

PERMANENT ALARMS  
SELECTORS, CONNECTORS, P.B.X. TRUNKS,  
AND REVERTING CALL SELECTORS  
OPERATION TESTS  
STEP-BY-STEP SYSTEMS

1. GENERAL

1.01 This section describes a method of testing the visual and audible permanent signal alarm equipment associated with selectors, connectors, P.B.X. trunks and reverting call selectors in STEP-BY-STEP offices.

1.02 This section is reissued principally to revise the method of testing permanent signal alarms of level hunting connectors arranged for 3-7 minute timing for calling party permanents, and 22-44 minute timing for called party permanents, and to add tests for P.B.X. trunk alarms.

1.03 The tests included are:

- A. Selector Permanent Alarm Test
- B. Connector and P.B.X. Trunk Permanent Alarm Test - Offices Equipped with PS Jacks - 3-7 or 22-44 Minute Timing
- C. Level Hunting Connector and P.B.X. Trunk Permanent Alarm Test - Both 3-7 and 22-44 Minute Timing
- D. Connector Permanent Alarm Test - Offices Not Equipped with PS Jacks
- E. Reverting Call Selector Permanent Alarm Test

1.04 These tests should preferably be made during a period of light traffic.

1.05 Selector shelves not grouped for alarms must be tested individually.

1.06 When testing an incoming selector, the associated trunk should be made busy in the approved manner for the duration of the test.

1.07 In some cases the PS lamp and PS jack referred to in this section are designated PERM lamp, and PERM-T jack, respectively.

1.08 In offices with a common timing circuit, the PS lamp will light, and the audible alarm will sound at the end of the timing interval. In other offices, such as those using dash-pot relays, the PS lamps will light

at once, and the audible alarm will sound at the end of the timing interval.

1.09 To ascertain that a switch in the normal position is idle, monitor with the dial hand test set (making sure that its switch is in the MON position). If dial tone or dial pulses are heard, disconnect at once. Otherwise operate the TALK switch of the dial hand test set momentarily. If the switch steps to the first level and releases, it is idle. Otherwise, disconnect at once.

2. APPARATUS

Tests (A) and (E)

2.01 No. 477A (or No. 375A) (make busy) tools, as required.

Test (B)

2.02 Two No. 349A plugs - for use in offices where PS jack sleeves are grounded.

2.03 Testing cords - Two WLW cords, each to be equipped locally with one No. 310 plug, and after removal of No. 59 cord tip, with one 240A plug connecting the WLW cord to the No. 3 and 4 springs thereof - for use in offices where PS jack sleeves are not grounded.

Test (C)

2.04 Two No. 320B plugs with gray shells and two No. 310 plugs with black shells. (The tips and sleeves of the 310 plugs should be connected together.)

Test (D)

2.05 Special test cords to be made up locally per Fig. 1 (or equivalent) (remove the No. 59 cord tips from the WLW cords and the banana plug from the WLAK cord before connecting these cords as shown in Fig. 1).

2.06 No. 1011G dial hand test set consisting of a W2CL cord, a No. 471A jack and a No. 240A plug (2W39A cord) (or equivalent).

2.07 Testing cord - No. 893 cord, 9 feet long, equipped with two No. 360A tools and two KS-6278 tools (1W13B cord) - (required only when level hunting connector test line terminal is 11).

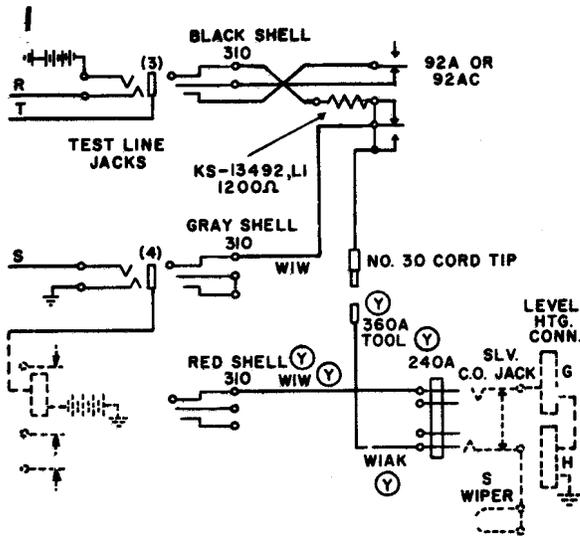


Fig. 1

2.08 Special Insulator - 1/2" x 2-1/2" (the KS-7187 Bell Seal Bond No. 20 relay cleaning paper may be used).

### 3. PREPARATION

3.01 Where equipment for speeding up alarms is provided in the common timing circuit, the short interval should be used for the tests of this section. In most cases operation of the PERM key on the office alarm frame will give the short interval timing in place of the 22-44 minute permanent interval. By also operating the 22M key the same short interval will be secured in place of the 3-7 minute interval used for timing connector permanents in offices with calling party control.

