

D-C SUPERVISORY RELAYS

CORD CIRCUITS

NO. 1D AND NO. 10 SWITCHBOARDS

1. GENERAL

1.01 This section describes methods of making current flow tests of the direct current supervisory relays of cord circuits in No. 1D and No. 10 offices. A method of checking the audible recall feature, where provided, is also included. The tests described are made at the front of the switchboard and are as follows:

- (A) Supervisory Relay Test, Manual Method
- (B) Supervisory Relay Test Using Interrupter Circuit SD-12848-01
- (C) Audible Recall Test

1.02 This section has been reissued to add electrical values for testing relays in offices working at extended ranges of 835 ohms.

1.03 When testing answering cords equipped with the audible recall feature, test (C) should be made as a part of test (A) or (B).

1.04 The electrical values to be employed for testing relays in cord circuits are shown in Table 1.

2. APPARATUS

Test (A) or (B)

2.01 35-type Test Set.

2.02 W2W Cord equipped with a No. 110 or No. 310 Plug and No. 360 Tools. (2W17A)
 See 3.05 and 3.17.

2.03 No. 365 Tool (for W2W Cord).

Test (B)

2.04 No. 110 or No. 310 Plug.

2.05 P3E Cord equipped with 2 No. 110 or No. 310 Plugs. (3P6B)

Test (C)

2.06 Operator's Telephone Set.

3. METHOD

3.01 Arrange the test set keys and switches as follows:

<u>Keys</u>	<u>Position Switches</u>		
1	Open	G	Open
2	Open	L	Closed to 10
3	Open	Res	0 (25,000 for 35A)
4	Open		
BATT &			
GRD CO	Operated		
REV	Normal		

TABLE 1

Test Values for Cord Circuit Supervisory Relays - No. 1D and No. 10 Switchboards

	<u>Normal Ranges (To 750 ohms)</u>	<u>Extended Ranges (To 835 ohms)</u>
118AC,* B2, B3, B4, B5, B44 and similar relays working on 24 volts		
Soak	.150 amp.	.150 amp.
Operate	.022 "	.017 "
Release	.0062 "	.0045 "
B5, B28, B33, B53, B352 and similar relays working on 48 volts		
Soak	.150 amp.	.150 amp.
Operate	.030 "	.030 "
Release	.0085 "	.0085 "

*Note: 118-type relays cannot be adjusted to meet the extended range requirements.

Precautions in Using the Test Set

3.02 Before using the current flow test set, care should be taken to see that all resistance is cut in to avoid damage to the milammeter. All resistance is cut in when all slides are to the extreme right.

3.03 Care should be taken that the scale change key, designated MIL-AMPS, is not operated from its normal position unless the reading on the normal (.750 ampere) scale indicates that the current flow in the circuit does not exceed the scale range as indicated by the designation of the position to which the key is to be operated. Before operating the MIL-AMPS key, a current flow which approximates the desired value should be set up on the normal (.750 ampere) scale of the milammeter; then the MIL-AMPS key should be operated to the .015 or .075 ampere position as required and the final value accurately set up. The position of any of the red sliders should not be changed while the MIL-AMPS key is in an operated position. These precautions will keep the current value within the limits of the milammeter scale used, thus avoiding damage to the milammeter.

3.04 Although it is not necessary to reset the resistance slides of the test set for each test, the various current values should be checked occasionally.

(A) Supervisory Relay Test, Manual Method

3.05 Connect ground to the tip of the test set SIGNAL BAT & GRD jack as follows: If the circuits being tested are common battery cords, insert the plug of one into the test set jack. If universal cords are being tested, use the W2W cord and connect the white (tip) conductor to ground by means of the No. 365 tool. See Fig. 1.

3.06 Insert the plug of the cord to be tested into the T&R jack of the test set. The supervisory lamp will light.

3.07 Depress key 2 and set the No. 2 resistance slides to obtain the specified

"soak" value of current.

