

ALARMS
METHOD OF TRACING
740A, 740B, 740C AND 740AX PBX

1. GENERAL

1.01 This section outlines methods which may be used in locating troubles causing alarm signals at No. 740-A, No. 740-B, No. 740-C and No. 740-AX PBX's.

1.02 This section has been revised to include the No. 740-AX P.B.X. and also to include under POWER ALARM the later type power plant having lamp signals for trouble indications. It also combines the methods for No. 740-A, No. 740-B and No. 740-C PBX's into one section.

1.03 In addition to a common audible alarm signal, which can be retired by the attendant, alarm lamps are provided at the jack panel on the switch frame for indicating the kind of trouble causing an alarm. The lamp designations are as follows:

<u>Indication</u>	<u>Lamp Signal Designation At Jack Panel</u>
Fuse Alarm	FA (See Note 1)
Call Blocked Alarm	C BLK
Permanent Signal Alarm	PS
Start Lead Ground Alarm	S
Chain Circuit Trouble Alarm	C
Release Magnet Alarm	RLS
Power Alarm	PWR (See Note 2)

Note 1: For Nos. 740-A, B and AX PBX's the fuse alarm lamp appears on the fuse panel on the switch frame instead of on the jack panel. The alarm lamp on this fuse panel also serves as a trouble indication for the fuses located on the fuse panel in the rear of No. 740-AX PBX switchboard positions.

Note 2: No. power alarm lamp is provided on the jack panel for Nos. 740-A, B and AX PBX's. If the power plant is not equipped with alarm lamp signals, the only indication of a trouble in the power circuit will be the POWER ALARM lamp at the attendant's position.

1.04 When the PBX alarms are extended to the central office, the alarm will appear at the central office as a Class A alarm with the exception of the permanent signal alarm which will appear as a Class B alarm. When the PBX alarms are not extended to the central office they will be reported by the attendant. The attendant's cabinet is equipped with three alarm pilot lamps which are designated FRAME ALARM, PS ALARM and POWER ALARM except for the No. 740-C PBX which is equipped with only one alarm pilot lamp and designated TROUBLE.

2. APPARATUS

- 2.01 Test Receiver (No. 528 or equivalent) equipped with Cords and Clips.
- 2.02 No. 258C Plugs (or equivalent), as required.
- 2.03 No. 375A Make-Busy Tools, as required
- 2.04 Dial Hand Test Set equipped with a No. 4CB Dial and a No. 240A Plug.

3. FUSE ALARM

3.01 This alarm is normally caused by the operation of a fuse on the fuse panel on the line finder side of the switch frame, the fuse on the No. 62C protector block mounted below the subscriber's sets associated with the test line or in the case of a No. 740-AX PBX a fuse on the fuse panel in the rear of the switchboard position.

3.02 Observe whether a fuse is actually operated. If the head end of a coil spring of a fuse is displaced to either side so that it does not rest on the face of the fuse, the alarm spring may be making contact with the alarm bar. In this case resetting the coil spring should retire the alarm.

3.03 If a fuse is operated, note which circuit obtains battery from this fuse.

3.04 Attempt to replace the fuse with a good fuse of the proper capacity. If the fuse does not operate again, test the associated apparatus and make a record of the circuit so that any repetition of the trouble may be noted.

3.05 If the fuse operates again, make the associated circuit busy. Then make a visual inspection of the equipment to determine the cause of the trouble. If no cause for the fuse operating is apparent, test the battery feeder for ground with the test receiver. If the ground is not removed open the battery feeder associated with the fuse at approximately the midpoint. Then test the circuit to see if the ground has been removed, by momentarily connecting the test receiver across the fuse posts. If a loud click is heard it is an indication that the ground is between the fuse and the point at which the circuit was opened. By further division of the circuit, isolate the point that is grounded.

3.06 Remove the ground, close all connections that were opened and again test for ground on the complete circuit.

3.07 If a ground fuse in a No. 740-AX PBX is involved repeat 3.05 and 3.06 checking for a battery cross instead of ground.

3.08 Replace the fuse, test the apparatus and restore it to service.

4. CALL BLOCKED ALARM

4.01 This alarm is caused, after a predetermined interval, by the continued operation of a line finder G relay.

4.02 Note that the TST key located on the jack panel is normal. Remove the relay cover on the group, subgroup and alarm relay equipment and note the subgroup in which the G relay remains operated.

4.03 If the line finders which are first choice to this subgroup are hunting and restoring, remove the relay cover from the line relays in the subgroup. Then check whether an L relay in the subgroup is actually operated or held up due to stickiness. If an L relay is operated, release and block it normal and the line finders should stop hunting. Check the reason for the CO relay not operating, or the L relay not releasing when the CO relay operates, as the case may be.

4.04 If all line finders are busy, monitor on each line finder, using the dial hand test set. If conversation ringing induction or busy signal is heard, disconnect the dial hand test set and proceed to the next operated line finder. If an operated line finder is found where no conversation, ringing induction or busy signal is heard, check the reason for this condition and restore the line finder to normal.

4.05 If the line finders are not hunting and are not all busy, note whether the first line finder in the subgroup is on a line. If it is not on a line, note the condition of the A relay. If the A relay is operated, check why the line finder does not step vertically. If the A relay is normal, check why it does not operate from a ground on the start lead.

