L MULTIPLEX TERMINALS

LMX-2

RECEIVING CIRCUITS

B2C GROUP REGULATED AMPLIFIER

TESTS

The purpose of this test is to determine:

(a) That the B2C regulated amplifier maintains the ▶group pilot output power at −25 dBm◀ with varying pilot input power

(b) That the end-of-range and alarm circuits meet operational requirements.

▶In this test, the group pilot frequency at the SP GR BK OUT A jack is connected through attenuators and a spare flat-gain amplifier to the GR BK IN A jack of the regular or spare group bank to be tested. This test frequency is obtained via the PIL OUT jacks in order to test the alarm circuits associated with the individual B2C amplifiers.◀

Caution: After the regulating pilot is applied and after each adjustment of pilot power, several seconds are required for the regulated amplifier to stabilize.

Note: The receiving group bank to be tested must be removed from service before this test can be performed.

This section is reissued:

(a) To specify application and removal of test frequencies via the PIL OUT jacks.

(b) To include references to patching procedures.

(c) To delete Step 19 (Issue 2).

(d) To make minor corrections.

Equipment Test Lists are not affected. Arrows are used to indicate significant changes.

The B2C group amplifier features are as follows:

(a) The received 104.08-kHz group pilot automatically regulates the B2C receiving group regulated amplifier to maintain ▶pilot output of −25 dBm at the GR DEM OUT jacks with pilot input power varying over a range of ±4 dB.◀ The regulated amplifier switches to a fixed nominal gain if the group pilot is removed.

(b) The alarm (ALM) lamp on the B2C amplifier lights when a loss of 104.08-kHz pilot occurs or, except when option S is used, when the scanner is connected to that amplifier.

(c) An end-of-range (EOR) lamp is associated with five B2C group amplifiers and the associated supergroup amplifier on the same shelf. ◗The EOR lamp lights when the B2C amplifier gain deviates more than ±4 dB from nominal.◖

APPARATUS

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

Frequency range: 300 to 600 kHz

Input power: −48 dBm

Input impedance: 75 ohms

Transmitting Group Bank (spare)

◗***Flat-Gain Amplifier*** [transistor-type (231D or 231L, if available, with ED-51318-30 test module) or tube-type (J68808F)]◖

14A Attenuator (or other 75-ohm attenuator ***not of the pull-to-turn type)***

10-dB pad (such as 9A attenuator or 19-type pad)

P2BJ Cords (for 75-ohm patches)

323A Plugs (135-ohm terminations)

STEP	PROCEDURE

Caution: To prevent momentary loss of pilot during attenuator adjustment, a pull-to-turn variable attenuator should not be used.

Note: Where so equipped, the color-coded plate on the front of the amplifier must be in the position in which the amplifier is in the regulating condition (black side out).

PREPARATION

1 Check that the equipment to be tested is out-of-service. ◗If not, use patching procedures as prescribed in Section 356-220-300.◖

2 Calibrate the group pilot measuring circuit in accordance with Section 356-012-504 and the end-of-range alarm unit in accordance with Section 356-012-502.

3 Set up and calibrate the RTE for a measurement of −48 dBm at the group frequency under test listed in Table A.

STEP	PROCEDURE

TABLE A

FREQUENCY TRANSLATION – GROUP DEMODULATORS

INPUT FREQ (kHz) FOR GROUPS 1 THROUGH 5				
1	2	3	4	5
315.92	363.92	411.92	459.92	507.92

4 Make the test connections shown in Fig. 1.

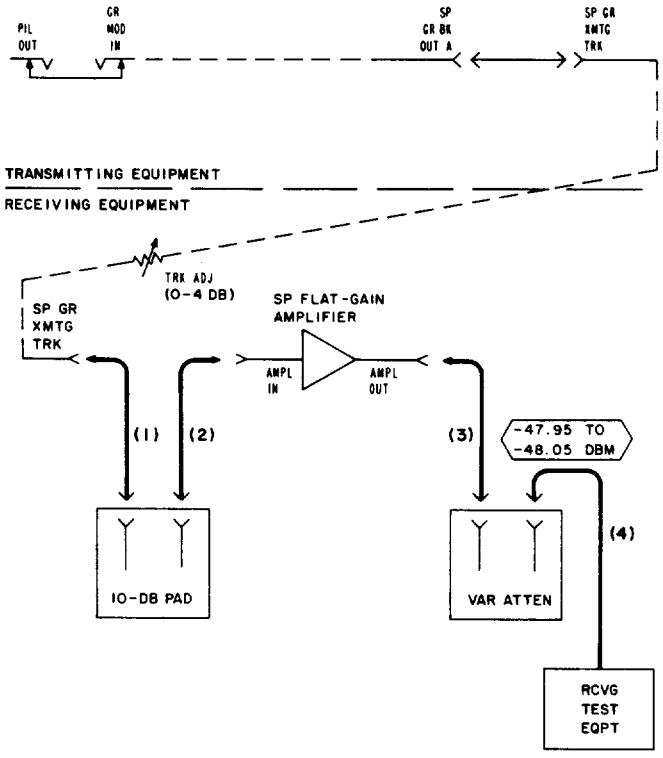

Fig. 1—Pilot Level Test Connections

STEP	PROCEDURE

5 Measure the power of the translated pilot for the group under test at the output jack of the attenuator.

Requirement: −48 dBm ±0.05 dB (−47.95 to −48.05 dBm)

Note: The attenuator loss must not be less than 4 dB.

