

"Gary's Pulse-2" Induction Metal Detector

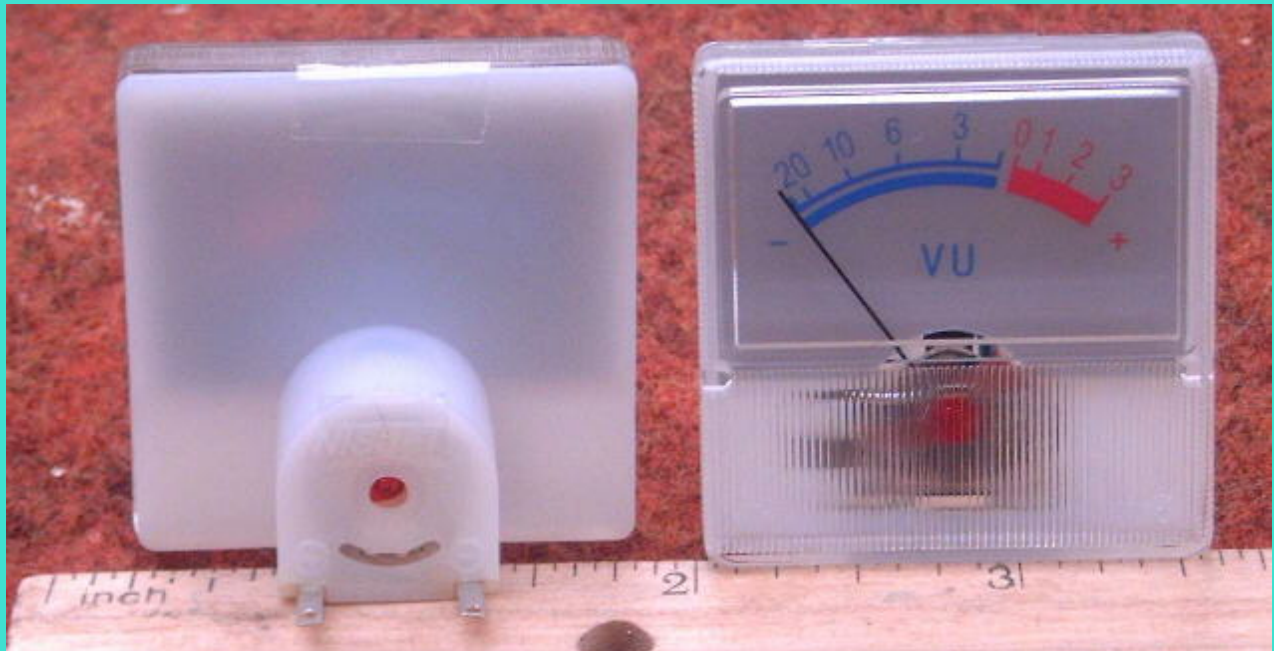
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This is an Improvement on my Pi Detector. I re-wrote this as a Seperate article as it was getting too confusing. However most of the info in that article will also apply to this one and it would be a good idea to read it Also.

Features Either a Single Coil Metal Detector,
Or 2 possible Dual Coil Configurations! You Choose which.

Same Features as my Pulse-1 but with additional controls
for Varying most of the Parameters.

Latest Update: Feb 23 2007



I can Now Supply these New Vu Meters

These Meters are Rated at 100 uA at the -3 Db and about 240 uA at the + 3Db.

The Cost is \$8.00 each, plus Shipping Cost.

Warning: This is NOT FOR BEGINNERS

Before Testing the Completed Unit

Wash the board to Remove All Flux Residue.

IT WILL NOT WORK CORRECTLY IF YOU DON'T!

**It is Also HIGHLY Recommended to use a Current Regulated Power Supply when first testing this unit.
(Less than 300 Ma. is quite satisfactory)**

Excessive Current (generating heat) will Destroy the REG1117A.

