MIL-STD-462
31 JULY 1967

MILITARY STANDARD

ELECTROMAGNETIC INTERFERENCE CHARACTERISTICS, MEASUREMENT OF

NOTICES INSERTED OR ADDED
ON TOP FOR INSERTION AS
APPLICABLE

† NOTICE 1 01 AUG 1968 INSERTED & ADDED
† NOTICE 2 (USAF) 01 MAY 1970 ADDED
NOTICE 3 (ARMY EL) 09 FEB 1971 ADDED
INTERIM NOTICE 4 (NAVY) 01 APR 1980 ADDED
INTERIM NOTICE 5 (NAVY) 04 AUG 1986 ADDED
NOTICE 6 (USAF) 15 OCT 1987 ADDED

+ MAKE PEN & INK CHANGES

FSC MISC

DEPARTMENT OF DEFENSE

WASHINGTON, D.C. 20301

Electromagnetic Interference
Characteristics, Measurement of
MIL-STD-426

1. This Military Standard is mandatory for use by all Departments and Agencies of the Department of Defense.

2. Recommended corrections, additions, or deletions should be addressed to Systems Engineering Group (SEPS), Wright-Patterson Air Force Base, Ohio, 45433.

MIL-STD-462
NOTICE 6 (USAF)
15 OCTOBER 1987

MILITARY STANDARD

ELECTROMAGNETIC INTERFERENCE CHARACTERISTICS,
MEASUREMENT OF

TO ALL HOLDERS OF MIL-STD-462:

1. THE FOLLOWING PAGES ARE ADDITIONS TO MIL-STD-462 DATED 31 JULY 1967, AND ARE APPLICABLE TO ALL AIR FORCE ACQUISITIONS.

NEW PAGES	DATE
58a	15 OCTOBER 1987
58b	15 OCTOBER 1987
58c	15 OCTOBER 1987
89a	15 OCTOBER 1987
94	15 OCTOBER 1987
95	15 OCTOBER 1987
96	15 OCTOBER 1987
97	15 OCTOBER 1987
98	15 OCTOBER 1987
99	15 OCTOBER 1987

2. RETAIN THIS NOTICE AND INSERT BEFORE TABLE OF CONTENTS.

3. Holders of MIL-STD-462 will verify that page changes and additions indicated above have been entered. This notice page will be retained as a check sheet. This issuance, together with appended pages, is a separate publication. Each notice is to be retained by stocking points until the military standard is completely revised or cancelled.

Preparing activity:
Air Force - 11

Project number EMCS-F123

Review activities:
Air Force - 13,14,15,17,18,19,50,70,71,80,82,84,90,99

AMSC:N/A

AREA EMCS

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METHOD CS12

CONDUCTED SUSCEPTIBILITY, COMMON MODE CABLE CURRENT PULSE, INTERCONNECTING AND POWER

1. Purpose. The purpose of this test is to verify that a test sample does not exhibit any degradation of performance or malfunction when subjected to transients on interconnecting and power cables.

2. Applicability. This test is applicable to Class A1 equipment (see MIL-STD-461). The drive current is to be applied to the cables in the final configuration.

3. Apparatus. The test apparatus shall consist of the following:

a. Pulse generators. Pulse generators used shall be capable of supplying the test parameters specified in MIL-STD-461, requirement CS12.

b. Coupling device

c. Oscilloscope (50 ohm input impedance)

d. Current probe

e. Line Impedance Stabilization Networks (LISNs), as specified in Figure 4.

4. Test procedure and setup. Test procedures and setup shall be as follows:

a. The test setup shall be as shown in Figure CS12-1.

b. At least one meter from the test sample, the coupling device shall be placed around a cable associated with an individual test sample connector.

c. The signal shall be applied at a one pulse per second repetition rate and the required current induced in the cable under test shall be measured within 15cm from the test sample.

d. The test shall be continued for a minimum of 5 minutes.

e. The pulse polarity shall be reversed and the above sequence shall be repeated.

f. The above procedure shall be repeated for each interconnecting and power cable of the test sample.

METHOD CS13

CONDUCTED SUSCEPTIBILITY, SINGLE WIRE COUPLED PULSE

1. Purpose. The purpose of this test is to verify that a test sample does not exhibit any degradation of performance or malfunction when subjected to transients on wires and multiple wire units (such as twisted pairs, and triax) in interconnecting and power cables.

