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**A6 CHANNEL BANK**  
**J68929( ) BAYS**  
**CHANNEL BANK TESTS AND ADJUSTMENTS**  
**OUT-OF-SERVICE**  
**COMMON EQUIPMENT**  
**ANALOG MULTIPLEX TERMINAL EQUIPMENT**

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The J68929AA A6 channel bank (Fig. 1) is a frequency-division multiplex terminal that translates 12 voice-frequency (VF) channels to the 60- to 108-kHz group band in its transmitting section and translates the 60- to 108-kHz group band to 12 VF channels in its receiving section. The A6 channel bank consists of:

- 12—J68929AF (MD) or AR (MD) or J68954BG (std) channel modem units
- 1—J68929AG (MD) or AU (MD) or J68954BH (std) channel bank modem unit
- 1—J68929BC (MD) or J68954BJ (std) carrier failure alarm (CFA) unit (optional)
- 1—J68929AH (A&M) or AW (std) -12 volt regulator unit

This section provides test and adjustment procedures for initial lineup and trouble location, as required. Refer to Section 356-016-301 for A6 channel bank operating procedures and to 356-016-500 for general maintenance considerations.

This section is reissued to change the title; to change most -16 and +7 dBm test levels to -26 and -3 dBm; and to delete the crosstalk test from old Charts 6 and 8, revise it, and reinsert it as new Charts 7 and 10. Due to extensive changes, change arrows are not used. **Equipment Test Lists are not affected.**

**Note 1:** If desired, the steps in the procedures in this section can be bypassed by referring to the applicable illustrations.

**Note 2:** Where equipment specifications are given in the apparatus list for any chart, this indicates only the **minimum** requirements for the tests in that chart. Any equipment meeting these requirements can be used.

**Note 3:** In the following charts, all operations are made at the bay under test unless specified otherwise.

Prior to making the tests and adjustments in this section, ensure that:

