

FIELD GROUND TEST



EQUIPMENT NEEDED:

- multimeter (two can be used)
- 4 lengths of wire, #12 AWG or larger, up to 70 ft. long.
- 2 short ground electrodes. (Copper or steel 1/2 to 3/4 inch diameter, 2 feet long is fine, but it must be clean and free of paint or oil. A single section of a sectional ground rod, NSN 5975-00-878-3791 works well, too.)
- At least 4 wire clamps. (These can be clip-type or other type. You need them to attach the wires to the ground electrode. The ground rod should have a clamp to attach a wire to it already, but if yours doesn't, you will need an extra clamp.) You will also need 4 terminals to connect the wire to the multimeter if your multimeter doesn't come with test clips.
- 1 hammer to drive the ground electrodes.
- 1 automobile or truck type battery, charged.
- A tape measure

Setup: See figures

Place all of the probes in a straight line with respect to the ground rod being tested. Place the current probe about 60 feet away and the potential probe at 0.62 times this distance from the ground rod under test (about 36 feet). Drive in the current and potential probes about 1 1/2 feet. Connect the wire as in the figure.

Procedure:

- 1) Place current probe, the multimeter and the battery in series with the ground under test. It is important to place the probes in a straight line with respect to the ground rod under test. Record the current reading. Disconnect the battery.
- 2) Place the multimeter in series with the potential probe and the ground rod. Set the multimeter for a voltage reading.
- 3) Connect the current probe and battery in series with the ground under test. Take the voltage reading with the multimeter. Disconnect the battery.
- 4) Divide the voltage [volts] by the current [amperes] yielding resistance. This is the resistance of the ground under test. (Make sure the units are correct - the multimeter most likely will read in milliamperes, which is one thousand of an ampere.)

U.S. ARMY COMMUNICATIONS-ELECTRONICS COMMAND SAFETY OFFICE

Questions?

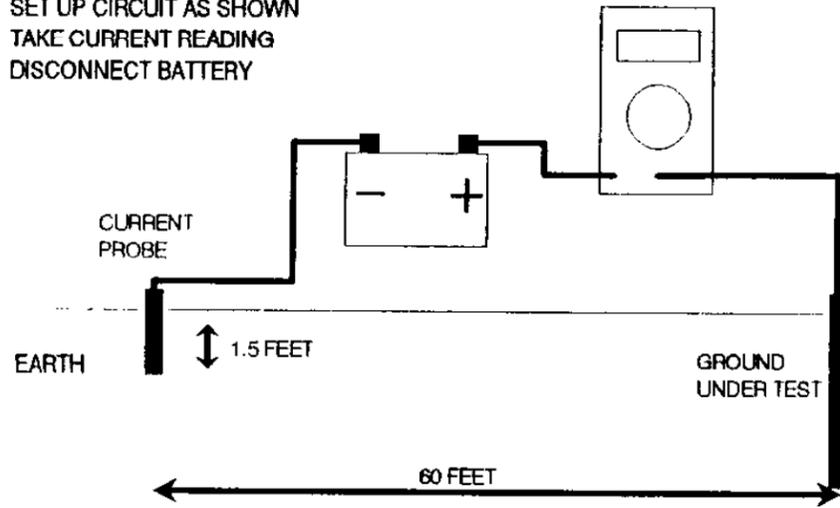
For technical and safety questions,
contact the CECOM Safety Office,
(908) 532-0084/DSN 992-0084

Or write:

