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**RECEIVING SUBMASTERGROUP BANK**  
**LOSS TESTS**  
**MMX-1**  
**ANALOG MULTIPLEX TERMINAL EQUIPMENT**

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A receiving submastergroup bank SD-59539-02 (Fig. 1) receives the output signal for one mastergroup from a receiving MMX-1 mastergroup bank and provides two output signals to a receiving supergroup bank. This section provides procedures for adjusting the output signal levels and for checking the passband of the two paths through the submastergroup equipment.

This section is reissued to clarify the test procedures and to correct errors. Arrows are used to indicate significant changes. ***Equipment Test Lists are not affected.***

The submastergroup input signal spectrum includes two bands of frequencies which are designated submastergroup 1 and submastergroup 2. The input signal is connected via a hybrid to the two submastergroup paths. Signals in submastergroup 1 pass to the supergroup bank without any further frequency translation. Two steps of frequency translation in submastergroup 2 produce the proper signals for the receiving supergroup bank.

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**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 3080 kHz at -14 dBm

***Receiving test equipment*** capable of detecting, from 75-ohm circuits, signals between 320 kHz and 2040 kHz at powers between -15 and -25 dBm

***P2BJ Cords***

***368A Plugs.***

**NOTICE**

Not for use or disclosure outside the  
Bell System except under written agreement

