

L MULTIPLEX TERMINALS
MMX-1
TRANSMITTING SUBMASTER GROUP BANK
GAIN TESTS

PURPOSE OF TESTS

- (a) To ensure that the output level is correct.
- (b) To ensure that the passband is correct.

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 (Fig. 2)

The transmitting submaster group bank circuit provides a means for translating the output frequencies from the supergroup banks into the proper frequency band, and at the proper power for transmission to a transmitting MMX-1 mastergroup bank.

Each submaster bank contains two transmission paths, submaster group 1 and submaster group 2. The output frequencies from the supergroup banks are received at the submaster group hybrids, amplified, and transmitted to the mastergroup. Submaster group 1 frequencies are transmitted to the mastergroup with no additional frequency translation. Submaster group 2 uses two stages of modulation to shift the output frequencies from the supergroup banks to the proper frequency band for transmission to the mastergroup.

APPARATUS

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

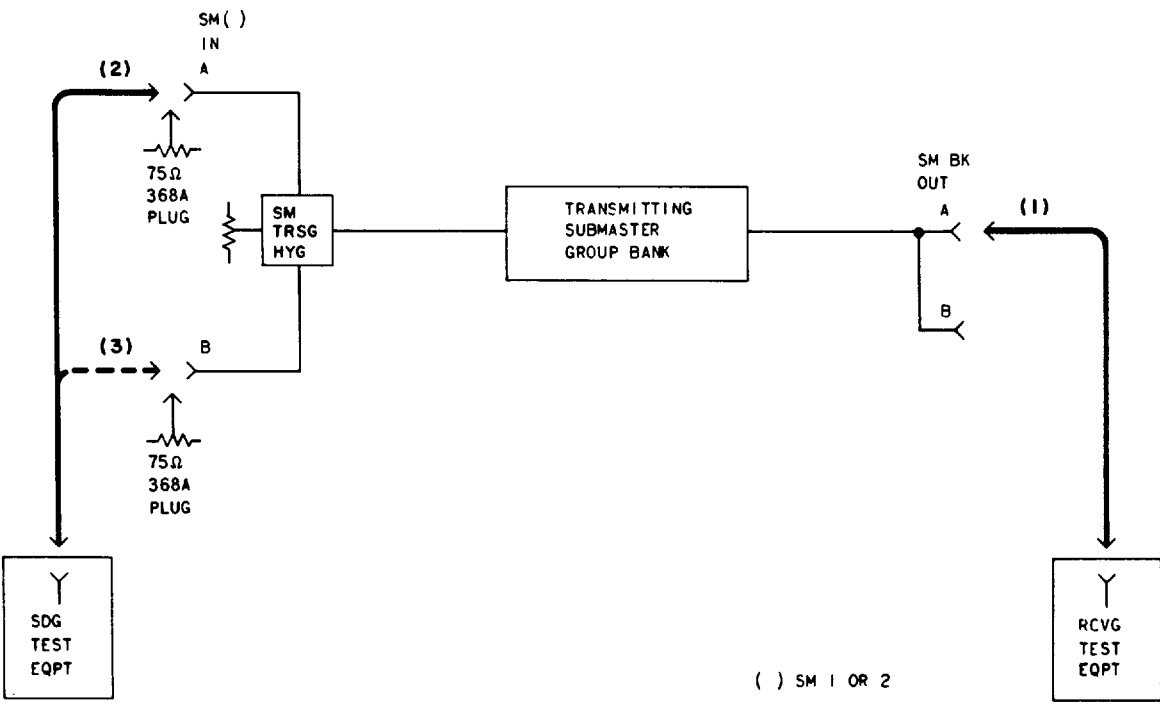
Sending test equipment capable of delivering, into 75-ohm circuits, signals between 320 kHz and 2040 kHz at -43.4 dBm

Receiving test equipment capable of detecting, from 75-ohm circuits, signals between 320 kHz and 3080 kHz at powers between -15 dBm and -25 dBm.