2. Applicability. This test is appliable to Class A1 equipment (see MIL-STD-461). Multiple wire units such as twisted pairs or triax shall be treated as single wires. Wire shields present in the actual installation shall be maintained. Antenna ports shall have the specified waveform coupled to the center conductor of the coaxial cable.

3. Apparatus. The test apparatus shall consist of the following:

a. Pulse generators. Pulse generators used shall be capable of supplying the test parameters specified in MIL-STD-461, requirement CS13.

b. Coupling device

c. Line Impedance Stabilization Networks (LISNs) as specified in Figure 4.

d. Oscilloscope (50 ohm input impedance)

e. Current probe

f. Insulated but unshielded Number 18 American Wire Gage (AWG) wire.

4. Pulse signal source calibration

a. The signal source for current pulse calibration shall be set up using a shorted turn of insulated, but unshielded, Number 18 AWG wire as shown in Figure CS13-1.

b. The appropriate pulse generator setting shall be determined to produce the current waveform and level required by MIL-STD-461, requirement CS13, at each test frequency.

c. The signal source for voltage probe calibration shall be set up using a single turn of insulated, but unshielded, Number 18 AWG wire, with a series one kohm non-inductive resistor, as shown in Figure CS13-1.

d. The appropriate pulse generator setting shall be determined to produce the voltage waveform and level required by MIL-STD-461, requirement CS13, at each test frequency.

e. The higher of the two settings determined above for each frequency shall be used for testing.

5. Test procedure and setup. Test procedures and setup shall be as follows:

a. The test setup shall be as shown in Figure CS13-2.

b. The coupling device shall be placed 15cm from the test sample around the single wire or multiple wire unit (such as twisted pair or triax) to be tested.

c. At each test frequency, the pulse signal shall be applied at the level determined during calibration. The pulse signal shall be applied at a one pulse per second repetition rate for not less than one minute.

d. The test shall be repeated for a minimum of 50 pulses.

e. The pulse polarity shall be reversed and the above sequence shall be repeated.

f. The above procedure shall be repeated for each single wire and multiple wire unit.

METHOD RS06

RADIATED SUSCEPTIBILITY, ELECTROMAGNETIC FIELD,
SWITCHING PULSES (CHATTERING RELAY)

1. Purpose. The purpose of this test is to verify that the test sample does not exhibit any malfunction or degradation of performance when subjected to a radiated electromagnetic field generated by fast switching pulses.

2. Applicability. This test is applicable to Class A1 equipment (see MIL-STD-461).

3. Apparatus. The test apparatus shall consist of the following:

a. Type MS25271 relay

b. Ten microfarad feedthrough capacitor

c. Insulated but unshielded Number 18 American Wire Gage (AWG) wire (six meters long)

d. Oscilloscope

e. Two reversing switches, Double-Pole Double-Throw (DPDT)

f. Line Impedance Stabilization Networks (LISNs) as specified in Figure 4.

4. Test procedure and setup. The test procedures and setup shall be as follows:

a. The test setup shall be as shown in Figure RS06.

b. It shall be verified that the peak-to-peak voltage specified in MIL-STD-461, Requirement RS06, is developed during continuous operation of the relay.

c. The relay circuit shall be operated for at least five minutes in each of the four possible test configurations determined by the power and antenna polarity reversing switches.

