone connector	External connection for phone service.
3.	THINLAN connectors	BNC connectors used to connect to other systems.
4.	DTSS	TFOCA II connection used to connect to other systems.
5.	CP LAN	TFOCA II connection used to connect to other systems.
6.	MSE	External connections for MSE receive and transmit (NBC and phone).

2-2.4.9 Emergency Switches

2-2.4.9.1 Emergency Light and Power Switch

**Figure 2-63 Emergency Light and Power Switch****Table 2-63 Emergency Light and Power Switch**

Item	Connectors	Function
1.	EMER LT BTRY DISC	Emergency light battery disconnect switch used to disconnect emergency light when shelter is not in use.
2.	EMER PWR OFF SW	Power shut off switch used to disconnect power to the shelter in emergencies. Push the LOAD CONNECT button to reset the power to the shelter.

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SECTION II OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

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2-3 GENERAL

2-3.1 Preventive Maintenance Checks and Services Introduction

This section contains information that you will need to perform Preventive Maintenance Checks and Services (PMCS). Illustrated steps are included to help you perform these procedures easily and quickly. PMCS consists of scheduled maintenance items used to make sure that the DTSS-L (V) 2 is ready for operation at all times. Inspect the system regularly and carefully so that you can find any defects and correct or prevent them.

2-3.2 Preventive Maintenance and Services Checks Rule

Follow these rules when performing PMCS:

- a. Before You Operate. Always keep in mind the CAUTIONS and WARNINGS. Perform the “Before” Checks and services before the DTSS-L (V) 2 leaves its containment area to perform its intended mission.
- b. While You Operate. Always keep in mind the CAUTIONS and WARNINGS. Perform the “During” checks and services when the DTSS-L (V) 2 is being used in its intended mission.
- c. After You Operate. Be sure to perform the “After” checks and services when the DTSS-L (V) 2 is taken out of its mission mode or returned to its containment area.
- d. If Your Equipment Fails to Operate. Troubleshoot with the recommended equipment specified in the troubleshooting procedures. Report any deficiencies on the proper forms. (See DA PAM 738-750). If you find problems that you cannot correct when doing PMCS, notify your supervisor.
- e. Whenever Necessary. Routine checks such as general cleaning, dusting, washing, checking for burned or frayed cables or damaged components, storing items not in use, and checking for loose nuts and bolts are not listed as PMCS. These procedures must be performed as needed.

2-3.2 Preventive Maintenance and Services Checks Rules (Cont'd)

- f. If Your Equipment Is Reported Not Fully Mission Capable. Do not attempt to operate the equipment unless directed. Ask your supervisor what you should do.
- g. The following are checks that are common to the entire system:
 - Keep it clean: Dirt, grease, oil, and debris only get in the way and may cover up serious problems. Use soap and water on rubber or plastic. Upholstery should be cleaned with soap, water, and a damp cloth.
 - Rust and corrosion: Check all metal for rust and corrosion. If any bare metal or corrosion exists, report it to your supervisor.
 - Bolt, nuts, and screws: Check them all for a missing, bent, or broken condition. Look for chipped paint, bare metal, or rust around bolt heads. If you find anything loose, tighten it and report it to your supervisor.
 - Welds: Look for loose or chipped paint, rust, or gaps where parts are welded. If you find a suspect weld, report it to your supervisor.
 - Electric wires and connectors: Look for cracked, frayed, or broken insulation, bare wires, and loose or broken connectors. Tighten loose connectors. Report any damaged wires to your supervisor.
 - Hoses and fluid lines: Look for wear, damage, and leaks, and make sure clamps and fittings are tight. Wet spots and stains around a fitting or connector can indicate a leak. If a leak is from a loose fitting or connector, tighten it. If something is broken or worn out, report it to your supervisor.
- h. When you check for “operating condition,” look at the component to see if it is serviceable.

2-4 PMCS PROCEDURES

2-4.1 PMCS Table

The PMCS tables (Table 2-64) list the inspections and care required to keep your system in good operating condition. The PMCS table is organized so that you can make your Before operation checks as you walk around the system. The PMCS table consists of five columns described below:

- a. Item No. column: This column lists the sequence numbers of all procedures in the table, regardless of interval. You must use the Item No. column as a source of item numbers for the TM Number column on DA Form 2404, Equipment Inspection and Maintenance Worksheet.
- b. Interval column: This column tells you when to perform PMCS. The “Before” procedures must be done before you operate or use the equipment. The “During” procedures must be done during the time you are operating or using the equipment. The “After” procedures must be done immediately after you have operated or used the equipment.
- c. Location and Item to Check/Service column: This column identifies the name of the items to be checked or serviced.
- d. Procedure column: This column gives the procedures to check or to service the item listed in the Item to Check/Service column.
- e. Not Fully Mission Capable if column: This column identifies the faults that will keep the equipment from being capable of performing its mission. If system does not perform as required, refer to Chapter 3 Section II, Operator Troubleshooting Procedures. If anything looks wrong and you cannot fix it, IMMEDIATELY report it to your supervisor and report it on DA Form 2404.

2-4.2 PMCS General Notes

CAUTION

Optical coating on screen will be damaged if an inappropriate cleaning solution is used.

Refer to TB 43-1035, Environmentally Safe Substances For Use With Communications-Electronics Equipment.

2-4.2.1 Cleaning the Engine

CAUTION

When cleaning under the hood of the truck, be sure the engine is at outside air temperature. **Do not** direct water at electrical connections or radiator fins. **Do not** use high-pressure water. Damage to engine, electrical system, and other components may result.

When cleaning engine area, cover the alternator, air cleaner inlet, and air compressor. Use water pressure and volume similar to standard household water supply system.

After cleaning engine, allow engine to air dry. **Do not** use compressed air or run the engine to reduce drying time.

2-4.2.2 Leakage Definitions

CAUTION

When operating with Class I or II leaks, continue to check fluid level as required by PMCS. Class III leaks should be reported immediately to your supervisor.

2-4.2.2.1 Class I

Class I leaks include seepage of fluid (indicated by wetness or discoloration) not great enough to form drops.

2-4.2.2.2 Class II

Class II leaks are leaks of fluid great enough to form drops but not enough to cause drops to drip from item being checked or inspected.

2-4.2.2.3 Class III

Class III leaks are leaks of fluid great enough to form drops that fall from item while being checked or inspected.

2-4.3 Preventive Maintenance Checks and Services for the DTSS-L (V) 2

NOTE

If the equipment must be kept in continuous operation, do only the procedures that can be done without disturbing operation. Make complete checks and services when the equipment is shut down.

Table 2-64 Operator PMCS for DTSS-L (V) 2

Item No.	Interval	Location	Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
1		EXTERNAL EQUIPMENT		
1-1	Before/ After	Mechanical General	Check for loose hardware and tighten to prevent falling off while in motion.	Damaged beyond use. Contact Unit Maintenance.
1-1.1		Truck, Utility, 1-1/4 Ton, 4x4, M1113, HMMWV-ECV	Check for fluids or grease on floor of shelter, and clean up with dry cloths.	Damage to fuel tank or hydraulic line.
1-1.1.1		HMMWV-ECV	Refer to LO-9-2320-280-10 for truck lubrication procedures. Refer to TM-9-2320-280-10 for vehicle PMCS.	
1-1.2		Generator set, model PU-798 or PU-753	Refer to LO-9-6115-642-12 for generator lubrication procedures. Refer to TM 9-6115-642-10 or TM 9-6115-660-13&P for operator maintenance.	

2-4.3 Preventive Maintenance Checks and Services for the DTSS-L (V) 2 (Cont'd)

Table 2-64 Operator PMCS for DTSS-L (V) 2 (Cont'd)

Item No.	Interval	Location Item to Check/Service	Procedure	Not Fully Mission Capable if:
1-1.3		Lightweight Multipurpose Shelter (LMS)		
1-1.3.1	Before/ After	ECU Rack Assembly	a. Check for loose or missing bolts, nuts, pins, and for bent, cracked, or broken parts. b. Check connectors, hoses, and clamps. Ensure that rack is securely tightened to shelter.	Damaged beyond use. Contact Unit Maintenance.
1-1.3.2	Before/ After	ECU	a. Check fabric cover for damage. b. Check for broken hold-down fasteners on the cover.	
1-1.3.3	During	Refrigerant sight glass	After 15 minutes of operation in maximum cooling: a. Check for bubbles or milky flow indicating low refrigerant charge. b. Check for yellow color, which indicates presence of moisture.	If bubbles, milky flow, or yellow color. Contact Unit Maintenance.
1-1.3.4	During	Condensate drain	Check that no water is dripping anywhere except from the drain.	Contact Unit Maintenance.

2-4.3 Preventive Maintenance Checks and Services for the DTSS-L (V) 2 (Cont'd)

Table 2-64 Operator PMCS for DTSS-L (V) 2 (Cont'd)

Item No.	Interval	Location Item to Check/Service	Procedure	Not Fully Mission Capable if:
1-1.4		PEP		
1-1.4.1	Before/ After	Cover	a. Inspect for damage. b. Check for cracks and for broken or missing parts.	Damaged beyond use. Contact Unit Maintenance.
1-1.4.2	Before/ After	Faceplate	a. Visually/physically inspect for damage and functionality. b. Clean with clean, dry cloth.	Damaged beyond use. Contact Unit Maintenance.
1-1.5		SEP		
1-1.5.1	Before/ After	SEP Cover	a. Inspect for damage. b. Check for cracks and for broken or missing parts.	Damaged beyond use. Contact Unit Maintenance.
1-1.5.2	Before/ After	Faceplate	a. Visually/physically inspect for damage and functionality. b. Clean with clean, dry cloth.	Damaged beyond use. Contact Unit Maintenance.

2-4.3 Preventive Maintenance Checks and Services for the DTSS-L (V) 2 (Cont'd)

Table 2-64 Operator PMCS for DTSS-L (V) 2 (Cont'd)

Item No.	Interval	Location Item to Check/Service	Procedure	Not Fully Mission Capable if:
			WARNING Be careful climbing onto the roof of the shelter. Always use hand-hold/step assemblies. Personal injury can result from a fall.	
1-1.6	Before/After	Hand Hold/step assembly	Check for cracks and for broken or missing parts. Ensure that hand hold will remain in a vertical position until folded flat into recess. When on the roof, check the support handle.	Damaged beyond use. Contact Unit Maintenance.
1-1.7	Before/After	Lifting Rings	Climb on the roof of the shelter and check to ensure that the rings do not have cracks or broken or missing parts.	Damaged beyond use. Contact Unit Maintenance.
1-1.8		Shelter Door and Secondary Exit		
1-1.8.1	Before/After	Weather Seal	Ensure that seal is present and that it is not brittle, cracked, or dry rotted.	Damaged beyond use. Contact Unit Maintenance.
1-1.8.2	Before/After	Door Handle Assembly	Ensure that the door handle assembly is not damaged and that it operates properly.	Damaged beyond use. Contact Unit Maintenance.
1-1.8.3	Before/After	Hinges	Ensure that the hinges operate freely without excessive movement.	Damaged beyond use. Contact Unit Maintenance.
1-1.8.4	Monthly	Hinges	Lubricate with engine oil or aerosol lubricant.	

2-4.3 Preventive Maintenance Checks and Services for the DTSS-L (V) 2 (Cont'd)

Table 2-64 Operator PMCS for DTSS-L (V) 2 (Cont'd)

Item No.	Interval	Location Item to Check/Service	Procedure	Not Fully Mission Capable if:
1-1.9		TIP		
1-1.9.1	Before/ After	Cover	Inspect for damage. Check for tears and broken fasteners.	Damaged beyond use. Contact Unit Maintenance.
1-1.9.2	Before/ After	Faceplate	Visually/physically inspect for damage. Clean with clean, dry cloth.	
1-1.9.3	Before/ After	Connectors	Visually/physically inspect for damage. Clean with clean, dry cloth.	Damaged beyond use. Contact Unit Maintenance.
1-1.10		Storage Box		
1-1.10.1	Monthly	Hinge/Handle	Lubricate with engine oil or aerosol lubricant.	Damaged beyond use. Contact Unit Maintenance.
1-1.11		SWGS		
1-1.11.1	Before/ After	Cable, Pegs	Check for missing or damaged parts.	Damaged beyond use. Contact Unit Maintenance.

2-4.3 Preventive Maintenance Checks and Services for the DTSS-L (V) 2 (Cont'd)

Table 2-64 Operator PMCS for DTSS-L (V) 2 (Cont'd)

Item No.	Interval	Location Item to Check/Service	Procedure	Not Fully Mission Capable if:
2		INTERNAL EQUIPMENT		
2-1		Mechanical General		
2-1.1		Operator chair		
2-1.1.1	Before/After	Fabric	Inspect for tears or worn fabric.	Damaged beyond use. Contact Unit Maintenance.
2-1.1.2	Before/After	Chair base and swivel	Visually/physically inspect arm, swivel, and wheels for damage. Clean with clean, dry cloth. Lubricate swivel with aerosol lubricant	Damaged beyond use. Contact Unit Maintenance.
2-1.1.3	Before/After	Chair retaining bracket	Check for loose or damaged parts.	Damaged beyond use. Contact Unit Maintenance.
2-1.2		Equipment racks		
2-1.2.1	Before/After	Rack supports	Check for loose or missing hardware or damaged supports.	Damaged beyond use. Contact Unit Maintenance.
2-1.2.2	Before/After	Rack slides	Check for loose or missing hardware or damaged slides.	Damaged beyond use. Contact Unit Maintenance.

2-4.3 Preventive Maintenance Checks and Services for the DTSS-L (V) 2 (Cont'd)

Table 2-64 Operator PMCS for DTSS-L (V) 2 (Cont'd)

Item No.	Interval	Location Item to Check/Service	Procedure	Not Fully Mission Capable if:
2-1.3		Transit heater		
2-1.3.1	Before/ After	Front louvers	Check for loose or missing hardware. Clean with clean, dry cloth.	Damaged beyond use. Contact Unit Maintenance.
2-1.4		ECU		
2-1.4.1	Before/ After	ECU control module	Inspect for damage, secure mounting, and ensure proper operation in TM 5-4120-401-14.	Damaged beyond use. Contact Unit Maintenance.
2-1.4.2	Before/ After	Conditioned air supply louver	Check for proper adjustment and for freedom of operation.	Damaged beyond use. Contact Unit Maintenance.
2-1.5	Before/ After	Fire extinguisher	Check for loose hardware or damage. Check charge.	Damaged beyond use. Contact Unit Maintenance.
2-1.6	Before/ After	Drain Plug	Check for proper operation. Make sure it is screwed in tightly.	Damaged beyond use. Contact Unit Maintenance.

2-4.3 Preventive Maintenance Checks and Services for the DTSS-L (V) 2 (Cont'd)

Table 2-64 Operator PMCS for DTSS-L (V) 2 (Cont'd)

Item No.	Interval	Location Item to Check/Service	Procedure	Not Fully Mission Capable if:
2-2		ELECTRICAL-GENERAL		
2-2.1		Lights and power receptacles	WARNING Lethal voltage is present in light set when it is connected to power source. Disconnect light set from power source before inspecting or repairing any electrical component. Be careful not to contact electrical connections. Electrical shock and death can result from failure to heed this warning.	
2-2.1.1	Before/After	Ac lights	Check for operation, inspect for damage.	Damaged beyond use. Contact Unit Maintenance.
2-2.1.2	Before/After	Ac and Dc receptacles, roadside	Inspect for damage.	Damaged beyond use. Contact Unit Maintenance.
2-2.1.3	Before/After	Ac receptacles, front wall	Inspect for damage.	Damaged beyond use. Contact Unit Maintenance.
2-2.1.4	Before/After	Emergency lights, front wall	Inspect for damage, secure mounting, and proper operation.	Damaged beyond use. Contact Unit Maintenance.
2-2.1.5	Before/After	Ac receptacles curbside	Inspect for damage.	Damaged beyond use. Contact Unit Maintenance.
2-2.1.6	Before/After	Ac receptacles	Inspect for damage.	Damaged beyond use. Contact Unit Maintenance.

2-4.3 Preventive Maintenance Checks and Services for the DTSS-L (V) 2 (Cont'd)

Table 2-64 Operator PMCS for DTSS-L (V) 2 (Cont'd)

Item No.	Interval	Location Item to Check/Service	Procedure	Not Fully Mission Capable if:
2-2.2	Before/ After	Power Distribution Panel	a. Check all panels for operation, inspect for obvious damage. b. Clean surfaces with a clean, dry cloth.	Damaged beyond use. Contact Unit Maintenance.
2-2.3		UPS		
2-2.3.1	Before/ After	UPS Front Panel	a. Check all panels for operation. Inspect for obvious damage. b. Clean surfaces with a clean, dry cloth.	Damaged beyond use. Contact Unit Maintenance.
2-2.3.2	Before/ After	Front Panel Fan Filter	a. Inspect Front Panel Fan Filter for excessive dirt. b. Service: Power down UPS. c. Vacuum as required.	Damaged beyond use. Contact Unit Maintenance.
2-2.3.3	Before/ After	Ac receptacles	Inspect for damage.	
3		SICPS TENT See TM 11-7010-257-12&P for information.		
			WARNING Fingers and hands can be pinched or cut by telescoping joints and slide covers.	

2-4.3 Preventive Maintenance Checks and Services for the DTSS-L (V) 2 (Cont'd)

Table 2-64 Operator PMCS for DTSS-L (V) 2 (Cont'd)

Item No.	Interval	Location Item to Check/Service	Procedure	Not Fully Mission Capable if:
3-1	Before/ After	Tent	Ensure that all components are present. Check for tears, cracks, or broken parts.	Major components missing or damaged beyond use.
3-1.1	Before/ After	Frame assembly	a. Check condition of telescopic joints for freedom of movement. b. Inspect tubing for bends or other damage.	Tubing bent or joints do not extend.
3-1.2	Before	Cable assemblies	Check cable assemblies for frayed cables or damage to swaged ends.	Cable assemblies frayed, damaged, or missing.
3-1.3	Before/ During	End fittings and handles	a. Check end fittings for damage. b. Check that handles move freely.	Cracked or broken end fittings. Handles inoperable.
3-1.4	Before/ During/ After	Fabric walls, wall liners, roof cap, and floor	Check for tears, rips, punctures, as well as seams that may have separated in walls, liners, roof cap, and floor.	Fabric ripped or torn. Separated seams or fabric punctures. Roof cap leaks.
3-1.5	Before/ During/ After	Hook and loop fasteners	a. Inspect hook and loop fasteners for proper alignment and cleanliness. b. Remove dirt by brushing fastener strips.	Hook and loop fasteners do not hold when pressed together. Fastener strips loose.

2-4.3 Preventive Maintenance Checks and Services for the DTSS-L (V) 2 (Cont'd)

Table 2-64 Operator PMCS for DTSS-L (V) 2 (Cont'd)

Item No.	Interval	Location Item to Check/Service	Procedure	Not Fully Mission Capable if:
3-1.6	Before/ During/ After	Tent lines	Inspect tent lines for cuts or fraying.	Tent lines cut, frayed, or excessively worn.
3-1.6.1	During	Tent lines	Check for and tighten loose tent lines.	
3-1.6.2	Before	Tent line slips	Inspect for broken tent line slips.	
3-1.7	Before/ After	Quick disconnect fasteners and straps	Check interior and exterior quick-disconnect fasteners and straps for fraying, tears, or broken hardware.	Quick-disconnect fasteners broken. Straps loose or missing.
3-1.8	Before/ After	Fabric transport bags, frame transport bag, and tent pin container	a. Check fabric transport bags, frame transport bag, and tent pin container for rips, tears, or splitting. b. Check strap assemblies for fraying or missing hardware. c. Check carrying handles for excessive fraying.	Fabric/frame transport bags or tent pin container are ripped. Straps or handles are loose. Broken or missing hardware.

2-4.3 Preventive Maintenance Checks and Services for the DTSS-L (V) 2 (Cont'd)

Table 2-64 Operator PMCS for DTSS-L (V) 2 (Cont'd)

Item No.	Interval	Location Item to Check/Service	Procedure	Not Fully Mission Capable if:
3-2		Light set		
3-2.1	Before/ After	Light set	a. Ensure that light set, spare lamp, spare fuse, fuse holder, and support straps are in storage container. b. Check for damage such as cracked or broken parts. c. Check for moisture or mildew.	Parts of light set are broken or missing. Contact Unit Maintenance.
3-2.2	Before	Support straps	Check support straps for tears or fraying.	Support straps are frayed, broken, or missing. Contact Unit Maintenance.
3-2.3	Before/ During/ After	Luminaries	a. Ensure that luminaries, spare lamp, spare fuse, fuse holder, and support straps are in storage container. b. Check for damage such as cracked or broken parts. c. Clean light set by wiping with dry cloth.	Lamp is burned out or flickering.
3-2.4	Before/ After	Light filter	Check light filter for tears or punctures.	Light escapes through area other than designated opening in light filter.

2-4.3 Preventive Maintenance Checks and Services for the DTSS-L (V) 2 (Cont'd)

Table 2-64 Operator PMCS for DTSS-L (V) 2 (Cont'd)

Item No.	Interval	Location Item to Check/Service	Procedure	Not Fully Mission Capable if:
			WARNING Lethal voltage is present in light set when it is connected to power source. Disconnect light set from power source before inspecting or repairing any electrical component. Be careful not to contact electrical connections. Electrical shock and death can result from failure to heed this warning.	
3-2.5	Before	Luminaries cables	Check luminaries power cables for cracks, breaks, or frayed insulation.	Contact Unit Maintenance.
3-2.6	Before/ After	Storage container	Check storage container for damaged or missing hardware or for torn padding.	Storage container broken or missing parts.
3.3		Table		
3-3.1	Before	Table hinges	a. Check hinges for smooth operation. b. Check for cracks or breaks in hinges or braces.	Table does not fold or open. Bent or broken hinges or braces.

2-4.3 Preventive Maintenance Checks and Services for the DTSS-L (V) 2 (Cont'd)

Table 2-64 Operator PMCS for DTSS-L (V) 2 (Cont'd)

Item No.	Interval	Location Item to Check/Service	Procedure	Not Fully Mission Capable if:
3-4		Map board		
3-4.1	Before/ During/ After	Complexers, overlays, and locator assemblies	a. Ensure complexers snap together. b. Check for broken or scratched overlays. c. Check for presence and condition of locator assemblies.	Complexers broken or missing. Overlays not serviceable. Locator assembly missing. Contact Unit Maintenance.
3-5		Tent bootwall		
3-5.1	Before/ After	Poles and bootwall	Check for tears, broken fasteners, and bent poles.	Contact Unit Maintenance.
			NOTE If the equipment must be kept in continuous operation, do only the procedures that can be done without disturbing operation. Make complete checks and services when the equipment is shut down	

2-4.3 Preventive Maintenance Checks and Services for the DTSS-L (V) 2 (Cont'd)

Table 2-64 Operator PMCS for DTSS-L (V) 2 (Cont'd)

Item No.	Interval	Location Item to Check/Service	Procedure	Not Fully Mission Capable if:
4		WORKSTATION EQUIPMENT		
4-1	Weekly	Workstation	a. Check exterior for damage or loose hardware. b. Check for completeness. c. Clean exterior as required using mild detergent/glass cleaner and lint-free cloth.	Damaged beyond use. Contact Unit Maintenance.
4-1.1	Before	Cables	Ensure that cable connections are secure; tighten if necessary.	Damaged beyond use. Contact Unit Maintenance.
4-1.2	Before	LAN connector(s)	Inspect for T-connector and Terminator or cable on LAN connector.	Damaged beyond use. Contact Unit Maintenance.
4-1.3	Daily/as required	Air filter	WARNING Installing a wet filter may create a shock hazard that can result in serious injury or death. Clean/replace as required by performing the following procedure: 1. Power down workstation as per Paragraph 2-12. 2. Remove screws holding air filter bracket in place. 3. Clean as required by performing one of the following: a) Vacuum on both sides of the element (avoid touching element with the vacuum nozzle). b) Gently, dip the element in/out of a mild soap and-water solution until clean. Allow to air dry. DO NOT wring. (c) Gently tap the element against a hard flat surface (intake side down) until the excess dirt is knocked out.	Damaged beyond use. Contact Unit Maintenance.

2-4.3 Preventive Maintenance Checks and Services for the DTSS-L (V) 2 (Cont'd)

Table 2-64 Operator PMCS for DTSS-L (V) 2 (Cont'd)

Item No.	Interval	Location Item to Check/Service	Procedure	Not Fully Mission Capable if:
4-1.4	Before	LS-120 FDD drive	Check exterior for damage or loose hardware. Check for completeness. Inspect for operable condition.	Damaged beyond use. Contact Unit Maintenance.
4-1.4.1	During	LS-120 FDD drive	Inspect for damage to controls or for indicators not functioning.	
4-1.4.1.1	Weekly	LS-120 FDD drive	Clean exterior as required using mild detergent/glass cleaner and lint-free cloth. Clean as required using a commercial LS 120 cleaning kit. Follow kit instructions.	
4-1.5	Before	DVD-RAM drive	Check exterior for damage or loose hardware. Check for completeness. Inspect for operable condition.	Damaged beyond use. Contact Unit Maintenance.
4-1.5.1	During	DVD-RAM drive	Inspect for damage to controls or for indicators not functioning.	Damaged beyond use. Contact Unit Maintenance.
4-1.5.1.1	Weekly	DVD-RAM drive	Clean exterior as required using mild detergent/glass cleaner and lint-free cloth. Clean drive as required using a commercial cleaning kit. Follow kit instructions.	
4-1.6	Before	JAZ drive	Check exterior for damage or loose hardware. Check for completeness. Inspect for operable condition.	Damaged beyond use. Contact Unit Maintenance.
4-1.6.1	During	JAZ drive	Inspect for damage to controls or for indicators not functioning.	
4-1.6.1.1	Weekly	JAZ drive	Clean exterior as required using mild detergent/glass cleaner and lint-free cloth. Clean drive as required using a commercial cleaning kit. Follow kit instructions.	
4-1.7	Before	8-mm tape drive	Check exterior for damage or loose hardware. Check for completeness. Inspect for operable condition.	Damaged beyond use. Contact Unit Maintenance.
4-1.7.1	During	8-mm tape drive	Inspect for damage to controls or for indicators not functioning.	

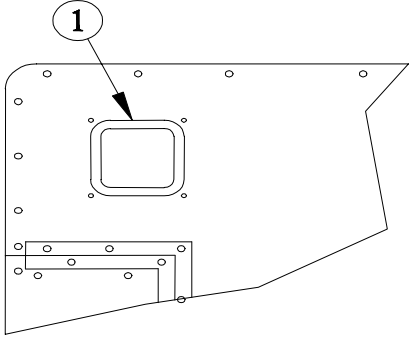
2-4.3 Preventive Maintenance Checks and Services for the DTSS-L (V) 2 (Cont'd)

Table 2-64 Operator PMCS for DTSS-L (V) 2 (Cont'd)

Item No.	Interval	Location Item to Check/Service	Procedure	Not Fully Mission Capable if:
4-1.7.1.1	Weekly	8-mm tape drive	Clean as required using a commercial cleaning kit. Follow kit instructions.	Damaged beyond use. Contact Unit Maintenance.
4-1.7.1.2	Monthly	8-mm tape drive	Clean the tape head after 30 hours of use or if the status lights display a warning fault.	
4-1.8	Daily/as required	RHDD drive	Inspect for damage to controls or for indicators not functioning.	Damaged beyond use. Contact Unit Maintenance.
5		CFPD		
5-1.1	Daily/as required	Display Panel	Clean as required using optical glass cleaning solution that will not harm optical coatings and lint-free cloth.	
5-1.2	Daily/as required	Cabinet exterior	a. Check exterior for damage or loose hardware. b. Clean as required using mild detergent/glass cleaner and lint-free cloth.	Damaged beyond use. Contact Unit Maintenance.

2-4.3 Preventive Maintenance Checks and Services for the DTSS-L (V) 2 (Cont'd)

Table 2-64 Operator PMCS for DTSS-L (V) 2 (Cont'd)

Item No.	Interval	Location	Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
5-1.3	Quarterly	Air filter	a. Clean/replace as required by performing the following: 1. Power down CFPD. 2. Unsnap air filter holder from CFPD (1) and carefully remove filter. 3. Place the new filter into position.  4. Replace the filter/cover and snap the fasteners in position.	Damaged beyond use. Contact Unit Maintenance.

2-4.3 Preventive Maintenance Checks and Services for the DTSS-L (V) 2 (Cont'd)

Table 2-64 Operator PMCS for DTSS-L (V) 2 (Cont'd)

Item No.	Interval	Location	Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
			5. If no replacement filters are available, clean the filters away from the air intakes by either of three options: a) Vacuum on both sides of the element (avoid touching element with the vacuum nozzle). b) Gently, dip the element in/out of a mild soap and-water solution until clean. Allow to air dry. DO NOT wring. (c) Gently tap the element against a hard flat surface (intake side down) until the excess dirt is knocked out.	
6		PRINTER		
6-1	Before/ During	HP Deskjet printer	Check exterior for damage or loose hardware. Check for completeness.	Damaged beyond use. Contact Unit Maintenance.
6-1.1	During	HP Deskjet printer	Inspect for operable condition and damage to controls or for indicators not functioning.	Damaged beyond use. Contact Unit Maintenance.
6-1.1.1	Weekly	HP Deskjet printer	Clean exterior as required using mild detergent/glass cleaner and lint-free cloth.	

2-4.3 Preventive Maintenance Checks and Services for the DTSS-L (V) 2 (Cont'd)

Table 2-64 Operator PMCS for DTSS-L (V) 2 (Cont'd)

Item No.	Interval	Location	Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
7		PERIPHERAL EQUIPMENT		
7-1	Before/ During	RAID	Check exterior for damage or loose hardware. Check for completeness.	Damaged beyond use. Contact Unit Maintenance.
7-1.1	During	RAID front and rear panel	Inspect for operable condition and damage to controls or for indicators not functioning. See Table 2-43 for LED status indicators and icons.	Damaged beyond use. Contact Unit Maintenance.
7-1.1.1	Weekly	RAID front panel	Clean exterior as required using mild detergent/glass cleaner and lint-free cloth	
			<u>CAUTION</u> Do not use alcohol or benzene to clean the disk media. Avoid getting fingerprints or foreign substances on the surface of the disk media during cleaning.	
7-2	Before/ During	CD–RW	Check exterior for damage or loose hardware. Check for completeness.	Damaged beyond use. Contact Unit Maintenance.
7-2.1	Before/ During	CD–RW	Inspect for operable condition and damage to controls or for indicators not functioning.	Damaged beyond use. Contact Unit Maintenance.
7-2.1.1	Weekly	CD–RW	Clean exterior as required using mild detergent/glass cleaner and lint-free cloth. Clean drive as required using a commercial cleaning kit. Follow kit instructions	

2-4.3 Preventive Maintenance Checks and Services for the DTSS-L (V) 2 (Cont'd)

Table 2-64 Operator PMCS for DTSS-L (V) 2 (Cont'd)

Item No.	Interval	Location	Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
7-3	Before/ During	SCSI switch	Check exterior for damage or loose hardware. Check for completeness.	Damaged beyond use. Contact Unit Maintenance
7-3.1	Before/ During	SCSI switch	Inspect for operable condition and damage to controls or for indicators not functioning.	Damaged beyond use. Contact Unit Maintenance.
7-3.1.1	Weekly	SCSI switch	Clean external surface as required using mild detergent/glass cleaner and lint-free cloth.	
7-4	Before/ During	KVM switch	Check exterior for damage or loose hardware. Check for completeness.	Damaged beyond use. Contact Unit Maintenance.
7-4.1	Before/ During	KVM switch	Inspect for operable condition and damage to controls or for indicators not functioning.	Damaged beyond use. Contact Unit Maintenance.
7-4.1.1	Weekly	KVM switch	Clean external surface as required using mild detergent/glass cleaner and lint-free cloth	
7-5	Before/ During	Scanner	Check exterior for damage or loose hardware. Check for completeness. Check cable connections. (See Paragraph 2-11.3.1 for how to access the rear of the scanner.)	Damaged beyond use. Contact Unit Maintenance.
7-5.1	During	Scanner	Inspect for operable condition and damage to controls or for indicators not functioning. Use the scanner software on the workstation to obtain error codes and status messages.	Damaged beyond use. Contact Unit Maintenance.
7-5.1.1	Weekly	Scanner	Clean optical glass as required using glass cleaner and lint-free cloth.	

2-4.3 Preventive Maintenance Checks and Services for the DTSS-L (V) 2 (Cont'd)

Table 2-64 Operator PMCS for DTSS-L (V) 2 (Cont'd)

Item No.	Interval	Location	Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
7-6	Before/ During	DLT Autoloader	Check exterior for damage or loose hardware. Check for completeness.	Damaged beyond use. Contact Unit Maintenance.
7-6.1	Before/ During	DLT Autoloader	Inspect for operable condition and damage to controls or for indicators not functioning.	Damaged beyond use. Contact Unit Maintenance.
7-6.1.1	Weekly	DLT Autoloader	Clean external surfaces as required using mild detergent/glass cleaner and lint-free cloth.	
7-8	Before/ During	Plotters	Check exterior for damage or loose hardware. Check for completeness. Check cable connections. (See Paragraph 2-11.1.1 for how to access the rear of the plotter.)	Damaged beyond use. Contact Unit Maintenance.
7-8.1	Before/ During	Plotters	Inspect for operable condition and damage to controls or for indicators not functioning.	Damaged beyond use. Contact Unit Maintenance.
7-8.1.1	Weekly	Plotters	Clean external surfaces as required using mild detergent/glass cleaner and lint-free cloth.	
7-8.1.2	Before/ After	Plotters	Check interior for paper coating dust and damage to paper feeder wheels.	Damaged beyond use. Contact Unit Maintenance.

2-4.3 Preventive Maintenance Checks and Services for the DTSS-L (V) 2 (Cont'd)

Table 2-64 Operator PMCS for DTSS-L (V) 2 (Cont'd)

Item No.	Interval	Location	Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
7-9	Weekly	Laptop Computer	Check exterior for damage or loose hardware. Check for completeness. Clean exterior as required using mild detergent/glass cleaner and lint-free cloth.	Damaged beyond use. Contact Unit Maintenance.
7-9.1	Before	Cables	Ensure laptop cable connections and (if used) connections to SCSI booster and emulator are secure; tighten if necessary.	Damaged beyond use. Contact Unit Maintenance.
7-9.1.1	Daily/as required	Floppy Disk Drive/DVD-ROM drive	Clean 3.5 FDD as required using commercial cleaning kit. Clean DVD-ROM drive using commercial cleaning kit. Follow kit directions.	

2-4.3 Preventive Maintenance Checks and Services for the DTSS-L (V) 2 (Cont'd)

Table 2-64 Operator PMCS for DTSS-L (V) 2 (Cont'd)

Item No.	Interval	Location	Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
7-10	Weekly	Ethernet Switch	Check exterior for damage or loose hardware. Check for completeness. Inspect for operable condition and damage to controls or for indicators not functioning. Clean exterior as required using mild detergent/glass cleaner and lint-free cloth.	Damaged beyond use. Contact Unit Maintenance. Damaged beyond use. Contact Unit Maintenance.
7-10.1	Before/ During			
7-10.1.1	Weekly			
7-11	Before/ During	Media Converter	Check exterior for damage or loose hardware. Check for completeness. Inspect for operable condition and damage to connectors or for indicators not functioning. Clean exterior as required using mild detergent/glass cleaner and lint-free cloth.	Damaged beyond use. Contact Unit Maintenance. Damaged beyond use. Contact Unit Maintenance.
7-11.1	Before/ During			
7-11.1.1	Weekly			
7-12	Before/ During	SCSI Booster Power Supply	Check exterior for damage or loose hardware. Check for completeness. Inspect for operable condition and damage to controls or for indicators not functioning.	Damaged beyond use. Contact Unit Maintenance. Damaged beyond use. Contact Unit Maintenance.
7-12.1	Before/ During			
7-13	Before/ During	SCSI Booster	Check exterior for damage or loose hardware. Check for completeness. Inspect for operable condition and damage to connectors or for indicators not functioning. Clean exterior as required using mild detergent/glass cleaner and lint-free cloth.	Damaged beyond use. Contact Unit Maintenance. Damaged beyond use. Contact Unit Maintenance.
7-13.1	Before/ During			
7-13.1.1	Weekly			
7-14	Before/ During	SCSI Switch	Check exterior for damage or loose hardware. Check for completeness. Inspect for operable condition and damage to controls or for indicators not functioning. Clean exterior as required using mild detergent/glass cleaner and lint-free cloth.	Damaged beyond use. Contact Unit Maintenance. Damaged beyond use. Contact Unit Maintenance.
7-14.1	Before/ During			
7-14.1.1	Weekly			

2-4.3 Preventive Maintenance Checks and Services for the DTSS-L (V) 2 (Cont'd)

Table 2-64 Operator PMCS for DTSS-L (V) 2 (Cont'd)

		Location		
Item No.	Interval		Procedure	Not Fully Mission Capable if:
7-15	Before/ During	Netra Server	Check exterior for damage or loose hardware. Check for completeness.	Damaged beyond use. Contact Unit Maintenance.
7-15.1	Before/ During		Inspect for operable condition and damage to controls or for indicators not functioning.	Damaged beyond use. Contact Unit Maintenance.
7-15.1.2	Weekly		Clean exterior as required using a lint-free cloth.	
8		COMMUNICATIONS EQUIPMENT		
8-1	Before/ During	STE	Check exterior for damaged or loose hardware. Check for completeness. Inspect for operable condition.	Damaged beyond use. Contact Unit Maintenance
8-1.1	Weekly/ As Required		Unplug the terminal prior to cleaning. Clean surfaces of the terminal using nonabrasive cleaner and a soft, lint free cloth. Do not apply the cleaner directly to terminal surfaces but rather apply cleaner to cloth and then clean terminal. NOTE Avoid accidentally programming or erasing any memory dialer buttons during cleaning.	
8-1.1.2	Before/ After		Ensure that cables between the STE and the tactical wedge adapter are serviceable and secure.	Damaged beyond use. Contact Unit Maintenance

2-4.3 Preventive Maintenance Checks and Services for the DTSS-L (V) 2 (Cont'd)

Table 2-64 Operator PMCS for DTSS-L (V) 2 (Cont'd)

Item No.	Interval	Location	Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
9		GPFU		
9-1	Before/ After	GPFU Module Hoses	Check for cracks and loose hoses.	Damaged beyond use. Contact Unit Maintenance. System is non-functional. Contact Direct Support.
9-1.1	Weekly	GPFU System	Turn GPFU ON.	
9-1.1.2	Before/ During	Air Blower	Check exterior for damaged, loose, or missing hardware.	
9-1.1.3	Weekly/ As required	Air Blower Filter	Clean filter using one of the following methods: a) Vacuum on both sides of the element (avoid touching element with the vacuum nozzle). b) Gently, dip the element in/out of a mild soap and-water solution until clean. Allow to air dry. DO NOT wring. (c) Gently tap the element against a hard flat surface (intake side down) until the excess dirt is knocked out.	

SECTION III OPERATION UNDER USUAL CONDITIONS

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2-5 SCOPE

This section contains information for operating the DTSS-L (V) 2 under usual conditions. Overview operating information is presented in the following paragraphs.

2-6 GENERAL OPERATING OVERVIEW

The following lists summarize the major tasks required to operate the DTSS-L (V) 2 under usual conditions. Your Unit Standard Operating Procedure (USOP) establishes the exact sequence in which these tasks are performed. However, the daily routine will generally follow the sequence shown in the operational flowchart. Special procedures for operating under unusual conditions are provided in Section IV of this chapter.

2-7 EMPLACEMENT

The emplacement procedure is based upon one system, consisting of one HMMWV-ECV with one LMS (S-788/G) shelter, one generator, and one Standardized Integrated Command Post System (SICPS) tent with boot wall. Procedures are provided for:

- Site Selection
- Positioning and disconnecting the generator
- Positioning the HMMWV-ECV
- Connecting power cables between generator and shelter
- Grounding the DTSS-L (V) 2
- Opening the shelter entry door
- Preparing the DTSS-L (V) 2 shelter
- Connecting data/signal cables
- SICPS tent assembly

INITIAL SETUP (GROUNDING)

Personnel Required: two (per vehicle)

References: TM 9-6115-642-10
 TM 9-6115-660-13&P
 TM 11-6675-295-10 App. E

2-7 EMPLACEMENT (Cont'd)

Tools:

Hammer slide
Shovel
Flat tip screwdriver
SWGS (kit)

Materials/Supplies:

Ground rods (3 or as required)
Additional items, as required by local USOP

2-7.1 Site Selection

- a. Select a site as level as possible to locate single or multiple shelters.
- b. Select a site that has sufficient space to include extension tents.
- c. Ensure accessibility for tactical vehicles.
- d. Ensure that there are no overhead obstructions (e.g., electrical wires).

2-7.1.1 Position and Disconnect the Generator

The generator is positioned as directed by USOP. Emplacement procedures for the generator are found in TM 9-6115-642-10, TM 9-6115-660-13&P and in this section of the manual.

WARNING

Exhaust discharge contains deadly gases. Do not operate the generator set in enclosed areas unless exhaust discharge is properly vented outside. Severe personal injury or death due to carbon monoxide poisoning could result.

NOTE

Ensure that the HMMWV-ECV and generator are on level ground.

- a. Apply handbrakes.
- b. Pull out the plunger and lower front support leg. Lock front support leg in lowered position by pushing plunger in all the way.
- c. Lift receptacle cover of HMMWV-ECV from slot and disconnect plug of intervehicular cable from vehicle receptacle.

2-7.1.1 Position and Disconnect the Generator (Cont'd)

- d. Lift receptacle cover of HMMWV-ECV from slot and disconnect plug of intervehicular cable from vehicle receptacle.
- e. Pull back latch. Latch cover of intervehicular cable is spring-loaded to close.
- f. Remove breakaway chain from the towing vehicle. Remove two safety chains from the towing vehicle eyebolts.
- g. Remove safety pin from pintle hook.
- h. Pull up on locking latch and open pintle hook.

WARNING

Draw bar is a heavy, 280-lb (128 kg) loaded tongue weight. Failure to follow this warning may cause trailer to tip, resulting in serious injury to personnel.

- i. If equipped with fixed front support leg, lift drawbar coupler from pintle hook.
- j. If equipped with adjustable front support leg, use hand crank to adjust height of drawbar coupler. Remove drawbar coupler from pintle hook.
- k. Close pintle hook. Pull up on the pintle hook to ensure that locking latch is engaged. Install safety pin.
- l. If equipped, pull out on release handle and lower rear stabilizer. Turn foot assembly until it firmly contacts the ground.

WARNING

Position DTSS-L (V) 2 a minimum of 6 m (approximately 20 ft) any system with a Very High Frequency (VHF) receiver. Failure to follow this warning may cause interference to VHF receiver.