P2BJ Cords

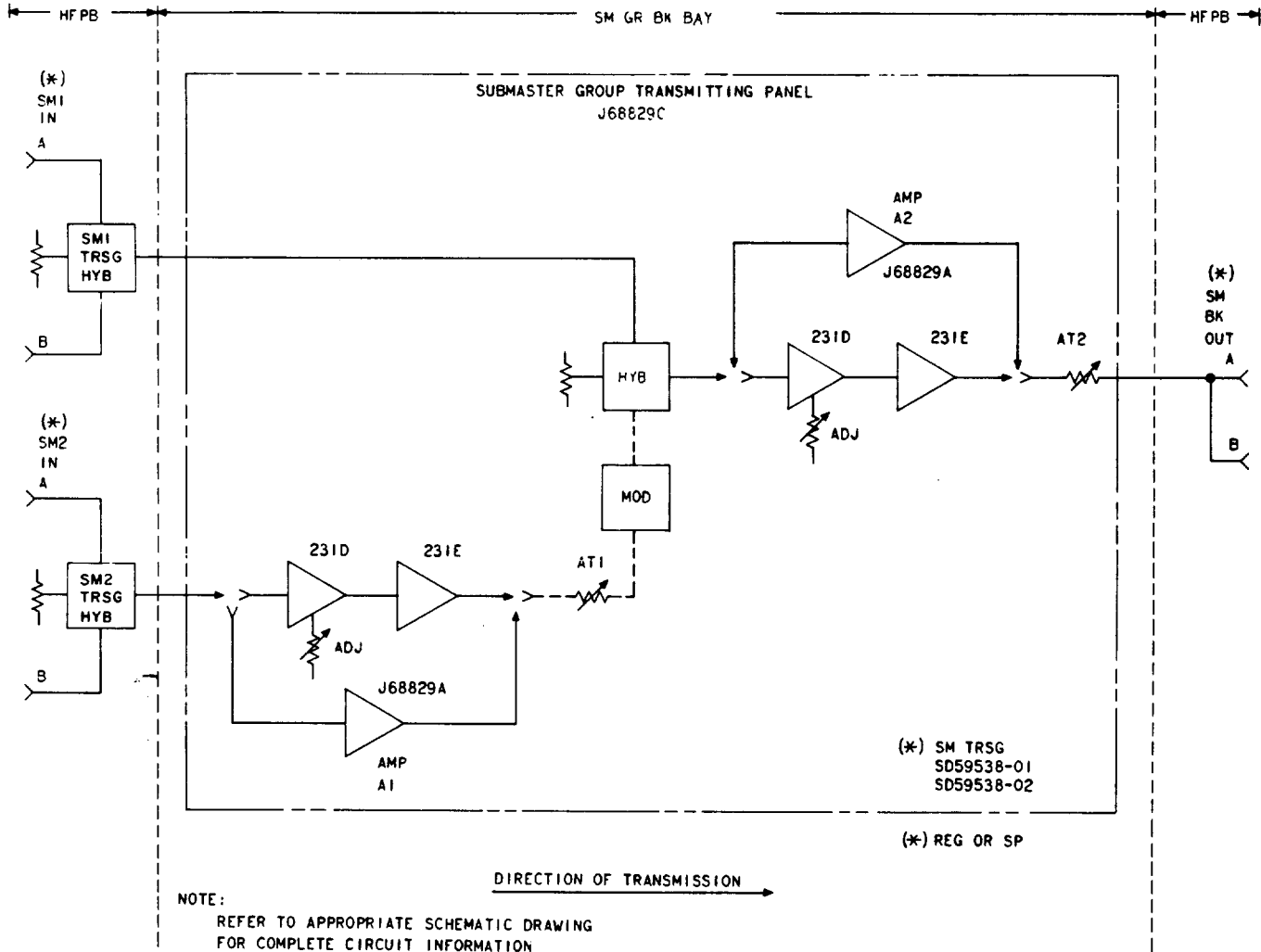
368A Plugs

STEP	PROCEDURE																																														
1 2 3 4 5 6 7 8	GAIN TESTS																																														
	<i>Note:</i> Refer to Fig. 2 to determine the location of jacks and controls used in this test.																																														
	<i>Caution:</i> Gain adjustments of the submaster group 1 bank circuit change the overall gain of the submaster group 2 bank circuit. Therefore, the gain of the submaster group 1 circuit must be checked and if necessary, adjusted prior to testing the submaster group 2 circuit.																																														
	Check that the equipment to be tested is out-of-service.																																														
	Prepare the STE (sending test equipment) to produce a signal at the send frequency and power in Table A for the submaster group bank circuit to be tested.																																														
	◆ TABLE A ◆																																														
	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="8" style="text-align: center;">GAIN TESTS</th> </tr> <tr> <th rowspan="2" style="text-align: center;">SM GROUP BANK</th> <th colspan="3" style="text-align: center;">SEND</th> <th colspan="4" style="text-align: center;">RECEIVE</th> </tr> <tr> <th style="text-align: center;">JACK</th> <th style="text-align: center;">FREQ (KHZ)</th> <th style="text-align: center;">POWER (DBM)</th> <th style="text-align: center;">JACK</th> <th style="text-align: center;">FREQ (KHZ)</th> <th style="text-align: center;">REQUIREMENT</th> <th style="text-align: center;">GAIN ADJUSTMENT</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">SM 1 IN A SM 1 IN B</td> <td style="text-align: center;">1500</td> <td style="text-align: center;">-43.4</td> <td style="text-align: center;">SM BK OUT A</td> <td style="text-align: center;">1500</td> <td style="text-align: center;">-21.0 dBm ±0.3 dB</td> <td style="text-align: center;">Step 9</td> </tr> <tr> <td style="text-align: center;">2</td> <td style="text-align: center;">SM 2 IN