L MULTIPLEX TERMINALS

LMX-1

RECEIVING CIRCUITS

GROUP DEMODULATOR

IN-SERVICE GAIN TESTS

PURPOSE OF TESTS

To determine that the output level of the group demodulator is correct.

REASON FOR ISSUE

To add Step 9 to Chart 1 and update the information. Arrows indicate significant changes. ***Equipment Test Lists are not affected.***

SYNOPSIS (Fig. 1 and 2)

Each receiving group bank:

(a) Accepts the basic 312- to 552-kHz supergroup band at -28 dBm.

(b) Translates this supergroup band into the five basic 60- to 108-kHz group bands.

(c) Provides amplification in each group demodulator circuit to maintain the correct transmission level at the output. Amplification is by a nonregulated amplifier having two outputs. One output provides -5 dBm at the GR DEM OUT jacks where connection is made to either a channel bank or group connector. The other output connects to the scanner circuits, thereby providing automatic scanning.

The output level of the auxiliary amplifier is manually adjusted using the GAIN control. The 104.08-kHz pilot, 20 dB below message level, appears at the output of each amplifier.

METHOD OF TESTING

The circuit to be tested is manually selected by scanner control circuits. The group pilot output level is then monitored (Chart 1) using the group pilot measuring circuit. Adjustment is made with the GAIN control.

An alternate method (Chart 2) is used where the GROUP PILOT-DB meter cannot be observed from the equipment location. The N and M leads are extended through the GR TEST jacks to the equipment location where connection is made to a 1R or 1AC tube test set. Adjustment is made

using the GAIN control while observing the tube test set. However, final adjustment is dependent upon the indication on the GROUP PILOT-DB meter of the group pilot measuring circuit.

APPARATUS

Supergroup and Group Pilot Measuring Circuits

Receiving Test Equipment (RTE) (Section 356-010-500)

Frequency: 315 to 508 kHz

Power: -48 dBm

Impedance: 75 ohms, unbalanced

IR or IAC Tube Test Set

327A Plug (open-circuited dummy plug)

P2BJ Cord

CHART **PAGE**

CHART 1

GAIN TEST

STEP	PROCEDURE
	Input Pilot Test
1	Calibrate the supergroup and group measuring circuits as follows:
	(a) Supergroup Pilot Measuring Circuit—Section 356-012-505 or 356-225-503.
	(b) Group Pilot Measuring Circuit—Section 356-012-504
2	On the scanner control panel (Fig. 3),
	(a) Set the BAY (or MG), SG, and GR selector switches for the circuit to be tested.
	(b) Press the SELECT pushbutton.

CHART 1 (Cont)

STEP	PROCEDURE
3	Read the SUPERGROUP PILOT—DB meter. ***Requirement:*** 0 ±0.2 dB (-0.2 to +0.2 dB)
4	If the requirement of Step 3 is met, proceed to Step 5. If it is not met, perform tests in Section 356-115-501.
5	Read the GROUP PILOT-DB meter. ***Requirement:*** 0 ±0.5 dB (-0.5 to +0.5 dB)
6	If the requirement of Step 5 is met, proceed to Step 9. If it is not met, adjust the GAIN control (Fig. 1 and 2) on the associated auxiliary amplifier. ***Requirement:*** 0.0 dB ***Note:*** A second person may be required to observe the GROUP PILOT-DB meter while adjustment is made.
7	If the requirement of Step 6 is met, proceed to Step 9. If it cannot be met, proceed as follows: ***Group 1:*** Remove the associated group bank from service and perform out-of-service tests as prescribed in Section 356-120-502. ***Group 2 through 5:*** Verify that the pilot input power requirement is correct for the group circuit being tested as follows: (a) Adjust the RTE as follows: Frequency: Table A Power: -48.0 dBm Impedance: 75 ohms, unbalanced ***Caution: Connect the patch cord to the RTE before making the connection to the SG DEM OUT B jack.*** (b) Connect the RTE to the SG DEM OUT B jack of the supergroup regulated amplifier associated with the group bank being tested [patch (1), Fig. 4]. (c) Measure the power of the input pilot. ***Requirement:*** -48 dBm

CHART 1 (Cont)

