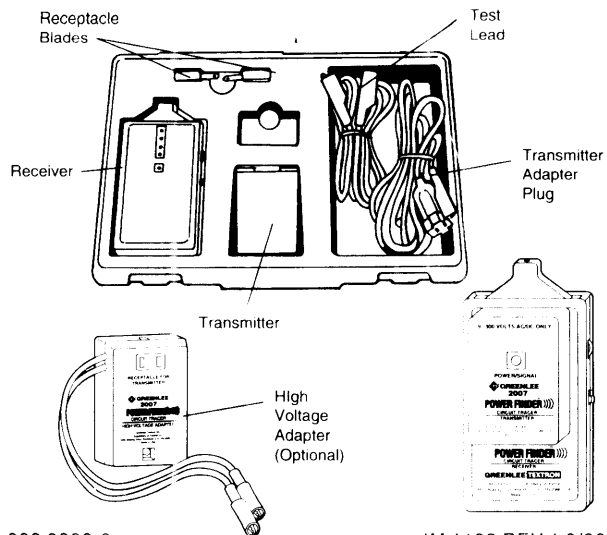


# Instruction and Safety Manual



## 2007

### POWER FINDER<sup>TM</sup>)))) CIRCUIT TRACER and 38583 High Voltage Adapter



999 0380.6

IM 1123 REV 1 8/92

## INDEX

- Section 1: WHAT THE POWER FINDER™ WILL DO
- Section 2: HOW THE POWER FINDER™ OPERATES
- Section 3: HOW TO TRACE LIVE CIRCUITS
- Section 4: HOW TO TRACE "DEAD" OR SHORTED CIRCUITS
- Section 5: POWER FINDER HIGH VOLTAGE ADAPTER



### **⚠ DANGER**

Avoid contact with live circuits.  
Electrical shock can result in injury or death.

The PowerFinder™ Circuit Tracer is designed to be used by experienced, trained electrical workers to identify and/or trace circuits. This requires that the transmitter be integrated into the circuit being traced or identified and that the circuit is powered by 9 to 300 volts AC or DC (680 VAC or 1000 VDC when using the 38583 High Voltage Adaptor). The transmitter is designed to plug into a standard 120V outlet. For all other uses, a transmitter plug adapter, with alligator clips and attachable receptacle blades are included.

## SECTION 1 WHAT YOUR POWER FINDER™ WILL DO

**NOTE: All examples of circuit connections are shown in Section 3 and 4.**

The Greenlee POWER FINDER™ circuit tracer will find  
CIRCUIT BREAKERS,  
FUSES,  
POWER PANELS,  
LIGHTING PANELS,  
JUNCTION BOXES, and  
SHORTS TO GROUND.

With the POWER FINDER™ you can trace HOT, NEUTRAL, and GROUND WIRES IN WALLS, IN CONDUIT, and UNDERGROUND.

## SECTION 2 HOW YOUR POWER FINDER™ OPERATES

The POWER FINDER™ is composed of two primary components: the RECEIVER and the TRANSMITTER. When the TRANSMITTER is plugged into any 9-300 Volt AC or DC source (680 VAC or 1000 VDC when using the 38583 High Voltage Adaptor), it draws a very small current (8-100 ma) in a very unique manner: the current drawn is a crystal-controlled, precision combination of four separate frequencies. This composite signal gives it a specialized "signature".

To be received, the signal must have this exact combination of frequencies.

This feature greatly reduces the possibility of interference from electrical "noise", which is often caused by lamps, appliances, fluorescent fixtures, or machinery that is supplied by the same power source as the circuit being traced.

The current drawn by the transmitter generates a magnetic field "signature" around the conductor being traced which matches that of the current itself. This magnetic "signature" is present the entire length of the current path, including through breakers, fuses, switchgear, and transformers.

The POWER FINDER™ RECEIVER is "tuned" to pick up only that magnetic "signature" produced by the TRANSMITTER.

## SECTION 3 HOW TO TRACE LIVE CIRCUITS

### **IMPORTANT**

PRIOR TO PLUGGING THE TRANSMITTER INTO THE CIRCUIT TO BE TRACED, USE AN APPROVED VOLTAGE TESTER, SUCH AS THE GREENLEE 6706, 6708, OR 6709 TO DETERMINE THE VOLTAGE PRESENT. IF THE VOLTAGE IS LESS THAN 300 VOLTS AC or DC, YOU MAY CONTINUE

## IMPORTANT

DO NOT CONNECT THE POWER FINDER TO POWER IN EXCESS OF 300 VOLTS! CONNECTING THE UNIT TO MORE THAN 300 VOLTS WILL CAUSE DAMAGE TO THE UNIT!

