

ORIGINATING SENDER SUPERVISORY SIGNALS METHOD OF HANDLING NO. 1 CROSSBAR OFFICES

1. GENERAL

1.01 This section covers the method of handling originating sender supervisory signals in No. 1 crossbar offices.

1.02 This section is reissued to cover timed release subscriber senders and to include information relative to tracing calls beyond the district junctor. The title has been changed to include all types of originating senders. This section has been generally revised and therefore the arrows usually employed to indicate changes have been omitted.

1.03 Where sender monitor operation is used each subscriber sender has a stuck sender lamp and a make-busy jack on the sender make-busy frame at the maintenance center. The stuck sender lamps are lighted by action of the sender monitor operator to indicate to the plant forces the senders that are held for tracing.

1.04 Each key pulsing sender and each timed release subscriber sender has a make-busy jack and a cancel time release (CTR) key on the sender make-busy frame at the maintenance center. No provision is made for monitoring on senders provided with cancel time release keys.

1.05 Under normal conditions it is desirable that the (CTR) keys be in the pulled out position to cause senders to remain stuck on trouble conditions and to permit tracing. Under abnormal conditions, however, such as trunk cable failure, etc., these keys should be in the pushed in position, to permit senders that become stuck to release automatically. However, if the subscriber senders are permitted to release automatically at all times, a serious trouble condition might develop in the equipment and exist for some time before it is detected.

1.06 In determining the number of senders which may be held for tracing, it should be recognized that a sufficient number of senders should be kept in service in each group to adequately handle the traffic. If an overload is indicated, however, all stuck senders should be released. Also, any senders held by make-busy plugs should be restored to service, if they are not being held because of inoperative conditions.

1.07 When stuck senders are being held, a trouble ticket should be made out at the maintenance center for each stuck sender indication. Every effort should be made to obtain essential and accurate information on each connection traced. In tracing the connection, determine if a subscriber line is being held, in which case the line should be released immediately. If no line is being held, the cause of the stuck condition should be located and the circuits restored to normal as soon as possible.

Note: Due to the timed release feature of the full selector terminating sender, a sender which has brought in a stuck sender indication may be released when the full selector terminating sender times out thus losing the trouble condition. A full selector terminating sender may be prevented from timing out on subsequent calls by inserting a make-busy plug into the HLD jack at the terminating trouble indicator frame.

1.08 Stuck sender registrations should be closely observed. If the number of registrations is considered to be excessive, or if it appears that the trend is in the increasing direction, and it has been determined that plant troubles are not involved, the Traffic people should be informed since it is possible that coverage of the call indicator "B" positions is the contributing factor.

2. APPARATUS

2.01 No. 275A or 322A Plugs (make-busy), as required.

2.02 No. 245 Plugs (shields), as required.

3. METHOD OF TRACING

3.01 When a stuck sender signal is received at the make-busy frame, the attendant at the maintenance center should insert a make-busy plug in the associated make-busy jack and make out a trouble ticket.

3.02 The switchman, upon receiving a trouble ticket on a stuck sender for tracing, should note the sender group number as well as the sender number given on the ticket. The make-busy plug should be replaced by a No. 245 plug (shield) to indicate the trouble has been dispatched.

SECTION 216-570-301

Obtaining Sender Information

3.03 At the sender frame, ascertain the condition (operated or normal) of the following equipment and enter this information on the trouble ticket:

F, S, S', FS, CS, CL, TR, and TP relays,
crosspoints operated on dial register
switch or dial register relays operated.

Any desired additional information may be entered in the space at the bottom of the ticket or on the back, such as:

OB, OG, CR, SD and TW relays.
DST and DRL relays.
Counting relays.

Obtaining District Junctor or Trunk Number - Key Pulsing Sender Only

3.04 The FT and FR relays indicate the routing of the call. If neither the FT or FR relay is operated, the call is routed through an A operator district junctor. If the FT relay is operated and the FR relay is normal, the call is routed to a distant office selector. If the FR relay is operated and the FT relay is normal, the call is routed to a distant incoming selector or to a local incoming trunk. If the FT and FR relays are both operated, the call is routed to a full selector tandem district.

3.05 The condition of the F00, or F10 and F0 to F9 relays indicates the frame number of the key pulsing sender link and A switchboard district junctor frames involved in the connection. Proceed to the sender link frame and determine from the designation card on the secondary bay the secondary switch number and horizontal level on which the sender under investigation appears. Observe which pair of crosspoints is operated on this horizontal level, thus identifying the secondary switch C and D verticals involved in the connection. The corresponding primary verticals may be determined by means of the standard link distribution plan for the key pulsing sender link circuit. For example, the pair of secondary verticals stenciled 2 and 3 on secondary switch 1 connect to A and B verticals stenciled 1 associated with trunk group 2 on primary switch 0.

3.06 Observe which crosspoint is operated on the primary verticals involved in the connection, thus determining the primary horizontal involved. The primary verticals determine the group of 10 district junctors or

trunks involved in the connection, and the horizontals, in conjunction with the stenciling on the primary switch, indicate directly the number of the district junctor or trunk involved in the connection.

