

PROGRESSIVE ELECTRONICS INC.

325 S. El Dorado, Mesa, Arizona 85202
(602) 966-2931 or (800) 528-8224
FAX (602) 967-8602

Model 528 Wire and Valve Locator Operating Instructions

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Overview:

The Model 528 Wire and Valve Locator is designed to aid in the troubleshooting and service of electronically controlled zone irrigation systems. The unit's primary features include the ability to locate the path, find breaks and determine the depth of direct buried control wiring. Additionally, the Model 528 can be used to pinpoint the exact location of buried solenoid valves or identify a specific valve in a multiple valve location. With practice, a technician may also be able to find buried slack loops, locate low resistance faults (severely nicked insulation) and locate bad splices. Additional features include: load matching transmitter output, automatic shut-off on both transmitter and receiver, and a rugged portable design.

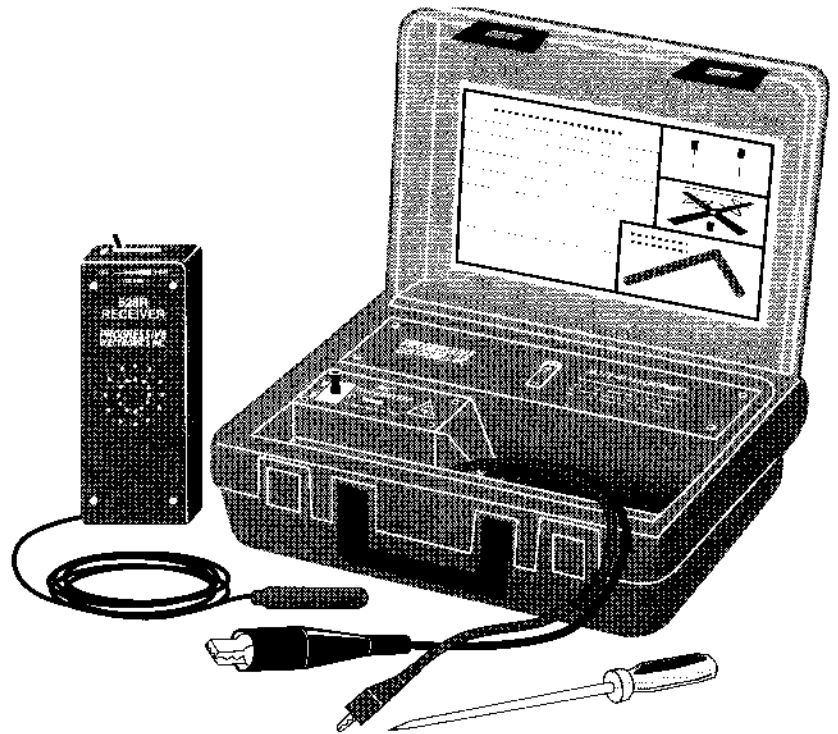
CAUTION: THE MODEL 528 PRODUCES A HIGH VOLTAGE SIGNAL. DO NOT HANDLE LEADS WHEN THE TRANSMITTER IS TURNED ON!

Battery Test

It is recommended that the battery condition of both the transmitter and receiver be checked prior to any locating function. To test the transmitter battery, connect (short) the red and black leads to each other and turn on transmitter by lifting the plunger switch. A bright flashing LED indicates acceptable transmitter battery condition. Next, turn on the receiver to the half position and move the antenna near the transmitter. A loud tone indicates acceptable receiver battery condition.

Tracking the Path of Buried Wires

Isolating (disconnecting) the subject wire from



other wires will normally produce the best results when tracking the path of a wire.

With the transmitter off, connect the red lead to the subject wire and connect the black lead to earth ground using the supplied grounding stake. Turn on the transmitter and note the condition of the LED. A flashing LED indicates an acceptable signal path has been established.

Next, turn on receiver and "sweep" a circle around the transmitter (stay at least 5 feet away from unit) looking for the peak signal intensity. With the antenna hanging perpendicular to the ground, the audible signal will increase as you near the wire then "null" (no signal) directly over the subject wire, then a loud signal will be heard on the other side of the wire. Swing the antenna over the suspected cable path following the nulls and mark the wire path. (see figure #1)

