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**L MULTIPLEX TERMINALS**  
**LMX-2**  
**RECEIVING CIRCUITS**  
**C2C SUPERGROUP REGULATED AMPLIFIER**  
**TESTS**

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The purpose of this test is to determine:

- (a) That the C2C regulated amplifier maintains the supergroup pilot output power at  $-48$  dBm with varying pilot input power.
- (b) That the end-of-range and alarm circuits meet operational requirements.

◆ In this test, the supergroup pilot frequencies at the SP SG BK OUT TST jack are connected through an attenuator and a spare flat-gain amplifier to the SG BK IN A jack of the regular or spare supergroup bank to be tested. These test frequencies are obtained via the SP SG MOD IN A jacks in order to test the alarm circuits associated with the individual C2C 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 supergroup 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 at the SP SG MOD IN A jacks.
- (b) To make minor corrections.

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

The C2C supergroup amplifier features are as follows:

- (a) The C2C supergroup amplifier is automatically regulated by the 315.92-kHz pilot. For incoming pilot variation over a range of  $\pm 6$  dB, the amplifier will maintain a  $-48$  dBm ◆ pilot output power at the SG DEM OUT A jack.◆ If the 315.92-kHz pilot is removed, the C2C amplifier will switch to a fixed nominal gain.
- (b) The alarm (ALM) lamp on the C2C amplifier lights when a loss of 315.92-kHz pilot occurs or when the scanner is connected to the amplifier, thereby indicating which supergroup is being scanned.

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(c) An end-of-range (EOR) lamp is associated with each regular C2C amplifier; however, an EOR lamp is associated with more than one spare C2C amplifier. The EOR lamp lights when the C2C amplifier gain deviates more than  $\pm 6$  dB from nominal.

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**APPARATUS**

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

Frequency range: 300 to 3000 kHz

Input power: -41.3 dBm

Input impedance: 75 ohms

***Spare transmitting group and supergroup banks***

***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*)

***368A Plug*** (75 ohms)

***P2BJ Cords*** (for 75-ohm patches)

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**STEP**

**PROCEDURE**

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***Note 1:*** Before beginning this test, calibrate the supergroup pilot measuring circuit in accordance with Section 356-012-505, and the end-of-range alarm unit in accordance with Section 356-012-502.

***Note 2:*** Where so equipped, the color-coded plate on the face of the C2C amplifier must be in the position in which the amplifier is in the regulating condition (black side out).

***Caution:*** *When performing this test, ensure that high signal power is not applied to the supergroup bank being tested. It is imperative that the power of the signal at the output of the attenuator be within the required limits before the signal is applied to the SG BK IN A jack of the supergroup circuit being tested.*

**PREPARATION**

- 1 Check that the equipment to be tested is out-of-service. If not, use patching procedures as prescribed in Section 356-215-300.
- 2 Calibrate the RTE for a direct measurement of the translated pilot of the supergroup under test.

***Note:*** Table A lists the translated 315.92-kHz pilot frequencies.

STEP	PROCEDURE
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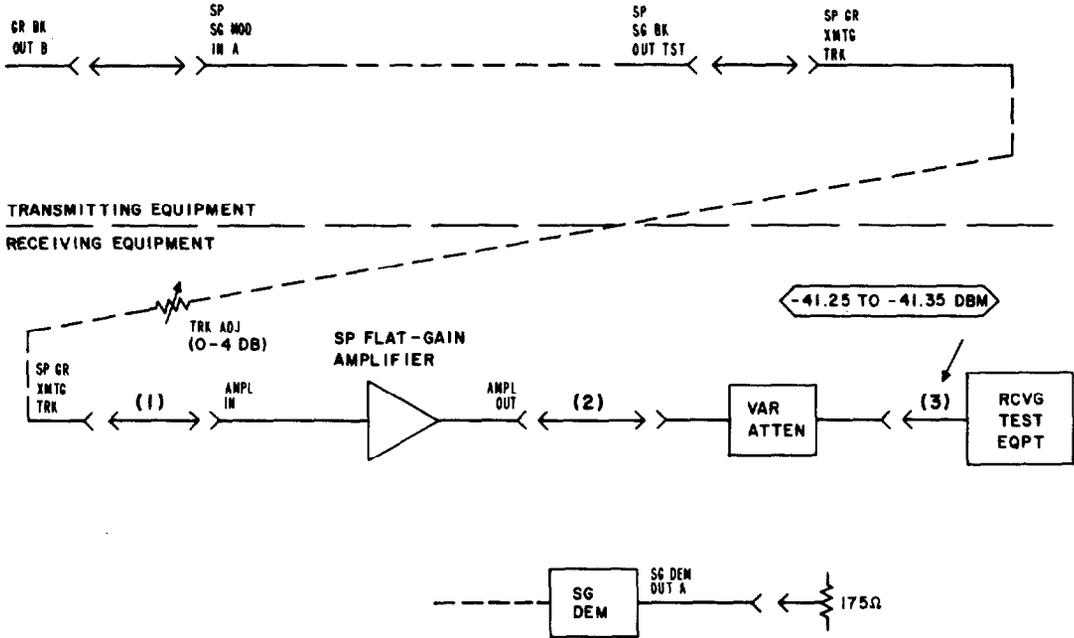
**TABLE A**  
**FREQUENCY TRANSLATION – SUPERGROUP DEMODULATORS**

