

**PERMANENT SIGNAL HOLDING TRUNKS
METHOD OF HANDLING PERMANENT SIGNALS
NO. 1 CROSSBAR OFFICES
WITH OR WITHOUT
AUTOMATIC NUMBER IDENTIFICATION**

1. GENERAL

1.01 This section covers the procedures to be followed when handling permanent signals on permanent signal holding trunks in No. 1 crossbar offices with or without Automatic Number Identification.

1.02 This section is reissued:

(a) To include 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.

(b) To include a reference to the BSP section for the procedure for handling permanent signals on lines connected to a 1-type line concentrator.

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 provided to the traffic operating forces.

1.04 Permanent signals are the result of line conditions involving receiver-off-hook, short circuits, cable failures or grounded ring conductors causing a customer's line to be connected to an originating sender. When no digits are received, the sender times out and gives a permanent signal indication to the marker. The call is then directed to a group of permanent signal holding trunks and the sender is dismissed.

1.05 Permanent signal holding trunks modified for ANI have a connection to a jack (PS-) 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 lines — will not identify.

(c) Coin lines are not connected to the number network and primary bus circuit — will not identify.

(d) Step-by-step lines using the local crossbar office as a tandem office — will not identify.

(e) Two-party lines — if both parties are cross-connected, the ring party will always be identified.

1.06 A permanent signal on a customer line connected to a 1-type line concentrator will hold one of the concentrator trunks busy in the connection to the central office. The holding of one or more of the concentrator trunks in this condition may affect the call handling capability of the concentrator. During periods of heavy traffic, when it is recognized that a permanent signal exists on a concentrated line, it may be advisable to release the concentrator trunk for service using the procedures covered in Section 067-105-302.

A. Trunk Terminates Only at the DSA Switchboard

1.07 Each permanent signal holding trunk appearance at the trouble supervisory position (formerly known as the sender monitor position) 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 customer's 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 office link frame on which it appears to the central office maintenance force. The trunk also applies high tone to the ring conductor as a "line out of order" signal.

1.08 Ordinarily, permanent signals are reported at predetermined intervals in accordance with local procedures, but under the following conditions the trouble supervisory operator will report them immediately.

- (a) Permanent signals which she classifies as a customer's emergency call requiring immediate attention.
- (b) When the PS lamp is lighted, indicating that all the 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 approximately 75% of the trunks in any group are busy.
- (e) Lines which have grounded ring conductors.
- (f) Lines which appear in coin groups.
- (g) Lines upon which conversation is heard.

1.09 The following phrases are used by the operator when making reports to the maintenance force. The nature of the phrase indicates the action that should be taken and whether it should be reported back to the trouble supervisory operator or to the repair service.

- (a) "PS Trunk 22, Office Link Frame 4 — Obtain calling line information."
- (b) "PS Trunk 9, Office Link Frame 3 — Trace line."
- (c) "PS Trunk 15, Office Link Frame 2 — Steady signal."
- (d) "PS Trunk 4, Office Link Frame 0 — Coin line."
- (e) "PS Trunk 20, Office Link Frame 1 — Conversation heard — ADam 2-1234 and BEacon 3-5678."

1.10 The only cases to be reported back to the operator are those reports of "obtain calling line information" and "trace line." The first phrase indicates the operator has an emergency call upon which she is unable to secure the customer's number and the second phrase is used to prevent using the howler on a PBX line in offices where the trouble supervisory position is equipped with a howler cord and the PBX class is not segregated. All other cases should be reported to the repair service.

✓ **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**

1.11 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. The lamps are designated C (coin), NC (noncoin) and PB (PBX) to indicate the class of service in central offices arranged to segregate these three classes. Only the lamps required are provided.

1.12 When the permanent signal holding trunk is selected by the marker, the associated lamp, corresponding to the class of service of the line 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 a high tone to the ring conductor of the line as a "line out of order" signal.

1.13 In general, the trouble supervisory operator answers the permanent signal and while the plug is in the jack 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 and 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 the trunk C (coin) lamp at the sender make-busy frame changes to a rapid flash and a minor alarm sounds as soon as the operator disconnects whenever the trunk is connected to a coin line.