### NOTE:

For circuits other than 120 volts, use the accessory leads provided with the unit.

Examples of possible connections follow.

### EXAMPLE 1: CONNECTION TO A "LIVE" (ONE WITH VOLTAGE PRESENT) 120 VOLT RECEPTACLE

#### STEP 1

Plug the transmitter into the receptacle. The green LED will blink intermittently.

#### STEP 2

Place the RECEIVER RANGE switch in the HIGH position.

Turn the GAIN knob "ON" by rotating it in a clockwise position (when facing the front of the RECEIVER).

The green POWER LED will glow. (If it does not, remove and replace the 9 volt battery, which is accessed by sliding the small battery door on the rear of the RECEIVER to the open position).

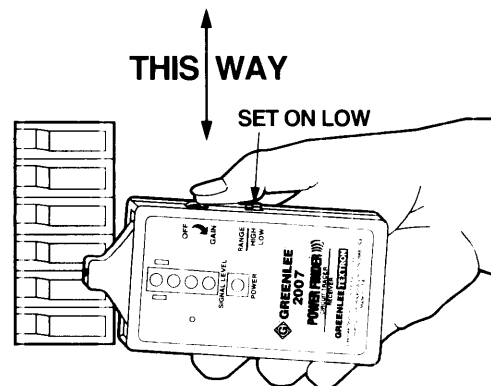
Continue to turn the GAIN knob in the clockwise direction until it has reached its maximum travel.

Move the RECEIVER to within a few inches of the TRANSMITTER.

All 4 red LEDs will intermittently glow, and the unit will emit a "beeping" sound. The 2007 is now ready to operate.

Take the RECEIVER to the vicinity of the suspected power source for the circuit being tested. If a signal is received, move the RECEIVER toward the equipment, producing the increase in signal strength. (The RECEIVER will pick up a signal within 12 to 18 inches of a panel, even with the panel cover closed).

If the signal is present, open the door, position the RANGE switch to LOW, and move the RECEIVER slowly down the row of breakers or fuses as shown on the next page.



## CIRCUIT BREAKERS

NOTE: THE RECEIVER MUST BE HELD IN THE POSITION AS SHOWN ABOVE TO BE PROPERLY ALIGNED WITH THE MAGNETIC FIELD PRODUCED BY THE TRANSMITTER, AND PROVIDE MAXIMUM PERFORMANCE.

If the signal is strong enough to cause all 4 RED LEDs to glow, the GAIN knob should be rotated in a counter-clockwise direction until only 2 or 3 LEDs are lit. Lowering the GAIN permits the 2007 to "zero-in" on only the "hot" wire or neutral of the circuit being tested.

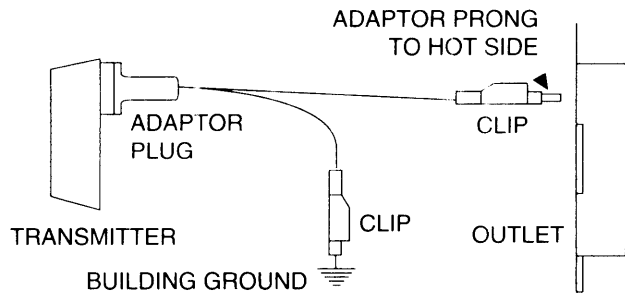
NOTE: SINCE ANY WIRE CARRYING THE LOAD FROM THE TRANSMITTER WILL HAVE THE MAGNETIC "SIGNATURE" AROUND IT, BOTH THE "HOT" AND THE NEUTRAL WILL CARRY THIS SIGNAL.

The breaker or fuse providing the strongest signal (lighting the most RED LEDs) is the one powering the TRANSMITTER, and hence, the receptacle or device to which it is connected.

If there is any doubt as to which is the correct breaker or fuse (due to unusual breaker design, wiring, or the possibility that two breakers are feeding the same circuit) remove the panel trim and check the wires.

