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**DISTRIBUTION AMPLIFIER TESTS**  
**SUPERGROUP CARRIER SUPPLIES**  
**LMX-1 CARRIER AND PILOT SUPPLY**  
**ANALOG MULTIPLEX TERMINAL EQUIPMENT**

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◆A supergroup carrier signal distribution circuit (SD-64986) is provided for each supergroup carrier frequency. Two 124-kHz harmonic generators supply the input signals which are connected, via fixed-gain amplifiers, to a distribution bus (Fig. 1). An adjustable pad is associated with each of the two amplifiers that feed the distribution bus. The output power of each carrier signal amplifier is set by strapping the associated pad.◆

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

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**APPARATUS:**

The tests in this section require suitable transmission test equipment. Refer to Section 356-010-500 and select from available equipment receiving units having the following capabilities:

***Receiving test equipment*** (RTE) capable of detecting, from 75-ohm circuits, signals between 620 and 3100 kHz at powers between +1.0 and +3.5 dBm

***P2BJ Cord***

***75-ohm Attenuator or Pad*** to provide 3-dB loss, if required.

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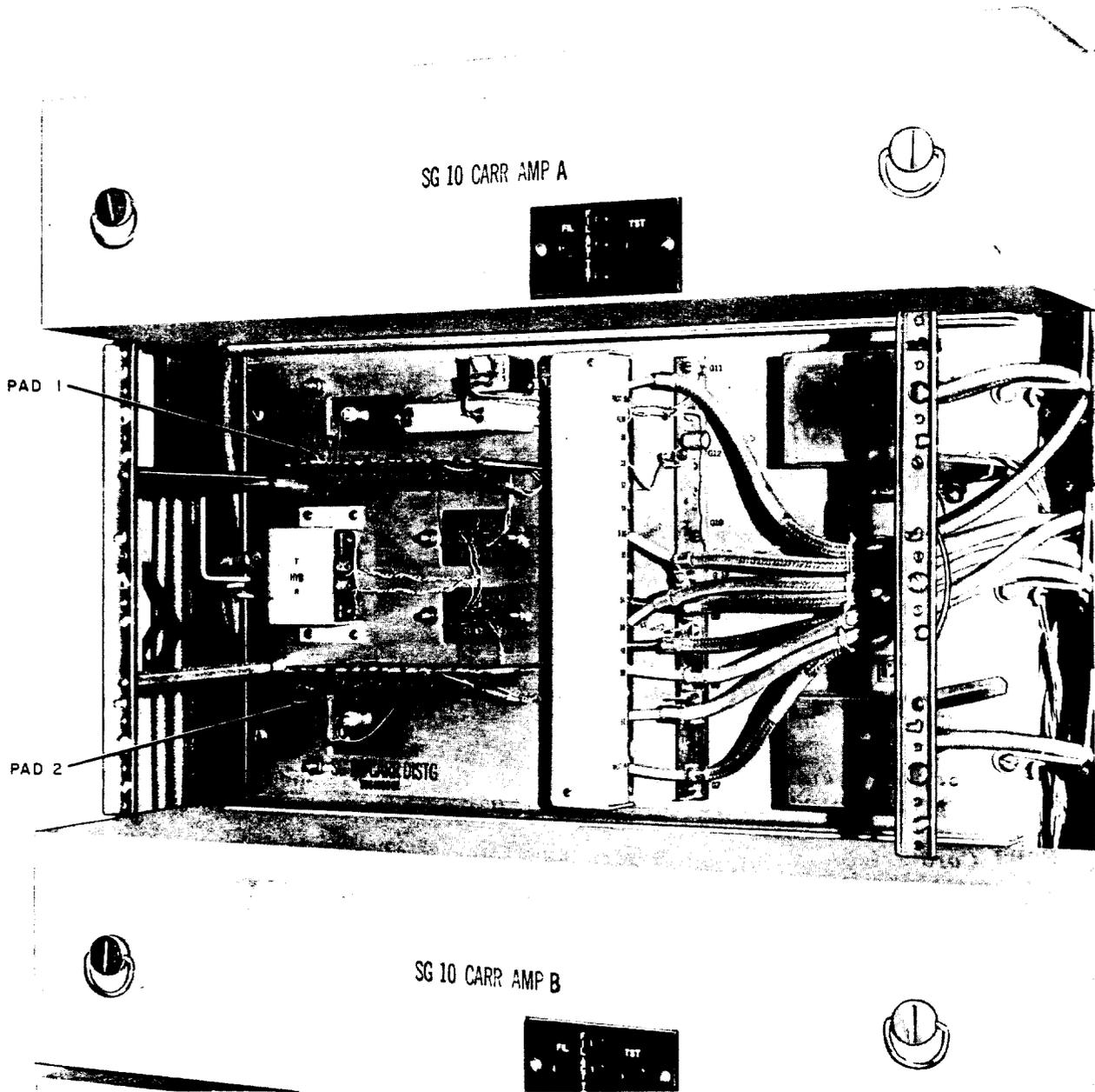