INPUT FREQUENCY (kHz) FOR SUPERGROUPS 1 THROUGH 10 (L600A TERMINAL)										
1	2	3	4	5	6	7	8	9	10	
296.08	315.92	800.08	1048.08	1296.08	1544.08	1792.08	2040.08	2175.92	2784.08	
INPUT FREQUENCY (kHz) FOR SUPERGROUPS 12 THROUGH D28 (L1860 TERMINAL)										
12	13	14	15	16	17	18	D25	D26	D27	D28
315.92	800.08	1048.08	1296.08	1544.08	1792.08	2040.08	2336.08	2584.08	2832.08	3080.08

- 3 Make the test connections shown in Fig. 1.
- 4 Measure the power of the translated pilot of the supergroup under test at the output jack of the attenuator.

**Requirement:** -41.3 dBm ±0.05 dB (-41.25 to -41.35 dBm)

**Note:** The attenuator loss must not be less than 6 dB.



**Fig. 1—Pilot Level Adjustment Connections**

STEP	PROCEDURE
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|----|--|
| 5  | If the requirement of Step 4 is <i>not</i> met, adjust the attenuator to meet the requirement.<br><br><i>Note:</i> The power at the attenuator output jack can be adjusted for one attenuator setting for all supergroups by adjusting the SG PAD control in each transmitting supergroup. |
| 6  | Remove patch (3), Fig. 1.  |
| 7  | Patch the attenuator output jack to the SG BK IN A jack [patch (3), Fig. 2].   |
| 8  | On the scanner control panel, set the BAY and SG selector switches to the supergroup under test.   |
| 9  | Press the SELECT pushbutton on the scanner control panel.<br><br><b>Requirement:</b> The ALM lamp on the associated supergroup amplifier lights.   |
| 10 | If the requirement of Step 9 is <i>not</i> met, replace the supergroup amplifier with a spare unit and repeat Step 9. If the requirement <i>cannot</i> be met, reinsert the original amplifier and check for trouble in the scanner circuit.   |

