METHOD OF HANDLING PERMANENT SIGNALS USING MASTER TEST FRAME NO. 5 CROSSBAR OFFICES

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1. GENERAL

1.01 This section is reissued to include procedures for handling permanent signals in offices arranged for permanent signal expanded routing feature. Since this reissue covers a general revision, arrows ordinarily used to indicate changes have been omitted.

1.02 Permanent signals are the result of line conditions involving receivers off-hook, short circuits, cable failures or grounded ring conductors, causing a customer line to be connected to an originating register. When no digits are received, the originating register times out and gives the marker a permanent signal indication. Where the marker ***is not arranged for permanent signal expanded routing feature,*** the marker then attempts to terminate the call first to a permanent signal

holding trunk (40 trunks maximum) where the customer line may be connected to an auxiliary trunk for automatic application of receiver off-hook announcement and tone or to an operator through a concentrating circuit. If the marker is unable to complete a connection to the permanent signal holding trunk group, a route advance by the marker is made to a common overflow trunk (100 trunks maximum) where interrupted high tone is returned to the connected line. Where the marker ***is arranged for permanent signal expanded routing feature,*** the marker will test each permanent signal through a test termination using a trunk appearance circuit (dummy trunk) on the trunk link frame before final routing. The marker is arranged to distinguish, within practical limits, between a trouble condition and a receiver off-hook condition. The marker then attempts to route advance to a PSG trunk (common overflow trunk) for all trouble conditions where interrupted high tone is returned to the connected line or to an ROH trunk (permanent signal holding trunk) for all receiver off-hook conditions where the customer line may be connected to an auxiliary trunk for automatic application of receiver off-hook announcement and tone or to an operator through a concentrating circuit. If the marker is unable to complete a connection to the PSG trunk group, ROH trunk group, or trunk appearance circuit, a route advance by the marker is made to a selected ***overflow link*** termination where interrupted high tone is returned to the connected line. The customer line is also accessible, free of central office equipment, to the master test frame and local test desk. Generally, the local test desk handles a permanent signal only upon request of the central office maintenance force.

A. Permanent Signal Holding Trunks

1.03 Where the marker ***is not arranged for permanent signal expanded routing feature,*** the marker attempts to complete a connection to the permanent signal holding trunk to terminate a customer line on which there is any type of permanent signal condition. Where the marker ***is arranged for permanent signal expanded routing feature,*** the marker attempts to complete a connection to a permanent signal holding trunk to terminate a customer line, only after it has made a permanent signal test and has determined that a receiver off-hook condition exists.

1.04 In any marker group, each permanent signal holding trunk appearance on the master test frame jack bay and trouble supervisory position consists of a jack and three lamps. The lamps are designated NC (noncoin), C (coin), and PB (PBX) to indicate the class of customer line. When a customer line is connected to a permanent signal holding trunk, the marker sets the trunk to light the lamp which indicates the class on the master test frame jack bay and at the trouble supervisory position. The lamp is extinguished at the trouble supervisory position if the signal is not answered within a predetermined time, and the indication at the master test frame changes from a steadily lighted lamp to 120-ipm flashing lamp and a minor alarm is sounded. The permanent signal holding trunk applies high tone to the ring conductor to indicate a line out of service to the traffic force and to aid the maintenance personnel in tracing the line.

1.05 When automatic application of receiver off-hook announcement and tone feature is provided, the customer line is first connected to an auxiliary trunk for receiver off-hook announcement and tone. If the permanent signal has not been cleared during this action, the concentrating circuit then connects the trunk to a switchboard position. If the signal is answered at the trouble supervisory position, only a monitoring connection can be established from the master test frame or local test desk. When a permanent signal is answered at the master test frame or local test desk before the operator answers, the permanent signal lamp at the trouble supervisory position is extinguished.

1.06 If the operator is answering the call as the timed interval ends, the following conditions will exist.

(a) On a permanent signal holding trunk circuit with no provision for coin return after disconnect, the trouble supervisory operator will be disconnected automatically.

(b) On a permanent signal holding trunk circuit with provision for coin return after disconnect, the trouble supervisory operator holds the trunk circuit as long as the switchboard connection is maintained.

1.07 If a permanent signal is answered at the master test frame or local test desk before the timing interval has expired, the steadily lighted NC, C, or PB trunk lamp at the master test frame

changes to a 60-ipm flashing lamp at the end of the timing interval.

1.08 If a permanent signal is answered at the master test frame or local test desk after the timing interval has expired, the 120-ipm flashing NC, C, or PB trunk lamp at the master test frame changes to a 60-ipm flashing lamp and the alarm is silenced.

1.09 If the permanent signal is caused by a receiver off-hook condition and the operator is successful in causing the customer to replace the receiver, the permanent signal trunk is restored to normal. The lighted NC, C, or PB lamps at both the trouble supervisory position and master test frame are then extinguished.

