

PROGRAM TRANSMISSION
INSTRUCTIONS FOR SWITCHES AND REVERSALS

^1. GENERAL%%

1.01 This section provides information regarding the making of switches and reversals on program transmission services of the Southwestern Bell Telephone Company.

1.02 Information regarding the making of switches and reversals on program transmission services of the Long Lines Department may be found in instructions issued by that department.

1.03 In general, switches and reversals will be authorized by Program Transmission Service Orders, except where special arrangements have been made to accept informal orders from authorized representatives of the customer.

1.04 Various precautions and checks must be made to guard against errors in performing switches and reversals. It is necessary to emphasize such precautions in order to maintain the quality of the service which the Telephone Company has undertaken to furnish and because of the large number of people whose satisfaction as listeners would be marred by imperfect transmission of a program.

1.05 This section has been revised to include additional concerning the handling of switches and reversals and assignment of responsibilities for carrying out the various operations.

^2. DEFINITIONS%%

2.01 ^Switch%%: The transfer of an outgoing circuit or loop from one incoming source of program (old source) to another incoming source (new source).

2.02 ^Normal Switch%%: A switch which is started and completed within the 5 second period immediately following receipt of a given cue or scheduled time.

2.03 ^Delayed Switch%%: A switch which is started and completed within the 5 second period immediately following a specified delay period.

2.04 ^Delay Period%%: A time interval of waiting which is observed immediately following receipt of a given cue and at the expiration of which a delayed switch is performed. The duration of a delay period is specified by the customer.

2.05 ^Switching Cue%%: A group of words or musical notes which serve as a signal for a switch operation. A specified clock time also may be used as a switching cue. A word cue is timed by the receipt of the last word of the cue. A cue consisting of musical notes (e.g. chimes) is timed by the receipt of the last of the musical notes.

2.06 ^Scheduled Time of a Switch%%: The approximate time given in the order authorizing a switch.

2.07 ^Reversal%%: A reversal consists of a change of the direction of transmission, on a specified section of a network, on a circuit, or on a loop from the normal direction of transmission to the opposite direction of transmission.

2.08 ^Restoral%00: A change from the opposite direction of transmission back to the normal direction of transmission is known as a restoration (commonly termed Restoral).

2.09 The instructions given herein with respect to reversals shall be understood to also apply to restorals.

^3. INSTRUCTIONS FOR SWITCHES AND REVERSALS%00

3.01 At least fifteen minutes will normally be allowed for a reversal except in those cases where suitable facility arrangements have been made for quick reversals, in which case the allowance is ordinarily about fifteen seconds.

3.02 Switches and reversals shall be made under the general direction of the control office. As soon as information concerning scheduled switches or reversals is available, the control office shall inform all offices involved of the scheduled time, type of switch or reversal, cue source or sources, and the cue.

3.03 Orders stating the scheduled time, type of switch, reversal, restoration, cue source and cue should be furnished to all offices involved.

3.04 Five to ten minutes before the scheduled time of a switch or reversal the control office should check all offices involved to insure that these offices are in readiness; however, each office shall be responsible for its readiness to perform required operations.

3.05 Three minutes prior to the scheduled time of a switch or reversal, each office having operations to perform shall start monitoring. Except for unusual conditions, such as a fire or power failure, the attendant shall not leave the switching or reversing position within three minutes of the scheduled time.

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3.06 In general, programs normally conclude 20 to 30 seconds prior to the quarter-hour, half-hour, or the hour, thus permitting switches, station identifications, etc., to be completed which normally will start on the quarter-hour, half-hour, or the hour.

3.07 The switch or reversal shall be performed by all offices immediately after the cue or scheduled time unless a delayed basis is specified, in which case the operation shall be started immediately after the delay period.

3.08 Frequently principals desire switches to be made on "special cues", that is, word cues, differing from standard cues. Such switches are usually ordered for times other than the quarter-hour, half-hour, and hour). The approximate time at which a special cue is to be given will be included in the order with the cue and this approximate time shall be considered the scheduled time of the switch. Frequently a special cue, if given, will differ slightly from that given in an order. In such case the switch shall be made if the attendant recognizes the cue, even though the words preceding the last word of the cue do not conform exactly with those specified in the order. The last word of the given cue must conform exactly, however.

3.10 In case of a switch scheduled to be performed on a word or musical note cue, if no cue is received and the program on the cues source has concluded, make the switch as soon as a new program starts on the cue source. If no new program has started

by 10 seconds past the scheduled start, make the switch on a time basis at this time. If no new program is scheduled to start on the cue source, make the switch on a time basis at 10 seconds past the scheduled start of the new program on the facility being switched.

3.11 In the event of an interrupted cue (that is, a cue which was started but interrupted prior to its completion) if the attendant is satisfied that the cue which was interrupted was the correct switching cue, he shall make the switch as if the entire cue had been received. If the attendant is uncertain as to whether or not the interrupted cue was the correct switching cue, he shall proceed in accordance with the preceding paragraphs, as if the cue had not been received.

3.12 In the event of a wrong cue for a switch the control office should be advised immediately with a request for instructions before proceeding with the switch.

3.13 In the event of a late switching cue caused by a program "running over" the attendant should continue in readiness until the cue is received, and then make the switch, unless instructed otherwise by the control office prior to the receipt of the cue.