USACECOM Safety Office
ATTN: AMSEL-SF
Ft. Monmouth, NJ 07703-5000

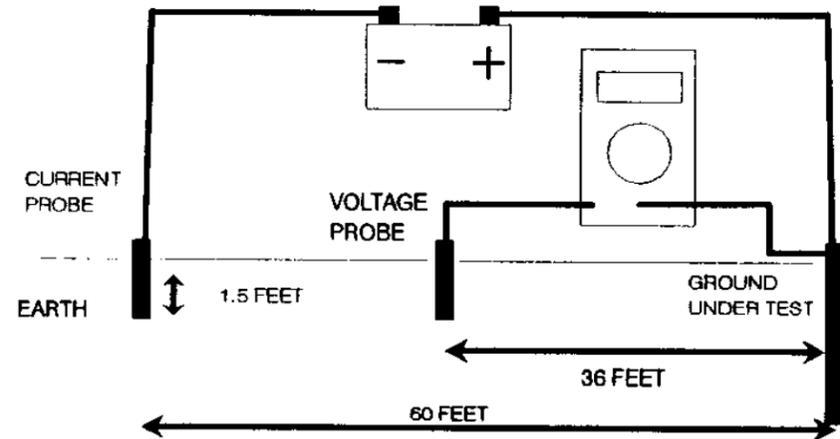
STEP 1

SET MULTIMETER FOR CURRENT READING
 SET UP CIRCUIT AS SHOWN
 TAKE CURRENT READING
 DISCONNECT BATTERY



STEP 2

SET MULTIMETER FOR VOLTAGE READING
 SETUP CIRCUIT IN DIAGRAM - CONNECT BATTERY LAST
 TAKE VOLTAGE READING
 DISCONNECT BATTERY



STEP 3

DIVIDE VOLTAGE BY CURRENT
 (VOLTS/AMPERES)

THE RESULT IS THE RESISTANCE TO GROUND
 IN OHMS



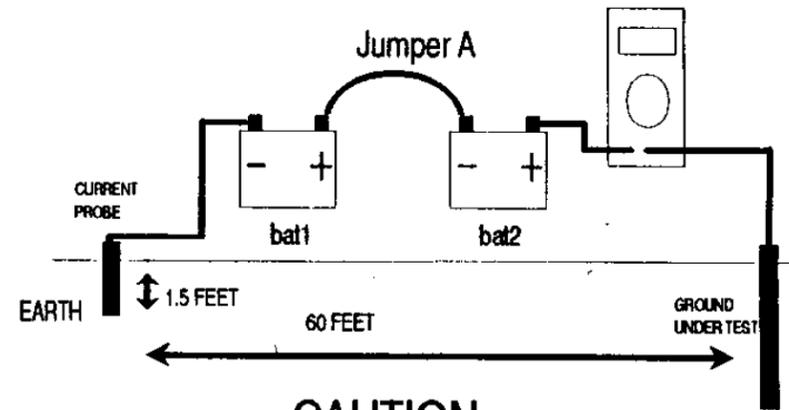
CAUTION

OBSERVE THE FOLLOWING PRECAUTIONS WHEN
 PERFORMING THIS TEST!

DON'T WORK ALONE - GET HELP.
 WEAR SAFETY GOGGLES/GLOVES FOR DRIVING STAKES.
 CHECK HAMMER TO ENSURE HEAD IS NOT LOOSE.
 DO NOT SHORT BATTERY TERMINALS! PLACE TAPE OVER
 THE TERMINALS UNTIL READY TO USE.
 DO NOT SMOKE OR HAVE OPEN FLAME NEAR THE
 BATTERY. EXPLOSION MAY RESULT!

SPECIAL CIRCUMSTANCES

A SINGLE BATTERY MAY NOT BE SUFFICIENT WHEN MEASURING HIGH
 RESISTANCE TYPE SOILS (DRY, SANDY, ROCKY, ETC). IF THE
 MULTIMETER READINGS ARE NOT STABLE, USE TWO BATTERIES IN
 SERIES AS SHOWN BELOW (NOTE PROPER POLARITY):



CAUTION

DO NOT EXCEED 30 VOLTS TOTAL ($V_{total} = V_{bat1} + V_{bat2}$)

TO FURTHER REDUCE THE POTENTIAL FOR SHOCK, CONNECT JUMPER A
 LAST BEFORE THE TEST, AND DISCONNECT JUMPER A FIRST AFTER THE
 TEST. THIS WILL LIMIT THE VOLTAGE BETWEEN ANY ACCESSIBLE PARTS
 AND GROUND TO THE VOLTAGE RATING OF A SINGLE BATTERY.