
L3 AND L4 CARRIERS
COMMON EQUIPMENT
J68820 AUTOMATIC LINE SWITCHING
TESTS
MANUAL OPERATIONS

The manual switch control circuit provides facilities to lock regular lines in service or to transfer a regular line to the protection line. A manual operation is initiated by simultaneously depressing two nonlocking keys in the L3 miscellaneous bay or the L4 control connecting bay. When transferring a regular line to the protection line, the select line manual key must first be depressed. Indicating lamps light to show that manual operations have been completed. Manual line switching can be initiated only at the receiving end of a switching section.

A manual switch is released by simultaneously depressing the nonlocking keys, MSTR and RLS. By momentarily operating these keys, the regular and protection lines are placed in their normal condition.

This section is reissued to include a continuity tone check when performing a manual switch as specified in Chart 1. Arrows are used to indicate significant changes. Equipment Test Lists are not affected.

Some special considerations of this group of tests are as follows:

- (a) The tests in this section apply to 2-line, multiline, expanded multiline, and supermultiline switching circuits.
- (b) In a 2-line circuit (L3 only), the protection line may be manually switched in or out of service regardless of the condition of the PIL ALM relays.
- (c) In the other three switching circuits, a manual switch cannot be completed if the protection PIL ALM relays are operated.
- (d) A manual switch can only be released by manually operating the MSTR and RLS keys.
- (e) Manual operations override all automatic operations.

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CHART 1

MANUAL SWITCH AND RELEASE OF A REGULAR LINE

These tests verify that manual line switching can be made in a switching section (a) singly in either direction of transmission (odd or even) or (b) concurrently for both directions. For example, in the case of (b), a manual switch may be made in the odd direction (W—E) while a switch in the even direction (E—W) is in effect. Manual line switching can be initiated only at the receiving end of the line.

STEP	PROCEDURE
1	Coordinate test with personnel at the transmitting and receiving end of the associated switching section.
2	At the receive terminal of the regular line under test, ensure that all switches in the switching section are normal. Requirement: No lamps should be lighted in the L3 miscellaneous bay or L4 control connecting bay.
3	At the transmitting terminal of the regular line under test, establish a continuity tone and monitor at the receive terminal. Insert the tone (correct level) before the transmitting line switch and monitor after the receive line switch. Note: A continuity tone check is necessary to ensure correct message is present during manual switch of the regular line to the protection line. A. Manual Switch
4	At the receiving terminal, located in the L3 miscellaneous bay or the L4 control connecting bay, depress the SEL LINE MAN key of the regular line to be switched to protection. Requirement: The associated SEL LINE MAN lamp is lighted.
5	Monitor the continuity tone and simultaneously depress the MSTR and MAN keys.

CHART 1 (Contd)

STEP	PROCEDURE
	Requirement 1: The continuity tone is present. Requirement 2: The OUT SERV MAN lamp is lighted. Requirement 3: The OUT SERV lamp is lighted in the L3 or L4 receive bay. Requirement 4: The REG relay on the switch signal filter panel (located at the top of the switch control bay) operates (except in 2-line switching).
6	If the requirements in Step 5 are not met, proceed to Step 7. A requirement not met indicates the switching section under test is in trouble and the manual switch should be released immediately. Standard trouble analysis procedures should be initiated to clear the trouble before proceeding.
7	Request the transmitting terminal to select a regular receive line in the switching section under test and repeat Steps 2 through 6.
	B. Manual Release
8	At the receive terminal, monitor the continuity tone and simultaneously depress the MSTR and RLS keys.
	Requirement 1: The continuity tone is present. Requirement 2: The SEL LINE MAN lamp is extinguished. Requirement 3: The OUT SERV MAN lamp is extinguished. Requirement 4: The OUT SERV lamp is extinguished in the L3 or L4 receive bay. Requirement 5: The REG relay on the switch signal filter panel releases (not operated in 2-line switching).
9	Request the transmitting terminal to perform Step 8.

CHART 2

LOCKING REGULAR LINES NORMAL
(LOCKING PROTECTION LINE OUT OF SERVICE)

STEP

PROCEDURE

Note: Keys and lamps are located on the mounting strip in the L3 miscellaneous bay or the L4 control connecting bay (unless otherwise specified).

- 1 Simultaneously depress the MSTR and LOCK NORM keys.