### 4. METHOD

#### A. Selector Permanent Alarm Test

4.01 Insert a No. 477A tool between the No. 1 and No. 2 springs of the test jack of an idle selector on the top shelf to prepare the circuit for operating the group relay. Observe that within the specified time, the corresponding PS and aisle pilot (or bay SUPV) lamps light, and that the audible alarm sounds.

4.02 Insert a No. 477A tool between the No. 1 and No. 2 springs of the test jack of an idle selector on the next shelf and remove the No. 477A tool from the selector on the top shelf. Observe that the lamp of the top shelf is extinguished, that the lamp on the next shelf is lighted, and the aisle pilot (or bay SUPV) lamp remains lit (see 1.05). The audible alarm will continue to sound.

4.03 Continue in this order on the other selector shelves until the first alarm group has been tested; then proceed in the same manner on each succeeding group. Observe that as each shelf is tested the previous shelf

lamp is extinguished, the corresponding shelf lamp is lighted and the aisle pilot (or bay SUPV) lamp remains lighted. The audible alarm will continue to sound. This method of testing will avoid the necessity of waiting each time for the common timing circuit to function.

4.04 When the last shelf lamp in an alarm group has been tested and the No. 477A tools have been removed, all lamps will be extinguished and the audible alarm silenced.

4.05 If the short interval timing has been used, restore the PERM key to normal unless other tests are to be made at this time.

#### B. Connector and P.B.X. Trunk Permanent Alarm Test - Offices Equipped with PS Jacks - 3-7 or 22-44 Minute Timing

→PS Jacks with Grounded Sleeves - 3-7 or 22-44 Minute Timing

4.06 Insert a No. 349A plug into the PS jack associated with the top shelf of a particular group of connectors, or PBX trunks. Observe that within the specified time the shelf and aisle pilot lamps are lighted and that the audible alarm is sounded.

→ 4.07 Insert a second No. 349A plug into the PS jack associated with the next shelf of connectors or P.B.X. trunks and remove the No. 349A plug from the top shelf. Observe that the lamp of the top shelf is extinguished, that the lamp of the next shelf is lighted and that the aisle pilot lamp remains lighted. The audible alarm will continue to sound.

→ 4.08 Continue in this order on the other connector or P.B.X. trunk shelves until the particular alarm group has been tested; then proceed in the same manner on each succeeding group. Observe that as each shelf is tested the previous shelf lamp is extinguished, the corresponding shelf lamp is lighted and the aisle pilot lamp remains lighted. The audible alarm will continue to sound. This method of testing will avoid the necessity of waiting each time for the common timing circuit to function.

4.09 When the last shelf lamp in an alarm group has been tested and the No. 349A plugs have been removed, all lamps will be extinguished and the audible alarm silenced.

4.10 If the short interval timing has been used, restore the PERM and 22M keys to normal unless other tests are to be made at this time.

#### PS Jacks without Grounded Sleeves

4.11 By means of a cord per 2.03 connect ground to the tip of the PS jack associated with the top shelf of a particular group of connectors, by inserting the No. 310 plug into the PS jack and the No. 240A plug into the test jack of an idle connector. Ob-

serve that within the specified time the shelf and aisle pilot lamps are lighted and the audible alarm sounds.

4.12 With a second cord per 2.03 connect ground to the tip of the PS jack associated with the next shelf of connectors and remove the cord from the top shelf. Observe that the lamp of the top shelf is extinguished, that the lamp of the next shelf is lighted and the aisle pilot lamp remains lighted. The audible alarm will continue to sound.

4.13 Continue in this order on the other connector shelves until the particular alarm group has been tested; then proceed in the same manner on each succeeding group. Observe that as each shelf is tested the previous shelf lamp is extinguished, the corresponding shelf lamp is lighted and the aisle pilot lamp remains lighted. The audible alarm will continue to sound. This method of testing will avoid the necessity of waiting each time for the common timing circuit to function.

4.14 When the last shelf lamp in an alarm group has been tested and the WIW cords← have been removed, all lamps will be extinguished and the audible alarm silenced.

4.15 If the short interval timing has been used, restore the PERM and 22M keys to normal unless other tests are to be made at this time.