STEP	PROCEDURE
	(d) If the requirement of (c) is met, the trouble exists in the group bank. Remove the associated group bank from service and perform out-of-service tests as prescribed in Section 356-120-502.
8	If the requirement of Step 7 (c) is not met, proceed as follows: (a) Locate and correct the pilot level irregularity. (b) Disconnect the RTE [patch (1), Fig. 4]. (c) Repeat Step 5.
9	◗Press the SCAN pushbutton on the scanner control panel.◖

CHART 2

GAIN TEST—ALTERNATE METHOD

STEP	PROCEDURE
	Input Pilot Test
1	Calibrate the supergroup and group measuring circuits as follows: (a) ◗Supergroup Pilot Measuring Circuit—Section 356-012-505 or 356-225-503◖ (b) Group Pilot Measuring Circuit—Section 356-012-504
2	On the scanner control panel (Fig. 3), (a) Set the BAY (or MG), SG, and GR selector switches for the circuit to be tested. (b) Press the SELECT pushbutton.
3	Read the SUPERGROUP PILOT-DB meter. ***Requirement:*** ◗0 ±0.2 dB (-0.2 to +0.2 dB)◖
4	If the requirement of Step 3 is met, proceed to Step 5. If it is not met, perform tests in Section 356-115-501.

CHART 2 (Cont)

STEP	PROCEDURE
	Gain Test
5	Read the GROUP PILOT-DB meter. ***Requirement:*** ◗0 ±0.5 dB (-0.5 to +0.5 dB)◖
6	If the requirement of Step 5 is met, proceed to Step 15. If it is not met, perform the following at the HFPB: (a) On the GRP & SG PIL MEAS panel (Fig. 3), operate the GR MEAS SW control to the REMOTE (vertical) position. (b) Insert a 327A plug into the GR TST jack associated with the group circuit being tested [patch (1), Fig.5].
7	On the 1R or 1AC tube test set, set the keys and switches as follows: (a) SCALE (#3) key to SPACE MILLI-V (b) SHUNT (#4) key to ON (c) Rotary switch to P2.
8	At the equipment location, ◗use an M4T cord to◖ connect the tube test set to the TRANS IND jack on the auxiliary amplifier associated with the circuit being tested [patch (2), Fig. 5].
9	◗Adjust the GAIN control on the associated auxiliary amplifier for an indication of 0.0 millivolts on the tube test set meter.◖
10	If the requirement of Step 9 is met, proceed to Step 12. If it is not met, proceed as follows: ***Group 1:*** Remove the associated group bank from service and perform out-of-service tests as prescribed in Section 356-120-502. ***Groups 2 through 5:*** Verify that the input level requirement is correct for the group circuit being tested as follows: (a) ◗Adjust the RTE as follows: Frequency: Table A Power: -48.0 dBm Impedance: 75 ohms unbalanced◖

CHART 2 (Cont)

STEP	PROCEDURE
	Caution: Connect the patch cord to the RTE before making the connection to the SG DEM OUT B jack.
	(b) Connect the RTE to the SG DEM OUT B jack of the supergroup regulated amplifier associated with the group bank being tested [patch (1), Fig. 4].
	(c) Measure the power of the input pilot.
	Requirement: -48 dBm
	(d) If the requirement of (c) is met, the trouble exists in the group bank. Remove the associated group bank from service and perform the out-of-service test as prescribed in Section 356-120-502.
11	If the requirement of Step 10(c) is not met, proceed as follows:
	(a) Locate and correct the pilot level irregularity.
	(b) Disconnect the RTE [patch (1), Fig. 4].
	(c) Repeat Step 9.
12	Disconnect the tube test set [patch (2), Fig. 5].
13	Perform the following at the HFPB:
	(a) On the GRP & SG PIL MEAS panel, operate the GR MEAS SW control to the MANUAL (horizontal) position.
	(b) Remove the 327A plug from the GR TST jack [patch (1), Fig. 5].
14	Read the GROUP PILOT-DB meter.
	Requirement: ◆0 ±0.5 dB (-0.5 to +0.5 dB)◆
15	Press the SCAN pushbutton on the scanner control panel.

