



METAL DETECTORS

Searching for buried treasure can be a profitable—and sometimes expensive—pastime. Before you purchase any equipment, know its capabilities.

ROBERT F. GALLAGHER

MOST PEOPLE WHO USE METAL DETECTORS don't seem to be too concerned with what makes their detectors detect. After reading over the instructions, they blithely set out to make their fortunes.

Many coin collectors are using their metal detectors for what is called "coin shooting." Other hobbyists are concerned with digging up artifacts—things that were popular during Revolutionary times—like cannon balls as big as shotputs, or tools and eating utensils from that era. Other treasure hunters look for valuable objects on the bottom of streams and lakes.

Some experts say it doesn't matter whether you're using an inexpensive or expensive detector. But as we see it, the construction of a detector, and its circuitry, are important in the production of a quality product, and in doing the job for which it has been purchased.

We spoke with a man who decided about a year ago to make "coin shooting" a hobby. His advice is to gather as much literature as possible on various types of metal detectors before you make a decision to buy one. He selected a detector that has helped him dig up about 1500 coins during the past year.

That's prudent—when you figure that metal detectors cover a price-

range from \$40.00 to \$350.00-plus. It's much like any other hobby or sport. Initially, you wouldn't buy the most expensive golf clubs after making the decision to become a weekend golfer.

Today, there are a number of amateur treasure hunters who not only are concerned with what they find, but who want to know something about the circuitry that stirs up the buzzing sounds that indicate when they should start digging.

Kinds of metal detectors

There are two basic types of metal-detector circuits—the transmitter/receiver (T/R) and the very low frequency (VLF) type.

The T/R type is where a transmitter circuit radiates a signal, that, when bounced back, is detected by the receiver circuit. When a conductive target interrupts the field, an audio response is generated.

Basically, the VLF unit is a T/R type circuit that operates below 30 kHz. It is typically more sensitive and has greater depth capabilities than the higher-frequency T/R type circuit.

The word "discrimination" is important to the treasure hunter. He doesn't want to spend half of his free time digging up bottle caps, pull tabs, foil, or other useless objects. The dis-

criminator is a circuit with a built-in ability to tell the differences among an extremely wide variety of objects while rejecting trash.

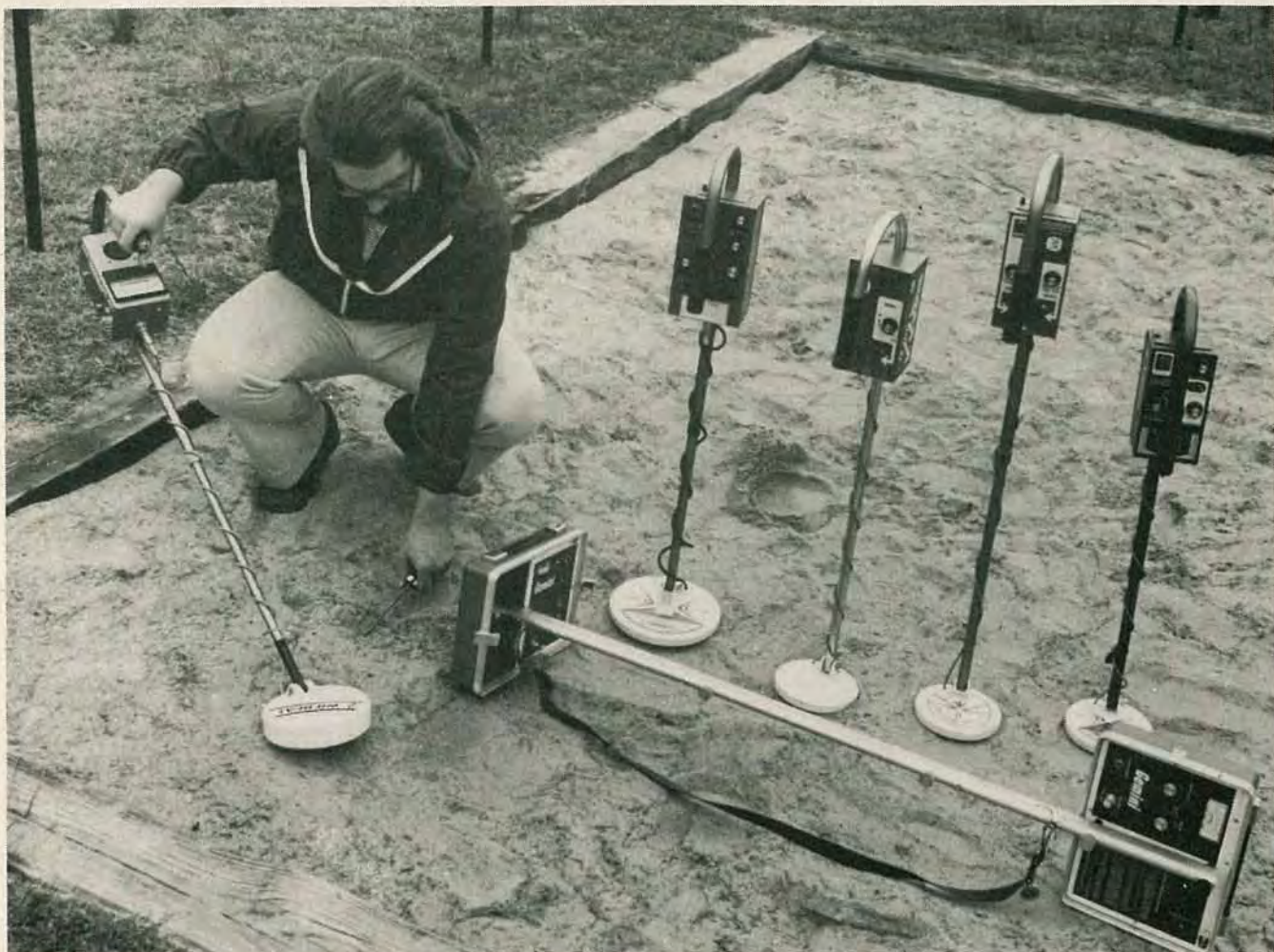
Metal detectors are much more sophisticated today than they were a few years ago. There were no discriminators, and no matter what the detector cost, it could not tell the difference between trash and treasure.