4.06 If the first line finder in the subgroup is on a line and the E relay is operated, follow the procedure described above on the line finder which normally would hunt for the line.

5. PERMANENT SIGNAL ALARM

5.01 This alarm occurs after a predetermined interval, when an extension user fails to dial after removing the receiver from the switchhook or the extension line becomes grounded or crossed, or when a calling or called party fails to hang up the receiver at the conclusion of a call.

5.02 On successive selector-connectors whose shafts are normal, move the shaft upward until the off-normal springs make contact. On idle selector-connectors a click of the release magnet should be heard.

5.03 When a selector-connector is located on which a click is not heard, note the extension to which the associated line finder is connected.

5.04 First determine that the receiver is on the hook at the extension or that a key is not operated at the No. 740-A or No. 740-B attendant's cabinet (or no cord is connected to the line at the switchboard on No. 740-AX PBX's). If the permanent signal persists, trace the shunt from the extension or the ground on the LR lead from the central office trunk or tie trunk.

6. START LEAD GROUND ALARM

6.01 This alarm may be caused by the start lead becoming grounded due to circuit trouble.

6.02 If the switches are not hunting and are not all busy, momentarily operate the AR key located on the jack panel and note whether the alarm is retired. If the alarm is retired, the trouble may be due to improper adjustments of the relays in the start lead wiring. Make an inspection of the equipment to determine the cause and record the trouble so that any repetition may be noted.

6.03 If the switches are hunting, connect the test receiver to the equipment end of a fuse on the fuse panel and test for ground on the start lead as follows:

6.04 Starting with the first line finder in subgroup No. 1 and then the last line finder in subgroup No. 1, first line finder in subgroup No. 2, etc., insert a No. 258C plug into the associated test jack. If the line finders stop hunting, the ground should be located in the line finder.

6.05 If the line finders continue to hunt, insulate spring 10 from 11 and 9 from 8 on the D relay. If ground is found on springs 9 and 11, the ground is on the start lead toward the succeeding line finder. If the ground is found on springs 8 and 10, it is on the start lead from the preceding line finder.

6.06 The alarm may be retired when the ground has been removed from the start lead by momentarily operating the AR key on the jack panel.

7. CHAIN CIRCUIT TROUBLE ALARM

7.01 This alarm is caused by the multiple chain circuit becoming grounded or crossed with battery.

7.02 Note whether the S or CH relay in the group circuit is released. If the S relay is released and the CH relay operated, there is a foreign ground on the chain circuit. If the CH relay is released and the S relay operated, there is foreign battery on the chain circuit.

7.03 Insert No. 258C plugs in all of the test jacks of the line finders in the group, regardless of whether they are busy or idle and note whether this retires the alarm. Immediately remove all these plugs in order to avoid interference with service.

7.04 If the alarm was retired when the plugs were in all of the test jacks and the previous inspection indicated a battery cross, the trouble lies between the test jacks and the

CH relay or if the previous inspection indicated a ground cross, the trouble lies between the test jacks and the S relay. If the alarm was not retired when the plugs were in all of the test jacks and the previous inspection indicated a battery cross, the trouble lies between the test jacks and the S relay or if the previous inspection indicated a ground cross, the trouble lies between the test jacks and the CH relay.

7.05 Inspect the portion of the chain circuit wiring indicated by the above tests as being in trouble, and correct the condition.

7.06 The alarm lamp should be extinguished when the trouble has been cleared.

8. RELEASE MAGNET ALARM

8.01 This alarm is caused by the failure of a switch to release due usually to wipers becoming snagged, interference with wiper cords, or lack of tension in the shaft restoring spring.

8.02 If the cause of the alarm is not apparent from inspection of the switch wipers and cords, remove the covers from switches which are off normal until a selector-connector is found with the A relay normal or a line finder with the B relay normal.

8.03 Make the switch busy and determine the reason for the switch not restoring. When the trouble is cleared restore the switch to service.

9. POWER ALARM

9.01 This alarm is usually caused by a failure of the power supply, failure of the motor generator, a rectifier bulb burned out, operation of a service, charge or discharge fuse or any other fuse associated with the power circuit, failure of the ringing machine to start or generate or when the battery voltage has exceeded its high or low limit.

9.02 If the power plant is not equipped with lamp signals to indicate the cause of the trouble, it will be necessary to make an inspection of the equipment indicated in 9.01 in order to determine the cause of the trouble.

9.03 If the power plant is equipped with lamp signals, note if any of the lamps are lighted. If this is the case the lamp designation will indicate the trouble. The various kinds of trouble as indicated by the different lamp signals are shown in Table 1.

<u>Lamp Signal Designation</u>	<u>Indication</u>
GFA	Power Failure Operated Service Fuse Operated Charge Fuse Failure of Motor Generator Rectifier Bulb Burned Out
FA	Operated Discharge Fuse
RM	Failure of Ringing Machine to Start or Generate
VA	Battery Voltage has Exceeded its High or Low Limit

TABLE 1.

9.04 If none of the lamp signals are lighted, note if any of the alarm type fuses associated with the power circuit are operated.

9.05 Observe that after any operated fuses have been replaced or any other trouble is cleared the alarm is retired.

10. REPORTS

10.01 The required record of the alarms should be entered on the proper form.