3.08 Depress key 3 and set the No. 3 resistance slides for the specified test "operate" value. See 3.03 for use of MIL-AMPS key.

3.09 Depress key 4 and set the No. 4 resistance slides for the specified test "release" value. See 3.03

Release Test

3.10 Apply the "soak" current to the supervisory relay by depressing keys 2 and 4 at the same time. After approximately one second, release key 2, holding key 4 depressed. The supervisory lamp of the cord under test should be extinguished while the keys are depressed and it should light promptly when key 2 is released, indicating that the relay releases properly on the test "release" current. Repeat the release test several times.

Flashing Test

3.11 Depress key 2 for one second to apply the "soak" current. One-half second after releasing key 2 depress and release key 3 four times at a rate of two times per second. The period of make to break (key depressed to released) should be at the ratio of 3 to 2.

Note: This rate of interruption provides for the exact requirements set up for the relays but it is recognized that the manual method can apply these requirements only approximately.

3.12 Observe that the supervisory lamp flashes three times, that is, each time that key 3 is released, indicating that the relay meets flashing requirement "C" as specified in the section in the AL60 Division covering the requirements for the relay. If it is desired to obtain more flashes, the "soak" current should be applied again for a period of one second for each three flashes.

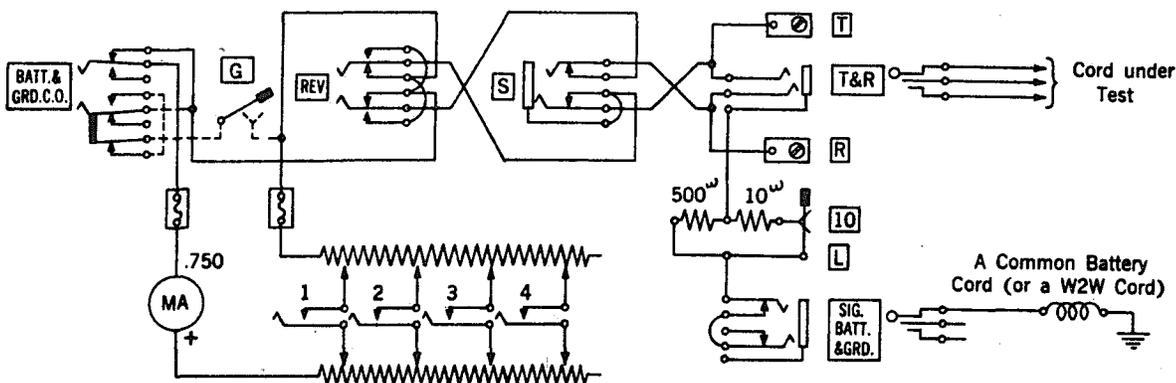


Fig. 1 - Manual Test

(B) Supervisory Relay Test Using Interrupter Circuit SD-12848-01

- 3.13 Strap the test set binding post S and L1 together with a piece of insulated wire. Arrange the set as in 3.01.
- 3.14 Connect the 3R jack of the test set to the interrupter circuit jack in the switchboard with a P3E cord. See Fig. 2.
- 3.15 Insert the plug of the cord to be tested into the T&R jack of the test set. The supervisory lamp will light.
- 3.16 Depress key 2 and set the No. 2 resistance slides to obtain the specified "soak" value of current.
- 3.17 If common battery cord circuits are being tested, insert a spare No. 110 plug into the SIGNAL BATT & GRD jack of the test set or open the strap between the S and L1 binding posts. If universal cord circuits are being tested, insert the plug of the W2W cord into the SIGNAL BATT & GRD jack and connect the white (tip) conductor to ground. The above procedure stops the interruptions on the tip and ring of the interrupter circuit so that the current value can be obtained through key 3.
- 3.18 Depress key 3 and set the No. 3 resistance slides for the specified test "operate" value. See 3.03 for use of the MIL-AMPS key. Then remove the plug from the SIGNAL BATT & GRD jack or restore the strap on the S and L1 binding posts.
- 3.19 Depress key 4 and set the No. 4 resistance slides for the specified test "release" value. See 3.03.