Today, leading manufacturers offer a diversity of detectors with prices falling in the range of \$40.00 to \$440.00.

What's available

Metal detectors are available from many sources. We have listed the most available ones at the end of this article. For more information circle the appropriate numbers on the Free Information card in this issue.

Although considered low-priced, the \$79.95 *Deluxe TR Earth Challenger* has a sensitivity found in higher-priced models. Features include a 10-turn metal/mineral tuner, 6-inch waterproof search coil, a 1/4-inch stereo ear-phone jack for plugging into the user's own headset, eight "AA" batteries with snap-lock battery door, and an adjusting telescope shaft which extends to 44 inches. It's of all-metal construction and weighs two pounds, five ounces. Its circuit is shown in Fig. 1.



ALMOST LIKE SELECTING golf clubs. Prospective metal detector buyer checks them out.



GROUNDTRACK metal locator from Heathkit is said to work in up to two feet of water.



COIN SHOOTING is the function of the Heath GD-1190. Search coil is optimized for this.

Bounty Hunter, a Tempe, Arizona based detector manufacturer, has introduced a unit called the *Red Baron*. Considered high-priced, it sells for about \$400.00 and comes with an eight-inch coil.

A versatile detector, mode changing, and retuning are combined in one control button. It handles mineralized and non-mineralized soil in all-metal or discriminate modes.

The *Red Baron's* synchronous-phase discrimination circuitry enables discrimination at VLF depths. It's a technique that uses a type of analog computer that reads the sensing signal of the combined targets and matrix (supporting soil around the target) then subtracts the effects of the matrix—leaving only the sound of the target itself to analyze.