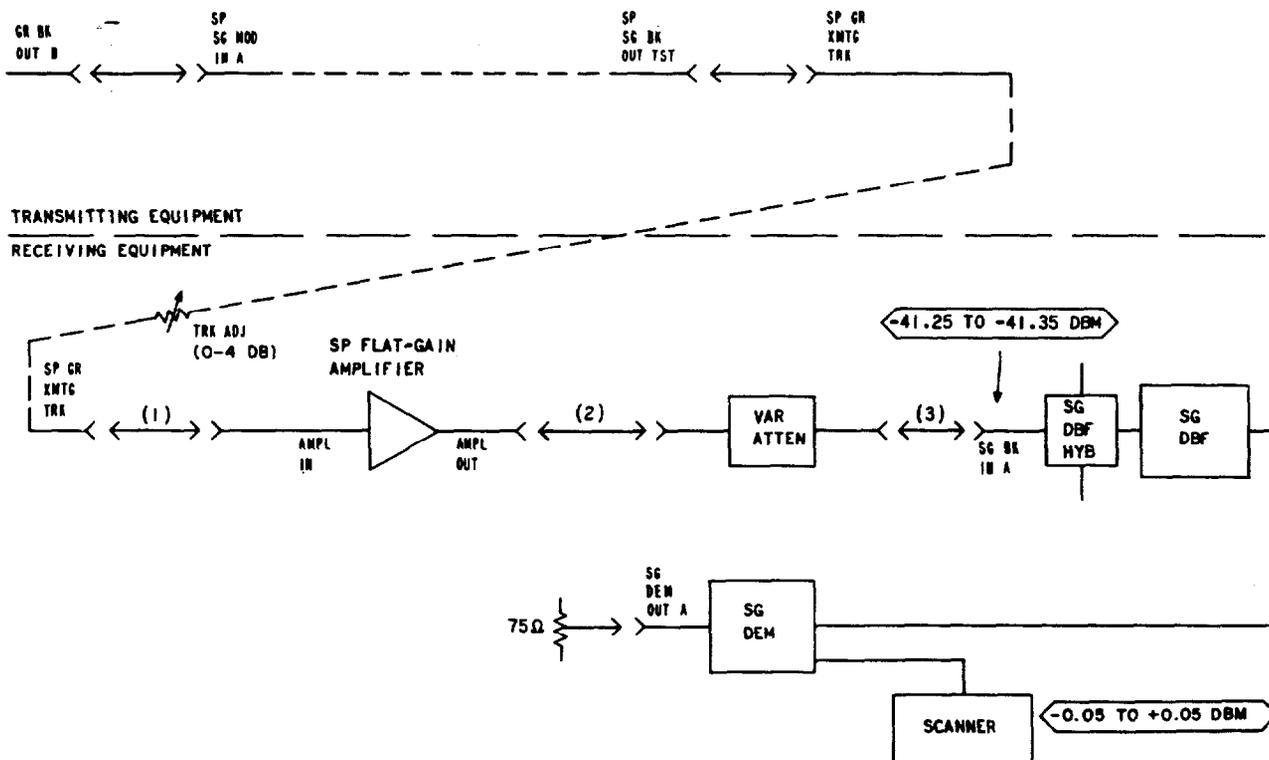


Fig. 2—Regulated Amplifier Test Connections

STEP	PROCEDURE
11	<p>Read the SUPERGROUP PILOT-DB meter indication.</p> <p><b>Requirement:</b> <math>0 \pm 0.05</math> dB (<math>-0.05</math> to <math>+0.05</math> dB)</p>
12	<p>If the requirement of Step 11 is <i>not</i> met, adjust the SG OUTPUT control on the C2C supergroup regulated amplifier to meet the requirement. If the requirement <i>cannot</i> be met, replace the C2C amplifier with a spare unit and repeat Steps 9 through 11.</p>
13	<p>Read the SUPERGROUP GAIN meter indication.</p> <p><b>Requirement:</b> All supergroups except SG1: 2-dB HIGH GAIN to 1-dB LOW GAIN SG1: 3-dB HIGH GAIN to 1-dB LOW GAIN.</p>
14	<p>If the requirement of Step 13 is <i>not</i> met, perform the test in Section 356-215-502.</p>
15	<p>Adjust the attenuator until the SUPERGROUP GAIN meter indicates 0 dB.</p>
16	<p>Record the value of the attenuator setting.</p>
<b>LOSS OF PILOT—ALARM TEST</b>	
17	<p>On the scanner control panel, set the SG selector switch to a different position, then press the SELECT pushbutton.</p> <p><b>Requirement:</b> On the amplifier under test, the ALM lamp is extinguished.</p>
18	<p>Remove the pilot by removing the test connection between the GR BK OUT B jack and the SP SG MOD IN A jack (Fig. 2).</p> <p><b>Requirement:</b> The loss of pilot ALM lamp (on the supergroup amplifier under test only) lights.</p>
19	<p>If the requirement of Step 18 <i>is</i> met,</p> <p>(a) Restore the pilot by replacing the connection between the GR BK OUT B jack and the SP SG MOD IN A jack (removed in Step 18).</p> <p>(b) Reselect the supergroup under test by operating the SG switch and pressing the SELECT pushbutton</p>
20	<p>If the requirement of Step 18 is <i>not</i> met,</p> <p>(a) Replace the supergroup regulated amplifier with a spare unit.</p> <p>(b) Restore the pilot by replacing the connection between the GR BK OUT B jack and the SP SG MOD IN A jack (removed in Step 18).</p>

## STEP

## PROCEDURE

(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 supergroup pilot indication of the supergroup under test as indicated by the scanner SUPERGROUP PILOT-DB meter.