2-7.1.2 Position the HMMWV-ECV

The shelter is positioned as directed by USOP. The distance between the HMMWV-ECV and the generator must not exceed the 50-foot length of the shelter ground cable.

- a. Set the vehicle brake and block the wheels in the selected site.
- b. Remove the ladder from the rear door by undoing the retaining straps and placing on the ground.
- c. Place the attachment device on the top of the ladder into the mounts below the rear door.

2-7.2 Open the Shelter Entry Door

The DTSS-L (V) 2 shelter entry door must be opened to retrieve equipment and check the power distribution panel prior to emplacement. To open the shelter entry door do the following:

- a. Unlock the combination lock.
- b. Unlock the cipher lock.
- c. Open GPFU over pressure vent in shelter door.
- d. Open the door using the door handle.

2-7.3 Grounding the DTSS-L (V) 2

There are two means of grounding the DTSS-L (V) 2 shelter:

- The SWGS is the primary grounding for the shelter.
- Standard MilSpec ground rods are the secondary grounding for the shelter.

The preferred method for grounding a single DTSS-L (V) 2 shelter deployed is by using the SWGS. Other options may be available, but the major concerns of safety must be satisfied prior to operation of the system. Procedures for the preferred method are contained in the following paragraphs.

WARNING

All communications-electronics equipment shall be grounded or bonded to the shelves. The shelves, in turn, are bonded to the racks, which are bonded to the vehicle. The vehicle is grounded by the SWGS or a grounding rod assembly. Incorrect or no grounding of equipment can result in serious electrical shock or death. See Figures E-1 through E-13, App. E, Safe Grounding of Communications-Electronic Equipment in the Field for information on grounding.

2-7.3.1 Grounding a Single DTSS-L (V) 2 Shelter

When a single DTSS-L (V) 2 shelter is deployed, the SWGS and ground rod should be used. (Refer to Appendix E.)

- a. Select a ground cable layout that will allow no or little interference with personnel traffic and power/signal cables.
- b. Position the shelter as required by USOP.
- c. Remove the ground rods, cables, clips, slide hammer, and SWGS storage in the shelter and generator set.

2-7.3.1 Grounding a Single DTSS-L (V) 2 Shelter (Cont'd)

- d. Confirm that all CBs and equipment power switches are turned off.
- e. Extend SWGS cable (1) out to full length as shown in Figure 2-64 (1 of 2) so that the loose end comes within 10 feet of the roadside rear corner.
- f. Attach one 10-ft wire from roadside rear corner (7) bumper to the SWGS cable with 75-A copper clips.
- g. Attach one 10-ft wire from roadside front bumper (3) to the SWGS cable with 75-Ampere copper clips.
- h. Attach end of SWGS ground cable to ground stud on PEP (2).
- i. Starting near PEP, using the sledgehammer, drive the SWGS pegs along the approximately 70-ft cable (1) so cable can lie on top of ground. Evenly space the pegs.
- j. Using the hammer slide and ground rod, drive rod(s) into ground (5) where ground cable from shelter can be connected (use rods as required by soil type).
- k. Attach the ground cable (4) to the ground rod using the clip.
- l. Attach the other end of the ground cable to the PEP (2).
- m. Extend generator ground cable (6) from the generator to the ground rod (5).
- n. Attach the ground cable (6) from generator to the ground rod using the clip.
- o. Attach the ground cable (6) to the generator.
- p. For generator connections required, see Paragraph 2-7.4.

When the DTSS-L (V) 2 shelter is deployed less than 8 ft from other operating systems, the SWGS should not be used. Refer to Figure 2-64 (2 of 2).

- a. Select a ground cable layout that will allow little or no interference with personnel traffic and power/signal cables.
- b. Position the shelters side by side, facing the same direction, less than 8 ft apart.

2-7.3.1 Grounding a Single DTSS-L (V) 2 Shelter (Cont'd)

- c. Remove the ground rods (three), cables (six), clips (four), and slide hammer from storage in the shelter and generator set.
- d. Confirm that all CBs and equipment power switches are turned off.
- e. Extend the ground cable (1 per shelter) from the PEP to a point near the front of the shelters.
- f. Connect the ground cable (1) to the PEP on each shelter.
- g. Connect the ground cable from the PEP of each shelter to the ground rod.
- h. Extend the ground cable (1 per generator) from the generator to the ground rod.
- i. Connect the ground cable (2) from each generator (roadside front, just beneath the accessory box) to the ground rod using the clip on the ground rod.
- j. Extend the ground cable (1 per generator) from the generator to the respective PEP.
- k. Connect the ground cable (3) from each generator to the respective PEP.

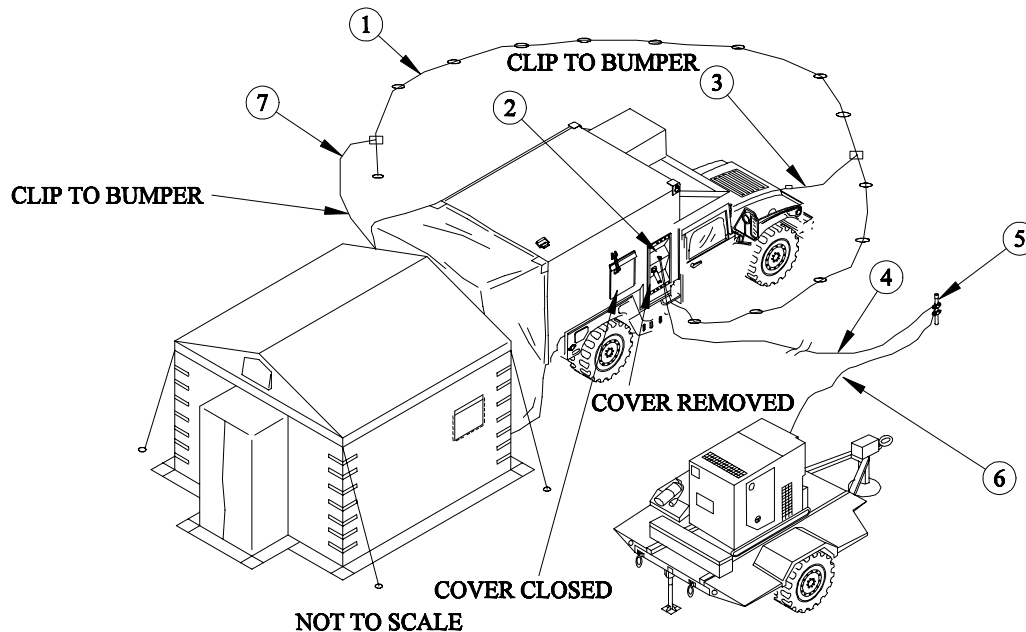


Figure 2-64 Grounding a DTSS-L (V) 2 Deployed (1 of 2)

2-7.4 Connect Power Cables Between Generator and Shelter

The procedures for connecting the power cable include the following:

- a. Remove the power cable from the storage compartment on the curbside of the shelter.
- b. Deploy the cable between the generator and the shelter.
- c. Remove and inspect for damage to the dust covers on each end of the cable.
- d. Connect the cable to the shelter PEP after removing and inspecting the dust cover from the PEP. Report any damage to your supervisor. Be sure to turn the cable collar clockwise until hand tight.
- e. Remove the 10-ft cable with 5-wire connection, if required, from storage and inspect for damage.
- f. Connect the 5-wire connection end of the 10-ft cable to the generator. Refer to TM 9-6115-642-10 or TM 9-6115-660-13&P.

5-wire connection

Connect the BLACK cable wire, Phase A, to Generator L1 terminal.
Connect the RED cable wire, Phase B, to Generator L2 terminal.
Connect the BLUE cable wire, Phase C, to Generator L3 terminal.
Connect the WHITE cable wire, NEUT, to Generator L0 terminal.
Connect the GREEN cable wire, GND, to Generator GND terminal.

WARNING

Be sure to install the ground cable between the generator and shelter for proper grounding of the system. Loose or broken ground and power connections can cause electrical shock or death. Serious personnel injury or death may result from failure to observe this warning.

CAUTION

Loose or broken ground and power connections can cause fires or electrical system anomalies (i.e. EMI). All cable and clamp connections must be tight before power is applied. Do not start generator at this time, or equipment damage may result.

- g. Connect the 50-ft cable to the 10-ft cable. Be sure to turn the cable collar clockwise until hand tight.
- h. Recheck all ground and power connections. Verify all connections for tightness.

2-7.4 Connect Power Cables Between Generator and Shelter (Cont'd)

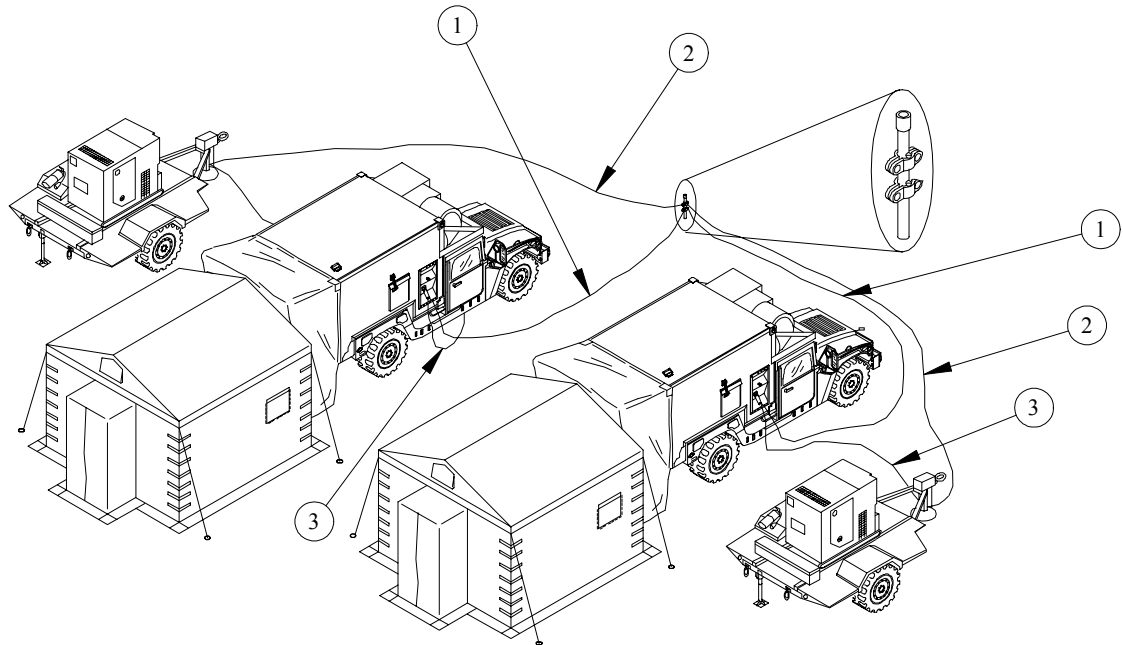


Figure 2-64 Grounding a DTSS-L (V) 2 Deployed (2 of 2)

2-7.5 Standardized Integrated Command Post System Tent Assembly Procedures

The SICPS abbreviated tent assembly setup procedures are provided in the following paragraphs. For detailed setup procedures, refer to TM 11-5410-229-12&P. A typical component-cabling diagram using CHS equipment in the SICPS tent can be found in Paragraph 2-8. These procedures require at least three personnel.

WARNING

Failure to follow tie-down and staking instructions may result in possible injury to personnel and damage to equipment. Weight of each tent transport bag with appropriate parts is a three-person load.

2-7.5.1 Tent Frame Assembly (Figure 2-65, 1 of 4)

CAUTION

Do not stand or walk on tent frame assemblies. They can be damaged by misuse. When handling tent frame, do not twist or force the frame. Unfold frame and set it on the ground. Do not pick up the frame to unfold it, as this will cause binding of the fitting assemblies and damage to the frame.

2-7.5.1 Tent Frame Assembly (Cont'd)

NOTE

Erecting the tent frame assembly requires at least two persons.

- a. Unpack tent assembly components from transport bags.
- b. Perform PMCS on tent assembly components per Table 2-65
- c. Unpack three frame assemblies.

There are two identical end frame assemblies (1) and one center assembly (2).

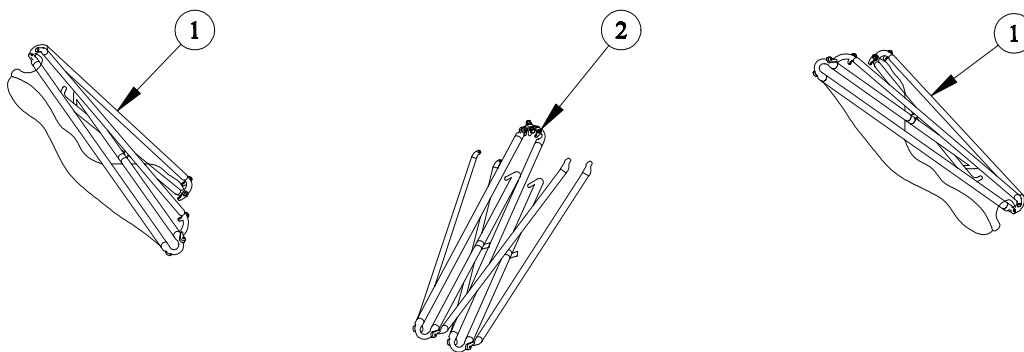


Figure 2-65 Frame Assemblies (1 of 4)

- d. Lay three frame assemblies on ground (Figure 2-65, 2 of 4).
- e. Put center assembly (2) between end of two end assemblies (1).
- f. Ensure that the ridgepole (3) on each end assembly (1) is on top.
- g. Unfold roof poles (4) on each frame assembly away from center as far as they will go.

Each frame assembly should form a “V” and will form the roof peak (6).

NOTE

Do not unfold the legs (5) yet.

- h. Lock the roof poles (4) into place at the peak by turning the locking lever (7) on each pole (4) downwards until it is tight and the poles (4) cannot move.

2-7.5.1 Tent Frame Assembly (Cont'd)

Complete this process for each of the frame assemblies.

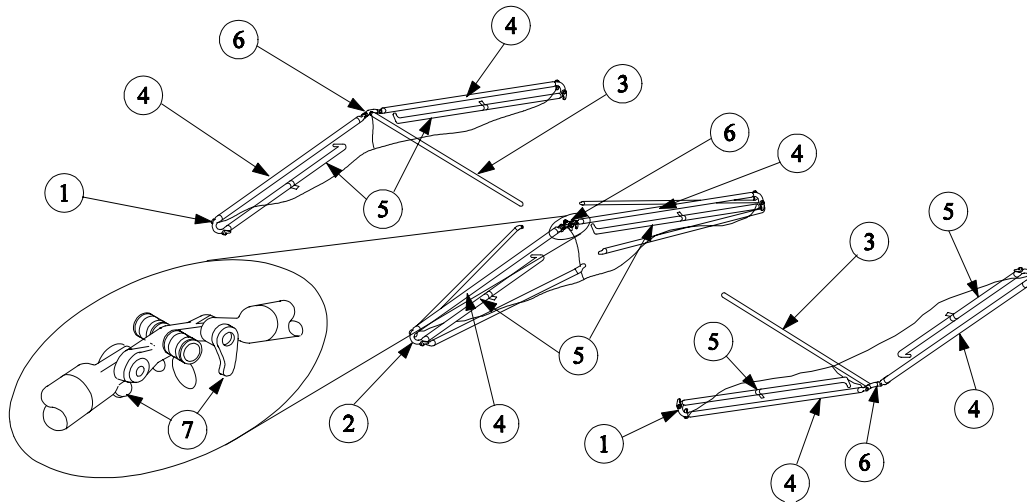


Figure 2-65 Frame Assemblies (2 of 4)

- i. Rotate center frame assembly (2) up and unfold four side poles (8) (on center frame piece) (Figure 2-65, 3 of 4).

They form the base with the peak located in the middle of the base.

- j. Lock these into place with locking lever (7) on each pole by turning the lever (7) towards the center.
- k. Rotate ridgepole (3) of each end frame assembly (1) so that it points into the air. Lock in place with the locking lever (7) on the ridgepole (3) (Figure 2-65, 3 of 4).

NOTE

Do not force the plug into the socket. If the plug does not fit easily, pull the pull-pin and wiggle the plug into the socket.

When viewed from above, the center frame assembly (2) appears in the shape of an “H.”

- l. Rotate one of end frame assemblies (1) so the plug end (9) of the ridgepole (3) is facing the peak of the center frame assembly (2) (Figure 2-65, 4 of 4).
- m. Push plug end (9) into other socket (10) on top of peak of center assembly (2) and lock into place.

2-7.5.1 Tent Frame Assembly (Cont'd)

- n. Repeat steps l and m for other end frame assembly (1).

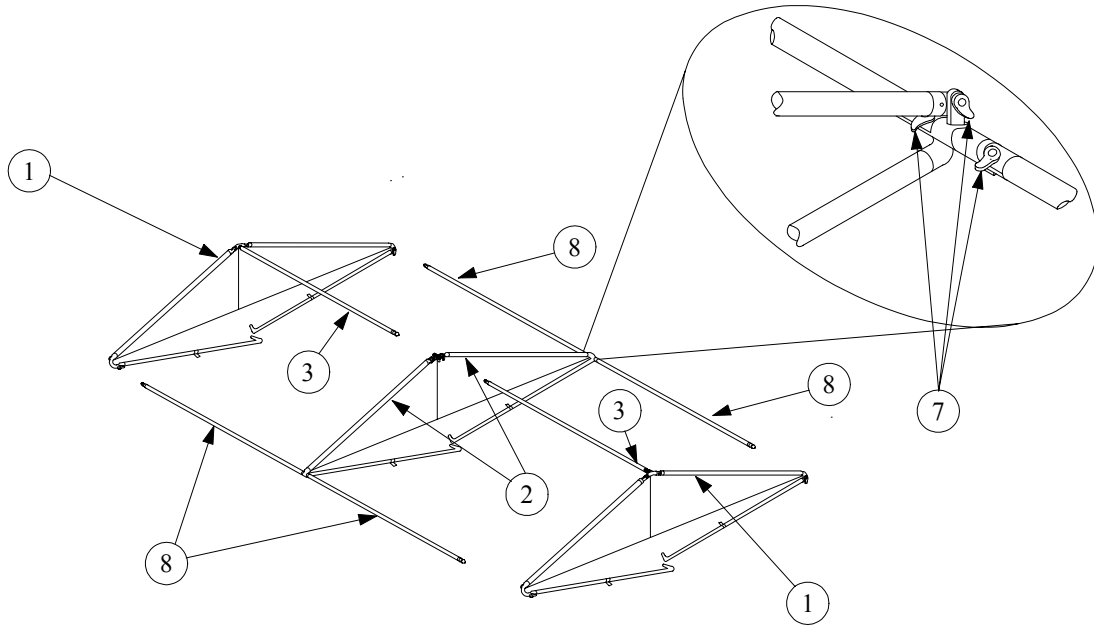


Figure 2-65 Frame Assemblies (3 of 4)

- o. Connect side poles (8) from center frame assembly (2) to corners of end frame assemblies (1) at plug and socket corners (11)(Figure 2-65, 4 of 4). Lock four side poles (8) by turning locking lever (7).

2-7.5.1 Tent Frame Assembly (Cont'd)

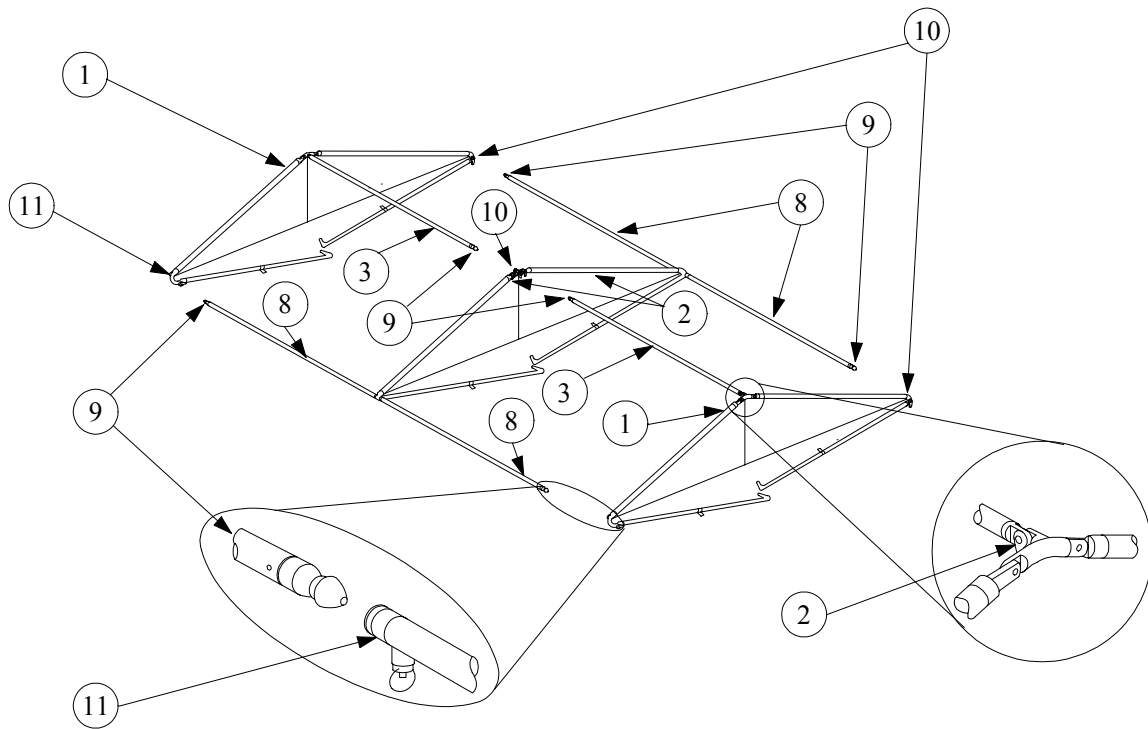


Figure 2-65 Frame Assemblies (4 of 4)

2-7.5.2 Roof Installation

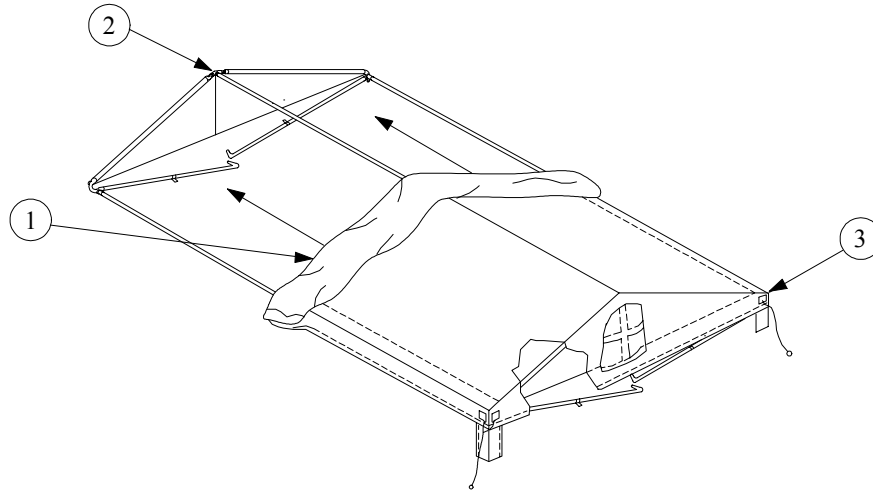
- a. Lift folded tent roof (1) and align it along center peak support (2).

NOTE

Locate the stovepipe opposite the door end of the tent. Vents are at the ends of the tent. See Figure 2-65, (1 of 4).

2-7.5.2 Roof Installation (Cont'd)

- b. Unfold one half of the roof (1) and stretch it over the corners of the tent frame (3) with vent perpendicular to center ridge.

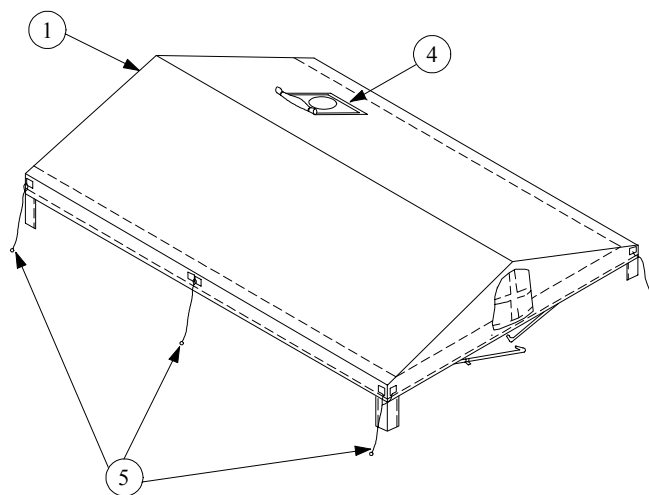
**Figure 2-66 Roof Installation (1 of 3)**

- c. Repeat step b for other half of roof (1) (Figure 2-66, 2 of 3).
- d. Open stove pipe opening (4) if applicable.

NOTE

Stovepipe opening is positioned toward shelter end of tent.

- e. Free six tent lines, three on each side (5), on the roof (1).

**Figure 2-66 Roof Installation (2 of 3)**

2-7.5.2 Roof Installation (Cont'd)

WARNING

Do not use steps f and g at night or in other conditions of poor visibility. Failure to follow tie-down and staking instructions may result in possible injury to personnel and damage to equipment.

NOTE

The following procedures help in roof installation in moderate to high winds.

- f. Place stakes (6) in the ground at a 45° angle, about seven feet from each corner of the tent frame (3) (Figure 2-66, 1 of 3).
- g. Loop the anchor ropes (7) at each corner over the stakes (6).
- h. Leave the ropes (7) loose enough to raise tent frame.

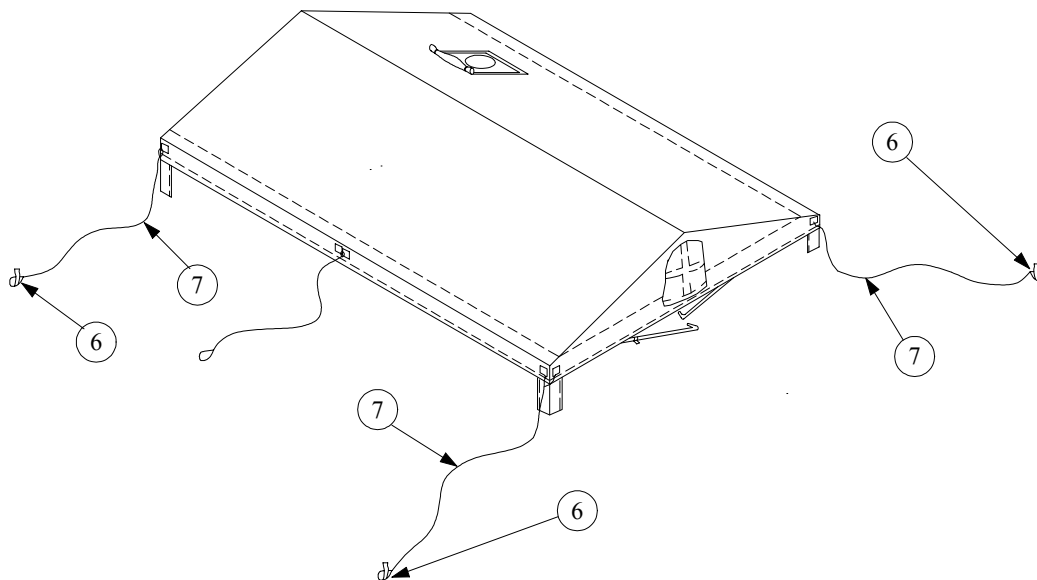


Figure 2-66 Roof Installation (3 of 3)

2-7.5.3 Unfold and Set Tent Frame Legs to Half Height

- a. Select one side with three legs (1) and lift frame (2) up to about one-half height at two corners and rotate legs (1) out until they stop.
- b. Lock legs (1) into position by turning locking lever (3) downwards until tight.

2-7.5.3 Unfold and Set Tent Frame Legs to Half Height (Cont'd)

- c. Rotate center leg (4) out until it stops; tighten the same way.
- d. Repeat for other side.

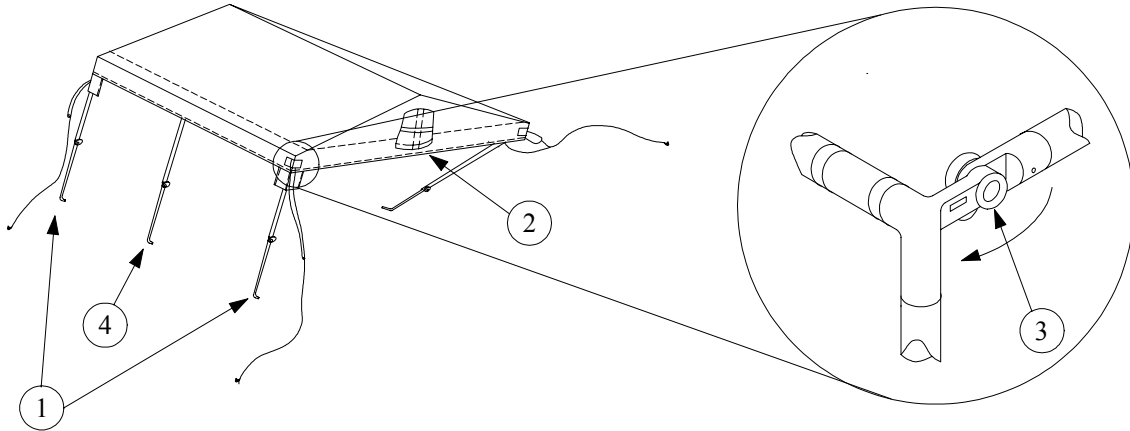


Figure 2-67 Unfolding Tent Frame Legs

2-7.5.4 Anchoring Roof Cap

- a. Pull roof cap (1) tight across frame (2) and over four corners.
- b. Snug corner tent lines (3) to keep roof cap (1) in place.
- c. On inside of frame (2) locate, buckle, and tighten set of buckles (4) on reinforced roof straps (5) that are on sides of roof cap (1).
- d. Ensure that straps (5) are tight to eliminate any sag in roof cap (1).

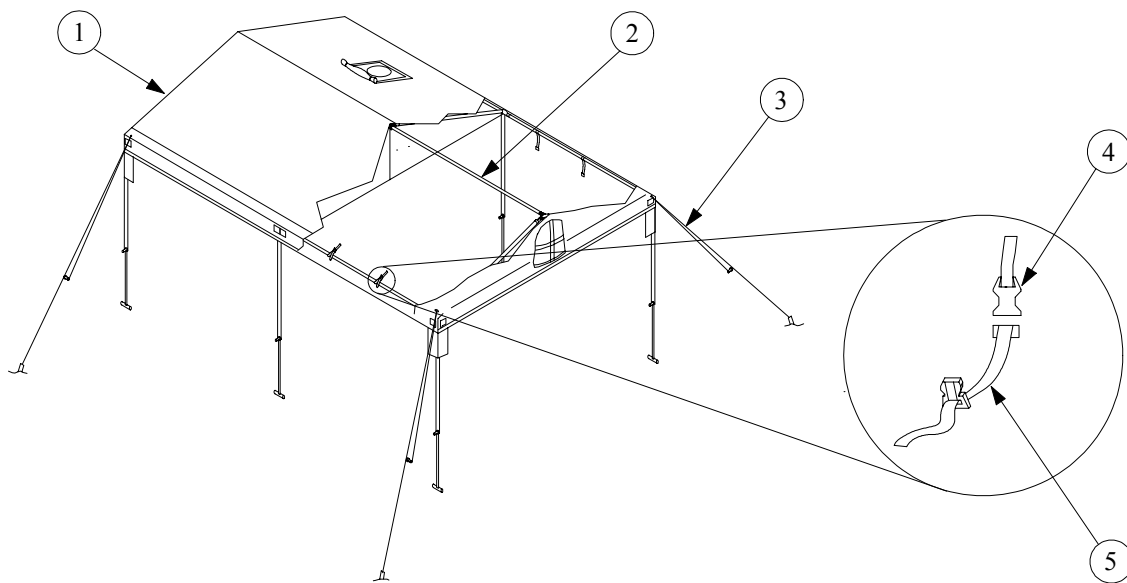


Figure 2-68 Anchoring Roof Cap

2-7.5.5 Light Set Installation

NOTE

Install light set before raising tent to full height. This avoids unsafe working conditions resulting from attempts to install the luminaries at full tent height. Ensure that male connector is toward power source.

- a. Connect hooks of two luminaries support straps (1) to center ridgepole (3) of frame and hang luminaries (2) with male connector end of one luminary facing the female connector end of second luminaries.
- b. Connect luminaries male connector (5) to female connector (6) above luminaries.
- c. Connect remaining male connector (5) to power source.

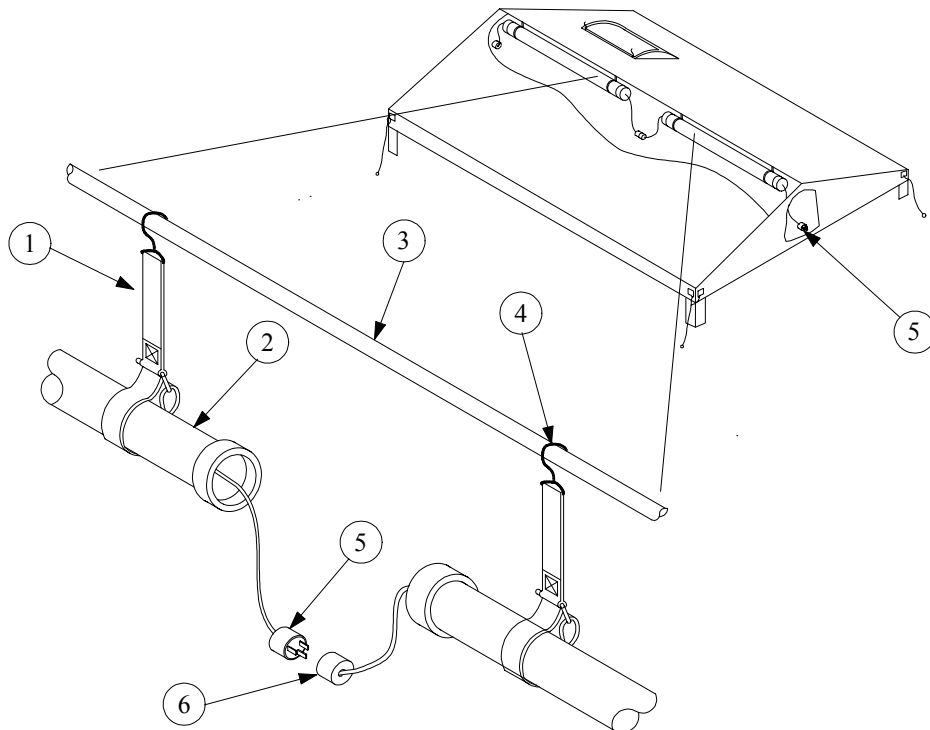


Figure 2-69 Light Set Installation

2-7.5.6 Extending Tent Frame To Full Height

CAUTION

Do not twist or turn tent frame. Damage to frame can result.

- a. Loosen all roof tent cap lines (1).
- b. Choose one of the sides with three legs (2).
- c. Place one person at each corner.

NOTE

Do not extend center legs yet

- d. Lift tent frame (3) and pull pin (4) on base of each leg assembly (5). Pull leg extensions (6) out until they lock. (Intermediate holes are provided for final height adjustment.)
- e. Extend and lock center legs (7).
- f. Repeat steps c, d, and e for other side.

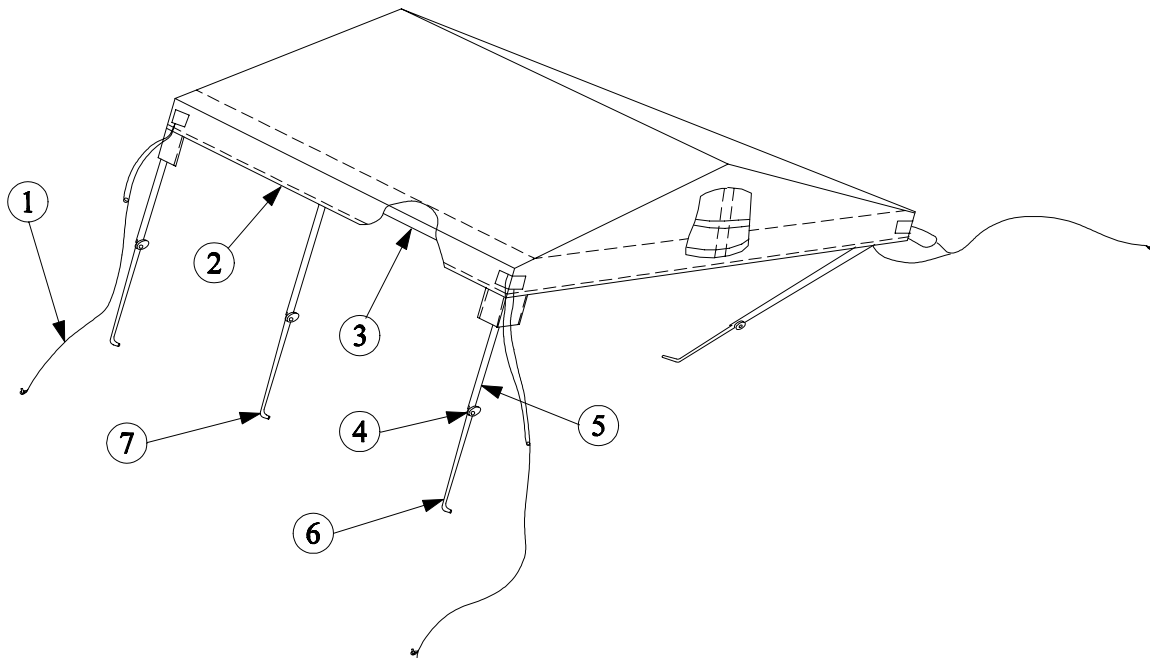


Figure 2-70 Extending Tent Frame To Full Height (1 of 2)

2-7.5.6 Extending Tent Frame To Full Height (Cont'd)

- g. Adjust roof tent cap lines (1) as required (Figure 2-70, 2 of 2).
- h. Stake tent frame feet (8) down with steel tent pins (9).
- i. Install floor (10), black side down, by spreading it inside tent frame (3).

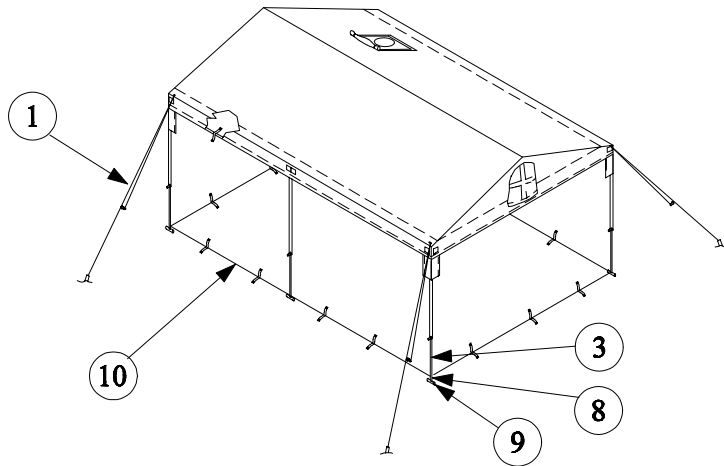


Figure 2-70 Extending Tent Frame To Full Height (2 of 2)

2-7.5.7 Wall Installation

- a. Stand inside the tent frame (1) and align either a window wall (3) or plain wall (2) to corner of tent frame (Figure 2-71, 1 of 2).
- b. Buckle wall to roof (4).
- c. Fasten hook and loop (5), attaching from center out.
- d. Repeat steps a and b for other walls (7) and entranceway wall (6).

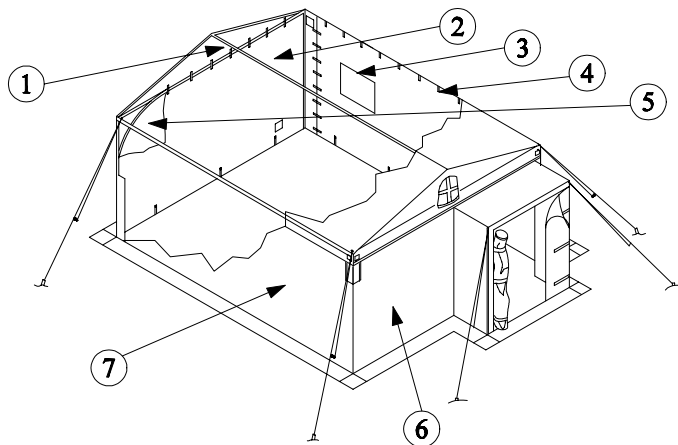
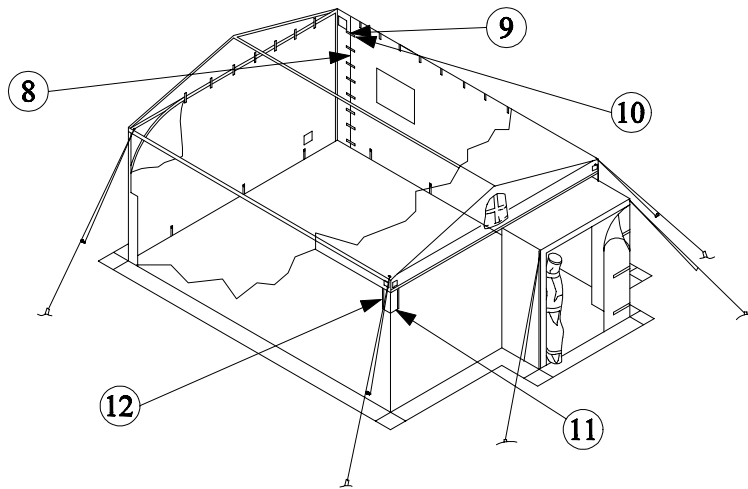


Figure 2-71 Wall Installation (1 of 2)

2-7.5.7 Wall Installation (Cont'd)

- e. Overlap tent fabric (8) at corners of four walls.
- f. Fasten buckles (9) and tighten straps (10) in all corners.
- g. Fasten outside tent wall buckles (11).
- h. If a liner is not used, buckle edges of floor (12) to walls (3 buckles per side).
- i. Pull down outside corner flaps on roof.

**Figure 2-71 Wall Installation (2 of 2)**

2-7.5.8 Tent Liner Installation (if applicable)

- a. Unfasten buckles (1) on walls (2) and let buckles fall free so walls hang by hook and loop (3) only.
- b. Attach tent liners (4) behind legs (5) in front of walls (6) (2) along horizontal top frame.

NOTE

Liners attach with hook and loop over top of walls and also attach with buckles that will match top half of the buckles just unfastened. Refer to Paragraph 2-7.5.7 for procedure.

- c. Buckle the floor (7) to the liner (4) (3 buckles per side).

