81D1 TELETYPEWRITER SWITCHING SYSTEM

INSTRUCTIONS FOR PATCHING CIRCUIT UNITS

AND MACHINES AT SWITCHING CENTERS

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1. GENERAL

1.01 This section covers the instructions for patching circuit units or machines in the switching center of the 81D1 teletypewriter switching system to substitute a spare circuit unit or machine for one that is in service. These instructions cover the step-by-step procedures.

1.02 This section is reissued to change the rating from Preliminary to Standard and to remove the restrictive notice stating that the Practice is not a publication.

1.03 These procedures must be followed in the sequence in which they are given to avoid undesirable interference with the operation of other equipment associated with the system while the patching operation is being performed.

1.04 The patchable circuit units are terminated on one or more cords, each equipped with a 50-conductor socket. The office cabling of the various items of equipment assigned to a specific line, trunk, originating station, or local outlet are terminated on one or more permanently mounted 50-conductor plugs. The connection of a circuit unit to office cabling for a specific line, trunk, originating station, or local outlet is, therefore, accomplished by inserting the plug (or plugs) into the socket (or sockets).

1.05 In general, the plugs for the office cabling and the cords and sockets for associated circuit units are located together in a patching cabinet or in the cabinet with the equipment, the plugs being suitably designated to indicate the cabling they terminate. Cords and sockets are designated to indicate a particular circuit unit with which they are associated. Where patching facilities are situated in a location other than in the patching cabinet, their location will be specified.

2. INCOMING LINE OR INCOMING TRUNK CIRCUIT

PATCHING CIRCUIT UNIT — MULTISTATION INCOMING LINE

2.01 Preparation:

(a) Operate GO-STOP key on Control Board for the line involved to STOP, if it is not already so operated.

(b) Operate the DIR STOP-DIR HOLD key on the machine cabinet for the line involved to DIR HOLD and wait for cross-office transmission to stop at the end of any message then in progress.

(c) Wait for signals on incoming line to cease.

(1) If the patch is being made for routine maintenance purposes, this will be indicated by the normal lighting of the END TRANS lamp on the Control Board panel for the line involved, upon the receipt of a normal end-of-transmission signal.

(2) If the patch is being made because of a trouble condition, it may be necessary to operate the EMER STOP key on the Control Board for the line involved to stop incoming signals, in lieu of waiting for a normal end of transmission.

(d) Operate the machine cabinet power switch for the reperforator-transmitter associated with the line involved to its OFF position.

(e) If a receiving-only teletypewriter is provided for the incoming line, advance the paper on the machine to a position where any extraneous printing will not deface copy previously received.

(f) Arrange with the operator in charge of the switching center to take any action necessary in connection with servicing messages that might be garbled or incomplete.

2.02 Patching (Performed at Patching Cabinet):

(a) If the circuit unit that is to be substituted for the one in service is the one designated SPARE, it may be equipped with two sockets. If so, make sure both of them are removed from the plugs designated TST.

(b) Patch in replacing circuit unit. Only one cord and socket is required for the patch.

2.03 Restoration:

(a) Check that the socket is firmly in place.

(b) Restore machine cabinet power switch to its ON position.

(c) Advance paper on incoming-line receiving-only teletypewriter, if one is provided, to dispose of any extraneous printing that may have occurred.

(d) When the END TRANS lamp on the Control Board lights for the line involved, restore GO-STOP key to GO.

Note: If the END TRANS lamp does not light immediately, wait for it to light in about 45 seconds.

(e) Observe operation on next incoming message for possible faults.

(f) Restore DIR STOP-DIR HOLD key to its normal position.

PATCHING CIRCUIT UNIT — SINGLE-STATION INCOMING LINE OR INCOMING TRUNK

2.04 Preparation:

(a) Arrange with the operator in charge of the switching center to have incoming transmission stopped.

(b) Operate the DIR STOP-DIR HOLD key on the machine cabinet for the line or trunk involved to DIR HOLD and wait for cross-office transmission to stop at the end of any message then in progress.

(c) Operate the machine cabinet power switch for the reperforator-transmitter associated with the line or trunk involved to its OFF position.

(d) In the case of a single-station incoming line, if a receiving-only teletypewriter is provided for it, advance the paper on that machine to a position where any extraneous printing will not deface copy previously received.

(e) Arrange with the operator in charge of the switching center to take any action necessary in connection with servicing messages that might be garbled or incomplete.

2.05 Patching (Performed at Patching Cabinet):

(a) If the circuit unit that is to be substituted for the one in service is the one designated SPARE, it may be equipped with two sockets. If so, make sure both of them are removed from the plugs designated TST.

(b) Patch in replacing circuit unit. Only one cord and socket is required for the patch.

2.06 Restoration:

(a) Check that the socket is firmly in place.

(b) Restore machine cabinet power switch to its ON position.

(c) In the case of a single-station incoming line, advance paper on incoming-line receiving-only teletypewriter, if one is provided, to dispose of any extraneous printing that may have occurred.

(d) Arrange with the operator in charge of the switching center to have incoming transmission resumed.

(e) Observe operation on next incoming message for possible faults.

(f) Restore DIR STOP-DIR HOLD key to its normal position.

PATCHING FOR REPLACING REPERFORATOR-TRANSMITTER — ROUTINE MAINTENANCE

2.07 Preparation:

(a) In replacing a reperforator-transmitter associated with a multistation incoming line, follow the preparation steps outlined below:

(1) Operate GO-STOP key on control board for the line involved to STOP, if it is not already so operated.

(2) Operate the DIR STOP-DIR HOLD key on the machine cabinet for the line involved to DIR HOLD and wait for cross-office transmission to stop at the end of any message then in progress.

(3) Wait for signals in incoming line to cease. If the patch is being made for routine maintenance purposes, this will be indicated by the lighting of the END TRANS lamp on the Control Board panel for the line involved, upon the receipt of a normal end-of-transmission signal. If the patch is being made because of a trouble condition, it may be necessary to operate the EMER STOP key on the Control Board for the line involved to stop incoming signals, in lieu of waiting for a normal end of transmission.

(b) In the case of a reperforator-transmitter associated with a single-station incoming line or an incoming trunk, follow the preparation steps outlined below:

(1) Arrange with the operator in charge of the switching center to have incoming transmission stopped.

(2) Operate the DIR STOP-DIR HOLD key on the machine cabinet for the line or trunk involved to DIR HOLD and wait for cross-office transmission to stop at the end of any message then in progress.

(c) Manually feed out about 30 to 40 LTRS characters and tear a notch in the No. 1 pulse edge of the tape at a point about one inch beyond the end-of-message code perforations for the last message on the tape.

(d) Operate the machine cabinet power switch for the reperforator-transmitter involved to its OFF position.

(e) Disengage the tape-winder reel by pulling it upward and forward, to relieve the tension exerted by it on the tape.

(f) Mark the tape to indicate the character then over the sensing pins, remove it from the transmitter head of the reperforator-transmitter, and tear it off at the code punch block.

2.08 Patching (Performed at Machine Cabinet):

(a) Remove both Jones plug and power plug of machine to be replaced and remove machine from cabinet.

(b) Place replacing machine in cabinet and insert its Jones plug and power plug.

2.09 Restoration:

(a) Check that the Jones plug and the power plug are firmly in place.

(b) Restore machine cabinet power switch to its ON position.

(c) Insert tape in new machine and manually feed out about five feet of LTRS characters.

(d) Splice the end of this tape to the end of the tape on the winder, overlapping the two ends about one inch and fastening them with a wire stapler, and reinsert the tape in the transmitter head with the previously marked character over the sensing pins. Then restore tape-winder reel to its operating position.

(e) If the reperforator-transmitter involved is associated with a multistation incoming line, follow the restoration steps outlined below:

(1) Restore GO-STOP key at the Control Board for the line involved to GO.

(2) Observe operation on next incoming message for possible faults.

(3) Restore DIR STOP-DIR HOLD key to its normal position and observe operation of the Director for possible faults.

(f) If the reperforator-transmitter involved is associated with a single-station incoming

line or an incoming trunk, follow the restoration steps outlined below:

(1) Arrange with the operator in charge of the switching center to have incoming transmission resumed.

(2) Observe operation on next incoming message for possible faults.

(3) Restore DIR STOP-DIR HOLD key to its normal position and observe operation of the Director for possible faults.

(g) When the notch which was torn in the edge of the tape reaches the transmitter sensing pins, it should bring in a tape-out alarm. At that time, operate the DIR STOP-DIR HOLD key to DIR HOLD, remove the tape from the transmitter head, manually step all but the last few of the fed-out LTRS characters past the transmitter and permit the tape to wind on the tape winder until the point of the splice is well past the snubber pins of the winder.

(h) Reinsert the tape in the transmitter head.

(i) Restore the DIR STOP-DIR HOLD key to normal.

(j) Observe operation of the Director for possible faults.

PATCHING FOR REPLACING REPERFORATOR-TRANSMITTER — MACHINE TROUBLE

2.10 Preparation:

(a) If the reperforator-transmitter is associated with a multistation incoming line, operate the GO-STOP key on the Control Board for the line involved to STOP, if it is not already so operated, and wait for incoming transmission to cease upon receipt of a normal end-of-transmission signal, or if necessary, operate the EMER STOP key on the Control Board for the line involved to stop incoming transmission at once.

(b) If the reperforator-transmitter is associated with a single-station incoming line or an incoming trunk, arrange with the operator in charge of the switching center to have incoming transmission stopped.

(c) If there is a message then in progress cross-office, follow one of the steps outlined below, whichever is appropriate to the conditions involved:

(1) If the message is complete and ungarbled, operate the DIR STOP-DIR HOLD key on the machine cabinet for the line or trunk involved to DIR HOLD and wait for cross-office transmission to stop at the end of that message.

(2) If the message is incomplete or garbled, operate the DIR STOP-DIR HOLD key on the machine cabinet for the line or trunk involved to DIR STOP, to stop cross-office transmission immediately, and then operate the FIGS H & INT key on the machine cabinet for the line or trunk involved to break down the cross-office connection. Arrange with the operator in charge of the switching center to take appropriate action in connection with servicing the message.

(3) If, because of the nature of the trouble, neither (1) nor (2) above succeeds in breaking down the cross-office connection, it can be broken down by manual operation of the LR relay in the Director associated with the incoming line or trunk involved. Should this be necessary, arrange with the operator in charge of the switching center to take appropriate action in connection with servicing the message.

(d) If, after cross-office transmission has been stopped, there are no messages remaining to be transmitted cross-office, manually feed out about 30 to 40 LTRS characters, if this is possible. If there are messages remaining in the tape, follow one of the steps outlined below, whichever is appropriate to the conditions involved:

(1) If all the remaining messages are complete and ungarbled, manually feed out about 30 to 40 LTRS characters and tear a notch in the No. 1 pulse edge of the tape at a point about one inch beyond the end-of-message code perforations for the last message in the tape.

(2) If there are good messages remaining, followed by one or more that are incomplete or garbled, omit the manual LTRS feed out and tear a notch in the No. 1 pulse edge of the tape at the perforations for the LTRS characters of the end-of-message code for the last good message in the tape.

(3) If there is only one message remaining in the tape and it is incomplete or garbled, omit both the manual LTRS feed out and the notching of the tape.

(e) Operate the machine cabinet power switch for the reperforator-transmitter involved to its OFF position.

(f) Disengage the tape-winder reel by pulling it upward and forward, to relieve the tension exerted by it on the tape.

(g) Note the last message that was completely transmitted cross-office, remove the tape from the transmitter head of the reperforator-transmitter, and tear it off at the code punch block.

2.11 Patching (Performed at Machine Cabinet):

(a) Remove both Jones plug and power plug of machine to be replaced and remove machine from cabinet.

(b) Place replacing machine in cabinet and insert its Jones plug and power plug.

2.12 Restoration:

(a) Check that the Jones plug and power plug are firmly in place.

(b) Restore machine cabinet power switch to its ON position.

(c) Insert tape in new machine and manually feed out about five feet of LTRS characters.

(d) Splice the end of this tape to the end of the tape on the winder by overlapping the two ends about one inch, and fastening them with a wire stapler.