**NOTICE**

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

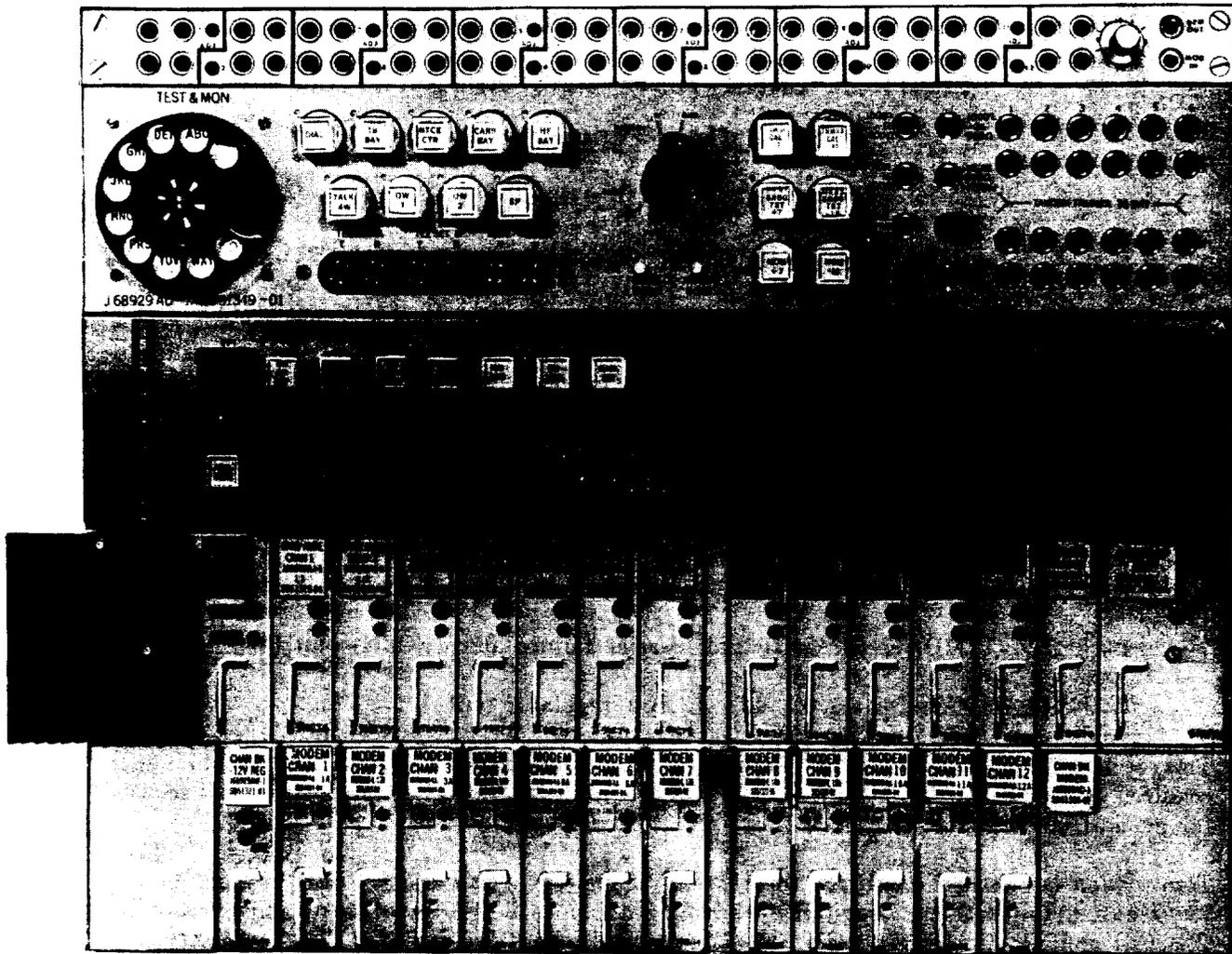


Fig. 1—A6 VF Jack Panel, VF Test Panel, Carrier Supply, and Channel Bank

- (a) All test equipment has been calibrated.
- (b) The equipment under test is out of service.
- (c) The channel bank under test is fused and equipped with the -12 volt regulator, the channel bank modem, at least one channel modem, and a CFA unit (if this option is used).

**Caution:** The channel bank under test should be equipped and fused as prescribed in Section 356-016-300.

**Note 4:** The associated A6 carrier supply should be equipped and tested as described in Section 356-016-501.

**Note 5:** If the channel bank under test is equipped for CFA, the CFA plug-in unit should be in place for **all tests, except as noted in Charts 3, 8, 9, and 10.**

The jacks and controls used in making the tests in this section are located as listed in Table A.

CHART	PAGE
1--12 Volt Regulator Test . . . . .	5
2--Transmitting Level Adjustment . . . . .	7
3--Carrier Leak Test . . . . .	11
4--Receiving Level Adjustment . . . . .	14
5--Frequency Response Test--Equal-Level Looping . . . . .	17
6--Noise Test--Equal-Level Looping . . . . .	22
7--Crosstalk Test--Equal-Level Looping . . . . .	28
8--Frequency Response Test--Unequal-Level Looping . . . . .	42
9--Noise Test--Unequal-Level Looping . . . . .	45
10--Crosstalk Test--Unequal-Level Looping . . . . .	50

**Note 1:** For initial lineup, the charts should be used in the given sequence, except that (a) Chart 4 may be omitted as noted in that chart, and (b) **either** the equal-level looping tests (Charts 5, 6, and 7) **or** the unequal-level looping tests (Charts 8, 9, and 10) should be used, **but not both. Similarly, for trouble location, applicable charts should be used in the given sequence.**

**Note 2:** Observe the following:

- (a) Use Charts 5, 6, and 7 **if spare group equipment is available.**
- (b) Use Charts 8, 9, and 10 **only if spare group equipment is not available.**

TABLE A

## JACK AND CONTROL LOCATION

DESIGNATION	LOCATION
GRD jack	J68929AH or AW — 12 volt regulator
-12V jack	J68929AH or AW — 12 volt regulator
MOD IN jack	A6 jack mounting assembly
DEM OUT jack	A6 jack mounting assembly
CH BK IN jack	LMX-2 equipment
GDF IN jack	LMX-3 equipment
CH BK OUT ALT jack	LMX-2 equipment
GDF OUT ALT jack	LMX-3 equipment
GR BK IN jack	LMX-2 and LMX-3 equipment
GR BK OUT jack	LMX-2 equipment
GR BK OUT ALT jack	LMX-3 equipment
TRMT ADJ control	A6 channel bank modem
ADJ control	A6 jack mounting assembly (J68929AF modem) or A6 channel modem (J68929AR/J68954BG modems)

## CHART 1

## -12 VOLT REGULATOR TEST

For proper operation, the output from the J68929AH or AW -12 volt regulator must be within the specified limits of -11.60 to -12.40 volts.

