L MULTIPLEX TERMINALS

MMX-1

TRANSMITTING SUBMASTER GROUP BANK

TURNOVER TESTS

PURPOSE OF TESTS

To determine that the regular and spare transmitting submaster group circuits, when multipled, do not produce a large decrease in power because of phase difference.

REASON FOR REISSUE

To include reference to solid-state amplifiers in modified MMX-1 transmitting submaster group bank panels. Arrows are used to indicate significant changes. *Equipment Test Lists are not affected.*

SYNOPSIS

In the MMX-1 mastergroup multiplex terminal, large numbers of circuits are assigned to common equipment units. Corresponding equipment units are provided as spare and are interchangeable if required. To avoid service interruptions when patching service from regular submaster group circuits to spare submaster group circuits on an in-service basis, it is important that little or no difference exists in the phase relationship between the corresponding circuits. A difference in phase relationship may occur from wiring turnover in the submaster group equipment.

METHOD OF TESTING

In this test, the output power of the regular submaster group is measured. Output power is measured again when the regular submaster group is multipled with a corresponding spare submaster group. With no wiring turnover, ▶and little or no difference in the amplifier phase relationships,◀ the combined output power will differ only a small amount from the output power of either submaster group bank when measured independently. ▶The transmitting submaster group bank gain tests (Section 356-132-501) shall be performed prior to making this test.◀ The submaster group banks must be removed from service to perform this test.

APPARATUS:

Transmission test equipment. Refer to Section 356-010-500 and select, from available equipment, sending and receiving units having the following capabilities:

Sending test equipment capable of delivering, into 75-ohm circuits, 1500 kHz at −43.4 dBm

APPARATUS (Cont):

Receiving test equipment capable of detecting, from 75-ohm circuits, signals of 1500 kHz and 2540 kHz at approximately −21 dBm.

In addition, the following are required:

Spare or Out-of-Service Transmitting Submaster Group Bank Terminal

P2BJ Cords

368A Plugs (75 ohms)

STEP	PROCEDURE
	Caution: ♦*This test requires that the regular and spare submaster equipment panels contain like amplifiers. A loss of level may occur when patches are made between a panel containing a vacuum-tube amplifier and one equipped with solid-state amplifiers.♦*
	Note: If the requirements in this test cannot be met, check the carrier supply and the hybrid coils within the regular and spare transmitting submaster group bank circuits for wiring turnover.
	SUBMASTER 1 TRANSMITTING GROUP BANK
1	Verify that the equipment to be tested is out of service.
2	Prepare the RTE (receiving test equipment) for a 75-ohm terminated measurement of 1500 kHz at −21 dBm.
3	Prepare the STE (sending test equipment) for an output of 1500 kHz at −43.4 dBm.
4	Make patches (1), (2), (3), and (4) in Fig. 1.
5	Insert 75-ohm 368A plugs in the REG SM 1 IN B and SP SM 1 IN B jacks.
6	Measure and record the level of the 1500-kHz signal at the REG SM BK OUT A jack. *Requirement:* Approximately −21 dBm.
7	Make patches (5) and (6) in Fig. 1.
8	Measure the 1500-kHz level of the multipled submaster 1 group circuits. *Requirement:* A decrease of not more than 2.5 dB from the value recorded in Step 6.
9	Remove patches (3), (5), and (6) in Fig. 1.
10	Remove the 75-ohm 368A plugs from the REG SM 1 IN B and SP SM 1 IN B jacks.
11	Insert 75-ohm 368A plugs in the REG SM 1 IN A and SP SM 1 IN A jacks.

STEP	PROCEDURE
12	Make patch (7) in Fig. 1.
13	Measure and record the level of the 1500-kHz signal at the REG SM BK OUT A jack. *Requirement:* Approximately −21 dBm.
14	Make patches (6) and (8) in Fig. 1.
15	Measure the 1500-kHz level of the multipled submaster 1 group bank circuits. *Requirement:* A decrease of not more than 2.5 dB from the value recorded in Step 13.
16	Remove patches (6), (7), and (8) in Fig. 1.
17	Remove the 75-ohm 368A plugs from the REG SM 1 IN A and SP SM 1 IN A jacks.
18	Insert 75-ohm 368A plugs in the REG SM 1 IN B and SP SM 1 IN B jacks.
	SUBMASTER 2 TRANSMITTING GROUP BANK
19	Prepare the RTE for a 75-ohm terminated measurement of 2540 kHz at −21 dBm. *Note:* Frequency translation occurs in the submaster 2 group bank circuit. An input signal of 1500 kHz will appear at the submaster group bank output as a signal of 2540 kHz.
20	Make patch (9) in Fig. 1.
21	Insert 75-ohm 368A plugs in the REG SM 2 IN B and SP SM 2 IN B jacks.
22	Measure and record the level of the 2540-kHz signal at the REG SM BK OUT A jack. *Requirement:* Approximately −21 dBm.
23	Make patches (6) and (10) in Fig. 1.
24	Measure the 2540-kHz level of the multipled submaster 2 group bank circuits. *Requirement:* A decrease of not more than 2.5 dB from the value recorded in Step 22.
25	Remove patches (6), (9), and (10) in Fig. 1.
26	Remove the 75-ohm 368A plugs from the REG SM 2 IN B and SP SM 2 IN B jacks.
27	Insert 75-ohm 368A plugs in the REG SM 2 IN A and SP SM 2 IN A jacks.
28	Make patch (11) in Fig. 1.
29	Measure and record the level of the 2540-kHz signal at the REG SM BK OUT A jack.