(e) If all good messages in the tape had been completely transmitted cross-office when cross-office transmission was stopped in the preceding preparation steps, manually step the tape past any incomplete or garbled messages and past all but the last few of the fed-out LTRS characters and insert it in the transmitter head of the new reperforator-transmitter. Restore tape-winder reel to its operating position and permit the tape to be wound until the point of the splice is well past the snubber pins of the winder. If, however, all good messages in the tape had not been completely transmitted cross-office when cross-office transmission was stopped, insert the tape in the transmitter head of the new reperforator-transmitter with the perforations for the LTRS character of the end-of-message code for the last message that was completely transmitted cross-office over the sensing pins and restore the tape-winder reel to its operating position.

(f) If the reperforator-transmitter involved is associated with a multistation incoming line, follow the restoration steps outlined below:

(1) Restore GO-STOP key at the Control Board for the line involved to GO.

(2) Observe operation on next incoming message for possible faults.

(3) Restore DIR STOP-DIR HOLD key to its normal position and observe operation of the director for possible faults.

(g) If the reperforator-transmitter involved is associated with a single-station incoming line or an incoming trunk, follow the restoration steps outlined below:

(1) Arrange with the operator in charge of the switching center to have incoming transmission resumed.

(2) Observe operation on next incoming message for possible faults.

(3) Restore DIR STOP-DIR HOLD key to its normal position and observe operation of the Director for possible faults.

(h) If the tape was notched in the preceding preparation steps, a tape-out alarm should be brought in when the notch reaches the transmitter sensing pins. At that time, operate the DIR STOP-DIR HOLD key to DIR HOLD, remove the tape from the transmitter head, manually step it past any incomplete or garbled messages and past all but the last few of the fed-out LTRS characters, and permit it to wind on the tape winder until the point of the splice is well past the snubber pins of the winder.

(i) Reinsert the tape in the transmitter head.

(j) Restore the DIR STOP-DIR HOLD key to normal.

(k) Observe operation of the Director for possible faults.

PATCHING FOR REPLACING RECEIVING-ONLY TELETYPEWRITER – ROUTINE MAINTENANCE OR MACHINE TROUBLE

2.13 Preparation:

(a) If the receiving-only teletypewriter is associated with a multistation incoming line operate the GO-STOP key on Control Board for the line involved to STOP if it is not already so operated. If the teletypewriter is associated with a single-station incoming line arrange with the operator in charge of the switching center to have incoming transmission stopped.

(b) If the machine is being replaced for routine maintenance reasons, wait for signals on incoming line to cease before proceeding further.

(1) If the machine involved is associated with a multistation incoming line, this will be indicated by the lighting of the END TRANS lamp on the control board panel for the line involved.

(2) If the machine involved is associated with a single-station incoming line, arrange with the operator in charge of the switching center to have incoming transmission stopped.

(c) If the machine is being replaced because of trouble, operate the RO-REP key on the machine cabinet for the line involved to REP without waiting for incoming signals to cease.

Note: This will result in receiving on the incoming line reperforator-transmitter a copy of any messages intended for the receiving-only teletypewriter and arrangements should be made with the operator in charge of the switching center to take any action necessary in connection with servicing such messages. Those with an office code having Z as a second character will be directed to miscellaneous intercept when the Director acts upon them. Those with an office code having H as a second character will be directed normally, except that copy which might be received on the receiving-only teletypewriter may not be usable.

(d) Arrange with the operator in charge of the switching center to take any servicing action necessary in connection with any garbled messages that may have been received on the teletypewriter prior to the operation of the RO-REP key.

2.14 Patching (Performed at Teletypewriter Table):

(a) Remove both Jones plug and power plug of machine to be replaced and remove machine from the table.

(b) Install replacing machine on the table and insert its Jones plug and power plug.

2.15 Restoration:

(a) Check that the Jones plug and power plug are firmly replaced and that the paper is properly inserted and the carriage properly set.

(b) Restore the RO-REP key to normal.

(c) If the teletypewriter is associated with a multistation incoming line, restore the GO-STOP key to GO.

(d) If the teletypewriter is associated with a single-station incoming line, arrange with the operator in charge of the switching center to have incoming transmission resumed.

(e) Observe operation of teletypewriter, on next incoming message, for possible faults.

3. ORIGINATING STATION CIRCUIT

PATCHING CIRCUIT UNIT

3.01 Preparation:

(a) If the patch is being made for routine maintenance purposes, operate the DIR STOP-DIR HOLD key on the originating station table to DIR HOLD and wait for cross-office transmission to stop at the end of any message then in progress.

(b) If the patch is being made because of a trouble condition and there is a message then in progress cross-office that is being garbled in transmission, operate the DIR STOP-DIR HOLD key on the originating station table to DIR STOP, to stop cross-office

transmission immediately, and then operate the FIGS H & INT key on the originating station table to break down the cross-office connection. If because of the nature of the trouble this action fails to break down the connection, it can be broken down by manual operation of the LR relay in the Director associated with the originating station involved.

(c) If the patch is being made because of a trouble condition and there is no message then in progress cross-office, merely operate the DIR STOP-DIR HOLD key on the originating station table to DIR STOP.

(d) Operate the power switch on the originating station table to OFF to prevent the teletypewriter from running open.

(e) Arrange with the operator in charge of the switching center to take any servicing action necessary in connection with any message that was not completely transmitted cross-office or that was garbled in cross-office transmission.

3.02 Patching (Performed at Patching Cabinet):

(a) If the circuit unit that is to be substituted for the one in service is the one designated SPARE, it may be equipped with two sockets. If so, make sure both of them are removed from the plugs designated TST.

(b) Patch in replacing circuit unit. Only one cord and socket is required for the patch.

3.03 Restoration:

(a) Check that the socket is firmly in place.

(b) Restore power switch on the originating station table to its ON position.

(c) Arrange with the operator in charge of the switching center for the cross-office transmission of a message and observe the operation of the Director associated with the originating station on this message.

PATCHING FOR REPLACING A TELETYPEWRITER UNIT — ROUTINE MAINTENANCE

3.04 Preparation:

(a) Operate the DIR STOP-DIR HOLD key on the originating station table to DIR HOLD and wait for cross-office transmission to stop at the end of any message then in progress.

(b) Operate the power switch on the originating station table to OFF.

(c) If the transmitter-distributor is to be replaced, mark the tape to indicate the character then over the sensing pins, disengage the tape-winder reel by pulling it upward and forward, to relieve the tension exerted by it on the tape, and remove the tape from the transmitter.

(d) If any teletypewriter unit other than the transmitter-distributor is to be replaced, perforate about 30 to 40 LTRS characters before removing the tape from the perforator-transmitter. If the tape contains messages that have not yet been transmitted, also tear a notch in the No. 5 pulse edge of it at a point at least eight characters beyond the end-of-message perforations for the last message it contains.

3.05 Patching (Performed at Originating Station Table):

(a) If the transmitter-distributor is to be replaced, remove its Jones plug and slide the unit off its base plate. If the teletypewriter base is to be replaced, remove the plugs from the RED and BLACK jacks and also the two power plugs. For the replacement of other units of the teletypewriter, no plugs need be removed.

(b) Install the replacing unit on the table and insert its plug or plugs.

3.06 Restoration:

(a) Check that all plugs are firmly in place.

(b) Restore the power switch on the originating station table to its ON position.

(c) If the transmitter-distributor was replaced, insert the tape in the new unit with the previously marked character over the sensing pins. Then restore the tape-winder reel to its operating position.

(d) If any teletypewriter unit other than the transmitter-distributor was replaced, reinsert the tape in the perforator-transmitter and perforate about five feet of LTRS characters. Splice the end of this tape to the end of

the tape still in the transmitter-distributor, overlapping the two ends about one inch and fastening them with a wire stapler. Then proceed with one of the steps below, whichever is appropriate to the conditions involved:

(1) If the tape does not contain messages to be transmitted, remove it from the transmitter, manually step the fed-out LTRS characters past the transmitter until the tape becomes taut, and permit it to be wound on the tape winder until the point of the splice is well past the snubber pins of the winder. Then reinsert it in the transmitter.

(2) If the tape contains messages that are to be transmitted, restore the DIR STOP-DIR HOLD key on the originating station table to its normal position and wait for transmission and further direction to stop after the notch that was previously torn in the tape reaches the tape-out pin of the transmitter-distributor. At that time, operate the DIR STOP-DIR HOLD key to DIR STOP, remove the tape from the transmitter and manually step the fed-out LTRS characters past the transmitter until the tape becomes taut, unless additional messages have been perforated in the meantime, in which case manually step all but the last few of the fed-out LTRS characters past the transmitter. Permit the tape to be wound on the tape winder until the point of the splice is well past the snubber pins of the winder and then reinsert it in the transmitter.

(e) Let the DIR STOP-DIR HOLD key remain in the DIR STOP position for the originating station operator to restore when additional messages are ready for transmission.

(f) Observe the operation of the equipment for possible faults.

PATCHING FOR REPLACING A TELETYPEWRITER UNIT — MACHINE TROUBLE

3.07 Preparation:

(a) If the trouble involves a teletypewriter unit other than the transmitter-distributor and there are good messages in the tape that have not yet been transmitted, perforate sufficient LTRS characters to permit the last good message in the tape to be transmitted completely. Then, while transmission is in progress on that message, operate the DIR STOP-DIR HOLD key on the originating station table to DIR HOLD and wait for transmission to stop at the end of the message.

(b) If, however, the trouble involves a teletypewriter unit other than the transmitter-distributor and cross-office transmission is in progress on a message that is garbled or incomplete in the tape, proceed as for transmitter-distributor trouble in (c) below.

(c) If the trouble involves the transmitter-distributor and there is a message then in progress cross-office that is being garbled in transmission, operate the DIR STOP-DIR HOLD key on the originating station table to DIR STOP, to stop cross-office transmission immediately, and then operate the FIGS H & INT key on the originating station table to break down the cross-office connection. If because of the nature of this trouble this action fails to break down the connection, it can be broken down by manual operation of the LR relay in the Director associated with the originating station involved.

(d) If the trouble involves the transmitter-distributor and there is no message then in progress cross-office, merely operate the DIR STOP-DIR HOLD key on the originating station table to DIR STOP if it is not already so operated.

(e) Operate the power switch on the originating station table to OFF.

(f) Arrange with the operator in charge of the switching center to take any servicing action necessary in connection with messages that were garbled or incomplete either on the tape or in transmission cross-office.

(g) If in the foregoing steps the DIR STOP-DIR HOLD key was operated to DIR STOP, determine the last message that was transmitted cross-office complete and ungarbled. If there are good messages following it in the tape, mark the tape at the LTRS character of the end-of-message code for that message, and tear a notch in the tape at the character immediately following the LTRS character of the end-of-message code for the last good message following that one in the tape. If no good messages follow in the tape, omit the marking and notching of the tape.

(h) If necessary, perforate sufficient LTRS characters to permit complete transmission of all good messages in the tape when transmission is later resumed.

(i) If the trouble involves the transmitter-distributor, disengage the tape-winder reel by pulling it upward and forward, to relieve the tension exerted by it on the tape, and remove the tape from the transmitter.

(j) If the trouble involves a teletypewriter unit other than the transmitter-distributor, tear the tape at the punch block of the perforator-transmitter.

3.08 Patching (Performed at Originating Station Table):

(a) If the transmitter-distributor is to be replaced, remove its Jones plug and slide the unit off its base plate. If the teletypewriter base is to be replaced, remove the plugs from the RED and BLACK jacks and also the two power plugs. For the replacement of other units of the teletypewriter, no plugs need be removed.

(b) Install the replacing unit on the table and insert its plug or plugs.

3.09 Restoration:

(a) Check that all plugs are firmly in place.

(b) Restore the power switch on the originating station table to its ON position.

(c) If the transmitter-distributor was replaced, insert the tape in the new unit with the previously marked character over the sensing pins and restore the tape-winder reel to its operating position.

(d) If a teletypewriter unit other than the transmitter-distributor was replaced, perforate about five feet of LTRS characters and splice the end of this tape to the end of the tape still in the transmitter by overlapping the two ends about one inch, and fastening them with a wire stapler.

(e) If the tape was spliced, proceed with one of the steps below, whichever is appropriate to the conditions involved:

(1) If there are no good messages in the tape that require transmission, remove it from the transmitter, manually step any garbled or incomplete messages and the fed-out LTRS characters past the transmitter until the tape becomes taut, and permit it to be wound on the tape winder until the point of the splice is well past the snubber pins of the winder. Then reinsert it in the transmitter.