## APPARATUS

**Digital Voltmeter (DVM)** meeting the following minimum specifications:

Range: 0.00 to 30.00 volts dc

Resolution: .01 volt

Accuracy: .05 volt

## STEP

## PROCEDURE

- 1 Connect the DVM to the GRD and -12V jacks on the regulator under test [connections (1) and (2), Fig 2A].
- 2 Measure the voltage at the -12V jack.

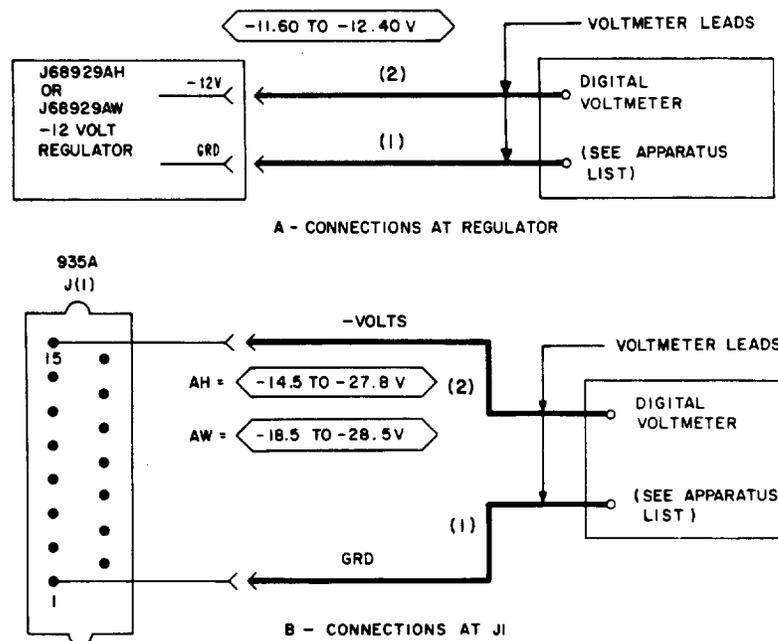


Fig. 2—Patching Diagram—-12 Volt Regulator Test

## CHART 1 (Contd)

STEP	PROCEDURE
3	<p><b>Requirement:</b> -11.60 to -12.40 volts</p> <p>If the requirement of Step 2 is <b>not</b> met,</p> <ul style="list-style-type: none"><li>(a) Remove the fuse for the regulator under test.</li><li>(b) Replace the regulator module with a spare unit.</li></ul> <p><b>Caution:</b> <i>No field adjustments can be made on the -12 volt regulator.</i></p> <ul style="list-style-type: none"><li>(c) Reinsert the fuse removed in Step 3 (a).</li><li>(d) Repeat Step 2.</li></ul>
4	<p>If the requirement of Step 2 <b>cannot</b> be met,</p> <ul style="list-style-type: none"><li>(a) Measure the voltage between pin 1 (+) and pin 15 (-) on the regulator connector J1 (Fig. 2B).</li></ul> <p><b>Requirement:</b> -14.5 to -27.8 volts <i>for J68929AH regulators</i> -18.5 to -28.5 volts <i>for J68929AW regulators</i></p> <p><b>Note:</b> Incorrect voltage may be an indication of trouble in the dropping resistor circuit in the J68929( ) fuse panel (SD-51323-01) when the J68929AH regulator is used—or in the wiring between the fuse panel and the regulator when the J68929AW regulator is used.</p> <ul style="list-style-type: none"><li>(b) Correct the indicated trouble, then repeat Step 2.</li></ul>
5	Remove connections (2) and (1), Fig. 2A.
6	Repeat applicable Steps 1 through 5 for all other J68929AH or AW regulators to be tested.