1.10 If the operator cannot clear a permanent signal and disconnects, the NC, C, or PB lamp at the trouble supervisory position is extinguished, but the lamp will remain lighted at the master test frame until the end of the timed interval when the lamp changes to a 120-ipm flashing signal and a minor alarm is sounded.

1.11 When the operator cannot clear a permanent signal which is operator classified as a customer emergency call requiring immediate attention, the operator requests the maintenance force to identify the line. The maintenance personnel obtains the trunk number from the master test frame and then identifies the line connected to the trunk. This information is then given to the operator.

1.12 Permanent signal holding trunks may be equipped with the option "immediate alarm after disconnect." If the operator disconnects without clearing the permanent signal from such a trunk when it is connected to a coin line, the CN lamp at the master test frame immediately flashes at 120-ipm and sounds the minor alarm. The permanent signal alarm is then handled by the maintenance force.

1.13 At the master test frame, connection to a permanent signal holding trunk is made by patching from the T jack of the permanent signal holding trunk to the T1 jack of the voltmeter test circuit. The master test frame telephone circuit provides a talking connection from the voltmeter test circuit. Where the office is equipped with range extension for unigauge cabling, tone signals are provided to indicate whether a non-long loop or a long loop line is associated with the permanent signal holding trunk. With the connection to the trunk established, the maintenance personnel can perform any of the following operations to the customer 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 to customer line for an off-hook condition

(e) Voltmeter tests.

B. Common Overflow Trunks

1.14 Where the marker ***is not arranged for permanent signal expanded routing feature,*** the marker will complete a connection to a common overflow trunk to terminate a customer line on which there is any type of permanent signal condition, only after it was unable to complete a connection to a permanent signal holding trunk group due to an all permanent signal holding trunk busy condition or no channel available to the permanent signal holding trunks. Where the marker ***is arranged for permanent signal expanded routing feature,*** the marker attempts to complete a connection to a common overflow trunk to terminate a customer line, only after it has made a permanent signal test and has determined that a trouble condition other than a receiver off-hook condition exists.

1.15 In any marker group each common overflow trunk appearance on the marker test frame jack bay consists of a T jack and PS lamp. If the OTC lamp and OTC key are also provided, the OTC key must be held operated in order to determine the amount of permanent signals that have reached the overflow trunks indicated by lighted PS lamps. The OTC lamp lighed indicates that at least one permanent signal has reached an overflow trunk. When a customer line is connected to a common overflow trunk and the OTC key (if provided) is held operated, the associated PS lamp will light and a signal will be passed to the permanent signal alarm circuit as indications of a

permanent signal condition on this trunk. The common overflow trunk then applies interrupted high tone to the customer line to aid maintenance personnel in tracing the line.

1.16 At the master test frame, connection to a common overflow trunk is made by patching from the T jack of the common overflow trunk to the T1 jack of the voltmeter test circuit. The master test frame telephone circuit provides a talking connection from the voltmeter test circuit. If a test cord is connected to this trunk and the permanent signal condition is cleared before the test cord is removed, the trunk will not release until the test cord is removed. If the permanent signal condition clears before a test cord is connected to this trunk, the trunk will release and restore to its normal idle condition and the PS lamp will extinguish. With the test connection to the trunk established, the maintenance personnel can perform any of the following operations to the customer line.

Note: Where the office is arranged for range extension for unigauge cabling, it is not presently possible to distinguish between a non-long loop and a long loop line. Therefore, in those offices, these procedures do not apply.

(a) Talking with loop supervision

(b) Ringing on tip or ring with or without ringing ground.

(c) Voltmeter tests.

(d) Howler tone application to customer line for an off-hook condition.

C. Overflow Links

1.17 There are twenty overflow links provided for each overflow trunk circuit and one overflow trunk circuit is provided for each trunk link frame arranged for ***permanent signal expanded routing feature.*** The marker will complete a connection to an overflow link to terminate a customer line on permanent signal, only after it was unable to complete a connection to a PSG trunk, ROH trunk, or trunk appearance circuit due to an all trunk busy or no channel available condition. 120-ipm overflow tone is then applied to the customer line when connected to any overflow link.

1.18 In the marker group arranged for ***permanent signal expanded routing feature,*** a monitor and release control circuit consisting of TL-PC00-19 lamps, a RLS-PC key, a RLS-TL key, a MON jack, and a MON lamp is provided at the master test frame jack bay for common use for monitoring and testing all overflow links on any trunk link frame arranged for use with overflow trunk circuits.