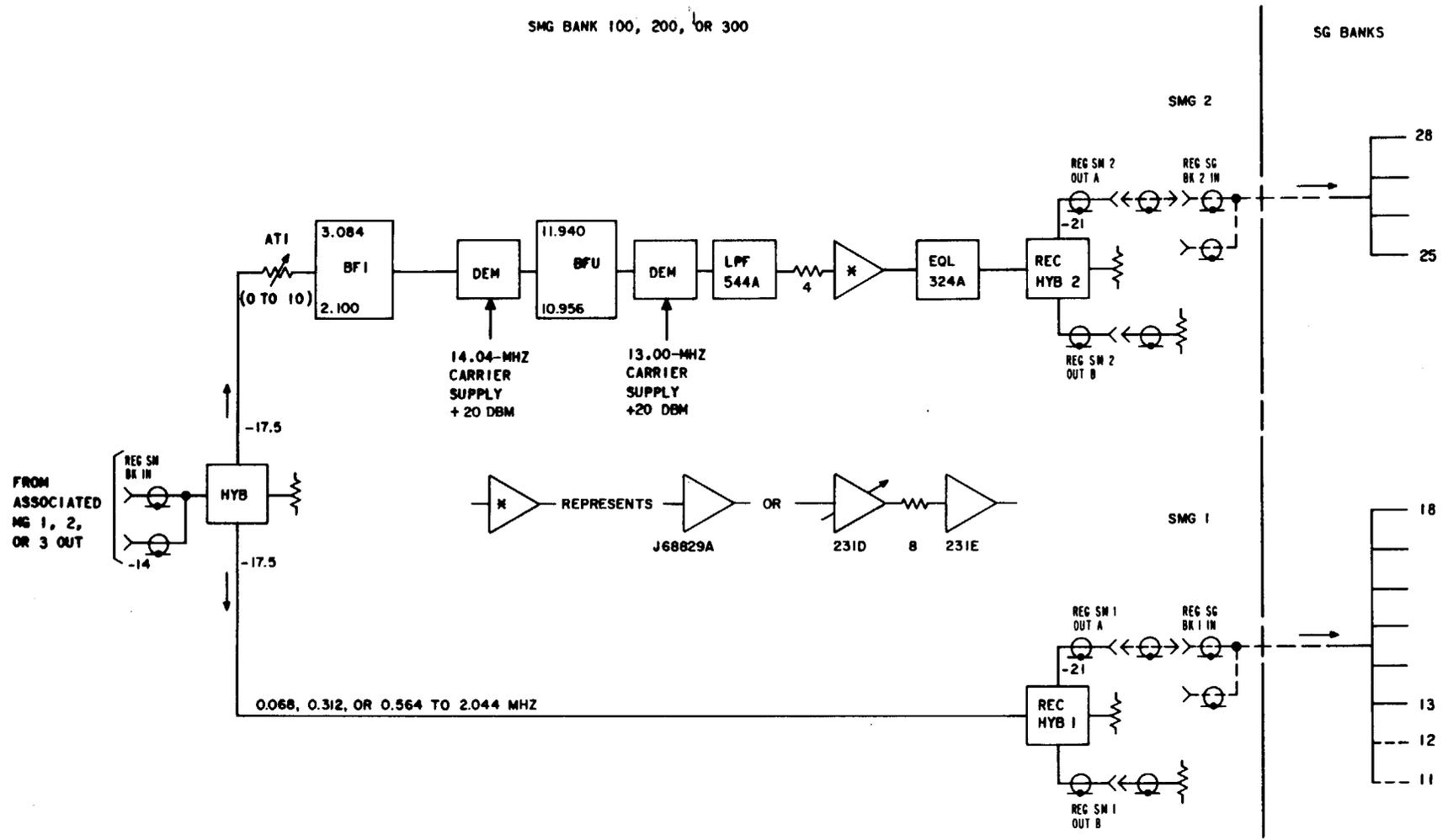


Fig. 1—Receiving Submastergroup Bank

STEP	PROCEDURE
	<b>A. Loss Tests</b>
1	Check that the receiving submastergroup bank to be tested is out of service.  <b>Note:</b> ♦Patching procedures for receiving submastergroups are explained in Section 356-138-300.♦
2	Refer to Fig. 2 to determine the location of jacks and controls used in these tests.
3	Prepare the STE (sending test equipment) to produce a signal at the frequency and power listed in Table A for the submastergroup bank to be tested.
4	Prepare the RTE (receiving test equipment) for a 75-ohm terminated measurement of the receive frequency at -21 dBm.
5	Connect the STE to the SM BK IN A jack [patch (1), Fig. 3].
6	Connect the RTE to the SM( ) OUT A jack [patch (2), Fig. 3].  <b>Note:</b> Parentheses indicates 1 or 2, according to the submastergroup under test.
7	♦Insert a 75-ohm 368A plug into the SM( ) OUT B jack for the submastergroup under test [patch (3), Fig. 3].♦
8	Measure and record the power of the signal at the SM( ) OUT A jack.  <b>Requirement:</b> See Table A.
9	Proceed to Step 22 if the requirement is met. Otherwise, proceed to Step 10.
10	Remove the panel cover from the submastergroup under test.
11	Proceed to Step 12 for submastergroup 1 or proceed to Step 14 for submastergroup 2.  <b>Submastergroup 1</b>
12	♦Check the loss of the hybrid in the submastergroup receiving panel, check the wiring to the receive hybrid in the high frequency patch bay, and check the loss of this hybrid.  <b>Note:</b> Hybrid losses are 3.5 dB from input to each output.♦
13	Repeat the procedure in Steps 3 through 8 to verify that the trouble has been cleared.  <b>Submastergroup 2</b>
14	Proceed to Step 15 for a submastergroup 2 equipped with 231D and 231E amplifiers, or proceed to Step 19 for a submastergroup 2 equipped with amplifier J68829A (Fig. 2).

STEP	PROCEDURE
<b>231D and 231E Amplifiers</b>	
15	◆Set the 231D amplifier ADJ control to the maximum clockwise position for maximum gain.◆
16	Adjust attenuator AT1 to obtain a signal power between -18.8 and -18.3 dBm at the SM2 OUT A jack.
17	Readjust the 231D amplifier ADJ control to obtain a signal power of -21.0 dBm at the SM2 OUT A jack.
18	Proceed to Step 20.
<b>Amplifier J68829A</b>	
19	Adjust attenuator AT1 to obtain a signal power of -21.0 dBm $\pm 0.3$ dB at the SM2 OUT A jack.
20	Perform signal tracing procedures to locate and correct the trouble, if required.
<b>Note:</b> Flat-gain amplifier J68829A should be replaced only if tube replacement does not clear the trouble.	
21	Repeat Steps 3 through 20, as required.
22	Disconnect the RTE from the SM( ) OUT A jack [patch (2), Fig. 3].
23	Remove the 75-ohm 368A plug from the SM( ) OUT B jack.
24	Insert a 75-ohm 368A plug into the SM( ) OUT A jack.
25	Connect the RTE to the SM( ) OUT B jack [patch (4), Fig. 3].
26	Measure the power of the signal at the SM( ) OUT B jack.
<b>Requirement:</b> See Table A.	
27	Disconnect the RTE from the SM( ) OUT B jack [patch (4), Fig. 3].
28	Remove the 75-ohm 368A plug from the SM( ) OUT A jack.
29	Insert a 75-ohm 368A plug into the SM( ) OUT B jack.
30	Proceed to Part B if the passband tests are to be made. Otherwise, proceed to Step 37.