(2) If, however, there are good messages in the tape that require transmission, or good messages that require retransmission because they were garbled or incomplete on the original transmission, disengage the tape-winder reel by pulling it upward and forward, to relieve the tension exerted by it on the tape, and remove the tape from the transmitter. Pull it back off the winder, if necessary, and reinsert it in the transmitter with the previously marked character over the sensing pins. Restore the tape-winder reel to its operating position. Then restore the DIR STOP-DIR HOLD key on the originating station table to its normal position and wait for the transmitter to stop when the notch that was previously torn in the tape reaches the tape out pin of the transmitter-distributor. At that time, operate the DIR STOP-DIR HOLD key to DIR HOLD, remove the tape from the transmitter and manually step any garbled or incomplete messages and the fed-out LTRS characters past the transmitter until the tape becomes taut, unless additional messages have been perforated in the meantime in which case manually step all but the last few of the fed-out LTRS characters past the transmitter. Permit the tape to be wound on the tape winder until the point of the splice is well past the snubber pins of the winder and then reinsert it in the transmitter.

(f) Let the DIR STOP-DIR HOLD key remain in the DIR HOLD position for the originating station operator to restore when additional messages are ready for transmission.

(g) Observe the operation of the equipment for possible faults.

4. DIRECTOR CIRCUIT

PATCHING CIRCUIT UNIT

Note: The following procedures cover patching of the director circuit unit only. If it is necessary to patch the reperforator-transmitter, or the originating station circuit or the transmitter-distributor, with which the Director is associated, follow the procedures given in connection with the particular circuit unit to which the Director is assigned.

4.01 Preparation:

(a) If the patch is being made for routine maintenance purposes, operate the DIR STOP-DIR HOLD key (on the machine cabinet or on the originating station table) for the Director involved to DIR HOLD and wait for cross-office transmission to stop at the end of any message then in progress.

(b) If the patch is being made because of a trouble condition in the Director that resulted in a Director Tie-up Alarm, operate the DIR STOP-DIR HOLD key to DIR HOLD. This should clear the alarm indications.

(c) If the patch is being made because of a trouble condition in the Director that did not result in a Director Tie-up Alarm, operate the DIR STOP-DIR HOLD key to DIR STOP and note whether the Director is in a "search" condition (relay SE operated) or whether it is in a "text" condition (relay CT operated). If it is in the search condition proceed immediately to item (d) or (e), whichever is appropriate. If it is in a text condition, proceed as follows:

(1) Attempt to break down the cross-office connection that is established by operating the FIGS H & INT key for the Director involved. Note whether this action results in the satisfactory cross-office transmission of FIGS-H-LTRS to the outlet to which the connection is established and whether it breaks down the connection (releases the CT relay).

(2) If the above action fails to break down the cross-office connection, it should be possible to break it down by manual operation of the LR relay.

(d) If the trouble involves a Director associated with a reperforator-transmitter, remove the tape from the transmitter head of the reperforator-transmitter and reinsert it with the character over the sensing pins that immediately precedes the call directing characters of the message involved in the trouble.

(e) If the trouble involves a Director associated with an originating station, remove the tape from the transmitter-distributor and reinsert it with the first character of the call-directing characters of the message involved in the trouble over the sensing pins.

4.02 Patching (Performed at Patching Cabinet):

(a) If the circuit unit to be substituted for the one in service is one designated SPARE, it may be equipped with two sets of sockets. If so, make sure that both sets are removed from the plugs designated TST.

(b) Patch in replacing circuit unit. Two cords and sockets are required for the patch.

4.03 Restoration:

(a) Check that the sockets in the patching cabinet are firmly in place.

(b) If the patch was made because of a trouble condition in the Director that necessitated breaking down an established cross-office connection and if in the process of breaking down the connection FIGS-H-LTRS was not satisfactorily transmitted to the outlet to which the connection was made, arrange with the operator in charge of the switching center to take appropriate action in connection with servicing the interrupted message.

(c) Restore the DIR STOP-DIR HOLD key to its normal position.

(d) Observe the operation of the Director for possible faults.

(e) Arrange with the operator in charge of the switching center to take appropriate action in connection with servicing any messages that might have been directed to Miscellaneous Intercept as a result of trouble in the Director.

5. LOCAL OUTLET CIRCUIT — USED AS A LOCAL OUTLET

PATCHING CIRCUIT UNIT

Note: The following procedures are applicable for patching both the local outlet sequence circuit and the local outlet individual circuit.

5.01 Preparation:

(a) Operate the BUSY key for each appearance of the local outlet at the Control Board and wait for cross-office transmission

to stop at the end of any message or messages then in progress. If typing reperforators are involved, also wait for the end-of-tape feed-out.

(b) Arrange with the operator in charge of the switching center for intercepting on a willful intercept basis those messages destined for the local outlet.

(c) Operate the power switch for each teletypewriter machine associated with the local outlet involved to its OFF position. If the machine or machines are located away from the switching center arrange to have this done on such machines.

(d) Arrange with the operator in charge of the switching center to take any action necessary in connection with servicing messages that might be garbled or incomplete.

5.02 Patching (Performed at the Patching Cabinet): Patch in replacing circuit unit. Sequence circuits and individual circuits are patchable separately. One cord and socket is required in each case. If the unit to be substituted for the one in service is designated SPARE, it may be equipped with more than one socket. If so, make sure that none of them are already patched to plugs.

5.03 Restoration:

(a) Check that each socket involved in the patch is on its proper plug and is firmly in place.

(b) Operate the power switch for each teletypewriter machine associated with the local outlet involved to its ON position. If the machine or machines are located away from the switching center, arrange to have this done on such machines.

(c) Restore the BUSY key for each appearance of the local outlet at the Control Board.

(d) Arrange with the operator in charge of the switching center to discontinue interception of messages for the local outlet and to transmit any messages.

(e) Observe that messages are received properly on each appearance of the local outlet.

PATCHING FOR REPLACING A TELETYPEWRITER UNIT – ROUTINE MAINTENANCE

5.04 Preparation:

(a) Operate the BUSY key at the Control Board for the local outlet appearance on which the unit is to be replaced and wait for cross-office transmission to stop at the end of any message then in progress. If a typing reperforator arranged for tape feed-out is involved, also wait for the end-of-tape feed-out.

(b) Operate the power switch for the teletypewriter machine involved on the local outlet circuit to its OFF position. If the machine involved is located away from the Switching Center, arrange for this to be done.

5.05 Patching (Performed at Local Outlet Station Table Appearance):

(a) If the local outlet station appearance is equipped with machine alarm and the teletypewriter base is to be replaced, remove the Jones plug from its socket and the power plug from its receptacle in the table. If the appearance is not equipped with machine alarm and the teletypewriter base is to be replaced, remove the plug from the RED jack and also the power plug or plugs from their receptacles in the table. If the receiving unit is to be replaced, merely remove the unit. Arrange for the above to be done if the station machine is not located at the switching center.

(b) Install the replacing unit on the table, inserting plugs as required or, if the appearance is not located at the switching center, arrange for this to be done.

5.06 Restoration:

(a) Check that all plugs are firmly in place.

(b) Restore the power switch for the teletypewriter machine involved on the local outlet circuit to its ON position or arrange for this to be done if the machine is located away from the switching center.

(c) Restore the BUSY key for the local outlet appearance at the Control Board.

(d) Observe that messages are received properly on the local outlet machine appearance.

PATCHING FOR REPLACING A TELETYPEWRITER UNIT — MACHINE TROUBLE

5.07 Preparation:

(a) Operate the BUSY key at the Control Board for the local outlet appearance on which the unit is to be replaced and wait for cross-office transmission to stop at the end of any message then in progress. If a typing reperforator arranged for tape feed-out is involved, also wait for the end-of-tape feed-out. If the nature of the trouble is such that the machine will not feed out, the end of feed-out can be determined by observing the local outlet individual circuit unit for the operation of the F2 relay.

(b) Operate the power switch for the teletypewriter machine involved on the local outlet circuit to its OFF position. If the machine involved is located away from the switching center, arrange for this to be done.

(c) Arrange with the operator in charge of the switching center to take appropriate action in connection with servicing any messages unsatisfactorily received at the local outlet machine appearance.

5.08 Patching (Performed at Local Outlet Station Table Appearance):

(a) If the local outlet station appearance is equipped with machine alarm and the teletypewriter base is to be replaced, remove the Jones plug from its socket and the power plug from its receptacle in the table. If the appearance is not equipped with machine alarm and the teletypewriter base is to be replaced, remove the plug from the RED jack and also the power plug or plugs from their receptacles in the table. If the receiving unit is to be replaced, merely remove the unit. Arrange for the above to be done if the station machine is not located at the switching center.

(b) Install the replacing unit on the table, inserting plugs as required or, if the appearance is not located at the switching center, arrange for this to be done.

5.09 Restoration:

(a) Check that all plugs are firmly in place.

(b) Restore the power switch for the teletypewriter machine involved on the local outlet circuit to its ON position or arrange for this to be done if the machine is located away from the Switching Center.

(c) Restore the BUSY key for the local outlet appearance at the Control Board.

(d) Observe that messages are received properly on the local outlet machine appearance.

6. LOCAL OUTLET CIRCUIT — USED AS WILLFUL INTERCEPT

PATCHING CIRCUIT UNIT

6.01 Preparation:

(a) If two willful intercept circuits are provided in the switching center and if INCPT keys are operated at the time for both, arrange with the operator in charge of the switching center to have all interception performed by the willful intercept that is to be left in service. If only one willful intercept is provided, no action need be taken in connection with operated INCPT keys because in that case any messages which would otherwise reach willful intercept will be received by miscellaneous intercept during the period while the willful intercept patching operation is being performed.

(b) Operate the BUSY keys on the machine cabinets for all the reperforator-transmitters of the willful intercept to be patched and wait for cross-office transmission to stop at the end of any message then being received by that intercept

(c) If cross-office transmission is in progress from that intercept operate the DIR STOP-DIR HOLD key on its machine cabinets to DIR HOLD and wait for transmission to stop at the end of the messages in progress if they are complete and ungarbled and if they are being transmitted ungarbled. If any message from one of the machines is incomplete or garbled, or if it is being garbled in transmission, operate the key for that machine, instead, to DIR STOP, to stop cross-office transmission immediately, and then operate the FIGS H & INT key to break down the cross-office connection.

(d) Operate the machine cabinet power switches for the reperforator-transmitters associated with the willful intercept involved to their OFF position.

(e) Arrange with the operator in charge of the switching center to take any action necessary in connection with servicing messages that might have been either received or transmitted by the willful intercept garbled or incomplete.

6.02 Patching (Performed at Patching Cabinet): Patch in replacing circuit unit. Sequence circuits and individual circuits are patchable separately. One cord and socket is required in each case. If the unit to be substituted for the one in service is designated SPARE, it may be equipped with more than one socket. If so, make sure that none of them are already patched to plugs.

6.03 Restoration:

(a) Check that the socket is firmly in place.

(b) Restore machine cabinet power switch to its ON position.

(c) Restore the DIR STOP-DIR HOLD key to the position it had been in prior to the preceding preparation steps.

(d) Restore the BUSY key to its normal position.

(e) If two willful intercepts are provided in the switching center, and if in the previous preparation steps it was necessary to change the position of any INCPT keys, arrange with the operator in charge of the switching center to restore interception to its former basis.

(f) If only one willful intercept is provided in the switching center, and if any messages which should have reached willful intercept were received by miscellaneous intercept while the willful intercept patching operation was being performed, arrange with the operator in charge of the switching center to transmit such messages from an originating station.

Note: Such messages can be transmitted immediately and thus reintroduced into the willful intercept tape, if desired, or they can be held for transmission later, when the codes involved are no longer being intercepted.

(g) Observe operation of the willful intercept circuit for possible faults.

PATCHING FOR REPLACING REPERFORATOR-TRANSMITTER – ROUTINE MAINTENANCE

6.04 Preparation:

(a) Operate the BUSY key on the machine cabinet of the willful intercept machine involved and wait for cross-office transmission to stop on any message then in progress to that intercept machine.

(b) If cross-office transmission is in progress from that intercept machine, operate the DIR STOP-DIR HOLD key on its machine cabinet to DIR HOLD and wait for transmission to stop at the end of that message.

(c) Manually feed out about 30 to 40 LTRS characters and if there are messages in the tape that have not been transmitted, tear a notch in the No. 1 pulse edge of the tape at a point about one inch beyond the end-of-message code perforations for the last message in the tape. If there are no such messages in the tape, the notching should be omitted.

(d) Operate the machine cabinet power switch for the reperforator-transmitter involved to its OFF position.