1.19 When any of the twenty overflow links within an overflow trunk circuit on a trunk link frame are connected to a customer line, the TL-PC00-19 lamp associated with that trunk link frame will light as an indication of at least one permanent signal connection within that overflow trunk circuit. With a permanent signal connection to an overflow trunk circuit established, the maintenance personnel can perform the following operation to customer lines.

Note: Where the office is arranged for range extension for unigauge cabling, it is not presently possible to distinguish between a non-long loop and a long loop line. Therefore, in those offices, these procedures do not apply.

(a) Select a particular overflow trunk circuit.

(b) Select an individual overflow link within the selected overflow trunk circuit.

(c) Patching MON jack of monitor and release control circuit to T1 jack of voltmeter test circuit.

(d) Talking with loop supervision.

(e) Coin return on coin lines.

(f) Voltmeter tests to distinguish between receiver off-hook conditions and trouble conditions.

(g) Ringing on tip or ring with or without ringing ground.

(h) Howler tone application to customer line for an off-hook condition.

(i) Subscriber cable failure procedures for trouble conditions.

D. Trouble Records and Alarms

1.20 Where the marker ***is not arranged for permanent signal expanded routing feature,*** means are provided for recording permanent signals on trouble recorder cards for both the permanent signal holding trunk and common overflow trunk groups. When the APS/NPS key is operated to the APS position, all subsequent permanent signals will be recorded; when operated to the NPS position no permanent signals will be recorded. When the APS/NPS key is in the normal position, the number of recordings from these two trunk groups is controlled by cross-connections placed in the permanent signal alarm circuit (cross-connected for operation of an accumulation of 2 to 41 permanent signals). If the PST key on the master test frame jack bay is provided, momentary operation of the PST key (pull-push) associated with each permanent signal holding trunk with the APS/NPS key operated to the APS position will release and then reestablish an existing permanent signal in order to obtain a trouble record. When the marker ***is arranged for permanent signal expanded routing feature,*** means are provided for recording permanent signals on trouble recorder cards for the ROH trunk group, the PSG trunk group, and the overflow links. When the APS/NPS key is operated to the APS position, all subsequent permanent signals will be recorded; when operated to the NPS position; no permanent signals will be recorded. When the APS/NPS key is in the normal position, all permanent signals except receiver off-hook condition will be recorded. If the PST key on the master test frame jack bay is provided, momentary operation of the PST key (pull-push) associated with each permanent signal holding trunk with the APS/NPS key operated to the APS position will release and then reestablish an existing permanent signal receiver off-hook condition in order to obtain a trouble record.

1.21 Where the marker ***is not arranged for permanent signal expanded routing feature,*** a permanent signal alarm is provided for use with ***both*** the permanent signal holding trunk and common overflow trunk groups. A major alarm is sounded with the APS/NPS key in the normal position when there is a predetermined number (2 to 41) of permanent signals originated from these two trunk groups at one time. Where the marker ***is arranged for permanent signal expanded routing feature,*** a permanent signal alarm is provided for use with ***only*** the PSG trunk group (common overflow trunks). A major alarm is sounded with the APS/NPS key in the normal position when there is a predetermined number (2 to 41) or permanent signals originated from this trunk group at one time.

1.22 In offices where the permanent signal alarm is controlled from the jack, lamp, and key circuit, a PSA lamp is also lighted when the major alarm sounds. Momentary operation of the PSA-AR key will determine whether or not the condition that caused the alarm is still present. If the PSA lamp remains lighted after the operation of the PSA-AR key, the major alarm may be silenced by momentary operation of the PSAC key but the PSA lamp remains lighted as a guard signal. When the permanent signals are cleared, the alarm circuit may be restored to normal by momentary operation of the PSA-AR key. The PSA lamp will extinguish and the major alarm will silence if the PSAC key had not been previously operated. In offices where the permanent signal alarm is controlled from an equipment unit at a relay rack, a MP lamp at the unit is also lighted when the major alarm sounds. The major alarm may be silenced by momentarily operating the CO swich on the equipment unit but the MP lamp remains lighted. When the permanent signals are cleared, the alarm circuit may be restored to normal by momentary operation of the AR switch on the unit. The MP lamp will extinguish and the major alarm will silence if the CO switch had not been previously operated.

1.23 In any marker group, all permanent signals which cannot be cleared by the maintenance personnel at the master test frame are ordinarily reported to repair service for further action after the line has been identified.

Note 1: If the office records for determining the line number are not available at the maintenance center and the office is not equipped with AMA, submit the trunk number and the customer line location to the repair service.

Note 2: In offices with AMA, the line number may be obtained by using the master test frame and the transverter on all but PBX and coin class of service. For PBX and coin, follow procedure in Note 1.

1.24 In any marker group, a permanent signal on a customer line served by a 1A or 2A 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 capacity of the concentrator. To release the concentrator trunk for service, use the procedure covered in Section 067-105-302 or 067-109-302 for the 1A or 2A line concentrator, respectively.