3.14 In the event of an early switching cue if the cue is received during the 3 minutes immediately preceding the scheduled switch time, the switch shall be performed. If the switching cue is received more than 3 minutes early the control office should be asked for instructions. (A cue received within the 30 seconds immediately preceding the scheduled switch time is not considered an early cue.)

3.15 When operating switching keys or panels push the buttons to the full extent of their travel to assure positive operation, otherwise the key may release itself. Likewise, the plugs of patching cords should be inserted their full extent to assure proper contact.

3.16 Immediately after completing a switch inspect switching keys and/or patch cords involved to assure that the operation was completed properly.

3.17 When making a switch from a program bridge by use of patch cords, make sure that the new source selected is one which will deliver the proper volume for the type of facility being switched. When switches are made from one source to another when bridges are not involved make sure the relative volume levels of the two sources are taken into consideration as it may be necessary to adjust gains to insure proper levels. Prior to making the switch check the patch cord for continuity, where feasible, by connecting the cord to the new source and using that material for the continuity test. Tag patch cords prominently.

3.18 When the new source is one which is normally dead-ended in the testroom at which the switch is to be performed, the switching office shall check the volume at the new source, about 10 minutes prior to the switch. If the volume differs appreciably from that expected and if the condition appears to be a local one, correct it promptly. If this condition appears to locate elsewhere on the incoming circuit, it should be referred to the control office and the switch carried out unless otherwise instructed.

3.19 When switching an outgoing circuit which is part of a continuous loop (round robin) circuit, proceed as follows:

(a) Open the circuit being switched.

(1) For a normal switch, immediately after receipt of the cue.

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(2) For a delayed switch, immediately after expiration of the delay period.

(b) Hold the circuit open for three seconds.

(c) Connect the circuit to the new source.

These three steps shall be completed within five seconds. The three-second "hold open" period is to prevent feedback, and may be judged by counting "thousand and one, thousand and two, thousand and three".

3.20 When switching an outgoing circuit which is not part of a continuous loop, (round robin) circuit, proceed as follows:

(a) Open the circuit being switched.

(1) For a normal switch, immediately after receipt of the cue.

(2) For a delayed switch, immediately after expiration of the delay period.

(b) Connect the circuit to the new source, observing no "hold open" period.

3.21 If, at any office, some switched are of the type of paragraph 3.10 and some are of the type of paragraph 3.20, the procedure of paragraph 3.19 may be followed exclusively to permit uniform switching.

3.22 A reversal shall be performed by transposing the input and output of the line amplifier with respect to the incoming or outgoing lines and adjusting the gain and equalization of the line and associated bridging amplifiers for the new preceding section as determined during a prior preliminary lineup test; or by patching to spare amplifiers and/or line facilities previously lined up in the reverse direction. This latter method is desirable when suitable facilities are available, particularly in the case of circuits established on four wire cable facilities.

3.23 After a switch or reversal, each office shall continue to monitor until the circuit is checked to insure that the operation has been performed satisfactorily, and that the program is passing with satisfactory volume and quality. Terminal offices shall check to see that the circuit is connected through to the specified transmitting and receiving circuits at the proper time.

3.21 If an office observes that the program is unsatisfactory after a switch or reversing operation due to conditions which are apparently beyond its control the office shall immediately inform the control office.

3.25 On days when reversals are scheduled a 1000-cycle lineup shall be made in both directions of transmission prior to the opening of business. Ordinarily, it should not be necessary to check the gain frequency characteristic of the circuit in the reverse direction if this has been checked within the preceding 30 day period.

4.01 Switch operations, should where feasible, be made directly from the Operation Order or Program Transmission Service Order.

4.02 Where it is not feasible to work directly from the original order received, a switch schedule should be prepared from the original orders received.

4.03 All details necessary for performance of each switch operation shall be listed, such as the time of switch, facility to be switched, old source, new source, whether normal or delayed switch, cue and cue source. The arrangement of the details of the switch schedule shall be determined locally.

4.04 Each switch schedule shall be checked for accuracy, preferably by someone other than the one who prepared it. The person checking the switch schedule should initial it after completion of his check.

4.05 It is suggested that the Supervisor check the portion of the switch schedule against the original orders and any subsequent corrections or changes, to insure accuracy.

4.06 Prior to each switch, the supervisor shall ascertain that the attendant is familiar with all details of the switch operation. At offices having one man coverage, while this procedure will not be feasible, the man assigned for duty should be thoroughly familiar with instructions and methods for performing switches on program facilities.

5. USE OF TIMING DEVICES%

5.01 A sweep second-hand clock should be conveniently located and easily visible to the attendant for timing the delay period of delayed switches.

5.02 Alarm type clocks, to warn of an approaching switch operation, have been provided in certain offices, particularly those which have only part time program coverage. Some of these clocks permit preselection of alarms over a 12-hour period. However, an alarm clock is not an infallible device and care must be used in adjusting and setting it. Even though a clock is provided the responsibility for performing scheduled operations on time must still be that of the testroom personnel.

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Where feasible, the setting of an alarm clock, prior to a scheduled operation, should be checked by a second person (preferably the supervisor is charge) to minimize the possibility of error due to improper adjustment.

5.03 The use of dummy clocks to indicate the time of the next scheduled switch is approved for offices which desire to use such a device.

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