(e) Disengage the tape-winder reel by pulling it upward and forward, to relieve the tension exerted by it on the tape.

(f) If there are messages in the tape that have not been transmitted, mark the tape to indicate the character then over the sensing pins.

(g) Remove the tape from the transmitter head of the reperforator-transmitter, and tear it off at the code punch block.

6.05 Patching (Performed at Machine Cabinet):

(a) Remove both Jones plug and power plug of machine to be replaced and remove machine from cabinet.

(b) Place replacing machine in cabinet and insert its Jones plug and power plug.

6.06 Restoration:

(a) Check that the Jones plug and the power plug are firmly in place.

(b) Restore machine cabinet power switch to its ON position.

(c) Insert tape in new machine and manually feed out about five feet of LTRS characters.

(d) Splice the end of this tape to the end of the tape on the winder by overlapping the two ends about one inch and fastening them with a wire stapler.

(e) If there are messages in the tape that have not been transmitted, proceed immediately to step (f). If, however, there are no such messages in the tape, proceed as follows:

(1) Restore the tape-winder reel to its operating position.

(2) Manually step all but the last few of the fed-out LTRS characters past the transmitter and permit the tape to be wound on the tape winder until the point of the splice is well past the snubber pins of the winder.

(3) Insert the tape in the transmitter head.

(4) Restore the BUSY key to its normal position.

(5) Arrange for the willful interception of a message about to be transmitted from an originating station by operation of the appropriate INCPT key on the Control Board.

(6) As this message is being received on willful intercept, restore the INCPT key that was operated, and also restore the DIR STOP-DIR HOLD key on the machine cabinet of the willful intercept involved to its normal position.

(7) As soon as cross-office transmission of the intercepted message starts, reoperate the DIR STOP-DIR HOLD key to DIR HOLD.

(8) Observe the operation of the machine with respect to both receiving and transmitting, for possible faults.

(f) If there are messages in the tape that have not been transmitted, and the INCPT key or keys for those messages are still operated, proceed as follows:

(1) Insert the tape in the transmitter head with the previously marked character over the sensing pins.

(2) Restore the tape-winder reel to its operating position.

(3) Restore the BUSY key to its normal position.

(4) Restore the DIR STOP-DIR HOLD key on the machine cabinet of the willful intercept involved to its normal position.

(5) If the machine is functioning properly, this action will cause the messages to be transmitted from willful intercept and received again by willful intercept. Observe the operation of the machine with respect to both receiving and transmitting, for possible faults.

(6) When all messages that had been intercepted originally have been cleared and the notch that was torn in the tape has reached the sensing pins, it should bring in a Tape-out Alarm.

(7) When the alarm is received, reoperate the DIR STOP-DIR HOLD key to DIR HOLD, remove the tape from the transmitter head, manually step all but the last few of the fed-out LTRS characters past the transmitter, and permit the tape to be wound on the tape winder until the point of the splice is well past the snubber pins of the winder.

(8) Reinsert the tape in the transmitter head.

PATCHING FOR REPLACING REPERFORATOR-TRANSMITTER – MACHINE TROUBLE

6.07 Preparation:

(a) Operate the BUSY key on the machine cabinet of the willful intercept involved and wait for cross-office transmission to stop on any message then in progress to that intercept machine.

(b) Arrange with the operator in charge of the switching center to take any servicing action necessary in connection with any message received garbled or incomplete by that intercept and in connection with the Machine Trouble Alarm in the event the nature of the trouble is such as to have resulted in one.

(c) If cross-office transmission is then in progress from that intercept proceed with one of the following steps, whichever is appropriate to the conditions involved:

(1) If the message is complete and ungarbled, and if it is being transmitted satisfactorily, operate the DIR STOP-DIR HOLD key on the machine cabinet for the intercept involved to DIR HOLD and wait for cross-office transmission to stop at the end of that message.

(2) If the message is incomplete or garbled, or if it is being garbled in transmission, operate the DIR STOP-DIR HOLD key on the machine cabinet for the intercept involved to DIR STOP, to stop cross-office transmission immediately, and then operate the FIGS H & INT key on the machine cabinet for the intercept involved to break down the cross-office connection. Arrange with the operator in charge of the switching center to take appropriate action in connection with servicing the interrupted message.

(3) If, because of the nature of the trouble, neither (1) nor (2) above succeeds in breaking down the cross-office connection, it can be broken down by manual operation of the LR relay in the Director associated with the willful intercept involved. Should this be necessary, arrange with the operator in charge of the switching center to take appropriate action in connection with servicing the interrupted message.

(d) If, after cross-office transmission has been stopped, there are no messages remaining to be transmitted cross-office, manually feed out about 30 to 40 LTRS characters, if this is possible. If there are messages remaining in the tape, follow one of the steps outlined below, whichever is appropriate to the conditions involved:

(1) If all the remaining messages are complete and ungarbled, manually feed out about 30 to 40 LTRS characters and tear a notch in the No. 1 pulse edge of the tape at a point about one inch beyond the end-of-message code perforations for the last message in the tape.

(2) If there are good messages remaining, followed by one or more that are incomplete or garbled, omit the manual LTRS feedout and tear a notch in the No. 1 pulse edge of the tape at the perforations for the LTRS character of the end-of-message code for the last good message in the tape.

(3) If there is only one message remaining in the tape and it is incomplete or garbled, omit both the manual LTRS feed-out and the notching of the tape.

(e) Operate the machine cabinet power switch for the reperforator-transmitter involved to its OFF position.

(f) Disengage the tape-winder reel by pulling it upward and forward to relieve the tension exerted by it on the tape.

(g) Note the last message that was properly transmitted cross-office, remove the tape from the transmitter head of the reperforator-transmitter, and tear it off at the code punch block.

6.08 Patching (Performed at Machine Cabinet):

(a) Remove both Jones plug and power plug of machine to be replaced and remove machine from cabinet.

(b) Place replacing machine in cabinet and insert its Jones plug and power plug.

6.09 Restoration:

(a) Check that the Jones plug and power plug are firmly in place.

(b) Restore machine cabinet power switch to its ON position.

(c) Insert tape in new machine and manually feed out about five feet of LTRS characters.

(d) Splice the end of this tape to the end of the tape on the winder by overlapping the two ends about one inch and fastening them with a wire stapler.

(e) If there are good messages in the willful intercept tape that have not been transmitted complete and ungarbled, proceed immediately to (f). If, however, there are no such messages in the tape, proceed as follows:

(1) Restore the tape-winder reel to its operating position.

(2) Manually step any incomplete or garbled messages and all but the last few of the fed-out LTRS characters past the transmitter and permit the tape to be wound on the tape winder until the point of the splice is well past the snubber pins of the winder.

(3) Insert the tape in the transmitter head.

(4) Restore the BUSY key on the willful intercept machine cabinet.

(5) Arrange for the willful interception of a message about to be transmitted from an originating station, by operation of the appropriate INCPT key on the Control Board.

(6) As this message is being received on willful intercept, restore the INCPT key that was operated and also restore the DIR STOP-DIR HOLD key on the machine cabinet of the willful intercept involved to its normal position.

(7) As soon as cross-office transmission of the intercepted message starts, reoperate the DIR STOP-DIR HOLD key to DIR HOLD.

(8) Observe the operation of the machine with respect to both receiving and transmitting, for possible faults.

(f) If there are good messages in the willful intercept tape that have not been transmitted complete and ungarbled, and if the INCPT key or keys are still operated on the same basis as they were when the machine trouble was encountered, proceed as follows:

(1) Insert the tape in the transmitter head with the LTRS character of the end-of-message code for the last good message that was satisfactorily transmitted over the sensing pins.

(2) Restore the tape-winder reel to its operating position.

(3) Restore the BUSY key on the willful intercept machine cabinet.

(4) Restore the DIR STOP-DIR HOLD key on the machine cabinet of the willful intercept involved to its normal position.

(5) If the machine is functioning properly, this action will cause the good messages in the tape to be transmitted from willful intercept, and those for which INCPT keys are still operated will be received again by willful intercept. Observe the operation of the machine with respect to both receiving and transmitting, for possible faults.

(6) When all good messages have been cleared and the notch that was torn in the tape has reached the sensing pins, it should bring in a Tape-out Alarm.

(7) When the alarm is received, reoperate the DIR STOP-DIR HOLD key to DIR HOLD, remove the tape from the transmitter head, manually step any remaining garbled or incomplete messages and all but the last few of the fed-out LTRS characters past the transmitter, and permit the tape to be wound on the tape winder until the point of the splice is well past the snubber pins of the winder.

(8) Reinsert the tape in the transmitter head.

7. LOCAL OUTLET CIRCUIT — USED AS MISCELLANEOUS INTERCEPT

PATCHING CIRCUIT UNIT

7.01 Preparation:

(a) Note the condition of all DIR STOP-DIR HOLD keys in the switching center and operate to DIR HOLD any that are not already operated either to DIR HOLD or to DIR STOP, after first notifying the operator in charge of the center that this action will be necessary.

(b) Operate the BUSY keys on the miscellaneous intercept table or tables.

(c) Wait for the end-of-tape feed-out that will result from the operation of the BUSY keys, if the miscellaneous intercepts are idle at the time, or that will follow any message then in the process of cross-office transmission, if miscellaneous intercepts are busy at the time.

(d) Arrange with the operator in charge of the switching center to take appropriate action in connection with servicing any messages unsatisfactorily received by miscellaneous intercept.

7.02 Patching (Performed at Patching Cabinet): Patch in replacing circuit unit. Sequence circuits and individual circuits are patchable separately. One cord and socket is required in each case. If the unit to be substituted for the one in service is designated SPARE, it may be equipped with more than one socket. If so, make sure that none of them are already patched to plugs.

7.03 Restoration:

(a) Check that the socket is firmly in place.

(b) Restore to their normal position all DIR STOP-DIR HOLD keys that, in the preceding preparation steps, it was necessary to operate to DIR HOLD.

(c) Restore the BUSY keys to their normal positions.

(d) Check the operation of the replacing circuit unit for possible faults by arranging to have a message directed to miscellaneous intercept from an originating station.

PATCHING FOR REPLACING TYPING REPERFORATOR — ROUTINE MAINTENANCE

Note: If only the typing reperforator unit itself is to be replaced, there will be no patching operations involved and 7.05 can be omitted.

7.04 Preparation:

(a) Operate the BUSY key on the miscellaneous intercept table.

(b) Wait for the end-of-tape feed-out that will result from the operation of the BUSY key if miscellaneous intercept is idle at the time, or that will follow any message in the process of cross-office transmission, if miscellaneous intercept is busy at the time.

7.05 Patching (Performed at Miscellaneous Intercept Table):

(a) Remove both the Jones plug and the power plug of typing reperforator and remove the machine from its table.

(b) Place replacing machine on table and insert its Jones plug and power plug.

7.06 Restoration:

(a) Check that the Jones plug and the power plug are firmly in place.

(b) Restore the BUSY key to its normal position.

(c) Check the operation of the replacing machine for possible faults by arranging to have a message directed to miscellaneous intercept from an originating station.

PATCHING FOR REPLACING TYPING REPERFORATOR — MACHINE TROUBLE

Note: If only the typing reperforator unit itself is to be replaced, there will be no patching operations involved and 7.08 can be omitted.

7.07 Preparation:

(a) Operate the BUSY key on the miscellaneous intercept table.

(b) Wait for the end-of-tape feed-out that will result from the operation of the BUSY key, if miscellaneous intercept is idle at the time, or that will follow any message in the process of cross-office transmission, if miscellaneous intercept is busy at the time. If the nature of the trouble is such that the machine will not feed out, the end of feed-out can be determined by observing the circuit unit for the operation of the F2 relay.

(c) Arrange with the operator in charge of the switching center to take appropriate action in connection with servicing any messages unsatisfactorily received by miscellaneous intercept.

7.08 Patching (Performed at Miscellaneous Intercept Table):

(a) Remove both the Jones plug and the power plug of the typing reperforator and remove the machine from its table.

(b) Place replacing machine on table and insert its Jones plug and power plug.

7.09 Restoration:

(a) Check that the Jones plug and the power plug are firmly in place.

(b) Restore the BUSY key to its normal position.

(c) Check the operation of the replacing machine for possible faults by arranging to have a message directed to miscellaneous intercept from an originating station.

8. LOCAL OUTLET CIRCUIT — USED AS MULTIPLE ADDRESS INTERCEPT

PATCHING CIRCUIT UNIT

8.01 Preparation:

(a) Operate the TRANS STOP-DIR HOLD keys on all multiple address levels to DIR HOLD.