2. APPARATUS

2.01 Master test frame jack, lamp, and key circuit (SD-25762-01).

2.02 Master test frame miscellaneous circuit (SD-25574-01).

2.03 Voltmeter test circuit (SD-25792-01).

2.04 Telephone, key, and lamp circuit (SD-25744-01).

2.05 Patching cord, P3F cord, 4 feet long, equipped with one 309 plug and one 310 plug (3P12A cord).

3. METHOD

A. Permanent Signal Holding Trunks

3.01 If a permanent signal indication appears at the master test frame jack bay as indicated by a flashing (120-ipm) NC, C, or PB trunk lamp, patch the T jack of the trunk to the T1 jack of the voltmeter test circuit. Where the office is eqipped with range extension for unigauge cabling and an NC or PB lamp is lighted, it is necessary to monitor on the trunk to determine whether a non-long loop or a long loop customer line is associated with the permanent signal. This is accomplished by operating the T and PSM keys at the voltmeter test panel. Steady high tone indicates connection to a non-long loop line. In this case the PSM key is restored and the procedures in 3.02 are applied. High tone interrupted at 60-ipm rate increases connection to a long loop line. In this case, the LOLP key is operated and the PSM key is restored before applying the procedures in 3.02.

Note: In some cases it may be desirable to follow these procedures for steadily lighted NC, C, or PB trunk lamp indications. When a connection is made to a trunk under this condition and the signal has been answered at the trouble supervisory position, a monitoring connection only is established at the master test frame.

Permanent Signal Expanded Routing Feature *Not* Provided

3.02 Perform voltmeter tests in accordance with approved procedures to determine whether the permanent signal is a trouble condition or a receiver off-hook condition (refer to 1.03), and if a trouble condition is inside or outside the office.

3.03 If the voltmeter tests indicate a receiver off-hook condition, perform the following operations in accordance with approved procedures to attract the attention of the customer.

(a) Talk on the line.

(b) Apply ringing current.

(c) Apply howler tone (only in accordance with local procedures).

3.04 If the action in 3.03 causes the customer to replace the receiver on the hook, clearing the permanent signal, no further investigation is required. If the permanent signal is ***not*** cleared as outlined in 3.02 and 3.03 proceed to 3.05.

3.05 Originate a trouble record report for the repair service clerk. On this report, record the permanent signal holding trunk number, line location, class of service, and the line number. The method used for determining the line location and line number depend on whether or not a trouble recorder card was produced for the permanent signal (refer to 1.20). If a trouble recorder card was produced, determine the line location and line number as outlined in 4.01 through 4.07. If a trouble recorder card was ***not*** produced and the PST key is provided, determine the line location and line number as outlined in 4.08 and 4.09. If a trouble recorder card was ***not*** produced and the PST key is ***not*** provided, determine the line location and line number as outlined in 4.10 through 4.20.

Permanent Signal Expanded Routing Feature Provided

3.06 Perform voltmeter tests in accordance with approved procedures to verify that the permanent signal is a receiver off-hook condition (refer to 1.03).

3.07 Perform the following operations in accordance with approved procedures to attract the attention of the customer.

(a) Talk on the line.

(b) Apply ringing current.

(c) Apply howler tone (only in accordance with local procedures).

3.08 If the action in 3.07 causes the customer to replace the receiver on the hook, clearing the permanent signal, no further investigation is required. If the permanent signal is ***not*** cleared as outlined in 3.06 and 3.07, proceed to 3.09.

3.09 Originate a trouble record report for the repair service clerk. On this report, record the permanent signal holding trunk number, line location, class of service, and the line number. The method used for determining the line location and line number depend on whether or not a trouble recorder card was produced for the permanent signal (refer to 1.20). If a trouble recorder card was produced, determine the line location and line number as outlined in 4.01 through 4.07. If a trouble recorder card was ***not*** produced and the PST key is provided, determine the line location and line number as outlined in 4.08 and 4.09. If a trouble recorder card was ***not*** produced and the PST key is not provided, determine the line location and line number as outlined in 4.10 through 4.20.

B. Common Overflow Trunks

3.10 If a customer line is connected to a common overflow trunk and the OTC key (if provided) is held operated, the associated PS lamp at the master test frame jack bay will be lighted. Patch the T jack of the trunk to the T1 jack of the voltmeter test circuit.

> ***Note:*** Where the office is arranged for range extension for unigauge cabling, it is not presently possible to distinguish between a non-long loop and a long loop line. Therefore, in those offices, these procedures do not apply.

Permanent Signal Expanded Routing Feature *Not* Provided

3.11 Perform voltmeter tests in accordance with approved procedures to determine whether the permanent signal is a trouble condition or a receiver off-hook condition (refer to 1.14) and if a trouble condition is inside or outside the office.