2-7.5.8 Tent Liner Installation (Cont'd)

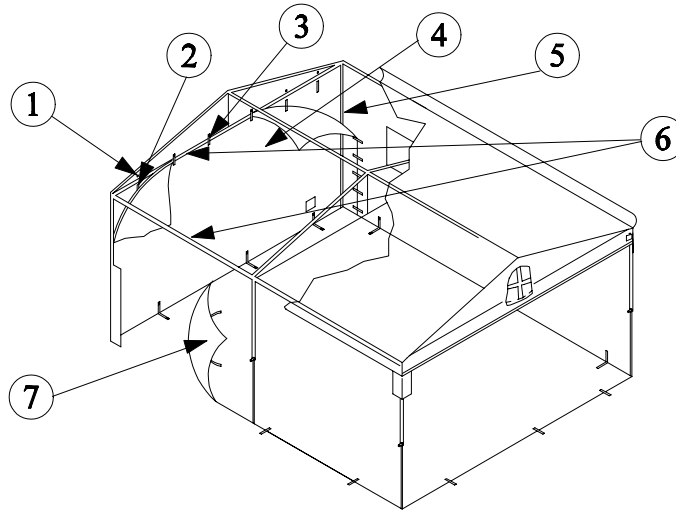


Figure 2-72 Tent Liner Installation

2-7.5.9 Entrance Way Installation

- a. Put bottom of aluminum telescopic poles (1) through two loops (2) on each side of the entrance with pointed end facing up.
- b. Put the pointed end in grommet (3) in webbing (4) on top of each side of entranceway (5).
- c. Extend bottom of poles (1) through grommets (6) in bottom corners.
- d. Use two tent lines (7) to anchor the entranceway (5).

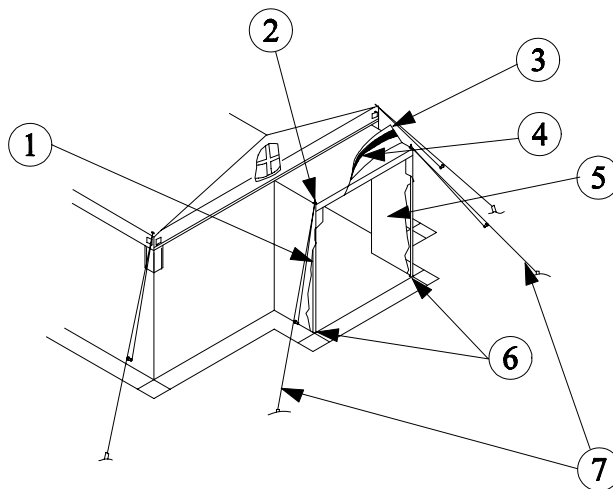


Figure 2-73 Entrance Way Installation

2-7.5.10 Rain Gutter Installation

NOTE

Use when two or more tents are attached. Position the tents next to one another with the corners lined up and spaced 3 to 6 inches apart. Tents may be joined end-to-end, side-to-end, or side-to-side.

If tents are not complexed, stake down the tent lines. Always stake down the tent lines at the four corners and the frame feet. Use the other four tent lines in moderate to high winds.

- a. Connect one side of rain gutter (1) to inside of roof cap (2) of one of connecting tents (3).
- b. Attach other side of rain gutter (1) to other roof cap (2).
- c. Lift outside corner flaps (4) of the roof cap (2) out of the way. Fasten rain gutter flaps (5) to the Hook and loop (6). The rain gutter (1) will extend 10 to 12 inches from tent (3).
- d. Pull corner flaps (4) down to seal small opening where rain gutters (1) extend from inside of tent (3).
- e. Raise one end of gutter higher than the other to enable water to run out.

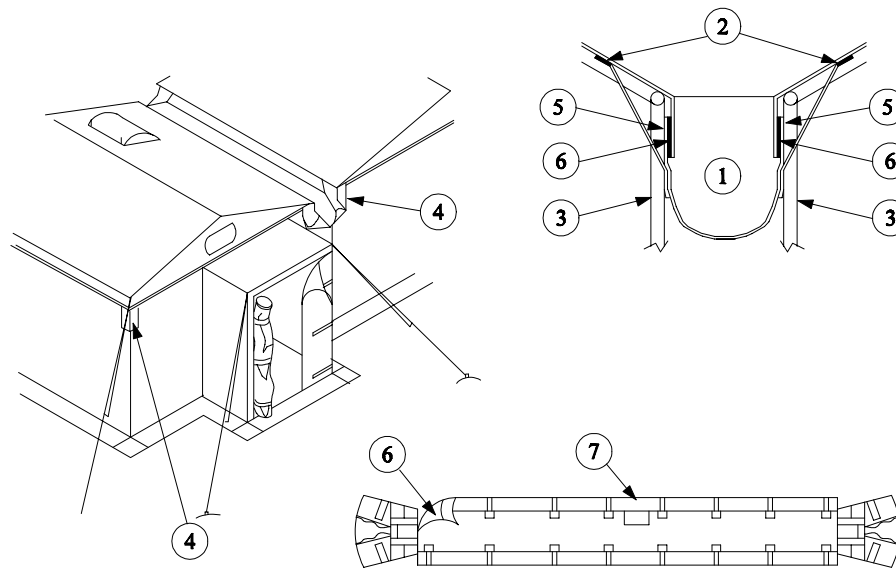


Figure 2-74 Rain Gutter Installation

2-7.5.11 Tent Boot Wall Installation

The boot wall installation is made to connect the shelter to the SICPS tent, which should be erected about four to six feet from the end of the shelter. The end wall on the tent facing the shelter is not mounted, as the boot wall replaces it (see Figure 2-75, Tent Boot wall Installation, top and roadside views). This procedure requires three persons to complete.

- a. Unfold boot wall, stretch it out, and orient it so that the boot wall is facing away from the shelter (1) with the shiny side facing inward.
- b. Roll the door cover and secure it in place (2).
- c. Remove the ladder (3) if it is in the way.
- d. The boot corner reinforcements (4) should be located on each side as a guide when lifting the boot wall to the shelter top.
- e. Insert the top portion of the boot wall pole support (5) into the three hook and loop fasteners, one in each corner and the center, and tighten.

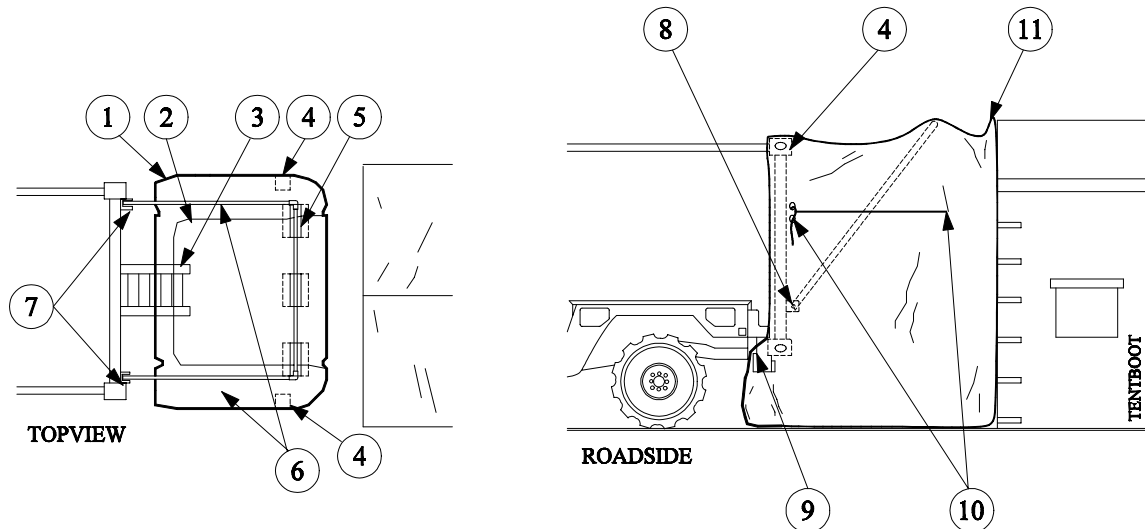


Figure 2-75 Tent Boot wall Installation

2-7.5.11 Tent Boot Wall Installation (Cont'd)

- f. Insert the two poles into the top boot wall support (6). Then remove the retaining pin from the bottom portion of the poles and let them hang from the tether.
- g. Position the pole support brackets and install retaining pins (7).

WARNING

Be careful climbing on the roof during rain and snow conditions. Failure to use care could cause serious injury by falling from the shelter.

- h. With one person on the roof of the shelter, two persons lift the two poles to the upright position and carefully walk the top of the boot wall to the shelter. The person on the roof grasps the top of the wall and pulls it over both corners, making sure the boot corner reinforcements (4) cover the corner supports that hold the lifting rings in place.
- i. When the person on the roof has the top in place, the two pole holders can place each pole in the pole support bracket (7, top view) on each side of the shelter and secure with the tethered pins on the pole (8, road side view).
- j. The two persons on the ground can place the bottom of the boot behind vehicle taillights (9). If slack is needed to get behind the taillights, loosen the roadside part of the boot wall by undoing the tightening straps (10) and the hook and loop strip as well, which can be pulled up or down. Re-tighten as required.
- k. Attach the boot wall (11) to the end of the tent frame facing the shelter, moving the tent frame if required. Start from the center and move to the ends for a smooth fit.
- l. Check the top corners of the shelter (4) for proper fit of the boot corner reinforcements.
- m. Fasten the roof cap and boot wall buckles together over the support cables.
- n. Starting in the center of the boot wall, line up the hook and loop strips on the wall and roof cap and press them together. Work from the center toward each end in order to prevent wrinkles in the hook and loop joints.
- o. Position loose edge of flap under the loose edge of the roof cap and fasten.
- p. Make the hook and loop attachments between the boot wall and shelter.

2-7.6 Connect Data/Signal Cables

Data/signal cables are required to be connected inside the shelter and to the exterior data/signal connectors on the SEP and the TIP. The only interior connection of data/signal cables is to the laptop computer from the workstation. The exterior data/signal cable connections available are:

- FDDI CP-LAN
- ThinLAN
- Fiber-Optic
- Commercial Phone
- MSE Circuit Switch

2-7.6.1 Internal Data/Signal Connections

Internal data/signal connections for the DTSS-L (V) 2 consist of connection of the laptop computer LAN connection when it is to operate in the shelter in degraded mode. See Paragraph 2-18.2 for connection procedures.

2-7.6.2 External Data/Signal Connections

Connections to the SEP and TIP are shown in Paragraphs 2-8.2 and 2-8.3. Connections are made based upon mission requirements.

WARNING

Never look into the end of a fiberoptic cable or connector. Infrared (IR) signals can cause eye damage.

2-7.7 Setting Up the Laptop Computer in the SICPS Tent

The laptop computers can be set up in the SICPS tent when directed by local USOP. The SICPS tent should be deployed and the tables prepared for use (see Paragraph 2-7.5 for tent and boot wall set-up). The following procedures are for setup in the tent:

- a. Inside the shelter, unstrap and remove laptop transit case from shelf.
- b. Remove laptop and cables from transit case.
- c. Place the laptop computer on table in the SICPS tent.
- d. Attach the LAN cable (W-400) from the TIP (DTSS/CP-LAN/RJ45), to the laptop computer.
- e. Locate power strip/extension cord W401 in shelter.
- f. Connect power strip/extension cord W401 into any AC receptacle on TIP.
- g. Connect laptop Ac power cord W308 P2 into any receptacle on power strip/extension cord W401 and connect W308 P1 into laptop computer power supply.
- h. Connect laptop computer power supply cable to laptop computer.

2-8 EQUIPMENT INTERCONNECTION

This paragraph provides operational connections for the DTSS-L (V) 2. Interconnect cabling information and diagrams are provided for the shelter, CHS 2, non-CHS-2 computer equipment, and communications equipment. The DTSS-L (V) 2 system has power and data cables installed within shelter raceways. The operator is required to verify connection during preparation for operations. The laptop computer is the only piece of computer and communications equipment that has to be connected for operation in the shelter or the SICPS tent when deployed.

2-8.1 DTSS-L (V) 2 Ground and Power Interconnect Cabling

WARNING

All communications-electronics equipment shall be grounded or bonded to the shelves. The shelves in turn are bonded to the racks, which are bonded to the vehicle. The vehicle is grounded by the SWGS or a grounding rod assembly. Incorrect or no grounding of equipment can result in serious electrical shock or death. See App. E for Safe Grounding of Communications-Electronic Equipment in the field.

The ground and power interconnect cabling diagram (Figure 2-76) provides the ground and power cable numbers and connections for the shelter and tent configurations.

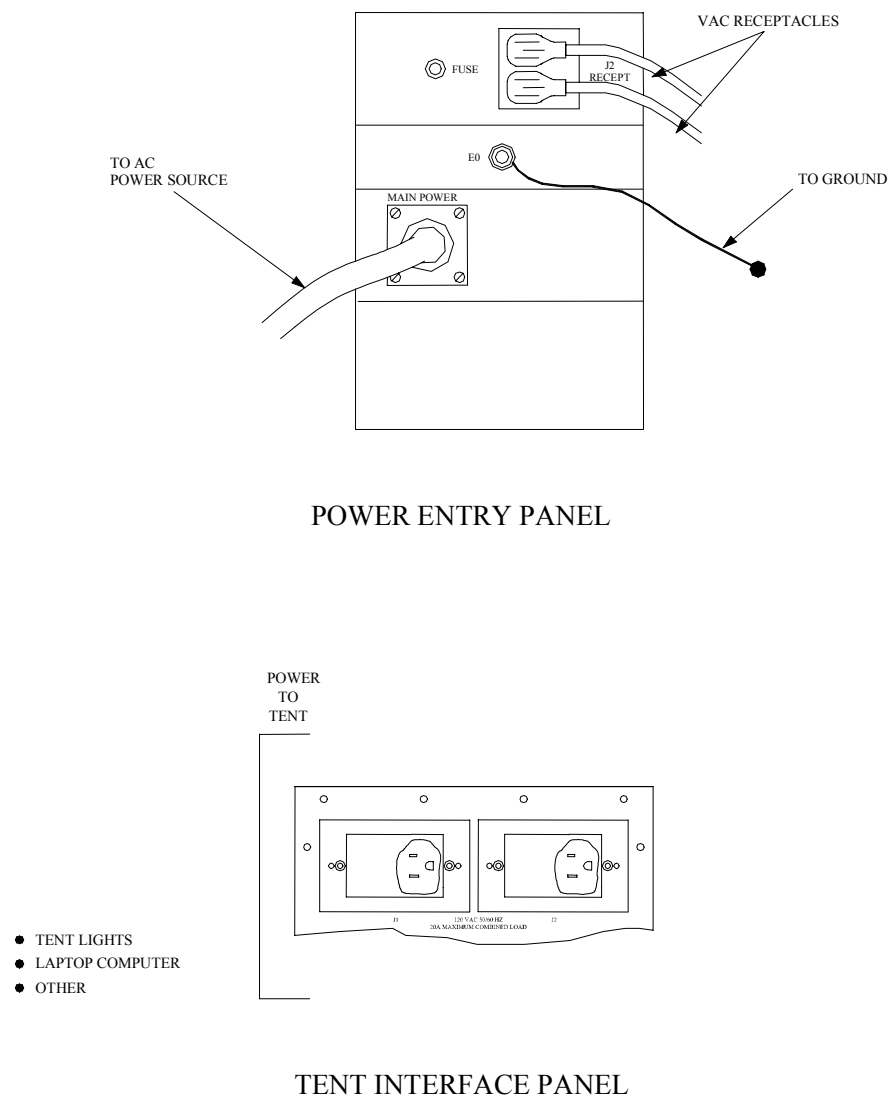


Figure 2-76 DTSS-L (V) 2 Ground and Power Interconnect

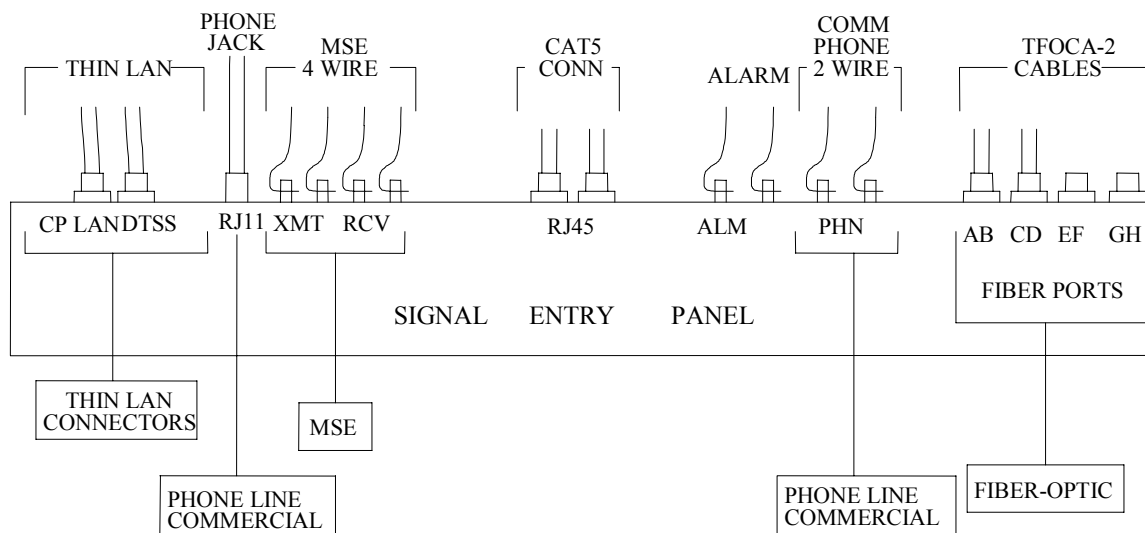
2-8.2 DTSS-L (V) 2 Data/Signal Interconnect Cabling

The diagram in Figure 2-77 shows the external cable/wire connections which can be made through the SEP and TIP. Connections through the SEP, Figure 2-77 (1 of 2), provide connectivity to external voice/data sources and/or connectivity between co-located DTSS-Ls (V) 2. The laptop computer and STE, operating in the SICPS tent, are connected to the DTSS-L through the TIP. Figure 2-77 (2 of 2) shows the TIP with laptop computer connections, DTSS/CP-LAN/ RJ45, and STE connections, RJ11 and MSE 2 wire. See paragraph 2-7.7 for procedures connecting the laptop computer to the DTSS-L in the SICPS tent and Figure 2-78 for interconnecting co-located DTSS-Ls.

WARNING

Never look into the end of a fiber-optic cable or connector. IR signals can cause eye damage.

Signal Entry Panel



NOTE

ALL LAN CONNECTIONS MUST BE TERMINATED.
USE THE CAPTIVE COVERS ON THE SEP FOR TERMINATION.

Figure 2-77 DTSS-L (V) 2 Data/Signal Interconnect Cabling Diagram (1 of 2)

2-8.2 DTSS-L (V) 2 Data/Signal Interconnect Cabling (Cont'd)

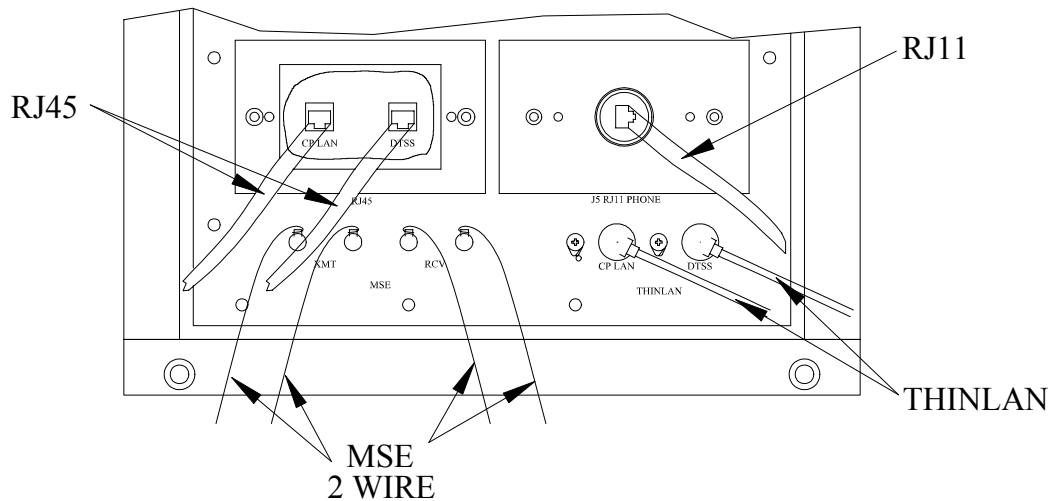
Tent Interface Panel

**Figure 2-77 External DTSS-L (V) 2
Data/Signal Interconnect Cabling Diagram (2 of 2)**

2-8.2.1 DTSS-L (V) 2 General Data/Signal Interconnect Cabling

Connectors as shown in Figure 2-4 and Figure 2-62, TIP and SEP, are typical of connections that can be made on the panels. Local USOP will provide specific connections. The SEP Tactical Fiber Optic Cable Assembly (TFOCA) connections, J5 and J6 (Figure 2-62), are shown, but they used as spares only. The other connections include ThinLAN and RJ45 are shown in Figure 2-77 (1 of 2).

2-8.3 Deployment Configurations

When connecting to another DTSS system or to a TOC LAN, connections at SEP are shown deployed in Figure 2-77 (1 of 2) or Figure 2-78. Each system is connected via ThinLAN, TFOCA or CAT5 cables. The maximum distance between any two systems is 300 meters, which is the length of the deployed TFOCA. If ThinLAN is used, the maximum distance is reduced to 150 feet. If a CAT5 cable is used, the maximum distance is 100 feet. Figure 2-78 depicts the connectivity of the various cable connections. A fiberoptic connection from a DTSS-L (V) 2 could be made to a fiberoptic tactical LAN with cabling from either J3 or J4.

2-8.3 Deployment Configurations

Data/signal interconnect cabling connections when multiple DTSS-L (V) 2s are configured together.

WARNING

Never look into the end of a fiber-optic cable or connector. IR signals can cause eye damage.

Signal Entry Panel

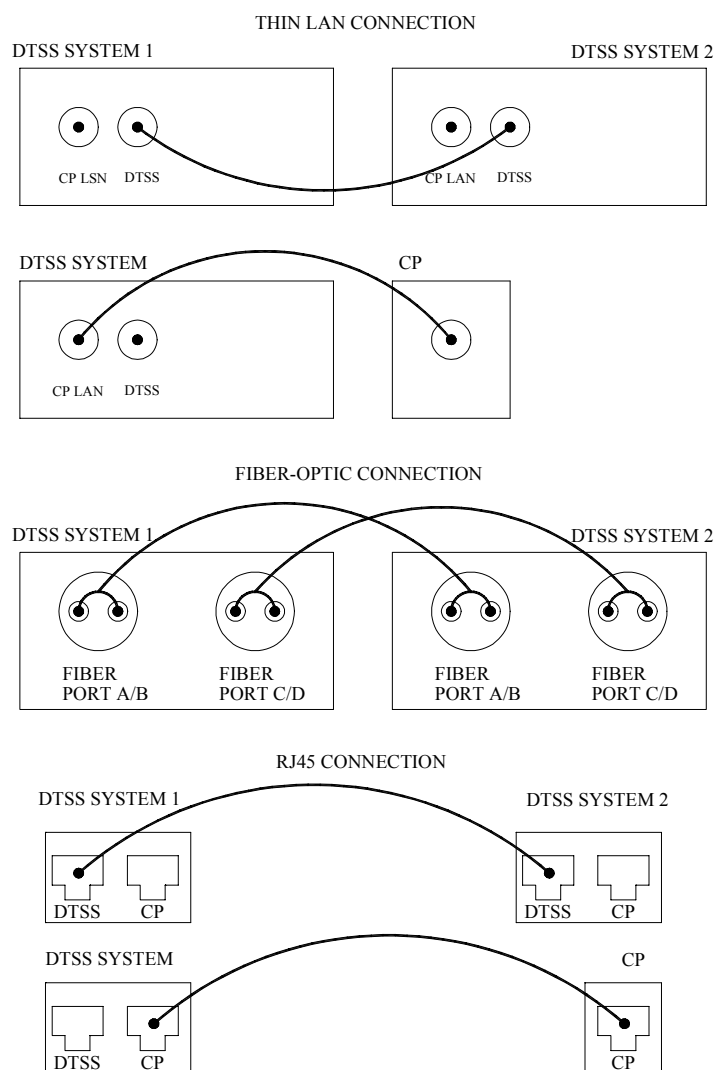


Figure 2-78 DTSS-L (V) 2 Deployment Configurations

2-9 SHELTER EQUIPMENT POWER-UP

2-9.1 Power Up the 10-kW Generator

For information on generator startup, see TM 5-6115-642-10 or TM 9-6115-660-13&P.

CAUTION

The generators that are used to provide power to your system may experience wet stacking if they are run for long periods at less than 25 percent load. Wet stacking is detected by fuel seeps around the exhaust system and, in extreme cases, poor performance. Refer to the generator technical manuals for information concerning preventing and/or correcting wet stacking problems.

2-9.1.1 Prepare the DTSS-L (V) 2 Shelter for Interior Operation

2-9.1.1.2 Remove Printer Transit Case from Shelter

Remove the straps securing the printer transit case to the floor of the shelter. Remove case from the shelter to be opened later per Paragraph 2-9.7.3.

2-9.1.1.3 Remove Operator's Chair from Tie Downs

Remove the straps from the operator's workstation chair in front of the operator's station. To do this, release the straps securing the base of the chair to the floor clips

2-9.2 DTSS-L (V) 2 Shelter Power Up

NOTE

An audible alarm will sound if there is a power fault. Check the PDU for fault lights and digital meter for correct phases.

NOTE

During night operations the operator can place emergency light battery switch to the ON position.

The shelter power-up procedures include:

- Power up the shelter
- Turn on the shelter lighting
- Perform pre-operational checks
- Power up the ECU

2-9.2.1 Power Up Shelter

- a. At the PDU curbside inside the shelter, verify that the **ESA OPERATIONAL** indicators on the power monitor panel are lit green.
- b. At the CB panel, verify that all CBs are set to **OFF**.
- c. Place **MAIN Ac POWER** CB in the **ON** position.

NOTE

A loud click will be heard as the relay applies power to the PDU. Press **LOAD CONNECT** button.

- d. Press **LOAD CONNECT** button.
- e. On the power monitor panel, verify that all **POWER OK** and **ESA OPERATIONAL** phase LEDs are lit.

NOTE

The smoke alarm may sound for a few seconds.

- f. Turn **ALARM** CB to the **ON** position.

2-9.2.2 Turning on the Shelter Lighting

- a. On the CB panel, place the CB labeled **LIGHTS** in the **ON** position.
- b. On the CB panel, place the CB labeled **BLACKOUT OVERRIDE** in the **ON** position.
- c. At the rear roadside TIP vault, set the emergency light switch to **NORMAL** (left)
- d. Verify the emergency light by pressing and holding the test button until the lamp lights.

2-9.2.3 Performing the Pre-Operational Checks

Perform these pre-operational checks to verify the input voltage and frequency:

- a. Verify that none of the "FAULT" lights are lit.
- b. Check the voltage meter and verify that:
 1. At the power meter select "Volts" and step through all phases and voltage levels by pressing the **PHASE NEXT** button.
 2. The voltage meter shows 120 Vac to 128 Vac for each phase-to-neutral setting. Press **PHASE NEXT** button to check for all three phases (**ØA**, **ØB**, **ØC**).
 3. The frequency meter shows 47.5 to 63 Hz at any setting.

2-9.2.3 Performing the Pre-Operational Checks (Cont'd)

NOTE

Press "PHASE NEXT" button on digital meter to toggle through phases.
See Figure 2-6 (2 of 2)

- c. Verify that the 7.5% over/under voltage switch is in **OFF** position.

2-9.3 Power-Up ECU

2-9.3.1 Uncovering the ECU

WARNING

Be careful climbing on the cab or shelter roof. Always use hand hold/step assemblies. Personal injury can result from a fall.

CAUTION

Operating in the cool mode with the fabric cover rolled down can cause damage to the equipment. Under normal operating conditions, before starting the ECU in any mode, make sure that the fabric cover on the outside of the ECU is rolled up and secured, that the condenser fan intake screen and fan guard are in place and unobstructed, and that the evaporator fan intake and discharge grille louvers are fully open. **EXCEPTIONS:** Under extreme climatic conditions, such as blowing snow that might enter the compressor section, the unit may be operated in the VENT or HEAT mode with the fabric cover rolled down and snapped in place. When operated in this manner, outside air cannot be drawn through the fresh air damper, which should be positioned fully closed. The fabric cover cannot be rolled down if the unit is connected to a NBC filter.

- a. From a position in front of the HMMWV-ECV windshield, unsnap the ECU flap and roll the flap to the top of the ECU.
- b. Securely tie the rolled flap at the top of the ECU with the ties provided.
- c. Check the sight glass for proper level after 15 minutes of operation in maximum cooling; check for bubbles or milky flow indicating low refrigerant charge. Check for yellow color indicating presence of moisture. If a problem is indicated, call Unit Maintenance for assistance.

2-9.3.2 Powering Up the ECU

After the exterior flap is rolled and tied, follow these procedures to operate the ECU.

2-9.3.2 Powering UP the ECU (Cont'd)

- a. At the PDU, place the **AIR COND** circuit breaker on the CB panel in the **ON** position.
- b. Open air blower door.
- c. Place VENT FAN CB to ON.
- d. At the ECU control panel, place the mode selector switch in the vent position, wait 20 minutes and then place in the **COOL** or **HEAT** position.

CAUTION

Perform the following steps only if the DTSS-L (V) 2 equipment is within operating range temperatures (+45°F to +100°F). Serious equipment damage may result from failure to observe this warning.

2-9.3.3 Cooling

CAUTION

Do not operate in the cool mode with the fabric cover rolled down. Damage to the equipment may result if personnel fail to observe this precaution.

- a. Ensure that the ECU outside fabric cover is rolled up and secured to prevent overheating.
- b. Verify the source power at the power monitor panel.
- c. Set the ECU circuit breaker on the CB panel to **ON**.
- d. Place the mode select switch in the **COOL** position. This energizes the compressor and the fan to cool the shelter.
- e. Wait a few minutes to make sure that the ECU is cooling.
- f. Set the **TEMPERATURE SELECTOR** to a cooler setting.

2-9.3.4 Heating

CAUTION

Do not use the transit heater when the system is deployed and the ECU is operating.

- a. Ensure that the ECU outside fabric cover is rolled up and secured to prevent overheating.
- b. Verify the source power at the power monitor panel.
- c. Set the ECU circuit breaker on the CB panel to **ON**.
- d. Place the mode select switch in the **HEAT** position. This energizes the compressor and the fan to heat the shelter.
- e. Wait a few minutes to make sure that the ECU is heating.
- f. Set the **TEMPERATURE SELECTOR** to a warmer setting, as required.

2-9.3.5 Ventilating

- a. Ensure that the ECU outside the flap is rolled up and secured to prevent overheating.
- b. Verify the source power at the power monitor panel.
- c. Set the ECU circuit breaker on the CB panel to **ON**.
- d. Place the mode select switch in the **VENT** position.
- e. Wait a few minutes to make sure that the ECU is circulating air.

2-9.4 Powering On the Shelter Receptacles

The two receptacles above the curbside rack and the one roadside (rear) receptacles are powered by the **UTILITY ROADSIDE** and the **UTILITY CURBSIDE** circuit breakers.

- a. At the PDU CB panel, place the **UTILITY ROADSIDE** and **UTILITY CURBSIDE** (ceiling) CBs in the **ON** (up) position.

2-9.5 Powering ON the TIP Receptacles

- a. When required, at the PDU CB panel, place the **TENT INTERFACE PANEL** CB in the **ON** (up) position.

2-9.6 GPFU Operation

- a. At the PDU, turn **OFF** the DC vent CB.

NOTE

Hold bracket while depressing handle to close air blower door.
--

- b. Close the air blower door.
- c. Place Ac MODE SELECTOR to OFF.
- d. Turn the AIR CON CB to the **OFF** position.
- e. Close the shelter door.
- f. Deploy Chemical Agent Protective Entry (CAPE).
- g. At the PDU, turn **ON** the GPFU CB.
- h. At the GPFU control panel, activate the GPFU.

2-9.7. Unlock and Open the Shelter Storage Cabinet

- a. Unlock the combination lock on the map sheet storage drawers.
- b. Remove the lock and retaining rod and set aside.

2-9.7.1 Prepare and Connect Stored Equipment

The plotter, the printer, the workstation, the laptop computer, and STE require preparation. Prepare the stored equipment in the following order:

- | | |
|---------------|---------------------------------|
| • Plotter | • STE |
| • Printer | • Laptop computer, if required |
| • Workstation | (See Paragraph 2-7.7 for use in |
| | tent or Paragraph 2-18.2 for |
| | degraded mode) |

2-9.7.2 Plotter

- a. Unlatch tie-down straps on plotter.

2-9.7.3 Printer

- a. Remove printer from transit case.
- b. Position printer on platform to the left of the CFPD or on the pull out table.
- c. Connect cable to parallel to port on rear of printer and to port on Print Server module.
- d. Connect power cable to Ac input on rear of printer and to Ac receptacle.
- e. Press power ON button.

2-9.7.3.1 Print Server Module

NOTE

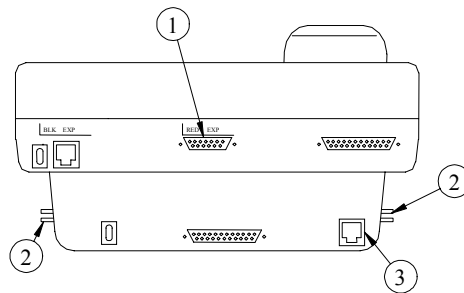
Before plugging print server into Ac receptacle, ensure all dip switches are in the down position.

- a. Connect RJ45 cable from front of Ethernet panel to rear of Print Server module.
- b. Connect power cable to Ac input on Jet Direct module and to Ac receptacle.
- c. Power on the printer.

2-9.7.4 Workstation

- a. Workstation keyboard slide:
 1. Press latch located on left at the far back underside of the tray to release the keyboard tray.
 2. Pull the keyboard slide as far out as it will go.
- b. Workstation Front Panel:
 1. Open the workstation front panels by unscrewing the captive thumbscrews, and lowering the front panels for access to each of the internal peripherals.
 2. Insert RHDD (if necessary).

2-9.7.5 STE

**Figure 2-79 STE Connections**

- a. If the STE is stored, open the safe.
- b. Remove the STE from the safe.
- c. Place the STE on the platform to the right of the CPFD.
- d. Verify that the STE power adapter cord is connected to the power adapter
- e. Connect power adapter cord to the rear power connector (1) of the STE.
- f. Connect cable W140 to RJ 11 (3) connection on the wedge.
- g. Connect cable W138 to the binding posts (2) (W1 and 2 go to black, W3 and 4 go to red binding posts.)

2-10 COMPUTER EQUIPMENT POWER-UP

The computer equipment power-up listed below is covered in this paragraph.

- Workstation
- DVD–RAM drive (part of the workstation)
- 8-mm tape drive (part of the workstation)
- LS 120 FDD (part of the workstation)
- JAZ drive (part of the workstation)
- Keyboard (part of the workstation)
- Mouse (part of the workstation)
- CFPD
- STE
- KVM switch
- Netra
- Ethernet switch
- SCSI switch
- DLT Autoloader
- CD-RW
- RAID
- Plotter
- Scanner

The power-up of the computer equipment must be completed in a sequence that enables all SCSI equipment to be turned on in proper sequence allowing correct addressing for the devices. The procedures in the following paragraphs are sequenced for an efficient power-up of all the computer equipment.

NOTE

All computer equipment is protected by the workstation CB which must be **ON** for the equipment to be operational.

NOTE

All peripherals are left in the **ON** position. This eliminates any possible problems with SCSI addresses as well as shortens the time needed for power up.

2-10.1 Power Up the System

The peripherals that are internal to the workstation are powered up when the workstation is turned on. The other peripherals are powered up when the workstation CB is turned on except for the plotter, scanner, and printer.

- a. At the PDU, place the UPS PHASE A and UPS PHASE B CB in the **ON** (up) position.
- b. At each UPS, place the POWER ON switch in the **ON** position. The unit will perform an internal test (the indicators will be illuminated in green, amber, red, and off-sequence).
- c. At the PDU, place the workstation CB in the **ON** (up) position.

The CFPD is usually in a standby mode until the workstation is powered. If not, press the **ON** switch located on the front panel.

2-10.1 Power Up the System (Cont'd)

NOTE

There is approximately a five-minute warm-up for the RAID. In order to ensure that the storage RAID is powered up, verify that all unit number displays are lit.

2-10.2 Power-Up the STE

- a. Verify that the workstation CB is in the **ON** position.
- b. Verify that the STE power supply Ac power cord is connected to the receptacle.
- c. Verify that the STE power supply power cord is connected to the STE. The unit is now powered on.

2-10.3 Power Up the Workstation

To power up the workstation, proceed as follows:

NOTE

When the workstation CB is placed in the ON position, the following peripherals will power-up: KVM switch, Netra server, Ethernet switch, SCSI switches, DLT Autoloader, CD-RW, and RAIDS.

CAUTION

If unit number is not displayed, power-down RAID and, then, reseal drive. Drive keys should not be used while RAID is powered-on. To do so may cause the RAID to default and go to rebuild mode.

NOTE

Verify that power to all external peripherals except the plotter and the scanner are **ON** before applying power to the workstation. Failure to do so may require the system to be rebooted.

- a. Verify that all peripherals are fully booted. The RAID has the longest boot-up time.

NOTE

In the event the workstation powers-up prior to peripherals, power-down the workstation and reboot after peripherals are fully operational.

- b. Power up the workstation by depressing the ON/OFF button on the front of the VCU.
- c. View CFPD for status of the boot.
- d. Log-on when the log-on window appears as directed by the System Administrator. See the TB 11-6675-295-10 for log-on procedures.

2-10.4 Power Up the Laptop Computer

- a. Power up the laptop computer by pressing the ON button (located on the middle top above the keyboard).
- b. Log-on when the log-on window appears as directed by the System Administrator. See the TB 11-6675-295-10 for log-on procedures.

2-10.5 Power Up the Plotter

NOTE

The plotters and printer may be powered-up after the workstation log-on has been completed.

- a. Verify that the tie-down straps on the plotter are unlatched.
- b. Place plotter CB in the on position.

NOTE

If plotter does not come on ensure that power cable is properly installed. See Paragraph 2-11.1.1 Accessing Rear of Plotter for instructions.

- c. At the plotter, press the **LINE** button in to the **ON** position.
- d. Verify that the plotter display reads Self Test.
- e. Verify that the plotter display panel shows **Please Wait**.

When the plotter is ready, the display will show **READY TO PLOT**.

2-10.6 Power Up the Scanner

- a. Place the scanner CB in the ON position.
- b. Verify scanner completes self-test and the green light is lit.

2-11 OPERATIONS

- Plotter operating procedures
- CD-RW operating procedures
- Scanner operating procedure
- Printer operating procedure
- System administrations operation

All software procedures are provided in the TB 11-6675-295-10.

NOTE

For the system start-up procedure in a degraded mode, refer to Section IV, Paragraph 2-18.

2-11.1 Plotter Operating Procedures

WARNING

Keep hair, jewelry, clothing, and foreign objects away from plotter mechanisms. Serious personnel injury may result from failure to observe this warning.

To operate the plotter, the operator must be familiar with the following procedures:

- Access rear of plotter
- Plotter loading
- Putting a new roll on the spindle
- Loading roll media
- Removing the plot
- Removing unplotted media
- Replacing ink cartridges

2-11.1.1 Accessing Rear of Plotter

- a. Remove top two safety pins from left and right catches on top bar.

NOTE

To remove top bar move left end up and out of notch. Pull bar toward the center of the shelter.

- b. Unlatch and remove top bar.
- c. Remove two locking pins from below plotter.
- d. Remove roll paper from plotter.
- e. Pull plotter out to first stop.
- f. RJ45 and power cable are now accessible.

To return plotter to position:

- a. Return plotter tray to position by releasing side locking pins; slide plotter tray into place.
- b. Replace two locking pins from below the plotter.
- c. Replace top bar and two safety pins on top bar.
- d. Replace roll paper.

2-11.1.2 Plotter Loading-Single Sheet

NOTE

As you load a sheet of paper, remember that it is the side facing up on which the plotter will print.

- a. Do not remove rolled paper from the feeder. The printer will remove the roll of paper to a standby position.
- b. Verify that the handles are in the down position.
- c. Open the window. Follow instructions on display panel.
- d. Hold sheet on the sides; align right edge of sheet with blue dashed line on entry platen. Air suction will hold the paper in place.
- e. Close the window.
- f. Press arrow key to select the type of paper you are loading, then press the ENTER key. The printer will now load the paper, checking the alignment.
- g. If the paper is properly aligned, you will hear a “BEEP.” (If it is not correctly align, the front panel will display an instruction.)
- h. The front panel will display “Ready.” Begin printing.

2-11.1.3 Putting a New Roll on the Spindle

- a. Remove the empty spindle by pulling firmly on both media end caps.
- b. Remove the left hand blue media end cap and stand spindle vertically, with fixed end cap on the floor.
- c. Slide roll onto spindle.
- d. Make sure that media winds clockwise.
- e. Put removable blue colored media end cap onto upper end of spindle and push it down as far as it will go. Do not use excessive force.
- f. With blue colored media end cap on the left, slide the spindle into the printer insert left and then right sides.

2-11.1.4 Loading Roll Media

NOTE

The leading edge of the media must be straight to ensure successful loading of roll media.

- a. After the roll of paper has been installed on the printer spindle (see Paragraph 2-11.1.2), check the leading edge of the paper as it unwinds from the spool. If it is not evenly cut or if it is skewed (not perpendicular to the guides), trim the leading edge of the paper roll as follows:

2-11.1.3 Loading Roll Media (Cont'd)

1. Pull the paper over the top of the machine and lay it over the cutting track.

WARNING

The knife blade is sharp. Keep fingers clear of the cutting path. Serious personnel injury may result from failure to observe this warning.

2. Use the knife in the pocket located on the back of the printer to cut off the first few inches of the paper.
3. Retract the blade and return the knife to its pocket.
4. Press the **Top** button to select the main menu on the front panel.
5. Make sure the front panel displays the “**Ready for paper**” message.
6. Lift the handles so that they are in the up position.
7. Pull out approximately one foot of paper.
8. The front panel message will tell you how to load the roll.

NOTE

The leading edge of the media must be straight to ensure successful loading of roll media. This may take several attempts.