1.14 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 and the minor alarm sounds.

1.15 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).

1.16 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.

1.17 When the operator answers a permanent signal which she classifies as an emergency call and she is unable to obtain the customer's number, she holds the connection and requests the maintenance force to "obtain calling line information." The customer's number should be promptly determined and the information given to the operator.

1.18 At the sender make-busy frame, connection to a permanent signal holding trunk is made 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 craftsman can apply any of the following conditions to the customer's 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 a coin.

- (d) Howler tone application for a receiver-off-hook condition on non-PBX lines.

- (e) Voltmeter tests.

1.19 All permanent signals which can not be cleared by the craftsman are reported to the repair service for further action. Cases where conversation is heard on a trunk should be checked for a possible double connection on the link frames involved before referring to the repair service. The following phrases are typical when making these reports in offices where the line equipment records are available. In other offices the line equipment (C-SW-V) shall be substituted for the line number.

- (a) "PS Trunk 22 — ADam 2-0123 — Ground ring."

- (b) "PS Trunk 4 — Conversation heard — ADam 2-1234 and BEacon 3-5678."

- (c) "PS Trunk 20 — ADam 2-9880 — Coin line."

- (d) "PS Trunk 23 — ADam 2-0730 or ADam 2-0731 (2-party line) Short circuit."

- (e) "PS Trunk 46 — ADam 2-4567 — PBX line — Steady signal."

1.20 In addition to its appearance at the sender make-busy frame, each permanent signal holding trunk also appears on the office link multiple at the outgoing trunk test frame and on the test distributor where provided. The former appearance provides a means of making the trunk busy and the latter is used by the repair service testman to obtain direct access to the trunk when testing the reported trouble.

1.21 When a number of permanent signals appear within a relatively short period of time, the condition should be promptly investigated as a possible cable failure indication.

C. Trunk Terminates Only at the Sender Make-Busy Frame

1.22 Each permanent signal holding trunk appearance at the sender make-busy frame usually consists of a jack and a lamp, but in offices where the coin district junctor circuits

are not arranged for automatic coin disposal on calls to the operator, an additional coin supervisory jack and lamp are provided. Permanent signal holding trunks are usually grouped into three classes, Coin, Noncoin and Non-PBX and PBX.

1.23 When a permanent signal holding trunk is selected by the marker, the lamp at the sender make-busy frame lights steadily but no audible alarm sounds. If the signal is not answered within the predetermined time interval (20 to 42 minutes) the lamp changes to a rapid flash (120 IPM) and the minor alarm sounds. Whenever the signal is answered the lamp changes to a slow flash (60 IPM) and the audible alarm is retired if operated. The permanent signal holding trunk also applies high tone to the ring conductor as a "line out of order" signal.

1.24 At the sender make-busy frame, connection to a permanent signal holding trunk is made by patching the T jack of the trunk to the T jack of the voltmeter test circuit. With the test connection established, the craftsman can apply any of the following conditions to the customer's line:

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

1.25 All permanent signals that can not be cleared by the craftsman are reported to the repair service for further action. Cases where conversation is heard on a trunk should be checked for possible double connection on the link frames involved before reporting to the repair service. The following phrases are typical when making these reports in offices where the line equipment records are available. In other offices the line equipment (C-SW-V) shall be substituted for the line number.

- (a) "PS Trunk 22 — ADam 2-0123 — Ground Ring."
- (b) "PS Trunk 4 — Conversation Heard — ADam 2-1234 and BEacon 3-5678."

(c) "PS Trunk 20 — ADam 2-9880 — Coin Line."

(d) "PS Trunk 23 — ADam 2-0730 or ADam 2-0731 (2-Party Line) Short Circuit."

(e) "PS Trunk 46 — ADam 2-4567 — PBX Line — Steady Signal."

1.26 If conversation or sounds are heard which indicate that assistance of an emergency nature may be required by the customer, proceed immediately as outlined in 3.31.

1.27 Should a number of permanent signals appear within a relatively short period of time, the condition should be promptly investigated as a possible cable failure indication.