6 If the requirement of Step 5 is ***not*** met, adjust the attenuator until the requirement is met.

7 Remove patch (4) in Fig. 1 and make patch (4) in Fig. 2. Also, insert a 135-ohm termination in the GR DEM OUT jack.

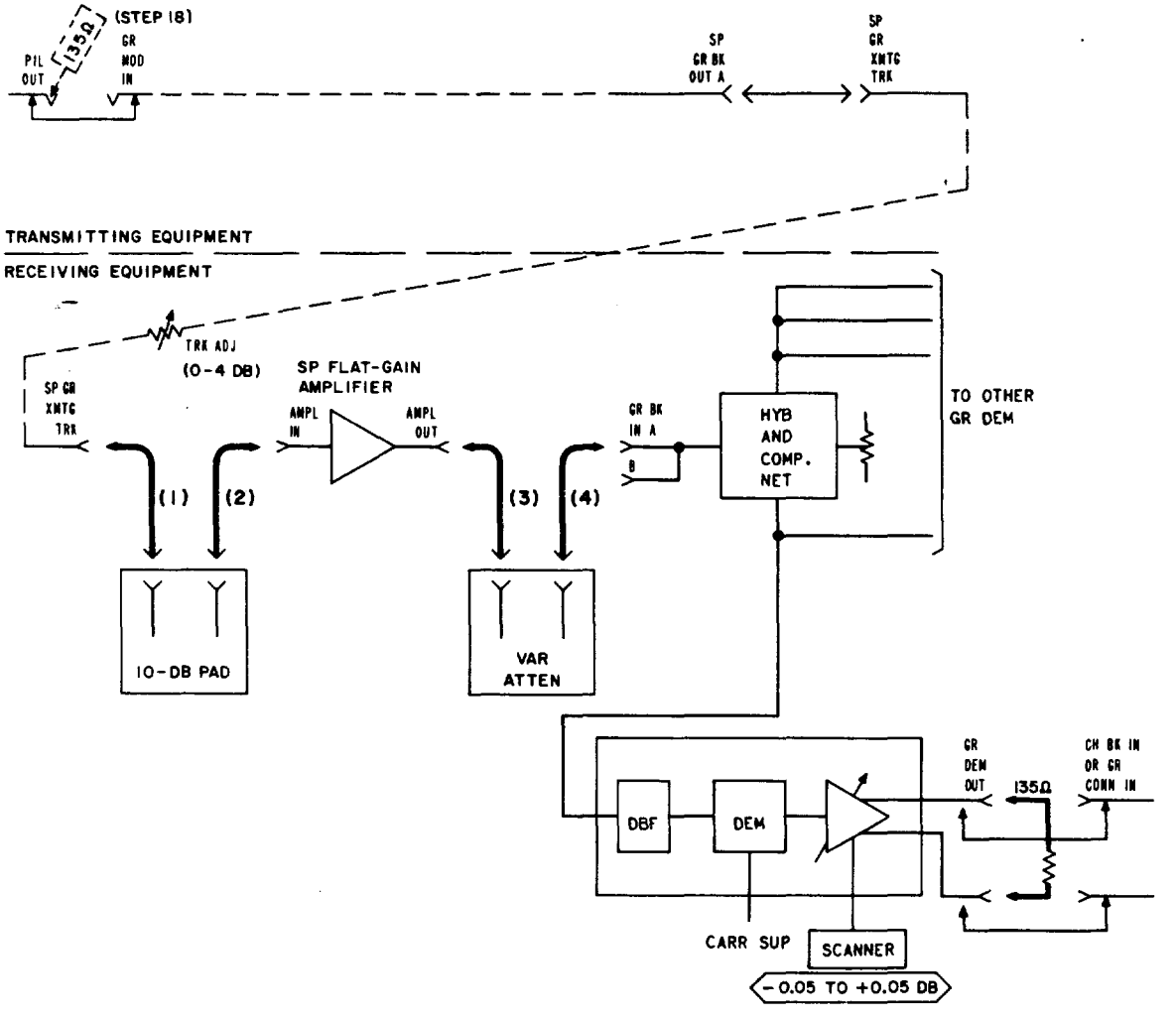

Fig. 2—Test Connections for Amplifier Adjustments

STEP	PROCEDURE
8	Set the scanner selector switch to the bay, supergroup, and group under test.
9	Press the SELECT pushbutton. ***Requirement:*** The ALM lamp on the selected amplifier lights, except when option S (SD-50146-02, Issue 10) is provided.
10	If the requirement of Step 9 is ***not*** met, replace the group amplifier with a spare unit and repeat Step 9. If the requirement ***cannot*** be met, reinsert the original group amplifier and check for trouble in the scanner circuit.
11	Read the GROUP PILOT-DB meter indication. ***Requirement:*** 0 $\pm$0.05 dB (−0.05 to +0.05 dB)
12	If the requirement of Step 11 is ***not*** met, slowly adjust the GRP OUTPUT control on the B2C amplifier until the requirement is met. If the requirement ***cannot*** be met, replace the B2C amplifier with a spare unit and repeat Steps 9 through 11.
13	Read the GROUP GAIN meter indication. ***Requirement:*** Within the range of 1.5 dB HIGH GAIN to 1.5 dB LOW GAIN
14	If the requirement of Step 13 is ***not*** met, perform the tests in Section 356-220-502.
15	Adjust the attenuator until the GROUP GAIN meter indicates 0 dB.
16	Record the value of the attenuator setting.
	♦LOSS OF PILOT—ALARM TEST♦
17	Set the scanner GRP switch to a different group position, then press the SELECT pushbutton. ***Requirement:*** On the amplifier under test, the ALM lamp is extinguished.
18	♦Remove the pilot by inserting a 135-ohm termination in the PIL OUT jack for the B2C amplifier under test. ***Requirement:*** The loss of pilot ALM lamp (on the group amplifier under test only) lights.
19	If the requirement of Step 18 ***is*** met, (a) Restore the pilot by removing the 135-ohm termination from the PIL OUT jack (inserted in Step 18). (b) Reselect the group under test by operating the GRP switch and pressing the SELECT pushbutton.♦

STEP	PROCEDURE

20 If the requirement of Step 18 is ***not*** met,

(a) Replace the group regulated amplifier with a spare unit.