3.12 If the voltmeter tests indicate a receiver off-hook condition, perform the following operations in accordance with approved procedures to attract the attention of the customer.

(a) Talk on the line

(b) Apply ringing current.

(c) Apply howler tone (only in accordance with local procedures).

3.13 If the action in 3.12 causes the customer to replace the receiver on the hook, clearing the permanent signal, no further investigation is required. If the permanent signal is ***not*** cleared as outlined in 3.11 and 3.12, proceed to 3.14.

3.14 Originate a trouble record report for the repair service clerk. On this report record the common overflow trunk number, line location, class of service, and the line number. The method used for determining the line location and line number depend on whether or not a trouble recorder card was produced for the permanent signal (refer to 1.20). If a trouble recorder card was produced, determine the line location and line number as outlined in 4.21 through 4.27. If a trouble recorder card was ***not*** produced, determine the line location and line number as outlined in 4.28 through 4.38.

Permanent Signal Expanded Routing Feature Provided

3.15 Perform voltmeter tests in accordance with approved procedures to verify that the permanent signal is a trouble condition other than a receiver off-hook condition (refer to 1.14) and if the trouble condition is inside or outside the office.

3.16 If the trouble condition is outside the office, originate a trouble record report for the repair service clerk. On this report record the common overflow trunk number, line location, class of service, and the line number. The method used for determining the line location and line number

depend on whether or not a trouble recorder card was produced for the permanent signal (refer to 1.20). If a trouble recorder card was produced, determine the line location and line number as outlined in 4.21 through 4.27 If a trouble recorder card was ***not*** produced, determine the line location and line number as outlined in 4.28 through 4.38.

C. Overflow Links

Permanent Signal Expanded Routing Feature Provided

3.17 When any of the twenty overflow links (S_ relay terminations) within an overflow trunk circuit on a trunk link frame are connected to a customer line, the TL-PC00-19 lamp associated with that trunk link frame will light as an indication of at least one permanent signal connection within that overflow trunk circuit. With a permanent signal connection to an overflow trunk circuit established, the maintenance personnel can perform the following operations to customer lines.

Note: Where the office is arranged for range extension for unigauge cabling, it is not presently possible to distinguish between a non-long loop and a long loop line. Therefore, in those offices, these procedures do not apply.

(a) At the master test frame, momentarily operate (pull-push) the TL-PC00-19 key corresponding to the lighted TL-PC00-19 lamp. The MON lamp will light. A ***new*** display of lighted TL-PC00-19 lamp(s) will now indicate the individual overflow link(s) within the overflow trunk circuit, that are connected to customer line(s) on permanent signal.

(b) Patch the MON jack which is associated with ***all*** overflow trunk circuits to the T1 jack of the voltmeter test circuit.

(c) Select an individual overflow link to be monitored by observing a steady lighted TL-PC00-19 lamp.

(d) Operate (pull) the corresponding TL-PC00-19 key of the individual overflow link selected in (c).—The 120-ipm overflow tone is removed from the customer line. The T and R of the selected overflow link are now connected to the voltmeter test circuit.

(e) From the voltmeter test circuit, determine whether or not talking is heard from the customer line.

3.18 If talking is heard or the customer responds while challenging by talking on the line, perform the following operations in accordance with approved procedures.

(a) Determine from the calling customer whether or not the call is a coin line with a coin problem.

(b) If the call is a coin call with a coin problem, perform standard procedures to return coin.

(c) If the coin cannot be cleared, determine from calling customer, the directory number of the coin telephone. Request calling customer to hang up the receiver and verify that the S lamp extinguishes at the voltmeter circuit.

(d) If the call is not a coin call or the coin is cleared on a coin call, request calling customer to hang up the receiver and verify that the S lamp extinguishes at the voltmeter circuit.

3.19 If talking is ***not*** heard and the customer does ***not*** respond while challenging by talking on the line, perform voltmeter tests in accordance with approved procedures to determine whether the permanent signal is a receiver off-hook condition or a trouble (PSG) condition.

3.20 If the voltmeter tests indicate a ROH condition, perform the following operations in accordance with approved procedures.

(a) If background noises are heard, apply ringing on customer line.

(b) If background noises are ***not*** heard or permanent signal is not cleared after applying ringing on customer line, apply howler tone.

(c) If the permanent signal is still ***not*** cleared and it is desired to obtain the line location of the customer line, operate the APS/NPS key to the APS position. Release call by momentarily operating the RLS-PC key. The corresponding TL-PC00-19 lamp will extinguish and a trouble recorder card will be produced when the permanent signal comes back into the network. The PS

and line location designations should be punched and the GT5 designation should not be punched.