1.28 All trouble tickets originated by the maintenance force for tracing purposes shall show the complete information as regards the report, the trace and the final disposition. Connections may be traced as outlined in 4.01 through 4.10. Customer's lines arranged for AN1 may be identified as outlined in 4.11 through 4.20.

1.29 When signal plugs or shields are used to indicate the status of permanent signals, they should be used in the following manner:

- (a) Blue signal plug or black shield in jack indicates the permanent signal has been tested at SMB frame.
- (b) Red signal plug or shield in jack indicates the trunk has been referred for tracing.
- (c) White signal plug or shield in jack indicates the trouble has been referred to the repair service or to the trouble supervisory operator.

2. APPARATUS

2.01 Sender make-busy frame test circuit J27950 (SD-21697-01).

2.02 Miscellaneous circuits for sender make-busy frame J27950 (SD-25076-01).

2.03 Permanent signal identification circuit (SD-95817-01).

2.04 No. 67C test set (for use where PST key is provided).

- 2.05 Patching cord, P3F cord, 6 feet long, equipped with one No. 309 plug and one No. 310 plug (No. 3P12F cord).
- 2.06 No. 322A (make-busy) plugs, as required.
- 2.07 No. 6A signal plugs (red) or No. 19C shields (red) (for 92-type jacks).
- 2.08 No. 6B signal plugs (white) or No. 19B shields (white) (for 92-type jacks).
- 2.09 No. 6C signal plugs (blue) (for 92-type jacks).
- 2.10 No. 19A shields (black) (for 49-type jacks).

3. METHOD OF HANDLING REPORTS

A. Trunk Terminates Only at the DSA Switchboard

- 3.01 **Emergency Calls:** When the operator reports "obtain calling line information," request the operator to remain on the talking line, obtain the line number immediately and 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 is not segregated, the operator will request a trace on a receiver-off-hook condition to prevent using the howler on a PBX line. Obtain the line number and refer to the operator.
- 3.03 **"Conversation Heard":** If the operator reports "conversation heard" trace the call promptly, checking the connections on the link frames involved for possible double connections. If trouble is found, clear it in the approved manner. If no trouble is found in the central office, refer the report to the repair service.
- 3.04 **"Steady Signal, Ground Ring, Coin Line":** When the operator reports any of these conditions trace the connection or initiate the permanent signal identification procedure and refer the report to the repair service.
- 3.05 **"PS Lamp Lighted or a Number of Permanent Signals":** If the operator reports that a PS signal lamp is lighted or that a number of permanent signals appeared within a rela-

tively short period of time, trace or identify a number of them immediately and report them to the repair service as a possible cable failure. Repeat this procedure until the defective cable is located or until all permanent signals have been traced or identified.

Note: In offices equipped with a PST key, proceed as outlined in 4.21.

B. Trunk Terminates on 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 Trouble Supervisory Operator

3.06 **Emergency Calls:** When the operator reports "obtain 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:

- (a) Request the operator to remain connected to the trunk and to repeat the phrase, "This is the operator, may I be of assistance." Then, using the patching cord, monitor on the permanent signal holding trunks in use 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.

3.07 When the permanent signal holding trunk has been located, place a red signal plug in the jack at the sender make-busy frame, obtain the line number and give the information to the operator. Replace the red signal plug with a white signal plug.

3.08 **"Conversation Heard":** When the operator reports "conversation heard" on permanent signal holding trunk, request the operator to hold the connection and then act promptly to locate the trunk. This can be accomplished by the methods outlined in 3.06 with the following exception: Do not request the operator to speak

on the trunk but monitor on the trunks in use until the one with conversation on is found.

3.09 When the trunk has been located, place a red signal plug in the jack at the sender make-busy frame and trace the connection. While tracing the connection through the link frames involved, check for any possible condition that may cause a double connection.

3.10 If trouble is found in the central office, clear it using the approved methods and request the operator to disconnect the cord.

3.11 If no trouble is found in the central office, request the operator to disconnect the cord and refer the report to the repair service. Replace the red signal plug with a white signal plug.

Calls Handled by the Maintenance Force

3.12 When a permanent signal appears at the sender make-busy frame as indicated by a steady NC, PB, C or a rapid flashing C lamp, patch the T jack of the voltmeter test circuit to the T jack of the trunk using the P3F cord.

