

BELL SYSTEM PRACTICES
Outside Plant Construction
and Maintenance

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MEGGER TEST SETS

HIGH VOLTAGE TYPES

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1. GENERAL

1.01 This section covers the description and operation of the high voltage Megger Test Set used for measuring insulation resistance of coaxials. The 628DS Megger Test Set and the Megger 648 Test Set are described. The latter set supersedes the 628DS Megger Test Set which is no longer manufactured. Section G50.244.6 is cancelled.

2. PRECAUTIONS

2.01 These meggers generate potentials as high as 2500 volts. It is, therefore, essential that the operator be extremely careful in working with these meggers, to avoid electric shock. The precautions that must be observed in testing coaxials are covered in Section G50.244.3.

2.02 **The high voltage ranges** on these meggers **must never be used** for measuring insulation resistance between the coaxial outer conductors and the cable sheath, nor the insulation resistance of paper-insulated conductors, as the high voltages may damage the paper insulation.

2.03 These meggers are precision instruments and should be handled with care at all times. When not in use they should be stored in the carrying case, if provided. They should be shipped in the well-padded wooden shipping cases, if provided.

3. DESCRIPTION OF 628DS MEGGER TEST SET

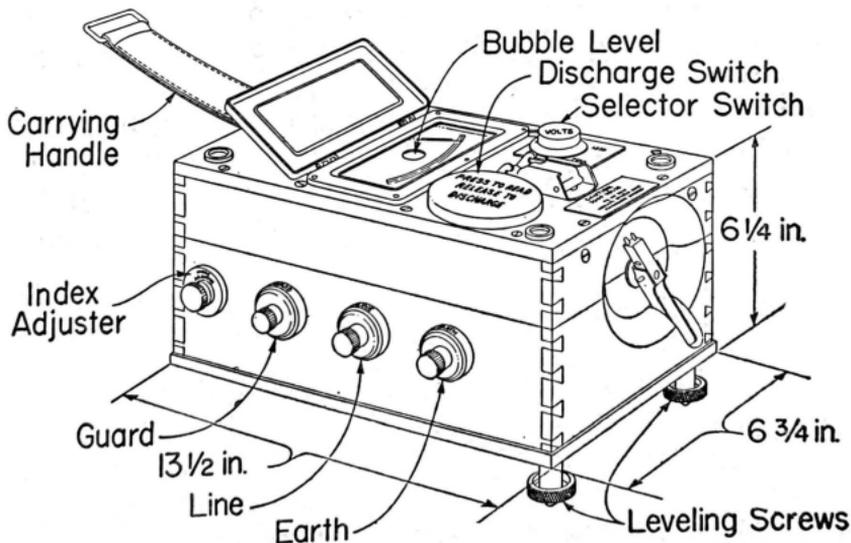
3.01 The 628DS Megger Test Set is contained in a teakwood case. Three leveling screws are provided on its base. A lid protects the glass cover over the meter scale. The driving crank for the generator folds into a recess in one end of the case. The carrying handle is leather covered and when released from the catch it can be swung out of the way when the set is in use.

3.02 The internal hand operated magneto generator and the megohm meter are arranged to operate at either 2500 volts or 1250 volts, depending on the setting of the selector switch. A centrifugal clutch connects the hand crank and the generator. Steady potential is obtained when the crank is turned at or above the "slip" speed of the clutch.

3.03 When the selector switch is set for 2500 volts the reading is taken on the scale 4-10,000 megohms; when the switch is set for 1250 volts the reading is taken on the scale 1.5-5000 megohms.

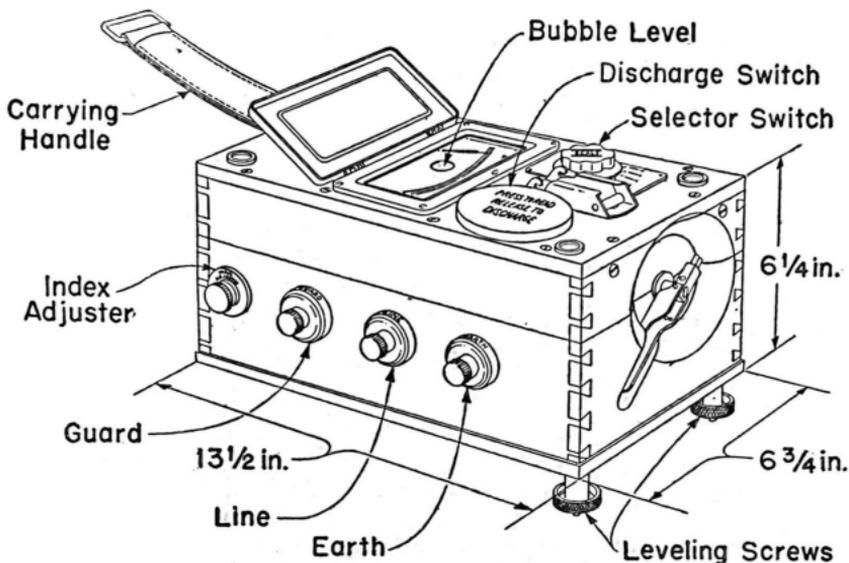
3.04 The "GUARD," "LINE" and "EARTH" Terminals and the "INDEX ADJUSTER" Knob are on the side of the case as shown. The "DISCHARGE SWITCH" must be held down to connect the megger to the line. When released, the discharge switch disconnects the megger and shorts the line.

