

METHOD OF HANDLING PERMANENT SIGNALS
ON PERMANENT SIGNAL HOLDING TRUNKS
WITH OR WITHOUT
AUTOMATIC NUMBER IDENTIFICATION
PANEL OFFICES

1. GENERAL

1.01 This section outlines the procedures to be followed by switchmen when handling permanent signals occurring on permanent signal holding trunks in panel offices where the following trunk terminations are used.

A. Trunk Terminates Only at DSA Switchboard (Not Concentrated)

B. Trunk Terminates at the Sender Make-Busy Frame and Served Through Concentrating Circuits to the DSA Switchboard in the Same or in Another Building

1.02 This section is reissued to include a provision for handling permanent signals in offices arranged for automatic number identification (ANI) where any permanent signal holding trunk has been modified to use ANI, and to revise the title accordingly.

1.03 The methods of handling emergency calls outlined in this section are predicated on the provision of emergency bulletin information at the sender make-busy frame, such as is provided to the traffic operating forces.

1.04 Permanent signals are the result of line conditions involving receivers off hook, short circuits, cable failures, or grounded ring conductors causing a subscriber line to be connected to a sender. When no digits are received, the sender times out and the call is routed to an idle permanent signal holding trunk.

A. Trunk Terminates Only at DSA Switchboard (Not Concentrated)

1.05 Each permanent signal holding trunk appearance at the trouble supervisory position (formerly known as the sender monitor po-

sition) of the DSA switchboard consists of a jack, a key, and a lamp. Trunk appearances are usually grouped by class of service such as coin, noncoin, and PBX. When a subscriber line is connected to a permanent signal holding trunk, the associated lamp lights at the switchboard. The trouble supervisory operator attempts to clear the permanent signal; but if unable to do so, reports the trunk number and the number of the district selector frame on which it appears to the central office maintenance force. The trunk also applies high tone to the ring of the line as a *line out of order* signal. In circuits modified to release locked-in 1A key equipment, the tone will be interrupted at the rate of 60 ipm.

1.06 The trouble supervisory operator will ordinarily report permanent signals at predetermined intervals, in accordance with local procedures. However, under the following conditions she will report them without awaiting the usual interval.

- (a) Permanent signals which she classifies as a subscriber emergency call requiring immediate attention.
- (b) When the PS OFL (permanent signal overflow) lamp is lighted indicating that all permanent signal holding trunks are busy.
- (c) When a number of permanent signals appear at about the same time indicating a possible cable failure.
- (d) When a given percentage of trunks, to be determined locally, are busy.
- (e) Lines which have a definite trouble condition.
- (f) Lines which appear in coin groups.
- (g) Lines upon which conversation is heard.

1.07 The following phrases are examples of the terminology which will be used by the operator when making reports to the maintenance force. The nature of the phrase indicates the action that should be taken.

- (a) "Emergency Trace! Permanent Signal 95 Frame 101 — Calling Line Information."
- (b) "P.S. 94 — Frame — 101 — Trace."
- (c) "P.S. 96 — Frame — 104 — Trouble."
- (d) "P.S. 94 — Frame — 106 — Coin Line."
- (e) "P.S. 96 — Frame — 101 — Conversation Heard."

The only cases to be referred back to the trouble supervisory operator are those shown in (a) and (b) above. Cases (c), (d), and (e) will be handled, as required, by the established local procedures. However, a report of "Conversation Heard" may be an indication of a possible double connection and it may be desirable to trace these promptly to obtain the necessary information.

B. Trunk Terminates at the Sender Make-Busy Frame and Served Through Concentrating Circuits to the DSA Switchboard in the Same or in Another Building

1.08 Each permanent signal holding trunk appearance at the sender make-busy frame and each concentrating circuit appearance at the DSA switchboard consists of a jack and three lamps. These lamps are designated C (coin), NC (noncoin), and PB (PBX) to indicate class of service of subscriber line being served. In some cases, the PBX class of service may not be separately grouped.