- b. Insert roll paper edge below the handles and above the paper entry roller.
- c. Align right edge of the paper with white line on the right side of the entry roller.
- d. When the paper has been inserted enough the printer will “BEEP.”
- e. Lower the handles
- f. The front panel will ask you to wrap back onto the roll any excess paper and press **ENTER**.
- g. Carefully wind the excess roll paper back onto the spindle. Use the wings on the blue removable media end cap to turn the roll paper until paper is rewound.
- h. Press the **ENTER** key.
- i. The front panel will ask for the type of roll paper loaded. Select it from the options displayed on the front panel using the ↑ and ↓ keys and then press the **ENTER** key.
- j. The printer will now automatically load, check and align the paper as well as trim off the lead edge of the paper to give a straight edge.

NOTE

If a problem occurs while loading the roll paper, instruction will be displayed on the front panel.

- k. If the paper is well aligned, the printer will accept the roll load and give one more single “BEEP.”
- l. The front panel will say, “Ready,” and you can begin printing.

2-11.1.5 Removing the Plot

- a. Make sure that the ink is dry.
- b. FOR SHEET MEDIA: pull sheet out by edges.
- c. FOR ROLL MEDIA: wait for plotter to cut media after ink drying time.

2-11.1.6 Removing Unplotted Media

2-11.1.6.1 Removing Unplotted Sheet Media

- a. Press “Form Feed/Cut.”
- b. Pull sheet by edges when plotter has finished plotting.
- OR-
- c. Lift media lever, then pull out sheet by edges and lower the media lever.

2-11.1.6.2 Removing Unplotted Roll Media

- a. Lift the handles and turn the roll of paper upward.

NOTE

Keep the paper tightly wound on the roll throughout the unloading procedure. If it begins to unwind, it will become more difficult to handle.

- b. Turn the blue removable media end cap by hand, using the wings, until the paper is removed from the inside of the printer.
- c. Remove the roll paper from the printer by pulling first the left side of the roll (blue media end cap) and then the right side

2-11.1.7 Replacing Ink Cartridges

There are two types of ink cartridge removal. The first is when the ink cartridge is empty and the front panel tells you to replace the ink cartridge. The second is when the ink cartridge is very low and you want to replace the ink cartridge before it becomes empty.

2-11.1.7.1 Ink Cartridge Empty

- a. The front panel displays a message showing which color cartridge is empty.
- b. Remove the corresponding color ink cartridge by pushing the dimpled recess in the ink cartridge inward and upward. This releases the ink cartridge to be pulled out horizontally.
- c. Remove and discard empty cartridge.
- d. Pick up the new ink cartridge and find the label identifying the ink color. Hold the ink cartridge so that you can see the identifying colored label at the top of the side facing you.
- e. Insert the ink cartridge into the ink cartridge slot labeled with the same color.
- f. Slide the ink cartridge into the slot until you feel some resistance and stop.

2-11.1.7.2 Ink Cartridge Very Low

- a. Press the **TOP** key on the front panel to go to the main menu.
- b. Select the Ink System Menu on the front panel by using the ↑ and ↓ keys, and then press the **ENTER** key.
- c. Press the ↑ and ↓ keys until “Replace Ink cartridge” is selected. Press **ENTER**.
- d. Select “yes (replace)” then press **ENTER**.
- e. Then follow the steps in Paragraph 2-11.1.7.1, Ink Cartridge Empty.

NOTE

Refer to HP 1055CM User’s Manual for more details.
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2-11.2 CD-RW Operating Procedures

The CD–RW operating procedures are located in the TB 11-6675-295-10.

2-11.3 Scanner Operations

The scanner operating procedures are located in the TB 11-6675-295-10.

NOTE

If the scanner does not power up, check power cable on rear of scanner. See Paragraph 2-11.3.1 for instructions to access the rear of the scanner.

2-11.3.1 Accessing the Rear of the Scanner

- a. Remove top two safety pins from left and right catches on top bar.

NOTE

To remove top bar move left end up and out of notch. Pull bar toward the center of the shelter.

- b. Unlatch and remove top bar.
- c. Remove two locking pins from below scanner.
- d. Pull scanner out to first stop.
- e. Cables are now accessible.

2-11.4 Printer Operations

2-11.4.1 Loading Paper

- a. The paper “in” tray is located in the front of the printer below the paper “out” tray.
- b. Load paper (envelopes, transparencies, labels, and photographs).
 1. Feed single envelopes through envelope slot or stack no more than 15 envelopes with flap side on the left on the right side of the paper “in” tray.
 2. Fan the edges of the transparencies and align edges. Load no more than 30 transparency sheets in the paper “in” tray.
 3. Fan edges of label sheets to separate them and align sheets. Load no more than 20 sheets (label side down) in the paper “in” tray.
 4. Fan edges of paper to separate them and align edges. Load no more than 20 sheets print side down in the paper “in” tray.

NOTE

Refer to User’s manual for direction for printing specialty items such as business cards, greeting cards, iron-on transfers, banners and posters.

2-11.4.2 Replacing the Print Cartridges

The print cartridge status light flashes when one or both of the print cartridges are low on ink, improperly installed, or malfunctioning. This light also flashes if the wrong print cartridge type is used.

NOTE

If the ink level is low in a print cartridge, the print cartridge status light stops flashing when the printer’s top cover is opened. If the problem is <u>not</u> related to low ink, the light continues to flash after the cover is opened.
--

To replace a print cartridge:

- a. Verify that the Out tray is down.
- b. Press the Power button to turn on the printer.
- c. Open the top cover. The cradle moves to the center of the printer.
- d. Raise the cradle catch.
- e. Lift the print cartridge out of the print cartridge cradle and discard it.
- f. Remove the replacement cartridge from its packaging and carefully remove the protective vinyl tape.
- g. Insert the print cartridge firmly into the cradle.

2-11.4.2 Replacing the Print Cartridges (Cont'd)

NOTE

There are five icons above the print cartridge, from left to right, as follows: tri-color print cartridge problem, black cartridge problem, tri-color print cartridge low-ink, black cartridge low-ink, and cartridges OK icons. If the yellow arrow points to a print cartridge problem icon, the print cartridge is either missing, improperly installed, defective, or is the wrong print cartridge for the printer.

2-11.4.3 Paper Jam Detection

A paper jam occurs when the rear access door is used.

- a. Remove the paper from the In and Out trays.

NOTE

If you are printing labels, verify that a label is not stuck inside the printer.

- b. Press the RESUME button to print the document. Reload paper in the In tray.
- c. If the paper jam is not clear, open and remove the Rear Access Door.
- d. Remove the paper jam from the printer.
- e. Replace and close the Rear Access Door.
- f. Press the Resume button to continue printing.

NOTE

More detailed information is available in the commercial manual.

2-11.5 System Administration Operations

The System Administration operations are located in TB 11-6675-295-10. System operation topics include:

- System administration
- User Security
- System operation in unusual conditions

CAUTION

While operating computer systems and equipment, smoking, drinking any beverage, or eating are not allowed. Smoke residue builds up on the surfaces of the equipment and could affect the ability of the floppy disk drive and/or tape heads to read and write data from/to the floppy disk and/or tape media. In addition, liquid spills from drink and/or food could cause electrical shorts and/or inoperable/sticky keyboard keys and mechanical switches. Serious equipment damage may result from failure to observe this warning.

2-11.5.1 System Administration Procedures

System Administration operations are provided in the TB 11-6675-295-10 which is available for use in the DTSS-L (V) 2 as directed by the unit commander.

2-11.5.2 User Security

The DTSS Security Plan provides the procedures for tactical and garrison operations in conjunction with the USOPs. The security procedures for tactical and garrison operations are essentially the same and cover Communications Security (COMSEC), physical security, personnel accesses, visitor accesses, destruction of classified material, and storage of classified material. In addition, DTSS Topographic Analysts and supervisors shall use the User Security Manual (USM)/USOP for additional guidance for DTSS operations.

2-11.5.3 System Operations in Unusual Conditions

Operations in unusual conditions are located in Chapter 2, Section IV of this document and contain these topics:

- | | |
|-----------------------------------|-----------------------------|
| • Catastrophic shutdown procedure | • Dust storms or sandstorms |
| • Emergency shutdown procedure | • Extreme cold |
| • Emergency exit procedure | • Extreme dry heat |
| • Fire emergency procedures | • Extreme moist heat |
| • Operation in degraded mode | • Salt air or salt spray |
| • Night operation | • Snow or mud |

2-12 COMPUTER AND SHELTER EQUIPMENT POWER-DOWN

2-12.1 Power-Down Procedure Overview

Workstation, computer equipment, and shelter equipment power-down procedures are provided for the following equipment:

- Computer equipment
- Workstation
- Printer
- Plotter
- ECU
- UPS
- PDU

CAUTION

Whenever possible, power down in an orderly fashion to prevent data corruption. **DO NOT** turn off shelter power until all computer equipment has been powered down. Serious equipment damage may result from failure to observe this warning.

2-12.2 Computer Equipment Power-Down

NOTE

All external peripherals are left in the ON position with the exception of the plotter and the printer.

All computer equipment and the STE are protected by the workstation CB, which must be **ON** for the equipment to be operational.

2-12.2.1 Workstation Power-Down

- a. On the CFPD, make sure that all data are saved and windows are closed.
- b. Select the Start button and go to Shut Down.
- c. At Shut Down window select YES.

Wait for Restart window to appear.

NOTE

Power down may take up to ten minutes before shut down occurs.

- d. Press Workstation power button. The green LED will go off. The internal peripherals will shut down.
- e. The CFPD will go to “sleep” mode.

2-12.2.2 Power Down the Laptop Computer

The laptop computer may be powered down at any time once the system has been shut down. See procedures for the workstation, Paragraph 2-12.2.1, Workstation Power-Down.

- a. On the laptop computer display, make sure that all data are saved and windows are closed.
- b. Go to Start and select Shut Down.
- c. In the Shut Down window, select YES.
- d. Wait for the shutdown sequence to complete.

2-12.2.4 Power Down the Printer

On the front panel of the printer, press power button to turn **OFF**.

2-12.2.5 Power Down the Plotter

On the plotter control panel display press power button and verify that the front panel power LED turns red.

2-12.3 Power Down the ECU

NOTE

Prior to shut down of the ECU's, check the humidity level. If the humidity is above 50%, reduce the water content in the shelter prior to movement to preclude condensation in the shelter. Place the ECU in the cool mode at max temperature until the humidity drops to 50% or less if in a hot climate. In a cold climate, place the ECU in heat mode at Max temperature with secondary exit open slightly until humidity drops to 50% or less.

At the ECU control panels:

NOTE

Under certain environmental conditions, operator may leave the ECU operational during final power down.

- a. Set **MODE SELECTOR** switch to the **OFF** position.

2-12.4 Power Down the Two UPS Units

At each UPS:

- a. Switch MAIN PPOWER to **OFF** position by holding switch to the left until beep is sounded and lights go out.
- b. Verify that the UPS front panel STATUS LEDs are not lit.

2-12.5 Power Down the Power Distribution Unit

At the PDU:

- a. Set **UTILITY ROADSIDE** and **CURBSIDE** CBs to the **OFF** position.
- b. Set UPS ØA, UPS ØB, CBs to the **OFF** position.
- c. Set **AIR COND** CB in the **OFF** position (see NOTE page 2-166).
- d. Set **SCANNER** CB is in the **OFF** position.
- e. Set **PLOTTERS** CB to the **OFF** position.
- f. Set **WORKSTATION** CB to the **OFF** position.
- g. Set **TENT INTERFACE PANEL** CB to **OFF** position.

The final powering off procedures of the PDU are found in Paragraph 2-13.9. Lights remain on during the preparation for movement in order to properly secure all equipment.

2-13 PREPARATION FOR MOVEMENT

This preparation for movement checklist assumes that the power-down procedures of Paragraph 2-12 have already been performed.

CAUTION

Failure to tie down or store loose equipment could cause serious damage to the equipment.

If shelter is to be transported by air, the pressure release panels must first be opened in order to prevent pressure damage to the shelter. Serious equipment damage may result from failure to observe this warning.

2-13 PREPARATION FOR MOVEMENT (Cont'd)

Preparation for movement includes:

- Securing the laptop computer
- Securing the workstation
- Securing the plotter
- Securing material
- Disconnecting signal cables from the shelter
- Securing chair
- Securing printer
- Disabling the emergency light
- Final shelter powering off
- Generator power down
- Disconnecting shelter power
- Disconnecting the grounding equipment
- Tent preparation
- Packing the support vehicle
- Final shelter closing
- Connecting the generator trailer to the HMMWV-ECV

2-13.1 Securing the Laptop Computer

The laptop computer must be disconnected from data/signal and power cables. Procedures for preparation for movement of the SICPS tent are found in Paragraph 2-13.14. The following procedures apply to laptop computer operations in the SICPS tent:

- a. Power down the laptop computer (Paragraph 2-12.2.2) and close laptop.
- b. Disconnect laptop computer power supply cable from laptop computer.
- c. Disconnect laptop computer AC power cord W308 P2 from power strip/extension cord and W308 P1 from laptop computer power supply. Place laptop computer power supply and AC power cord W308 in Laptop computer transit case.
- d. Disconnect LAN cable W201 from TIP and laptop computer. Place in laptop computer transit case.
- e. Disconnect power strip/extension cord W401 from TIP and store in shelter.
- f. Place laptop computer in laptop computer transit case.
- g. Secure laptop computer transit case on shelf in shelter with straps.

2-13.2 Securing the Workstation

- a. Remove hard drive (if necessary) and place in approved GSA container.
- b. Secure all disks in the safe, as required.
- c. Secure all modules, and close cover on workstation.
- d. Workstation keyboard slide: Push in the keyboard as far as it will go. Keyboard lock will engage. Verify that the keyboard will not pull out from under the platform.

2-13.3 Securing the STE

- a. Disconnect data cable from STE and leave in place.
- b. Disconnect power supply cable from the STE leave in place then unstrap the unit and remove; place in storage, if required.

2-13.4 Securing the Plotters

- a. Remove hard drive (if necessary) and place in approved GSA container.
- b. Ensure the top of the plotter is closed.
- c. Secure straps to hold the plotter in place during transit.

2-13.5 Securing the Printer

- a. Disconnect data cable from Print Server Module. Leave data cable in place.
- b. Disconnect Print Server Module cable from rear of printer.
- c. Disconnect power cable from Ac receptacle and rear of printer.
- d. Place printer, printer power cable, and Print Server Module in printer transit case and set aside.

CAUTION

Ensure RAID has been powered down prior to removing disk drives. Drive keys should not be used while RAID is powered on. To do so may cause the RAID to default and go to rebuild mode.
--

2-13.6 Securing the RAID

- a. Remove all hard drives.
- b. Store in an approved GSA container

2-13.7 Securing Material

- a. Store STE equipment.
- b. Secure and lock all storage cabinets.

2-13.7.1 Store Classified Material

- a. Return all classified material to the appropriate storage container.
- b. Workstation RHDD, and RAID drives are to be secured.
- c. Verify that the Mosler safe is closed and locked.

2-13.7.2 Secure and Lock All Storage Cabinets

- a. Secure the map drawers and install bar and lock.
- b. Verify that the front curbside storage cabinet is packed properly and the door closed.
- c. Verify that the storage compartment below the safe contains the spare cables and is closed.

2-13.8 Disconnect Signal Cables From the Shelter

Disconnect signal cables from the signal entry panel using the following procedures:

- a. Disconnect all cables.

WARNING

Never look into the end of a fiberoptic cable or connector. IR signals can cause eye damage.

- b. Place dust caps on all open connectors.
- c. Store the signal cables.
- d. Close the SEP cover and tighten the two captive screws that hold the SEP cover to the shelter wall.

2-13.9 Disable the Emergency Light

- a. At the TIP I/O panel, set emergency light switch to off to prevent the emergency light from draining the emergency battery.
- b. Place the **BLACKOUT CB** in the **OFF** position.

2-13.10 Final Shelter Powering Down

The last power-down procedures for the shelter are:

NOTE

Ensure the ECU is powered OFF and that the AIR CON CB is OFF per Paragraph 2-12.3.

- a. Place the **LIGHTS CB** in the **OFF** position.
- b. Turn **GPFU CB OFF**.
- c. Turn **VENT fans CB OFF**.
- d. At the PDU, set **ALARM SYSTEM CB** to the **OFF** position.

NOTE

See Paragraph 2-23, item d for use of DC transit heater in Extreme Cold Weather.

- e. Verify that the **Dc POWER** breaker is in the **OFF** position.
- f. Verify the **BLACKOUT OVERRIDE CB** in the **OFF** position.
- g. Place **MAIN Ac POWER CB** in the **OFF** position.
- h. Verify that all PDU CBs are now set to **OFF**.

2-13.11 Generator Power Down

For information on generator power-down, see TM 9-6115-642-10 or TM 9-6115-660-13&P.

2-13.12 Disconnecting Shelter Power

NOTE

Outside power source must be OFF prior to disconnecting the shelter power.

Disconnect power cables from the power entry panel using the following procedures:

- a. Disconnect the power cable used between the 10-kW generator and DTSS-L (V) 2.
- b. Place the dust caps on all open connectors.
- c. Disconnect the ground cable.
- d. Close the PEP cover and tighten the two captive screws holding the cover to the shelter wall.
- e. Store the power cable(s) and ground cable(s).

2-13.12.1 Storing the 50-Foot Power Cable

In most cases, the power cable will be stored in the storage compartment located at the front of the shelter on the curbside of the vehicle.

2-13.13 Disconnecting the Grounding Equipment

To disconnect the ground, follow these procedures:

- a. Disconnect grounding rods used for the 10-kW generator and shelter.
- b. Pull ground rods from ground or remove SWIGS.
- c. Store one ground rod set in the ground rod holders in the rear of the shelter. Store the remaining ground rod set on the generator/store SWIGS in bag provided.
- d. Store the cables in the generator storage box.

2-13.14 Tent Preparation

Prepare tent for movement as follows:

- a. Clean the tent with hot soapy water and let it air dry before taking it down.
- b. Locate the three tent transport bags and the light set storage container near tent.
- c. Break down and remove tables from tent.
- d. Break down and remove map boards from tent.
- e. Unplug power cord from outlet and luminaries.
- f. Break down tent as follows:
 1. Loosen all tent lines and detach the tent from the boot wall by separating the hook and loop attachment where the roof cap meets the tent wall. Detach the hook and loop joints and buckles from the boot wall.
 2. Close all windows.
 3. Release all hook and loop fasteners at the inside and outside corners.
 4. Remove the rain gutters and stow in fabric transport bag.
 5. Remove entranceway tent poles and stow in frame transport bag.
 6. Remove steel pins from entranceway wall and stow in tent pin container.
 7. Secure all blackout doors on end wall assembly.
 8. Remove all liner assemblies.
 9. Fold each liner with identification label visible and stow in fabric transport bag.
 10. Remove walls.
 11. Fold walls with identification label visible and stow in fabric transport bag.
 12. Loosen hook and loop fasteners holding roof cap to tent frame assembly.
 13. Remove steel tent pins from feet of frame assemblies.
 14. Stow steel tent pins in tent pin container.
 15. Collapse center wall frame assembly legs as follows:
 - (a) Pull locking pins on end wall assemblies.
 - (b) Rotate feet 90° and lower frame assembly.
 - (c) Lock the leg assemblies after they are collapsed.
 - (d) Remove luminaries and straps. Place in storage container and remove from tent.

NOTE

If a pole or leg does not rotate easily, do not force it. Check the handles to make sure that none of the handles is locked or jammed.

- (e) Unlock handles by pushing them towards center of tent.

2.13.14 Tent Preparation (Cont'd)

16. Lower frame assembly to ground and remove roof cap as follows:
 - (a) Unlock handles at corners of one side.
 - (b) Raise side of frame and swing legs in toward center of tent.
 - (c) Lower side of frame to ground, repeat for other side.
 - (d) Remove tent lines from wooden pins. Remove pins and place them in tent pin container.
 - (e) Lift roof cap assembly from frame and fold in toward center frame assembly.
 - (f) Remove roof cap assembly from frame and place in transport bag.
 - (g) Remove end wall frame assemblies from center wall frame assemblies.
 - (h) Loosen handles at peak of roof and fold frame members in toward center of tent.
 - (i) Place frame members in frame transport bag.
17. Remove floor.
18. Fold floor with identification label visible and stow in fabric transport bag.

WARNING

Be careful climbing on the HMMWV-ECV and shelter roof during rain and snow conditions. Failure to use care could cause serious injury.

19. Remove and stow boot wall.
 - (a) Loosen the roadside tightening straps to take pressure off the boot.
 - (b) Remove the lower part of the boot wall from under the taillights.
 - (c) With one person on the roof, and one person on each support pole, remove the pin from each support pole.
 - (d) The person on the shelter roof clears each boot corner reinforcement as the two persons on the ground lift the support poles and move slowly away from the shelter.
 - (e) Lay the boot wall on the ground so it faces the shelter.
 - (f) Remove the two support poles and the top portion of the support poles.
 - (g) Fold and store the boot wall.

2-13.15 Packing the Support Vehicle

A unit TOE vehicle will carry some pieces of equipment, such as the camouflage net, SICPS tent, boot wall, folding tables and display boards used in the tent, cables, the loose plotter, and supplies.

2-13.15.1 Store the Camouflage Net

To remove the camouflage net:

- a. Untie all guy ropes.
- b. Remove all poles and tent pegs.
- c. Carefully climb the collapsible steps on the curbside of the shelter.
- d. Remove and fold the camouflage net.
- e. Place the camouflage net and support poles in the unit supply vehicle.

2-13.16 Final Shelter Closing

In a cold climate, turn **ON** transit heater and set temperature to 50°.

NOTE

The transit heater is for use **ONLY** during movement between mission locations. **Do not** turn on the transit heater during shipment or during storage.

Secure the chair and printer in shelter as follows:

- a. Attach arm straps (two each) and lower strap to threaded inserts on floor. Secure straps.
- b. Place printer transit case in shelter and secure with strap to threaded inserts on floor.
- c. Secure and lock shelter entry door.
- d. Cover and strap down the ECU covers.

2-13.16.1 Store the Shelter Ladder

Remove the ladder after the shelter has been powered down and no further activity takes place in the shelter.

- a. Lift the ladder off the retaining bracket below the shelter door.
- b. Place the ladder on the retaining brackets on the rear of the shelter.
- c. Tie the retaining straps around the ladder steps and tighten.

2-13.17 Connect the Generator Trailer to the HMMWV-ECV

(See TM 9-6115-642-10 or TM 9-6115-660-13&P)

NOTE

Ensure that the HMMWV-ECV and generator are on level ground.
--

- a. Apply handbrakes.

WARNING

Ensure that the weight of the generator trailer is on the front support leg before raising rear stabilizer. Failure to follow this warning may cause trailer to tip, resulting in serious injury to personnel or damage to equipment.

- b. Turn the foot assembly as far as it will go into the rear storage stabilizer. Swing rear stabilizer up until the latch hooks onto the up-latch pin.
- c. Remove the safety pin from the pintle hook on the rear of the HMMWV-ECV.
- d. Pull up on the locking latch to open the pintle hook.

WARNING

All personnel must stand clear of HMMWV-ECV and generator set during coupling operation. Failure to follow this warning may cause trailer to tip, resulting in serious injury to personnel.

- e. Back HMMWV-ECV in front of drawbar coupler.
- f. If equipped with fixed front support leg, lift drawbar coupler and place on pintle hook.

WARNING

Drawbar is a heavy (280 pounds/128 kilograms)) loaded tongue weight. Failure to follow this warning may cause trailer to tip, resulting in serious injury to personnel.

2-13.17 Connect the Generator Trailer to the HMMWV-ECV (Cont'd)

- g. If equipped with adjustable front support leg, use hand crank to adjust height of drawbar coupler. Place drawbar coupler in pintle hook.
- h. Close pintle hook. Check to see that pulling up on the pintle hook locks the locking latch. Install safety pin.
- i. Cross two safety chains under drawbar coupler and hook to towing vehicle.
- j. Attach breakaway chain to HMMWV-ECV. Ensure that there is enough slack in breakaway chain to allow trailer to make full turns.

CAUTION

Ensure that breakaway lever is fully released. If it is not fully released, brakes will drag, heat up, and burn out.
--

- k. Ensure that breakaway lever is pushed all the way back toward trailer, and that ratchet teeth are not engaged in leaf spring. If breaks are applied, release by lifting leaf spring and pushing breakaway lever all the way back toward the trailer.
- l. Open latch cover of intervehicular cable and push latch to hold latch cover to the open position.
- m. Lift receptacle cover of towing vehicle. Push plug of intervehicular cable all the way into towing vehicle. Release receptacle cover. Ensure that tab rests in slot.
- n. Pull out on plunger and raise front support leg. Lock front leg in raised position by pushing plunger in all the way.
- o. If equipped with adjustable front support leg, stow hand crank on leg with chain and cotter pin.
- p. Release handbrakes.

SECTION IV OPERATION UNDER UNUSUAL CONDITIONS

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2-14 INTRODUCTION

Information about operating the DTSS-L (V) 2 under unusual conditions is contained in the following paragraphs.

Operating the DTSS-L (V) 2 under unusual conditions.

- | | |
|------------------------------------|-----------------------------|
| • Catastrophic shutdown procedures | • Dust storms or sandstorms |
| • Emergency shutdown procedure | • Extreme cold |
| • Night operation | • Extreme dry heat |
| • Operation in degraded mode | • Extreme moist heat |
| • Emergency exit procedures | • Salt air or salt spray |
| • Fire emergency procedures | • Snow or mud |

Follow these instructions and warnings carefully to ensure safe and correct operation of the DTSS-L (V) 2. If you cannot perform any of the steps, or if you notice a condition that is a safety hazard, report it to your supervisor.

2-15 CATASTROPHIC SHUTDOWN PROCEDURES

Procedures for a catastrophic event and an emergency event are provided in Sections 2-15 and 2-16, respectively. Time is a key factor in these two events.

WARNING

No person should operate this equipment without knowing the location of all power **ON/OFF** switches.

NOTE

There are no emergency stop-power breakers located on the computers.

2-15.1 Catastrophic Event Procedures

During a catastrophic event, when there is no time to enter commands into the computer, as you exit the shelter, push the emergency shut off switch located on the TIP vault.

2-15.2 Effect of Catastrophic Events

If the equipment is suddenly stopped (total loss of power), there is the possibility that damaging events may occur.

- Disk drives: Normally, on loss of power, the drive heads will retract. Place the computer switch to **OFF** before power is restored. Remove or replace disks and then restore power.
- Residual heat: In a catastrophic event, fan-cooled, high-operating-temperature components mounted on heat sinks will temporarily rise in temperature. Sudden application of power to overheated components may cause failures. Always let the system cool before restoring power.

2-16 EMERGENCY SHUTDOWN PROCEDURES

INITIAL SETUP

Personnel Required: 1 (per vehicle)

References: TM 9-2320-280-10
TM 9-6115-642-10
TM 9-6115-660-13&P

2-16.1 Shutdown

In the event of an emergency, perform the following shutdown procedures to turn power **OFF** in the DTSS-L (V) 2.

CAUTION

The **MAIN** Ac CB should be used as an emergency stop only under the most extreme conditions.

- a. At power control panel, set **MAIN** Ac power CB to **OFF**.
- b. Turn **OFF** the Ac output power switch on the front of each of the UPS.
- c. Power-down the 10 kW generator. (Refer to TM 9-6115-642-10 or TM 9-6115-660-13&P).

2-17 NIGHT OPERATIONS

INITIAL SETUP

Personnel required: 1

During night operations, ensure that the blackout curtain is deployed and blackout lighting is set for operation as follows:

- a. Set the **BLACKOUT OVERRIDE** switch to **OFF**.
- b. Deploy blackout curtain as follows:
 1. Unfasten restraints (two on curbside) that secure blackout curtain to the curbside of shelter entry door.
 2. Pull blackout curtain toward the roadside of entry door.
 3. Ensure that hook and loop strips secure the blackout curtain to the shelter wall.
 4. Ensure that blackout curtain closes against shelter roof.
 5. Keep the shelter entry door closed.

2-17 NIGHT OPERATIONS (Cont'd)

NOTE

The scanner lights will generate light when used and are not controlled by the blackout light switch.

2-18 OPERATION IN A DEGRADED MODE

This paragraph contains procedures to operate the DTSS-L (V) 2 in a degraded mode. Degraded mode compensates for failures at the workstation or the laptop computer that will not permit operation of any or all peripherals associated with the workstation. Redundancy considerations are discussed in relation to the ability to continue the mission requirements.

2-18.1 Redundancy Considerations

The DTSS-L (V) 2, as a system, is designed with built-in redundancy. This ensures full functionality in the event of any single component failure. For example, if the workstation in shelter fails, the laptop computer could be configured as an X-terminal. Additional redundancy is provided with removable hard disks in the workstation. Both computers have duplicate software, which allows the laptop computer to perform all image processing functionality, and a sub-set of the communications functionality in the event of a workstation failure. The connectivity discussed must be manually configured with cables stored in the shelter.

2-18.2 Degraded Mode Operations-Using the Laptop Computer in the Shelter

If the workstation becomes inoperable, the Laptop Computer can be used in the shelter to perform most of the functions of the workstation. This will allow access to the RAID and CD-RW. The following procedures are for setup in the shelter:

CAUTION

Before disconnecting any SCSI cables, power down all computer equipment and place the workstation CB to the OFF position.

NOTE

For gaining access to the laptop computer hard drive and/or the workstation through the KVM switch for single operator or degraded mode.

- a. Remove the laptop computer case from storage area
- b. Open case, remove laptop computer.
- c. Place laptop computer and cables on fully extended shelf.
- d. Connect cables W128 P3 KYBD and W128 P4 MSE into emulator using corresponding markings on cables and emulator.

2-18.2 Degraded Mode Operations-Using the Laptop Computer in the Shelter (Cont'd)

- e. Connect emulator cables into the adapter on cable W148.
- f. Connect cable W148 into the laptop's external mouse port, using marking on laptop.
- g. Connect cable W101 into RJ 45 port on laptop.
- h. Connect cable W128 P2 into 9-pin video serial port on the laptop computer.
- i. Connect cable W143 at the P1 end into the PCMCIA slim SCSI card and plug the SCSI card into the top PCMCIA slot on the laptop computer.

NOTE

Ensure SCSI booster DIP Switches A and B terminators are set to OFF.

- j. Connect cable W143 at the P2 end into the cable converter that is connected to the SCSI Booster.
- k. Loosen retainer screws on pull-out panel tray for CD-RW.
- l. Carefully pull out CD-RW panel tray.
- m. Remove connector J2 (cable W122) from Port A on SCSI booster.
- n. Replace cable W122 with cable W150 located in CD-RW panel tray.
- o. Carefully close CD-RW panel tray.
- p. Secure retaining screws on panel.
- q. Locate and connect the laptop computer power cord and plug into power jack (yellow) on the laptop computer.
- r. Follow power up procedures per Paragraph 2-10.1. Leave workstation (VCU) powered OFF.
- s. At SCSI switch, select "MENU" and arrow to "SET PORTS."
- t. Arrow to 1A and press "ENTER" to remove setting.
- u. Arrow to 1B and press "1B" to select; arrow right to "2B" to select.
- v. Power up the laptop computer.

NOTE

The KVM buttons "1" and "2" are used to change access between the workstation and the laptop computer.

- w. On the KVM switch, press the button labeled "2." The CFPD will display the laptop computer windows. The operator now uses the keyboard, mouse and CFPD to access the laptop computer.

2-18.3 Preparation for Movement in Degrade Mode-Securing the Laptop Computer

The laptop computer must be disconnected from data/signal and power cables. The following procedures apply when the laptop computer is used in shelter in degraded mode:

- a. Close laptop computer after power down is completed (Paragraph 2-12.2.2).
- b. Disconnect power supply cable from the laptop computer and Ac receptacle. Place in transit case.
- c. Disconnect SCSI Booster cable from the laptop computer and the SCSI Booster power supply connection. Place SCSI Booster in transit case.
- d. Disconnect cable W101 from the RJ45 port on the laptop computer (leave in place).
- e. Disconnect cable W128 from the Emulator.
- f. Disconnect the Emulator from the three connections (keyboard, mouse, and video) on the laptop computer. Place Emulator in transit case.
- g. Place laptop computer in its own case and then in the transit case.
- h. Secure transit case in laptop computer compartment or place in approved GSA container if necessary.

2-19 Indoor Workstation Deployment

On occasion, the components of the DTSS-L (V) 2 may need to be removed from the shelter and placed in a garrison environment. The following procedures describe how to set up these components on a tabletop.

NOTE

Operator must request Unit Maintenance support for the removal and replacement of the following components: Workstation, keyboard, monitor, RAID, and the UPS.

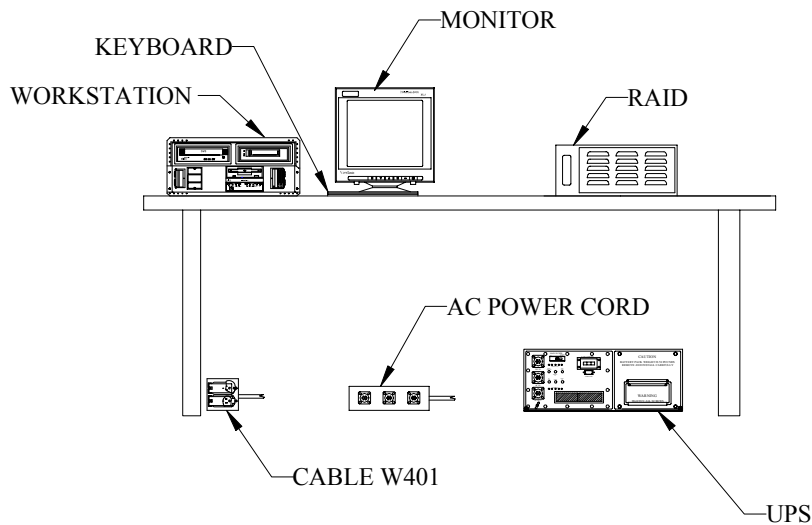


Figure 2-80 Indoor Workstation Deployment

Use the following Data/signal cabling configuration for setting up the indoor deployment.

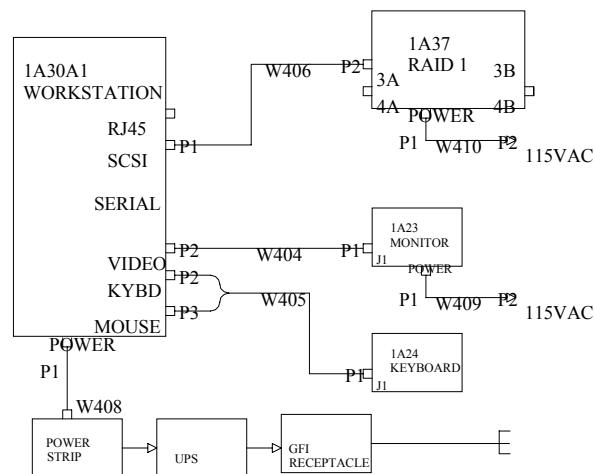


Figure 2-81 Indoor Workstation Deployment Cabling

2-19.1 Connecting and Cabling of Equipment

WARNING

The surge protector and power strip should be positioned so that moisture does not accumulate around them and that they do not rest in moisture.

NOTE

Check the ground status of the source power prior to powering up the equipment.

1. RAID

CAUTION

Use care when connecting any SCSI cable to avoid bending small pins in the connector.

- a. Connect 68-pin SCSI cable “W406” from SCSI port host channel 3 “in” on the RAID to PCI3 on back of workstation.
- b. Connect Ac power cable to Ac input on back of RAID using “W410”.

2. CFPD

- a. Connect cable “W404” from the top video port (APG) on the rear of the workstation to the video port on the CFPD.
- b. Connect Ac power cable “W409” to Ac input on back of CFPD.

3. Workstation Keyboard/mouse cable

- a. Connect keyboard/mouse cable “W405” to keyboard.
- b. Connect keyboard/mouse cable “W405” to the 6-pin keyboard ports on back of workstation.

2-19.1 Connecting and Cabling of Equipment (Cont'd)

4. Workstation
 - a. Connect Ac power cable "W408".
5. UPS

WARNING

The surge protector and UPS power strip should be positioned so that moisture does not accumulate around them and that they do not rest in moisture.

- a. On front of UPS "W418" (middle connector) connect the Ac input cable.
 - b. Connect Ac input cable to GFI Receptacle "W401".
 - c. Connect UPS power Strip "W419" into the Ac output on front of UPS (bottom connector).
6. UPS Power Strip
 - a. Plug in RAID power cord.
 - b. Plug in CFPD power cord.
 - c. Plug in Workstation power cord.

2-19.2 Power Up the UPS

WARNING**ELECTRICAL HAZARD**

Be sure the DTSS-L is properly grounded. Loose or broken ground and power connections can cause electrical shock or death. Serious personal injury or death may result from failure to observe this warning.

WARNING

The surge protector and power strip should be positioned so that moisture does not accumulate around them and that they do not rest in moisture.

CAUTION

Power up of the computer equipment must be completed in a sequence that enables all SCSI equipment to obtain correct addressing. The procedures in the following paragraphs explain the correct sequence to power up the computer equipment.

CAUTION

No person should operate this equipment without knowing the location of all power ON-OFF switches.

NOTE

Check the ground status of the source power prior to powering up the equipment.

At the UPS, place the 'Power On' switch in the ON position. The unit will perform an internal self-test (the indicators will be illuminated in green, amber, red, and off sequence). The green LED will light if the UPS is functioning correctly. After the self-test is complete, turn AC CB on front of UPS to the "ON" position.

2-19.3 Power Up the RAID

NOTE

There is approximately a five-minute warm-up for the RAID. In order to ensure that the storage RAID is powered up, verify that all unit number displays are lit. If a unit number is not displayed for a disk drive, reseal the hard disk drive. If the same problem occurs, call Unit Maintenance.

Verify that the RAID LCD lights up. This shows the RAID is receiving power.

2-19.4 Power Up the CFPD

Verify the CFPD is on by checking for orange LED lit. If not lit, turn CFPD ON.

2-19.5 Power Up the Workstation

NOTE

Verify that power to all external peripherals is on before applying power to the workstation. Failure to do so may require the system to be rebooted.

- a. Verify that all peripherals are fully booted. (The RAID has the longest boot-up time.)
- b. Power up the workstation by placing the CB 1 on rear of workstation in the "up" position.
- c. Verify that the EXT PWR, BAT PWR, DISK ACCESS LEDS are lit green. Press the PROC POWER ON/OFF button "ON."
- d. View color monitor for status of the boot.
- e. Log on when the NT Log-On window appears as directed by the system administrator. See the TB 11-6675-294-10 for log-on procedures

2-20 EMERGENCY EXIT PROCEDURES

In the event the shelter personnel door is blocked or is not accessible, a secondary exit located in the center of the shelter roof can be used as an emergency exit. To open the secondary exit, move the two exit handles toward the center of the exit and push the exit outward. Use the operator chair or any other suitable support to assist you in exiting the shelter.

2-21 FIRE EMERGENCY PROCEDURES**INITIAL SETUP**

Materials/Supplies: Fire extinguisher

Personnel required: 1

WARNING

After extinguishing a fire, combustion and decomposition products may be present in quantities hazardous to personnel.

NOTE

Any attempt to extinguish a fire in the shelter must be accomplished by using the fire extinguisher provided as part of the shelter equipment.

- a. Remove fire extinguisher from lower rear wall (roadside) bracket as follows:
 1. Unlatch restraint band and pull fire extinguisher from mounting bracket.
 2. For safe and proper operation of fire extinguisher, refer to operating instructions on unit.
 3. Shut down power at source.
- b. If fire cannot be contained, proceed as follows:
 1. Evacuate shelter IMMEDIATELY!!
 2. Close shelter entry door tightly — DO NOT lock.
 3. Shut down power at source.
 4. Summon EMERGENCY help if available.

2-22 DUST STORMS OR SAND STORMS

INITIAL SETUP

Materials/Supplies: cleaning cloth

Personnel required: 1

- a. During dust or sand storms, keep shelter entry door closed as much as possible.
- b. When storm is over, perform the following steps:

WARNING

Do NOT get cables or connectors wet when cleaning exterior of DTSS-L (V) 2 shelter with water. If you do, you could get a severe electrical shock. Refer to Paragraph 1-11, Equipment Data, for temperature and humidity limitations.

1. Turn **OFF** all power to shelter (generator) before washing.
2. Wash exterior shelter surfaces with water.
3. Inspect for signs of corrosion and chipped paint.
4. Report any such signs to your supervisor.

2-23 EXTREME COLD

INITIAL SETUP

Personnel required: 1

During extreme cold conditions, keep traffic in and out of shelter to a minimum.

CAUTION

To prevent DTSS-L (V) 2 failure, the heat mode should be turned on before the outside temperature drops below -46°C (-50°F).

- a. Operate air conditioner in heat mode as follows:
 1. Ensure that all exposed air inlets are clear of ice and snow.
 2. Check all openings in the enclosure, especially doors, to ensure they are tightly closed. Limit in and out traffic, if possible.
 3. Set MODE SELECTOR switch to HEAT LOW or HEAT HIGH.
 4. Turn TEMPERATURE SELECTOR control toward WARMER, as required.

NOTE

Cable insulation becomes stiff and brittle during extreme cold.

- b. Avoid unnecessary cable movement.
- c. If cables must be moved, check insulation for cracks and breaks. Report any damage to your supervisor.

CAUTION

To prevent ink cartridges from freezing and allow quicker start-up during clod transit, turn on transit heater.

- d. Operate transit heater in heat mode as follows:
 - 1. Place the “Dc Power” CB in the **ON** position.
 - 2. Ensure the system is secured in storage configuration.
 - 3. Ensure no loose papers or articles are located in proximity of transit heater.
 - 4. Ensure transit heater louvers are open.
 - 5. Turn **ON** transit heater.
 - 6. Set heater control dial at 50 degrees F.

2-24 EXTREME DRY HEAT**INITIAL SETUP**

Personnel required: 1

- a. During extreme dry-heat conditions, DTSS-L (V) 2 equipment will be exposed to more dust and dirt than usual. Increase the frequency of inspection for dirt and dust. Clean the equipment both inside and outside the DTSS-L (V) 2, as required. Refer to Paragraph 1-11, Equipment Data, for temperature and humidity limitations.
- b. Operate air conditioner in cooling mode as follows:
 - 1. Check all openings in the enclosure, especially doors, to ensure they are tightly closed. Limit in and out traffic, if possible.
 - 2. Set MODE SELECTOR switch to COOL.
 - 3. Turn TEMPERATURE SELECTOR control toward COOLER, as required.