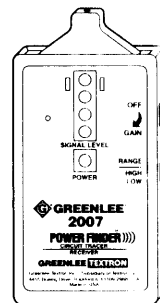
NOTE: IF THE "HOT" AND NEUTRAL ARE CLOSE TOGETHER AS IN A CONDUIT OR MULTI-CONDUCTOR CABLE, THE ELECTRICAL SIGNALS TEND TO "CANCEL EACH OTHER OUT". ALTHOUGH THE POWER FINDER™ RECEIVER IS SENSITIVE ENOUGH TO TRACE THE SIGNAL AT SHORT DISTANCES FROM THE CONDUIT OR CABLE IN QUESTION, MAXIMUM DISTANCE IS ACQUIRED BY SEPARATING THE CURRENT PATHS.

"SEPARATING THE CURRENT PATHS" SIMPLY MEANS DRAWING CURRENT THROUGH THE CABLE OR CONDUIT IN ONE DIRECTION BY USING A REMOTE GROUND PATH AS SHOWN BELOW.



## USING A REMOTE GROUND

BY CREATING A SEPARATE GROUND PATH, IT IS POSSIBLE TO TRACE WIRING FROM UP TO 20 FEET AWAY. WHEN TRACING CABLE IN THIS MANNER, THE RECEIVER SHOULD BE HELD AS SHOWN BELOW.



### EXAMPLE 2: CONNECTION TO A "LIVE" RECEPTACLE SUPPLIED BY MORE THAN 120 VOLTS (208, 220, 230, 240; etc.)

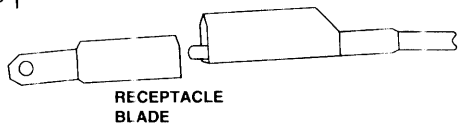
#### IMPORTANT

DO NOT CONNECT THE POWER FINDER™ TO VOLTAGE IN EXCESS OF 300 VOLTS! CONNECTING TO MORE THAN 300 VOLTS WILL DAMAGE THE UNIT!

#### IMPORTANT

PRIOR TO PLUGGING THE TRANSMITTER INTO THE CIRCUIT TO BE TRACED, USE AN APPROVED VOLTAGE TESTER, SUCH AS THE GREENLEE 6706, 6708, OR 6709 TO DETERMINE THE VOLTAGE PRESENT. IF THE VOLTAGE IS LESS THAN 300 VOLTS AC or DC YOU MAY CONTINUE.

STEP 1

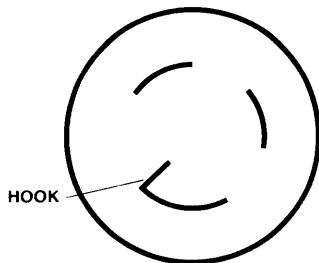


Using the TRANSMITTER ADAPTOR PLUG, connect one alligator clip to one of the RECEPTACLE BLADES by opening the clip SLIGHTLY and fastening it to the small prong INSIDE the round portion of the RECEPTACLE BLADE.

Connect the other alligator clip to the other RECEPTACLE BLADE in the same fashion.

STEP 2

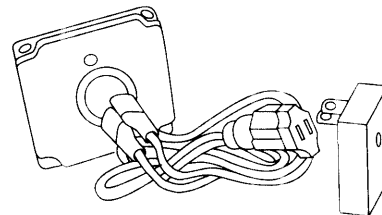
Plug the RECEPTACLE BLADES into any two of the rectangular openings in the receptacle being traced. (If the receptacle is a "twist-lock" type, use two of the curved slots other than the one with the "hook" on the end.)



TWIST LOCK RECEPTACLE

STEP 3

Plug the TRANSMITTER into the TRANSMITTER ADAPTOR PLUG.



STEP 4

Operate RECEIVER as in EXAMPLE 1, page 4.

**EXAMPLE 3:  
CONNECTION TO A "LIVE" CIRCUIT WITH NO  
RECEPTACLE**

**IMPORTANT**

PRIOR TO PLUGGING THE TRANSMITTER INTO THE CIRCUIT TO BE TRACED, USE AN APPROVED VOLTAGE TESTER, SUCH AS THE GREENLEE 6706, 6708, OR 6709 TO DETERMINE THE VOLTAGE PRESENT. IF THE VOLTAGE IS LESS THAN 300 VOLTS AC or DC, YOU MAY CONTINUE.