## CHART 2

## TRANSMITTING LEVEL ADJUSTMENT

For proper operation, the channel bank output power must be set to the standard transmission level. Using a 1-kHz VF test tone (-26 dBm) at the MOD IN jack of Channel 6, adjust the TRMT ADJ control on the channel bank modem to obtain the required output (-52.0 dBm) at the CH BK OUT ALT (LMX-2) or GDF OUT ALT (LMX-3) jack. Verify that the other 11 channels are within the specified limits (-51.3 to -52.7 dBm).

**Note:** In a partially equipped system, this adjustment is made in the channel nearest to Channel 6, if Channel 6 is not equipped.

## APPARATUS

***Sending Test Equipment (STE):***

***Milliwatt Distributing System*** (via the -26, 1000 $\Omega$ , 600 $\Omega$  jack on the J68929AD A6 VF test, monitor, and talk panel)

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

Frequency: 63 to 107 kHz

Power: -52 dBm

Impedance: 135 ohms balanced

***3P7A Cord*** (for 600-ohm patches)

***3P20B Cord*** (for 135-ohm patches)

STEP	PROCEDURE
1	Adjust the RTE as follows:  Impedance: 135 ohms balanced  Frequency: 87 kHz (Channel 6, Table B) or the test frequency listed in Table B for the channel nearest to Channel 6 in a partially equipped system.  Power: -52.0 dBm
2	Adjust the STE as follows:  Impedance: 600 ohms balanced

## CHART 2 (Contd)

## STEP

## PROCEDURE

Frequency: 1000 Hz

Power: -26 dBm

TABLE B

TEST FREQUENCIES AT CH BK OUT ALT OR GDF OUT ALT JACK WITH 1-KHZ INPUT

CHAN NO.	1	2	3	4	5	6	7	8	9	10	11	12
TEST FREQ (kHz)	107	103	99	95	91	87	83	79	75	71	67	63

- 3 Connect the STE to the MOD IN jack for the channel selected in Step 1 [patch (1), Fig. 3].
- 4 At the LMX equipment, connect the RTE to the CH BK OUT ALT (LMX-2) or GDF OUT ALT (LMX-3) jack [patch (2), Fig. 3].
- 5 Adjust the TRMT ADJ control (on the channel bank modem unit) to obtain a signal power of -52.0 dBm at the CH BK OUT ALT or GDF OUT ALT jack.  
  
*Note:* The TRMT ADJ control is a 25-turn potentiometer that should produce a change of at least 9 dB when varied from maximum counterclockwise to maximum clockwise.
- 6 If the adjustment of Step 5 *cannot* be made,
  - (a) Replace the channel modem under test with a spare unit.
  - (b) Repeat Step 5.
- 7 If the adjustment of Step 5 *still cannot* be made,
  - (a) Reinsert the channel modem removed in Step 6(a).
  - (b) Replace the channel bank modem with a spare unit.
  - (c) Repeat Step 5.
- 8 Remove patch (1), Fig. 3.
- 9 Readjust the RTE to the test frequency (Table B) for the next channel to be tested.