Recently, Bounty Hunter added a

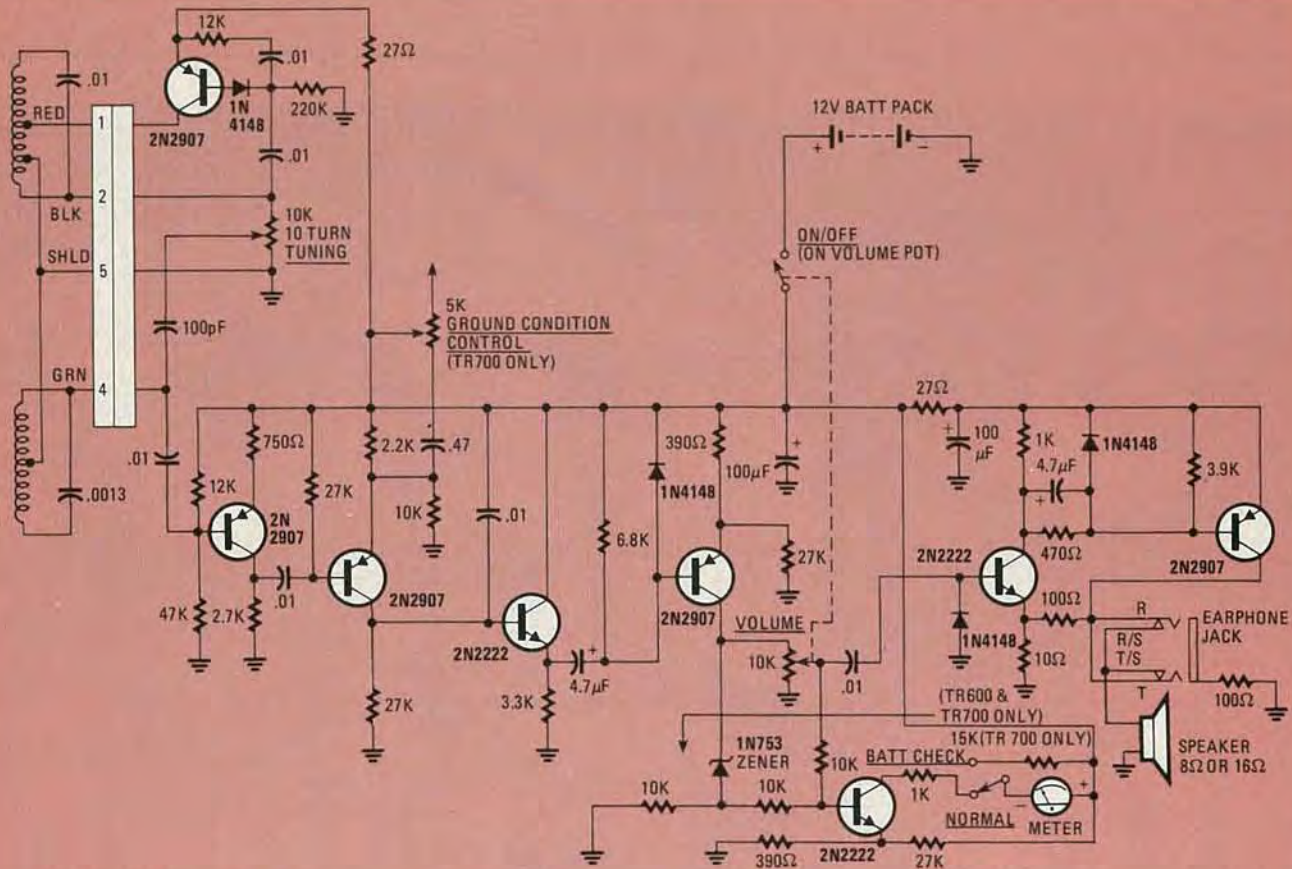


FIG. 1—COMPLETE CIRCUIT OF the Deluxe Earth Challenger II.