3.07 Enter the above information on the ticket.

Obtaining Sender Link Information

3.08 The condition of the F00 and F10 relays and the crosspoint operated on the F vertical of the dial register switch indicates the frame number of the sender link and district junctor frames involved in the connection. Proceed to the sender link frame and determine, from the designation card on the secondary bay, the secondary switch numbers and horizontal level on which the subscriber sender under investigation appears. Observe which pair of crosspoints is operated on this horizontal level, thus identifying the secondary switch C and D verticals involved in the connection. The corresponding primary horizontals may be determined by means of the standard link distribution plan for the subscriber sender link circuit. For example, the pair of secondary verticals stenciled 2 and 3 in the 9 group of C and D magnets connect to the 9 horizontals of primary switches 2 and 3.

3.09 Observe which crosspoint is operated on the primary horizontals involved in the connection, thus determining the primary vertical involved. The primary vertical, in conjunction with the stenciling on the primary switch, indicates directly the number of the district junctor and of the group of 10 district junctors involved in the connection.

3.10 Enter the above information on the ticket. Observe that one, and only one, each of magnets A, B, C and D, is operated on the connection, and that the proper select finger is engaged on each for completing the link circuit.

Obtaining District Link Information

3.11 Proceed to the district link frame and observe the primary horizontal associated with the district junctor circuit involved in the connection, noting the crosspoints engaged. This crosspoint identifies the district primary vertical involved in the connection. The district secondary horizontal may be determined from the standard link distribution method; for example, the 5 vertical on the left side of the 3 primary switch connects to the 3 horizontal on the left side of the 5 secondary switch. The particular crosspoint engaged on this secondary should then be determined by visual inspection. This crosspoint identifies the district link secondary vertical, or office junctor involved in the connection. By means of

the designation card, determine the corresponding office link frame and the office link primary vertical.

3.12 Enter the above information on the ticket and observe that one, and only one, finger is engaged on each horizontal multiple and vertical involved.

Obtaining Office Link Information

3.13 Proceed to the office link frame and determine by visual inspection the particular crosspoint engaged on the primary vertical, thus identifying the office link primary horizontal involved in the connection. The office link secondary vertical may now be determined by the standard link distribution method. For example, the 7 horizontal on the right side of the 2 primary switch connects to the 2 vertical on the right side of the 7 secondary switch. The particular crosspoint engaged on this secondary vertical should then be determined by inspection, thus identifying the secondary horizontal, left to right, involved in the connection. By means of the designation card on the office link secondary bay, determine the terminating office and trunk number involved in the connection.

3.14 Enter the above information on the ticket. Observe that one, and only one, finger is engaged on each horizontal multiple and vertical involved.

Testing Trunk

3.15 After the trace of the originating equipment has been completed, all connections which have terminated on outgoing trunks should be tested at the O.G.T. frame, to obtain additional information. Three voltmeter readings may be required in order to obtain complete information. These are:

- 1 - Voltage across tip and ring
- 2 - Voltage tip side to ground
- 3 - Voltage ring side to ground

3.16 The voltage readings above should be taken as follows:

- (a) Patch a test cord to the trunk with all test frame voltmeter circuit keys normal.
- (b) Operate the FEMF, REV and VM keys. The BY lamp should light if the trunk tests busy.
- (c) Operate the NT key. The reading obtained is the voltage across the tip and ring.

(d) Operate the G key. The reading obtained is the voltage from the tip side to ground.

(e) Restore the REV key. The reading obtained is the voltage from the ring side to ground.

3.17 Enter the above readings in the proper space on the back of the ticket.

3.18 The voltmeter readings in connection with the other information on the ticket will indicate whether the trouble is in the local central office equipment or whether it will be necessary to obtain additional information from the terminating equipment.

3.19 If it is concluded the trouble is not in the local equipment, the trunk should be made busy and the connection traced in the terminating office. In the case of non-repeating type panel incoming trunks, if it is apparent that the selector is off-normal in a 24-volt position, the VM-TLK key should be operated to advance the trunk circuit, in order to avoid holding lines busy falsely. Care should be taken when releasing connections that equipment is not left off normal.

Tracing Call Beyond Trunk

3.20 In some cases it is important that the progress of the call be traced to the terminating end. The sender positions corresponding to the various relay combinations in the sender are:

<u>Relay Combination</u>	<u>Sender Position</u>
S3, S3'	Office Test
S4, S4'	Office Brush
S5, S5'	Office Group
S6, S6'	Trunk Test
S1, S1', FS1, FS2	Incoming Brush
S2, S2', FS1, FS2	Incoming Group
S3, S3', FS1, FS2	Final Brush
S4, S4', FS1, FS2, FS3	Final Tens
S5, S5', FS1, FS2, FS3	Final Units
S6, S6', FS1, FS2, FS3	Incoming Advance

Releasing Stuck Senders

3.21 After completing the investigation of stuck senders, release them as follows:

- (a) Subscriber senders - Sender monitor operation - Request traffic to prime the sender.
- (b) Subscriber senders - Key pulsing senders (timed release senders) - Operate the CTR key.

4. REPORTS

4.01 The required records in this connection should be entered on the proper form.