(b) Operate the BUSY keys on the multiple address intercept table or tables.

(c) Wait for the end-of-tape feed-out that will result from the operation of the BUSY keys if the multiple address intercept machines are idle at the time, or that will follow any message then in process of cross-office transmission, if multiple address intercepts are busy at the time.

(d) Arrange with the operator in charge of the switching center to take appropriate action in connection with servicing any messages unsatisfactorily received by multiple address intercept machines.

8.02 Patching (Performed at Patching Cabinet): Patch in the replacing circuit unit. Sequence circuits and individual level circuits are patchable separately. One cord and socket is required in each case. If the unit to be substituted for the one in service is designated SPARE, it may be equipped with more than one socket. If so, make sure that none of them are already patched to plugs.

8.03 Restoration:

(a) Check that the socket is firmly in place.

(b) Restore to their normal positions the TRANS STOP-DIR HOLD keys of all multiple address levels.

(c) Restore the BUSY keys to their normal positions.

(d) Check the operation of the replacing circuit unit by arranging to have a message diverted to multiple address intercept from an originating station.

PATCHING FOR REPLACING TYPING REPERFORATOR — ROUTINE MAINTENANCE

Note: If only the typing reperforator unit itself is to be replaced, there will be no patching operations involved and 8.05 can be omitted.

8.04 Preparation:

(a) Operate the BUSY key on the multiple address intercept table.

(b) Wait for the end-of-tape feed-out that will result from the operation of the BUSY key if multiple address intercept is idle at the time, or that will follow any message in the process of cross-office transmission, if multiple address intercept is busy at the time.

8.05 Patching (Performed at Multiple Address Intercept Table)

(a) Remove the Jones plug and power plug of the typing reperforator and remove the machine from the table.

(b) Place replacing machine on table and insert its Jones and power plug.

8.06 Restoration:

(a) Check that the Jones plug and power plug are firmly in place.

(b) Restore the BUSY key to its normal position.

(c) Check the operation of the replacing machine for possible faults by arranging to have a message diverted to multiple address intercept from the originating station.

PATCHING FOR REPLACING TYPING REPERFORATOR — MACHINE TROUBLE

Note: If only the typing reperforator unit itself is to be replaced, there will be no patching operations involved and 8.08 can be omitted.

8.07 Preparation:

(a) Operate the BUSY key on the multiple address intercept table.

(b) Wait for the end-of-tape feed-out that will result from the operation of the BUSY key, if multiple address intercept is idle at the time, or that it will follow any message in the process of cross-office transmission, if multiple address intercept is busy at the time. If the nature of the trouble is such that the machine will not feed out, the end of feed-out can be determined by observing the circuit unit for the operation of the F2 relay.

(c) Arrange with the operator in charge of the switching center to take appropriate action in connection with servicing any messages unsatisfactorily received by multiple address intercept.

8.08 Patching (Performed at Multiple Address Intercept Table)

(a) Remove the Jones plug and power plug of the typing reperforator and remove the machine from its table.

(b) Place the replacing machine on the table and insert its Jones plug and power plug.

8.09 Restoration:

(a) Check that the Jones plug and power plug are firmly in place.

(b) Restore the BUSY key to its normal position.

(c) Check the operation of the replacing machine for possible faults by arranging to have a message directed to multiple address intercept from an originating station.

9. TRANSMITTER START CIRCUIT

PATCHING CIRCUIT UNIT

Note: The following procedures cover patching of the transmitter start circuit unit, only. If it is necessary to patch one of the reperforator-transmitters by which the transmitter start patterns are sent, follow the procedures covered in 9.07 through 9.09 or 9.10 through 9.12.

9.01 Preparation:

(a) Operate the GO-STOP key on the Control Board for the line with which the transmitter start circuit is associated to STOP.

(b) If incoming transmission is in progress on that line, wait for the END TRANS lamp on the Control Board to light, to indicate the end of transmission. If incoming transmission is not in progress, this lamp should already be lighted.

9.02 Patching (Performed at Patching Cabinet):

(a) If the circuit unit that is to be substituted for the one in service is the one designated SPARE, it may be equipped with two sockets designated PATCH A and two designated PATCH B. If so, make sure both the PATCH A sockets and both the PATCH B sockets are removed from their respective plugs designated TST.

(b) Patch in replacing circuit unit. Two cords and sockets are required for the patch, one designated PATCH A and the other PATCH B.

9.03 Restoration:

(a) Check that each socket is on its proper plug and that both are firmly in place.

(b) Operate the GO-STOP key on the Control Board to GO and observe whether incoming transmission results. This will be indicated by the extinguishing of the END TRANS lamp and by flashing of the BUSY IN lamp for the line involved.

10. OUTGOING LINE OR SINGLE CHANNEL OUTGOING TRUNK CIRCUIT

PATCHING CIRCUIT UNIT – MULTISTATION OUTGOING LINE

10.01 Preparation:

(a) Operate GO-STOP key on Control Board for the line involved to STOP if it is not already so operated.

(b) If the line involved is satisfactorily transmitting good messages to the line at the time, operate the TRANS STOP-TRANS HOLD keys for all levels at the machine cabinet for the line involved to TRANS HOLD and wait for transmission to stop at the end of any message then in progress. If one of the levels has no messages to transmit, is transmitting garbled messages, or is garbling good messages in transmission, operate the

TRANS STOP-TRANS HOLD keys for all levels to TRANS STOP.

(c) If the multiple address feature is provided at the switching center, operate the TRANS STOP-DIR HOLD keys for all levels at the multiple address machine cabinet to DIR HOLD and wait for cross-office transmission to stop at the end of any message or messages then in progress.

(d) Operate the BUSY keys for all levels at the machine cabinet and wait for cross-office transmission to stop at the end of any message or messages then in progress.

(e) Insert a dummy plug in the SET jack of the line jack circuit in the loop cabinet, for the line involved, to prevent the line from going open while the patch is being made.

(f) Operate INCPT keys at the Control Board as required to intercept all stations on the line. If any INCPT keys are already operated, note that fact for use in connection with the restoration procedures.

(g) With both levels of the outgoing line idle with respect to both receiving and transmitting, operate the machine cabinet power switch for all reperforator-transmitters to their OFF position.

(h) Arrange with the operator in charge of the switching center to take any action necessary in connection with servicing messages that might have been either received or transmitted, garbled or incomplete by the outgoing line.

10.02 Patching (Performed at Patching Cabinet):

(a) If the regular level circuit unit designated SPARE is the one to be substituted for the one in service, it may be equipped with two sockets designated PATCH A, two designated PATCH B, and two designated PATCH C. If so, make sure both the PATCH A sockets, both the PATCH B sockets, and both the PATCH C sockets are removed from their respective plugs designated TST.

(b) Patch in replacing circuit unit. Three cords and sockets are required for the patch, one designated PATCH A, one designated PATCH B, and one designated PATCH C.

(c) If the urgent level circuit unit designated SPARE is the one to be substituted for the one in service, it may be equipped with two sockets designated PATCH D and two designated PATCH E. If so, make sure both the PATCH D sockets and both the PATCH E sockets are removed from their respective plugs designated TST.

(d) Patch in replacing circuit unit. Two cords and sockets are required for the patch, one designated PATCH D and the other designated PATCH E.

10.03 Restoration:

(a) Check that each socket is on its proper plug and that all are firmly in place.

(b) Remove dummy plug from the SET jack of the line jack circuit in the loop cabinet.

(c) Restore machine cabinet power switch for each level to its ON position.

(d) If in the preparation steps the TRANS STOP-TRANS HOLD keys of all levels had been operated to TRANS HOLD or, if these keys had been operated to TRANS STOP because there was no tape to be transmitted, restore the keys to normal. If, however, these keys had been operated to TRANS STOP because messages either were garbled in the tape or were being garbled in transmission, proceed as follows:

(1) Disengage the tape-winder reel associated with the level which had been sending garbled copy to the line by pulling it upward and forward, to relieve the tension exerted by it on the tape.

(2) Remove the tape from the transmitter head of the reperforator-transmitter of that level. Pull back sufficient tape from the reel to permit reinserting the tape in the transmitter head with the character over the sensing pins that immediately precedes the FIGS-H-LTRS of the last good message transmitted.

(3) If there are no good messages between the punch block and the transmitter head, restore the TRANS STOP-TRANS HOLD key of that level to its normal position and as soon as transmission starts instantly operate the key to TRANS HOLD and proceed with (4). If, however, there are

good messages between the punch block and the transmitter head, merely restore the TRANS STOP-TRANS HOLD key to its normal position.

(4) Remove the tape from the transmitter head and manually step as much of the garbled tape as is possible past the head. Reinsert the tape in the transmitter head and operate the TAPE DISCARD key until the head rests against the punch block, then restore the TRANS STOP-TRANS HOLD key to its normal position.

(5) Restore the tape-winder reel to its operating position.

(e) Observe the operation of the outgoing line for possible faults in transmitting messages.

(f) Restore BUSY keys in all levels of the machine cabinet to their normal positions.

(g) Restore those INCPT keys at the Control Board that were operated in connection with the preparation steps and observe that messages are received properly on all of the outgoing line reperforator-transmitters. Arrange with the operator in charge of the switching center to take any action necessary in connection with servicing those messages which may have been willfully intercepted during the time the patch was being made.

(h) Restore the TRANS STOP-DIR HOLD keys for all levels of the multiple address machine cabinets to their normal position.

(i) Restore the GO-STOP key at the Control Board for the line involved to GO and observe the operation of the outgoing line for possible faults with respect to the transmission of start patterns.

PATCHING CIRCUIT UNIT — SINGLE-STATION OUTGOING LINE OR SINGLE-CHANNEL OUTGOING TRUNK

10.04 Preparation:

(a) Operate the TRANS STOP-TRANS HOLD keys for all levels at the machine cabinets for the line or trunk involved to TRANS HOLD if it is satisfactorily transmitting good messages to the line or trunk at the time and wait for transmission to stop at the end of any message then in progress. If either level has no messages to transmit, is transmitting garbled messages, or is garbling good messages in transmission, operate the TRANS STOP-TRANS HOLD keys for all levels to TRANS STOP.

(b) If the multiple address feature is provided at the switching center, operate the TRANS STOP-DIR HOLD keys for all levels at the multiple address machine cabinets to DIR HOLD and wait for cross-office transmission to stop at the end of any message or messages then in progress.

(c) Insert a dummy plug in the SET jack of the line jack circuit in the loop cabinet, for the line or trunk involved, to prevent the line or trunk from going open while the patch is being made.

(d) Operate the INCPT 1 key for the line or trunk at the Control Board. If the key is already operated, note that fact for use in connection with the restoration procedures.

(e) With all levels of the line or trunk idle, with respect to both receiving or transmitting, operate the machine cabinet power switch for each reperforator-transmitter to its OFF position.

(f) Arrange with the operator in charge of the switching center to take any action necessary in connection with servicing messages that might have been either received or transmitted by the line or trunk garbled or incomplete.

10.05 Patching (Performed at Patching Cabinet):

(a) If the regular level circuit unit designated SPARE is the one to be substituted for the one in service, it may be equipped with two sockets designated PATCH A, two designated PATCH B, and two designated PATCH C. If so, make sure both the PATCH A sockets, both the PATCH B sockets, and both the PATCH C sockets are removed from their respective plugs designated TST.

(b) Patch in replacing circuit unit. Three cords and sockets are required for the patch, one designated PATCH A, one designated PATCH B, and one designated PATCH C.

(c) If the urgent level circuit unit designated SPARE is the one to be substituted for the

one in service, it may be equipped with two sockets designated PATCH D and two designated PATCH E. If so, make sure both the PATCH D sockets and both the PATCH E sockets are removed from their respective plugs designated TST.

(d) Patch in replacing circuit unit. Two cords and sockets are required for the patch, one designated PATCH D and the other designated PATCH E.

10.06 Restoration:

(a) Check that each socket is on its proper plug and that all are firmly in place.

(b) Remove dummy plug from the SET jack of the line jack circuit in the loop cabinet.

(c) Restore machine cabinet power switches for all levels to their ON positions.

(d) If in the preparation steps the TRANS STOP-TRANS HOLD keys of all levels had been operated to TRANS HOLD, or, if these keys had been operated to TRANS STOP because there was no tape to be transmitted, restore the keys to normal. If, however, these keys had been operated to TRANS STOP because messages either were garbled in the tape or were being garbled in transmission, proceed as follows:

(1) Disengage the tape-winder reel associated with the level which had been sending garbled copy to the line or trunk by pulling it upward and forward, to relieve the tension exerted by it on the tape.