(d) Restore the APS/NPS key to the normal operating position.

3.21 If the voltmeter tests indicate a PSG condition, perform the following operations in accordance with approved procedures.

(a) Operate the APS/NPS key to the APS position. Release call by momentarily operating the RLS-PC key. The corresponding TL-PC00-19 lamp will extinguish and a trouble recorder card will be produced when the permanent signal comes back into the network. The PS, GT5, and line location designations should be punched.

(b) Restore APS/NPS key to normal operating position.

(c) Determine the line number (or numbers in the case of party lines), cable, and cable pair from the office records, after translating the punched indications of the line location (line link frame, horizontal group, vertical group, and vertical file).

(d) Determine from other trouble recorder cards, if most of the translated line locations are within the same cable count involved in a subscriber cable failure.

(e) If a cable failure is indicated perform the standard operations for subscriber cable failures in No. 5 Crossbar Offices in accordance with approved procedures.

3.22 If the permanent signal is ***not*** cleared as outlined in 3.17 through 3.21, originate a trouble record report for the repair service clerk. On this report record the overflow link number, line location, class of service, and the line number. The method used for determining the line location and line number depend on whether or not a trouble recorder card was produced for the permanent signal (refer to 1.20). If a trouble recorder card was produced, determine the line location and line number as outlined in 4.39 through 4.46. If a trouble recorder card was ***not*** produced, determine the line location and line number as outlined in 4.47 through 4.57.

3.23 After completing operations in 3.17 through 3.22, perform one of the following functions as required:

(a) If it is desired to test another overflow link within the same overflow trunk circuit, release (push) the operated TL-PC00-19 key. Operate a TL-PC00-19 key corresponding with another lighted TL-PC00-19 lamp and repeat 3.17(c) through 3.22.

(b) If it is desired to test overflow links associated with ***other*** overflow trunk circuits, release (push) the operated TL-PC00-19 key, momentarily operate the RLS-TL key and repeat 3.17(a) through 3.22.

(c) If no other overflow links are to be tested, release (push) the operated TL-PC00-19 key, momentarily operate the RLS-TL key, and remove the patching card from the MON jack.

4. PROCEDURE FOR DETERMINING LINE LOCATION AND LINE NUMBER

A. Permanent Signal Holding Trunks Trouble Recorder Card Produced

4.01 After determining the permanent signal holding trunk number, determine the trunk link frame and trunk from the office records.

4.02 Identify the trouble recorder card associated with the permanent signal in question by determining the location of the trunk link frame and trunk from the FS_, TS_, TB_, and TG_ punched indications. Observe that the punchings on this card for the trunk link frame and trunk agree with the information obtained from the office records.

> ***Note:*** If ***permanent signal expanded routing feature*** is provided, identify the type of permanent signal condition by noting whether or not the GT5 is punched. All receiver off-hook conditions are identified by the presence of the PS and absence of the GT5 punches.

4.03 Having selected the trouble recorder card for the permanent signal in question, determine the line number by translating the punched indications of the line link frame, horizontal group, vertical group, and vertical file and class of service

into the line number (or numbers in the case of 2-party lines) from the offfice records.

Note: If the office records for determining the line number are not available at the maintenance center, omit the recording of the line number requested in 4.04.

4.04 Record the type of permanent signal condition, line location, class of service, and line number or numbers on the trouble record report for the repair service clerk.

4.05 When the voltmeter tests indicate that the permanent signal is within the office, check for crosses between the tip and ring of the line between the line link frame and the main distributing frame; also, check the line switch involved in the connection for possible crosses.

4.06 If the permanent signal is cleared, enter this information on the report to the repair service clerk.

4.07 When the trouble record is completed, forward it to the repair service clerk in accordance with local instructions.

Trouble Recorder Card *Not* Produced and PST Key Provided

4.08 Obtain a trouble recorder card for the permanent signal appearing on the master test frame jack bay (except for permanent signals on coin lines in ground start areas) as follows:

(a) Operate the APS/NPS key to the APS position.

(b) Momentarily oprate (pull-push) the PST key to release the trunk.

4.09 Determine the line location and line number from the trouble recorder card produced in 4.08 as outlined in 4.01 through 4.07.

Trouble Recorder Card *Not* Produced and PST Key *Not* Provided

4.10 After determining the permanent signal holding trunk number determine the trunk link frame, trunk switch, and trunk switch horizontal level and appearance (A or B) from the office records. Determine the particular crosspoint engaged on the trunk switch horizontal level by visual inspection, thus identifying the vertical of the trunk switch.

Example: Trunk switch 5, vertical 2L (2 left).

4.11 From the trunk switch and vertical, determine the junctors switch and vertical by the standard trunk link distribution method. The left section of a trunk switch is always connected to the left section of the junctor switch and the right section of a trunk switch is always connected to the right section of the junctor switch.