Fig. 1—Supergroup Carrier Amplifiers and Associated Distribution Bus

## ◆CHART 1◆

## IN-SERVICE TESTS

| STEP | PROCEDURE |
|------|-----------|
|------|-----------|

**A. Check Amplifier A With Signal From One 4-kHz Harmonic Generator***At supergroup carrier supply bay,*

- 1 Prepare the RTE for a 75-ohm measurement at the supergroup carrier frequency for the amplifier under test.

**Note:** Table A lists the supergroup carrier frequencies.

- 2 Measure and record the supergroup carrier signal power at the TST jack on the front of supergroup carrier amplifier A [patch (1), Fig. 2].

**Requirement:** +2.2 dBm  $\pm$ 1.2 dB

- 3 Proceed to Part B if the requirement is met. Otherwise, perform the procedure in Chart 2.

**B. Check Amplifier A With Signal From Other 4-kHz Harmonic Generator***At channel carrier supply bay,*

- 4 Depress the TEST pushbutton on the carrier generator transfer panel to determine the **working** 4-kHz harmonic generator.

**Note:** The adjacent A or B lamp lights to indicate the working generator.

TABLE A

SUPERGROUP CARRIER FREQUENCIES

| SG         | 1   | 3    | 4    | 5    | 6    | 7    | 8    | 9    | 10   |
|------------|-----|------|------|------|------|------|------|------|------|
| FREQ (KHZ) | 620 | 1116 | 1364 | 1612 | 1860 | 2108 | 2356 | 1860 | 3100 |

**Note:** The 620-kHz carrier frequency for supergroup 1 is used only in earlier equipment. Later equipment uses a 612-kHz carrier frequency for supergroup 1. The 612-kHz carrier frequency is provided from the group 5 carrier supply.

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**CHART 10 (Contd)**


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**STEP****PROCEDURE**

**Caution:** *Transfer to the other generator will cause hits on data and carrier telegraph service; therefore, the number of transfers should be limited to minimize service interruptions.*

5 Transfer manually to the *standby* 4-kHz harmonic generator per Section 356-150-300.

*At supergroup carrier supply bay,*

6 Measure and record the supergroup carrier signal power at the TST jack on the front of supergroup carrier amplifier A.

**Requirement:** Carrier signal power is within  $\pm 0.3$  dB of the power recorded in Step 2.

7 Proceed to Part C if the requirement is met. Otherwise, perform the procedure in Chart 2.

**C. Check Amplifier B With Signal From One 4-kHz Harmonic Generator**

*At carrier generator transfer panel,*

8 Restore the generator transfer switch to NORM.

*At supergroup carrier supply bay,*

9 Remove patch (1), Fig. 2.

10 Measure and record the supergroup carrier signal power at the TST jack on the front of supergroup carrier amplifier B [patch (2), Fig. 2].