(b) ◆Restore the pilot by removing the 135-ohm termination from the PIL OUT jack (inserted in Step 18).◆

(c) Repeat Steps 8 through 19.

Caution: The PILOT ALM ADJ control should not be adjusted locally. It is a factory adjustment.

◆END-OF-RANGE (EOR) ALARM TEST◆

21 Record the group pilot indication of the group under test as indicated by the scanner GROUP PILOT-DB meter.

22 In 1-dB steps, slowly increase the attenuator loss 4 dB above the value recorded in Step 16.

Note: Allow several seconds after each 1-dB change for the regulated amplifier to stabilize.

Requirement: The shelf EOR lamp lights when a 4-dB change is made, ◆but ***not*** when a 3-dB change is made.◆

Note: If the EOR lamp does ***not*** light, add 1 dB more attenuation to light the lamp and then remove the 1 dB.

23 Read the GROUP PILOT-DB and GROUP GAIN scanner meter indications.

Requirement 1: The GROUP PILOT-DB meter indication decreases by not more than 0.2 dB below the indication recorded in Step 21.

Requirement 2: The GROUP GAIN meter indicates 4 $\pm$1.0 (3.0 to 5.0) dB HIGH GAIN.

24 Restore the attenuator to the value recorded in Step 16.

25 Extinguish the EOR lamp by operating the EOR RST key.

26 In 1-dB steps, slowly decrease the attenuator loss 4 dB below the value recorded in Step 16.

Note: Allow several seconds after each 1-dB change for the regulated amplifier to stabilize.

Requirement: The shelf EOR lamp lights when a 4-dB change is made, ◆but ***not*** when a 3-dB change is made.◆

Note: If the EOR lamp does ***not*** light, remove 1 dB more attenuation to light the lamp and then add the 1 dB.

STEP	PROCEDURE
27	Read the GROUP PILOT-DB and GROUP GAIN scanner meter indications. ***Requirement 1:*** The GROUP PILOT-DB meter indication increases by not more than 0.2 dB above the indication recorded in Step 21. ***Requirement 2:*** The GROUP GAIN meter indicates 4 $\pm$1.0 (3.0 to 5.0) dB LOW GAIN.
28	If the requirements of Steps 22, 23, 26, and 27 are ***not*** met, replace the group regulated amplifier with a spare unit and repeat Steps 9 through 27.
29	Remove all test patches and the 135-ohm termination from the GR DEM OUT jack (inserted in Step 7). Then restore the equipment to normal service ◗(Section 356-220-300).◖