A SM 2 IN B</td> <td style="text-align: center;">1500</td> <td style="text-align: center;">-43.4</td> <td style="text-align: center;">SM BK OUT A</td> <td style="text-align: center;">2540</td> <td style="text-align: center;">-21.0 dBm ±0.3 dB</td> <td style="text-align: center;">Step 10</td> </tr> </tbody> </table>								GAIN TESTS								SM GROUP BANK	SEND			RECEIVE				JACK	FREQ (KHZ)	POWER (DBM)	JACK	FREQ (KHZ)	REQUIREMENT	GAIN ADJUSTMENT	1	SM 1 IN A SM 1 IN B	1500	-43.4	SM BK OUT A	1500	-21.0 dBm ±0.3 dB	Step 9	2	SM 2 IN A SM 2 IN B	1500	-43.4	SM BK OUT A	2540	-21.0 dBm ±0.3 dB	Step 10
	GAIN TESTS																																														
SM GROUP BANK	SEND			RECEIVE																																											
	JACK	FREQ (KHZ)	POWER (DBM)	JACK	FREQ (KHZ)	REQUIREMENT	GAIN ADJUSTMENT																																								
1	SM 1 IN A SM 1 IN B	1500	-43.4	SM BK OUT A	1500	-21.0 dBm ±0.3 dB	Step 9																																								
2	SM 2 IN A SM 2 IN B	1500	-43.4	SM BK OUT A	2540	-21.0 dBm ±0.3 dB	Step 10																																								
Prepare the RTE (receiving test equipment) for a 75-ohm terminated measurement of the receive frequency at -21 dBm.																																															
Connect the RTE to the SM BK OUT A jack [patch (1), Fig. 1].																																															
Connect the STE to the SM() IN A jack [patch (2), Fig. 1].																																															
<i>Note:</i> Parentheses () denote SM1 or SM2.																																															
Insert a 75-ohm 368A plug in the SM() IN B jack.																																															
Measure and record the power of the signal at the SM BK OUT A jack.																																															
<i>Requirement:</i> -21.0 dBm ±0.3 dB.																																															
If the requirement of Step 7 is met, proceed to Step 12. If it is not met, remove the panel cover from the submaster group bank circuit under test and perform trouble clearing procedures in Step 9 or 10 as applicable.																																															