22 In 1-dB steps, slowly increase the attenuator loss 6 dB above the value recorded in Step 16.

**Note:** Allow sufficient time after each 1-dB increase in loss for the supergroup regulated amplifier to stabilize.

**Requirement:** The shelf EOR lamp lights when a 6-dB change is made, but *not* when for a 5-dB change is made.

23 Observe the indications on both the SUPERGROUP GAIN meter and the SUPERGROUP PILOT-DB meter.

**Requirement 1:** SUPERGROUP GAIN meter indicates  $6.0 \pm 0.5$  (5.5 to 6.5) dB HIGH GAIN

**Requirement 2:** SUPERGROUP PILOT-DB meter indication decreases by no more than 0.3 dB below the indication recorded in Step 21

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

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

26 In 1-dB steps, slowly decrease the attenuator loss 6 dB below the value recorded in Step 16.

**Note:** Allow sufficient time after each 1-dB decrease in loss for the supergroup regulated amplifier to stabilize.

**Requirement:** The shelf EOR lamp lights when a 6-dB change is made, but *not* when a 5-dB change is made.

27 Observe the indications on both the SUPERGROUP GAIN meter and the SUPERGROUP PILOT-DB meter.

**Requirement 1:** SUPERGROUP GAIN meter indicates  $6 \pm 0.5$  (5.5 to 6.5) dB LOW GAIN

**Requirement 2:** SUPERGROUP PILOT-DB meter indication increases by no more than 0.3 dB above the indication recorded in Step 21

28 If the requirements of Steps 22, 23, 26, and 27 are *not* met, replace the supergroup regulated amplifier with a spare unit and repeat Steps 22 through 27.

STEP	PROCEDURE
29	Remove the test patches and restore the equipment to the normal operating condition (Section 356-215-300).
	<i>Note:</i> See Fig. 3 for typical connections.

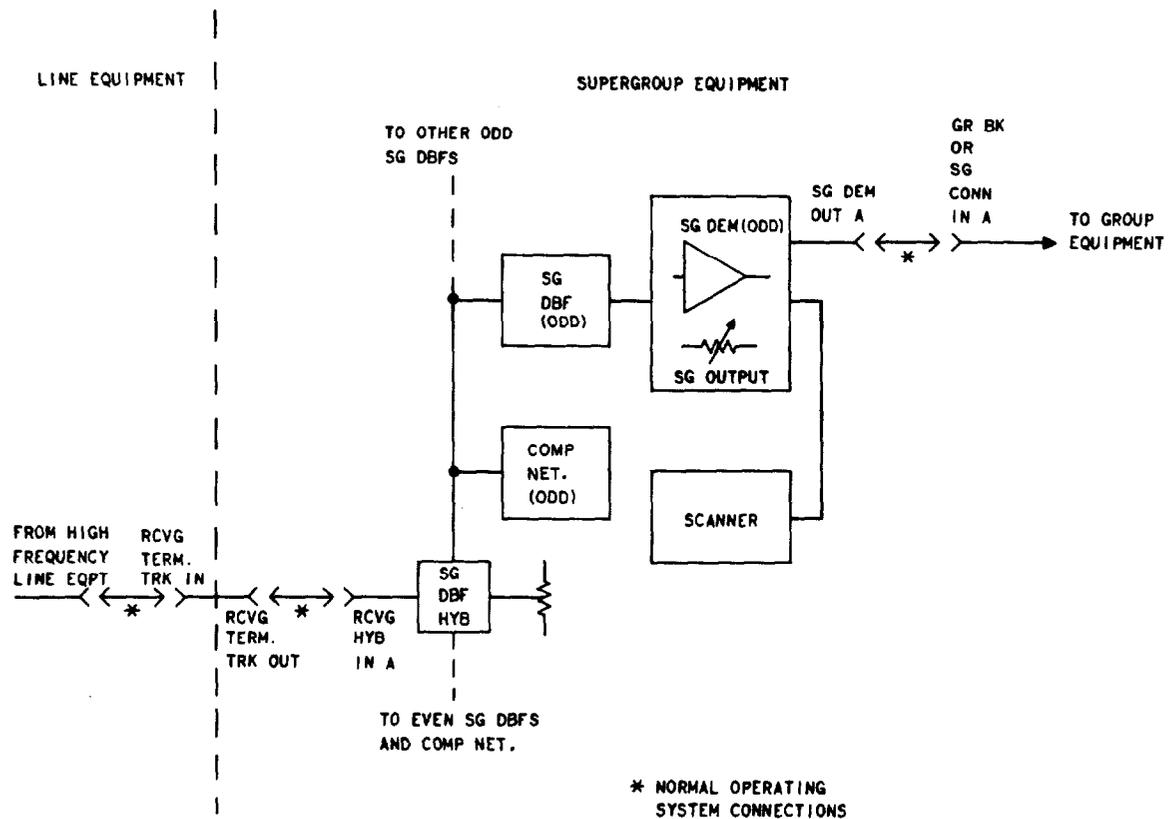


Fig. 3—Receiving Supergroup In-Service Connections—Simplified Block Diagram