**CAUTION**

DO NOT CONNECT THE POWER FINDER TO POWER IN EXCESS OF 300 VOLTS! CONNECTING THE UNIT TO MORE THAN 300 VOLTS WILL CAUSE DAMAGE TO THE UNIT!

### STEP 1

Connect the alligator clips of the TRANSMITTER ADAPTOR PLUG to the "HOT" and NEUTRAL. If neutral is not present, connect to "HOT" and known ground.

### STEP 2

Plug TRANSMITTER into TRANSMITTER ADAPTER PLUG.

### STEP 3

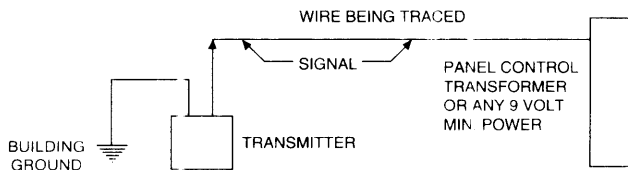
Operate RECEIVER as in EXAMPLE 1, page 3.

## EXAMPLE 4 TRACING LOW VOLTAGE CIRCUITS (TEL-COM, HVAC CONTROLS, SECURITY SYSTEMS; ETC.)

To trace low voltage circuits (those typically of 50 volts or less), connect one side of the TRANSMITTER ADAPTER PLUG to a known ground, and the other side to the low voltage "HOT" conductor, as shown below.

Plug the TRANSMITTER into the TRANSMITTER ADAPTER PLUG.

Operate the RECEIVER as stated in EXAMPLE 1, page 3.



## TRACING A LOW VOLTAGE WIRE

## SECTION 4 HOW TO TRACE "DEAD" AND SHORTED CIRCUITS

### EXAMPLE 5 A "DEAD" CIRCUIT

#### IMPORTANT

AN APPROPRIATE VOLTAGE TESTER, SUCH AS A GREENLEE 6706, 6708, OR 6709 MUST BE USED TO VERIFY THE ABSENCE OF VOLTAGE!

#### IMPORTANT

APPROPRIATE WARNING/LOCKOUT DEVICES MUST BE USED TO ENSURE THAT POWER CANNOT BE APPLIED TO THE CIRCUIT BEING WORKED ON!

A "DEAD" CIRCUIT caused by an open breaker or blown fuse can be traced by utilizing the "DEAD" circuit's NEUTRAL.

### STEP 1

Take power from a battery of 9 volts or greater potential and return it through the NEUTRAL of the "DEAD" circuit as follows:

Connect one lead of the TRANSMITTER ADAPTER PLUG to a known ground, and the other lead to the BATTERY.

Connect the other side of the BATTERY to the "DEAD" circuit's NEUTRAL using the TEST LEAD provided, as shown on next page.

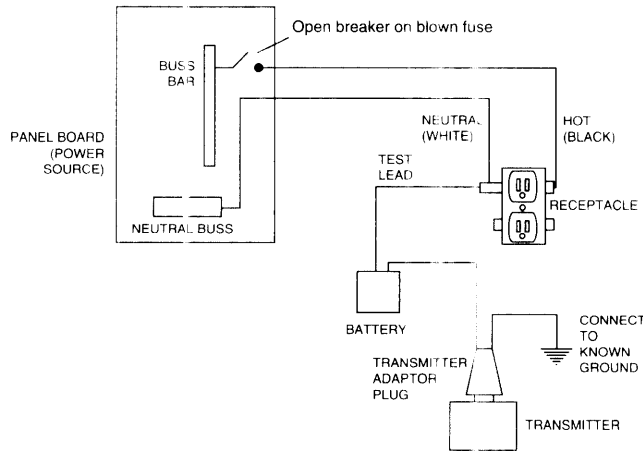
### STEP 2

Plug the TRANSMITTER into the ADAPTER PLUG.

### STEP 3

You may now operate the RECEIVER as described in "TRACING LIVE CIRCUITS", except that the signal generated will be carried back to the panel by the NEUTRAL.

# TRACE A "DEAD" CIRCUIT



## EXAMPLE 6 CONNECTION FOR FINDING A SHORT TO GROUND

### IMPORTANT

AN APPROPRIATE VOLTAGE TESTER, SUCH AS A GREEN-LEE 6706, 6708, OR 6709 MUST BE USED TO VERIFY THE ABSENCE OF VOLTAGE!