2-25 EXTREME MOIST HEAT

INITIAL SETUP

Personnel required: 1

- a. During extreme moist-heat conditions, you should be especially careful in performance of PMCS. Equipment is likely to be damaged by fungus, rust, and corrosion. Refer to Paragraph 1-11, Equipment Data, for temperature and humidity limitations.
 1. Check all openings in the enclosure, especially doors, to ensure they are tightly closed. Limit in and out traffic, if possible.
 2. Increase the frequency of visual inspections and lubrication of outside equipment.
 3. Report chips or cracks in painted surfaces to your supervisor.
 4. Inspect all outside surfaces, including cables and connectors, for fungus growth.
 5. Report any fungus growth to your supervisor.
 6. Perform cleaning of interior/exterior surfaces on a weekly basis.
- b. Operate air conditioner in cooling mode as follows:
 1. Set MODE SELECTOR switch to COOL.
 2. Turn TEMPERATURE SELECTOR control toward COOLER, as required.
- c. Air conditioner should dehumidify air and prevent moisture damage to equipment inside shelter. Frequently inspect all inside components for moisture or corrosion damage.
- d. Report any damage to your supervisor.

2-26 SALT AIR OR SALT SPRAY

INITIAL SETUP

Personnel required: 1

During salt air or salt spray conditions, it will be necessary to clean all exterior surfaces regularly, and keep traffic in and out of the shelter to a minimum.

WARNING

Do NOT get cables or connectors wet when cleaning DTSS-L (V) 2 with water. If you do, you could get a severe electrical shock.

- a. Turn off all power to shelter (at generator or facility source) before washing shelter.
- b. Wash external surfaces regularly with fresh water.
- c. Inspect for signs of corrosion and chipped paint. Report any signs of corrosion or chipped paint to your supervisor.

2-27 SNOW OR MUD

INITIAL SETUP

Personnel required: 1

- a. During snowy or muddy conditions, keep traffic in and out of shelter to a minimum.

WARNING

Keep personnel ladder steps clean to prevent slipping and falling. Serious injury to personnel could result.

- b. Clean and dry interior floor, as required.

2-28 CHEMICAL CONTAMINATION ENVIRONMENT

INITIAL SETUP

Personnel required: 1

WARNING

To avoid possible injury/loss of life, immediately put on your protective mask.

CAUTION

To avoid contamination of the shelter, immediately turn on the Gas Particulate Filter Unit (GPFU). (See Paragraph 2-9.6, GPFU Operation.)

- a. To avoid injury/loss of life or shelter contamination:
 1. Activate GPFU system.
 2. Turn **OFF** all fresh air vent systems at the main CB panel.
 3. Ensure the inlet and exhaust vents on the left side of the shelter (near the GPFU panel) are closed.
- b. To purge the shelter free of contamination:
 1. Put on protective mask and ensure that a proper seal between the face and the mask is achieved.
 2. Activate the GPFU system (ensure the fresh air vent fan system is turned **OFF**).
 3. Open the fresh air exhaust valve located near the GPFU control panel, allowing maximum fan speed and increasing airflow from the filter unit.
 4. Continue operation of the GPFU at maximum speed for at least 20 minutes.
 5. After completing purge, personnel should operate a detection device to ensure the crew area is clean. Once area is clean, remove your protective mask

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CHAPTER 3 MAINTENANCE INSTRUCTIONS

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SECTION I LUBRICATION INSTRUCTIONS

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3-2 DTSS-L (V) 2 HMMWV-ECV Lubrication.....	3-2
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3-1 SHELTER LUBRICATION

This paragraph provides instructions to lubricate components in the shelter. Lubrication of these components is to be performed semi-annually as follows:

NOTE

These lubrication instructions are mandatory.

INITIAL SETUP

Personnel required: 1
 Materials/Supplies: Grease, general-purpose
 Rag, cleaning

This paragraph provides instructions to lubricate components attached to the DTSS-L (V) 2 shelter. Lubrication of these components is to be performed semi-annually as follows:

Shelter Door Hinges

Using lubricant, lubricate shelter door hinges as follows:

- a. Clean away any dirt from the hinges.
- b. Lubricate the hinges.

3-2 DTSS-L (V) 2 HMMWV-ECV LUBRICATION

For HMMWV-ECV lubrication procedures, refer to lubrication order, Appendix G, TM 9-2320-387-10.

3-3 10-kW GENERATOR LUBRICATION

For 10 kW generator set lubrication procedures, refer to lubrication order, LO 9-6115-642-12, or TM 9-6115-630-14&P.

3-4 TRAILER LUBRICATION

For the generator trailer lubrication instructions, refer to LO 9-2330-392-14&P.

SECTION II OPERATOR TROUBLESHOOTING PROCEDURES

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3-5 GENERAL

This section contains symptom indexes and troubleshooting flowcharts to help in isolating faults within the shelter. Operator troubleshooting isolates failure symptoms to the Line Replaceable Unit (LRU).

3-5.1 Different Types of Troubleshooting Assistance Available

There are four types of troubleshooting aids:

- a. Error messages on Workstation/laptop computer displays
- b. LRU indicators
- c. Symptom Index
- d. Troubleshooting flowcharts

Error messages alert the operator to a hardware or software failure. They also provide instruction about system operation. Diagnostic software is described later. The Symptom Index is a problem-solution chart that lists common problems with probable solutions. Troubleshooting tables are provided for each LRU. Use the aids listed above in the order of appearance. The operator must complete the troubleshooting sequence defined in the order specified to minimize system downtime. Definitions for application software error messages are in the DTSS-L (V) 2 Software User's Manual TB 11-6675-295-10. The Symptom Index and troubleshooting tables are in this chapter.

3-6 DIAGNOSTICS

Diagnostics are part of the shelter troubleshooting procedures. Diagnostics isolate equipment faults and verify operation of selected functions. The shelter uses on-line diagnostics.

3-6.1 On-Line Diagnostics

These diagnostics (self-tests) reside in the workstation, laptop computer, and UPS. The information is automatically displayed on the CFPD or laptop display screen each time the equipment is turned on. The NT operating systems provide diagnostics for four different areas.

3-6.1 On Line Diagnostics (Cont'd)

The software diagnostics available are:

- NT workstation
- Scanner
- Laptop computer
- SCSI switch
- Network diagnostics
- Plotter
- Peripherals
- Netra server

Refer to TB 11-6675-295-10, for use of the software diagnostics available with the DTSS-L (V) 2.

3-7 SYMPTOM INDEX

The Symptom Index (Table 3-1) tells the operator what to do when a fault occurs. The index is arranged by LRU or functional area. When a fault occurs, carefully inspect the equipment for abnormal indicator responses to decide which Fault Indication to follow. Use the Action for a given Fault Indication in their order of appearance. If the Action(s) does not solve the problem, choose another Fault Indication to resolve the problem. Notify Unit Maintenance if you cannot solve the problem.

Table 3-1 Symptom Index

Item	Fault Indication	Action
1	Power distribution	
1-1	Shelter power failure	Check power source, power input cables, and CB panels. Contact Unit Maintenance.
1-1.1	Lighting system	Check CB panel, individual light switches, and blackout switch. Perform Lighting Troubleshooting (See Figure 3-5).
1-1.2	All equipment fails to power-up.	Check power source, power input cables, CB panels. Perform Power Distribution Troubleshooting (See Figure 3-3).
1-1.3	Single equipment fails to power-up or loses power.	Check CB panel, check for proper connection of device power cord. Verify that power switch is set to ON . Contact Unit Maintenance.
1-2	UPS	
1-2.1	UPS indicators out.	Ensure that external power sources and battery have adequate voltage; turn on Power ON switch. Contact Unit Maintenance.

3-7 SYMPTOM INDEX (Cont'd)

Table 3-1 Symptom Index (Cont'd)

Item	Fault Indication	Action
1-2.2	UPS fan inoperative.	Contact Unit Maintenance.
1-2.3	UPS BATTERY indicator lights amber.	Battery voltage low—may take up to 24 to 72 hours to recharge. Perform UPS Troubleshooting. (See Figure 3-4).
1-2.4	UPS BATTERY indicator lights red.	Perform UPS Troubleshooting. (See Figure 3-4). Contact Unit Maintenance.
1-2.5	TEMP indicator lights red.	Filter clogged. Clean filter. (See PMCS or See Figure 3-4).
1-3	ECU	
	ECU does not start.	Perform ECU Troubleshooting. (See Figure 3-18).
	ECU has reduced cooling capacity.	Perform ECU Troubleshooting. (See Figure 3-18).
	ECU is producing too much heat.	Perform ECU Troubleshooting. (See Figure 3-18).
	ECU has reduced heating capacity.	Perform ECU Troubleshooting (See Figure 3-18).
1-4	Fresh-air fan	
1-4.1	Fan not operating.	Verify ECU CB is ON. Contact Unit Maintenance.
2	Computer equipment	
2-1	Workstation	
2-1.1	Workstation fails during normal operations.	Check cabling. Perform Workstation Troubleshooting. (See Figure 3-6). Contact Unit Maintenance.

3-7 SYMPTOM INDEX (Cont'd)

Table 3-1 Symptom Index (Cont'd)

Item	Fault Indication	Action
2-1.2	Keyboard/Mouse does not respond.	Look for error messages on display. Check keyboard cabling. Perform Workstation Troubleshooting. (See Figure 3-6). Perform KVM Troubleshooting (See Figure 3-7).
2-1.3	DVD-RAM (fault)	Perform Workstation Troubleshooting. (See Figure 3-6).
2-1.4	8-mm tape drive	Perform Workstation Troubleshooting. (See Figure 3-6).
2-1.5	RHDD (fault)	Perform Workstation Troubleshooting. (See Figure 3-6).
2-1.6	LS 120 FDD (fault)	Perform Workstation Troubleshooting. (See Figure 3-6).
2-1.7	JAZ drive (fault)	Perform Workstation Troubleshooting. (See Figure 3-6).
2-2	CFPD	
2-2.1	CFPD display screen shows incorrect colors, text, or graphics.	Verify that SYNC video sync cables are connected correctly. Adjust display controls. Check KVM switch setting. Perform Workstation (video) Troubleshooting. (See Figure 3-6).
2-2.2	CFPD fan inoperative.	Check fan filter. If dirty, perform PMCS. If persists, Contact Unit Maintenance.
2-4	CD-RW	
2-4.1	CD-RW	Perform CD-RW Troubleshooting. (See Figure 3-12).
2-5	RAID	
2-5.1	RAID fails self-test.	Contact Unit Maintenance.
2-5.2	RAID does not upload/download.	Look for error messages on display. Perform RAID Troubleshooting. (See Figure 3-13). Follow corrective action in Software User's Manual (TB 11-6675-295-10). Check data cable connections. Verify that configuration files in workstation are correct. Contact Unit Maintenance.
2-5.3	RAID storage device does not respond.	Look for error messages on display. Follow corrective action in the TB 11-6675-295-10. Contact Unit Maintenance.
2-6	Scanner	
2-6.1	Scanner	Perform Scanner Troubleshooting (See Figure 3-14).
2-7	Plotter	
2-7.1	Plotter not printing properly.	Check default settings on plotter. Perform Plotter Troubleshooting (See Figure 3-15).
2-8	Printer	
2-8.1	Printer not printing properly.	Look for error messages on display. Check default settings on printer. Perform Printer Troubleshooting. (See Figure 3-16).

3-7 SYMPTOM INDEX (Cont'd)

Table 3-1 Symptom Index (Cont'd)

Item	Fault Indication	Action
2-9	Laptop computer	Run self-check software. Perform Laptop Computer Troubleshooting. (See Figure 3-17). Contact Unit Maintenance.
2-9.1	Laptop computer inoperative.	
2-10	Ethernet switch	NOTE Ensure all cables are properly connected.
2-10.1	Malfunctioning	
2-11	Media converter	Perform Media Converter Troubleshooting. (See Figure 3-9).
2-11.1	Malfunctioning	
3	STE	Perform STE Troubleshooting (See Figure 3-19).
3-1	STE	
4	DLT Autoloader	Check cables. Check front panel fault indicators. Perform DLT Autoloader Troubleshooting (See Figure 3-11).
4.1	Malfunctioning	
5	Netra Server	Check cables. Check fault LEDs. Perform Netra Troubleshooting (See Figure 3-8).
5.1	Malfunctioning	
6	KVM Switch	Check cables. Check front panel for error indications. Perform KVM switch Troubleshooting (See Figure 3-7).
6.1	Malfunctioning	
7	SCSI Switch	Check cables. Check front panel for error messages. Perform SCSI Switch Troubleshooting (See Figure 3-10).
7.1	Malfunctioning	

3-7.1 SCSI/Dip Switch Settings

If the SCSI/Dip Switch setting(s) is incorrect, the piece of equipment will not be visible to the system and will fail to function. The following table shows the correct SCSI ID setting(s) for the various pieces of equipment. If a piece of equipment has power, but is not “visible” to the system, check the SCSI ID setting, correct the setting and reboot the workstation.

Table 3-2 SCSI/Dip Switch Settings

Drive/Item	SCSI Setting
SCSI Booster (both dip switches)	Set to “ON”
CD–RW	Set to “5” to ON.
DVD-RAM (part of workstation)	Set to “3” to ON.
8-mm tape drive (part of workstation)	Set to “4” to ON.
JAZ/PCMCIA slots (part of workstation)	Set to “2” to ON.
Scanner (8 dip switches, only two are used)	Set “1” and “4” to ON

3-8 TROUBLESHOOTING FLOWCHARTS

CAUTION

Ten seconds time must be allowed after shutdown prior to restarting equipment to prevent damage to equipment.

These troubleshooting flowcharts are provided to guide the operator in fault isolation. Operator troubleshooting procedures are not limited to those found in this section. Fault indications can come from various sources including, but not limited to, the following:

- Power-up sequence indications
- Indications from diagnostics
- Indications during unit self-test
- Indications from manual troubleshooting techniques.

3-8.1 Power-Up Sequence Indications

Equipment indications during system power-up are valuable troubleshooting aids that supply sufficient information to help determine most faults. In most cases, when a problem develops, it is advisable to turn the equipment off. Execute the power-up process by following the procedures while observing the equipment indicator responses.

3-8.2 Diagnostic Indications

Refer to the diagnostics in TB 11-6675-295-10.

3-8.3 Unit Self-Test Indications

Refer to the unit self-tests in TB 11-6675-295-10.

3-8.4 Indications from Manual Troubleshooting Techniques

Manual troubleshooting techniques such as continuity tests and voltage checks are done only by the Unit Maintainer.

3-8.5 Use of Troubleshooting Flowcharts

3-8.5.1 Symptom Index Directed to Troubleshooting Flowchart

When the Symptom Index references a troubleshooting flowchart, the operator should always read through the entire flowchart before following the directions. This will help the operator understand the nature of the fault and make it easier to correct. Each flowchart provides specific malfunctions, tests or inspections, and corrective actions.

The operator can detect equipment failure in one of two ways:

- The equipment cannot be brought on-line after power turn-on.
- Failure occurs while the equipment is operating.

Observation of the equipment between power turn-on and system boot-up provides considerable information to localize failures.

3-8.5.2 LRU Removal and Replacement

Troubleshooting procedures require the removal and replacement of LRUs by Unit Maintenance to restore the shelter to operational capability. If a malfunction occurs that is not covered in troubleshooting, or corrective action provided does not remedy the trouble, call the unit maintainer.

3-8.5.3 After Corrective Action

After the corrective action is done, the equipment must be tested to verify that the problem is fixed. Testing should be performed using applicable diagnostics or unit self-tests. Locate the malfunction in the flowchart and perform the test or inspection. If the correct response is not obtained, perform the corrective action.

3-8.5.4 Specific Troubleshooting Flowcharts

This manual cannot list all malfunctions that may occur, or all tests or inspections and corrective actions. If a malfunction is not listed or is not corrected by the listed corrective actions, notify your supervisor/contact Unit Maintenance.

The troubleshooting flowcharts list procedures for:

- | | |
|--------------------------------------|-------------------------------------|
| • Power Distribution Troubleshooting | • DTL Autoloader Troubleshooting |
| • UPS Troubleshooting | • CD–RW Troubleshooting |
| • ECU Troubleshooting | • RAID Troubleshooting |
| • Lighting System Troubleshooting | • Scanner Troubleshooting |
| • Workstation Troubleshooting | • Plotter Troubleshooting |
| • CFPD Troubleshooting | • Printer Troubleshooting |
| • KVM Switch Troubleshooting | • Laptop Computer Troubleshooting |
| • Netra Server Troubleshooting | • STE Troubleshooting |
| • Ethernet Switch/Media Converters | • SCSI Power Supply Troubleshooting |
| • SCSI Switch Troubleshooting | • SCSI Booster Troubleshooting |

3-8.6 Specific Troubleshooting Flow Charts (Cont'd)

The following shows the meaning of each symbol used in the flowcharts:

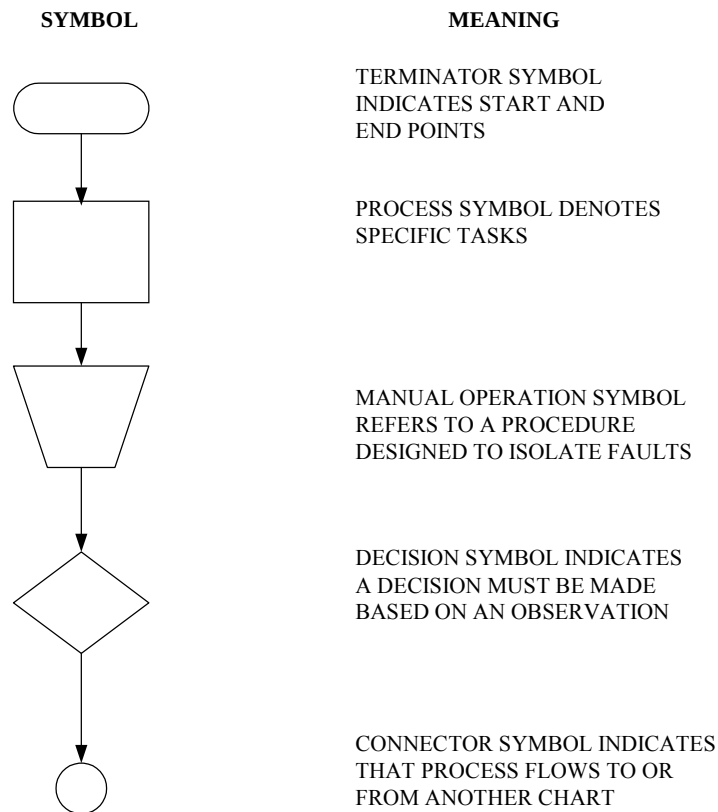


Figure 3-1 Flowchart Symbols

The troubleshooting flowcharts list procedures for the following DTSS–L components:

- Power distribution
- UPS
- Lights
- Workstation (including storage devices)
- KVM switch
- Netra server
- Ethernet switch
- SCSI switch
- DLT Autoloader
- CD–RW
- RAID
- Scanner
- Plotter
- Printer
- Laptop computer
- SCSI Booster Power Supply

3-8.6.1 DTSS-L (V) 2 Top Level Flowchart Troubleshooting

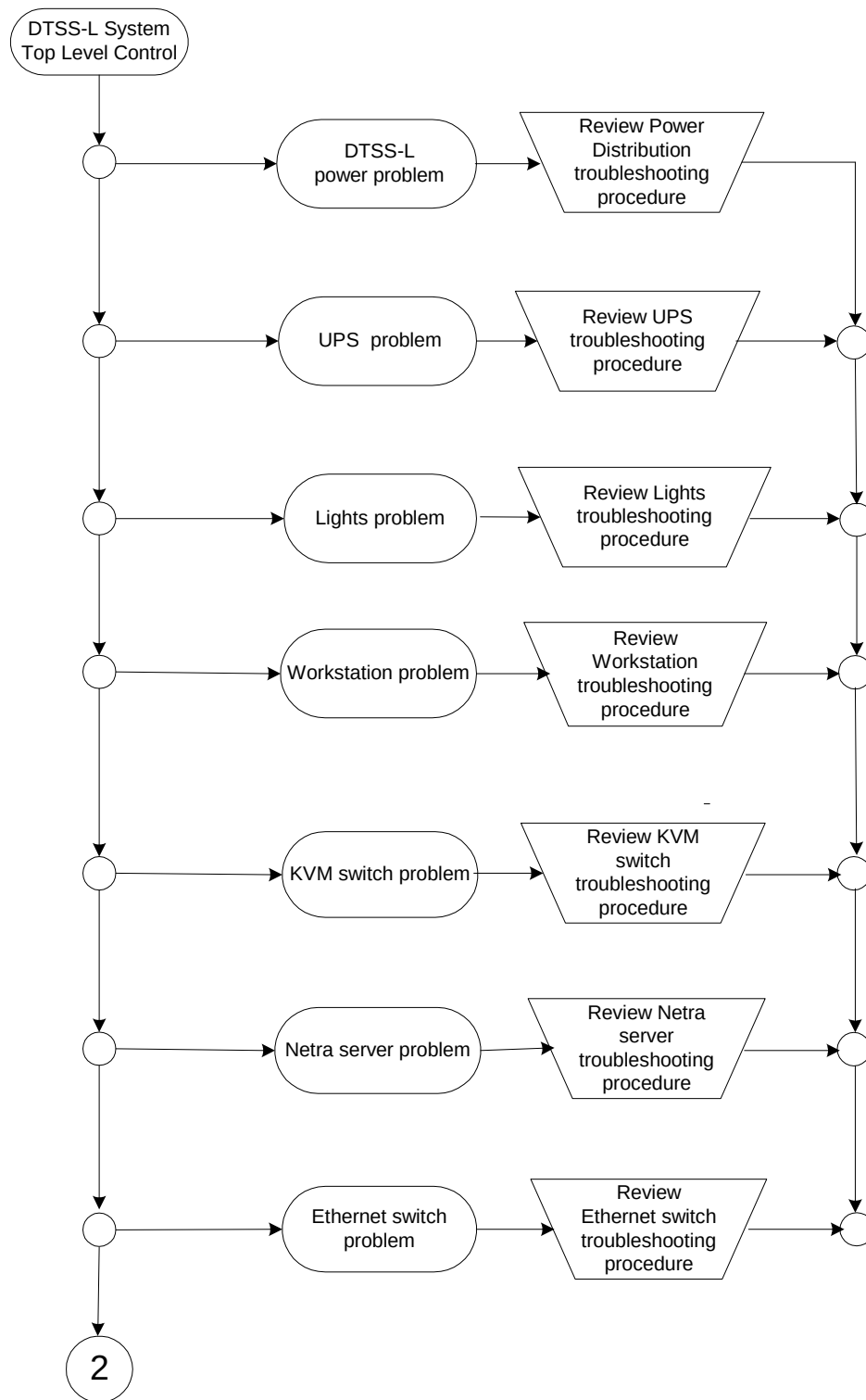


Figure 3-2 DTSS-L (V) 2 Top Level Flowchart (1 of 2)

3-8.6.1 DTSS-L (V) 2 Top Level Flowchart Troubleshooting (Cont'd)

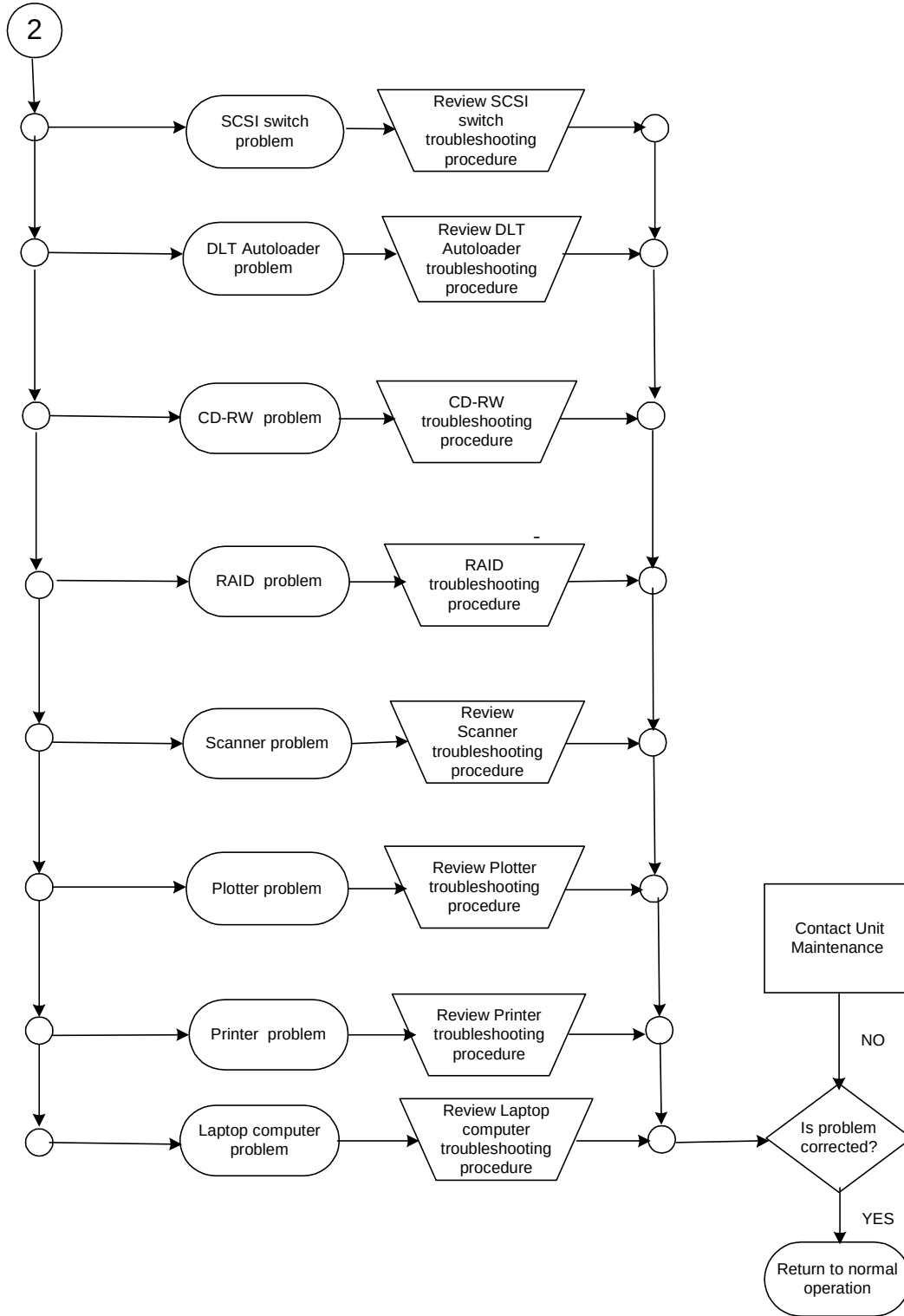


Figure 3-2 DTSS-L (V) 2 Top Level Flowchart (2 of 2)

3-8.6.2 DTSS-L (V) 2 Power Distribution Troubleshooting

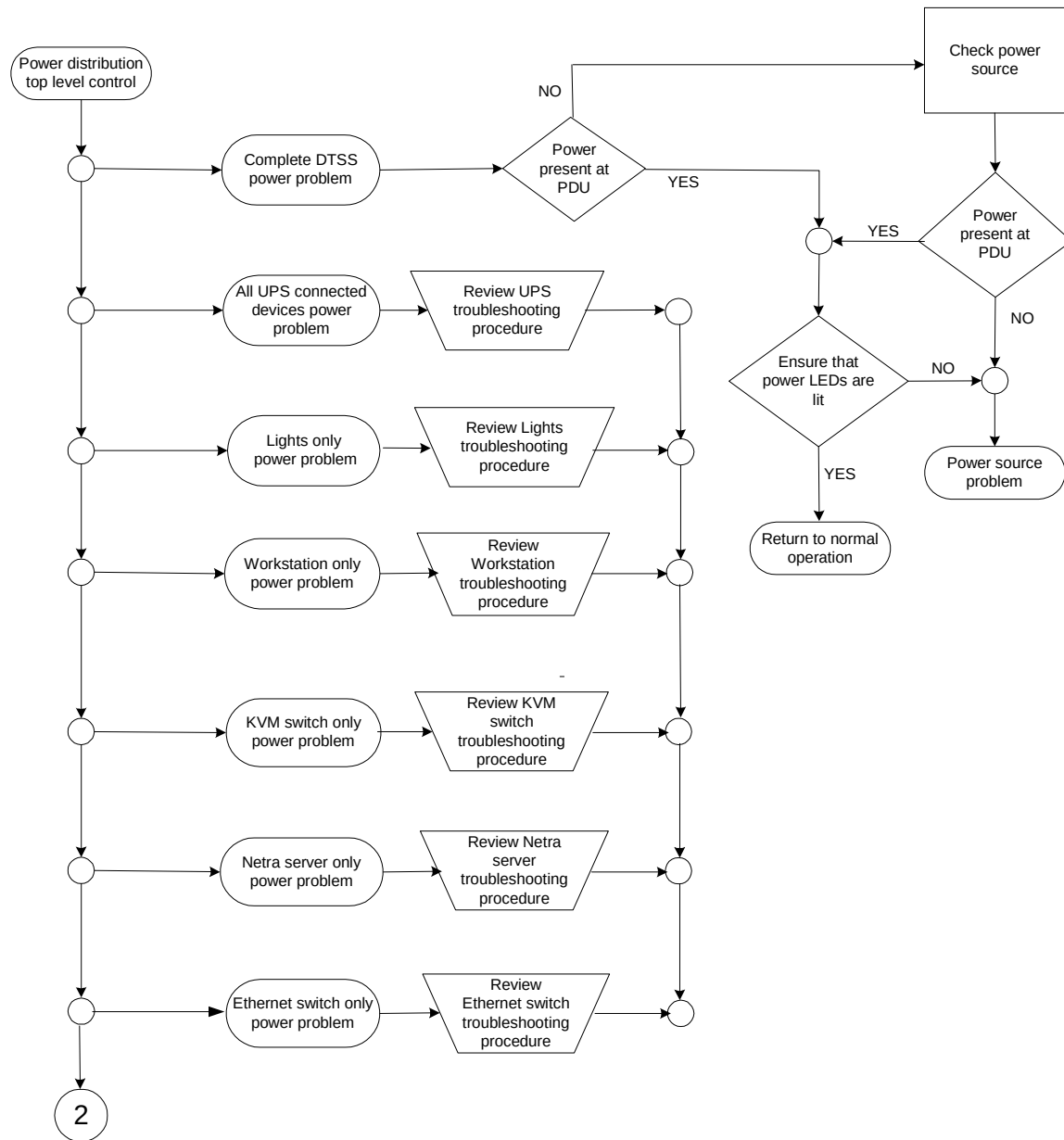


Figure 3-3 DTSS-L (V) 2 Power Distribution Troubleshooting (1 of 2)

3-8.6.2 DTSS-L (V) 2 Power Distribution Troubleshooting (Cont'd)

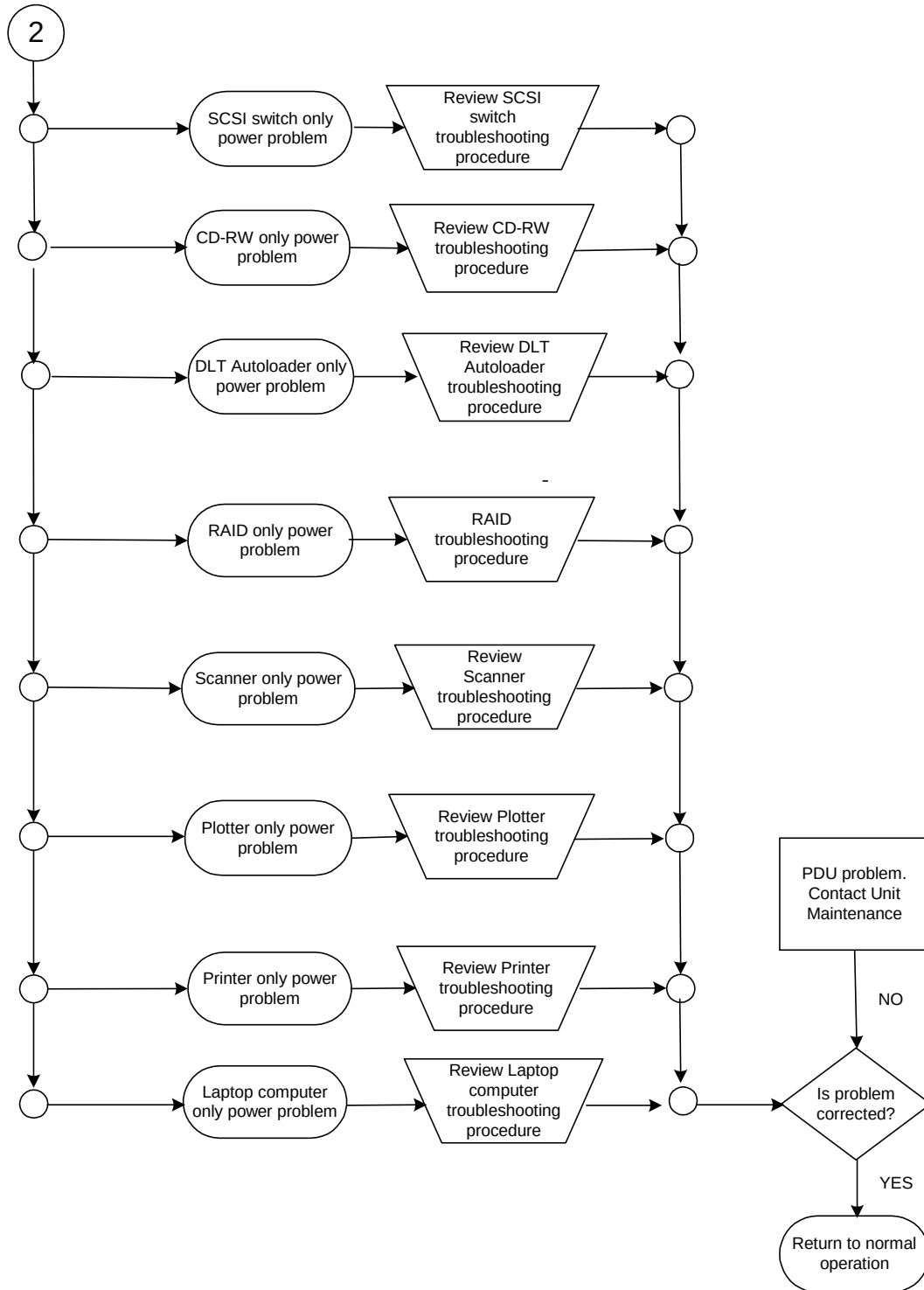


Figure 3-3 DTSS-L (V) 2 Power Distribution Troubleshooting (2 of 2)

3-8.6.3 UPS Troubleshooting

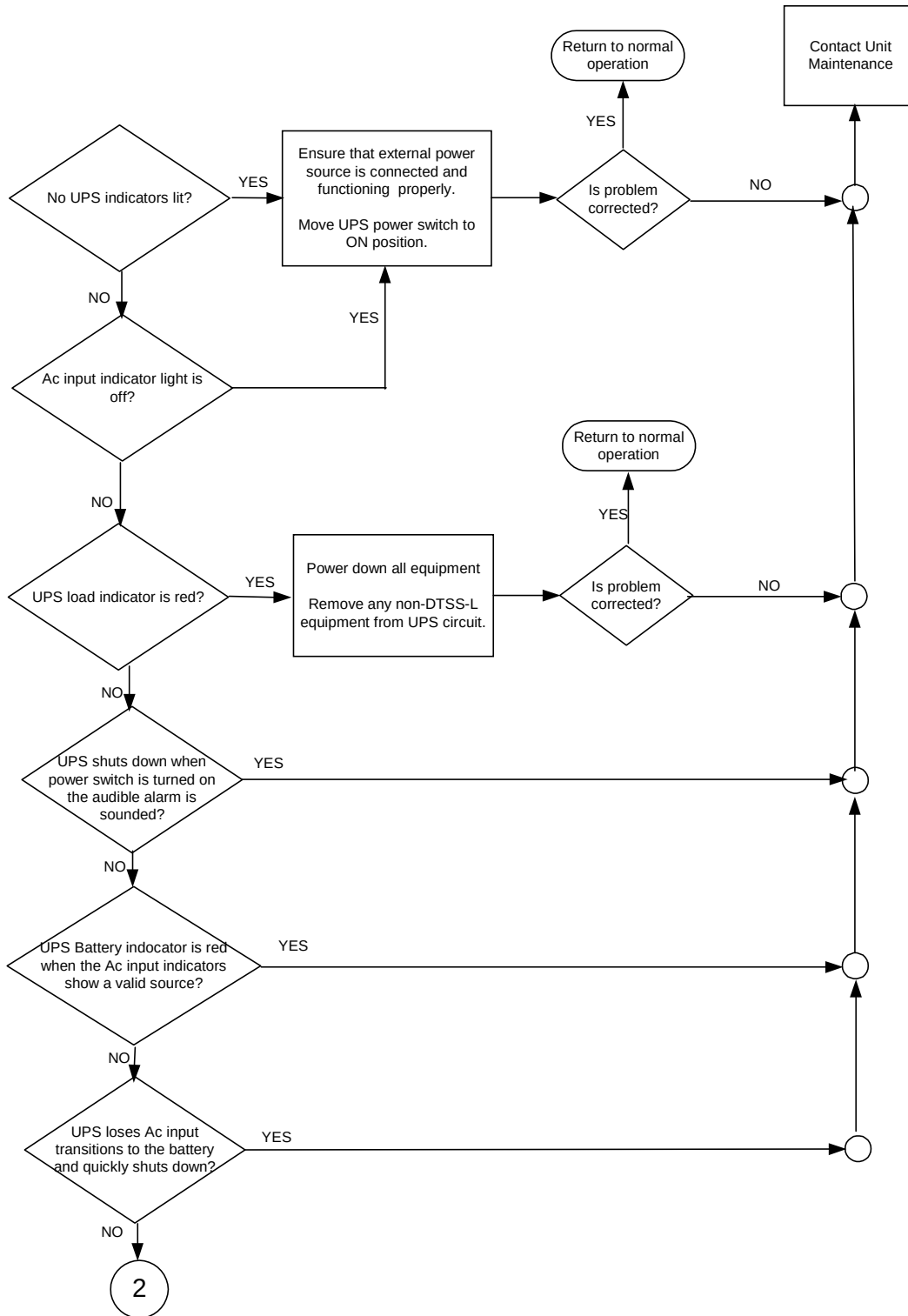


Figure 3-4 UPS Troubleshooting (1 of 2)

3-8.6.3 UPS Troubleshooting (Cont'd)

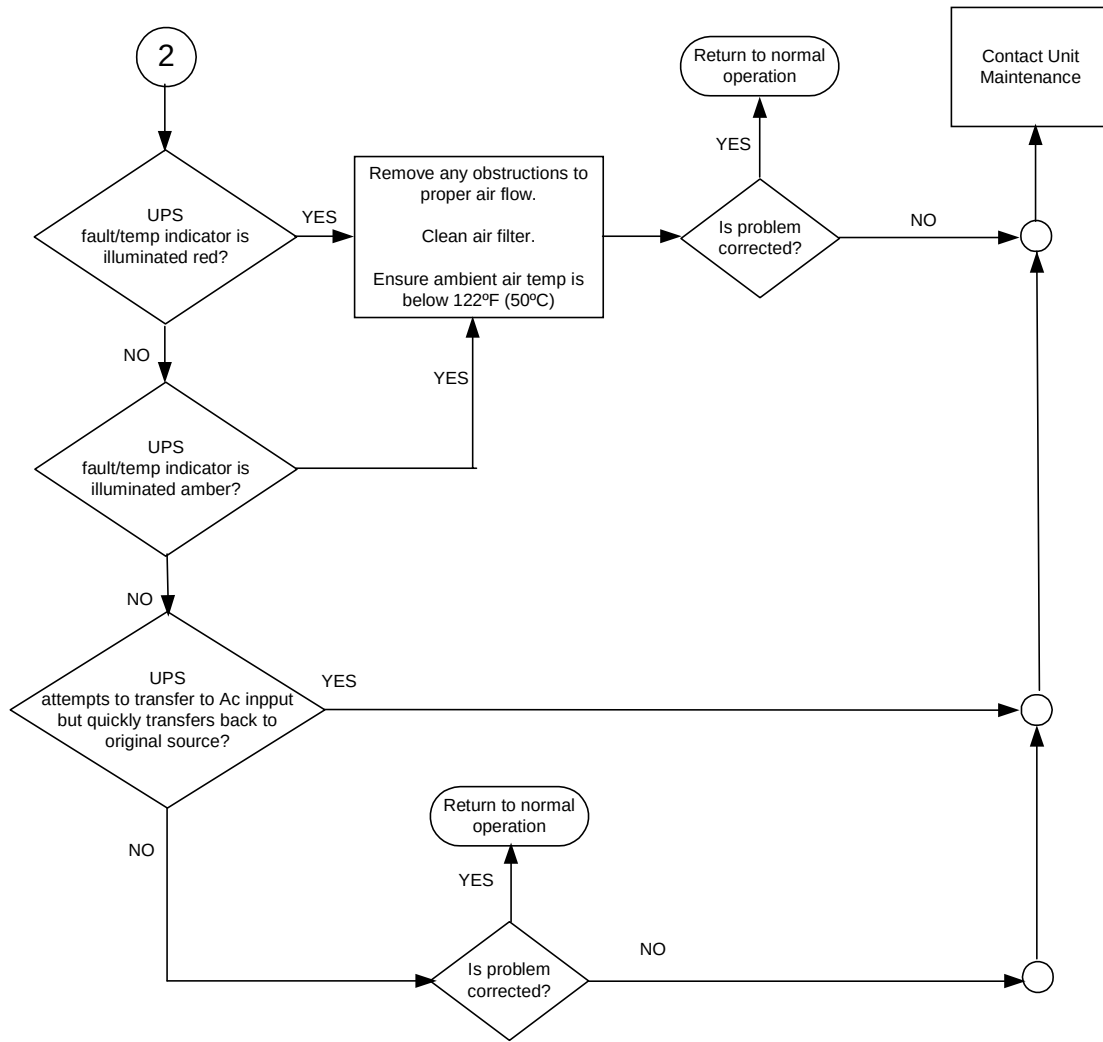


Figure 3-4 UPS Troubleshooting (2 of 2)