| STEP	PROCEDURE
	Requirement: Approximately −21 dBm.
30	Make patches (6) and (12) in Fig. 1.
31	Measure the 2540-kHz level of the multipled submaster 2 group bank circuits.
	Requirement: A decrease of not more than 2.5 dB from the value recorded in Step 29.
32	Remove all patch cords from the test jacks of the submaster group bank circuits under test.
33	Remove the 75-ohm 368A plugs from the REG SM 2 IN A and SP SM 2 IN A jacks.
34	Insert 75-ohm 368A plugs in the REG SM 2 IN B and SP SM 2 IN B jacks.
35	Restore the submaster group bank equipment to normal service.
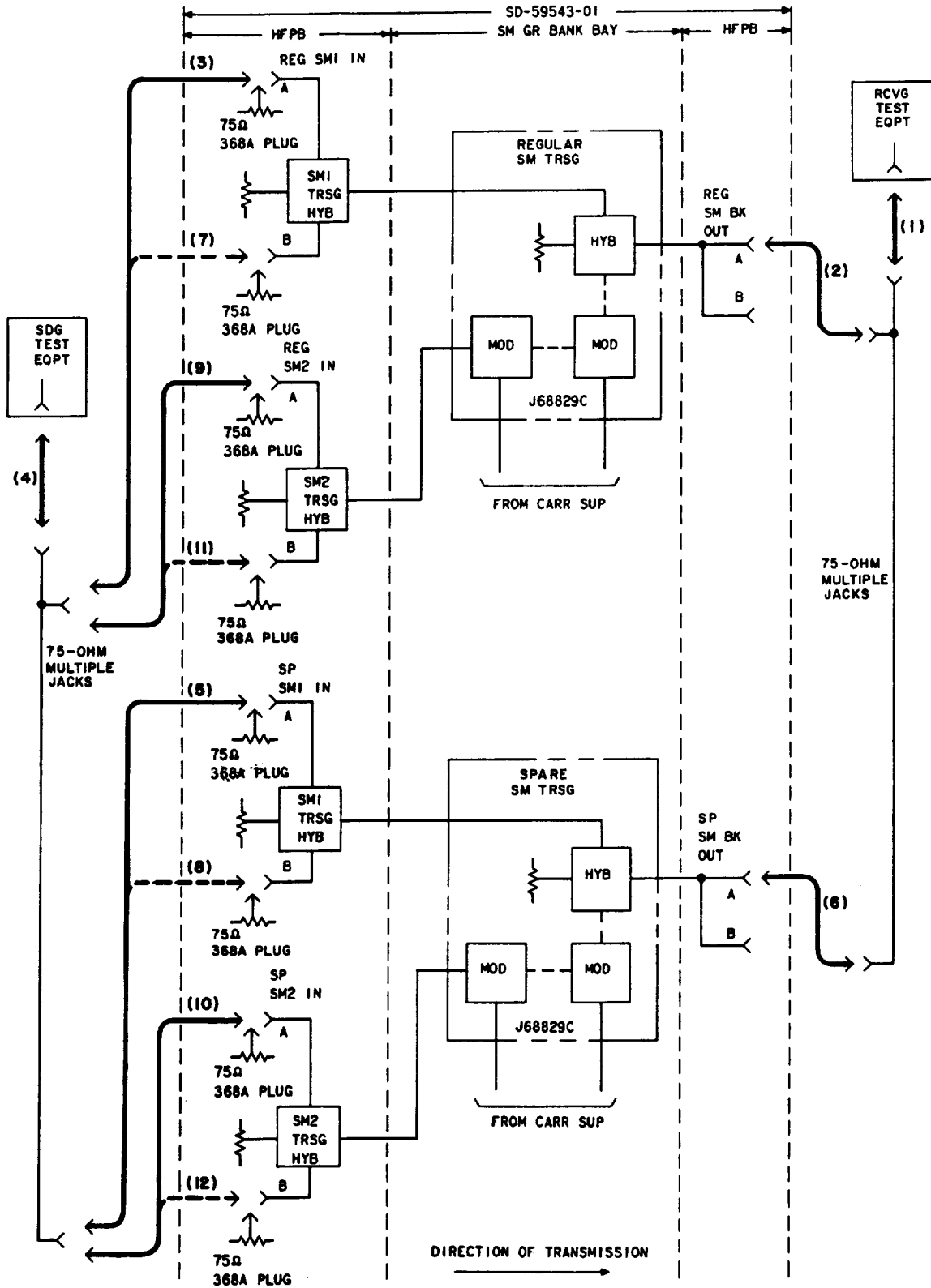
**Fig. 1—Transmitting Submaster Group Bank Circuits—
Turnover Tests**