Note: Before patching to the trunk, observe that the CCB (concentrating circuit busy) lamps associated with the concentrating circuits are extinguished, otherwise only a monitoring connection can be established.

3.13 With the patching connection established, make the proper voltmeter tests in accordance with approved procedures to determine the cause of the permanent signal.

Note: Facilities for making the various tests outlined in 1.18 are provided in the sender make-busy frame test circuit but should only be used in accordance with local procedures.

3.14 If the permanent signal clears while the voltmeter tests are being made, no further action is required.

3.15 *Receiver-Off-Hook. (Noncoin, PBX and Coin Lines — PSHT Not Equipped with Immediate Alarm):* If the voltmeter tests indicate a receiver-off-hook condition, place a blue signal plug in the trunk jack and allow the cir-

cuit to time for the predetermined interval (20 to 42 minutes).

3.16 When the time interval has elapsed as indicated by the steady trunk signal changing to a slowly flashing signal (60 IPM), replace the blue signal plug with a red signal plug and originate a trouble ticket for tracing purposes or initiate the ANI permanent signal identification procedure.

3.17 When the trace or identification is completed, refer the report to the repair service. Replace the red signal plug with a white signal plug.

3.18 *Short Circuits — Ground Ring, Etc (All Classes), Receiver-Off-Hook. (Coin Lines — PSHT Equipped with Immediate Alarm):* When the voltmeter test indicates any of these conditions, place a red signal plug in the trunk jack and originate a trouble ticket for tracing purposes or initiate the ANI permanent signal identification procedure.

3.19 When the trace or identification is completed, refer the report to the repair service and replace the red signal plug with a white signal plug.

3.20 When a number of permanent signals appear at approximately the same time, the craftsman shall trace or identify a number of them promptly and refer to the repair service as a possible cable failure. Repeat this procedure until the defective cable has been identified or until all the signals have been traced or identified.

Note: In offices equipped with a PST key, proceed as outlined in 4.21.

3.21 *Supervision of Trunk Signals:* If the trunk lamp is flashing rapidly and there is no signal plug in the jack, it is an indication that a line has seized the trunk and no action has been taken by the maintenance force. Proceed as for a new call.

3.22 If the trunk lamp is flashing rapidly and there is a signal plug in the jack, it is an indication that the original line has cleared and a second line has seized the trunk; remove the plug and proceed as for a new call.

C. Trunk Terminates Only at the Sender Make-Busy Frame

3.23 When a permanent signal appears at the sender make-busy frame, as indicated by a steady or rapidly flashing trunk lamp, patch the T jack of the voltmeter test circuit with the T jack of the trunk and challenge on the trunk.

Response Received

3.24 If a response is received, the craftsman shall identify himself as an employee and attempt to determine the cause of the signal.

3.25 If it appears that the customer is attempting to make a call, is waiting for the operator to answer or has delayed start of dialing unnecessarily, request that the customer hang up and attempt the call again.

3.26 If it appears that the customer does not understand how to use the dial or reports a cutoff, request that the customer hang up and dial the operator.

3.27 In case the customer reports trouble, request the number and originate a trouble ticket. Disconnect and report the trouble to the repair service. If the trunk lamp remains lighted, place a white signal plug in the jack.

Note: If, in any of these cases, the trunk is marked as a coin trunk, momentarily operate the CR key before disconnecting.

3.28 *Emergency Calls (Customer on the Line):*

If the customer wishes to report a fire, summon the police, or indicates that the call is of an emergency nature, obtain the customer's telephone number and address including the town name. Enter this information on the trouble ticket and inform the customer that it will be reported immediately.

3.29 If the customer wishes to report the emergency, use one of the following methods:

- (a) If the office is equipped with an emergency jack bridged to the outgoing dial line, dial the operator on the outgoing dial line and give her the information. Then patch the emergency jack to the permanent signal holding trunk using a patching cord.

- (b) If the office is not equipped with an emergency jack, dial the operator on the outgoing dial line, give her the information and instruct her to connect to the customer's line using a no-test trunk.

In either case, operate the transmitter cutout key and monitor on the call until its completion.