3-8.6.4 DTSS-L (V) 2 Lights Troubleshooting

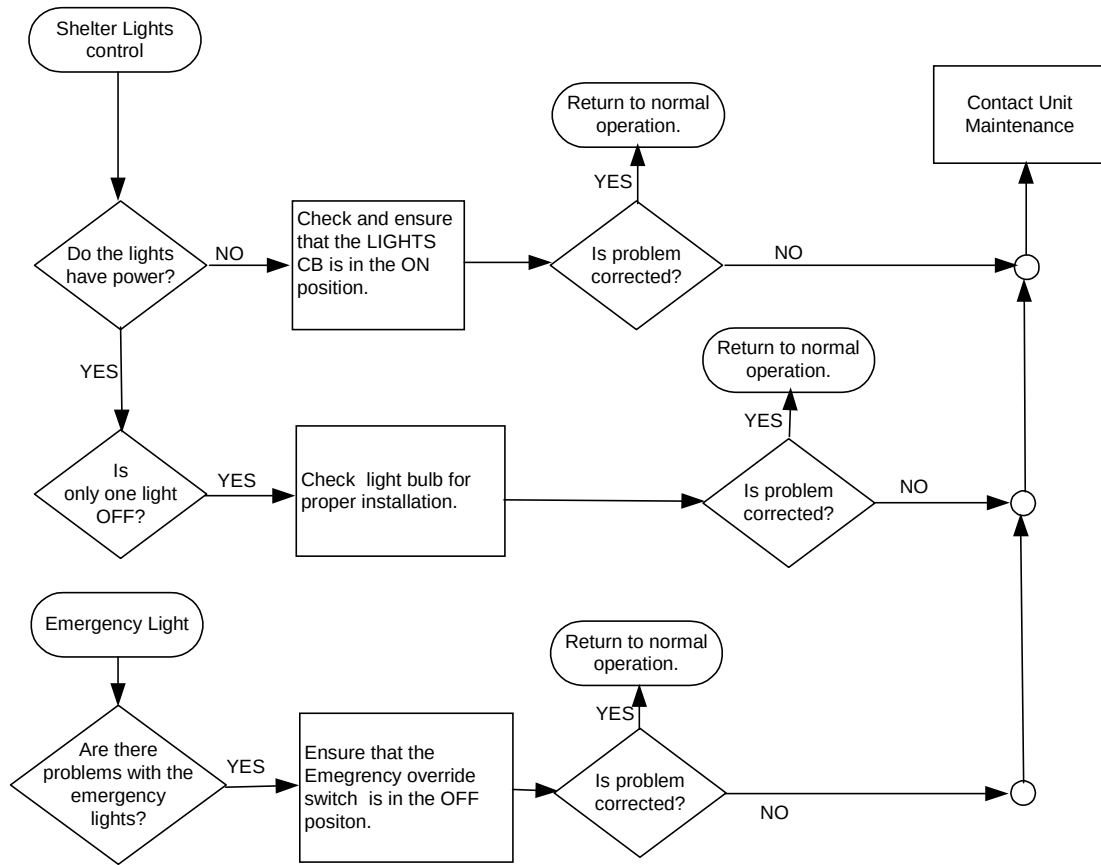


Figure 3-5 DTSS-L (V) 2 Lights Troubleshooting

3-8.6.5 DTSS-L (V) 2 Workstation Troubleshooting

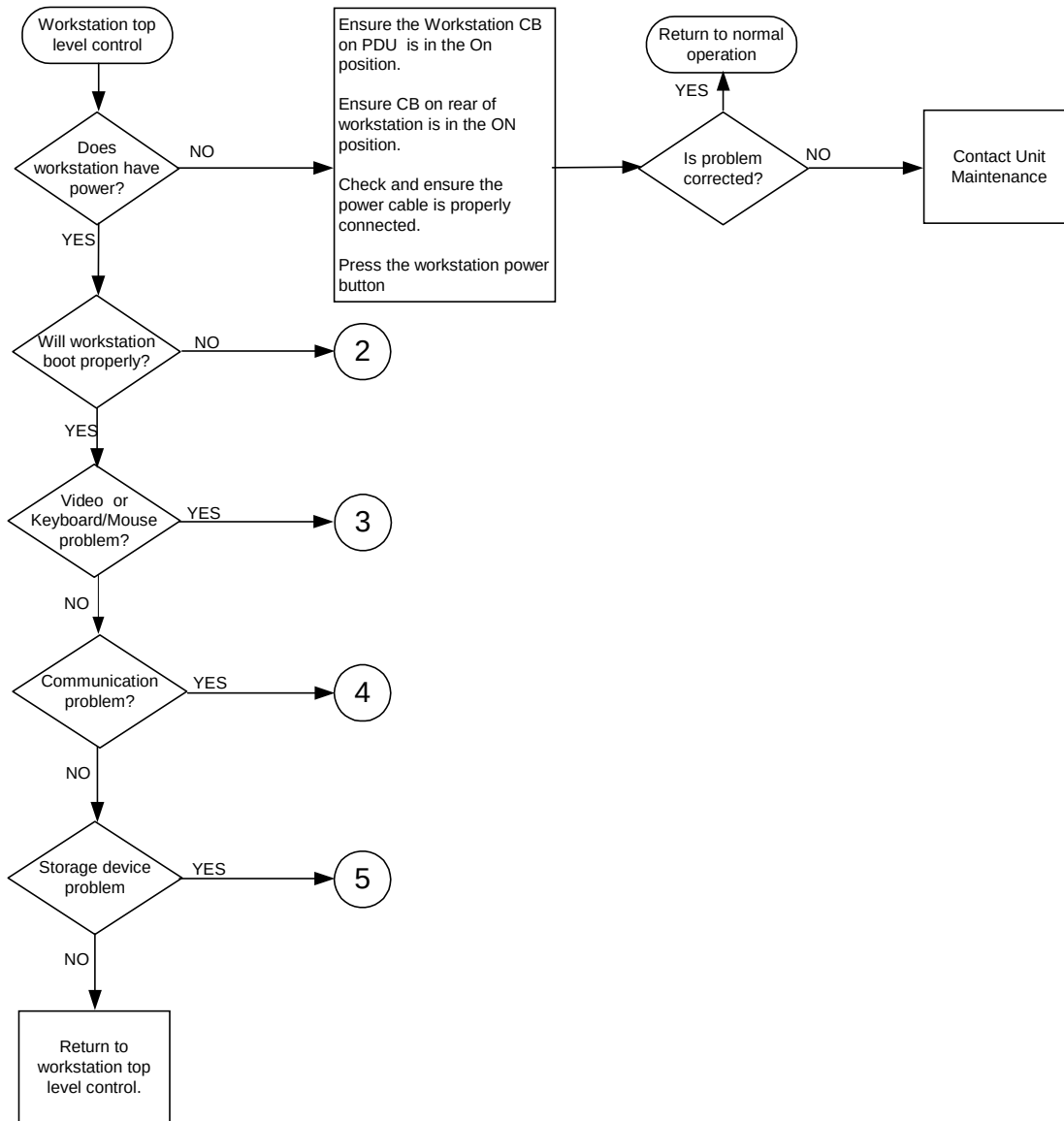


Figure 3-6 DTSS-L (V) 2 Workstation Troubleshooting (1 of 5)

3-8.6.5 DTSS-L (V) 2 Workstation Troubleshooting (Cont'd)

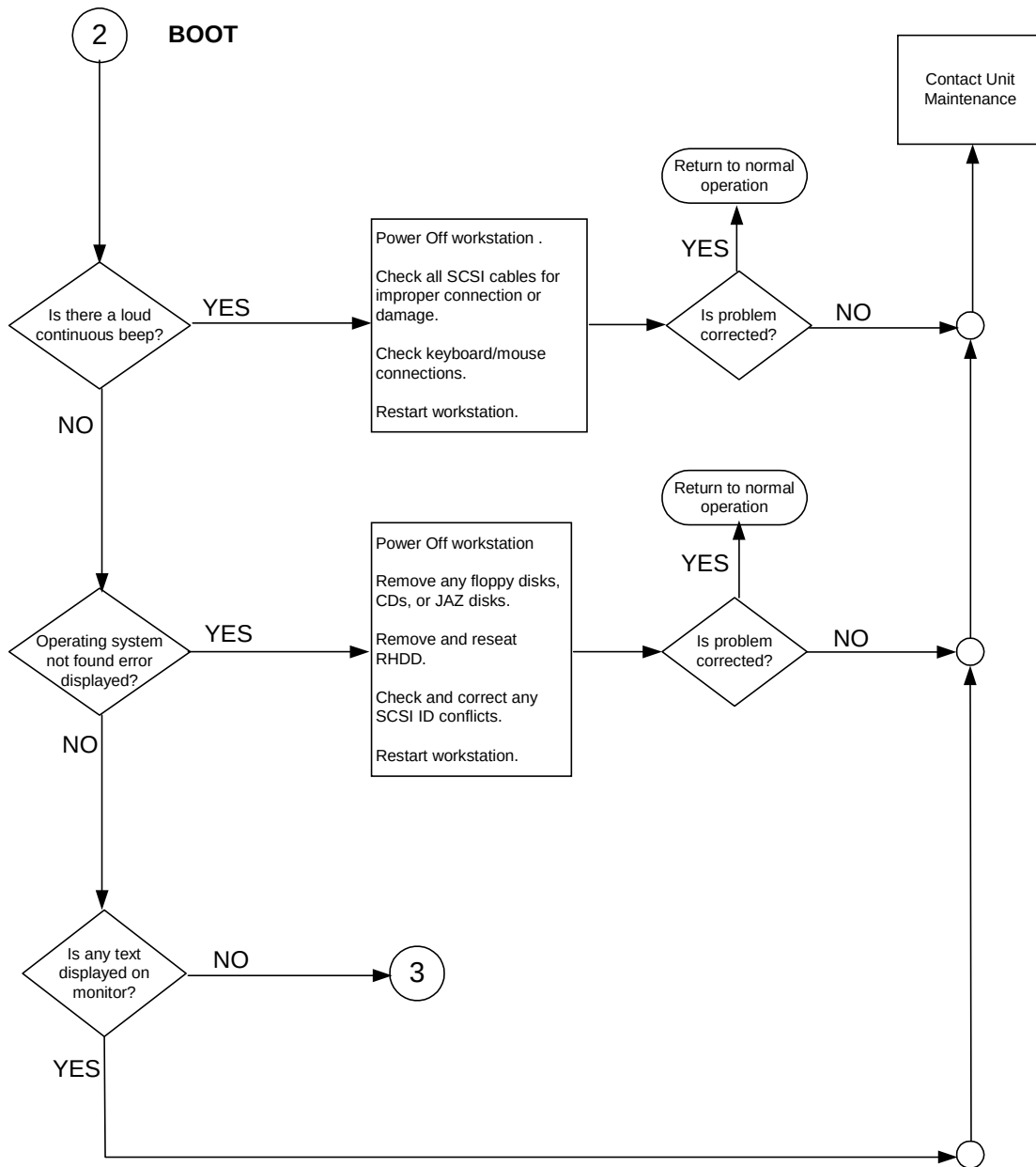


Figure 3-6 DTSS-L (V) 2 Workstation Troubleshooting (2 of 5)

3-8.6.5 DTSS-L (V) 2 Workstation Troubleshooting (Cont'd)

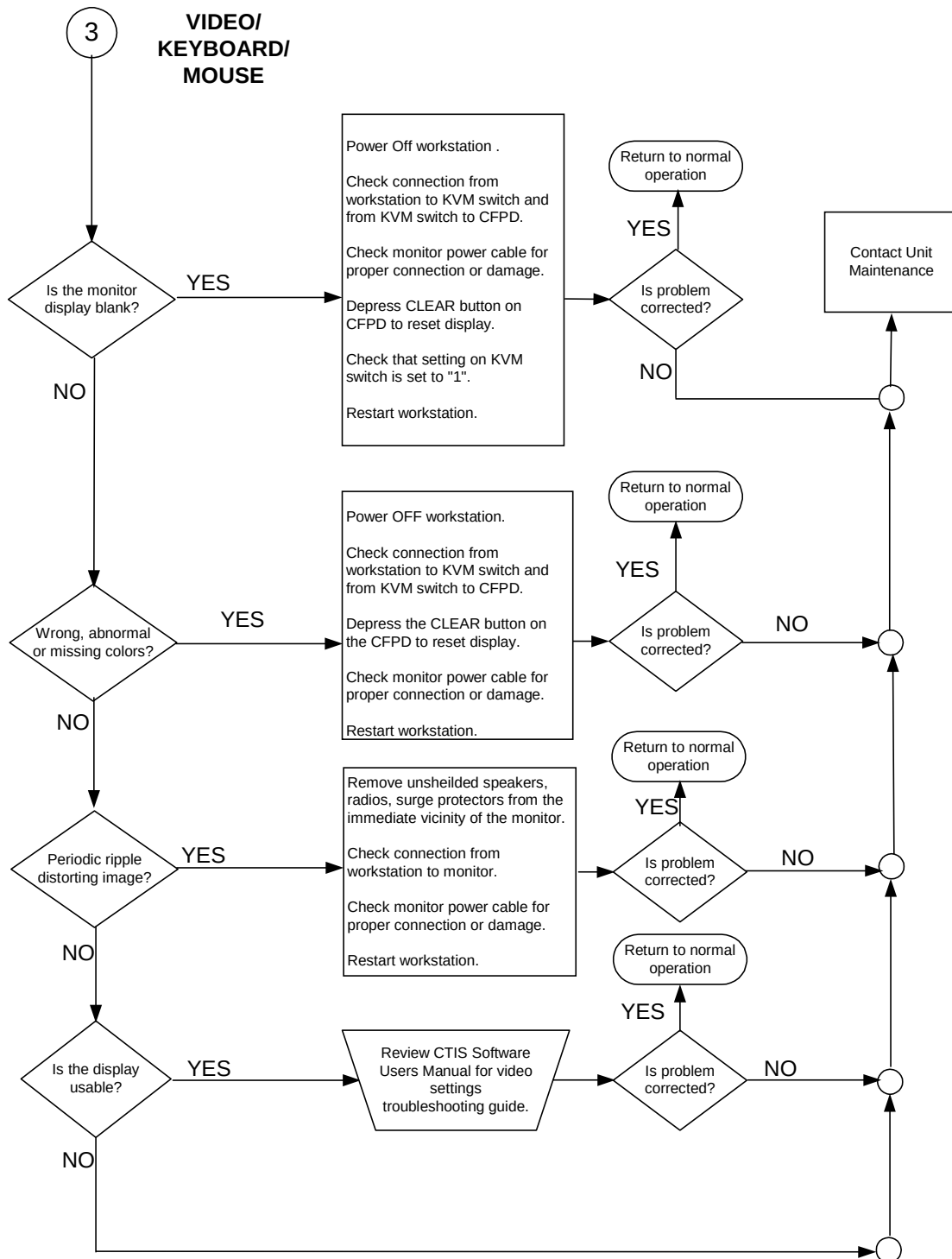


Figure 3-6 DTSS-L (V) 2 Workstation Troubleshooting (3 of 5)

3-8.6.5 DTSS-L (V) 2 Workstation Troubleshooting (Cont'd)

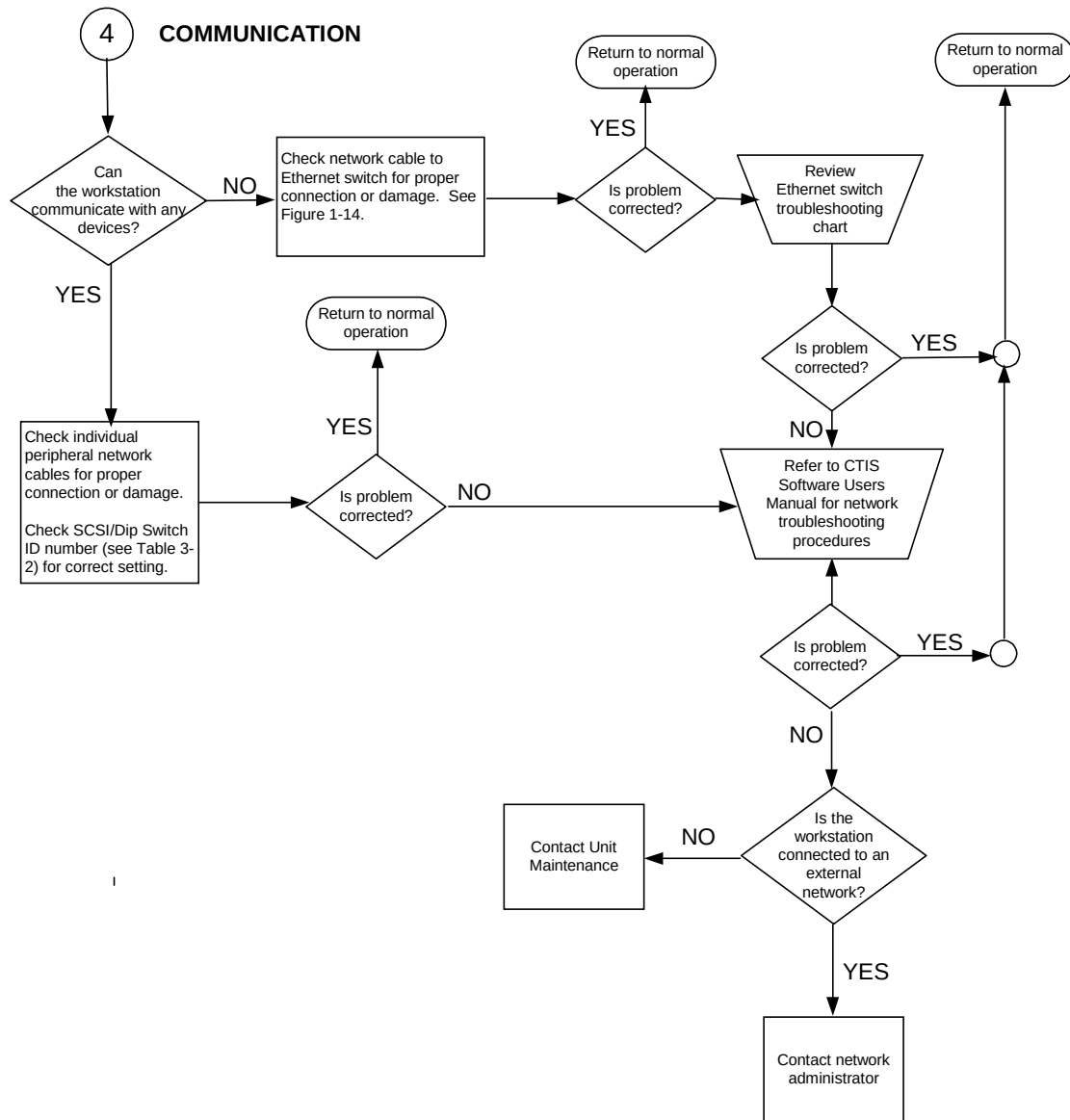


Figure 3-6 DTSS-L (V) 2 Workstation Troubleshooting (4 of 5)

3-8.6.5 DTSS-L (V) 2 Workstation Troubleshooting (Cont'd)

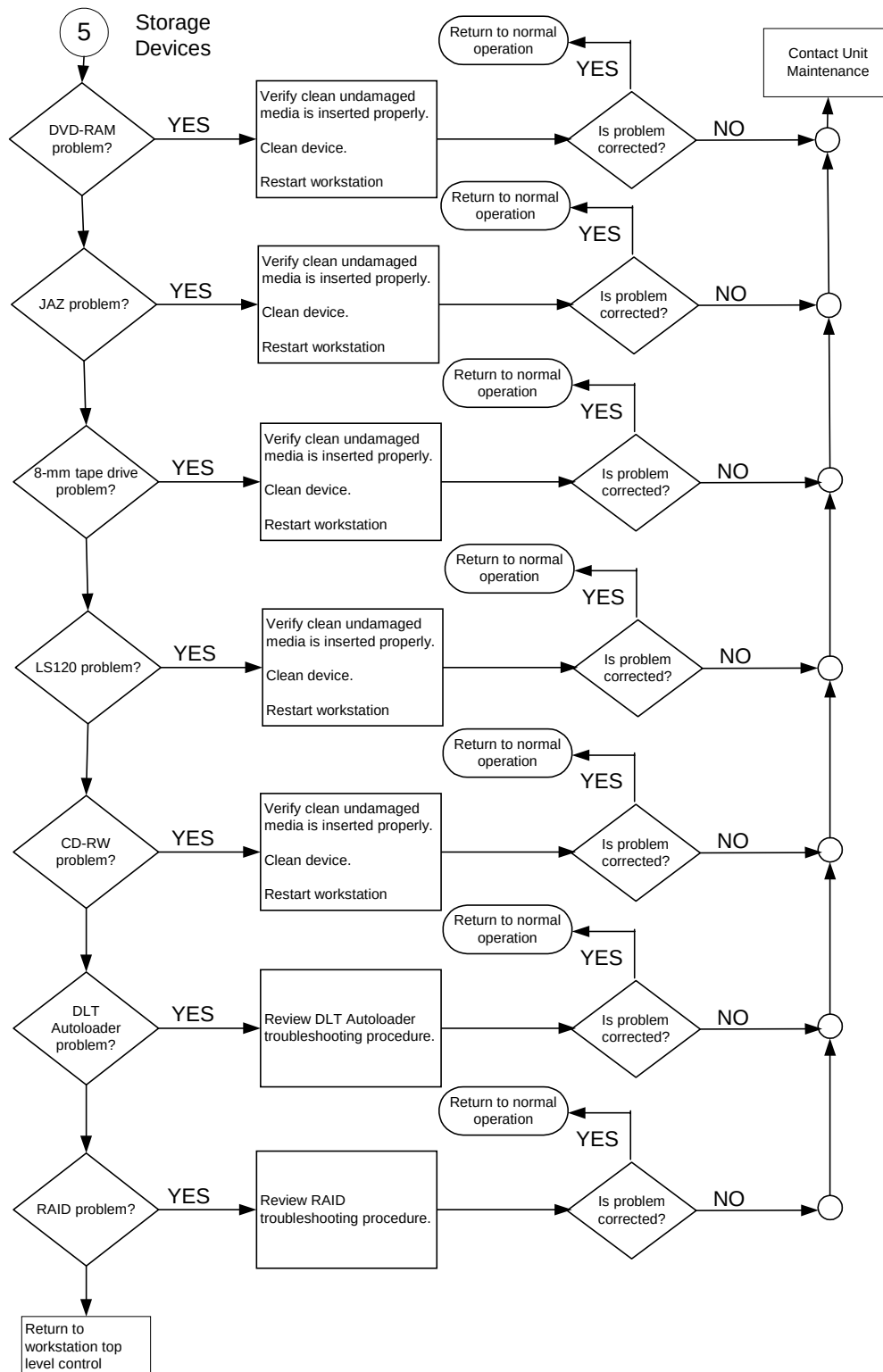


Figure 3-6 DTSS-L (V) 2 Workstation Troubleshooting (5of 5)