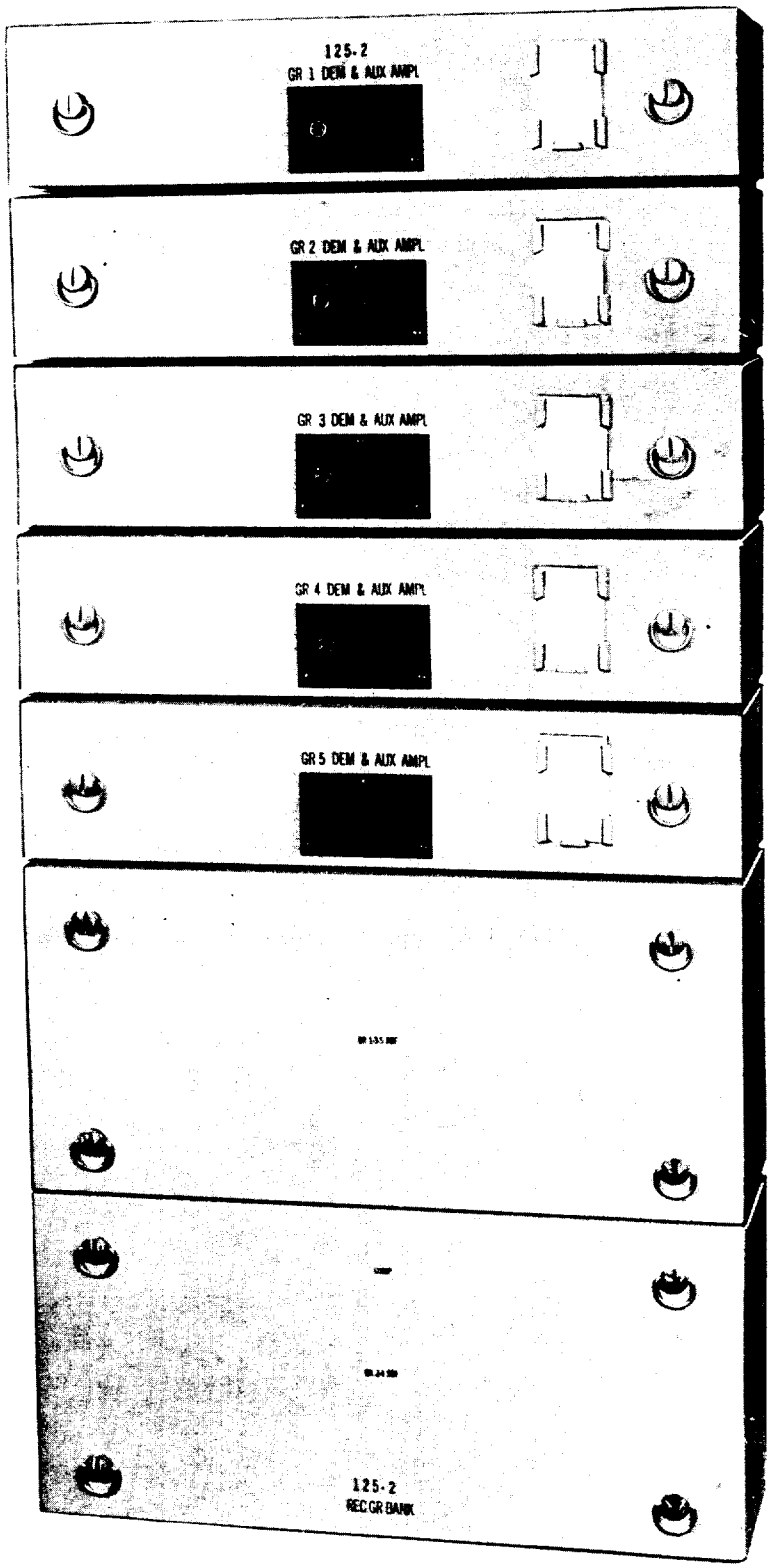

Fig. 1—LMX-1 Receiving Group Bank

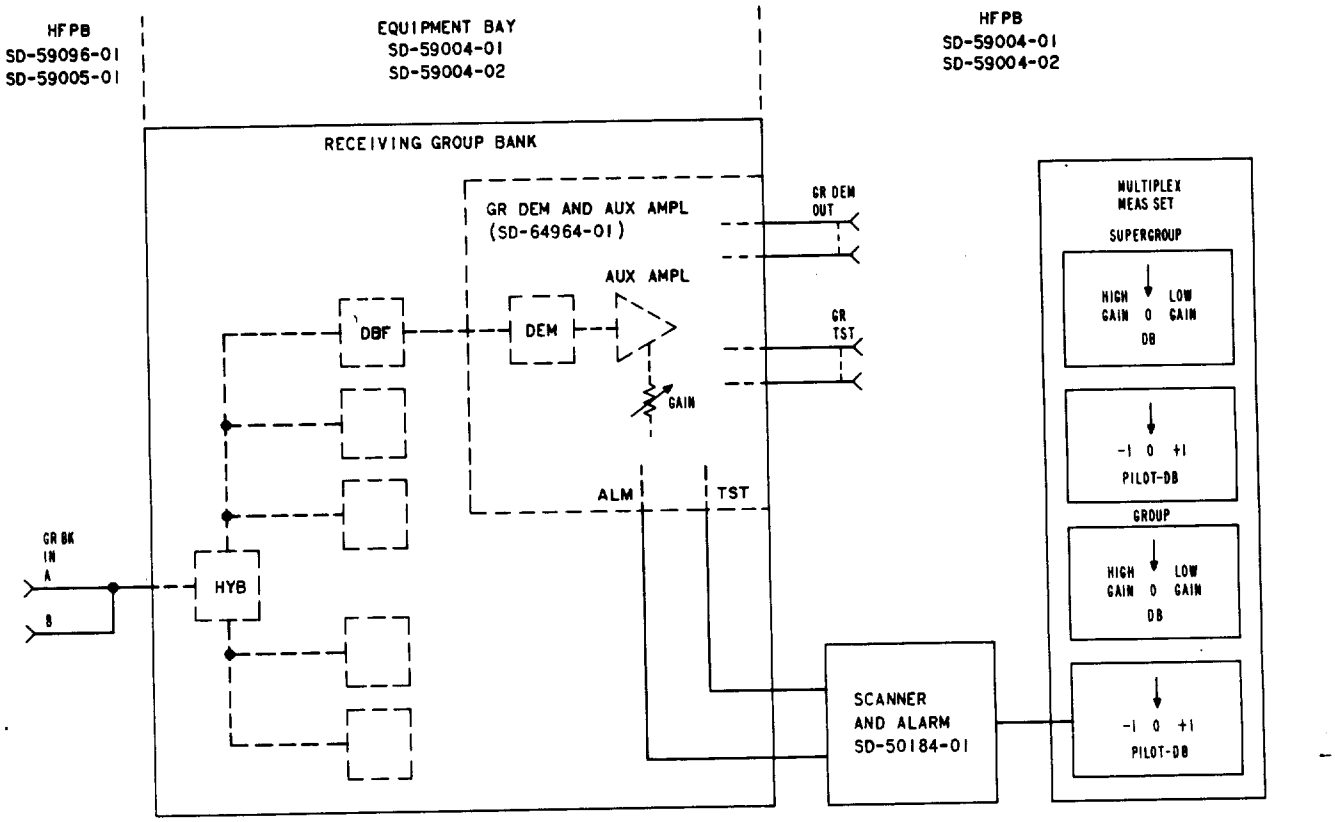

Fig. 2—LMX-1 Receiving Group Bank—Block Diagram

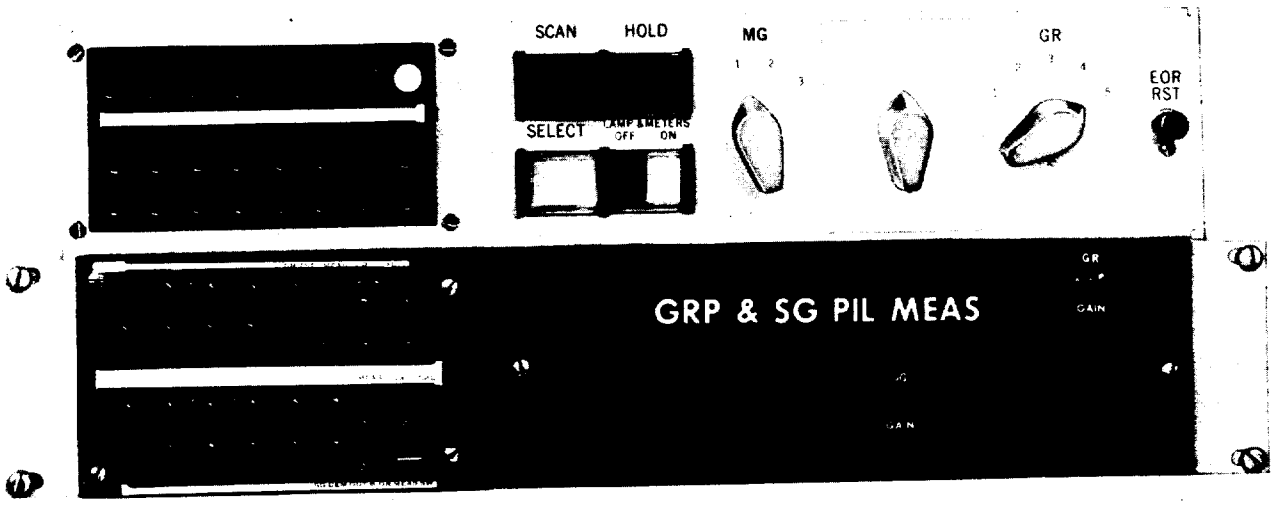

Fig. 3—AT HFPB: TOP—Scanner Control Panel
BOTTOM—Group and Supergroup Pilot Measuring Panel

TABLE A

FREQUENCY TRANSLATION (GROUP DEMODULATORS)				
INPUT PILOT FREQUENCY (KHZ) FOR GROUPS 1 THROUGH 5				
1	2	3	4	5
315.92	363.92	411.92	459.92	507.92