Requirement 1: The LOCK NORM lamp lights.

Requirement 2: The OUT SERV lamp for the protection line lights.

Note: The lamp is located in the L3 or L4 protection line receive bay.

Requirement 3: The STBY relay on the switch signal filter panel (located at the top of the switch control bay A or BA) operates (except in 2-line switching).

- 2 Release the locked normal condition by simultaneously operating the MSTR and RLS keys.

Requirement 1: The LOCK NORM lamp is extinguished.

Requirement 2: The OUT SERV lamp for the protection line is extinguished.

Requirement 3: The STBY relay on the switch signal filter panel releases (except in 2-line switching).

CHART 3

LOCKING THE PROTECTION LINE IN SERVICE

STEP

PROCEDURE

Note 1: The following procedure is performed after a regular line has *automatically transferred to the protection line*.

Note 2: Keys and lamps are located in the L3 miscellaneous bay or the L4 control connecting bay (unless otherwise specified).

- 1 Operate the SEL LINE MAN key of the failed regular line.

Requirement: The SEL LINE MAN lamp lights.

CHART 3 (Contd)

STEP	PROCEDURE
2	Simultaneously depress the MSTR and MAN keys on the mounting strip in the L3 miscellaneous bay or the L4 control connecting bay. Requirement 1: The OUT SERV AUTO lamp is extinguished and the OUT SERV MAN lamp lights. Requirement 2: The OUT SERV lamp in the associated receiving bay lights. Note: When the regular line returns to normal, the protection line can be released by performing the following step.
3	Simultaneously depress the MSTR and RLS keys on the mounting strip in the L3 miscellaneous bay or L4 control connecting bay. Requirement 1: The OUT SERV MAN lamp is extinguished in the L3 miscellaneous bay or L4 control connecting bay. Requirement 2: The OUT SERV lamp is extinguished in the associated receiving bay. Requirement 3: The SEL LINE MAN lamp is extinguished in the L3 miscellaneous bay or L4 control connecting bay.

CHART 4**LOCAL CHECK OF MANUAL OPERATIONS****APPARATUS:**

The tests in this chart require suitable transmission measuring equipment. Refer to Section 356-010-500 and select, from available equipment, sending and receiving units having the following capabilities:

Receiving Test Equipment (RTE)

Input

Frequency range: 280 to 296 kHz

Power: -50 to -90 dBm

Impedance: 75 ohms

11B Attenuator (30 dB)

CHART 4 (Contd)

APPARATUS (Contd):

P2BJ Cords

Adjustable Attenuator with the following characteristics:

75-ohm input and output

Loss from 0 to 90 dB

Adjustable in increments of at least 1.0 dB

STEP

PROCEDURE

Note: Keys and lamps are located in the L3 miscellaneous bay or the L4 control connecting bay (unless otherwise specified).

- 1 Ensure that the switching section under test is released.

Requirement: No lamps should be lighted in the L3 miscellaneous bay or L4 control connecting bay.

- 2 Remove patch plug as follows:

L3: Between jacks SW FIL OUT and SW AMP IN

L4: Between LVL COM OUT and SW AMP IN.

Note: Patch plug is located on the jack strip in the switch control bay.

- 3 Depress the SEL LINE MAN key of the desired regular line.

Requirement: The associated SEL LINE MAN lamp lights.

- 4 Simultaneously depress the MSTR and MAN keys on the mounting strip in the L3 miscellaneous bay or the L4 control connecting bay.

Requirement: The associated regular switch initiator will operate and initiate a line switch.

- 5 Prepare the RTE for a bridging measurement of the frequency and power at the line under test (Table A).

CHART 4 (Contd)

STEP

PROCEDURE

TABLE A

IDENTIFICATION FREQUENCIES

REGULAR LINE	GROUP (J68820 BAY)	FREQ (kHz)	POWER* (dBm)
1	A, AA, AB	290	-54
2	A, AA, AB	288	-54
3	A, AA, AB	286	-54
4†	A, AA, AB	284	-54

*Power includes 11B attenuator (30 dB)

†11-foot 6-inch bay only

- 6 Connect the 11B attenuator to the TRSG SW CONT () MON jack of the line under test.

Note: The jack is located in the jack strip on the switch control bay.

- 7 Connect the RTE to the 11B attenuator.

- 8 Measure the output power.

Requirement: See Table A.