3.30 If the customer can not stay on the line, relay the information direct to the proper authorities or refer it to the chief operator at the distant DSA switchboard in accordance with local procedures. In either case, hold the connection on the permanent signal holding trunk until the customer hangs up.

3.31 *Emergency Calls (Customer Not on the Line):*

If, when answering a permanent signal, conversation or sounds are heard that indicate an emergency, hold the connection and originate a trouble ticket for tracing or identification purposes. When the customer's number has been determined, proceed as outlined in 3.30.

3.32 *Conversation Heard:* If conversation is heard on a permanent signal holding trunk, attempt to obtain the customer's number, originate a trouble ticket and place a red shield in the trunk jack.

3.33 While tracing the connection through the link frames involved, check for any condition that may cause a double connection. If trouble is found, clear it using the approved methods.

3.34 If no trouble is found in the central office, refer the report to the repair service and replace the red shield with a white shield.

No Response Received

3.35 If no response is received when challenging on a trunk, make the proper voltmeter tests in accordance with approved procedures to determine the cause of the permanent signal.

Note: Facilities for making the various tests outlined in 1.24 are provided in the sender make-busy frame test circuit but should only be used in accordance with local procedures.

3.36 If the permanent signal clears while the voltmeter tests are being made, no further action is required.

3.37 **Receiver-Off-Hook:** When the voltmeter tests indicate a receiver-off-hook condition, place a black shield in the trunk jack and originate a trouble ticket for future tracing or identification. At the end of the time interval as determined by local procedure, replace the black shield with a red shield and trace the connection or initiate the ANI permanent signal identification procedure.

3.38 When the trace or identification has been completed, refer the report to the repair service and replace the red shield with a white shield.

3.39 **Trouble Conditions (Short Circuits, Ground Ring, Etc.):** If a trouble condition is indicated by the voltmeter tests, place a red shield in the jack and originate a trouble ticket or initiate the ANI permanent signal identification procedure.

3.40 When the trace or identification has been completed, refer the trouble to the repair service and replace the red shield with a white shield.

3.41 When a number of permanent signals appear at approximately the same time, trace or identify a number of them promptly and refer them to the repair service as a possible cable failure. Repeat this procedure until the defective cable has been identified or until all the signals have been traced or identified.

Note: In offices equipped with a PST key, proceed as outlined in 4.21.

3.42 **Supervision of Trunk Signals:** A shield in the trunk jack, with the lamp extinguished, indicates the line has cleared. Remove the shield.

3.43 A shield in the trunk jack, with the lamp lighted steadily or flashing rapidly, indicates that the original line has cleared and a second line has seized the trunk. Remove the shield and proceed as for a new call.

4. PROCEDURES FOR DETERMINING LINE NUMBERS

Tracing Permanent Signal Connections

4.01 When a permanent signal has been referred for tracing for any of the reasons previously mentioned, the following method shall be used by the maintenance force.

Note: When tracing the connection, it is advisable to make the trunk busy at the OGT board to prevent reseizure in case the trouble should clear while tracing.

4.02 To trace the connection and identify the customer's line, proceed to the office link frame shown on the trouble ticket and determine from the designation cards the horizontal level and, in case of split horizontal multiple, the side of the office secondary switch on which the trunk appears. The particular crosspoint engaged on this horizontal level shall then be determined by visual inspection, thus identifying the office secondary vertical involved.

Example: Secondary switch No. 5, vertical 2L (2 Left).

4.03 From the secondary switch and vertical, determine the primary switch and horizontal by the standard link distribution method. The left section of the secondary switch is always connected to the left section of the primary switch and the right section of the secondary switch is always connected to the right section of the primary switch.

Example: Secondary switch No. 5, vertical 2L (2 Left) is connected to primary switch No. 2, horizontal 5L (5 Left).

4.04 The particular crosspoints engaged on this primary horizontal shall then be determined by visual inspection, thus identifying the office primary vertical involved. By means of the designation cards, determine the corresponding district link frame and district link secondary vertical.

4.05 Proceed to the district link frame and determine by visual inspection the particular crosspoints engaged on the secondary vertical, thus determining the district link secondary horizontal involved in the connection. The district link primary vertical shall now be determined by the standard link distribution method.