(2) Remove the tape from the transmitter head of the reperforator-transmitter of that level. Pull back sufficient tape from the reel to permit reinserting the tape in the transmitter head with the character over the sensing pins that immediately precedes the FIGS-H-LTRS of the last good message transmitted.

(3) If there are no good messages between the punch block and the transmitter head, restore the TRANS STOP-TRANS HOLD key of that level to its normal position and, as soon as transmission starts, instantly operate the key to TRANS HOLD and proceed with (4). If, however, there are good messages between the punch block and the transmitter head, merely restore the TRANS STOP-TRANS HOLD key to its normal position.

(4) Remove the tape from the transmitter head and manually step as much of the garbled tape as is possible past the head. Reinsert the tape in the transmitter head and operate the TAPE DISCARD key until the head rests against the punch block, then restore the TRANS STOP-TRANS HOLD key to its normal position.

(5) Restore the tape-winder reel to its operating position.

(e) Observe the operation of the line or trunk for possible faults in transmitting messages.

(f) Restore BUSY keys in all levels of the machine cabinets to their normal position.

(g) Restore the INCPT 1 key at the Control Board if it was operated in connection with the preparation steps and observe that messages are received properly on each of the line or trunk reperforator-transmitters. Arrange with the operator in charge of the switching center to take any action necessary in connection with servicing those messages which may have been willfully intercepted during the time the patch was being made.

(h) Restore the TRANS STOP-DIR HOLD keys for all levels of the multiple address machine cabinet to their normal position.

PATCHING FOR REPLACING REPERFORATOR-TRANSMITTER — ROUTINE MAINTENANCE

10.07 Preparation:

(a) If the level of the machine cabinet in which the reperforator-transmitter is to be replaced is not transmitting a message, operate its TRANS STOP-TRANS HOLD key to the TRANS STOP position. If, however, the level is transmitting a message, operate the key to the TRANS HOLD position. In the latter case, wait for transmission to stop at the end of the message and then rapidly operate the key to the TRANS STOP position.

(b) Operate the BUSY key at the machine cabinet for the level involved and wait for cross-office transmission to stop at the end of any message which the level might be receiving at the time.

(c) Manually feed out about 30 to 40 LTRS characters and, if there are messages in the tape that have not been transmitted, tear a notch in the No. 1 pulse edge of the tape at a point about one inch beyond the end-of-message code perforations for the last message on the tape. If there are no such messages in the tape the notching should be omitted.

(d) Operate the machine cabinet power switch for the reperforator-transmitter involved to its OFF position.

(e) Disengage the tape-winder reel by pulling it upward and forward, to relieve the tension exerted by it on the tape.

(f) If there are messages in the tape that have not been transmitted, mark the tape to indicate the character then over the sensing pins.

(g) Remove the tape from the transmitter head of the reperforator-transmitter and tear it off at the code punch block.

10.08 Patching (Performed at Machine Cabinet):

(a) Remove both Jones plug and power plug of machine to be replaced and remove machine from cabinet.

(b) Place replacing machine in cabinet and insert its Jones plug and power plug.

10.09 Restoration:

(a) Check that the Jones plug and the power plug are firmly in place.

(b) Restore machine cabinet power switch to its ON position.

(c) Insert tape in new machine and manually feed out about five feet of LTRS characters.

(d) Splice the end of this tape to the end of the tape on the winder by overlapping the two ends about one inch and fastening them with a wire stapler.

(e) If there are messages in the tape that have not been transmitted, proceed immediately to (f). If, however, there are no such messages in the tape, proceed as follows:

(1) Restore the tape-winder reel to its operating position.

(2) Manually step all but the last few of the fed-out LTRS characters past the transmitter and permit the tape to wind on the tape winder until the point of the splice is well past the snubber pins of the winder.

(3) Insert the tape in the transmitter head.

(4) Restore the BUSY key and observe that messages are received properly on the reperforator-transmitter.

(5) Restore the TRANS STOP-TRANS HOLD key to its normal position and observe the operation of the line or trunk for possible faults in transmitting messages and, in the case of a multistation line, start patterns.

(f) If there are messages in the tape that have not been transmitted, proceed as follows:

(1) Insert the tape in the transmitter head with the previously marked character over the sensing pins.

(2) Restore the tape-winder reel to its operating position.

(3) Restore the TRANS STOP-TRANS HOLD key to its normal position and observe the operation of the line or trunk for possible faults in transmitting messages and, in the case of a multistation line, start patterns.

(4) Restore the BUSY key and observe that messages are received properly on the reperforator-transmitter.

(5) When the notch which was torn in the edge of the tape reaches the transmitter sensing pins, it should bring in a Tape-out Alarm. At that time, operate the TRANS STOP-TRANS HOLD key to TRANS HOLD, remove the tape from the transmitter head, manually step all but the last few of the fed-out LTRS characters past the transmitter and permit the tape to wind on the tape winder until the point of the splice is well past the snubber pins of the winder.

(6) Reinsert the tape in the transmitter head.

(7) Restore the TRANS STOP-TRANS HOLD key to normal.

(8) Observe operation of the line or trunk for possible faults.

PATCHING FOR REPLACING REPERFORATOR-TRANSMITTER – MACHINE TROUBLE

10.10 Preparation:

(a) Operate the BUSY key at the machine cabinet for the level involved and wait for cross-office transmission to stop at the end of any message which the level might be receiving at the time.

(b) Arrange with the operator in charge of the switching center to take any servicing action necessary in connection with any message received garbled or incomplete and in connection with the machine trouble alarm if the nature of the trouble is such as to have resulted in one.

(c) If the involved level of the machine cabinet is not transmitting a message to the line or trunk, operate its TRANS STOP-TRANS HOLD key to the TRANS STOP position. If, however, the level is transmitting a message, proceed with one of the following steps, whichever is appropriate to the conditions involved.

(1) If the message is complete and ungarbled, operate the TRANS STOP-TRANS HOLD key for that level to TRANS HOLD and wait for transmission to stop at the end of the message.

(2) If the message is incomplete or garbled, operate the TRANS STOP-TRANS HOLD key for that level to TRANS STOP to stop transmission immediately and momentarily operate the LINE RLS key so that the level will relinquish the line. Arrange with the operator in charge of the switching center to take appropriate action in connection with servicing the interrupted message.

(d) If, after transmission to the line or trunk has been stopped, there are no messages remaining to be transmitted, manually feed out about 30 to 40 LTRS characters, if this is possible. If there are messages remaining in the tape, follow one of the steps outlined below, whichever is appropriate to the conditions involved.

(1) If all the remaining messages are complete and ungarbled, manually feed out about 30 to 40 LTRS characters and tear a notch in the No. 1 pulse edge of the tape at a point about one inch beyond the end-of-message code perforations for the last message in the tape.

(2) If there are good messages remaining, followed by one or more that are incomplete or garbled, omit the manual LTRS feed-out and tear a notch in the No. 1 pulse edge of the tape at the perforations for the LTRS character of the end-of-message code for the last good message in the tape.

(3) If there is only one message remaining in the tape and it is incomplete or garbled, omit both the manual LTRS feed-out and the notching of the tape.

(e) Operate the machine cabinet power switch for the reperforator-transmitter involved to its OFF position.

(f) Disengage the tape-winder reel by pulling it upward and forward, to relieve the tension exerted by it on the tape.

(g) If there are good messages in the tape which have not been transmitted, note the last message that was properly transmitted to the line or trunk.

(h) Remove the tape from the transmitter head of the reperforator-transmitter and tear it off at the code punch block.

10.11 Patching (Performed at Machine Cabinet):

(a) Remove both Jones plug and power plug of machine to be replaced and remove machine from cabinet.

(b) Place replacing machine in cabinet and insert its Jones plug and power plug.

10.12 Restoration:

(a) Check that the Jones plug and power plug are firmly in place.

(b) Restore machine cabinet power switch to its ON position.

(c) Insert tape in new machine and manually feed out about five feet of LTRS characters.

(d) Splice the end of this tape to the end of the tape on the winder by overlapping the two ends about one inch and fastening them with a wire stapler.

(e) If there are good messages in the tape that have not been transmitted complete and ungarbled, proceed immediately to (f). If, however, there are no such messages in the tape, proceed as follows:

(1) Restore the tape-winder reel to its operating position.

(2) Manually step all but the last few of the fed-out LTRS characters past the transmitter and permit the tape to wind on the tape winder until the point of the splice is well past the snubber pins of the winder.

(3) Insert the tape in the transmitter head.

(4) Restore the BUSY key and observe that messages are received properly on the reperforator-transmitter.

(5) Restore the TRANS STOP-TRANS HOLD key to its normal position and observe the operation of the line or trunk for possible faults in transmitting messages and, in the case of a multistation line, start patterns.

(f) If there are good messages in the tape that have not been transmitted complete and ungarbled, proceed as follows:

(1) Insert the tape in the transmitter head with the LTRS character of the end-of-message code for the last good message that was transmitted over the sensing pins.

(2) Restore the tape-winder reel to its operating position.

(3) Restore the TRANS STOP-TRANS HOLD key to its normal position and observe the operation of the line or trunk for possible faults in transmitting messages and, in the start patterns, in the case of a multistation line.

(4) Restore the BUSY key and observe that messages are received properly on the reperforator-transmitter.

(5) When the notch which was torn in the edge of the tape reaches the transmitter sensing pins, it should bring in a Tape-out Alarm. At that time, operate the TRANS STOP-TRANS HOLD key to TRANS HOLD, remove the tape from the transmitter head, manually step all but the last few of the fed-out LTRS characters past the transmitter and permit the tape to wind on the tape winder until the point of the splice is well past the snubber pins of the winder.

(6) Reinsert the tape in the transmitter head.

(7) Restore the TRANS STOP-TRANS HOLD key to normal.

(8) Observe operation of the line or trunk for possible faults.

11. SEQUENCE CIRCUIT

PATCHING CIRCUIT UNIT

11.01 Preparation: Note the condition of all DIR STOP-DIR HOLD keys in the switching center and operate to DIR HOLD any that are not already operated either to DIR HOLD or to DIR STOP. If the patch is being made for routine maintenance, notify the operator in charge of the center accordingly, before proceeding.

11.02 Patching of Common Circuit Unit (Performed at Sequence Cabinet): Patch in replacing circuit unit. One cord and socket designated SPARE A are required for the patch.

11.03 Patching of Individual Circuit Unit (Performed at Sequence Cabinet): Patch the replacing individual circuit unit designated SPARE B. One cord and socket are required for the patch. Ten director appearances are patched at a time.

11.04 Restoration:

(a) Check that each socket is on its proper plug and that both are firmly in place.

(b) Restore to their normal position all DIR STOP-DIR HOLD keys that, in the preceding preparation steps, it was necessary to operate to DIR HOLD.

(c) Observe that proper cross-office direction of single-address messages takes place.

12. MULTIPLE ADDRESS CIRCUIT

Note: The multiple address circuit consists of four circuit units which are individually patchable.

12.01 Level Sequence Circuit Unit:

(a) Preparation

(1) Arrange with the operator in charge of the switching center to intercept multiple address messages on willful intercept during patching operations.

(2) Wait until all transmission to Multiple Address has stopped.

(b) Patching (Performed at Multiple Address Director Cabinet): Patch in replacing level sequence circuit unit. One cord and socket designated D are required for the patch.

(c) Restoration:

(1) Check that the socket is on its proper plug and is firmly in place.

(2) Arrange with the operator in charge of the switching center to discontinue the interception of multiple address messages and to release any messages that were so intercepted.

(3) Observe the operation of the replacing circuit.

12.02 Level Circuit Unit:

(a) Preparation:

(1) Arrange with the operator in charge of the switching center to intercept all multiple address messages on willful intercept.

(2) When transmission to the level to be replaced has ceased, operate all DIR HOLD-TRANS STOP keys of all multiple address levels to DIR HOLD.

(3) When transmission from the level being replaced has stopped, operate the power switch on the machine cabinet for the level being replaced to its OFF position.

(b) Patching (Performed at Multiple Address Level Cabinet): Patch in replacing level circuit unit. Two cords and sockets designated E and F are required for the patch.

(c) Restoration:

(1) Check that the sockets are on their proper plugs and firmly in place.