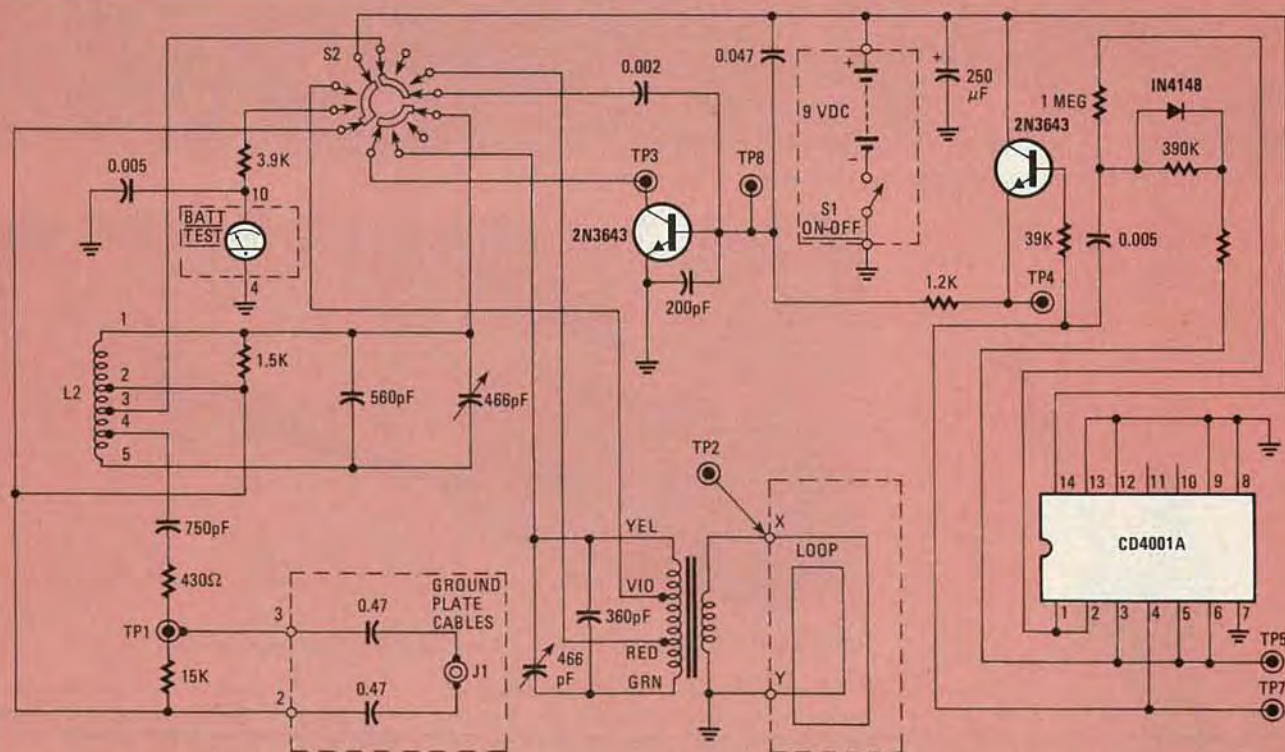


FIG. 2—TRANSMITTER IN THE Gemini II.

TR discriminator to the *Red Baron*, and now offers a selection of three modes: VLF (normal mode) SPD (ground-reject discrimination) and TR discrimination (for standard TR

operation with good depth and stability in non-mineralized ground).

Another popular Bounty Hunter offering is the *840 VLF/TR*. A discriminator with pushbutton tuning, it in-

cludes a battery check and a sensitivity meter. It weighs only 3¾ pounds and reportedly is ideal for those who fancy "coin shooting."