Failing a Regulated Supply, a 60 Watt/110 volt standard light bulb can be placed in series with the positive battery lead. This should limit current to a reasonable level, preventing any damage to parts.

Good Soldering and Lead Layout is a Must!

NOTE: It is Important to use a Good Soldering Iron, Rated at 15 to 25 Watts and having a Small Clean Tip!

Note also the Revision Dates on All My Articles.

Always check for changes, I update most articles quite regularly.



"CLICK HERE", I now have Flat Coils for sale!

New Coil Design for the metal detector. This is a coil designed by Nikola Tesla, Patent 512340 Jan 9 1894.



"CLICK HERE", To see this Coil.

Although Tesla patented this coil long ago, it was before Metal Detectors were invented. His application was for Radio Transmission and it had problems because of Parastatic Capacitance. This is Not a problem with a PI Detector because of he much lower frequencies.

My test results show increased Sensitivity using this type of coil on my detector. Especially on Smaller objects.

These coils require winding two separate wires simultaneously in a flat radial coil, than joining the wires to make the two coils in series, but out of phase with each other. Not so Easy to do.

I May Consider making some of them in the future.

Note: This metal Detector was Not specifically designed to Detect Gold Nuggets but these added controls may help.

****This project is offered totally Free for those who are interested in it. I have tried to make this article as complete as possible, but I will Not assume any liability for any "Errors or Omissions" in this article.**

The 3 possible coil Configurations are: 1) First configuration is just a single coil. Good for most applications!

2) Second is a dual coil, with noise and ground effects cancellation.

3) Third is a dual coil, one for transmit and one for receive.

My Recommended Optimum Flat Coil Sizes using 20AWG:

Really Small Objects: ID = 2.62 inches & OD = 6 inches with 52 turns. Coils wound on Ferrite Rods are also good.

Medium Objects: ID = 5.8 inches & OD = 8 inches with 34 turns.

Its Best to use this size coil for finding Coins.

Large Objects: ID = 8.2 inches & OD = 10 inches with 28 turns

ID = 10.4 inches & OD = 12 inches with 25 turns.