## CHART 2 (Contd)

STEP

PROCEDURE

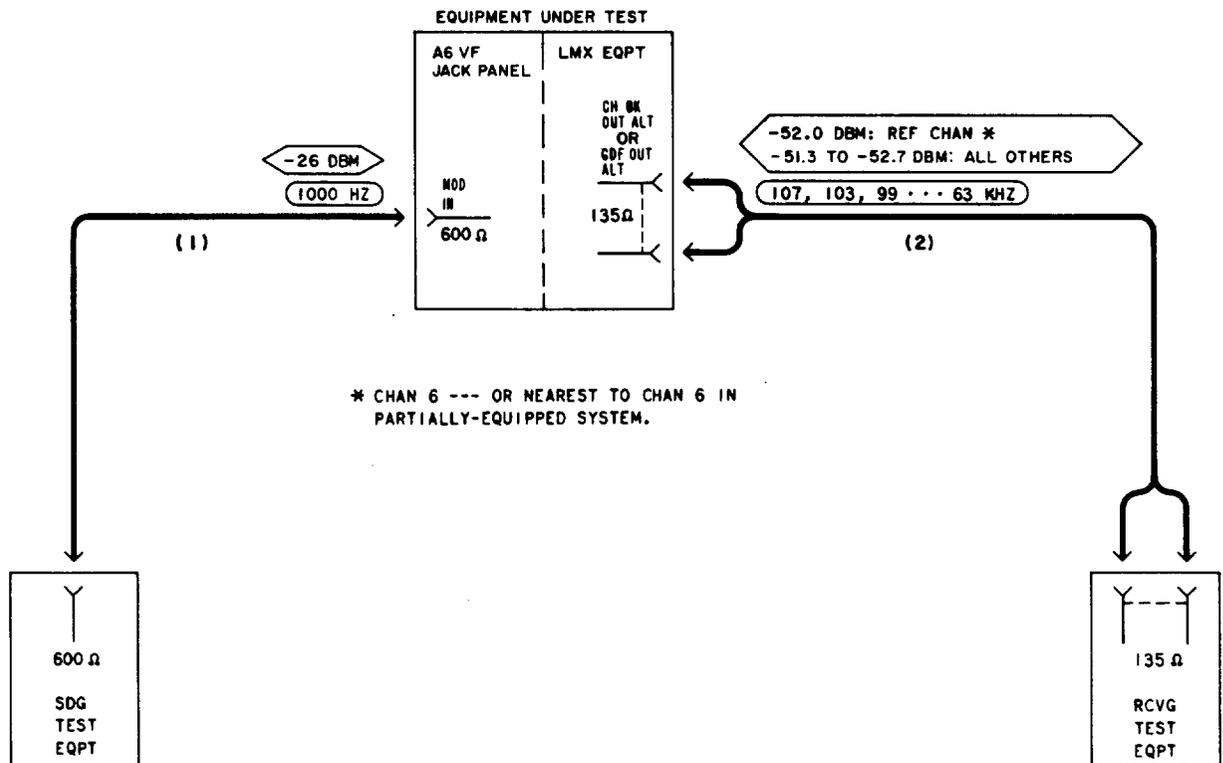


Fig. 3—Patching Diagram—Transmitting Level Adjustment

- 10 Connect the STE to the MOD IN jack for the channel selected in Step 9 [patch (1), Fig. 3].
- 11 Measure the signal power at the CH BK OUT ALT or GDF OUT ALT jack.  
**Requirement:** -51.3 to -52.7 dBm
- 12 If the requirement of Step 11 is *not* met,
  - (a) Replace the channel modem under test with a spare unit.
  - (b) Repeat Step 11.
- 13 Remove patch (1), Fig. 3.

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CHART 2 (Contd)

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STEP	PROCEDURE
14	Repeat applicable Steps 9 through 13 for all other channels in the bank under test.
15	At the LMX equipment, remove patch (2), Fig. 3.
16	Repeat applicable Steps 1 through 15 for all other channel banks to be tested.

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**CHART 3**
**CARRIER LEAK TEST**


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For proper operation, carrier leak for the 12 channels of the A6 bank must be kept at a low value (less than -75 dBm) to avoid interference with the group and supergroup pilots and the message information.

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

Frequency: 64 to 108 kHz

Power: -75 to -85 dBm

Impedance: 75 ohms unbalanced and 135 ohms balanced

**J68858AT (58AT) Pilot Filter Set**

**3P20B Cord** (for 135-ohm patches)

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

**262B Plug** (600-ohm termination)

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**STEP**
**PROCEDURE**


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- 1 Adjust the RTE as follows:
  - Impedance: Channels 1, 3, 4, ... 12: 135 ohms balanced
  - Channel 2: 75 ohms unbalanced
  - Frequency: 108 kHz (Channel 1, Table C)
  - Power: -75 dBm
- 2 Insert a 262B plug (600-ohm termination) in the MOD IN jack for the channel under test (Fig. 4).
- 3 At the LMX equipment, connect the RTE to the CH BK OUT ALT (LMX-2) or GDF OUT ALT (LMX-3) jack [patch (1), Fig. 4].
- 4 Measure the signal power at the CH BK OUT ALT or GDF OUT ALT jack.