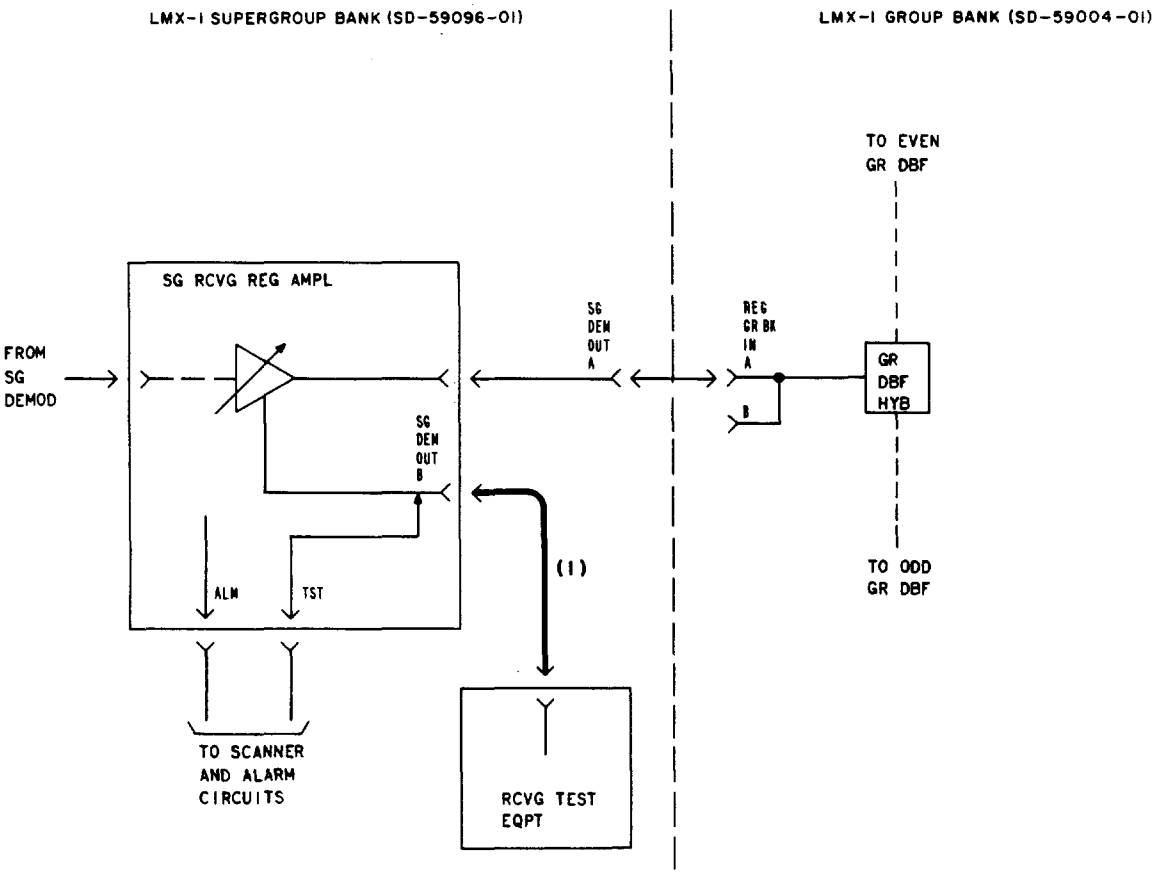

Fig. 4—Test Connections—Input Pilot Level Check