Example: Secondary switch No. 1, horizontal 8R (8 Right) is connected to primary switch No. 8, vertical 1R (1 Right).

4.06 The particular crosspoint engaged on the primary vertical shall be determined by visual inspection, thus identifying the district link primary horizontal involved. The primary district link switch and horizontal numbers identify the corresponding district junctor circuit.

4.07 Obtain the numbers of the line link frames and secondary link switches having access to the district junctor involved from the designation card on the district junctor frame and enter this information on the trouble ticket.

4.08 Proceed to the first line link frame listed and examine the secondary switch and vertical noted on the ticket. If the magnet of this vertical is not operated, proceed to the other line link frame listed and repeat the procedure. When an operated magnet is found observe the crosspoint engaged, thus identifying the secondary horizontal involved in the connection. The line link primary horizontal shall then be determined by the standard link distribution method.

Example: Secondary switch No. 3, horizontal 9 is connected to primary switch No. 9, horizontal 3.

4.09 Determine by visual inspection the particular crosspoint engaged on the primary switch horizontal, thus identifying the line link primary vertical which corresponds to the originating line. Record the primary bay, switch and vertical on the trouble ticket.

Note: Verification of the trace may be made by connecting a handset to the line equipment and attempting to meet the customer or listening for permanent signal tone.

4.10 With the customer's line equipment noted on the trouble ticket, refer to the office records, if available, to obtain the directory number (or numbers) and the class of service. The trouble ticket shall then be disposed of as outlined in the preceding paragraphs.

Note: If the permanent signal holding trunk has been made busy while tracing, release it at this time.

ANI Permanent Signal Identification Procedure

4.11 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 3A, B, or C as required. Then proceed with 4.12 through 4.20, or having received the PSH trunk number from the DSA switchboard operator or the sender make-busy frame, proceed as in 4.12 through 4.20.

4.12 At the trouble ticketer frame connect the PS cord of the permanent signal identification circuit to the PS- jack of the particular permanent signal holding trunk. 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.

4.13 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.

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

Caution: *If PS cord is allowed to remain in the PS jack, the ground on the cord will hold up the connection all the way to the line link even after the permanent signal condition is removed. The customer is denied service until the PS cord is removed.*

Note: If the PS cord is inserted into a PS-jack where no permanent signal exists and left there, a trouble ticket will be printed with no line identification and the following may occur. If a permanent signal appears, the marker might attempt to select the permanent signal holding trunk associated with the particular PS- jack containing the PS cord. The trunk would appear idle, but upon seizure the ground on the PS cord would cause the marker to detect a crossed sleeve condition (XS lamp) and produce a trouble indicator display.

Procedure for Permanent Signal Record Analysis

4.15 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 CD-95816-01 and in SD-95816-01 information notes of the trouble ticketer circuit. Table A shows a typical permanent signal record ticket.

4.16 Character positions 11 through 15 give the office and numericals 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.

4.17 When character position 16 shows a 7, it indicates a line other than a multiparty line was identified. When an 8 is recorded, it is a multiparty line and character positions 11 through 15 will show dashes to indicate that office and numericals can not be identified.

4.18 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. If no cross connections have been placed for a particular number, a PS record attempt would result in an identification failure. If the identity of both stations on a 2-party line is required, the office records must be consulted.

4.19 The networks associated with the trunks in a PBX group are usually multiplied 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

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

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

Procedure in Case of a Cable Failure — Offices Equipped with a PST Key

4.21 When the operator reports or the maintenance force observes a number of permanent signals appearing at approximately the same time, operate the PST key usually located at the end of the line distributing frame. With this key operated, high tone is applied to the sleeve conductors of all customer lines connected to a permanent signal holding trunk. The craftsman shall, therefore, connect one side of his test set through a capacitor to ground and with the other side of the test set run down the sleeve terminals of the directory number or line equipment terminal strips. When a number of lines are found with tone on the sleeve terminals, refer them to the repair service before completing the test of the remaining lines. This procedure shall be repeated until the defective cable has been identified or until all the lines have been tested.

5. REPORTS

5.01 The required records in this connection shall be entered on the proper forms.

TABLE A — TICKET ANALYSIS