3-8.6.7 Netra Server Troubleshooting

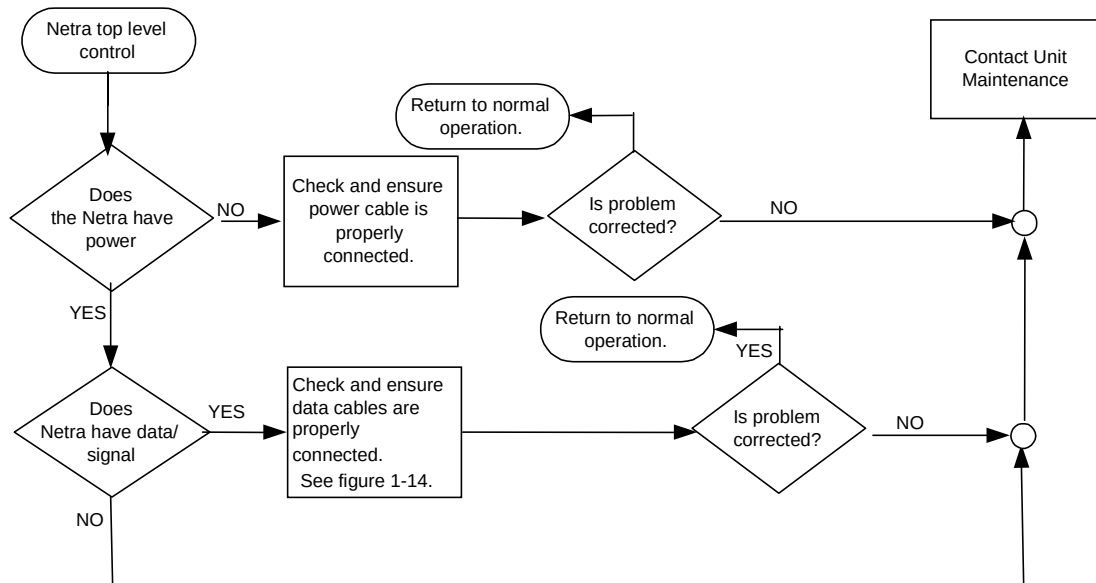


Figure 3-8 DTSS-L (V) 2 Netra Server Troubleshooting

3-8.6.8 Ethernet Switch Troubleshooting

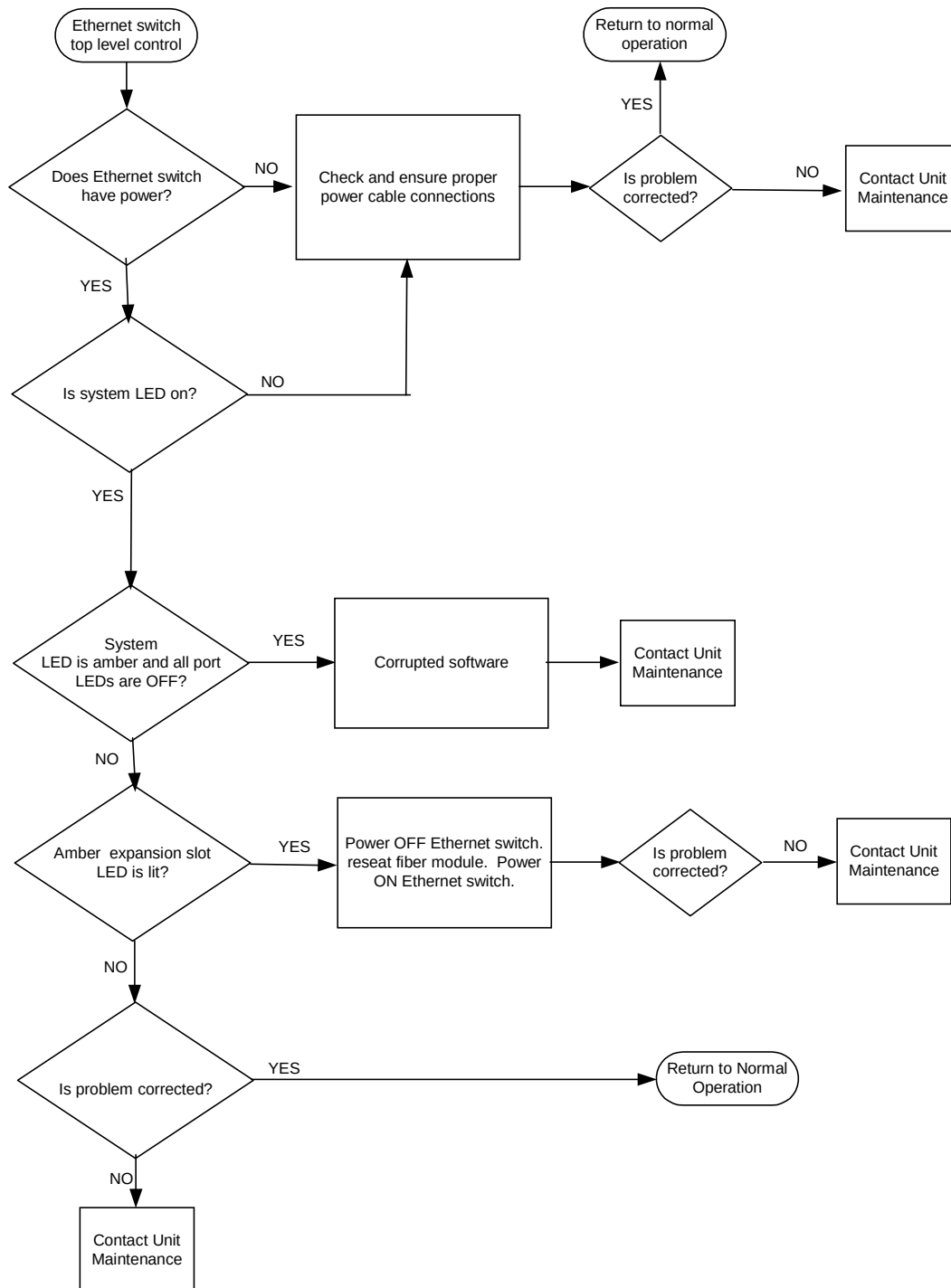


Figure 3-9 Ethernet Switch Troubleshooting

3-8.6.9 SCSI Switch Troubleshooting

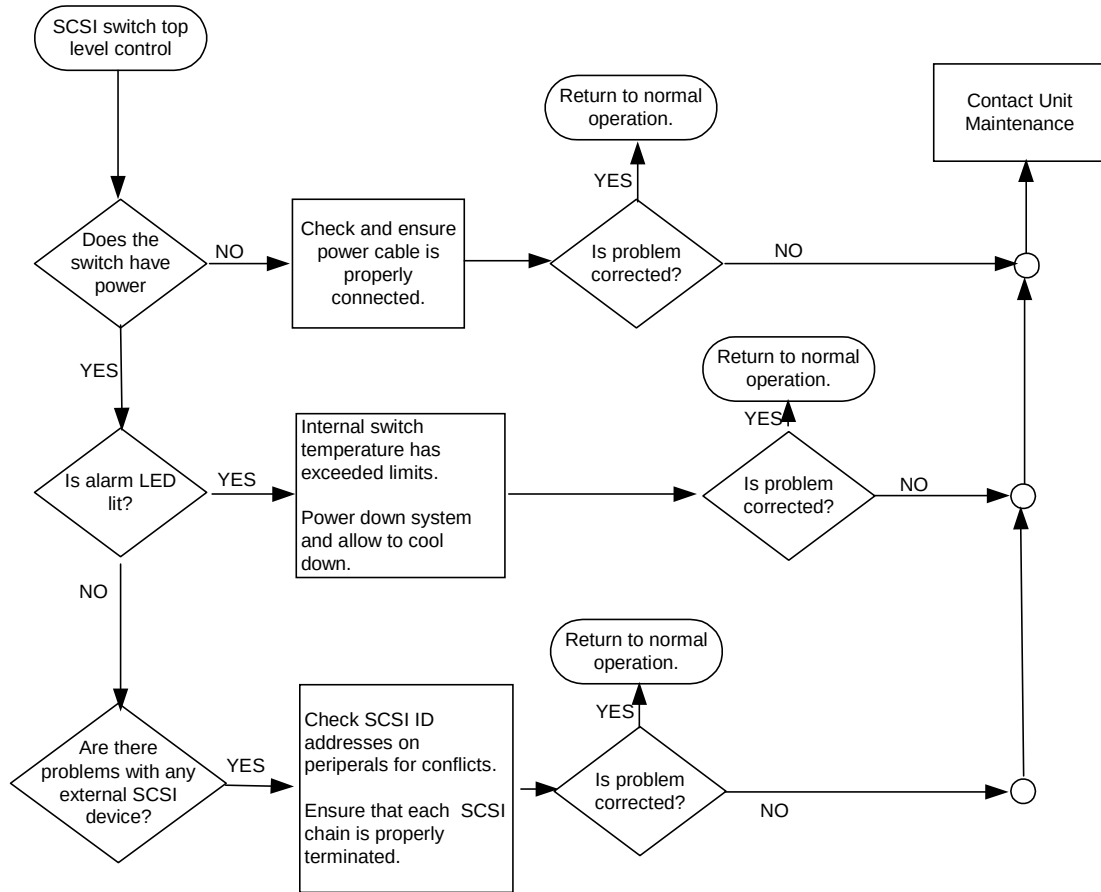


Figure 3-10 SCSI Switch Troubleshooting

3-8.6.10 DLT Autoloader Troubleshooting

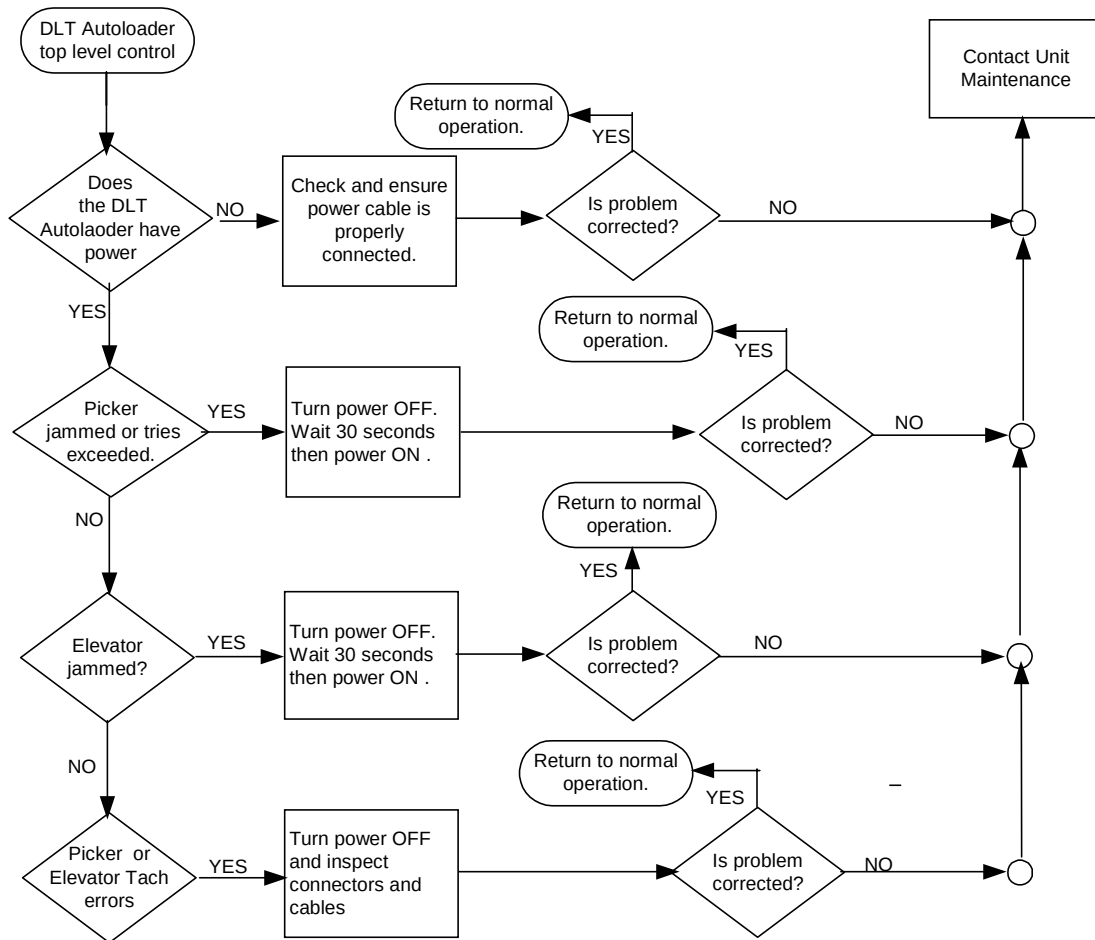


Figure 3-11 DLT Autoloader Troubleshooting

3-8.6.11 CD-RW Troubleshooting

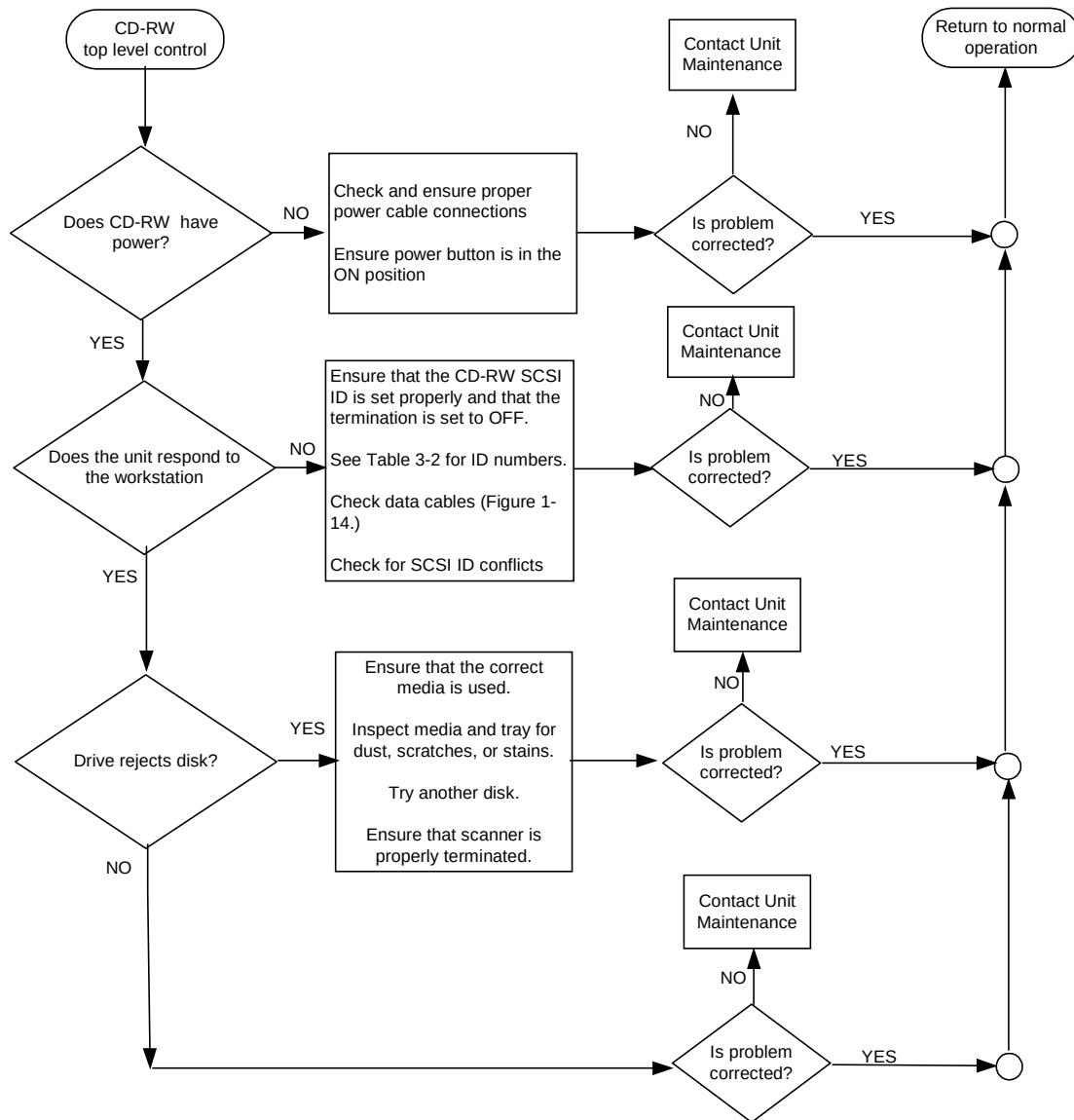


Figure 3-12 CD-RW Troubleshooting

3-8.6.12 RAID Troubleshooting

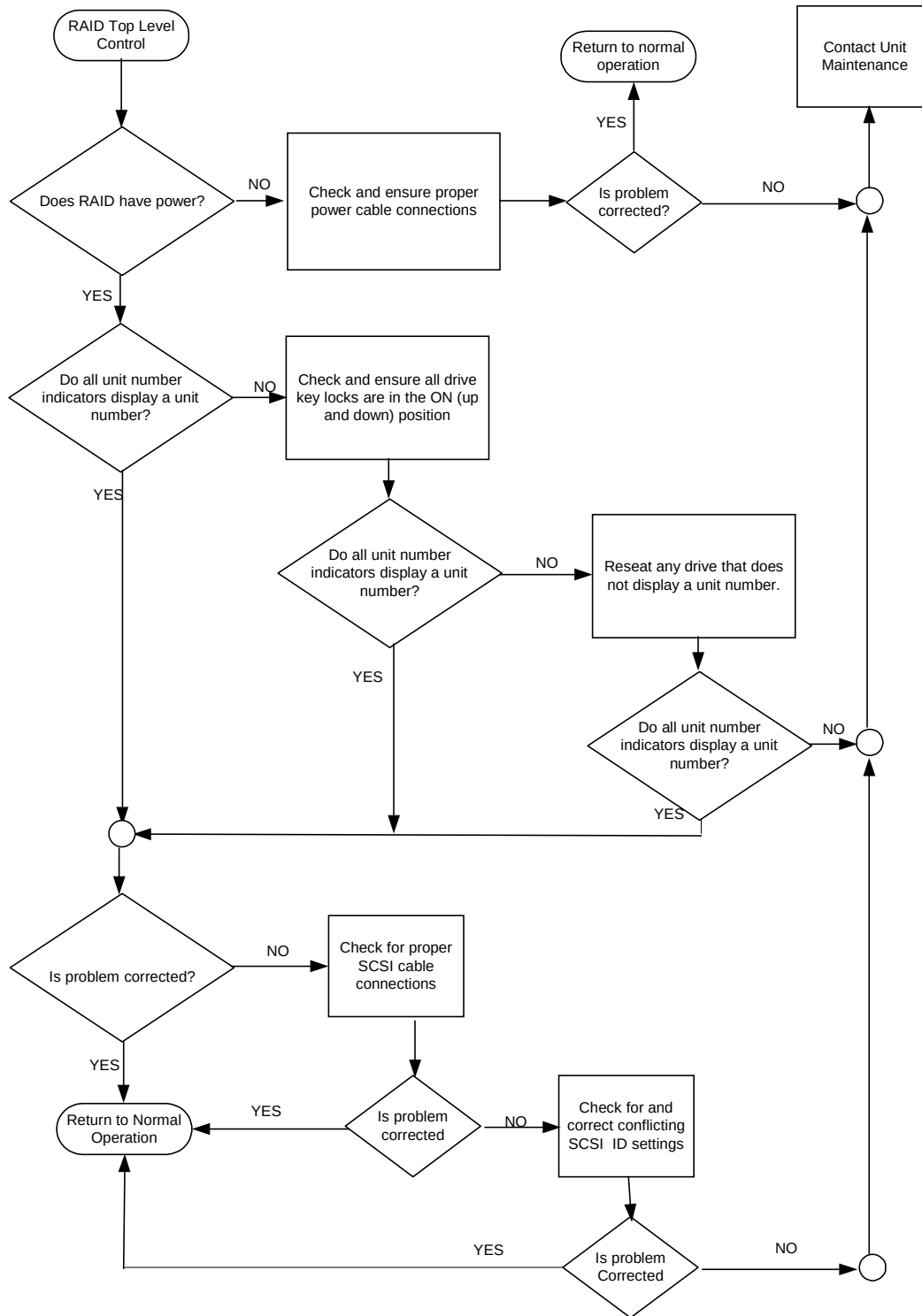


Figure 3-13 RAID Troubleshooting

3-8.6.13 Scanner Troubleshooting

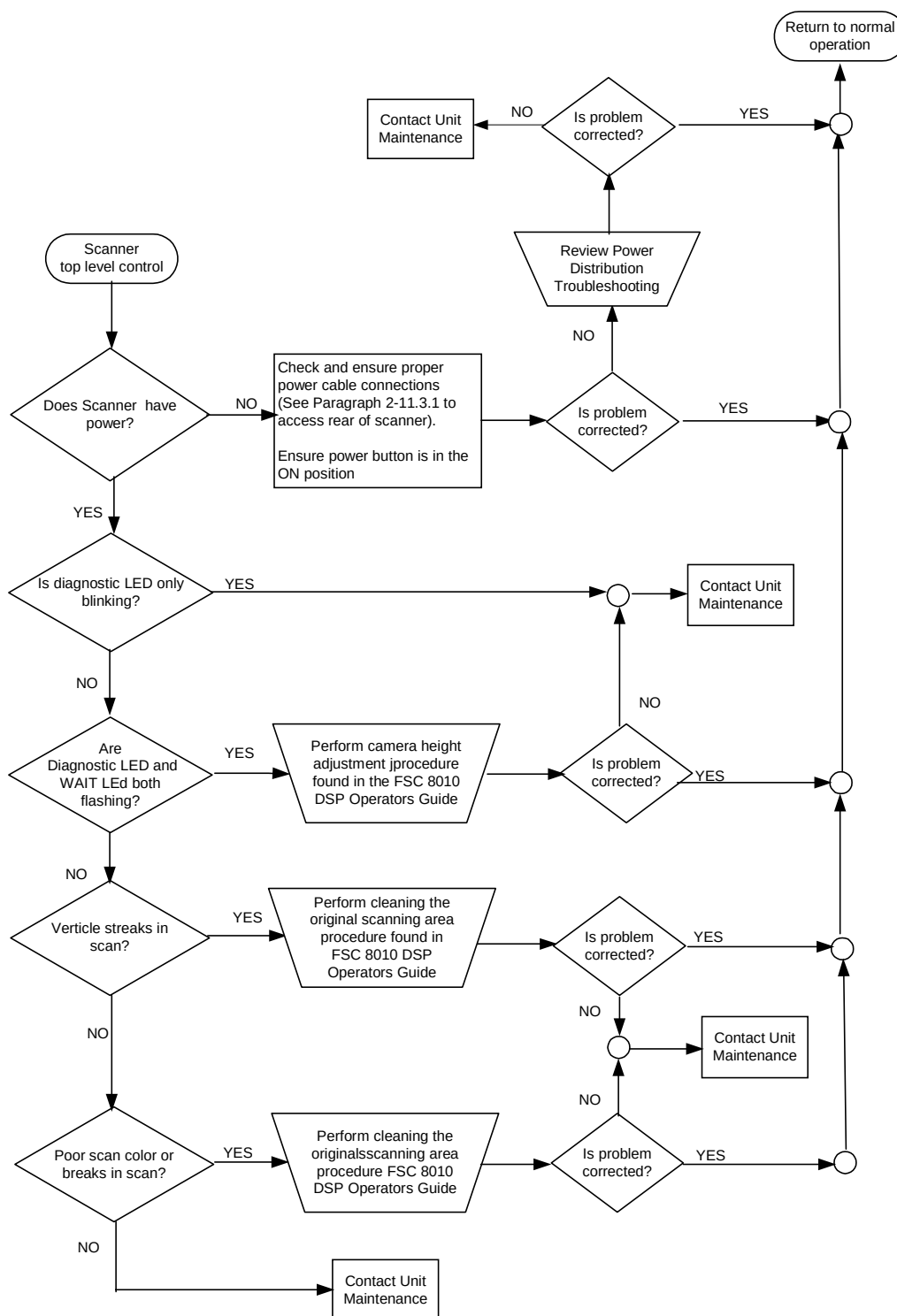


Figure 3-14 Scanner Troubleshooting

3-8.6.14 Plotter Troubleshooting

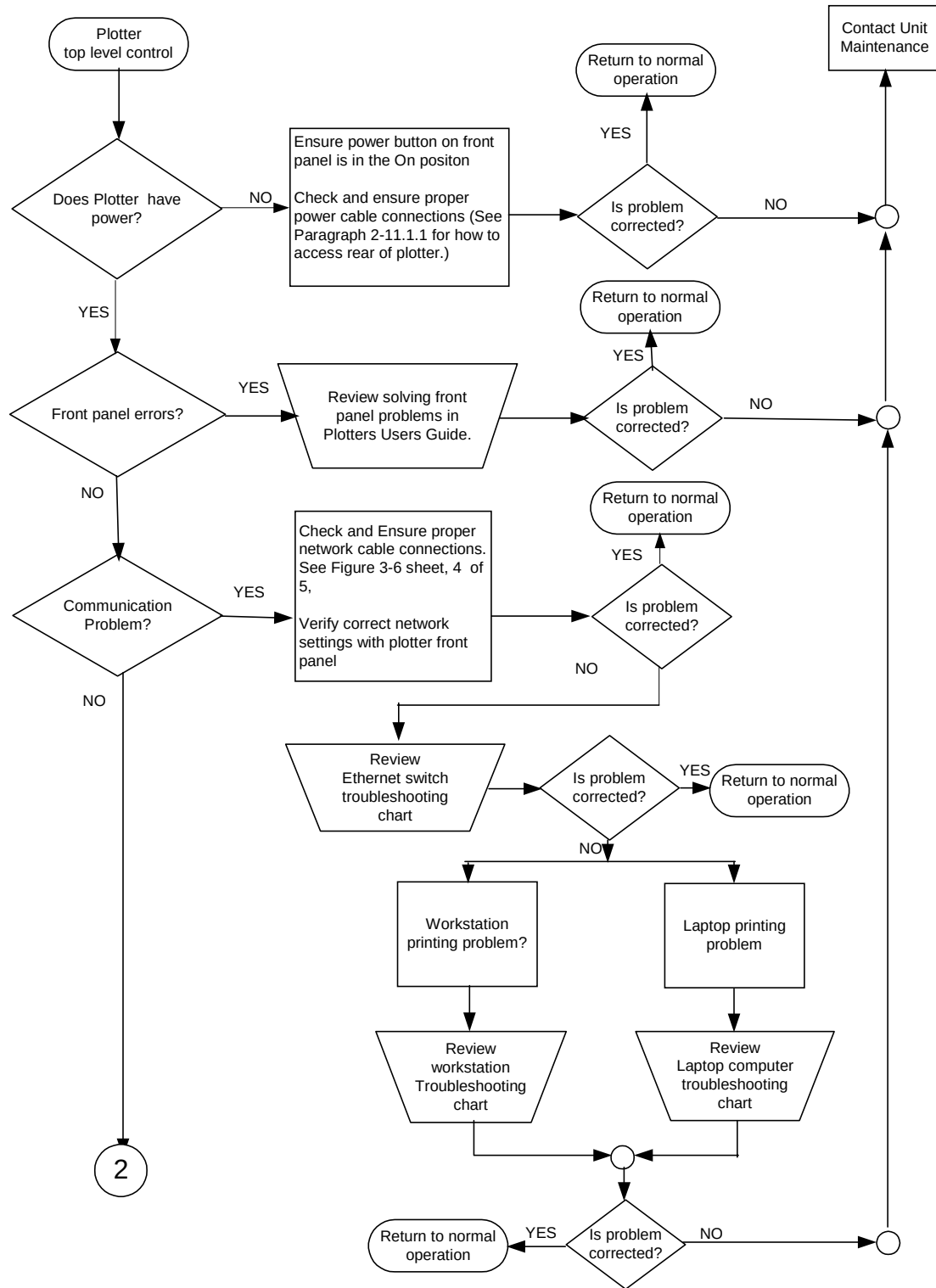


Figure 3-15 Plotter Troubleshooting (1 of 2)

3-8.6.14 Plotter Troubleshooting (Cont'd)

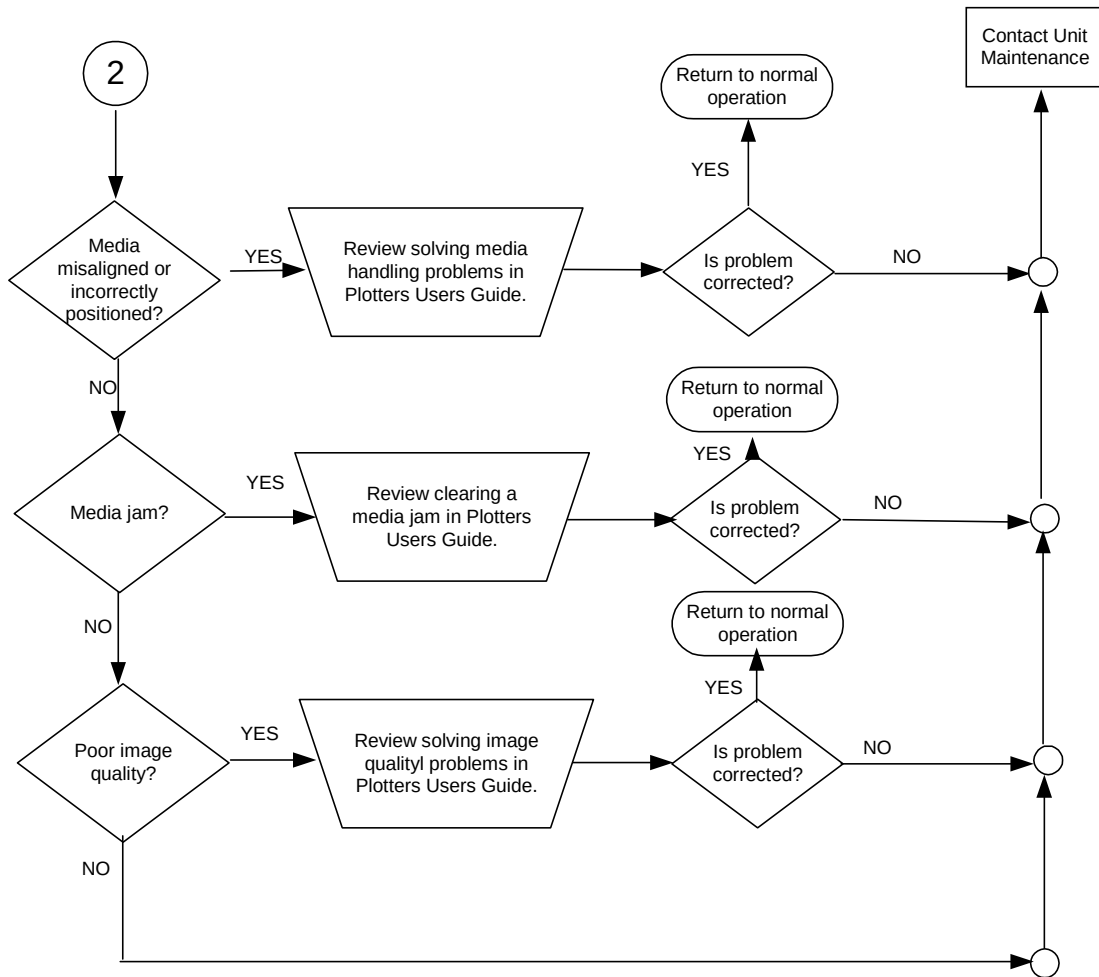


Figure 3-15 Plotter Troubleshooting (2 of 2)

3-8.6.15 Printer Troubleshooting

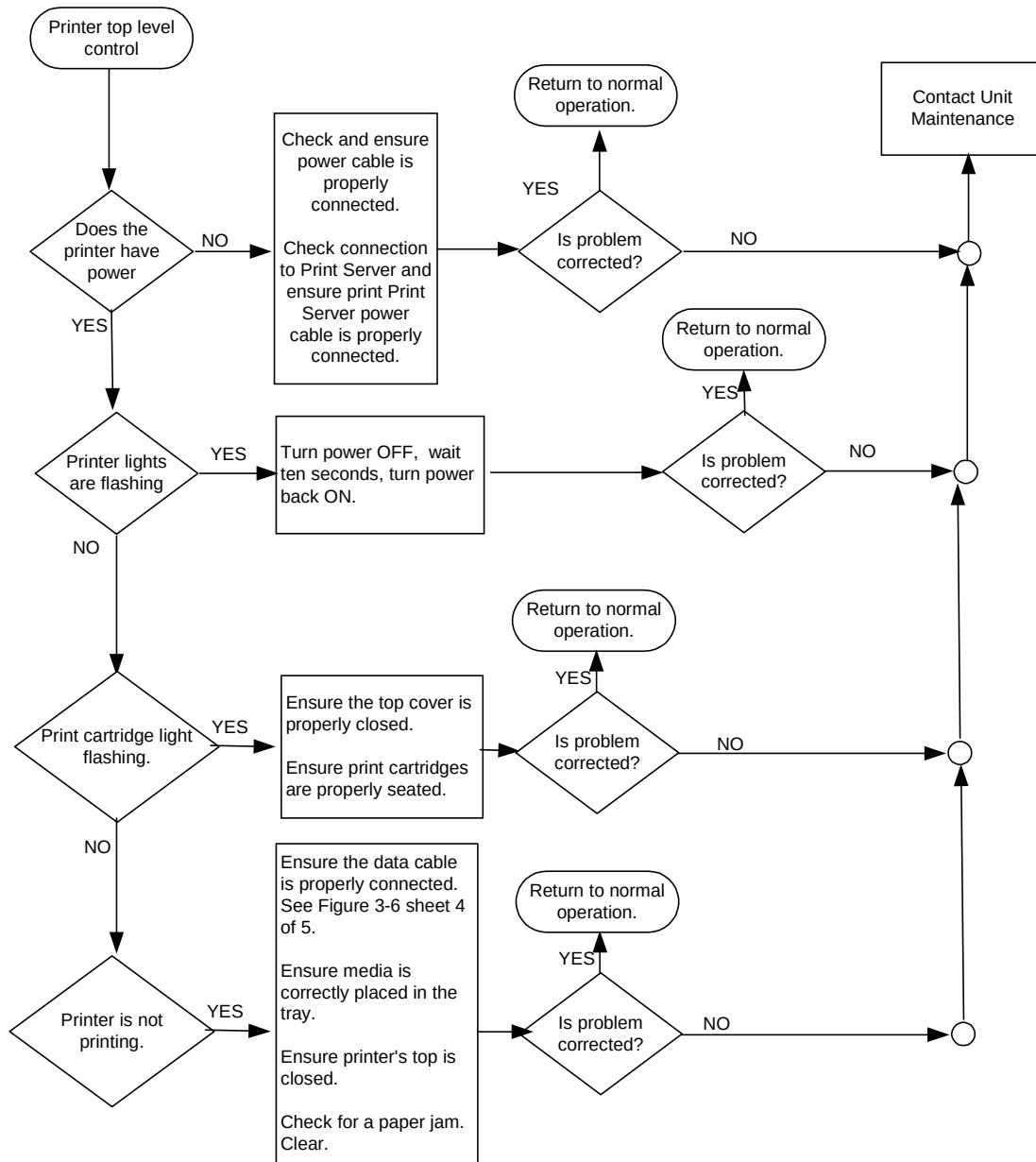


Figure 3-16 Printer Troubleshooting

3-8.6.16 Laptop Computer Troubleshooting

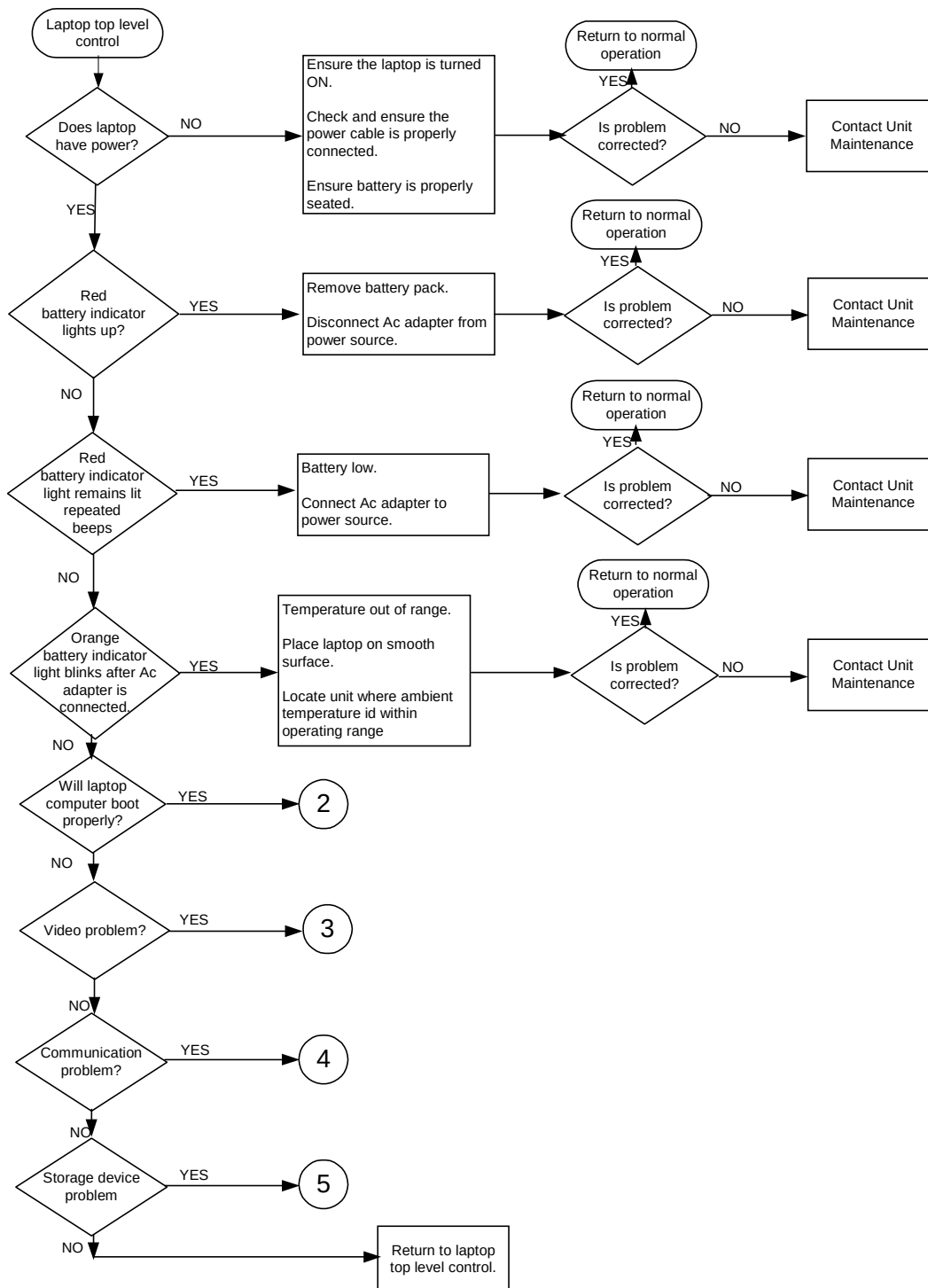


Figure 3-17 Laptop Computer Troubleshooting (1 of 5)

3-8.6.16 Laptop Computer Troubleshooting (Cont'd)

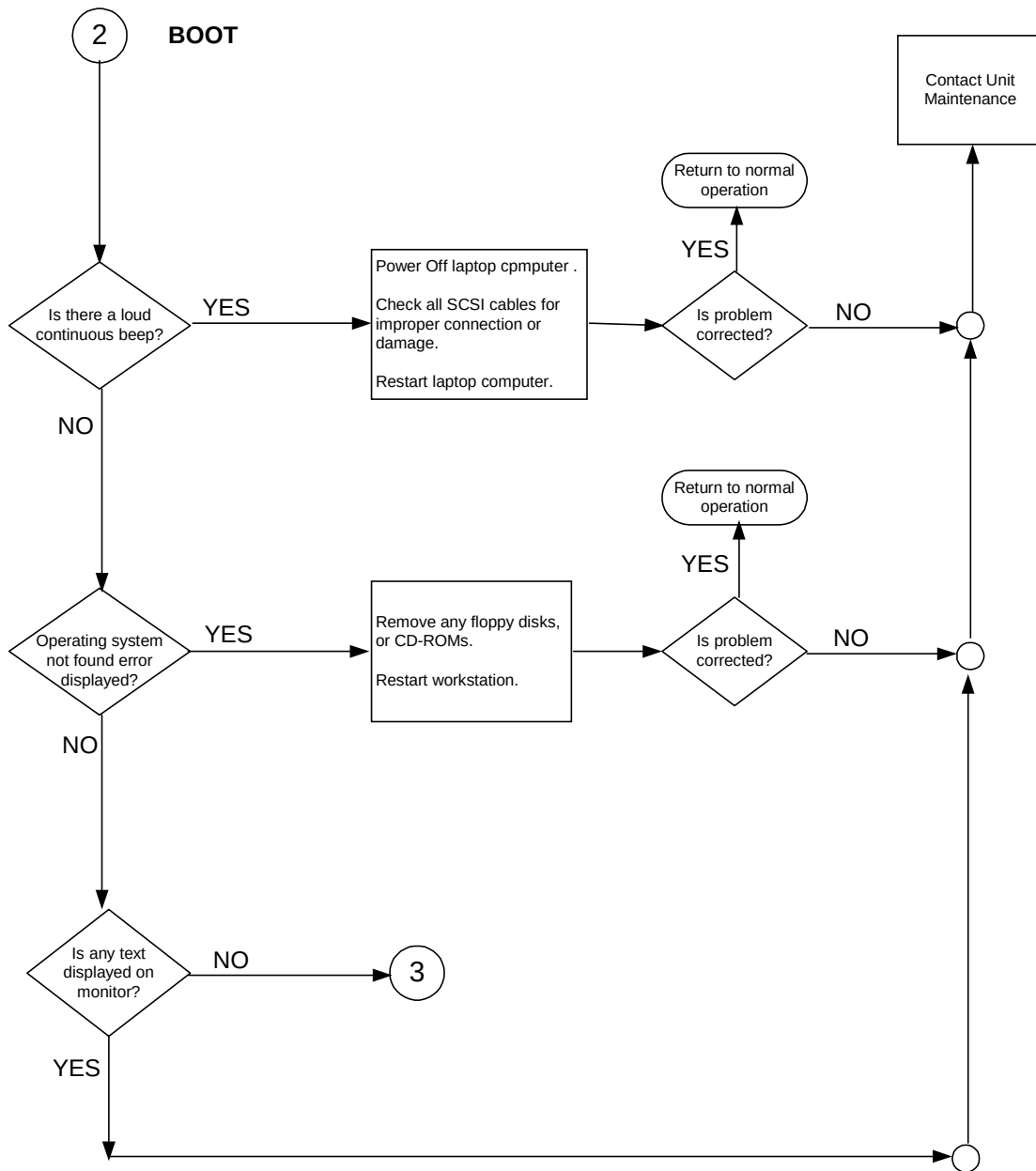


Figure 3-17 Laptop Computer Troubleshooting (2 of 5)

3-8.6.16 Laptop Computer Troubleshooting (Cont'd)

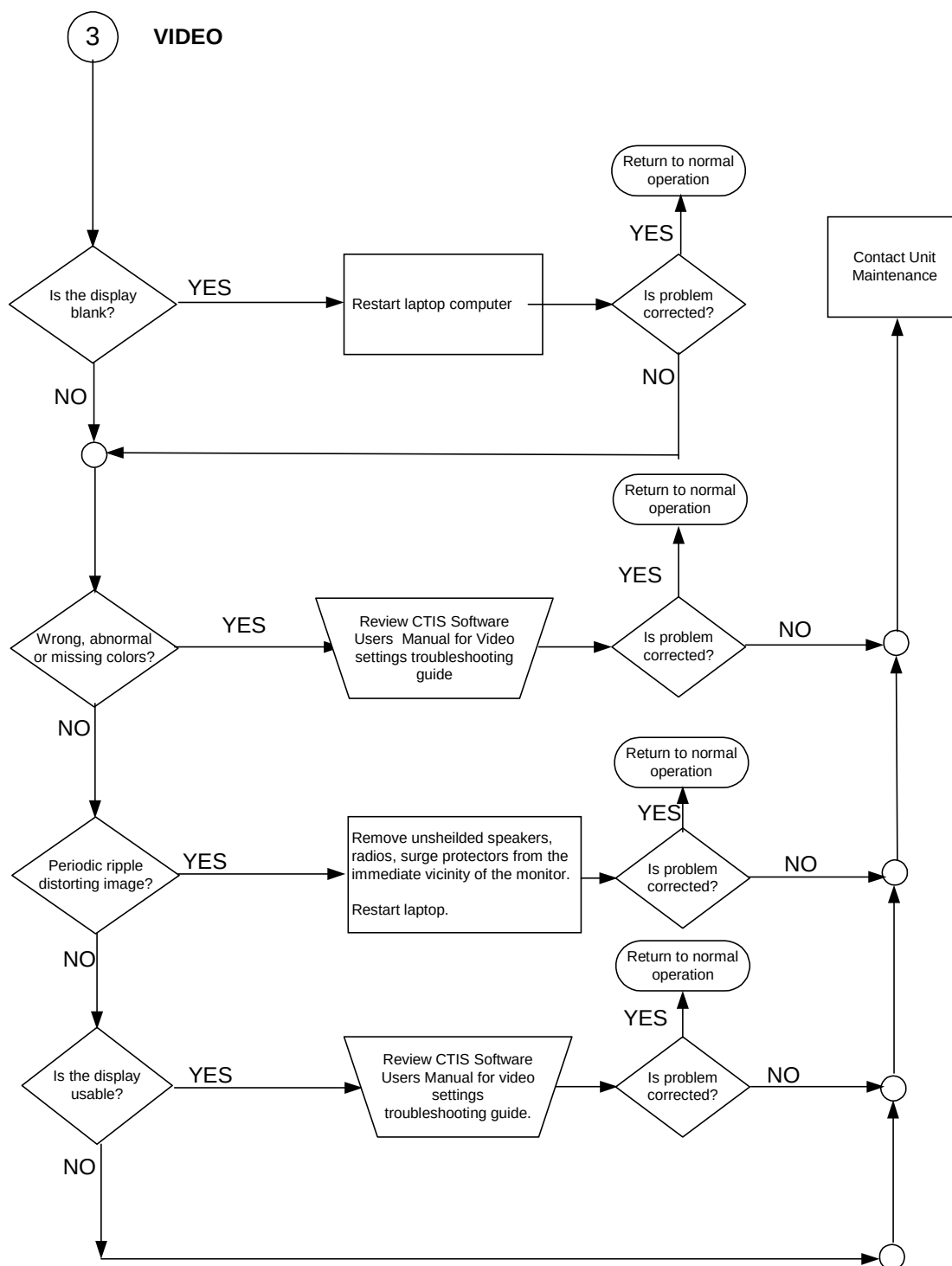


Figure 3-17 Laptop Computer Troubleshooting (3 of 5)

3-8.6.16 Laptop Computer Troubleshooting (Cont'd)

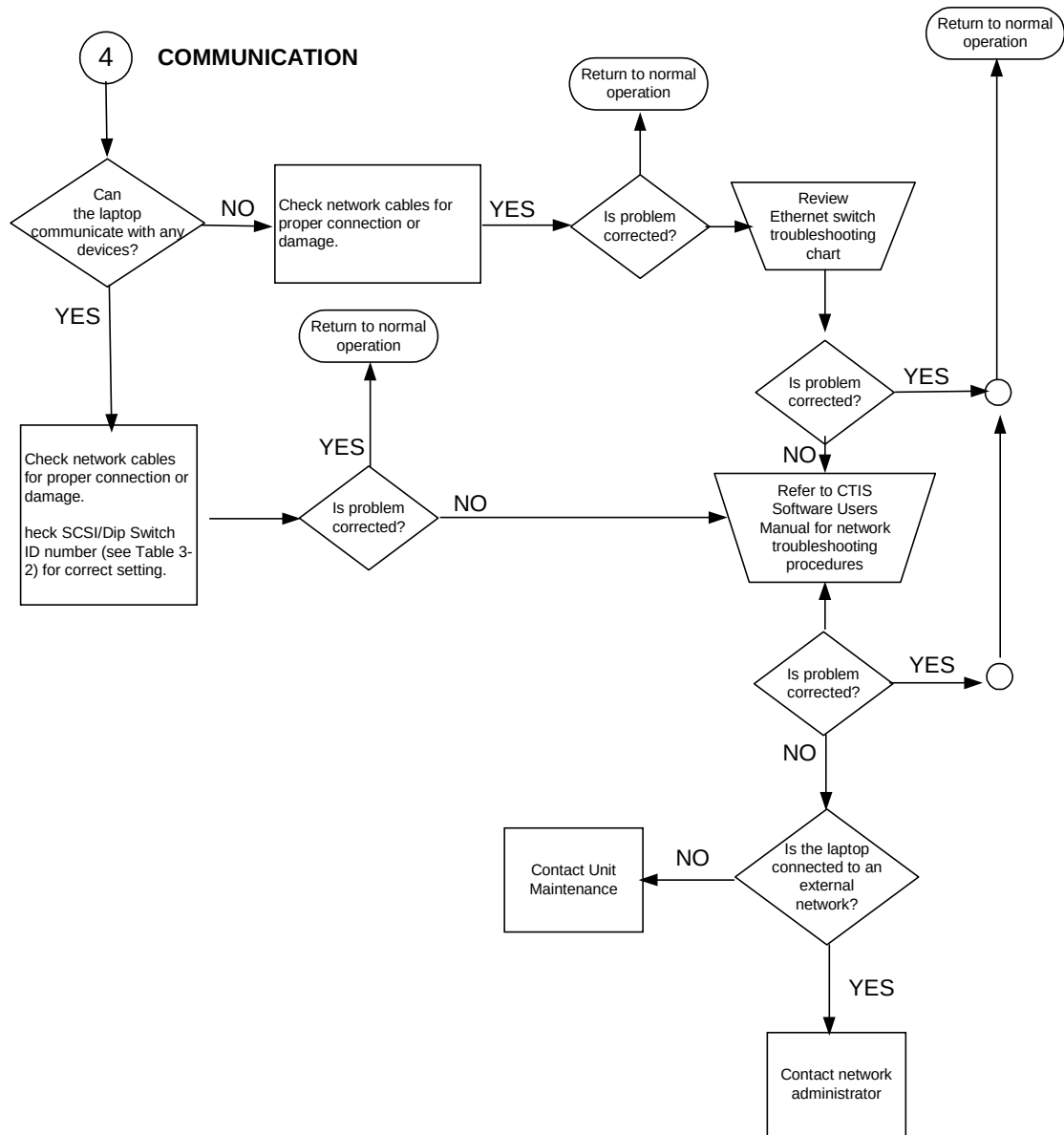


Figure 3-17 Laptop Computer Troubleshooting (4 of 5)

3-8.6.16 Laptop Computer Troubleshooting (Cont'd)

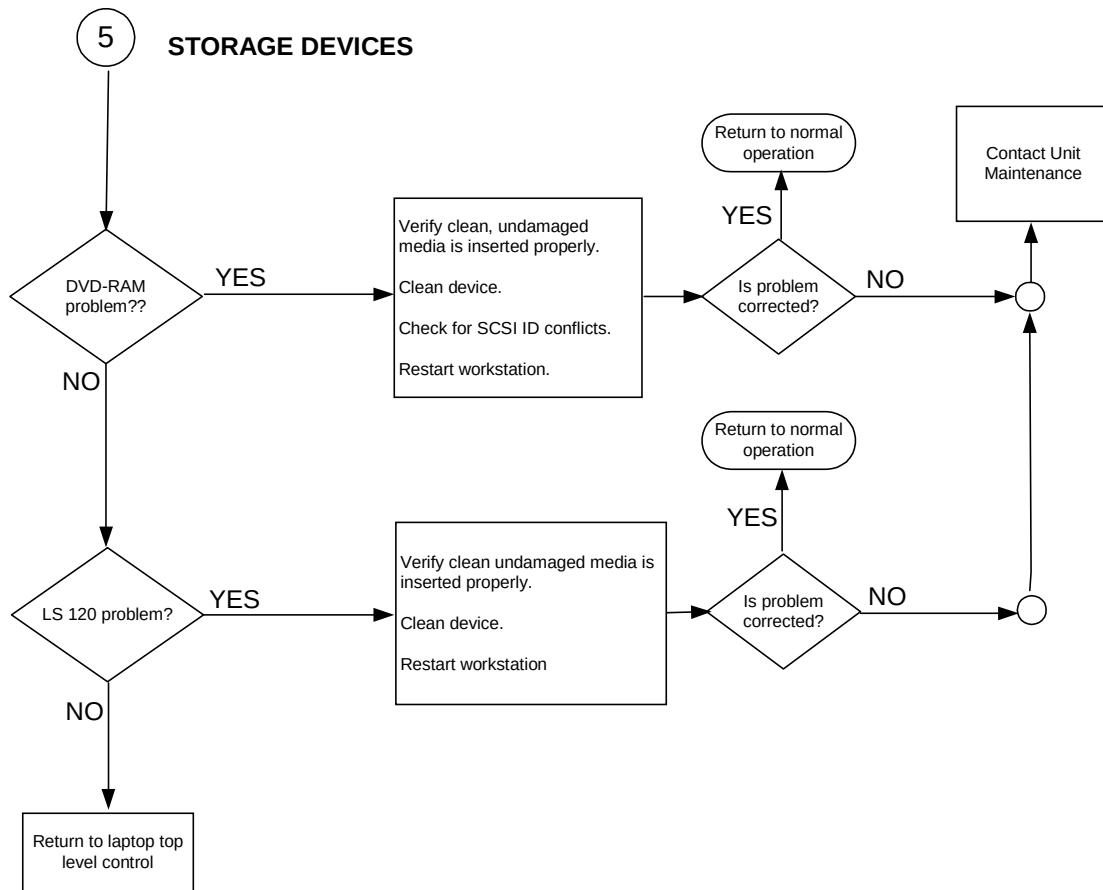
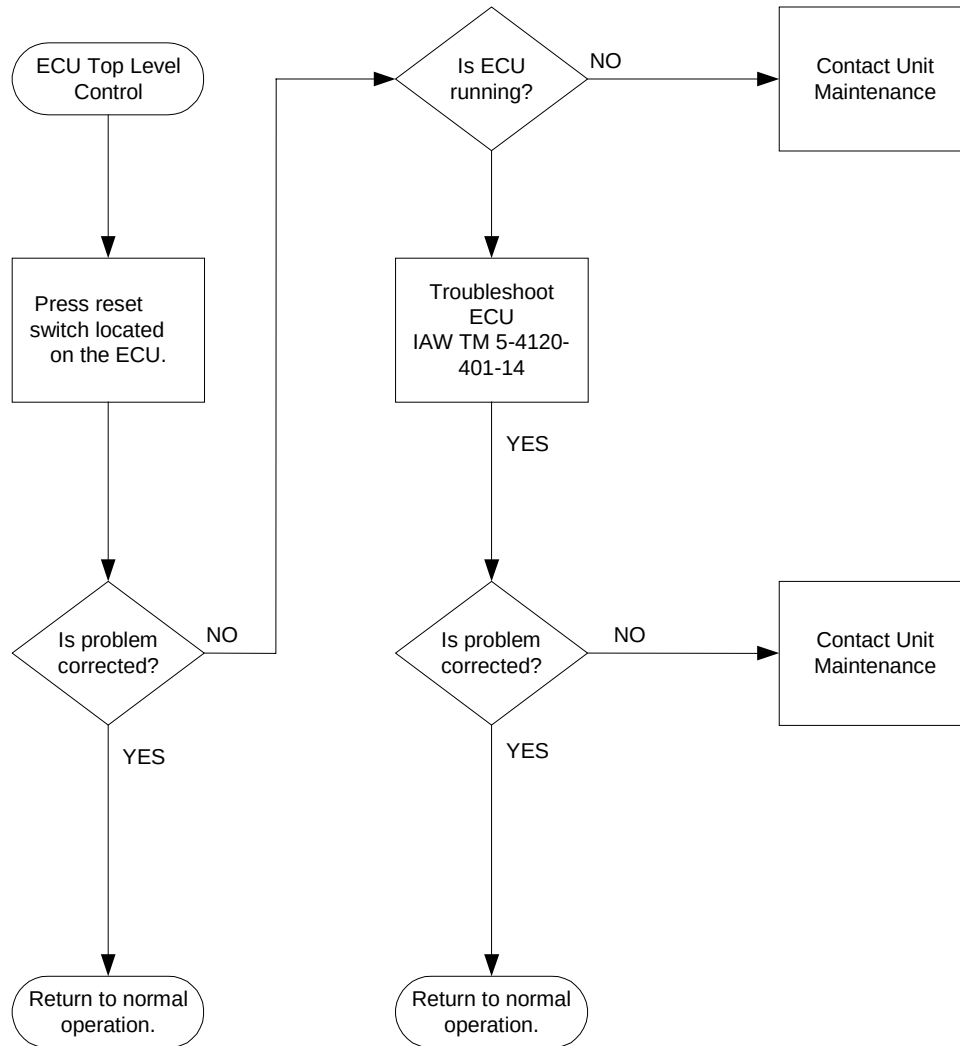


Figure 3-17 Laptop Computer Troubleshooting (5 of 5)

3-8.6.17 ECU Troubleshooting



NOTE

The Low and High refrigerant Pressure Cutout switches are located on the roadside rear of the ECU. Access to the switches must be made from the roadside near the tip of the unbit. The Low switch is first in from the roadside and High switch is the next.

Figure 3-18 ECU Troubleshooting

3-8.6.18 STE Troubleshooting

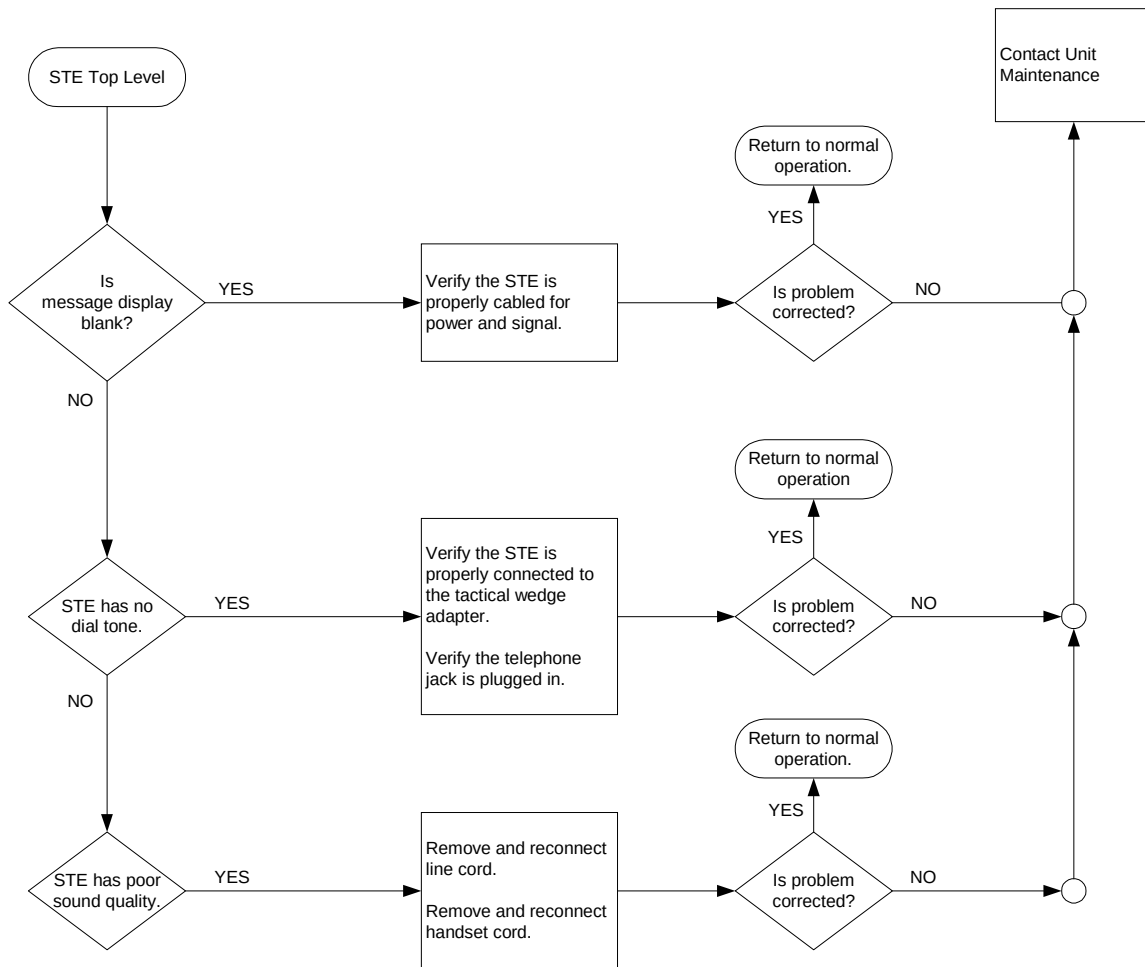


Figure 3-19 STE Troubleshooting

3-8.6.19 SCSI Booster Troubleshooting

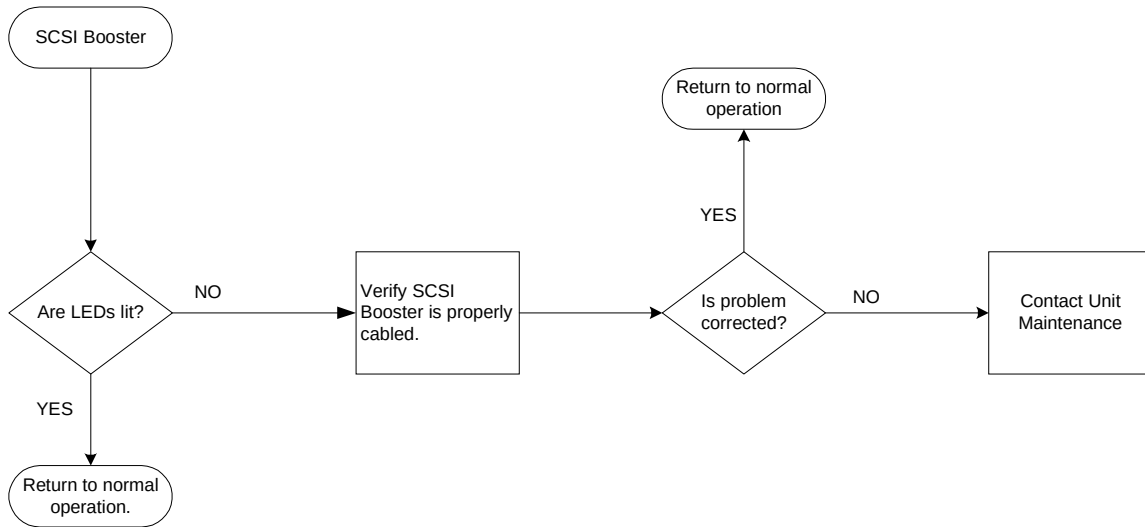


Figure 3-20 SCSI Booster Troubleshooting

3-8.6.20 Media Converter Troubleshooting

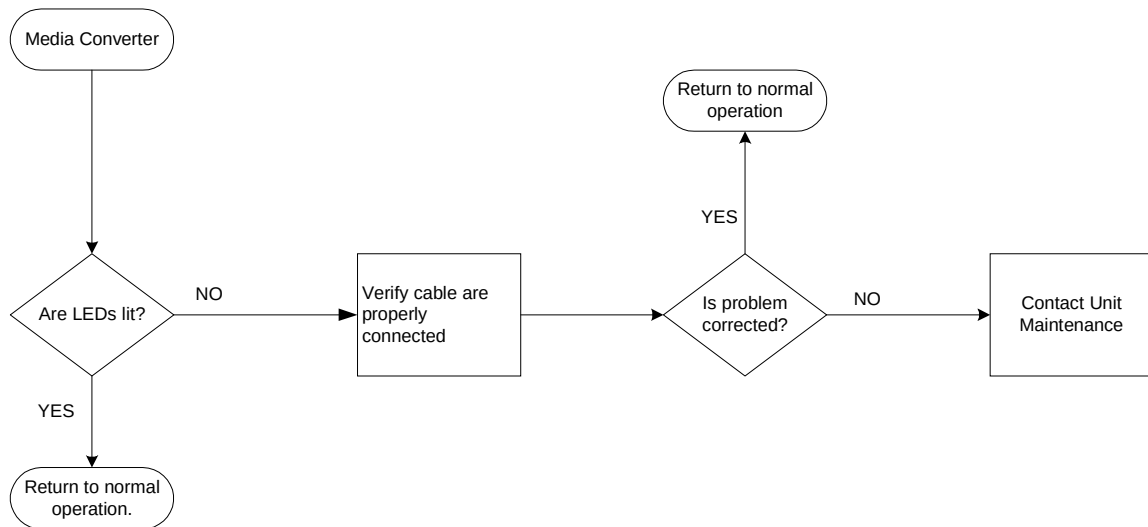
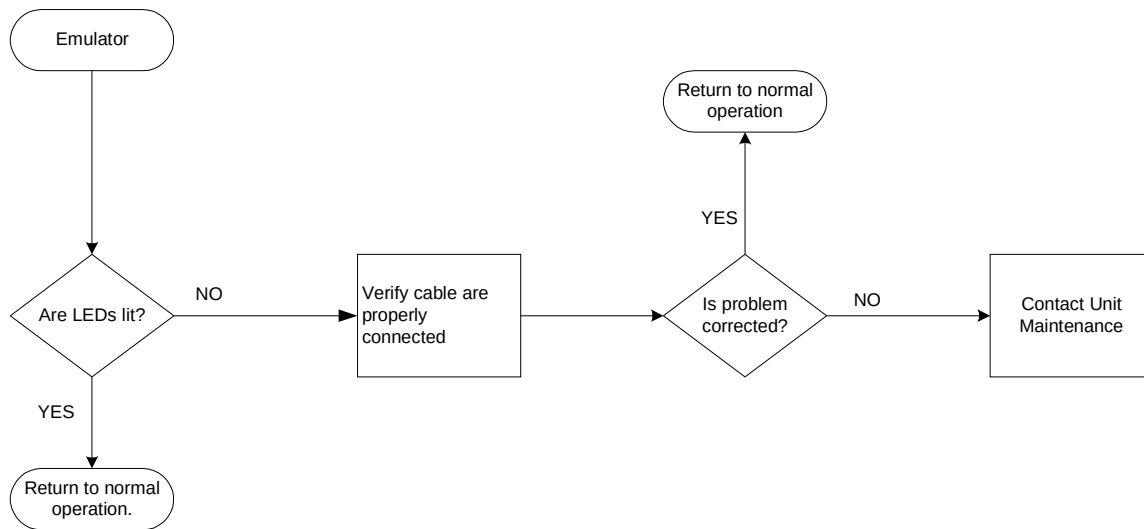


Figure 3-21 Media Converter Troubleshooting

3-8.6.21 Emulator Troubleshooting

**Figure 3-22 Emulator Troubleshooting**

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SECTION III

MAINTENANCE PROCEDURES

Para/Subject	Page
3-9 INTRODUCTION: Maintenance Procedures.....	3-45

3-9 INTRODUCTION

There is no operator maintenance for the DTSS-L (V) 2 except for PMCS.