3.05 The 628DS Megger Test Set is illustrated.



4. DESCRIPTION OF MEGGER 648 TEST SET

4.01 The Megger 648 Test Set illustrated below provides three operating potentials, 2500, 1500 or 400 volts. In other respects it is similar to the 628DS Megger described in Part 3.



4.02 The meter has an inner and an outer scale. With two positions of the selector switch for each voltage setting, this permits insulation resistance measurements to be made in six ranges. Use the multipliers shown on the selector switch as follows:

Selector Switch Setting Volts	Multiply Meter Reading by	Range of Measurement Megohms	
		Inner Scale	Outer Scale
400	1	0-40	2.5-8000
1500	3	0-120	8.5-24,000
2500	6	0-240	15.0-48,000

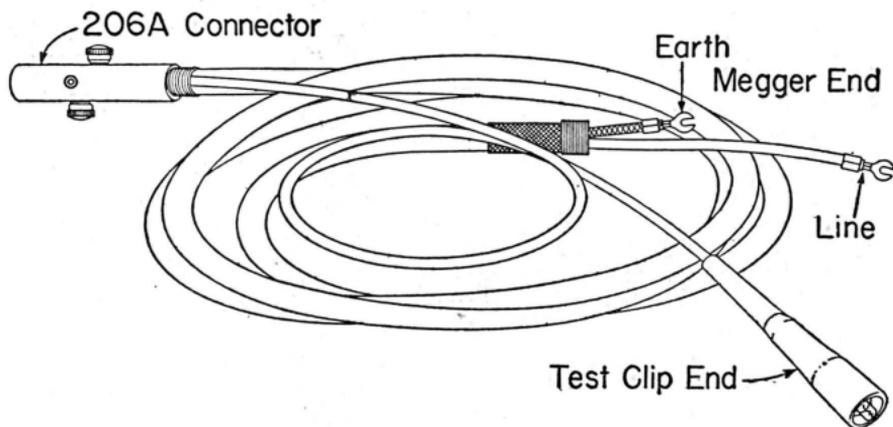
4.03 The 400-volt potential is provided for measuring the insulation resistance of paper-insulated pairs in cables containing coaxials. The method of operation of this set and the 628TS set on this range is covered in another section of the Practices.

5. DESCRIPTION OF 628TS MEGGER TEST SET

5.01 The code 628TS is used to designate 628DS meggers that have been modified to include a 400-volt scale, which reads from 0.65 to 1500 megohms, and a 1500-volt scale, which reads from 2.5 to 6,000 megohms as well as the 2500-volt scale which reads from 4 to 10,000 megohms.

6. DESCRIPTION OF W2DD CORD

6.01 The W2DD Cord, used to connect the set to the coaxials under test, is illustrated. This cord is equipped at one end with spade tips for connection to the megger terminals. The other end has a well-insulated 206A connector for making contact with the inner conductor of .270 or .375-inch coaxials in the cable or at 31B, 35A and similar type terminals. The connection to the "ground" is made by means of the short lead with the insulated test clip.



6.02 To determine if the insulation of the cord is in good condition, connect the cord to the megger and with the connector end clear of the ground, operate the megger; the reading should be "infinity."

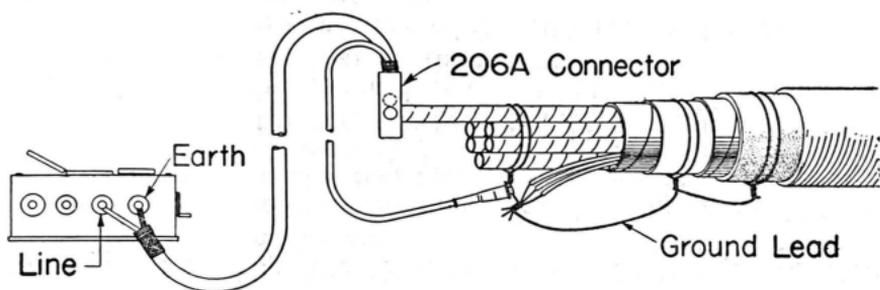
6.03 To check the continuity of the leads, short the test clip to the connector with a short length of well-insulated wire while turning the crank. The meter needle should immediately swing to the zero end of the scale.