(2) Restore the power switch on the machine cabinet for the level that has been replaced to its ON position.

(3) Operate the DIR HOLD-TRANS STOP keys of all multiple address levels to their normal positions.

(4) Arrange with the operator who is in charge of the switching center to discontinue the interception of multiple address messages and to release any messages that were so intercepted.

(5) Observe the operation of the replacing circuit.

12.03 Director Selector Circuit Unit:

(a) Preparation:

(1) Operate all of the DIR HOLD-TRANS STOP keys for the multiple-address levels to their DIR HOLD positions.

(2) Wait until the director has finished any connections it may be in the process of making.

(b) Patching (Performed at Multiple Address Director Cabinet): Patch in the replacing Director selector circuit unit. One cord and socket designated C are required for the patch.

(c) Restoration:

(1) Check that the socket is on its proper plug and is firmly in place.

(2) Operate all the DIR HOLD-TRANS STOP keys of the multiple address levels to their normal positions.

(3) Observe the operation of the replacing circuit.

12.04 Director Circuit Unit:

(a) Preparation:

(1) Operate the DIR HOLD-TRANS STOP keys for all multiple address levels to their DIR HOLD positions.

(2) Wait until the director has completed any connections it may be in the process of making.

(b) Patching (Performed at Multiple Address Director Cabinet): Patch in the replacing Director circuit unit. Two cords and sockets designated A and B are required for this patch.

(c) Restoration:

(1) Check that the sockets are on their proper plugs and firmly in place.

(2) Operate the DIR HOLD-TRANS STOP keys of all multiple address levels to their normal position.

(3) Observe the operation of the replacing circuit.

PATCHING FOR REPLACING A REPERFORATOR–TRANSMITTER — ROUTINE MAINTENANCE

12.05 Preparation:

(a) Operate the BUSY key on the multiple address machine cabinets for the level involved and wait for cross-office transmission to stop at the end of any message then being received by that level.

(b) If cross-office transmission is in progress from that level, operate its TRANS STOP-DIR HOLD key on the multiple address machine cabinet to DIR HOLD and wait for cross-office transmission to stop at the end of that message. If cross-office transmission is not in progress, operate the key to TRANS STOP.

(c) Manually feed out about 30 to 40 LTRS characters on that level and if there are messages in the tape that have not been transmitted, tear a notch in the No. 1 pulse edge of the tape at a point about one inch beyond the end-of-message code perforations for the last message in the tape. If there are no such messages in the tape, the notching should be omitted.

(d) Operate the machine cabinet power switch for the reperforator-transmitter involved to its OFF position.

(e) Disengage the tape-winder reel by pulling it upward and forward, to relieve the tension exerted by it on the tape.

(f) If there are messages in the tape that have not been transmitted, mark the tape to indicate the character then over the sensing pins.

(g) Remove the tape from the transmitter head of the reperforator-transmitter, and tear it off at the code punch block.

12.06 Patching (Performed at Machine Cabinet)

(a) Remove both the Jones plug and power plug of machine to be replaced and remove machine from cabinet.

(b) Place replacing machine in cabinet and insert its Jones plug and power plug.

12.07 Restoration:

(a) Check that the Jones plug and power plug are firmly in place.

(b) Restore machine cabinet power switch to its ON position.

(c) Insert tape in new machine and manually feed out about five feet of LTRS characters.

(d) Splice the end of this tape to the end of the tape on the winder, overlapping the two ends about one inch and fastening them with a wire stapler.

(e) If there are messages in the tape that have not been transmitted, proceed immediately to (f). If, however, there are no such messages in the tape, proceed as follows:

(1) Restore the tape winder reel to its operating position.

(2) Manually step all but the last few of the fed-out LTRS characters past the transmitter and permit the tape to be wound on the tape winder until the point of the splice is well past the snubber pins of the winder.

(3) Insert the tape in the transmitter head.

(4) Restore the BUSY key to its normal position.

(5) Restore the TRANS STOP-DIR HOLD key to its normal position.

(6) Observe the operation of the machine with respect to both receiving and transmitting, for possible faults.

(f) If there are messages in the tape that have not been transmitted, proceed as follows:

(1) Insert the tape in the transmitter head with the previously marked character over the sensing pins.

(2) Restore the tape-winder reel to its operating position.

(3) Restore the BUSY key to its normal position.

(4) Restore the TRANS STOP - DIR HOLD key to its normal position.

(5) Observe the operation of the machine with respect to both receiving and transmitting, for possible faults.

(6) When all messages in the tape have been transmitted and the notch that was torn in the tape has reached the sensing pins, it should bring in a Torn Tape Alarm.

(7) When the alarm is received, reoperate the TRANS STOP - DIR HOLD key to DIR HOLD, remove the tape from the transmitter head, manually step all but the last few of the fed-out LTRS characters past the transmitter, and permit the tape to be wound on the tape winder until the point of the splice is well past the snubber pins of the winder.

(8) Reinsert the tape in the transmitter head.

(9) Restore the TRANS STOP - DIR HOLD key to its normal position.

PATCHING FOR REPLACING A REPERFORATOR-TRANSMITTER — MACHINE TROUBLE

12.08 Preparation:

(a) Operate the BUSY key on the multiple address machine cabinet for the level involved and wait for cross-office transmission to stop at the end of any message then being received by that level.

(b) Arrange with the operator in charge of the switching center to take any servicing action necessary in connection with any message received garbled or incomplete by that level of multiple address and in connection with the Machine Trouble Alarm if the nature of the trouble is such as to have resulted in one.

(c) If cross-office transmission is then in progress from that level of multiple address, proceed with one of the following steps, whichever is appropriate to the conditions involved:

(1) If the message is complete and ungarbled, and if it is being transmitted satisfactorily, operate the TRANS STOP - DIR HOLD key on the machine cabinet for the level involved to DIR HOLD and wait for cross-office transmission to stop at the end of that message.

(2) If the message is incomplete or garbled, or if it is being garbled in transmission, operate the TRANS STOP - DIR HOLD key on the machine cabinet for the level involved to TRANS STOP, to stop cross-office transmission immediately, and then operate the FIGS H & INT key for the level involved. This action will result in the dismissal of the Multiple Address Director if it is connected to the level involved but, depending upon the nature of the trouble, may fail to result in the transmission of FIGS-H-LTRS cross-office and in the releasing of any seized outlets. In that event, manually operate the LT1 relay for that level involved to release the seized outlets, and arrange with the operator in charge of the switching center to take appropriate action in connection with servicing the interrupted message.

(d) If, after cross-office transmission has been stopped, there are no messages remaining to be transmitted cross-office, manually feed out about 30 to 40 LTRS characters, if this is possible. If there are messages remaining in the tape, follow one of the steps outlined below, whichever is appropriate to the conditions involved:

(1) If all the remaining messages are complete and ungarbled, manually feed out about 30 to 40 LTRS characters and tear a notch in the No. 1 pulse edge of the tape at a point about one inch beyond the end-of-message code perforations for the last message in the tape.

(2) If there are good messages remaining, followed by one or more that are incomplete or garbled, omit the manual LTRS feed-out and tear a notch in the No. 1 pulse edge of the tape at the perforations for the LTRS character of the end-of-message code for the last good message in the tape.

(3) If there is only one message remaining in the tape and it is incomplete or garbled, omit both the manual LTRS feed-out and the notching of the tape.

(e) Operate the machine cabinet power switch for the reperforator-transmitter involved to its OFF position.

(f) Disengage the tape-winder reel by pulling it upward and forward, to relieve the tension exerted by it on the tape.

(g) Note the last message that was properly transmitted cross-office, remove the tape from the transmitter head of the reperforator-transmitter, and tear it off at the code punch block.

12.09 Patching (Performed at Machine Cabinet)

(a) Remove both Jones plug and power plug of machine to be replaced and remove machine from cabinet.

(b) Place replacing machine in cabinet and insert its Jones plug and power plug.

12.10 Restoration:

(a) Check that the Jones plug and the power plug are firmly in place.

(b) Restore machine cabinet power switch to its ON position.

(c) Insert tape in new machine and manually feed out about five feet of LTRS characters.

(d) Splice the end of this tape to the end of the tape on the winder by overlapping the two ends about one inch and fastening them with a wire stapler.

(e) If there are good messages in the tape of the level involved that have not been transmitted complete and ungarbled, proceed immediately to (f). If there are no such messages in the tape, proceed as follows:

(1) Restore the tape-winder reel to its operating position.

(2) Manually step any incomplete or garbled messages and all but the last few of the fed-out LTRS characters past the transmitter and permit the tape to be wound on the tape winder until the point of the splice is well past the snubber pins of the winder.

(3) Insert the tape in the transmitter head.

(4) Restore the BUSY key on the multiple address machine cabinet.

(5) Restore the TRANS STOP - DIR HOLD key to its normal position.

(6) Observe the operation of the machine with respect to both receiving and transmitting.

(f) If there are good messages in the tape of the level involved that have not been transmitted complete and ungarbled, proceed as follows:

(1) Insert the tape in the transmitter head with the LTRS character of the end-of-message code for the last good message that was satisfactorily transmitted over the sensing pins.

(2) Restore the tape-winder reel to its operating position.

(3) Restore the BUSY key to its normal position.

(4) Restore the TRANS STOP - DIR HOLD key to its normal position.

(5) Observe the operation of the machine with respect to both receiving and transmitting, for possible faults.

(6) When all good messages in the tape have been transmitted and the notch that was torn in the tape has reached the sensing pins, it should bring in a Torn Tape Alarm.

(7) When the alarm is received, reoperate the TRANS STOP-DIR HOLD key to DIR HOLD, remove the tape from the transmitter head, manually step any remaining garbled or incomplete messages and all but the last few of the fed-out LTRS characters

past the transmitter, and permit the tape to be wound on the tape winder until the point of the splice is well past the snubber pins of the winder.

(8) Reinsert the tape in the transmitter head.

(9) Restore the TRANS STOP - DIR HOLD key to its normal position.

13. GROUP CODE CIRCUIT

Note: The group code circuit is provided in three parts, each of which is separately patchable. The preparations for the patch and restoration after the patch are the same for each of the three parts of the circuit.

13.01 Preparation:

(a) Operate the TRANS STOP - DIR HOLD keys for all levels of multiple address to their HOLD positions and wait until the multiple address director has completed making all the connections from the level it is connected to at this time and is dismissed.

(b) If a trouble condition exists it may be necessary to manually dismiss the director by operating the TRANS STOP-DIR HOLD key for the level connected to the director to its STOP position and then operating the FIGS H & INT key of that level.

(c) Arrange with the operator in charge of the switching center to take appropriate action in connection with servicing any message that may have been interrupted.

13.02 Patching:

(a) Outlet Relay Circuit Unit (Performed at Originating Group Code Cabinet): Patch in replacing circuit unit. One cord and socket designated A are required for the patch.

(b) Trunk Relay Circuit Unit (Performed at Originating Group Code Cabinet): Patch in replacing circuit unit. One cord and socket designated C are required for the patch.

(c) Code Relay Circuit Unit (Performed in the Cabinet in Which it is Located): Patch in replacing circuit unit. One cord and socket designated B are required for the patch.

13.03 Restoration:

(a) Check that the socket is on its proper plug and that it is firmly in place.

(b) Restore the TRANS STOP - DIR HOLD keys of all the multiple address levels to their normal positions.

(c) Observe the operation of the replacing circuit unit for possible faults on some message containing a group code.

14. MULTICHANNEL TRUNK CIRCUIT

Note: The multichannel trunk circuit is provided as two units which are patchable on an individual basis. The preparation for patching and the restoration after patching are the same for both units.

14.01 Preparation:

(a) Arrange with the operator in charge of the switching office to intercept all messages for the trunk and wait until all transmission to the trunk has ceased.

(b) If the trunk level unit is to be patched, put a dummy plug in the SET jack at the loop board for the level involved.

14.02 Patching (Performed at Patching Cabinet):

(a) Common Circuit Unit: Patch in the replacing circuit unit. One cord and socket designated A are required for the patch.

(b) Level Circuit Unit: Patch in the replacing circuit unit. One cord and socket designated B are required for the patch.

14.03 Restoration:

(a) Check that the socket is on the proper plug and firmly in place.

(b) Remove the dummy plug from the SET jack at the loop board.

(c) Arrange with the operator in charge of the switching center to discontinue interception and to release any messages that may have been intercepted.

(d) Observe the operation of the replacing circuit.