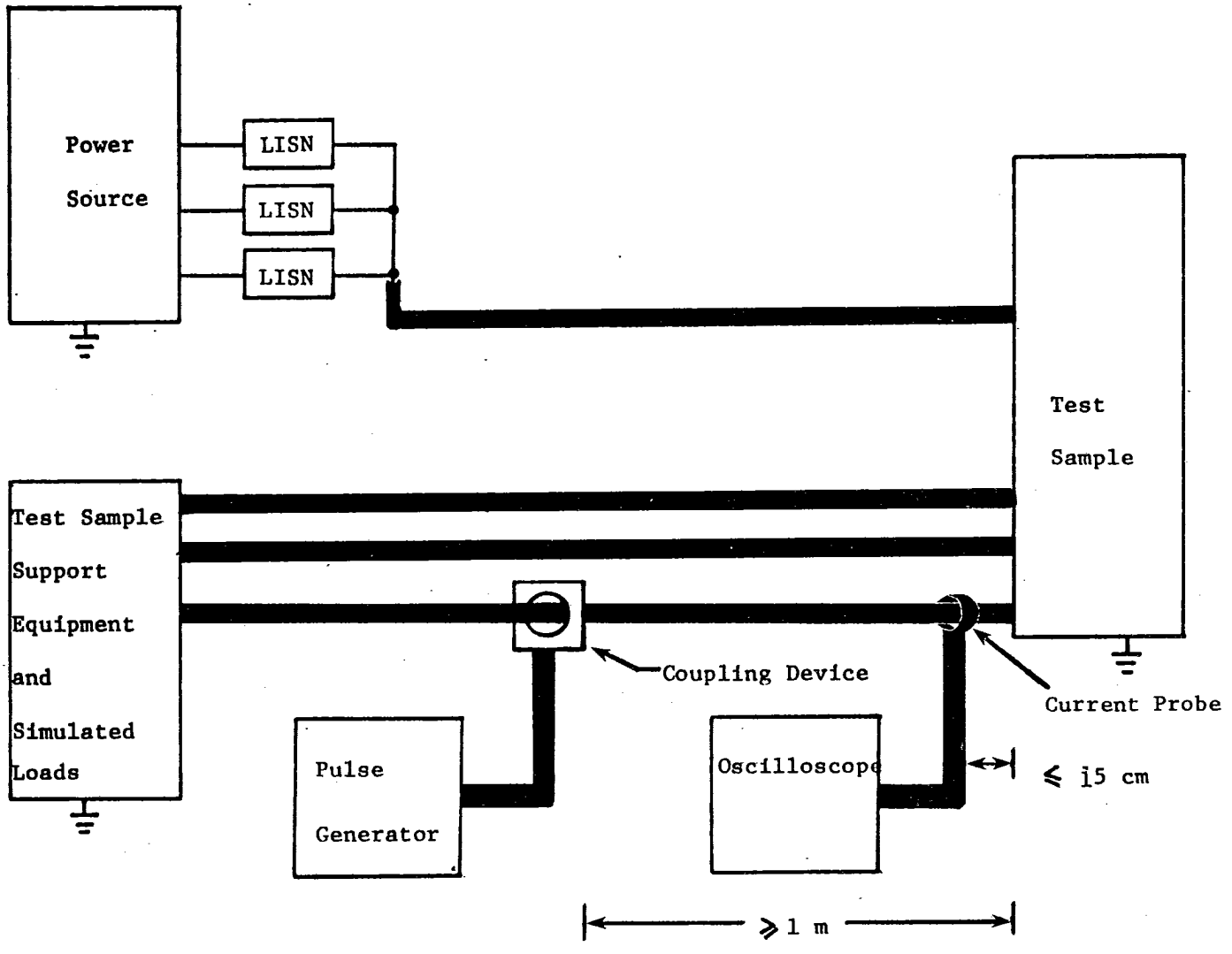
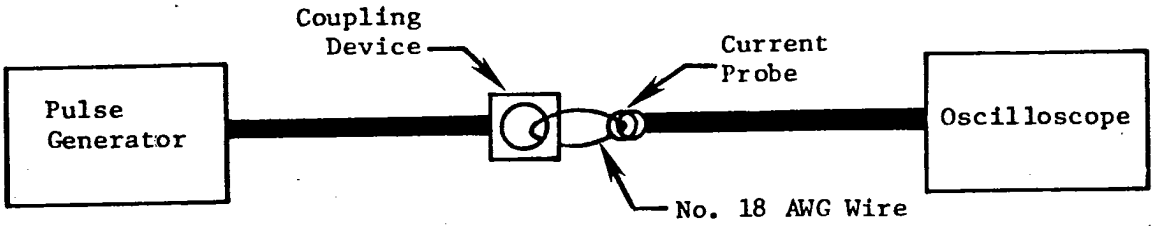
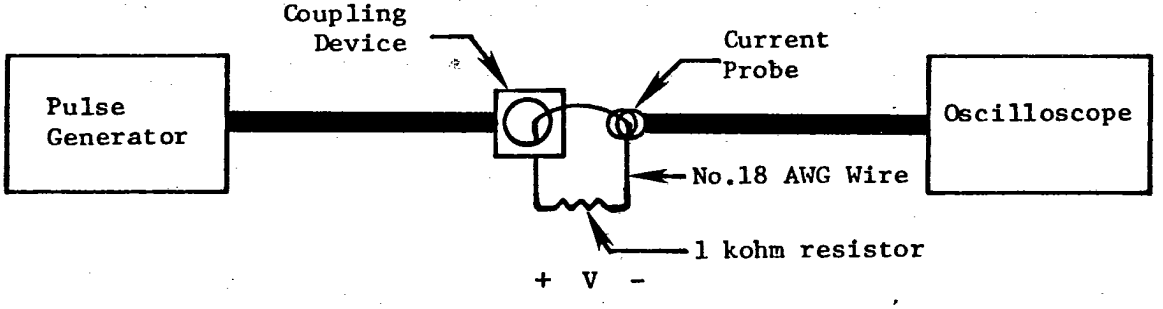