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APPENDIX A

REFERENCES

Table of Contents

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A-7	Miscellaneous Government Publications.....	A-3
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A-1 SCOPE

This appendix lists all forms, field manuals, technical manuals, miscellaneous government publications, non-government documents, and non-government document sources referenced in this manual.

A-2 FORMS

List of Forms

<u>Document</u>	<u>Description</u>
DA Form 2404	Equipment Inspection and Maintenance Worksheet
SF 361	Transportation Discrepancy Report (TDR)
SF 364	Report of Discrepancy (ROD)

A-3 FIELD MANUALS

List of Field Manuals

<u>Document</u>	<u>Description</u>
FM 21-11	First Aid for Soldiers

A-4 TECHNICAL MANUALS

List of Technical Manuals

<u>Document</u>	<u>Description</u>
TM 3-4240-325-20&P	Unit Maintenance Manual (Including Repair Parts and Special Tools List) for Filter Unit, Gas-Particulate: 100 CFM, 120V, 50, 60, and 400 Hz, M93 (NSN 4240-01-231-6515)
TM 5-6115-594-14&P	Operator, Organizational, Direct Support, and General Support Maintenance Manual (Including Repair Parts and Special Tools List), for Generator Sets, Diesel Engine Driven, Trailer Mounted
TM 5-6115-632-14&P	Operator, Unit, Intermediate Direct Support and Intermediate General Support Maintenance Manual (Including Repair Parts and Special Tools List)
TM 9-4125-401-24	Operator, Organizational, Direct Support, and General Support Maintenance Manual Air Conditioner Horizontal Compact 18,000 Btu/hr, 50/60 Hz Model F18H-MPI
TM 9-2320-387-10	Operator's Manual for Truck, Expanded Capacity Vehicle, 4X4, M1113 (NSN 2320-01-412-0143)
TM 9-2330-202-14&P	Operator, Unit, and Direct Support and General Support Maintenance Manual (Including Repair Parts and Special Tools List) for Trailer: Cargo, 1 Ton, 2-Wheel
TM 9-6115-642-10	Operator's Manual, for Generator Set Skid Mounted, Tactical Quiet 10-kW, 60 and 400-Hz
TM 9-6115-660-13&P	Operator, Unit, and Direct Support, Maintenance Manual (Including Repair Parts and Special Tools List) for Generator Diesel Engine Driven, Trailer Mounted
TM 10-6411-224-14	Operator, Unit Support, Direct Support, and General Support Maintenance for Lightweight Multipurpose Shelters (LMS), Model no. S788/g Type I and Type III, NSN 5411-01-357-3582 & 5411-01-357-3583
TM 11-5400-229-12&P	SICPS TENT

A-4 TECHNICAL MANUALS (Cont'd)**List of Technical Manuals**

<u>Document</u>	<u>Description</u>
TM 750-244-2	Procedures for Destruction of Electronics Materiel to Prevent Enemy Use (Electronics Command)
TM 750-244-6	Procedures for Destruction of Tank/Automotive Equipment to Prevent Enemy Use

A-5 LUBRICATION ORDERS**List of Lubrication Orders**

<u>Document</u>	<u>Description</u>
LO 9-6115-642-12	10kW Generator Set
LO 9-2330-392-4&P	Generator Trailer Lubrication Instructions

A-6 TECHNICAL BULLETINS**List of Technical Bulletins**

<u>Document</u>	<u>Description</u>
TB 11-6675-295-10	DTSS Software User's Manual

A-7 MISCELLANEOUS GOVERNMENT PUBLICATIONS**List of Miscellaneous Government Publications**

<u>Document</u>	<u>Description</u>
AR 735-11-2	Reporting of Item and Packaging Discrepancies
DA Pam 25-30	Consolidated Index of Army Publications and Blank Forms
DA Pam 738-750	Functional User's Manual for The Army Maintenance Management System (TAMMS)

A-8 NON-GOVERNMENT DOCUMENTS

The following lists of non-government documents are provided:

List of Non-Government Documents – Hardware

<u>Document</u>	<u>Description</u>
CEX-07 Installation Instructions (Cypher Dial)	Installation Instructions for the X-07/CEX-07 Lock, MAS-Hamilton Group, document number 013.034 (1987/1988)
Installation Instructions for the CEX-07 Type 1-F Security Lock	Installation Instructions for the CEX X-07 Type 1-F Security Lock, MAS-Hamilton Group, document number 001.123 (12/93)
Operating Instructions for the CEX-07 Type 1-F Security Lock	Operating Instructions for the X-07 Group 1-F Security Lock, MAS-Hamilton Group, part number 001.111
The X-07; Informational, Operations, and Installation Video	MAS-Hamilton Group, part number 104076
Operating Manual and Unit Maintenance Manual For CHS-2 Version 2 Uninterruptible Power Supply	Army Battlefield Command System (ABCS) Common Hardware Software 2 (CHS-2) Version 2 (V2) Uninterruptible Power Supply (NSN 6130-01-421-7678) (1 April 1997)
HP DeskJet Color Printer	HP DeskJet 952 C C6428B-ABA, 3000 Hanover Street, Palo Alto, CA 94304, http://www.hp.com/
HP DesignJet 1055CM User's Guide	User's Guide Hewlett-Packard DesignJet 1055CM, includes Set Up Instructions. Manual Part Number: C6075-90101, Edition 1, English http://www.hp.com/cposupport/manindex/hpdesignje33712_eng_man.html
HP JetDirect 400N Print Server	Hardware Installation Guide (Manual Part No. 5967-6986 (12-98)
Scanner, Ideal	CONTEX Scanning Technology Inc., 3200 Inland Empire Blvd., Suite 160, Ontario, California 91764 http://www.contex.dk/

A-8 NON-GOVERNMENT DOCUMENTS (Cont'd)**List of Non-Government Documents – Hardware (Cont'd)**

<u>Document</u>	<u>Description</u>
RAID	FlashDisk User Manual
CD Re-Writer	YAMAHA Quick Start Guide for CD-Recorder, CD-ROM, CD-Re-Writer, Model CDW 4416SXZ/CRW6416SXZ
Orange Book Part 2 for CD-R	Standards for CD-Recordable format
PARALAN User's Manual	PARALAN, 4655 Ruffner Street, San Diego, CA 92111 http://www.paralan.com/
STE	Secure Terminal Equipment, User's Manual, K10047662 (December 1998)
Ethernet Switch	Catalyst 2 900 Series XL Installation Guide
Netra Server	Sun Microsystems, Inc., 901 San Antonio Road, Palo Alto CA 94303
Print Server	HP JetDirect External Print Servers, Hewlett-Packard Company, 8000 Foothills Blvd., Roseville, CA 95747
SCSI Booster	Apcon Inc., 17938 SW Upper Boones Ferry Rd., Portland, Or 97224
SCSI Switch	Apcon Inc., 17938 SW Upper Boones Ferry Rd., Portland, Or 97224
DLT Autoloader	Overland Data Inc., 8975 Balboa Ave., San Diego, CA 92123
KVM switch	Raritan, 400 Cottontail Lane, Somerset, NJ 08873

A-9 NON-GOVERNMENT DOCUMENT SOURCES

Non-Government Document Sources

<u>References</u>	<u>Source</u>
Door Lock (Cypher)	MAS-Hamilton Group, 805-D Newton Circle Lexington, KY 40511-1240
GUI	TASC, 4801 Stonecroft Blvd., Chantilly VA 20171-3414
STE	L-3 Communications, Communications Systems East, One Federal Street, Camden, NJ 08103-1013

APPENDIX B

COMPONENTS OF END ITEM AND BASIC ISSUE ITEMS LISTS

	Table of Contents	Page
I	Introduction	B-1
II	Components of End Item	B-3
III	Basic Issue Items	B-5

SECTION I INTRODUCTION

B-1 SCOPE

This appendix lists components of end item and basic issue items for the DTSS-L to help you inventory items required for safe and efficient operation.

B-2 GENERAL

The components of end item and basic issue lists are divided into the following sections:

- a. Section II - Components of End Item. This listing is for informational purposes only and is not authority to requisition replacements. These items are part of the end item, but are removed and separately packaged for transportation or shipment. As part of the end item, these items must be with the end item whenever it is issued or transferred between property accounts. Illustrations are furnished to assist you in identifying the items.
- b. Section III - Basic Issue Items (BII). These are the minimum essential items required to place the DTSS-L in operation, to operate it, and to perform emergency repairs. Although shipped separately packaged, BII must be with the DTSS-L during operation and whenever it is transferred between property accounts. This manual is your authority to request/requisition replacement BII, based on TOE/MTOE authorization of the end item.

B-3 EXPLANATION OF COLUMNS

The following provides an explanation of columns found in the tabular listings:

- a. Column (1) - Illustration Number (Illus Number). Indicates the number of the illustration in which the item is shown

B-3 EXPLANATION OF COLUMNS (Cont'd)

- b. Column (2) - National Stock Number. Indicates the national stock number assigned to the item for requisitioning purposes.
- c. Column (3) - Description. Indicates the federal item name and, if required, a minimum description to identify and locate the item. The last line for each item indicates the commercial and government entity (CAGE) code (in parentheses) followed by the part number.
- d. Column (4) - Unit of Measure (U/M). Indicates the measure used in performing the actual operational/maintenance function. This measure is expressed by a two-character alphabetical abbreviation (e.g., ea, in, pr).
- e. Column (5) - Quantity Required (Qty Reqd). Indicates the quantity of the item authorized to be used with/on the equipment.

SECTION II COMPONENTS OF END ITEM

(1)	(2)	(3)	(4)	(5)
ILLUS NUMBER	NATIONAL STOCK NUMBER	DESCRIPTION CAGE CODE AND PART NUMBER	U/M	QTY REQD
1	5895-01-421- 7670	LIGHTWEIGHT MULTIPURPOSE SHELTER (MODIFIED) (28391),	EA	1
2		VERSATILE COMPUTER UNIT 1 VCU 1 (67032) 022757561-9	EA	1
3		MONITOR, FLAT PANEL, 20" (67032), 02-2757256-1	EA	1
4		KEYBOARD, VCU 1, (0AA21), MRI1523-001	EA	1
5		COMPACT COMPUTER UNIT (67032) 02-2757528-12	EA	1
6		SCANNER, ALTEK 24" (7Z659), MOD-ALS-430C	EA	1
7	4120-01-327- 1316	PLOTTER, #E SIZE DESIGN JET 1055CM (28480) C3198B	EA	2
8		HP 952C PRINTER, (28480), C6428B-ABA	EA	1
9		ENVIRONMENTAL CONTROL UNIT, HORIZONTAL, COMPACT	EA	1
10		RAID (40335) FDRI-ERRD-8W36	EA	1
11		REGENERATOR,SCSI (0WR53), SIR-S8	EA	1

SECTION II COMPONENTS OF END ITEM (Cont'd)

(1)	(2)	(3)	(4)	(5)
ILLUS NUMBER	NATIONAL STOCK NUMBER	DESCRIPTION CAGE CODE AND PART NUMBER	U/M	QTY REQD
12	6130-01-456-9451	POWER SUPPLY, UNINTERRUPTIBLE (25965), 28-2757053-3	EA	2
13		DRIVE EXTERNAL, 8-mm (0AA21), 02-2757884-3	EA	1
14		CD-ROM, RECORDABLE, (7X695), CDW6416SXZ	EA	1
15		SECURE TERMINAL EQUIPMENT (11447)	EA	1
16		LIGHT UNIT, EMERGENCY (0JNK1), M-126	EA	1
17	6115-01-319-9032 or 6115-00-033-1389	GENERATOR SET, DIESEL ENGINE, TRAILER MOUNTED	EA	1
18		EXTINGUISHER, FIRE, CARBON DIOXIDE (54905), 417T	EA	1
19		CHAIR, HIGHBACK (01VU8), WP8000BLK1112	EA	1

SECTION III BASIC ISSUE ITEMS

(1)	(2)	(3)	(4)	(5)
ILLUS NUMBER	NATIONAL STOCK NUMBER	DESCRIPTION CAGE CODE AND PART NUMBER	U/M	QTY REQD
1	5975-00-187-5294	ROD, GROUND (81349), MIL-R-11461	EA	1
2		CABLE ASSEMBLY, POWER, 10-ft (23991)A3253240-502	EA	1
3	5520-01-263-1760	SURFACE WIRE GROUNDING SYSTEM	EA	1
4		LAMP, INCANDESCENT (9F112), 4422	EA	1
5	8340-01-323-2454 8340-01-334-7529	TENT, SICPS - GREEN (81337), 5-4-6340-1 or TENT, SICPS – DESERT TAN (81337) 5-4-6340-2	EA	1
6		BOOTWALL, RWS (81349) MIL-B-44418, TYPE 4, CL1	EA	1
7		CABLE ASSEMBLY, POWER, 50-ft (23991), A3253240-501	EA	1
8		LOOPBACK CONNECTOR (81349), M49292/4-03	EA	1
9		CABLE ASSEMBLY, IEEE802.3 RB58 (59951), LCN300-0100	EA	1
10		CABLE, TFOCA, 300-ft (64959), 106924715	EA	1
11		CABLE ASSEMBLY (23991), A3253237-530	EA	1
12		CABLE ASSEMBLY (23991), A3253238-503	EA	1

SECTION III BASIC ISSUE ITEMS (Cont'd)

(1)	(2)	(3)	(4)	(5)
ILLUS NUMBER	NATIONAL STOCK NUMBER	DESCRIPTION CAGE CODE AND PART NUMBER	U/M	QTY REQD
13	4520-00-177- 6198	CABLE ASSEMBLY (23991), A3253237-531	EA	1
14		CABLE ASSEMBLY (23991), A3253237-532	EA	1
15		CABLE ASSEMBLY, POWER (23991), A3253245-501	EA	1
16		CABLE ASSEMBLY, POWER (23991), A3253245-502	EA	1
17		VACCUUM CLEANER, 57065-060	EA	1
18		HEATER SPACE ELECTRIC VALAD MODEL P15D	EA	1

APPENDIX C**ADDITIONAL AUTHORIZATION LIST (AAL)**

Section	Page
I Introduction	C-1
II Additional Authorized Items List	C-1

SECTION I INTRODUCTION**C-1 SCOPE**

This appendix lists additional items you are authorized for support of the DTSS-L.

C-2 GENERAL

This list identifies items that do not have to accompany the DTSS-L and that do not have to be turned in with it. These items are all authorized to you by CTA, MTOE, TDA, or JTA.

C-3 EXPLANATION OF LISTING

National stock numbers, descriptions, and quantities are provided to help you identify and request the additional items you require to support this equipment. The items are listed in alphabetical sequence by item name under the type documentation (i.e., CTA, MTOE, TDA, or JTA), which authorizes the item to you. If the item you require differs between serial numbers of the same model, effective serial numbers are shown in the last line of the description

SECTION II ADDITIONAL AUTHORIZED ITEMS LIST

Not applicable.

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APPENDIX D

EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST

SECTION	Page
I Introduction	D-1
II Expendable/Durable Supplies and Materials List	D-2

SECTION I INTRODUCTION

D-1 SCOPE

This appendix lists expendable supplies and materials you will need to operate and maintain the DTSS-L. This listing is for informational purposes only and is not authority to requisition the listed items. These items are authorized to you by CTA 50-970, Expendable/Durable Items (except Medical, Class V, Repair Parts, and Heraldic Items), or CTA 8-100, Army Medical Department Expendable/Durable Items.

D-2 EXPLANATION OF COLUMNS

- a. Column (1) - Item Number. This number is assigned to the entry in the listing and is referenced in the narrative instructions to identify the material (e.g., "Use cleaning compound, item 5, apdx D").
- b. Column (2) - Level. This column identifies the lowest level of maintenance that requires the listed item.
 - C-Operator/Crew
 - O-Unit Maintenance
 - F-Direct Support Maintenance
- c. Column (3) - National Stock Number. This is the national stock number assigned to the item; use it to request or requisition the item.
- d. Column (4) - Description. Indicates the federal item name and, if required, a description to identify the item. The last line for each item indicates the commercial and government entity (CAGE) code in parentheses followed by the part number.
- e. Column (5) - Unit of Measure (U/M). Indicates the measure used in performing the actual maintenance function. This measure is expressed by a two-character alphabetical abbreviation (e.g., ea, in, pr). If the unit of measure differs from the unit of issue, requisition the lowest unit of issue that will satisfy your requirements.

SECTION II EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) U/M)/ (U/I)
1	C		INK CARTRIDGE, PLOTTER – BLACK, (50443), C4872A	EA
2	C		INK CARTRIDGE, PLOTTER – CYAN, (50443), C4872A	EA
3	C		INK CARTRIDGE, PLOTTER – MAGENTA (50443), C4874A	EA
4	C		INK CARTRIDGE, PLOTTER – YELLOW (50443), C4873A	EA
5	C		PAPER, 36-in PLOTTER 150 FT (50443), C6020A	EA
6			PAPER, 36-in PLOTTER 300 FT (50443), C6810A	EA
7	C		PRINTERHEAD AND PRINTERHEAD CLEANER – BLACK C4820A	EA
8	C		PRINTERHEAD AND PRINTERHEAD CLEANER – CYAN C4821A	EA
9	C		PRINTERHEAD AND PRINTERHEAD CLEANER – MAGENTA C4822A	EA
10	C		PRINTERHEAD AND PRINTERHEAD CLEANER – YELLOW C4823A	EA
11	C	7045-01-455-2291	LS 120 CLEANING DISK, BOX OF 5	EA
12	C	Iomega 10597	JAZ DISK, 2G, PKG OF 3	EA
13	C		JAZ CLEANING DISK	EA
14	C	Imation 41134	DVD-RAM DISK	EA
15	C		DVD-RAM CLEANING DISK	EA

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) U/M)/ (U/I)
16	C	7045-01-405-4061	8-MM TAPE CARTRIDGE	EA
17	C	GSA 309258	EXABYTE PREMIUM CLEANING CARTRIDGE	EA
18	C	7045-01-470-3596	CD-RW DISK	EA
19	C		CD-RW CLEANING DISK	EA
20	C	7045-01-482-7540	CD-R DISK	EA
21	C	7045-01-459-4985	3 ½ IN FDD CLEANER KIT	EA
22	C	106051-003	DLT CLEANING CARTRIDGE (0EZ71)	EA
23	C	106051-002	DLT IV TAPE CARTRIDGE 5PK (0EX71)	EA
24	C	7920-01-214-6083	CLOTH, CLEANING (21994), TX308	EA
25	C	51645A	PRINTER INK CARTRIDGE, BLACK	EA
26	C	C6578DN	PRINTER INK CARTRIDGE, COLOR	EA
27	C	7930-01-326-8110	GLASS CLEANER	EA
28	C	6810-01-127-4246	ALCHOL ISOPROPYL (80244), TT-I-735- 6RA	OZ
29	C		LUBRICANT, GRAPHITE PENEPHITE, KANO LABS, AN	EA
30	C	5120-00-222-8852	SCREWDRIVER, FLAT-TIP, FLARED- TIP, PLASTIC HANDLE, ¼-in w/TIP, 4-in LONG BLADE w/WRENCH GRIP	EA
31	C	5120-00-234-8913	SCREWDRIVER, CROSS TIP, PLASTIC HANDLE, SIZE No. 2, 4-in LONG	EA

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APPENDIX E

SAFE GROUNDING OF COMMUNICATIONS–ELECTRONICS EQUIPMENT IN THE FIELD

Section/Subject	Page
E-1 Purpose and Scope	E-1
E-2 The Earth Grounding System.....	E-1
E-3 Selecting a Ground Rod	E-2
E-4 How to Install Ground Rods	E-3
E-5 Improving Soil Conductivity	E-5
E-6 Grounding With Underground Objects.....	E-5
E-7 Grounding in Poor Soil	E-6
E-8 How to Improve Your Ground.....	E-8
E-9 Shelters and Nearby Equipment.....	E-8

E-1 PURPOSE AND SCOPE

This appendix describes earth ground systems and how to install them. Grounding helps protect personnel and equipment from faulty power systems and from lightning strikes. Grounding also reduces circuit noise and other transmission interference in communications systems. These instructions will help you set up a safe ground system for your equipment or shelter.

E-2 THE EARTH GROUNDING SYSTEM

- a. Theory. An earth grounding system helps keep the electrical potential on metal surfaces at the same level as the surrounding earth. Earth grounding also provides a discharge path for externally generated electrical surges, including lightning. An earth ground is made by electrically connecting a generator, shelter, or structure to a buried metal conductor that is in contact with moist subsoil or reaches into the underground water table. The type of ground conductor and method of installation you use depend on the climate and soil conditions of the site.
- b. Ground rods and plates. A ground rod is generally the most effective conductor. You may get a good ground by connecting to a buried metal object already at the site, such as a metal pipe or a steel building frame. In the desert or other places where ground conductivity is poor, a ground plate or several ground rods connected together will be better than a single ground rod.
- c. Soils. Some types of soil make a better electrical ground than others. Use the type of ground conductor that works best for the soil in your location, as shown in Table E–1. Under very poor or poor conditions, take special steps, as explained in paragraphs E–5, 7, and 8.

E-2 THE EARTH GROUNDING SYSTEM (Cont'd)**Table E-1**

Type of Soil	Quality of Ground	Ground Conductor
Fine sand with high moisture content	Very good	Ground rod
Clay, loam, or shale	Good	Ground rod or ground plate
Clay, loam, or shale mixed with gravel or sand, or gravel, sand, or stone	Poor and very poor	Buried metal object, or a ground plate, or several ground rods electrically connected together

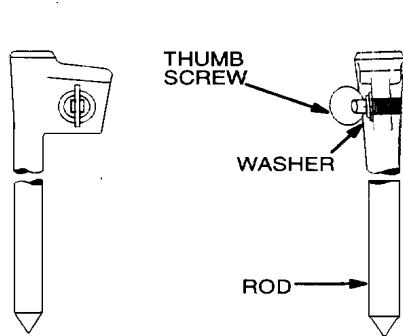


Figure E-1

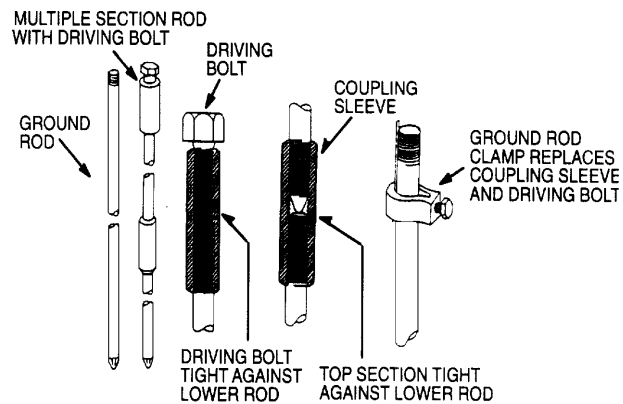


Figure E-2

E-3 SELECTING A GROUND ROD

- a. **Moist Soil Conditions.** In moist soil, select either the 8-foot ground rod NSN 5975-00-296-5324 or the 6-foot ground rod NSN 5975-00-224-5260. Both are single-section rods with a built-in driving head and a thumbscrew coupling for connecting to a ground strap, as shown in figure E-1.
- b. **Dry Soil Conditions.** In dry soil, select a multiple-section rod, such as NSN 5975-00-627-1552 or NSN 5975-00-878-4868, as shown in figure E-2. Drive the rod deep enough to reach moist subsoil. If there is no moist subsoil or the soil won't allow deep penetration, drive the rod as deeply as you can, then apply salt and water as explained in paragraph E-5. See paragraphs E-7 and E-8 for other ways to improve grounding when soil conductivity is poor.

E-4 HOW TO INSTALL GROUND RODS

- a. Clean the rod to remove all grease, oil, or paint. Wear gloves to protect your hands from sharp metal. See figure E-3.



Figure E-3

- b. Dig a hole at least 12 inches deep and 36 inches across.
- c. Drive the rod through to moist subsoil. To install a multiple-section ground rod, use a driving hammer as shown in figure E-4. Allow about 3 inches of the rod to protrude above the bottom of the hole.



Figure E-4

- d. Connect the rod to the equipment or shelter using a ground strap. If you don't have a ground strap, use a piece of the heaviest gauge wire you can find, #6 AWG or larger, preferably copper.
- e. Connect the ground strap to the ground rod.

- (1) Use the terminal screw on the ground rod. If it is missing or broken, connect the ground strap (or heavy wire substitute) with a tight-fitting clamp as shown in figure E-5.

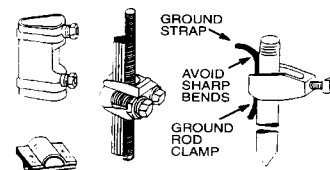


Figure E-5

E-4 HOW TO INSTALL GROUND RODS (Cont'd).

NOTE

The ground strap (or heavy wire substitute) should not be tied to the rod or loop it around the rod. A knot or loop will greatly reduce the effectiveness of the ground. The strap must be connected by the terminal screw, a clamp or bound with wire to the rod.

- (2) If you can't find a clamp, bind the ground strap (or heavy wire substitute) to the ground rod with at least 24 turns of stripped telephone wire or other bare wire as shown in figure E-6. Tightly twist the ends of the wire together. Tape the connection to block out moisture.

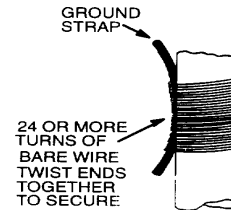


Figure E-6

- f. After you connect the ground strap (or heavy wire substitute) to the ground rod, connect the other end to the ground lug on the shelter or equipment. Keep the strap or wire as short and straight as possible and make sure there are no loops or knots. Make sure all connections are clean and tight. Figure E-7 shows a complete earth ground system.

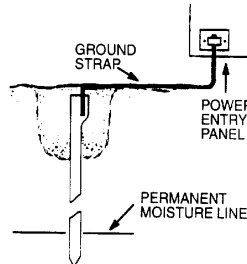


Figure E-7

- g. Fill the hole with water and let it soak in. Then fill the hole with soil. Add water as often as needed to keep the soil moist around the ground rod, at least once a day if it doesn't rain.
- h. Check the ground strap every day. Make sure the wire connections are clean and tight.

E-5 IMPROVING SOIL CONDUCTIVITY

Increase soil conductivity by adding salt and water as shown in figure E-8. Use one pound of salt per gallon of water. Replace salt that leaches into the soil by mixing salt with the water at least once a week for the first four weeks of use. Then add the mixture of salt and water at least once a month.

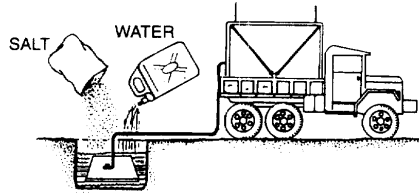


Figure E-8

E-6 GROUNDING WITH UNDERGROUND OBJECTS

WARNING

Do not attach ground to any pipe or container used for gasoline or other flammable gasses or liquids.

Metal objects buried at least six feet underground, such as pipes, steel building frames, metal poles, and storage tanks, provide excellent grounding. Connect the ground strap to the underground metal object with a clean, solid connection. Do not wrap or tie it on; avoid sharp bends. Figure E-9 shows examples of good connections to buried objects.

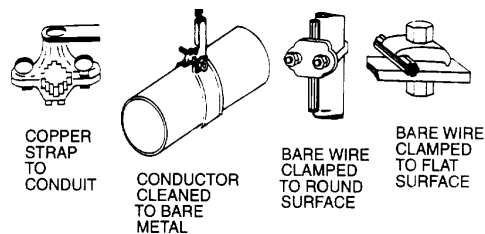


Figure E-9

E-7 GROUNDING IN POOR SOIL

When your site does not have fine topsoil, clay, loam, or shale, you must compensate for poor electrical conductivity as described in paragraphs E-7.a through E-7.e and E-8.

a. Desert.

- (1) In the desert, a ground plate may work better than a ground rod. Use a clean, bare metal plate or sheet at least 3 feet square and at least 1/8 inch thick. Select a metal bolt, nut and lockwasher, then drill a hole in the center of the plate just large enough for the bolt. Fasten a ground strap to the plate as shown in figure E-10. Make sure the connection is clean and tight. Bury the plate at least four feet underground. Apply salt and water as described in paragraph E-5.

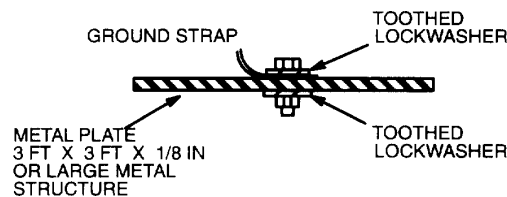


Figure E-10

- (2) Make a clean, tight connection to your equipment or shelter and check it every day.
 - (3) If necessary, install several rods or ground plates and connect them together as described in paragraph E-8.
- b. Sandy soils, gravel, stones, and soils mixed with gravel or sand. For ground rods, dig a hole 1 foot deep and 36 inches in diameter. For ground plates, dig a hole at least 4 feet deep, large enough to install the plate horizontally. Install the rod or plate as described in paragraphs E-4 and E-7.a. Keep the soil around the rod or plate moist and use salt to improve conductivity as described in paragraph E-5.
 - c. Mountains. It may be impossible to penetrate to moist soil or a water table in many mountainous areas. To properly ground your equipment, you must find a site where a ground rod can be installed. Stream beds are usually the best locations. (See figure E-11) If you cannot drive a rod to its full length, install additional rods as described in paragraph E-8.

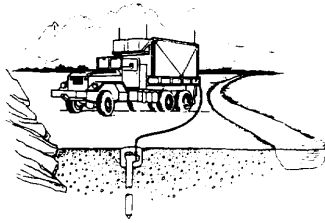
E-7 GROUNDING IN POOR SOIL (Cont'd).

Figure E-11

- d. Tropics. Install the ground rod as in paragraph E-4. Because of the humidity, take care to keep the strap connections clean and dry. Cover the connection to the ground rod with waterproof tape and check it every day.
- e. Arctic. Try to connect to a buried metal object such as an underground pipe or a building frame. Otherwise, drive in several ground rods as deeply as possible. Space them at least two rod lengths apart and connect them with #6 AWG or larger bare copper cable or braid. Connect the ground lug on the PEP of the shelter to the closest ground rod. Treat the soil with salt and water as described in paragraph E-5. Figure E-12 shows some possible ground rod layouts.

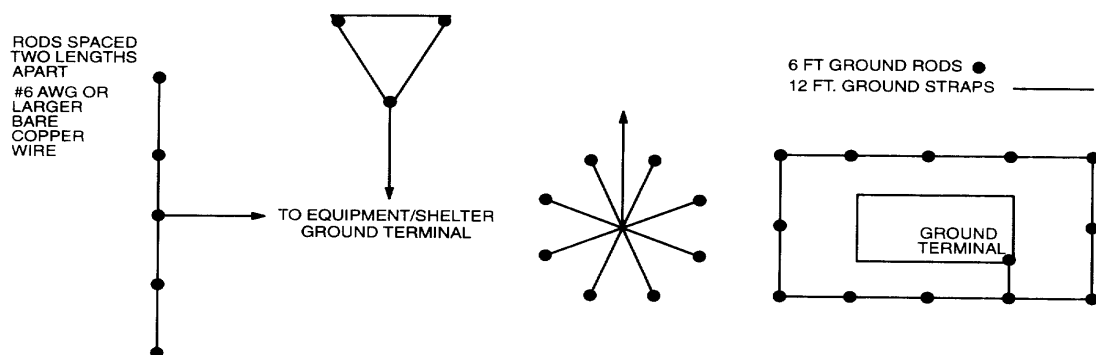
E-8 HOW TO IMPROVE YOUR GROUND.

Figure E-12

When a single ground rod provides a poor ground, drive in extra rods as shown in figure E-12. If you can, use 8 or more rods. The more rods you use, the better the electrical connection to the earth. Install rods around the perimeter of your shelter or equipment, spaced two rod lengths apart. Connect all rods together and connect the closest rod to the shelter's PEP ground connector using the heaviest wire you can find, preferably #6 AWG or larger bare copper cable. If possible, connect other perimeter rods to other points on the shelter. Treat the soil around each ground rod with salt and water as explained in paragraph E-5. If a perimeter installation is impractical, install the rods in one of the other layouts shown. Connect the center rod to the shelter and treat the soil with salt and water as explained in paragraph E-5.

E-9 SHELTERS AND NEARBY EQUIPMENT

WARNING

During thunderstorms, lightning flashover or arcing can occur between two or more unconnected or poorly connected adjacent metal structures. Flashover can cause lethal voltage on the ground in the vicinity of these objects.

To avoid lightning flashover, separate equipment shelters, antenna masts, and other metal structures by at least 6 feet or connect them with heavy copper cable. Cables should be as short and straight as possible. Connect all structures and objects located within 25 ft of each other to a common ground as shown in figure E-13. This will help prevent dangerous voltages between shelters and reduce signal interference from stray (or common mode) ground currents.

WARNING

Lighting warning for stand-alone equipment: When thunderstorms threaten, disconnect power from stand-alone equipment that is not sheltered by separate lightning protection system. Then separate all such equipment by at least 6 feet or bond them together with HEAVY COPPER CABLE.

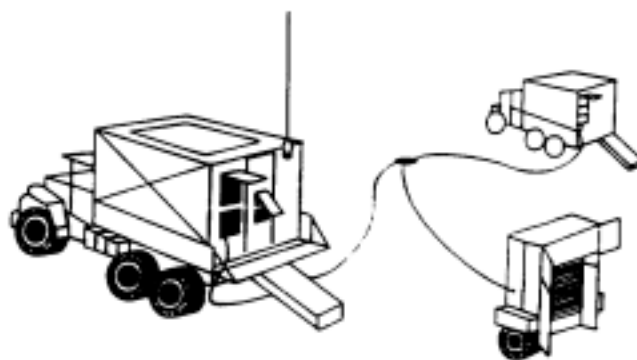


Figure E-13

See FM 11-487-4 and MIL-HDBK-419A, Vol. II. For help, contact your local safety office or your CECOM Logistics Assistance Representative or the CECOM Safety Office. You may call CECOM Safety at DSN 992-0084 or (732) 532-0084, or write to:

Commander,
US Army CECOM
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Fort Monmouth, NJ 07703-5024

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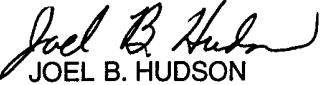
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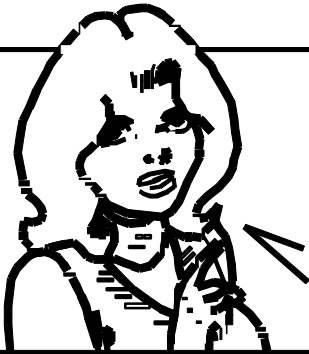
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2-25

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 f.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.

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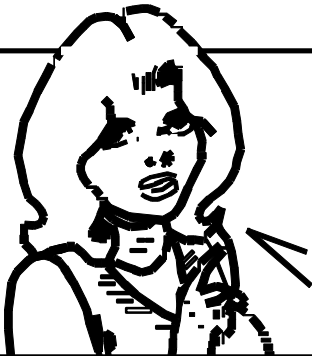
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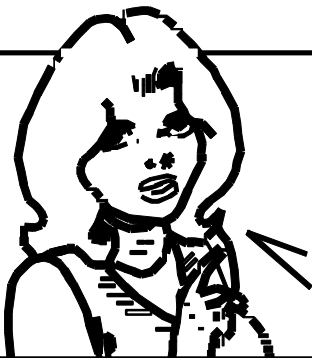
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THE METRIC SYSTEM AND EQUIVALENTS

LINEAR MEASURE

1 Centimeter = 10 Millimeters = 0.01 Meters = 0.397 inches
 1 Meters = 100 Centimeter = 1000 Millimeters = 39.37 inches
 1 Kilometer = 1000 Meters = 0.621 Miles

SQUARE MEASURE

1 Sq. Centimeter = 100 Sq. Millimeters = Millimeters = 0.155 Sq. inches
 1 Sq. Meter = 10,000 Sq. Centimeters = 10.78 Sq. Feet
 1 Sq. Kilometer = 1,000,000 Sq. Meters = 0.388 Sq. Miles

WEIGHTS

1 Gram = 0.0001 Kilogram = 1000 Milligrams = 0.035 Ounces
 1 Kilogram = 1000 Grams = 2.2 Lb.
 1 Metric Ton = 1000 Kilograms = 1 Megagram = 1.1 Short Tons

CUBIC MEASURE

1 Cu Centimeter = 1000 Cu Millimeters = 0.06 Cu Inches
 1 Cu Meter = 1,000,000 Cu Centimeters = 35.31 Cu Feet

LIQUID MEASURE

1 Milliliter = 0.001 Liters = 0.0338 Fluid Ounce
 1 Liter = 1000 Milliliters = 33.82 Fluid Ounces

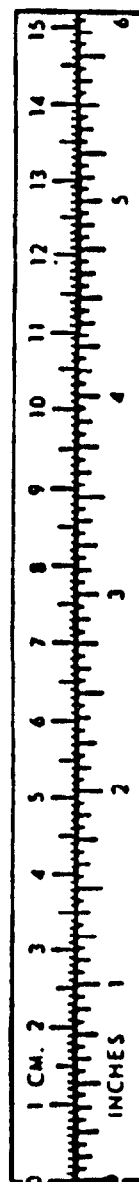
TEMPERATURE

$5/9 (^{\circ}\text{F} - 32) = ^{\circ}\text{C}$
 212° Fahrenheit is equivalent to 100° Celsius
 90° Fahrenheit is equivalent to 32.2° Celsius
 32° Fahrenheit is equivalent to 0° Celsius
 $9/5 \text{ C}^{\circ} + 32 = ^{\circ}\text{F}$

APPROXIMATE CONVERSION FACTORS

<u>TO CHANGE</u>	<u>TO</u>	<u>MULTIPLY BY</u>
Inches.....	Centimeters.....	2.540
Feet.....	Meters.....	0.305
Yards.....	Meters.....	0.914
Miles.....	Kilometers.....	1.609
Square Inches.....	Square Centimeters.....	6.4516
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
Pints.....	Liters.....	0.473
Quarts.....	Liters.....	0.946
Gallons.....	Liters.....	3.785
Ounces.....	Grams.....	28.350
Pounds.....	Kilograms.....	0.454
Short Tons.....	Metric Tons.....	0.907
Pound-Feet.....	Newton-Meters.....	1.358
Pounds per Square Inch.....	Kilopascal.....	6.895
Miles per Gallon.....	Kilometers per Liter.....	0.425
Miles per Hour.....	Kilometers per Hour.....	1.609

<u>TO CHANGE</u>	<u>TO</u>	<u>MULTIPLY BY</u>
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.....	1.067
Liters.....	Gallons.....	0.264
Grams.....	Ounces.....	0.035
Kilograms.....	Pounds.....	2.205
Metric Tons.....	Short Tons.....	1.102
Newton-Meters.....	Pound-Feet.....	0.738
Kilopascal.....	Pounds per Square Inch.....	0.145
Kilometers per Liter.....	Miles per Gallon.....	2.354
Kilometers per Hour.....	Miles per Hour.....	0.621



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