TRACKING PATH

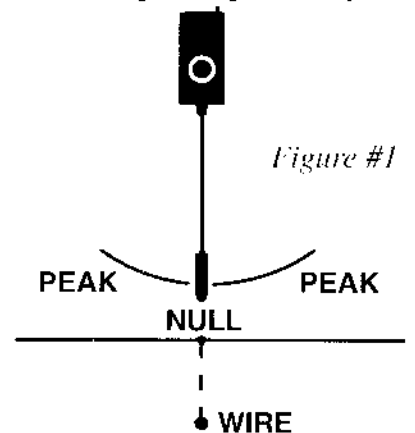
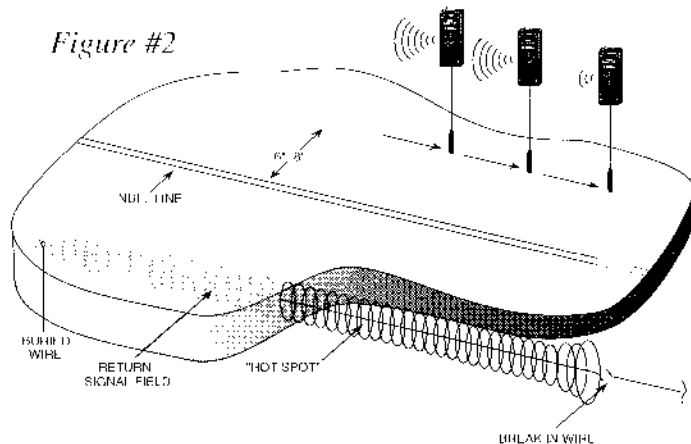


Figure #1

Locating Broken Wires

To locate the end of a broken wire, use the same method for tracking the path of a buried wire. The signal will become stronger as the antenna approaches the break then quickly decrease to no signal at all as the antenna passes beyond the break.

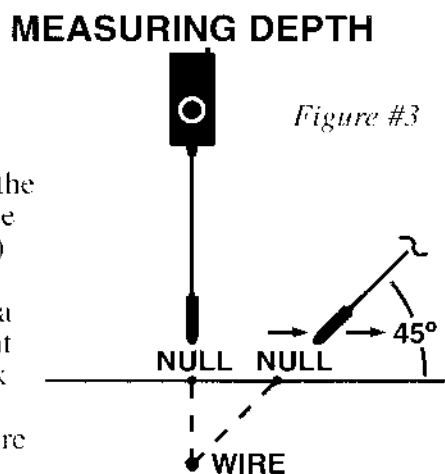


To more accurately identify the location of the break, hold the antenna perpendicular to the ground and the cable (approximately 6" left or right of the wire) and move the antenna down the wire path over the suspected area of the break. Signal intensity will diminish significantly as the antenna passes the break. (see figure #2)

Determining the Depth of Buried Wires

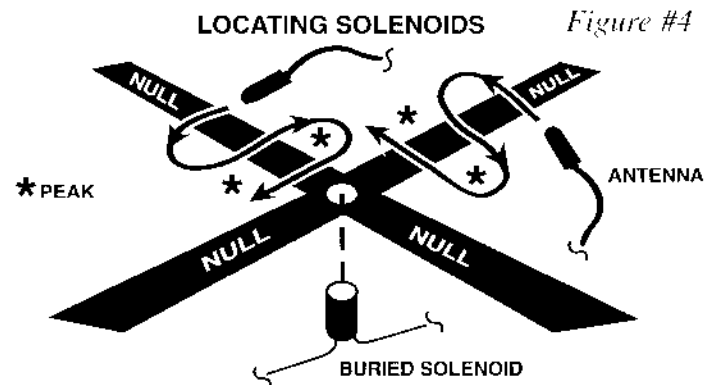
To determine the depth of a buried wire, first track the path of the conductor using the null method and mark the null location

where a depth measurement is required. Next, hold the antenna at a 45 degree angle to the ground and move (at a right angle) away from the cable path until a second null point is located. Mark the second null point and measure the distance between the marks. The distance between marks is the approximate depth of the wire. (see figure #3)



Locating Buried Solenoid Valves

The Model 528 provides a fast and accurate method of locating buried solenoid valves or identifying a specific valve within a bank of valves. This process requires adherence to the following 2-step procedure:



Step 1. Disconnect the common (ground) and station wires in question from the clock. Connect the red lead to the subject station wire and the black lead to earth ground using the included ground stake. Turn on transmitter and check for a flashing LED indicating a good signal path. Track the path of the buried wire using the null method listening for, and marking, distinct "hot spots" of signal intensity. Often times at a "hot spot" the signal intensity will be strong enough that a complete null may not occur. In this situation a stronger signal will be present on both sides of the wire path with a weak signal over-riding the null. **Step 2.** Turn transmitter off and remove the black lead from the ground stake and connect it to the common (ground) wire of the subject solenoid valve. Retrace the path of the subject wire paying close attention to the previously marked "hot spots". It is not necessary to swing the antenna over the path during this process. Hold the antenna perpendicular to the null path marked in Step 1 and retrace the wire path. Locate the area of strongest signal intensity. This area is most likely the specific valve attached to the red lead of the transmitter. Confirmation of the valve can be achieved using a 2-axis null method. Mark the approximate area of the "hot spot". Next, hold the antenna low and parallel to the ground while passing it back and forth over the "hot spot" as shown in figure 4. A distinct null will be detected intersecting your movements at right angles. Mark this line of null points then repeat the procedure to create a second line of null points at approximately 90 degrees to the first line. The intersection of the two lines (X-nulls) confirms the subject valve has been identified and pinpoints the exact location of the buried valve.