### IMPORTANT

APPROPRIATE WARNING/LOCKOUT DEVICES MUST BE USED TO ENSURE THAT POWER CANNOT BE APPLIED TO THE CIRCUIT BEING WORKED ON!

### STEP 1

Turn the "TRIPPED" BREAKER to the full "OFF" position. (If in a fuse panel, remove, but do not replace, the blown fuse!)

### STEP 2

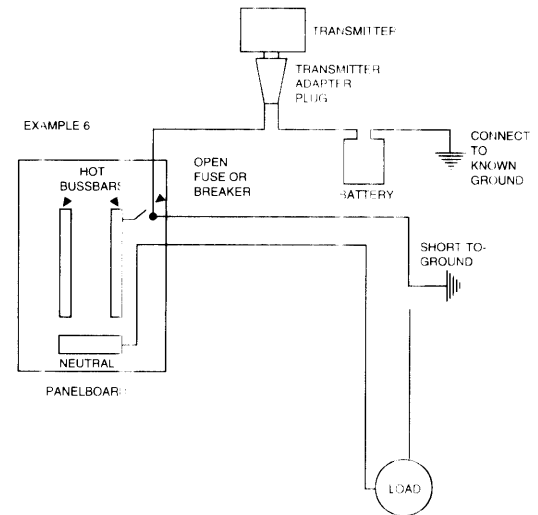
Disconnect the shorted "HOT" wire at its source (the fuse panel, breaker panel, safety switch, power panel, switchgear, etc.).

### STEP 3

Using an approved continuity-tester or multimeter, check the affected wire to ensure that a SHORT-TO-GROUND exists.

### STEP 4

Using the TRANSMITTER ADAPTOR PLUG, connect one alligator clip to the shorted lead at its connection point in the panel.



#### STEP 5

Connect the other alligator clip to one side of a battery.  
Connect the test lead from the other side of the same battery to a known ground.  
Plug in TRANSMITTER.

#### STEP 6

Using the RECEIVER, follow the wire until the signal disappears, indicating the location of the SHORT.

### SECTION 5 POWER FINDER HIGH VOLTAGE ADAPTER

The 38583 Adapter is an electronic high voltage adapter for use with the Power Finder™ Circuit Tracer. Using this adapter will increase the operating voltage rating of your Power Finder™ to 680 Volts AC or 1000 volts DC.

#### **CAUTION**

The 38583 is for use by qualified, trained electrical workers. Avoid contact with live circuits. Electrical shock can result in injury or death. Never make connection on a live circuit.

**USE:** To use this unit simply plug the Power Finder™ transmitter into the face of the adapter. Next, connect the adapter clip leads to the circuit to be traced. Both the transmitter and adapter LED's will flash indicating units are operating. The Power Finder™ may be connected using the methods previously shown in this instruction manual.

#### LIMITED LIFETIME WARRANTY

Greenlee warrants to the original purchaser for use that all Greenlee Power Finder™ Circuit Tracers manufactured and/or sold by Greenlee Textron Inc. will be free from defects in workmanship and material for the useful life of the tool, excepting abuse and normal wear.

Any questions pertaining to this limited warranty should be addressed to Greenlee Textron, Inc. at 4455 Boeing Drive, Rockford, IL 61109. Greenlee Textron Inc. has elected not to make available the informal dispute settlement mechanism which is specified in the Magnuson-Moss Warranty Act.

#### SPECIFICATIONS FOR THE POWER FINDER

##### TRANSMITTER:

Operating Voltage: 9-300 Volts, AC/DC  
(200-680 VAC , 200-1000 VDC when using  
the 38583 High Voltage Adaptor)  
Current: 8 MA Avg.; 100 MA Peak  
Operating Temperature: 0° - 120° F  
Size: 2-3/4" x 2" x 1.5"

##### RECEIVER:

Power: Standard 9 Volt Battery (Included)  
Range: Up to 20 feet from circuit  
Operating Temperature: 0° - 120° F  
Size: 5-1/2" x 2-3/4" x 1"



# **GREENLEE** **TEXTRON**

Greenlee Textron Inc. / Subsidiary of Textron Inc.  
4455 Boeing Drive, Rockford, IL 61109-2988 USA

©1992 Greenlee Textron Inc.

Printed in U.S.A.