STEP	PROCEDURE
<b>B. Passband Tests</b>	
31	◆ Prepare the STE to produce a signal at -14.0 dBm and at the lower test frequency listed in Table B for the submastergroup under test.
32	Prepare the RTE for a 75-ohm terminated measurement of the test signal at -21 dBm. <i>Note:</i> See Table B for the frequency translation in submastergroup 2.
33	Measure the test signal power at the SM( ) OUT A jack for the submastergroup under test.  <i>Requirement:</i> See Table B.
34	Repeat Steps 31 through 33 for the higher test frequency listed in Table B.
35	Proceed to Step 37 if the requirements in Table B are met at both frequencies. Otherwise, locate and correct the trouble in the submastergroup under test.◆
<i>Note:</i> See <i>Note</i> in Step 20.	

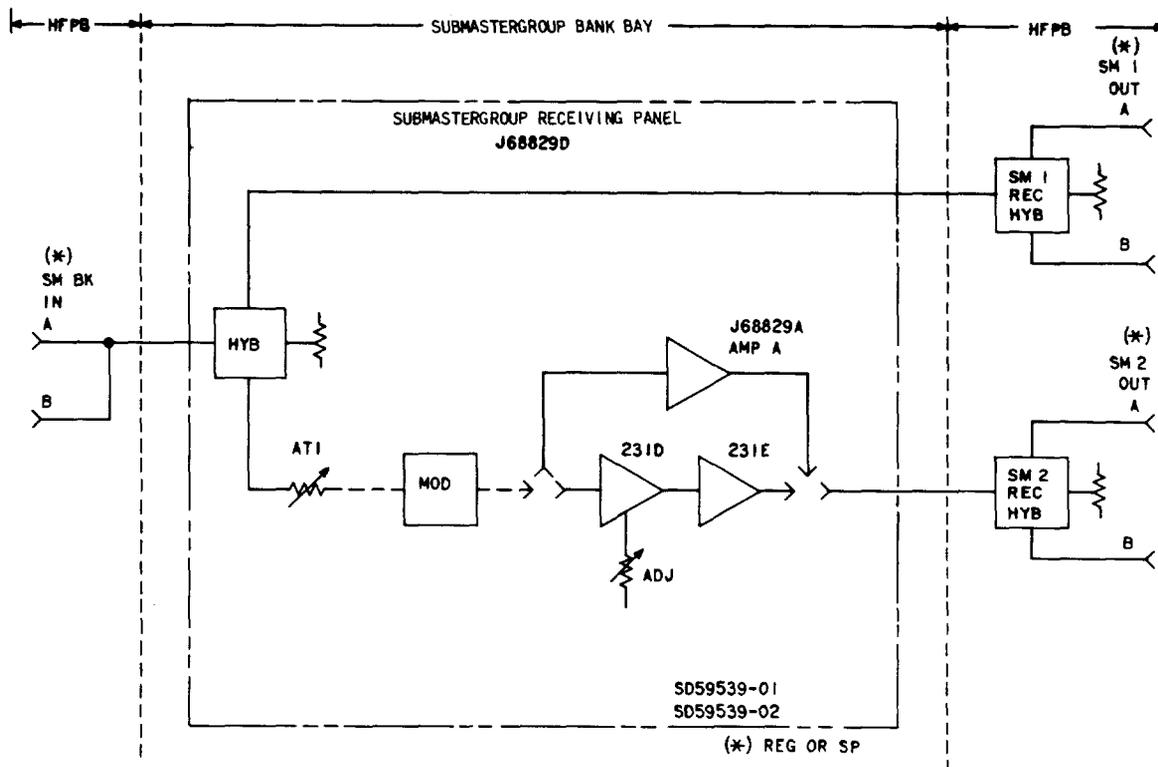


Fig. 2—Locations of Jacks and Controls

## STEP

## PROCEDURE

- 36 Repeat Steps 3 through 30, as required, to verify that the trouble has been cleared.
- 37 Replace the panel cover, if removed in Step 10.
- 38 Remove all patches from the submastergroup bank under test.
- 39 Restore the equipment to normal service.