Note: The 2-axis null (X-nulls) will only occur on the specific valve (station wire) attached to the transmitter. The exception to this rule would be the unlikely presence of a neatly coiled slack loop on the circuit created in step 2. Any other "hot spot" will produce only a single line of null points or none at all.

Helpful Hints

The Model 528 will increase in value as a technician becomes more familiar with the device. Because the locator provides audible results, a technician will develop an "ear" for certain conditions as experience with the locator increases. "Hot spots" or areas of signal intensity are created when certain conditions occur. These "hot spots" will vary in intensity depending on the quality of the circuit path and condition of the batteries. Hot spots are created by broken wires, low resistance faults (worn or severely nicked insulation), buried solenoid valves, bad/faulty splices, sharp direction changes and buried slack loops. (see figure #5)

Work Slowly. Passing the antenna over the cable

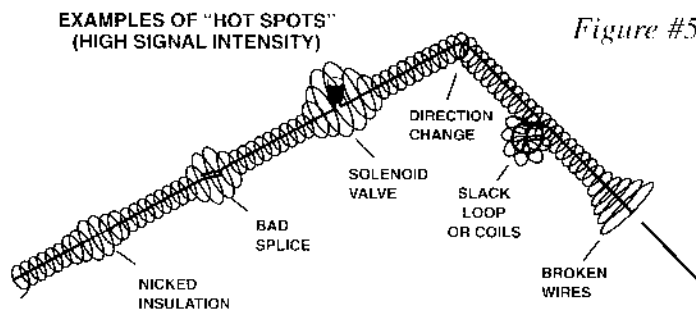


Figure #5

path every few inches will prevent a technician from missing (passing by) any number of situations. Keep the swing of the antenna down to a short (12 to 24") pendulum. This will allow the technician to progress more quickly along a wire path. Again, experience with the product will speed future operations.

The **ground path** will determine the strength of the transmitter signal. The far end of the subject conductor must permit a signal path to ground. If the transmitter LED in the on position shows a dim flashing light or no lights at all, test the batteries then assure the far end of the wire is grounded. It may be necessary to wet the ground or manufacture a ground contact if no circuit is established with the normal connection.

Isolating the conductor (disconnecting it from the system) is essential when working with any locating or testing equipment. This practice will serve two functions. First, by isolating the subject wire(s) a technician eliminates variables from the troubleshooting application and assures that only one wire path or station is being located. Second, by isolating the subject conductor the risk of damage to equipment or injury to technician is reduced. **Automatic Shut-Off** will occur on both the trans-

mitter and receiver units after approximately 1½ hours use. If you are using the Model 528 for extended periods of time and the units "time out", simply turn both the transmitter and receiver completely off then back on.

Maintenance

The only maintenance required on the Model 528 is the periodic replacement of the transmitter and receiver batteries.

To replace transmitter batteries, remove four Phillips head screws from battery cover, replace eight (8) D-cell batteries (note polarity), then reassemble.

To replace receiver batteries, remove four (4) slotted screws, separate case, replace one (1) standard 9 volt battery, then reassemble.

Should your Model 528 require any additional service or repair, please contact Progressive Electronics Inc. directly at (800) 528-8224 or (602) 966-2931.

Specifications

The Model 528 includes: one (1) 528T transmitter, one (1) 528R receiver and one (1) GS1 ground stake.

Size: 528T (includes case)- 13.5" x 9.25" x 3.25"
528R- 5.75" x 2.25" x 1" with 5' antenna.

Weight: (complete with batteries)- 6.25 lb.

Transmit Frequency: 2800 Hz

Transmit Power: 300Vp-p (100V rms maximum)
20-30mA rms load matching current

Maximum Circuit Impedance: (at 20mA)
2500 Ohm

Power Requirements: 528T- eight (8) D-cell batteries, 528R- one (1) 9V

Battery Life: 528T- 50 hr. nominal, 528R- 50 hr. nominal

Automatic Shut-Off: 528T- 100 min., 528R- 90 min.

Voltage Protection: (528T) 120V AC or DC

Progressive Electronics assumes no responsibility for errors in or omission of information within this document. Specifications or information is subject to change without notice.

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