STEP	PROCEDURE
	 <p style="text-align: center;">() SM 1 OR 2</p>
9	<p style="text-align: center;">◆ Fig. 1—Transmitting Submaster Group Bank-Testing Arrangement ◆</p> <p>Perform the following steps for gain adjustment of the submaster group 1 bank circuit equipped with:</p> <p>◆ 231D and 231E Amplifiers</p> <ol style="list-style-type: none"> At the AMPL 2 position, set the 231D amplifier ADJ control to the maximum counterclockwise position (minimum gain). Adjust attenuator AT2 for a power indication between -22.8 and -22.3 dBm. Readjust the 231D amplifier ADJ control for a power indication of -21 dBm.◆ <p>J68829A Amplifiers</p> <ol style="list-style-type: none"> Adjust attenuator AT2 for a power indication of -21.0 dBm ± 0.3 dB.
10	<p>Perform the following steps for gain adjustment of the submaster group 2 bank circuit equipped with:</p> <p>◆ 231D and 231E Amplifiers</p> <ol style="list-style-type: none"> At the AMPL 1 position, set the 231D amplifier ADJ control to the maximum counterclockwise position (minimum gain).

STEP	PROCEDURE
	<p>(b) Adjust attenuator AT1 for a power indication between -22.8 and -22.3 dBm.</p> <p>Caution: Do not change the setting of attenuator AT2.</p> <p>(c) Readjust the 231D amplifier ADJ control for a power indication of -21 dBm.♦</p>
	<p>J68829A Amplifiers</p> <p>(a) Adjust attenuator AT1 for a power indication of -21.0 dBm ± 0.3 dB.</p> <p>Caution: Do not change the setting of attenuator AT2.</p>
11	<p>If the requirement of Step 7 cannot be met, locate and correct the trouble in the submaster group bank circuit under test. Repeat Steps 7 through 10 as required.</p> <p>Note: J68829A flat-gain amplifiers should be replaced only after tube replacements have been made.</p>
12	<p>Disconnect the STE from the SM() IN A jack [patch (2), Fig. 1].</p>
13	<p>Remove the 75-ohm 368A plug from the SM() IN B jack.</p>
14	<p>Insert a 75-ohm 368A plug in the SM() IN A jack.</p>
15	<p>Connect the STE to the SM() IN B jack [patch (3), Fig. 1].</p>
16	<p>Measure the power of the signal at the SM BK OUT jack.</p> <p>Requirement: -21.0 dBm ± 0.3 dB.</p>
17	<p>Disconnect the STE from the SM() IN B jack [patch (3), Fig. 1].</p>
18	<p>Remove the 75-ohm 368A plug from the SM() IN A jack.</p>
19	<p>Insert a 75-ohm 368A plug in the SM() IN B jack.</p>
20	<p>If the passband tests are to be made, proceed to Step 21; otherwise, proceed to Step 25.</p> <p>PASSBAND TESTS</p>
21	<p>Prepare the STE to produce a signal at the send frequency and power (Table B) for the submaster group bank circuit under test.</p>
22	<p>Prepare the RTE for a 75-ohm terminated measurement of the receive frequency at -21 dBm.</p>

STEP	PROCEDURE					
♦ TABLE B ♦						
PASSBAND TESTS						
SM GROUP BANK	SEND			RECEIVE		
	JACK	FREQ (KHZ)	POWER (DBM)	JACK	FREQ (KHZ)	REQUIREMENT
1	SM 1 IN A	320	-43.4	SM BK OUT A	320	Within +0.1 dB to +1.1 dB of the power recorded in Step 7.
		2040			2040	Within -0.8 dB to +0.2 dB of the power recorded in Step 7.
2	SM 2 IN A	1064	-43.4	SM BK OUT A	2104	Within +0.0 dB to +1.0 dB of the power recorded in Step 7.
		2040			3080	Within -1.2 dB to -0.2 dB of the power recorded in Step 7.
23	Measure and record the power at the SM BK OUT A jack at each of the passband frequencies (Table B) for the submaster group bank under test.					
Requirement: See Table B.						
24	If the requirements of Step 23 are met, proceed to Step 25. If they are not met, locate and correct the trouble in the submaster group bank circuit under test (Note , Step 11). Repeat Steps 2 through 23, as required, to verify that the trouble has been cleared.					
25	Replace the panel cover if removed in Step 8.					
26	Remove all patches from the submaster group bank circuit under test.					
27	Restore the equipment to normal service.					



◆ Fig. 2—Submaster Group Bank Transmitting Circuit ◆