15. SUPPLEMENTARY MULTIPLE ADDRESS CIRCUIT

PATCHING CIRCUIT UNITS:

Note: The circuit units of the supplementary multiple address arrangement consist of

either three or five cross-office circuit units, a connection-control circuit unit, and either six or ten single-address receiving-circuit units, any one of which is independently patchable through the use of the corresponding spare circuit unit provided. The procedures that follow are applicable to the patching of any of these circuit units. Due to series paths between cross-office circuits and between single-address circuits, no patches may be made while the supplementary multiple address is in operation. For the same reason no working panel plug in the patch bays may be left unoccupied during service. Before any patching operations are made, all supplementary multiple address traffic must be intercepted (or diverted) and any supplementary multiple address traffic in progress, either in or out, must be completed.

15.01 Preparation:

(a) Arrange with the operator in charge of the switching center either for intercepting supplementary multiple address messages on willful intercept or for diverting such messages for regular multiple address handling until the patching operations have been completed.

(b) Following operation of keys by the operator to intercept or divert messages, wait until all cross-office transmission then in progress to supplementary multiple address has been completed as indicated both by the fact that all BUSY lamps are out and reception is no longer taking place on the supplementary multiple address reperforator-transmitters.

(c) If it is a cross-office circuit unit or the connection control circuit unit that is to be patched, proceed at once to (f). If, however, it is a single-address receiving circuit unit that is to be patched, proceed with (d).

(d) If cross-office transmission is in progress from the reperforator-transmitter associated with the single-address receiving circuit unit to be patched, operate its DIR STOP-DIR HOLD key on the machine cabinet to DIR HOLD and wait for cross-office transmission to stop at the end of that message if it is complete and ungarbled. If it is incomplete or garbled, operate the key, instead, to DIR STOP to stop cross-office transmission immediately, and then operate the FIGS H & INT key to break down the cross-office connection. If cross-office transmission is not in progress, merely operate the DIR STOP-DIR HOLD key to DIR HOLD.

(e) After all cross-office transmission both to and from supplementary multiple address has stopped normally or has been stopped by the above action, operate the machine cabinet power switch of the level for the reperforator-transmitter associated with the single-address receiving unit to be patched to its OFF position.

(f) Arrange with the operator in charge of the switching center to take any action necessary in connection with servicing messages that might have been either received or transmitted garbled or incomplete by supplementary multiple address.

15.02 Patching:

Note 1: Performed at first supplementary multiple address cabinet for cross-office units 1 through 5, for connection-control circuit unit and for single-address receiving units 1 through 6. Performed at third supplementary multiple address cabinet for single-address receiving units 7 through 10.

Patch in the desired type of spare replacing circuit unit. Cords and sockets required for the patch are designated for each of the three types of circuit units as shown below:

Circuit Unit	Designation
(1) Cross-office	CROSS OFFICE PATCH (A) and (B)
(2) Connection-control	CONN CONT PATCH (C) and (D)
(3) Single-address receiving	S ADD REC PATCH (E)

Note 2: An unassigned single-address receiving-circuit may be used as a replacing circuit unit, as well as the spare unit provided for maintenance. However, when an unassigned unit is not being used as a replacing unit, its socket must always be left disengaged from its associated plug in order to prevent interference with the proper operation of the working supplementary multiple address equipment. Before attempting to use the spare single-address receiving-circuit unit as a replacing

unit in either the first or third supplementary multiple address cabinet, check that the spare unit is not already being used in the cabinet other than the one in which the patch is to be made. The spare unit is multipled between the first and third cabinets and, therefore, can only be used in one of these cabinets at any time as a replacing unit.

15.03 Restoration:

(a) Check that each socket is on its proper plug and that each is firmly in place.

(b) If the circuit unit replaced was other than a single-address receiving-circuit unit, proceed immediately to (c). If the circuit unit replaced was a single-address receiving unit, restore the machine cabinet power switch of the level for the reperforator-transmitter associated with it to the ON position and the DIR STOP-DIR HOLD key of that same level to its normal position.

(c) Arrange with the operator in charge of the switching center either to discontinue the interception of supplementary multiple address messages on willful intercept and to release any messages so intercepted or to discontinue diverting such messages to regular multiple address, depending on which of these actions was arranged for under 15.01 above.

(d) Observe for possible fault the operation of the replacing circuit unit with respect to receiving on either a particular level of supplementary multiple address if a single-address receiving-circuit unit was replaced or on all levels of supplementary multiple address in the case where a cross-office circuit unit or the connection-control circuit unit was replaced.

PATCHING FOR REPLACING REPERFORATOR-TRANSMITTER – ROUTINE MAINTENANCE

15.04 Preparation:

(a) Operate the BUSY key on the machine cabinet for the level involved and wait for cross-office transmission to stop at the end of any message then being received by that level.

(b) If cross-office transmission is in progress from that level, operate its DIR STOP-DIR HOLD key on the machine cabinet to DIR HOLD and wait for cross-office transmission to stop at the end of that message. If cross-office transmission is not in progress, operate the key to DIR STOP.

(c) Manually feed out about 30 to 40 LTRS characters on that level and if there are messages in the tape that have not been transmitted, tear a notch in the No. 1 pulse edge of the tape at a point about one inch beyond the end-of-message code perforations for the last message in the tape. If there are no such messages in the tape, the notching should be omitted.

(d) Operate the machine cabinet power switch for the reperforator-transmitter involved to its OFF position.

(e) Disengage the tape-winder reel by pulling it upward and forward, to relieve the tension exerted by it on the tape.

(f) If there are messages in the tape that have not been transmitted, mark the tape to indicate the character then over the sensing pins.

(g) Remove the tape from the transmitter head of the reperforator-transmitter, and tear it off at the code punch block.

15.05 Patching (Performed at Machine Cabinet)

(a) Remove both the Jones plug and power plug of machine to be replaced and remove machine from cabinet.

(b) Place replacing machine in cabinet and insert its Jones plug and power plug.

15.06 Restoration:

(a) Check that the Jones plug and power plug are firmly in place.

(b) Restore machine cabinet power switch to its ON position.

(c) Insert tape in new machine and manually feed out about five feet of LTRS characters.

(d) Splice the end of this tape to the end of the tape on the winder, overlapping the two ends about one inch and fastening them with a wire stapler.

(e) If there are messages in the tape that have not been transmitted, proceed immediately to (f). If, however, there are no such messages in the tape, proceed as follows:

(1) Restore the tape-winder reel to its operating position.

(2) Manually step all but the last few of the fed-out LTRS characters past the transmitter and permit the tape to be wound on the tape winder until the point of the splice is well past the snubber pins of the winder.

(3) Insert the tape in the transmitter head.

(4) Restore the BUSY key to its normal position.

(5) Restore the DIR STOP-DIR HOLD key to its normal position.

(6) Observe the operation of the machine with respect to both receiving and transmitting, for possible faults.

(f) If there are messages in the tape that have not been transmitted, proceed as follows:

(1) Insert the tape in the transmitter head with the previously marked character over the sensing pins.

(2) Restore the tape-winder reel to its operating position.

(3) Restore the BUSY key to its normal position.

(4) Restore the DIR STOP-DIR HOLD key to its normal position.

(5) Observe the operation of the machine with respect to both receiving and transmitting, for possible faults.

(6) When all messages in the tape have been transmitted and the notch that was torn in the tape has reached the sensing pins, it should bring in a Torn Tape Alarm.

(7) When the alarm is received, reoperate the DIR STOP-DIR HOLD key to DIR HOLD, remove the tape from the transmitter head, manually step all but the last few of the fed-out LTRS characters past the transmitter, and permit the tape to be wound on the tape winder until the point of the splice is well past the snubber pins of the winder.

(8) Reinsert the tape in the transmitter head.

(9) Restore the DIR STOP-DIR HOLD key to its normal position.

PATCHING FOR REPLACING REPERFORATOR-TRANSMITTER — MACHINE TROUBLE

15.07 Preparation:

(a) Operate the BUSY key on the machine cabinet for the level involved and wait for cross-office transmission to stop at the end of any message then being received by that level.

(b) Arrange with the operator in charge of the switching center to take any servicing action necessary in connection with any message received garbled or incomplete by that level of supplementary multiple address and in connection with the Machine Trouble Alarm in the event the nature of the trouble is such as to have resulted in one.

(c) If cross-office transmission is then in progress from that level of supplementary multiple address, proceed with one of the following steps, whichever is appropriate to the conditions involved:

(1) If the message is complete and ungarbled, and if it is being transmitted satisfactorily, operate the DIR STOP-DIR HOLD key on the machine cabinet for the level involved to DIR HOLD and wait for cross-office transmission to stop at the end of that message.

(2) If the message is incomplete or garbled, or if it is being garbled in transmission, operate the DIR STOP-DIR HOLD key on the machine cabinet for the level involved to DIR STOP, to stop cross-office transmission immediately, and then operate the FIGS H & INT key for the level involved to break down the cross-office connection. Arrange with the operator in charge of the switching center to take appropriate action in connection with servicing the interrupted message.

(d) If, after cross-office transmission has been stopped, there are no messages remaining to be transmitted cross-office, manually feed out about 30 to 40 LTRS characters if this is possible. If there are messages remaining in the tape, follow one of the steps outlined below, whichever is appropriate to the conditions involved:

(1) If all the remaining messages are complete and ungarbled, manually feed out about 30 to 40 LTRS characters and tear a notch in the No. 1 pulse edge of the tape at a point about one inch beyond the end-of-message code perforations for the last message in the tape.

(2) If there are good messages remaining, followed by one or more that are incomplete or garbled, omit the manual LTRS feed-out and tear a notch in the No. 1 pulse edge of the tape at the perforations for the LTRS character of the end-of-message code for the last good message in the tape.

(3) If there is only one message remaining in the tape and it is incomplete or garbled, omit both the manual LTRS feed-out and the notching of the tape.

(e) Operate the machine cabinet power switch for the reperforator-transmitter involved to its OFF position.

(f) Disengage the tape-winder reel by pulling it upward and forward, to relieve the tension exerted by it on the tape.

(g) Note the last message that was properly transmitted cross-office, remove the tape from the transmitter head of the reperforator-transmitter, and tear it off at the code punch block.

15.08 Patching (Performed at Machine Cabinet)

(a) Remove both Jones plug and power plug of machine to be replaced and remove machine from cabinet.

(b) Place replacing machine in cabinet and insert its Jones plug and power plug.

15.09 Restoration:

(a) Check that the Jones plug and the power plug are firmly in place.

(b) Restore machine cabinet power switch to its ON position.

(c) Insert tape in new machine and manually feed out about five feet of LTRS characters.

(d) Splice the end of this tape to the end of the tape on the winder by overlapping the two ends about one inch and fastening them with a wire stapler.

(e) If there are good messages in the tape of the level involved that have not been transmitted complete and ungarbled, proceed immediately to (f). If there are no such messages in the tape, proceed as follows:

(1) Restore the tape-winder reel to its operating position.

(2) Manually step any incomplete or garbled messages and all but the last few of the fed-out LTRS characters past the transmitter and permit the tape to be wound on the tape winder until the point of the splice is well past the snubber pins of the winder.

(3) Insert the tape in the transmitter head.

(4) Restore the BUSY key to its normal position.

(5) Restore the DIR STOP-DIR HOLD key to its normal position.

(6) Observe the operation of the machine with respect to both receiving and transmitting, for possible faults.

(f) If there are good messages in the tape of the level involved that have not been transmitted complete and ungarbled, proceed as follows:

(1) Insert the tape in the transmitter head with the LTRS character of the end-of-message code for the last good message that was satisfactorily transmitted over the sensing pins.

(2) Restore the tape-winder reel to its operating position.

(3) Restore the BUSY key to its normal position.

(4) Restore the DIR STOP-DIR HOLD key to its normal position.

(5) Observe the operation of the machine with respect to both receiving and transmitting, for possible faults.

(6) When all good messages in the tape have been transmitted and the notch that was torn in the tape has reached the sensing pins, it should bring in a Torn Tape Alarm.

(7) When the alarm is received, reoperate the DIR STOP - DIR HOLD key to DIR HOLD, remove the tape from the transmitter head, manually step any remaining garbled or incomplete messages and all but the last few of the fed-out LTRS characters past the transmitter, and permit the tape to be wound on the tape winder until the point of the splice is well past the snubber pins of the winder.

(8) Reinsert the tape in the transmitter head.

(9) Restore the DIR STOP-DIR HOLD key to its normal position.