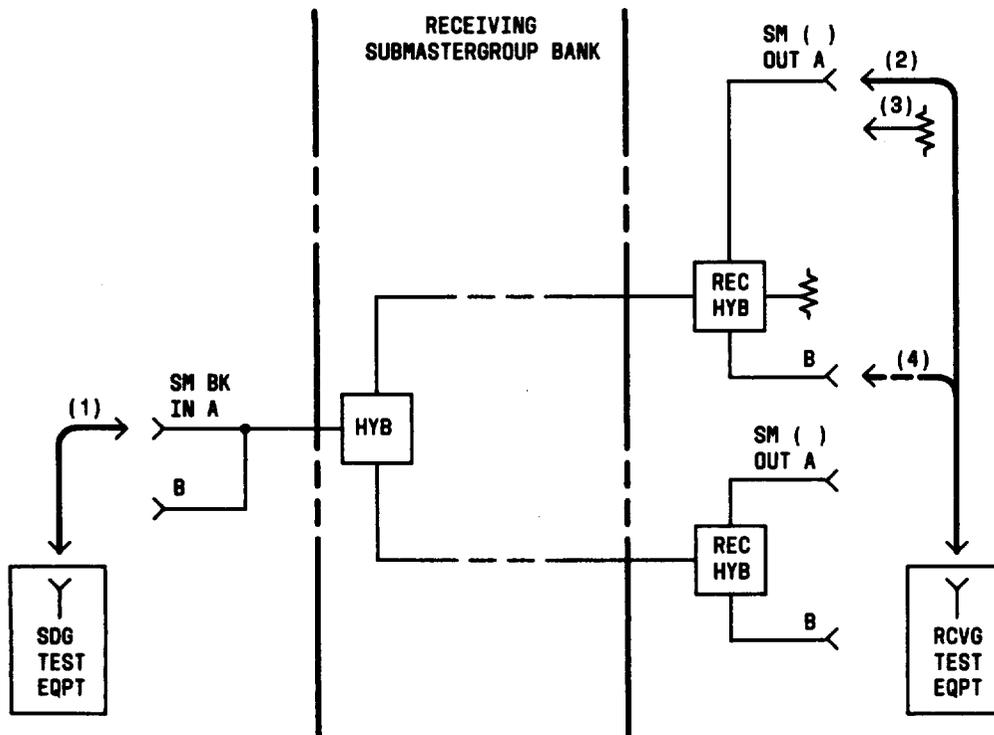


Fig. 3—Receiving Submastergroup Bank Testing Arrangement

TABLE A

## LOSS TESTS

SM GROUP BANK	SEND			RECEIVE			
	JACK	FREQ (KHZ)	POWER (DBM)	JACK	FREQ (KHZ)	REQUIREMENT	LOSS ADJUSTMENT
1	SM BK IN A	1500	-14	SM 1 OUT A	1500	-21.0 dBm $\pm$ 0.5 dB	-
				SM 1 OUT B			
2	SM BK IN A	2540	-14	SM 2 OUT A	1500	-21.0 dBm $\pm$ 0.3 dB	14
				SM 2 OUT B			

TABLE B

## PASSBAND TESTS

SM GROUP BANK	SEND			RECEIVE		
	JACK	FREQ (KHZ)	POWER (DBM)	JACK	FREQ (KHZ)	REQUIREMENT
1	SM BK	320	-14	SM 1	320	Within 0.0 dB to +1.0 dB of the power recorded in Step 8.
	IN A	2040		OUT A	2040	Within -0.8 dB to +0.2 dB of the power recorded in Step 8.
2	SM BK	2104	-14	SM 2	1064	Within -0.2 dB to +0.8 dB of the power recorded in Step 8.
	IN A	3080		OUT A	2040	Within -1.1 dB to -0.1 dB of the power recorded in Step 8.