

**SUBSCRIBER LINE LINK FRAME
ALARM ROUTINE
NO. 1 CROSSBAR OFFICES**

1. GENERAL

1.01 This section outlines the procedure to be followed in handling subscriber line link and control circuit alarms.

1.02 As stated in the section for subscriber sender link frame alarm routines, if alarms occur in two or more sender link frames within approximately 5 seconds of each other it may be assumed that the trouble is in a line link frame rather than a sender link frame. The line link frame involved will be indicated by the white aisle pilots which light from 4 to 11 seconds after the first sender link frame alarm.

1.03 Since this circuit times out under trouble conditions and leaves no indication of the equipment involved, a 298A plug may be inserted into the H jack to hold the circuit the next time the trouble occurs. With the circuit held in this manner, the equipment involved is determined as follows.

The operated HGO to HG9 relay indicates the horizontal group.

The operated VO to V6 relay indicates the vertical group.

The lowest numbered operated LTO to LT9 relay indicates the subscriber's line. If the subscriber disconnects, all these relays may release.

1.04 When a trouble occurs with a plug in the H jack and the subscriber does not disconnect, the line link frame is held out of service to both originating and terminating traffic. Therefore it is important that this hold feature be used under close maintenance supervision.

2. APPARATUS

2.01 No. 298A plug.

3. METHOD

(A) General

3.01 If in responding to a minor intermittent or major alarm, a lighted line link frame AL or MA lamp is found, determine the approximate location of the trouble as follows.

3.02 If the AL lamp is repeatedly lighted and extinguished approximately every six seconds, it is an indication of certain troubles as explained in 3.13.

3.03 If the AL lamp is lighted steadily, observe whether the TA2 or TB2 relay is operated. If the TB2 relay is operated, operate the TR key momentarily to restore the alarm and proceed to the mate control frame since as explained in 3.10 the trouble is likely to be in the mate circuit. In general there will be an AL lamp lighted on the mate frame and its TA2 relay will be operated.

3.04 If it is observed that the TA2 relay is operated it is an indication that the trouble is in the frame on which the TA2 relay is located.

3.05 After locating the line link frame in trouble, operate its TR key momentarily to restore the alarm and insert a 298A plug into the H jack if it is desired to hold the circuit when the trouble recurs.

3.06 When the trouble recurs observe the operated HGO to HG9 relays, the operated VO to V6 relays, and the lowest numbered operated LTO to LT9 relay. This locates the subscriber's line involved in the trouble.

3.07 The trouble may not recur with the plug in the H jack until a particular subscriber originates a call; therefore, if it is desired to leave the frame, first determine that calls from several horizontal and vertical groups, using various line test relays, proceed satisfactorily, then restore the alarm on the mate frame and the sender link frame by operating momentarily the associated TR and AR keys respectively. See 1.04.

3.08 When the trouble recurs with the plug in the H jack the major alarm is sounded instead of the minor alarm. Upon responding to the major alarm note the relays as mentioned in 3.06.

(B) Locating Troubles

Control Circuit Indications

3.09 If alarms are present on two line link frames that function as mates it is an indication that the trouble is in a control circuit. The control circuit associated with the operated TA2 relay should be investigated.

3.10 Reason: If a trouble is present in a control circuit, its frame times out and throws over to the mate control. While the mate control is busy, the mate frame selects its mate control in which as assumed,

a trouble is present so that this frame also times out and operates its TB2 relay. Thereafter both frames use the same control circuit in which there is no trouble, and the indications are as stated previously.

3.11 If an alarm is present on one frame only it may be an indication of a home control or start circuit trouble.

3.12 A control circuit trouble results in an alarm on its home frame only, if calls do not occur in the mate frame while its control circuit is busy and therefore the mate frame does not seize the control circuit which is in trouble.

3.13 A start circuit trouble results in an alarm on one frame only, since the frame times out and throws over to the mate control circuit. If the mate frame selects its mate control circuit under the conditions of 3.10, it will function satisfactorily and not cause a second alarm.