1.09 When the permanent signal holding trunk is selected, the associated lamp, corresponding to the class of service being served, is lighted steadily at the sender make-busy frame. The trunk then summons a concentrating circuit which locates the trunk and causes the proper class lamp to flash slowly at the trouble supervisory position of the DSA switchboard. The permanent signal holding trunk also applies high tone to the ring conductor of the line as a *line out of order* signal. In circuits modified to release locked-in 1A key equipment, the tone will be interrupted at the rate of 60 ipm.

1.10 In general, the trouble supervisory operator answers the permanent signal. While this connection is established at the DSA switchboard, only a monitoring connection can be established at the sender make-busy frame. If the operator succeeds in clearing the line, the permanent signal holding trunk and the concentrating circuit restore to normal when she disconnects. If the operator can not clear the line when she disconnects, the lamp signal at the DSA switchboard and the concentrating circuit restore to normal. The trunk lamp signal at the sender make-busy frame, however, remains steadily lighted for a predetermined time interval (20 to 42 minutes) after which it changes to a rapidly flashing signal (120 ipm) and a minor alarm sounds.

Note: Permanent signal holding trunks may be equipped with the option *immediate alarm after disconnection*. If this option is provided, whenever the trunk is connected to a coin line, the trunk C lamp at the sender make-busy frame changes to a rapid flash and a minor alarm sounds as soon as the operator disconnects.

1.11 If the signal is not answered at the DSA switchboard within the predetermined time interval, the concentrating circuit is dismissed, the lamp at the switchboard is extinguished, and the trunk lamp at the sender make-busy frame changes to a rapid flash, also, a minor alarm sounds.

1.12 When a permanent signal is answered at the sender make-busy frame before the operator answers, the concentrating circuit is dismissed, the lamp at the switchboard is extinguished, and the steadily lighted C, NC, or PB trunk lamp at the sender make-busy frame changes to a slowly flashing signal (60 ipm) at the end of the timing interval (20 to 42 minutes).

1.13 If a permanent signal is answered at the sender make-busy frame after the timing interval has expired, the rapidly flashing C, NC, or PB lamp changes to a slowly flashing lamp and the minor alarm is retired.

1.14 When the trouble supervisory operator answers a permanent signal which she classifies as an emergency call and she is unable to obtain the subscriber number, she holds the connection and, using the following terminology,

requests the maintenance force to trace the connection:

"Emergency Trace! — Calling Line Information."

1.15 In offices where noncoin and PBX classes of service are not segregated, the trouble supervisory operator may hold the connection and request the maintenance force to "Trace Line," if she wishes to use the howler.

1.16 In those cases where a conversation is present on a permanent signal holding trunk, the operator will hold the connection and report to the maintenance forces "Conversation Heard."

1.17 When an unusual number of permanent signals appear at the sender make-busy frame within a relatively short period of time, it may be desirable to investigate, as this may possibly be an indication of a cable failure.

1.18 At the sender make-busy frames, connections may be made to the permanent signal holding trunks by patching the T jack of the permanent signal holding trunk to the T jack of the voltmeter test circuit. With the test connection established, the maintenance forces can apply any of the following conditions to the subscriber line.

- (a) Talking with loop supervision.
- (b) Ringing on the tip or ring, with or without ringing ground.
- (c) Coin collect or return with a lamp indication to show presence of coin.
- (d) Howler tone application for a receiver-off-hook condition on non-PBX lines.
- (e) Voltmeter tests.

Normally, it is not necessary to test permanent signal holding trunks before tracing, unless otherwise specified in local procedures.

1.19 In addition to its appearance at the sender make-busy frame each permanent signal holding trunk also appears at the outgoing trunk test frame and, when provided, on the test distributor. The latter appearance is used by the repair service testman to obtain direct access to the trunk when testing the reported trouble.

1.20 Permanent signal holding trunks modified for ANI have a connection to a PS- jack on the ANI trouble ticketer frame. This feature provides a means of automatically identifying a line on permanent signal. The ANI permanent signal identification feature has the following limitations.