**Requirement:**  $+2.2$  dBm  $\pm 1.2$  dB

11 Proceed to Part D if the requirement is met. Otherwise, perform the procedure in Chart 2.

**D. Check Amplifier B With Signal From Other 4-kHz Harmonic Generator**

*At carrier generator transfer panel,*

12 Depress the TEST pushbutton to determine the *working* 4-kHz harmonic generator.

**Note:** The adjacent A or B lamp lights to indicate the working generator.

13 Transfer manually to the *standby* 4-kHz harmonic generator per Section 356-150-300.

*At supergroup carrier supply bay,*

14 Measure and record the supergroup carrier signal power at the TST jack on the front of supergroup carrier amplifier B.

◆CHART 1◆ (Contd)

| STEP | PROCEDURE |
|------|-----------|
|------|-----------|

**Requirement:** Carrier signal power is within  $\pm 0.3$  dB of the power recorded in Step 10.

15 Proceed to Part E if the requirement is met. Otherwise, perform the procedure in Chart 2.

**E. Return Equipment to Normal**

*At supergroup carrier supply bay,*

16 Remove patch (2), Fig. 2.

*At carrier generator transfer panel,*

17 Restore the generator transfer switch to NORM.

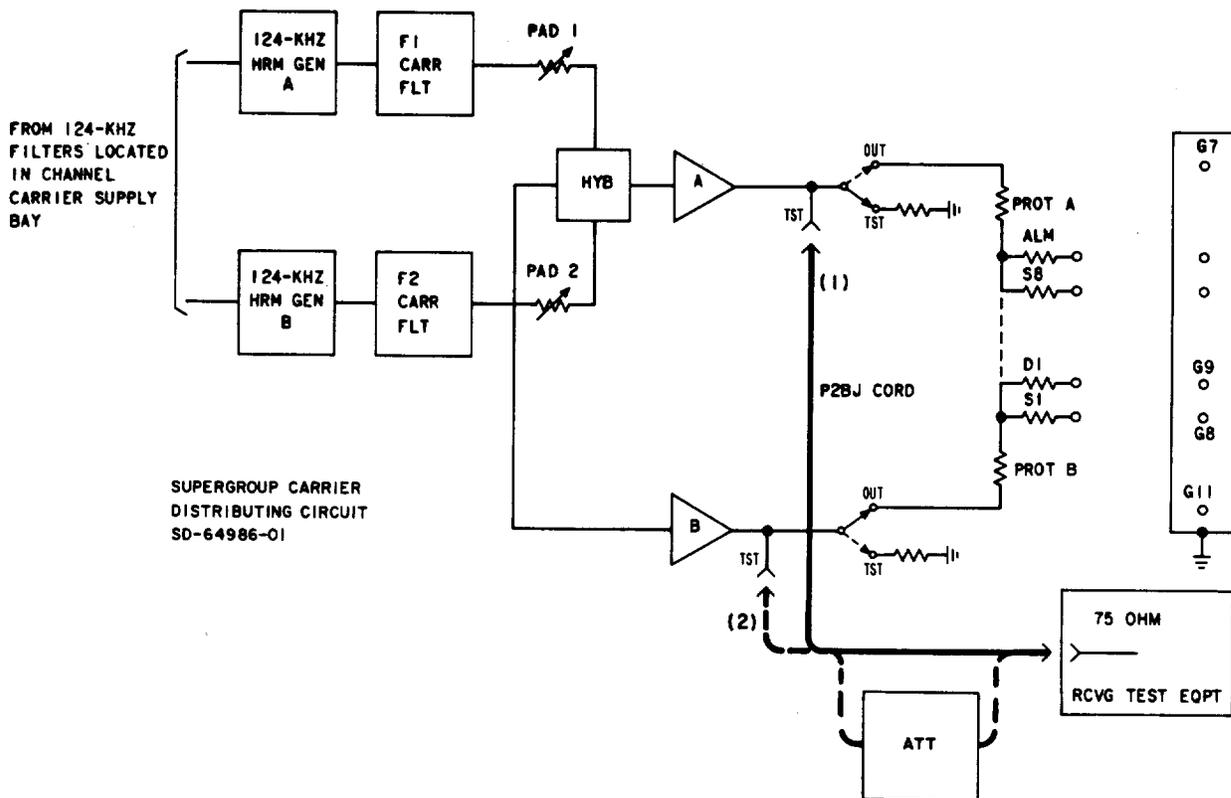


Fig. 2—Measurement of Amplifier Output Power

## ◆CHART 2◆

## OUT-OF-SERVICE TESTS AND ADJUSTMENTS

| STEP | PROCEDURE  |
|------|--|
|      | <b>A. Check With Signal From the A 4-kHz Harmonic Generator</b>  |
|      | <i>At channel carrier supply bay,</i>  |
| 1    | Depress the TEST pushbutton on the carrier generator transfer panel to determine the <i>working</i> 4-kHz harmonic generator.<br><br><i>Note:</i> The adjacent A or B lamp lights to indicate the working generator.<br><br><i>Caution: Transfer to the other generator will cause hits on data and carrier telegraph service; therefore, the number of transfers should be limited to minimize service interruptions.</i> |
| 2    | Transfer manually to the A 4-kHz harmonic generator, if required, per Section 356-150-300.<br><br><i>At supergroup carrier supply bay,</i>   |
| 3    | Remove the front panel cover of the supergroup carrier amplifier under test.   |
| 4    | Move the test link in the carrier amplifier panel to the TST position.<br><br><i>Note:</i> This disconnects the carrier amplifier output signal from the distribution bus. This will reduce the supergroup carrier signal power at the bus approximately 2 dB. This power reduction should not cause a service interruption.   |
| 5    | Prepare the RTE for a 75-ohm measurement at the supergroup carrier frequency for the amplifier under test.   |