Example: Trunk switch vertical 2L (2 left) of trunk switch is connected to vertical 5L (5 left) of junctor switch 2.

4.12 Determine the particular crosspoint engaged on the junctor or extension junctor switch vertical on the trunk link frame by visual inspection, thus identifying the horizontal on the switch.

4.13 From the designation card on the junctor switch, determine the line link frame and vertical number connected to this horizontal. The junctor switch number on the line link frame will be the same as on the junctor switch of the trunk link frame.

4.14 Proceed to the line link frame junctor switch bay and determine, by visual inspection, the particular crosspoint engaged on the junctor switch vertical, thus identifying the horizontal involved in the connection. From the junctor switch and horizontal, determine the line switch and horizontal connected to the particular junctor switch and horizontal by the standard line link distribution method.

Example: Horizontal 3 of junctor switch 5 is connected to horizontal 5 of line switch 3.

4.15 Determine the particular crosspoint engaged on the line switch horizontal by visual inspection, thus identifying the line switch vertical in terms of vertical group and vertical file.

4.16 Determine the line number (or numbers in the case of party lines) and class for this equipment location from the office records.

Note: If the office records for determining the line number are not available at the maintenance center, omit the recording of the line number requested in 4.17.

4.17 Record the equipment location of the line, class, and line number or numbers on the trouble record report for the repair service clerk.

4.18 When the voltmeter test indicates that the permanent signal is within the office, check for crosses between the tip and ring of the line between the line link frame connection for possible crosses.

4.19 If the permanent signal is cleared, enter this information on the report to the repair service clerk.

4.20 When the trouble record report is completed, forward it to the repair service clerk in accordance with local instructions.

B. Common Overflow Trunks

Trouble Recorder Card Produced

4.21 After determining the common overflow trunk number, determine the trunk link frame and trunk from the office records.

4.22 Identify the trouble recorder card associated with the permanent signal in question by determining the location of the trunk link frame and trunk from the FS_, TS_, TB_, and TG_ punched indications. Observe that, the punchings on this card for the trunk link frame and trunk agree with the information obtained from the office records.

Note: If ***permanent signal expanded routing feature*** is provided, identify the type of permanent signal condition by noting whether or not the GT5 is punched. All trouble conditions other than receiver off-hook conditions are identified by the presence of the PS and GT5 punches.

4.23 Having selected the trouble recorder card for the permanent signal in question, determine the line number by translating the punched indications of the line link frame, horizontal group, vertical group, and vertical file and class of service into te line number (or numbers in the case of 2-party lines) from the office records.

Note: If the office records for determining the line number are not available at the maintenance center, omit the recording of the line number requested in 4.24.

4.24 Record the type of permanent signal condition, line location, class of service, and line number or numbers on the trouble record report for the repair service clerk.

4.25 When the voltmeter tests indicate that the permanent signal is within the office, check for crosses between the tip and ring of the line between the line link frame and the main distributing frame; also, check the line switch involved in the connection for possible crosses.

4.26 If the permanent signal is cleared, enter this information on the report to the repair service clerk.

4.27 When the trouble record is completed, forward it to the repair service clerk in accordance with local instructions.

Trouble Recorder Cards *Not* Produced

4.28 After determining the common overflow trunk number determine the trunk link frame, trunk switch, and trunk switch horizontal level and appearance (A or B) from the office records. Determine the particular crosspoint engaged on the trunk switch horizontal level by visual inspection, thus identifying the vertical of the trunk switch.

Example: Trunk switch 5, vertical 2L (2 left).

4.29 From the trunk switch and vertical, determine the junctor switch and vertical by the standard trunk link distribution method. The left section of a trunk switch is always connected to the left section of the junctor switch and the right section of a trunk switch is always connected to the right section of the junctor switch.

Example: Trunk switch vertical 2L (2 left) of trunk switch 5 is connected to vertical 5L (5 left) of junctor switch 2.

4.30 Determine the particular crosspoint engaged on the junctor or extension junctor switch vertical on the trunk link frame by visual inspection, thus identifying the horizontal on the switch.

4.31 From the designation card on the junctor switch, determine the line link frame and vertical number connected to this horizontal. The junctor switch number on the line link frame will be the same as on the junctor switch of the trunk link frame.

4.32 Proceed to the line link frame junctor switch bay and determine, by visual inspection, the particular crosspoint engaged on the junctor switch vertical, thus identifying the horizontal involved in the connection. From the junctor switch and horizontal, determine the line switch and horizontal connected to the particular junctor switch and horizontal by the standard line link distribution method.

Example: Horizontal 3 of junctor switch 5 is connected to horizontal 5 of line switch 3.