- (a) PBX lines — will identify the billable number.
- (b) Multiparty — will not identify.
- (c) Coin lines not connected to the number network and primary bus circuit — will not identify.
- (d) Two-party lines — may identify either of two parties regardless of which is originating permanent signal.

2. APPARATUS

- 2.01 Sender make-busy frame test circuit, SD-21697-01.
- 2.02 Miscellaneous circuits for sender make-busy frame, SD-21663-01.
- 2.03 Patching cord, P3F cord, 4 feet long, equipped with one No. 309 plug and one No. 310 plug (No. 3P12A cord).
- 2.04 No. 6A signal plugs (red) or No. 19C shields (red).
- 2.05 No. 6B signal plugs (white) or No. 19B shields (white).
- 2.06 Permanent signal identification circuit, SD-95817-01.

3. METHOD OF HANDLING REPORTS

A. Trunk Terminates Only at DSA Switchboard (Not Concentrated)

3.01 **Emergency Calls:** When the trouble supervisory operator reports, "Emergency Trace! Calling Line Information," request the operator to remain on the talking line and trace the call immediately. When the trace is completed, give the information to the operator.

3.02 **Trace Line:** In offices where the trouble supervisory position is equipped with a howler cord and the PBX class of service is not

segregated, the trouble supervisory operator will request a trace on a receiver-off-hook condition to prevent using the howler on a PBX line. Trace the connection and refer to the trouble supervisory operator.

3.03 Conversation Heard: If the operator reports "Conversation Heard," it may be desirable to trace the call, checking the central office equipment for the possibility of double connections. If no trouble is found in the central office and the conversation is still heard, refer the report to the repair service.

3.04 Coin Line or Trouble: When the operator reports either of these conditions, the connection may be traced. If no trouble is found in the central office, the report may be referred to the repair service.

3.05 PS OFL Lamp Lighted or an Unusual Number of Permanent Signals: If there have been reports that the PS OFL lamp is lighted or that an unusual number of permanent signals appeared within a relatively short period of time, unless otherwise covered in local procedures, a number of them may be traced and the information reported to repair service as a possible cable failure. This procedure may be repeated until the defective cable is located or until all permanent signals have been traced.

3.06 Where local procedures specify that a written record be kept of all permanent signal holding trunks that have been traced, Form E-340 is available. If used, it should include all pertinent data plus the final disposition of the report.

Examples: (1) Referred to trouble supervisory operator, (2) Referred to repair service, or (3) Released while tracing.

B. Trunk Terminates at the Sender Make-Busy Frame and Served Through Concentrating Circuits to the DSA Switchboard in the Same or in Another Building

Calls Handled by the Sender Monitor Operator

3.07 Emergency Calls: When the trouble supervisory operator reports "Emergency Trace! — Calling Line Information," request the operator to stay on the talking line and then take immediate action to identify the permanent signal holding trunk. This can be accomplished by

either one of the following methods as locally agreed upon.

(a) The operator will remain connected to the trunk and repeat the phrase "This is the operator, may I help you?" Using the patching cord, monitor on the permanent signal holding trunks with steady signals until the one the operator is connected to is found.

(b) Obtain the number of the concentrating circuit the operator is connected to and proceed to its associated equipment. At the equipment frame observe the terminal that the 200-type selector is resting on and, from the chart adjacent to the equipment, determine the permanent signal holding trunk connected.

3.08 When the permanent signal holding trunk has been located, place a red signal plug in the jack at the sender make-busy frame and trace the connection. When the trace has been completed, give the information to the operator. Replace the red signal plug with a white signal plug.

Note: A red signal plug is an indication that the trunk is being traced; a white one, that the information has been referred. The white plug is removed when the signal clears.

3.09 Trace Line: When the PBX class of service is not segregated, the trouble supervisory operator may hold the connection and request "Trace Line" to determine class of service of the subscriber line. This is done to avoid use of the howler on PBX lines.

3.10 When the permanent signal holding trunk has been identified as in 3.07, place a red signal plug in the test jack at the sender make-busy frame and trace the connection. When the trace has been completed and the class of service of the subscriber line determined, refer this information to the operator. Replace red signal plug with a white signal plug. See 3.08 note for interpretation of plug colors.