| 6    | Measure and record the supergroup carrier signal power at the TST jack on the front of the supergroup carrier amplifier.<br><br><i>Requirement:</i> +2.2 dBm $\pm$ 1.2 dB  |
| 7    | Proceed to Part C if the requirement is met. Otherwise, proceed to Part B.   |
|      | <b>B. Check A Signal Path Including Pad 1</b>  |
| 8    | Perform tests of the A 124-kHz harmonic generator per Section 356-155-502.   |
| 9    | Make electron tube tests per Section 356-150-501.<br><br><i>Caution: Do not restrap pad 1 until the A 124-kHz harmonic generator is out of service.</i>  |

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**▶CHART 2▶ (Contd)**


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| STEP | PROCEDURE   |
|------|---|
| 10   | Transfer manually to the B 124-kHz harmonic generator, if required, per Section 356-150-300.<br><br><i>Note:</i> The green A lamp lights on the A 124-kHz harmonic generator to indicate this generator is out of service.<br><br><i>Caution: Do not proceed until the green A lamp is lighted on the A 124-kHz harmonic generator.</i> |
| 11   | Restrap pad 1 to change the supergroup carrier signal power the required amount.<br><br><i>Note:</i> Table B lists the strapping required for various loss values.  |
| 12   | Repeat Steps 6 through 11, as required.   |
| 13   | Remove patch (1) or (2), Fig. 2.  |
|      | <b>C. Check With Signal From the B 4-kHz Harmonic Generator</b>   |
|      | <i>At carrier generator transfer panel,</i>   |
| 14   | Transfer manually to the B 4-kHz harmonic generator per Section 356-150-300.<br><br><i>At supergroup carrier supply bay,</i>  |
| 15   | Measure and record the supergroup carrier signal power at the TST jack on the front of the supergroup carrier amplifier.<br><br><i>Requirement:</i> Carrier signal power is within $\pm 0.3$ dB of the power recorded in Step 6.  |
| 16   | Proceed to Part E if the requirement is met. Otherwise, proceed to Part D.  |
|      | <b>D. Check B Signal Path Including Pad 2</b>   |
| 17   | Perform tests of the B 124-kHz harmonic generator per Section 356-155-502.  |
| 18   | Make electron tube tests per Section 356-150-501.<br><br><i>Caution: Do not restrap pad 2 until the B 124-kHz harmonic generator is out of service.</i>   |
| 19   | Transfer manually to the A 124-kHz harmonic generator, if required, per Section 356-150-300.<br><br><i>Note:</i> The green A lamp lights on the B 124-kHz harmonic generator to indicate this generator is out of service.  |