Conditions Causing Flashing of the AL Lamp

3.14 If an alarm continues to come in and go out approximately every six seconds it is an indication that the trouble is in individual equipment so that the call has no alternate path. Such equipment includes the L relay, primary line hold magnet, LR, HM & HG relays. During periods of heavy traffic when a call cannot find an alternate district group because of paths to alternate district groups being busy, it is possible that a trouble in equipment associated with a district junctor group will result in the succession of alarms. Such equipment includes the D, DF, DA, DB relays, secondary hold magnets etc. However, this would result in one sender link alarm and should be handled as a sender link trouble.

Note in 3.09, 3.11 and 3.14 it is assumed that the mate half of the start circuit has been exercised by use of the EB jack and contains no trouble. If this has not been done, a trouble in this portion of the start circuit may cause the AL lamp to flash as in 3.14. Therefore this condition should be investigated on flashing AL lamp indications.

(C) Procedure if the Trouble Appears to be in the Start or Control Circuit

3.15 The following relays and magnets should be observed to determine the stage at which the circuit is failing. Also possible causes for the trouble are listed.

Relay or Magnets

3.16 The line link fails to select a sender link. This is indicated by failure of a DO to D4 relay to operate.

3.17 A DO to D4 relay repeatedly operates and releases immediately.

3.18 Line link selects the sender link but secondary line link hold magnet fails to operate.

3.19 Secondary hold magnets operate but line hold magnet fails to operate.

3.20 Line hold magnet operates but releases after the sender link times out.

3.21 Primary select magnets do not operate.

3.22 Secondary select magnets do not operate.

3.23 After determining the probable cause of the trouble, remove the plug from the H jack and insert it into the MB jack if the trouble is in the control circuit, or into the EB jack if the trouble is in the start circuit. Operate the TR key momentarily to restore the alarm.

Possible Causes of Trouble

Failure of Horizontal and Vertical selections.

False ground on V lead to VS relay.

False ground on a DO to D4 lead.

Continuity failure of DO to D4 lead.

Continuity failure SL lead to GE winding and secondary of GO to G9 relay.

DPO to DP4 lead continuity failure. False ground on S lead to S relay.

Continuity failure of A or B lead to GO to G9 relays.

Continuity failure of H lead to TO to T9 relay contacts, continuity failure of HM lead to LTO to LT9 relays.

Continuity failure to LLO to LL9 lead to TO to T9 windings.

CS lead continuity failure.

Cross between two CS leads.

ON lead continuity failure.

Continuity failure SA-SB leads from the RL relay.

Continuity failure of the MO to M9 leads from the SSO to SS9 jacks.

Crossed select magnet leads such as O and I may appear as an open select lead since the select magnet is energized in opposite directions and may not operate.

(D) Procedure if the Trouble Appears to be in Individual Equipment

3.24 The following relays and magnets should be observed to determine the stage at which the circuit is failing. Also possible causes for the trouble are listed.

<u>Relays or Magnets</u>	<u>Possible Causes of Trouble</u>
3.25 Primary hold magnet does not operate.	Continuity failure of HM lead thru HM relay.
3.26 Primary hold magnet operates but does not hold.	L relay does not release, causing the RE relay to remain operated, thereby preventing ON lead closure to the sender link.

3.27 After determining the probable cause of the trouble, immediately remove the plug from the HD jack and proceed to clear the trouble. When the frame times out every 6 seconds, during the time that the trouble is being cleared, subscribers in horizontal sub-groups not associated with the line in trouble receive service.

(E) Major Alarm When no Plug is in the H Jack

3.28 The following are possible causes for the major alarm when no plug is in the H jack.

3.29 Both home and mate control circuits made busy. Remove the 298A plug from the MB jacks of one or both control circuits and operate the associated TR key momentarily to restore the alarm.

3.30 A mate control circuit made busy and a home frame times out. Operate the TR key momentarily to restore the alarm. Remove the plug from the MB jack of the mate control circuit as soon as conditions permit.

3.31 A home control circuit made busy and a home frame times out. Operate the TR key momentarily to restore the alarm. Remove the plug from the MB jacks of the home frame as soon as conditions permit.

4. REPORTS

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