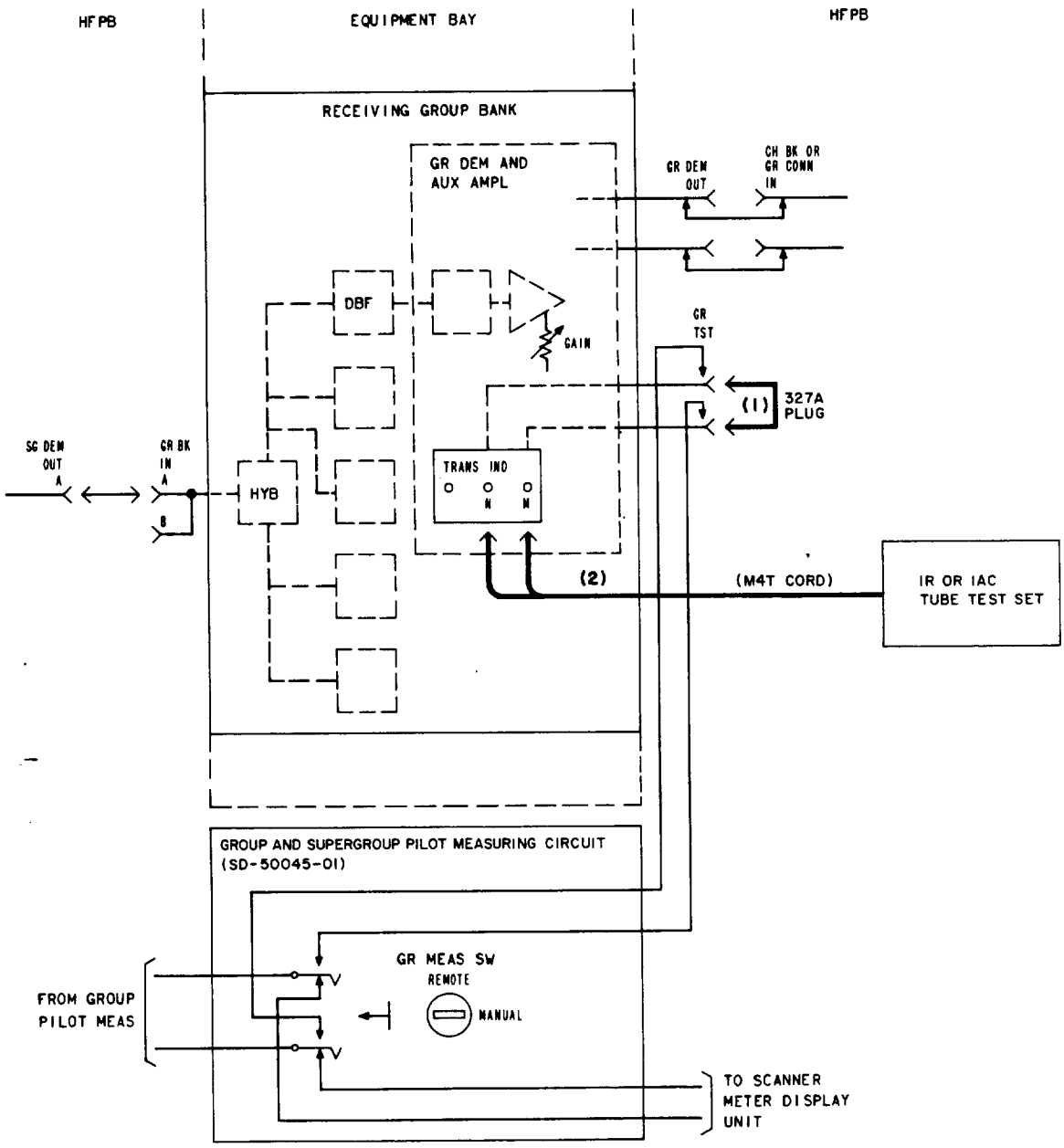

Fig. 5—Test Connections—Gain Test—Alternate Method