C. Level Hunting Connector and P.B.X. Trunk Permanent Alarm Test - Both 3-7 and 22-44 Minute Timing ↗

Calling Party Permanents

4.16 Insert a No. 310 plug (with the tip and sleeve connected) into the PS jack associated with the top shelf of the particular group of connectors and P.B.X. trunks. Observe that within the specified time the PS1 shelf lamp and the aisle pilot lamp are lighted and the audible lamp is sounded.

4.17 Insert a second No. 310 plug (with the tip and sleeve connected) into the PS jack associated with the next shelf of connectors or P.B.X. trunks and remove the No. 310 plug from the top shelf. Observe that the lamp of the top shelf is extinguished and the PS1 lamp of the next shelf is lighted and that the aisle pilot light remains lighted. The audible alarm will continue to sound.

4.18 Continue in this order on the other connector or P.B.X. trunk shelves until the particular alarm group has been tested; then proceed in the same manner on each succeeding group. Observe that as each shelf is tested the previous shelf lamp is extinguished, the corresponding shelf lamp is lighted and the aisle pilot lamp remains lighted. The audible alarm will continue to sound. This method ↘

of testing will avoid the necessity of waiting ↗ each time for the common timing circuit to function.

4.19 When the last shelf in the alarm group has been tested and the No. 310 plugs have been removed all lamps will be extinguished and the audible alarm silenced.

Called Party Permanents

4.20 Insert a No. 320B plug into the PS jack in the top shelf of the particular group of connectors. Observe that within the specified time the PS2 shelf lamp and the aisle pilot lamp are lighted and that the audible alarm is sounded.

4.21 Insert a second No. 320B plug into the PS jack with the next shelf of connectors or P.B.X. trunks and remove the 320B plug from the top shelf. Observe that the lamp of the top shelf is extinguished, that the PS2 lamp of the next shelf is lighted and the aisle pilot lamp remains lighted. The audible alarm will continue to sound.

4.22 Continue in this order on the other connector or P.B.X. trunk shelves until the particular alarm group has been tested; then proceed in the same manner on each succeeding group. Observe that as each shelf is tested the previous shelf lamp is extinguished, the corresponding shelf lamp is lighted and the aisle pilot lamp remains lighted. The audible alarm will continue to sound. This method of testing will avoid the necessity of waiting each time for the common timing circuit to function.

4.23 When the last shelf lamp in an alarm group has been tested and the No. 320B plugs have been removed, all lamps will be extinguished and the audible alarm silenced.

4.24 If the short interval timing has been used, restore the PERM and 22M keys to normal unless other tests are to be made at this time. ↘

D. Connector Permanent Alarm Test - Offices Not Equipped with PS Jacks

Offices Equipped with SUPV-1 and SUPV-2 Lamps

4.25 Insert the black and gray shelled No. 310 plugs of the special test cord (Fig. 1) into the No. 3 and No. 4 test line jacks, respectively, on the connector frame. The cord and apparatus designated (Y) is used only when testing level hunting connector shelves.

Note 1: To test level hunting connector shelves insert the black and red shelled No. 310 plugs of the special test cords (Fig. 1) into the No. 3 and No. 4 test line jacks, respectively, on the connector frame. Connect the No. 360 tool to No. 30← cord tip. Insert the No. 240A plug into the sleeve cutoff jack of the connector per

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4.26, so that the No. 4 spring and stay cord of the plug are to the right. Insert the special insulator (see 2.08) between the sleeve cutoff jack guard plate and the front end of the No. 240A plug flanges in order to prevent the springs of the plug from becoming crossed with the guard plate due to the weight of the cords attached to the plug. If the connector test line number is 11, connect ground to the commutator terminal for level No. 1, by means of the No. 893 cord.

Note 2: Because of a reversal in wiring on some connector sleeve cutoff jacks, caused by different numbering of the jack springs, the No. 240A plug must sometimes be reversed.

4.26 Insert the No. 240A plug of the dial hand test set into the test jack springs No. 1 and No. 2 of an idle connector (one not scheduled for test on this cycle) on the last shelf of the group to be tested. Dial the connector test line number and observe that the connector steps to the proper level and rotates to the connector test line terminal. (If the switch does not step after dialing, reverse the No. 240A plug as in note 2, 4.25.) After ringing is tripped, insert a No. 477A tool into the test jack springs No. 1 and No. 2 of the connector before fully removing the No. 240A plug of the hand test set, and manually rotate the connector wipers to the eleventh rotary step position.

Note: To reach the test line in the case of level hunting connectors, dial the digit which directs the switch to the ninth level if the test line number is 91, or dial any digit if the test line number is 11.