Release Test

3.20 Apply the "soak" current to the supervisory relay by depressing keys 2 and 4 at the same time. After approximately one second, release key 2, holding key 4 depressed. The supervisory lamp of the cord under test should be extinguished while the keys are depressed and it should light promptly when key 2 is released, indicating that the relay releases properly on the test "release" current. Repeat the release test several times.

Flashing Test

3.21 Depress and hold key 2 for approximately one second to apply the "soak" current. Immediately after releasing key 2 depress key 3 and observe that the supervisory lamp flashes at half-second intervals. After three flashes release key 3. If it is desired to obtain more flashes, the "soak" current should be applied again for a period of one second for each three flashes. The proper flashing of the lamp as noted indicates that the relay meets flashing requirement "C" as specified in the section in the A160 Division covering the requirements for the relay.

(C) Audible Recall Test

3.22 When testing the answering cord supervisory relays in cords provided with the audible recall feature, connect an operator's telephone set to the position under test.

3.23 Note that the audible recall signal is heard in the operator's telephone set when the relay operates and releases as keys Nos. 2 and 3 are depressed and released.

4. REPORTS

4.01 The required record of these tests should be entered on the proper form.

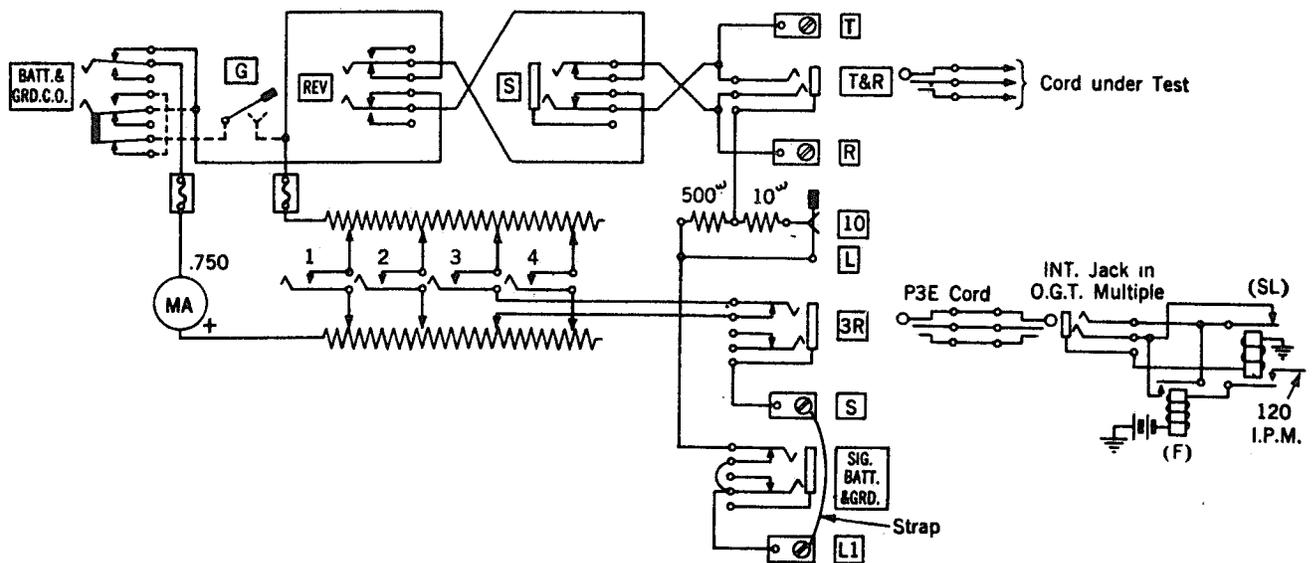


Fig. 2 - Test Using Interrupter Circuit