Edmund Scientific has a unit priced

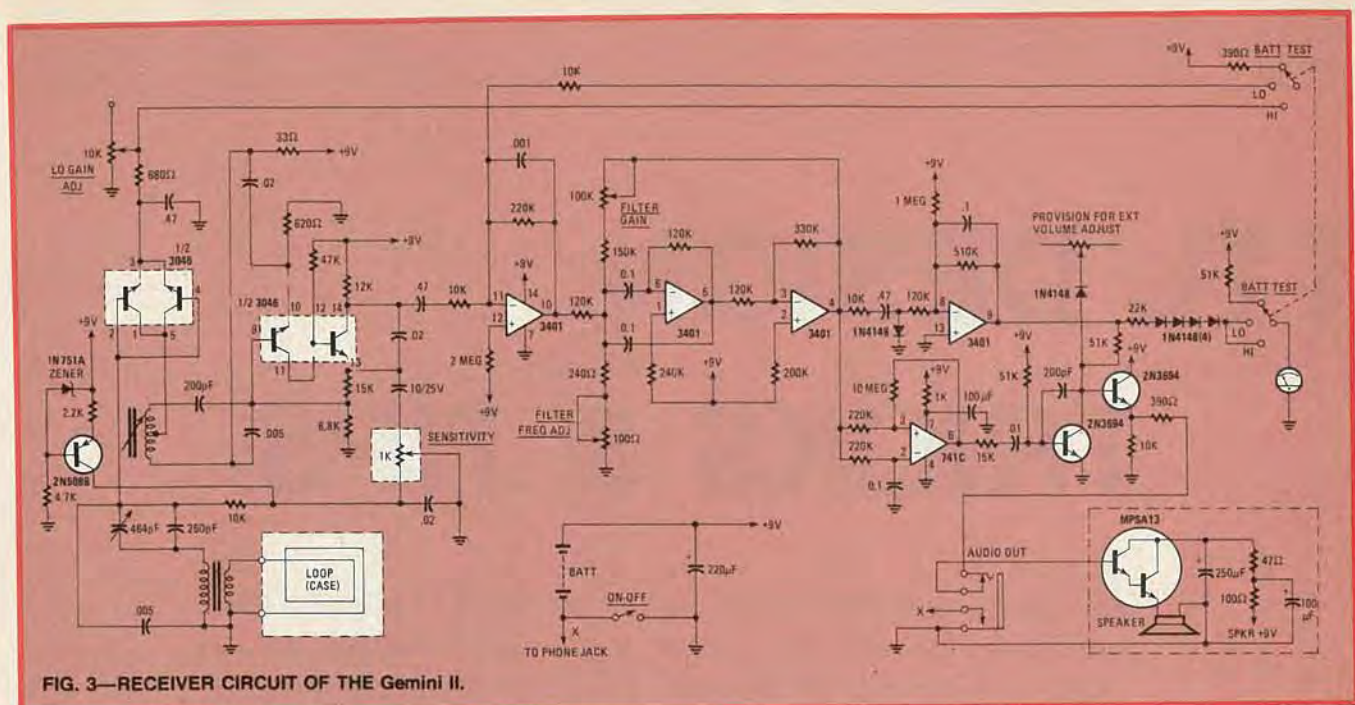


FIG. 3—RECEIVER CIRCUIT OF THE Gemini II.



HUNTING UP THE RIGHT SPOT to dig takes practice to fine-tune your skill in using the device.

at about \$40.00. It is recommended for the beginner who wants a fully transistorized detector offering quality performance.

Another respected name in the metal detector field is "Fisher." The Fisher Research laboratory at Los Banos, California, has developed an effective research and development program.

One of their most popular T/R detectors is called *Gemini II*, and sells for about \$350.00. (See schematic. Transmitter in Fig. 2, receiver in Fig. 3.) It fills the needs of an enthusiastic group of serious treasure hunters, who actively search for—and sometimes locate—major treasures.

Gemini II users have come up with

hoards of coins, gold and silver bullion, treasure chests, ore veins, and other deep treasure caches. This unit also has industrial uses, as it is capable of tracing water, gas, and sewer pipes—and electrical or phone cables—whose whereabouts have been forgotten.

When assembled, it measures 51 inches, weighs just 11 pounds, and has an output frequency of 82 kHz + 5 kHz. Housed in a closable, two-section, high-impact plastic case, it features moisture-proof solid-state circuits and offers quite a good penetration sensitivity.

Fisher's top-of-the-line model is listed as a *VLF 555-D*. The VLF discriminate mode rejects unwanted targets while still detecting deep coins that other detectors miss, claims the manufacturer.

Edmund Scientific reports many

compliments on its *Wildcat VLF Discriminator*. Priced at about \$280.00, it boasts instant tuning and true discrimination when used in just about any kind of terrain.

Batteries are included with this unit, which features a 6¼-inch, waterproofed search coil, a sensitivity adjuster, 3½-inch intensity meter, battery tester, and push-button tuning for making quick adjustments.

The Heath Company, a well known manufacturer of electronic kits, also has a line of metal detectors. All of their detectors are available only in kit form. The top-of-the-line model *GD-1290* features a VLF circuit, adjustable discrimination, 6-inch search coil, and collapsible shaft. It contains both a meter and speaker for the detector output plus a headphone jack. Power is supplied by 6 "AA" cells or an optionally available nickel-cadmium battery pack. The model *GD-1290* sells for \$189.95.

There are two more metal detectors in the Heath Company line. The model *GD-1190* has many of the features of the model *GD-1290*, but it sells for \$119.95. Known as the "Cointrack," its purpose is obvious from its name.

The lowest-priced model in the Heath line is the *GD-348* and it sells for \$79.95.

It seems to us that there is a metal detector available in just about anybody's price range. But all of the experts emphasize: Don't invest too much money until you really know what you're doing, or what you're looking for. Everyone agrees that treasure hunting is fun and profitable—and the more knowledge you gain, the more profitable it becomes. And we mean that in more than one sense of the word.

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For more information, circle the corresponding number on the Free Information card inside the back cover.

Bounty Hunter, Inc.
1309 West 21st Street
Tempe, AZ 85282
CIRCLE NO. 96

Edmund Scientific
101 E. Gloucester Pike
Barrington, NJ 08007
CIRCLE NO. 97

Fisher Research Laboratory
1005 I Street
Los Banos, CA 93635
CIRCLE NO. 99

Heath Company
Benton Harbor, MI 49022
CIRCLE NO. 98