3.11 Coin Lines: When the trouble supervisory operator is unable to dispose of a coin in the hopper and cause the receiver to be placed *on-hook*, she will disconnect.

Note: Where the feature to provide immediate alarm after release by the trouble supervisory operator is furnished, a flashing signal and a minor alarm will immediately

appear at the sender make-busy frame. These signals should be handled according to local instructions.

3.12 Conversation Heard: When the trouble supervisory operator reports "Conversation Heard" on a permanent signal holding trunk, the operator will hold the connection. Unless otherwise specified in local procedures, it is desirable to locate the trunk by the methods outlined in 3.07. The only difference in procedure is that as the craftsman monitors on each of the trunks with a steady signal, he will listen for the conversation instead of the operator's voice.

3.13 When the trunk has been located, request the operator to release the connection. Place a red signal plug in the test jack at the sender make-busy frame and trace the connection. While tracing the connection through the frames involved, check for any possible conditions that may cause a double connection. See 3.08 note for interpretation of plug colors.

3.14 If no trouble is found in the central office and the conversation is still heard, refer the report to the repair service. Replace the red signal plug with a white one. See 3.08 note for interpretation of plug colors.

Calls Handled by the Maintenance Forces

3.15 The maintenance forces may, in accordance with local instructions, trace permanent signal holding trunks and refer them to repair service. In the following cases, give the trunk number and originating line equipment information, unless trouble is found in the central office.

- (a) Trunks referred for tracing by the trouble supervisory operator. (Other than "Emergency" and "Trace Line" cases which are referred to the operator.)
- (b) Trunks on which steady signals have appeared in rapid succession indicating the possibility of a cable failure.
- (c) Trunks associated with the coin class of service on which the class-of-service lamp is flashing at 120 ipm with a minor audible alarm.
- (d) All other trunks on which the class-of-service lamp is flashing at 60 or 120 ipm with a minor alarm.

3.16 While tracing the permanent signal holding trunk, a red signal plug should be placed in the test jack at the sender make-busy frame. When the trace has been completed and referred to repair service, the red signal plug should be replaced by a white signal plug. See 3.08 note for interpretation of plug colors.

3.17 Where local procedures specify that a written record be kept of all permanent signal holding trunks that have been traced, Form E-340 is available. If used, it should include all pertinent data plus the final disposition of the report.

Examples: (1) Referred to trouble supervisory operator, (2) Referred to repair service, or (3) Released while tracing.

4. PROCEDURES FOR IDENTIFYING LINES

Tracing Permanent Signal Connections

4.01 When a permanent signal holding trunk has been referred for tracing for any of the reasons previously mentioned, the following method should be used by the maintenance forces for determining the particular line affected.

Note: When tracing the connection, it is advisable to make the trunk busy at the OGT (outgoing trunk) testboard to prevent re-seizure of the trunk in case the trouble should clear while tracing.

4.02 From local records determine the district selector frame or frames and the bank and terminal on which the trunk appears. At the district frame, determine the particular selector connected to the trunk being traced. This may be done by checking the racks of the selectors having a brush tripped in the permanent signal holding trunk group. The number of the associated line finder frame and selector may now be obtained from the designation bar on the district selector frame.

4.03 At the line finder frame, determine the line group number. From the reading of the rack associated with the line finder selector and the tripped line finder brush, determine the particular terminal in the group which is affected.

ANI Permanent Signal Identification

4.04 When a permanent signal appears at the DSA switchboard or at the sender make-busy frame and it is desired to identify the line, follow procedures covered in Part 3, Method, A or B in whole or in part and then proceed with 4.05 through 4.13; or having received the PSH (permanent signal holding) trunk number from the DSA switchboard operator or the attendant at the sender make-busy frame, proceed as in 4.05 through 4.13.