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**◆CHART 2◆ (Contd)**

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| <b>STEP</b> | <b>PROCEDURE</b>   |
|-------------|--|
|             | <b>Caution:</b> <i>Do not proceed until the green A lamp is lighted on the B 124-kHz harmonic generator.</i> |
| 20          | Restrap pad 2 to change the supergroup carrier signal power the required amount.                             |
|             | <b>Note:</b> Table B lists the strapping required for various loss values.                                   |
| 21          | Repeat Steps 15 through 20, as required.   |
|             | <b>E. Return Equipment to Normal</b>   |
|             | <b><i>At carrier generator transfer panel,</i></b>   |
| 22          | Restore the generator transfer switch to NORM.   |
|             | <b><i>At supergroup carrier supply bay,</i></b>  |
| 23          | Remove patch (1) or (2), Fig. 2.   |
| 24          | Move the test link in the carrier amplifier panel to the OUT position.                                       |
|             | <b>Note:</b> This connects the carrier amplifier output signal to the distribution bus.                      |
| 25          | Replace all equipment covers.  |
| 26          | Perform the procedure in Chart 1.  |

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**TABLE B**  
**LOSS VALUES FOR PAD 1 AND PAD 2 STRAPPING**

| DB  | STRAP                  | DB   | STRAP                                   |
|-----|------------------------|------|---|
| 0   | 3 to 8                 | 8.5  | A to 2, 4 to 5, 7 to B                  |
| 0.5 | 3 to 5, 6 to 8         | 9.0  | A to 2, 5 to 6, 7 to B                  |
| 1.0 | 4 to 8                 | 9.5  | A to 2, 7 to B                          |
| 1.5 | A to 1, 3 to 5, 6 to 8 | 10.0 | A to 2, 7 to B, 1 to 6, 3 to 4, 5 to 6  |
| 2.0 | A to 1, 4 to 8         | 10.5 | A to 2, 7 to B, 1 to 6, 4 to 5          |
| 2.5 | A to 1, 4 to 5, 6 to 8 | 11.0 | A to 2, 7 to B, 1 to 6, 5 to 6          |
| 3.0 | A to 1, 5 to 8         | 11.5 | A to 2, 7 to B, 1 to 6                  |
| 3.5 | A to 2, 4 to 5, 6 to 8 | 12.0 | 9 to 10                                 |
| 4.0 | A to 2, 5 to 8         | 12.5 | A to 1, 5 to 6, 9 to 10                 |
| 4.5 | A to 2, 6 to 8         | 13.0 | A to 1, 9 to 10                         |
| 5.0 | 3 to 6, 7 to B         | 13.5 | 7 to B, 9 to 10                         |
| 5.5 | 3 to 5, 7 to B         | 14.0 | A to 2, 4 to 5, 7 to B, 9 to 10         |
| 6.0 | 4 to 6, 7 to B         | 14.5 | A to 1, 7 to B, 9 to 10                 |
| 6.5 | A to 1, 3 to 5, 7 to B | 15.0 | A to 2, 7 to B, 9 to 10                 |
| 7.0 | A to 1, 4 to 6, 7 to B | 15.5 | A to 2, 1 to 3, 9 to 10                 |
| 7.5 | A to 1, 4 to 5, 7 to B | 16.0 | A to 2, 1 to 6, 5 to 6, 7 to B, 9 to 10 |
| 8.0 | A to 1, 5 to 6, 7 to B | 16.5 | A to 2, 1 to 3, 7 to B, 9 to 10         |