ID

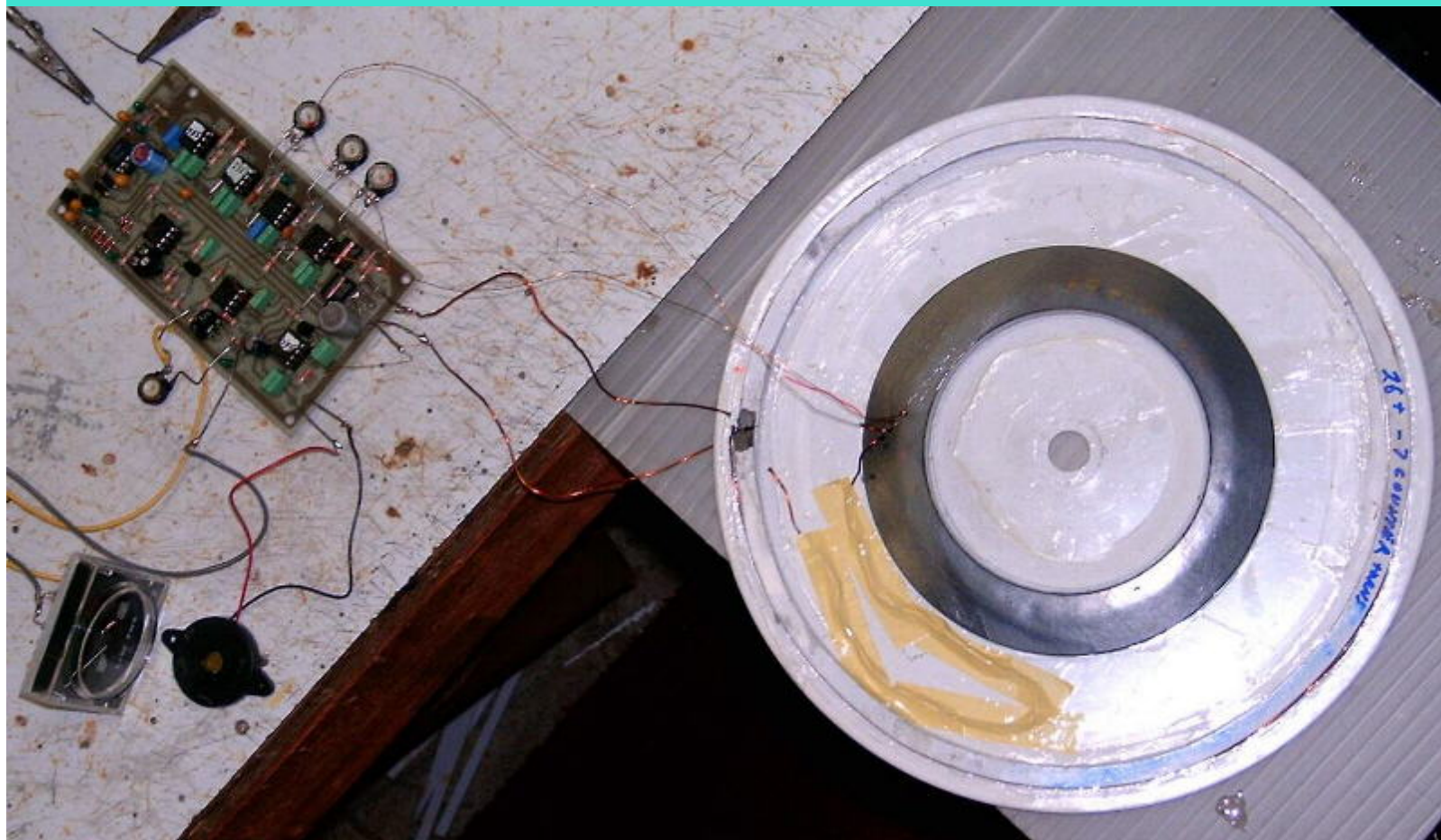
= 13.6 inches & OD = 15 inches with 21 turns.

ID = 39.2 inches & OD = 40 inches with 12 turns.

Sept 5 2004

Just for Curoosity, I made a "Coplanar Coil" Consisting of 26 turns on the transmit and with almost 7 turns on the Null Coil. The Recieve coil was 112 Turns for hopefully better signal detection.

I Very Carefully Nulled the coil with my scope and signal generator, Than connected it into my circuit as a Seperate Recieve/Transmit configuration.



To My Disapointment, After All that Trouble of making it. It was Not as good in Sensitivity as my flat coils of the same size. It also suffered considerably from ground effects, However I didn't use a faraday shield on it, Which would definately help.

It would be Greatly Appreciated to recieve Feedback from ALL Persons building this Detector.

"Click on the Titles below to open them"



A Very Detailed Picture Overlay of the Assembled Circuit Board.



A Large Printable Schematic. Re-Drawn Feb 2005, much Clearer and with considerable more Info.



Printed Circuit Board



My Test Setup, For a Dual Coil, With Seperate Transmit/Recieve Coils With This Setup, but with these coils adjusted on a Same Plane (Large coil Raised up Even with top of Ferrite Core on the Smaller coil, I can detect a 1/2 Gram Nugget at 1 1/2 inches. And close to 3/4 of an inch on a 1/4 Gram Nugget Wish I had a 1 Gram nugget to do tests on that also. Anyone Willing to send me one? Update: Same setup, but with More turns of smaller wire on the Recieve coil only, Now detection is a bit over 2 inches on that 1/2 gram nugget.



Explanations, Calibration and Setup Procedures



Parts List and pricing.

ADDITIONALLY, Remember This:

THE MOST IMPORTANT THING WITH ANY METAL DETECTOR, IS THE OPERATORS "ABILITIES", "SKILLS" AND "PATIENTS" in using it PROPERLY!

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