4.05 At the trouble ticketer frame, connect the cord of the permanent identification circuit to the PS- jack associated with the particular trunk on which the permanent signal is held. The line is then identified in the same manner as an ANI service call, but the outpulser passes the identity of the line along with a PS indication to the trouble ticketer circuit.

4.06 The trouble ticketer circuit will then print a permanent signal record ticket containing the office directory number of the line that is in a permanent signal condition. The TPD lamp at the trouble ticketer frame will light to indicate a ticket has been printed.

4.07 Remove PS cord from PS- jack to restore circuit to normal.

Procedure for Permanent Signal Record Analysis

4.08 The permanent signal record ticket is a slip of yellow paper approximately 4-1/4 inches long and 2-1/2 inches wide with a row of 35 numbers, dashes, and asterisks printed along the top. The remainder of the ticket is blank and provides space for the comments of maintenance personnel. Each character printed, a dash (—), an asterisk (*), or a number (from 0 through 9) under the 35-character positions on the ticket has a meaning as shown in the CD and in the SD information notes of the trouble ticketer circuit. (See Table A.)

4.09 Character positions 11 through 15 give the office and numerals of the billable number assigned to the line that is in a permanent signal condition. The number under character

position 11 stands for the office and the office records will specify the particular office.

4.10 When character position 16 shows a 7, it indicates a nonmultiparty line was identified. When an 8 is recorded, it is a multiparty line and character positions 11 through 15 will show dashes to indicate missing information.

4.11 On 2-party lines, the PS record will always be the ring party unless the ring party is not connected at the number network, and regardless of which station has the permanent signal condition. When the ring party is not connected and the tip party is connected at the number network, the PS record will show the tip party number. When neither tip nor ring party is connected at the number network, an identification failure will occur. If the maintenance man requires the identity of both stations on a 2-party line, the office records must be consulted.

4.12 The trunks in a PBX group are usually interconnected at the number network to permit the directory number of one trunk to be used for billing purposes for the entire group. The PS record will show the billable number only, which may or may not be the particular line responsible for the permanent signal condition.

Permanent Signal Identification Failures

4.13 If the ANI equipment is unable to identify the line, a trouble ticket (5 inches long) is printed (providing the trouble ticketer is available) and the TPD lamp does not light. Failure may occur under the following conditions.

- (a) Permanent signal was removed before PS identification was initiated.
- (b) Attempting to identify coin line not connected to the number network.
- (c) Premature removal of the PS cord from the PS- jack.
- (d) Condition (c), described above, followed by the too rapid insertion of the cord into the PS- jack of a different identifier group.

TABLE A — TICKET ANALYSIS

CHARACTER POSITION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
	*	*	9	0	0	-	0	9	0	-	0	3	4	0	1	7	-	*	-	9	0	0	0	-	1	0	-	-	-	1	5	3	0	*	*
Margin	←										→										←					→									
Permanent Signal Record Ticket	↑										↓										↑					↓									
Always Zeros — Trunk Subgroup 0 Tens & 0 Units	↑										↓										↑					↓									
Always a Dash No Trunk	↑										↓										↑					↓									
Number Registered on PS Call	↑										↓										↑					↓									
Outpulser Used	↑										↓										↑					↓									
Identifier Released	↑										↓										↑					↓									
Identifier Group Number	↑										↓										↑					↓									
Spacer	↑										↓										↑					↓									
Office & Numericals of Billable Number of Line in PS Condition (—) Dash for Multiparty Line	↑										↓										↑					↓									
Multi- or Nonmultiparty Indication — Eight for Multiparty Line	↑										↓										↑					↓									
Outpulser Progress — See Positions 25 & 26	↑										↓										↑					↓									
Identifier Progress — See Position 20	↑										↓										↑					↓									
Spacer	↑										↓										↑					↓									
Outpulser Progress — Identifier Released	↑										↓										↑					↓									
Spare	↑										↓										↑					↓									
Spacers	↑										↓										↑					↓									
Time of Day, Hours, & Minutes	↑										↓										↑					↓									
Margin	↑										↓										↑					↓									

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MARK
Flanked
by Two
Spacers