4.33 Determine the particular crosspoint engaged on the line switch horizontal by visual inspection, thus identifying the line switch vertical in terms of vertical group and vertical file.

4.34 Determine the line number (or numbers in the case of party lines) and class for this equipment location from the office records.

Note: If the office records for determining the line number are not available at the maintenance center, omit the recording of the line number requested in 4.35.

4.35 Record the equipment location of the line, class, and line number or numbers on the trouble record report for the repair service clerk.

4.36 When the voltmeter test indicates that the permanent signal is within the office, check for crosses between the tip and ring of the line between the line link frame connection for possible crosses.

4.37 If the permanent signal is cleared, enter this information on the report to the repair service clerk.

4.38 When the trouble record report is completed, forward it to the repair service clerk in accordance with local instructions.

C. Overflow Links

Trouble Recorder Cards Produced

4.39 After determining the overflow link number within an overflow trunk circuit on a trunk link frame determine the trunk link frame, channel, and right or left side appearance of the trunk switch from the office records.

4.40 Identify the trouble recorder card associated with the permanent signal in question by determining the location of the trunk link frame, channel, and right or left side appearance of the trunk switch from the FS_, CH_, and RK or LK punched indications. Observe that the punchings on this card for the trunk link frame, channel, and right or left side appearance of the trunk switch agree with the information obtained from the office records.

4.41 Identify the type of permanent signal condition by noting whether or not the GT5 is punched. All trouble conditions other than receiver off-hook conditions are identified by the presence of the PS and GT5 punches.

4.42 Having selected the trouble recorder card for the permanent signal in question, determine the line number by translating the punched indications of the line link frame, horizontal group, vertical group, and vertical file and class of service into the line number (or numbers in the case of 2-party lines) from the office records.

Note: If the office records for determining the line number are not available at the maintenance center, omit the recording of the line number requested in 4.04.

4.43 Record the type of permanent signal condition, line location, class of service, and line number or numbers on the trouble record report for the repair service clerk.

4.44 When the voltmeter tests indicate that the permanent signal is within the office, check for crosses between the tip and ring of the line between the line link frame and the main distributing frame; also, check the line switch involved in the connection for possible crosses.

4.45 If the permanent signal is cleared, enter this information on the report to the repair service clerk.

4.46 When the trouble record is completed, forward it to the repair service clerk in accordance with local instructions.

Trouble Recorder Card *Not* Produced

4.47 After determining the overflow link number within an overflow trunk circuit on a trunk link frame, determine the trunk link frame, trunk switch, channel, and right or left side appearance on the trunk switch from the office records. Determine the particular hold magnet (vertical) operated without crosspoints engaged by visual inspection (the channel and trunk switch vertical are numbered the same).

Example: Trunk switch 5, channel 2, left side (trunk switch 5, vertical 2 left).

4.48 From the trunk switch and vertical, determine the junctor switch and vertical by the standard trunk link distribution method. The left section of a trunk switch is always connected to the left section of the junctor switch and the right section of a trunk switch is always connected to the right section of the junctor switch.

Example: Trunk switch vertical 2L (2 left) of trunk switch 5 is connected to vertical 5L (5 left) of junctor switch 2.

4.49 Determine the particular crosspoint engaged on the junctor or extension junctor switch vertical on the trunk link frame by visual inspection, thus identifying the horizontal on the switch.

4.50 From the designation card on the junctor switch, determine the line link frame and vertical number connected to this horizontal. The junctor switch number on the line link frame will be the same as on the junctor switch of the trunk link frame.

4.51 Proceed to the line link frame junctor switch bay and determine, by visual inspection, the particular crosspoint engaged on the junctor switch vertical, thus identifying the horizontal involved in the connection. From the junctor switch and horizontal, determine the line switch and horizontal connected to the particular junctor switch and horizontal by the standard line link distribution method.

Example: Horizontal 3 of junctor switch 5 is connected to horizontal 5 of line switch 3.

4.52 Determine the particular crosspoint engaged on the line switch horizontal by visual inspection, thus identifying the line switch vertical in terms of vertical group and vertical file.

4.53 Determine the line number (or numbers in the case of party lines) and class for this equipment location from the office records.

Note: If the office records for determining the line number are not available at the maintenance center, omit the recording of the line number requested in 3.23.

4.54 Record the equipment location of the line, class, and line number or numbers on the trouble record report for the repair service clerk.

4.55 When the voltmeter test indicates that the permanent signal is within the office, check for crosses between the tip and ring of the line between the line link frame connection for possible crosses.

4.56 If the permanent signal is cleared, enter this information on the report to the repair service clerk.

4.57 When the trouble record report is completed, forward it to the repair service clerk in accordance with local instructions.

5. REPORTS

5.01 Any required record of the lines involved should be entered on the proper form.