4.27 To avoid the necessity of waiting for the common timing equipment to function, proceed to establish the permanent condition in each alarm group as outlined in 4.25 and after all groups are set up and the permanent lamp S1 is lighted in the first group and the audible alarm is sounded, proceed with 4.28.

4.28 Returning to the first shelf of the first alarm group, insert the No. 240A plug of the dial hand test set into the test jack springs No. 1 and No. 2 of an idle connector. Dial the connector test line number and observe that the connector steps to the proper level and rotates to the connector test line terminal. After ringing is tripped, operate the key of the special test cord. Observe that the associated SUPV-1 lamp is lighted.

4.29 Release the key of the special test cord and remove the No. 240A plug from the connector test jack. The SUPV-1 lamp will be extinguished and the SUPV-2 lamp will light.

4.30 Reoperate the key of the special test cord and observe that the switch restores to normal and that the associated SUPV-2 lamp is extinguished.

4.31 Proceed to test each succeeding shelf (except the last) in the alarm group in the same manner as the first shelf.

4.32 After testing the connector shelf preceding the one used to establish the permanent signal condition covered in 4.26, and before operating the key of the special test cord, as in 4.30, to release the connector, insert a No. 477A tool in the test jack springs No. 1 and No. 2 before fully removing the No. 240A plug of the dial hand test set and manually rotate the wipers to the eleventh rotary position. Then remove the No. 477A tool from the test jack springs No. 1 and No. 2 of the connector on the last shelf in the alarm group and observe that the switch returns to normal.

4.33 Proceed to test the last shelf in the alarm group.

4.34 When the last shelf of the alarm group has been tested, remove the special test cord, dial hand test set, and the No. 477A tool from the equipment in this alarm group.

4.35 Continue in this order until all shelves in all connector alarm groups have been tested.

4.36 After the last connector alarm group has been tested, all lamps will be extinguished and the audible alarm silenced.

4.37 If the short interval timing has been used, restore the PERM and 22M keys to normal unless other tests are to be made at this time.

Offices Equipped with SUPV-1 Lamp Only (Joint Control)

4.38 Proceed as outlined in 4.25 to 4.28.

4.39 Release the key of the special test cord and remove the No. 240A plug from the connector test jack. The SUPV-1 lamp will light.

4.40 Reoperate the key of the special test cord and observe that the switch restores to normal and that the associated SUPV-1 lamp is extinguished.

4.41 Proceed to test each succeeding shelf (except the last) in the alarm group in the same manner as the first shelf.

4.42 To test the last shelf in the alarm group, proceed as in 4.32 and 4.33.

4.43 When the last shelf of the alarm group has been tested, remove the special test cord, dial hand test set and the No. 477A tool from the equipment in this alarm group.

4.44 Continue in this order until all shelves in all connector alarm groups have been tested.

4.45 After the last connector alarm group has been tested, all lamps will be extinguished and the audible alarm silenced.

4.46 If the short interval timing has been used, restore the PERM and 22M keys to normal unless other tests are to be made at this time. ←

Offices Equipped with SUPV-1 Lamp Only (Calling Party Control)

4.47 Proceed as outlined in 4.26 to 4.28.

4.48 Remove the No. 240A plug from the connector test jack and observe that the switch restores to normal and the SUPV-1 lamp is extinguished.

4.49 Proceed to test each succeeding shelf (except the last) in the alarm group in the same manner as the first shelf.

4.50 To test the last shelf in the alarm group, proceed as in 4.32 and 4.33.

4.51 When the last shelf of the alarm group has been tested, remove the special test cord, dial hand test set and the No. 477A tool from the equipment in this alarm group.

4.52 Continue in this order until all shelves in all connector alarm groups have been tested.

4.53 After the last connector alarm group has been tested all lamps will be extinguished and the audible alarm silenced.

4.54 If the short interval timing has been used, restore the PERM and 22M keys to normal unless other tests are to be made at this time. ←

E. Reverting Call Selector Permanent Alarm Test

4.55 Insert a No. 477A tool between the No. 1 and No. 2 springs of the test jack of the first switch to prepare the circuit for operating the group relay. Observe that within the specified time the associated shelf and aisle pilot lamps are lighted and that the audible alarm is sounded.

4.56 Insert a No. 477A tool between the No. 1 and No. 2 springs of the test jack of the adjacent switch and remove the No. 477A tool from the switch previously tested. Observe that the shelf and aisle pilot lamps remain lighted and that the audible alarm continues to sound.

4.57 Proceed in the same manner until all switches have been tested. After testing is completed, the associated shelf and aisle pilot lamps will be extinguished and the audible alarm silenced.

4.58 If the short interval timing has been used, restore the PERM and 22M keys to normal unless other tests are to be made at this time. ←