7. OPERATION OF HIGH VOLTAGE MEGGER TEST SETS

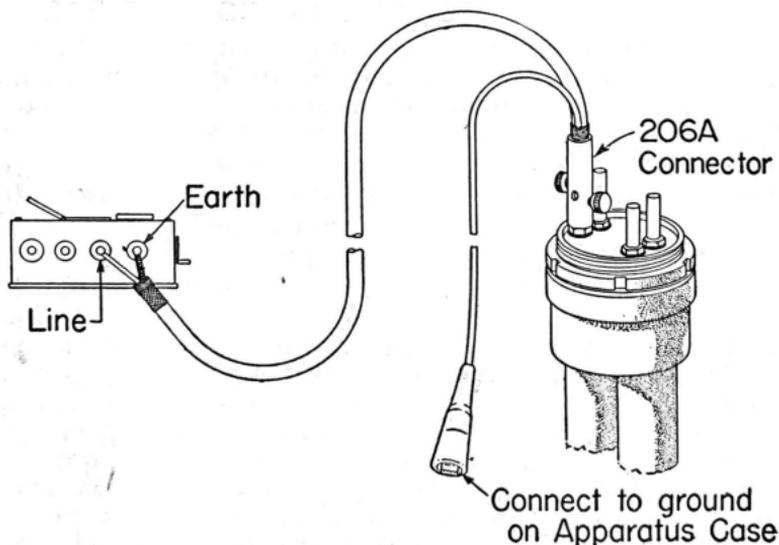
7.01 Before using these sets, the operator should be thoroughly familiar with the safety procedures outlined in Section G50.244.3—Precautions in Testing Coaxials.

7.02 When used outside of a building or hut, the set should be placed in a clear location at ground level; it should not be set up in a manhole or splicing pit. Prior to the start of testing, level the set by means of the leveling screws. Connect the leads of the W2DD Cord to the megger, the long inner conductor to the "Line" terminal and the short outer conductor to the "Earth" terminal. Adjust the scale reading to infinity with the generator in operation and the connector end of the cord clear of the ground.

7.03 In testing at an open cable end, the test clip should be connected to the bunched and grounded coaxial outer conductors, and the 206A Connector to the inner conductor of the coaxial under test as illustrated.



7.04 In testing at an auxiliary or main repeater station the connections are made to the coaxial terminal in the manner illustrated.



7.05 The set is operated by depressing the discharge switch and turning the crank rapidly until the clutch slips and the crank turns easily without much pressure. Then with the switch still depressed, keep turning the crank at the same speed until the indicator reaches a point where it remains fairly steady. If the insulation resistance is high, it will usually take a little time for the needle to reach a steady position. However, if low, the needle usually reaches a steady position quickly.

7.06 After testing each coaxial and before removing the leads from the coaxial, release the discharge switch on the set to discharge the coaxial.

7.07 During the course of testing when several consecutive "infinity" readings are obtained, check the continuity of the leads. Also, if a number of consecutive low values are obtained during the course of testing, check the insulation resistance of the leads to ensure that the low values are not the result of low insulation resistance in the leads.

8. CHECKING VOLTAGE OF MEGGER

8.01 The output voltage of the high voltage megger test sets can be checked using the 90A (or D-171237) Test Set as outlined below.

- (1) Disconnect the 90A set from the AC source of power.
- (2) Connect the W2DF cord to the SLIVER BURNER jack on the 90A set.
- (3) Connect the inner conductor of the cord to the EARTH terminal of the megger. Use a short piece of 10 or 13-gauge wire inserted in the connector to make the connection to the megger terminal.
- (4) Connect the ground lead of this test cord to the GUARD terminal of the megger.
- (5) Operate the cam keys of the 90A set to the OPEN and Sliver Burner positions.
- (6) Crank the megger in the normal manner and read the voltage on the voltmeter of the 90A set.
- (7) The reading obtained will indicate within about 75 volts the output voltage of the megger.
- (8) Release the lever keys. Make sure that the megger has stopped and that the voltmeter reading has returned to zero before disconnecting the cords.

9. MAINTENANCE

9.01 These meggers should require no maintenance and are sealed when they leave the factory. These seals are not to be broken. If, for any reason, these sets need to be repaired they should be returned in accordance with local routine.