- 9 Remove the RTE and the 11B attenuator from the TRSG SW CONT () MON jack.

- 10 Patch from the TST jack on the 296-kHz oscillator (director panel) to an adjustable attenuator.

- 11 Patch the RTE to the adjustable attenuator.

- 12 Adjust the attenuator for an indication of -71 dBm at 296 kHz on the RTE.

- 13 Remove the patch cord from the RTE and connect it to the SW AMP IN jack on the mounting strip in the associated switch control bay.

Requirement 1: The OUT SERV lamp lights in either the L3 or L4 receive bay.

Requirement 2: The OUT SERV MAN lamp lights in the L3 miscellaneous bay or the L4 control connecting bay.

CHART 4 (Contd)

STEP	PROCEDURE
14	Remove the patch cord from the SW AMP IN jack.
15	Simultaneously depress the MSTR and RLS keys on the mounting strip in the L3 miscellaneous bay or the L4 control connecting bay. Requirement 1: The OUT SERV lamp is extinguished. Requirement 2: The SEL LINE MAN and the OUT SERV MAN lamps are extinguished. Requirement 3: The TS RLS FAIL lamp lights in the L3 miscellaneous bay or the L4 control connecting bay.
16	Prepare the RTE for a bridging measurement of 282 kHz at -54 dBm.
17	Connect the 11B attenuator to the TRSG SW CONT 1 MON jack associated with Group A.
18	Connect the RTE to the 11B attenuator.
19	Measure the output power. Requirement: Approximately -54 dBm.
20	Remove the RTE and the 11B attenuator from the TRSG SW CONT 1 MON jack.
21	Patch from the TST jack on the 280-kHz oscillator (common switch control panel) to an adjustable attenuator.
22	Patch the RTE to the adjustable attenuator.
23	Adjust the attenuator for an indication of -71 dBm at 280 kHz on the RTE.
24	Remove the patch cord from the RTE and connect it to the SW AMP IN jack on the mounting strip in the associated switch control bay. Requirement: The TS RLS FAIL lamp is extinguished.
25	Use the procedure in Steps 3 through 24 for all regular lines to be tested.
26	Remove the patch cord from the SW AMP IN jack and the 280-kHz oscillator TST jack.
27	Replace the patch plug as follows: L3: Between jacks SW FIL OUT and SW AMP IN L4: Between jacks LVL COM OUT and SW AMP IN.

CHART 5

SWITCH INHIBITING
(LOCKING THE REGULAR LINES NORMAL AND TESTING THE HOLDING FEATURE)

STEP	PROCEDURE
	Note: Keys and lamps are located on the mounting strip in the L3 miscellaneous bay or the L4 control connecting bay (unless otherwise specified).
1	Ensure that the switching section under test is released. Requirement: No lamps should be lighted in the L3 miscellaneous bay or L4 control connecting bay.
2	Simultaneously depress the MSTR and LOCK NORM keys. Requirement 1: The LOCK NORM lamp lights. Requirement 2: The OUT SERV lamp for the protection line lights. Note: The lamp is located in the L3 or L4 protection receive bay. Requirement 3: The STBY relay on the switching signal filter panel operates.
3	Simulate a line failure as follows: L3: At the receiving repeater bay, manually adjust the 7266-kHz ZERO potentiometer until the upper or lower Sensitrol* contacts close. *Trademark of Weston Instruments, Inc. Note: The zero potentiometer and the Sensitrol relay are located on the pilot indicator panel. L4: (a) J68877B line receiving bay installed: At the rear of the line receiving bay, remove amplifier AR6 (231D) from its socket. (b) J68877BU line receiving bay installed: At the rear of the line receiving bay, remove amplifier AR4 (231D type) from its socket. Requirement: No switch takes place.
4	Restore simulated failed lines as follows: L3: Depress the RST button and adjust the ZERO potentiometer for a zero reading on the Sensitrol relay.

CHART 5 (Contd)

STEP

PROCEDURE

L4:

(a) Reinsert the 231D amplifier into its socket.

(b) Depress the RESET button on the HYB & M PNL.

Requirement: The high or low lamp is extinguished.

5 Release the locked normal condition by simultaneously operating the MSTR and RLS keys.

Requirement 1: The LOCK NORM lamp is extinguished.

Requirement 2: The OUT SERV lamp for the protection line is extinguished.