FIGURE CS12. Test setup for CS12.



Current Pulse Calibration



Voltage Pulse Calibration

NOTES: 1/ Calibration loops shall be a minimum length of No. 18 AWG wire.
2/ Voltage pulse calibration shall be determined by calculating the voltage (V) resulting from the measured current through the one kohm resistor.

FIGURE CS13-1. Calibration setup for CS13.

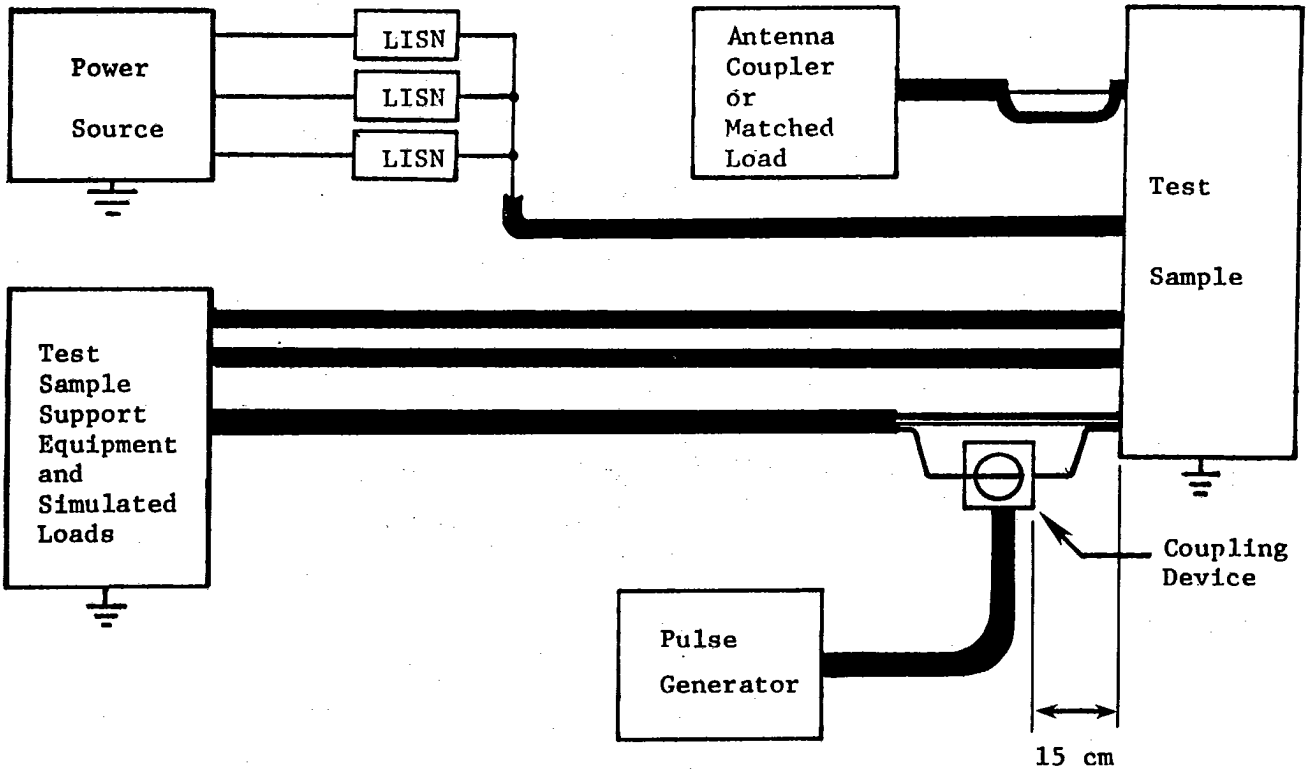
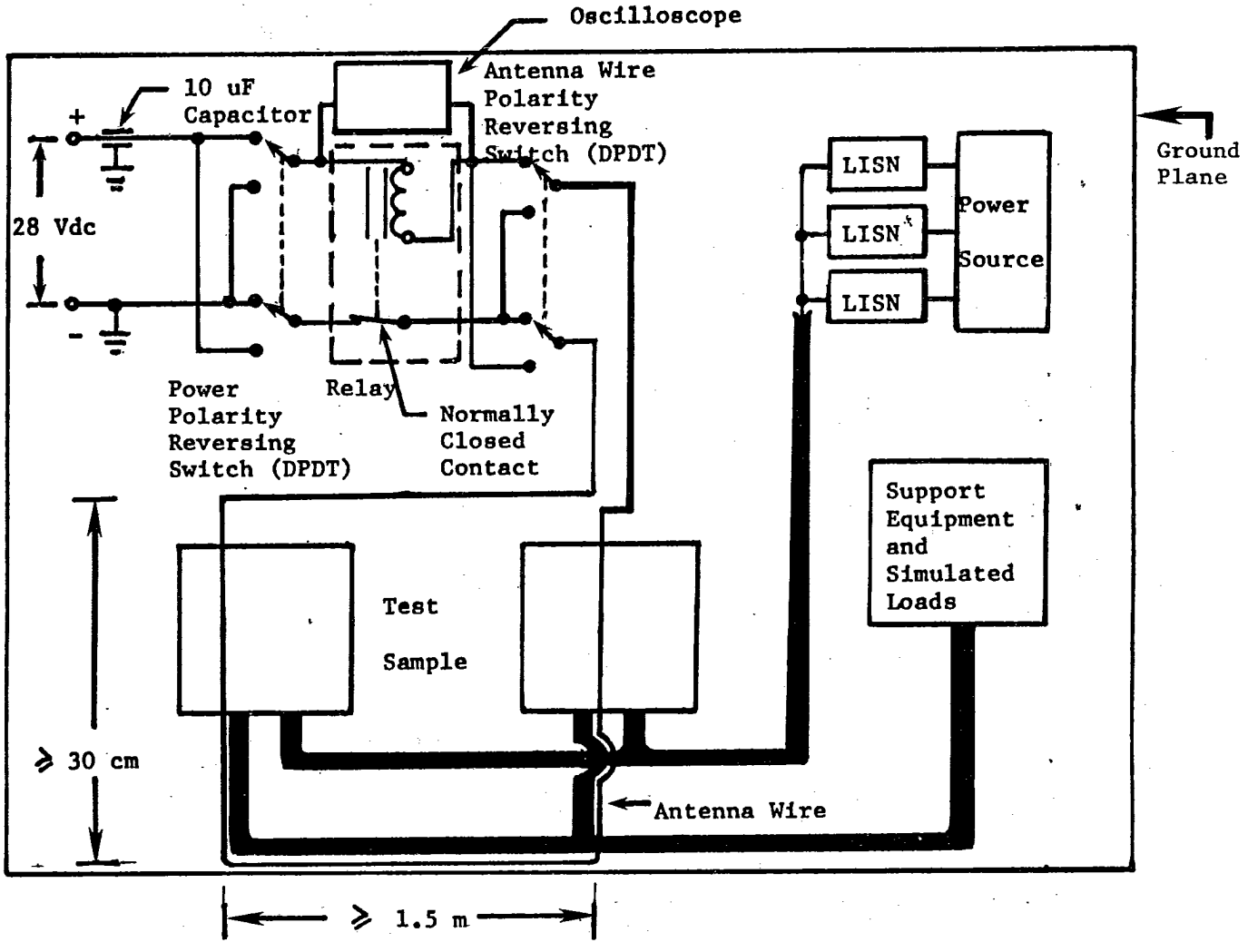
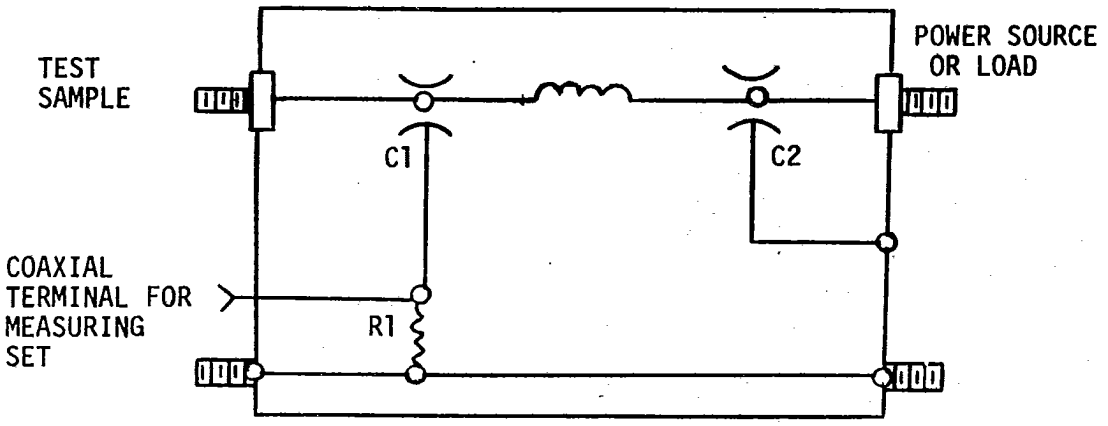


FIGURE CS13-2. Test setup for CS13.



NOTES: 1/ No suppression components (shielding, diodes, etc) shall be attached to the relay or its wiring.
2/ The antenna wire (No. 18 AWG wire) shall be taped to three sides of the test sample case(s) and shall be taped to and parallel with at least 1.5m of each power and interconnecting cable.
3/ Minimum separation between antenna wire sections in the loop shall be 30 cm.
4/ The antenna wire shall be maintained 5 cm above the ground plane, except where taped to the test sample case(s).

FIGURE RS06. Test setup for RS06.



ENCLOSURE DATA: 14 GAGE (B&S) ALUMINUM SUGGESTED SIZE 9-3/8 INCH BY 4 BY 4 INCH
FORM DATA: 5-1/4 INCH LENGTH, 3 INCH DIAMETER (O.D.), 0.125 INCH WALL DRILL 3/8 INCH HOLE, 7/16 INCH FROM EACH END
WIRE DATA: AWG 6, 600-VOLT, 0.310 INCH DIAMETER (O.D.)
COIL DATA: L1 - 5 MICROHENRIES, 13 TURNS SINGLE LAYER, 4 INCH WINDING LENGTH
CAPACITOR: C1 - SHALL BE MOUNTED ON ONE-INCH INSULATING BLOCK ABOVE GROUND
CAPACITOR DATA: C1 = 0.1 UF, 600-VOLT DC, FEEDTHRU
C2 = ONE UF, 600-VOLT DC, FEEDTHRU
RESISTOR DATA: R1 = 5,000-OHM, 5-WATT CARBON

NOTES: 1/ The values given for the component parts of the network are nominal. Regardless of the construction or deviation from nominal values, the network shall have an impedance within 20 percent of that given in Figure 5.
2/ Connecting leads to capacitors and resistors shall be as nearly as possible to zero length.
3/ Networks may also be constructed having a one-ohm series resistor between the line and capacitor C2. This one-ohm resistor shall be made up from ten 10-ohm, one-watt composition resistors.
4/ The data given in this figure is suitable for the construction of 50-ampere networks. Larger current-carrying networks may be constructed by increasing the wire size given for the coil and the size of the overall enclosure.
5/ The 50-ohm transmission line shall be extended within the enclosure right up to the location where connects with capacitor C1.
6/ CAUTION: The network shall be prominently and permanently marked as follows: "CAUTION--SHOCK HAZARD--CONNECT CASE TO EARTH GROUND BEFORE CONNECTING AC POWER LINE".
7/ Networks procured prior to the date of this Notice, but meeting the impedance requirements of Figure 5, may still be used.
8/ Each network shall be permanently labeled with the following data: current rating in amperes, and voltage rating in volts at direct current, 60, 400, and 800 Hz.

Figure 4. Powerline stabilization network schematic diagram.

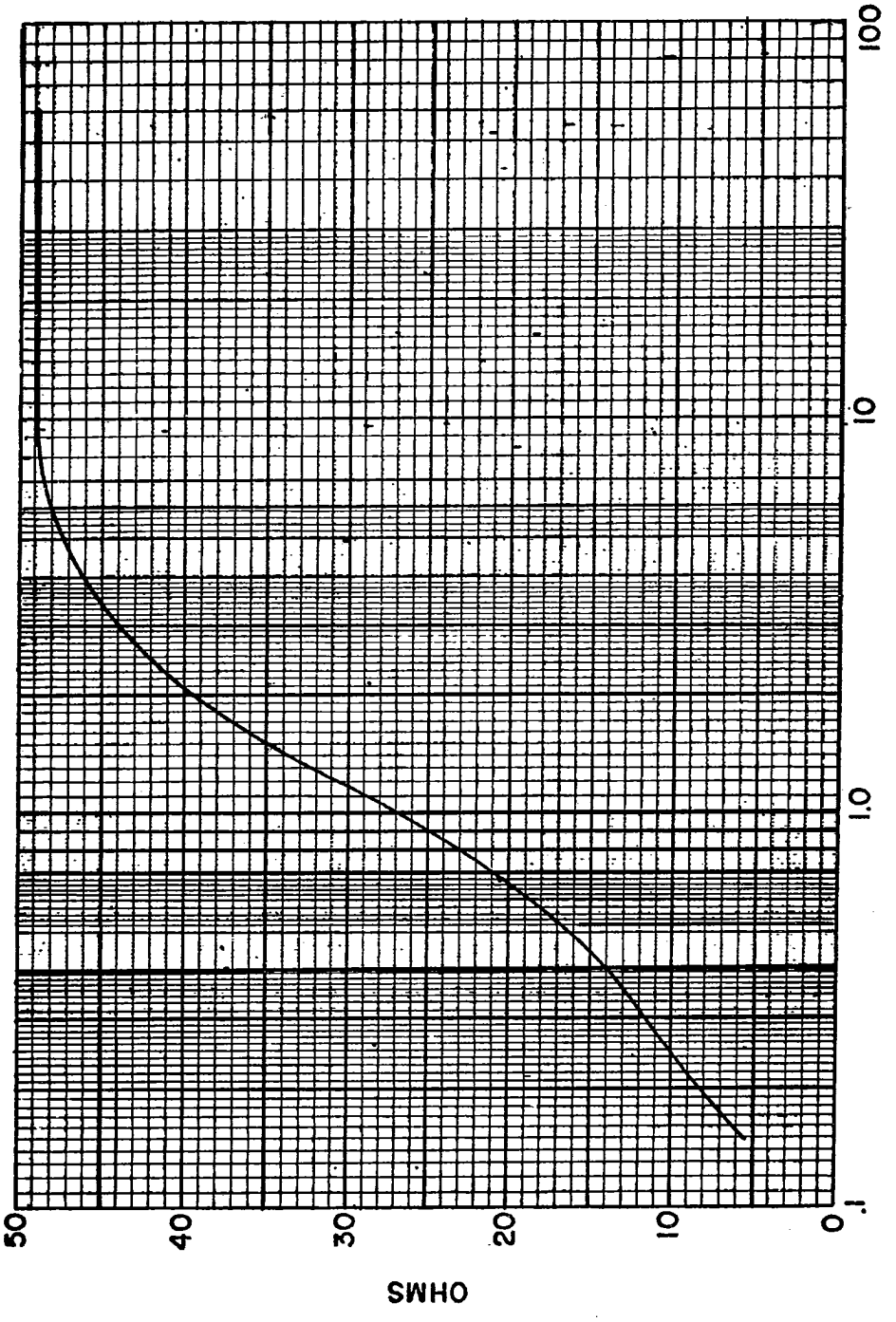


Figure 5. Input impedance at test sample terminal of stablization network with coaxial connector terminated in 50 ohms, power terminal open.