CHART 3 (Contd)

TABLE C

CHANNEL CARRIER FREQUENCIES

CHAN NO.	1	2	3	4	5	6	7	8	9	10	11	12
TEST FREQ (kHz)	108	104	100	96	92	88	84	80	76	72	68	64

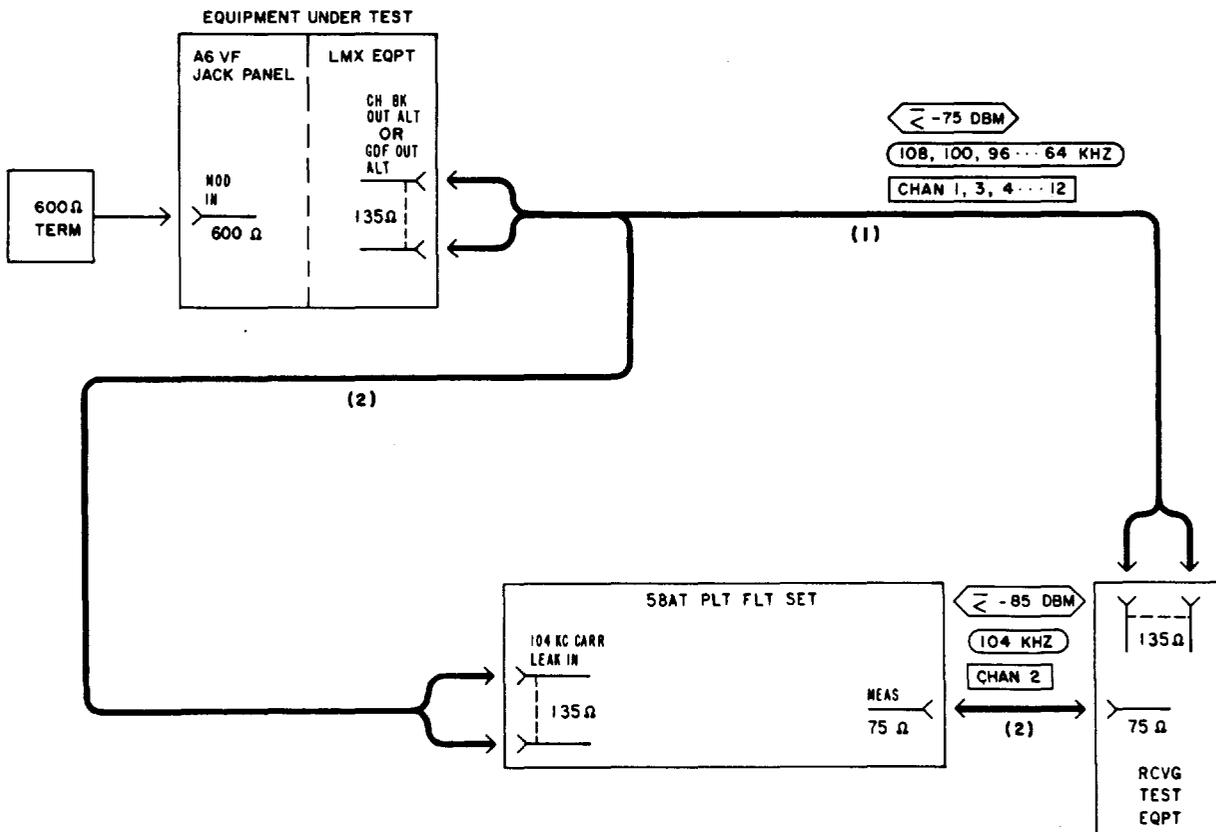


Fig. 4—Patching Diagram—Carrier Leak Test

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**CHART 3 (Contd)**


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<b>STEP</b>	<b>PROCEDURE</b>
	<p><b>Requirement:</b> Channels 1, 3, 4, ... 12: -75 dBm or less (-76 dBm is less than -75 dBm) Channel 2: -85 dBm or less (includes 10-dBm loss in 58AT pilot filter set)</p> <p><b>Note:</b> If the channel bank is equipped for CFA,</p> <p>(a) <i>Remove the CFA unit while making the Channel 3 carrier leak test.</i></p> <p>(b) <i>Reinsert the CFA unit after the Channel 3 carrier leak test is completed.</i></p>
5	<p>If the requirement of Step 4 is <i>not</i> met,</p> <p>(a) Replace the channel modem with a spare unit.</p> <p>(b) Repeat applicable steps in Chart 2 for the channel under test.</p> <p>(c) Repeat applicable Steps 1 through 4.</p>
6	Remove the terminating plug inserted in Step 2.
7	Repeat applicable Steps 1 through 6 for Channels 3 to 12 of the channel bank under test.
8	At the LMX equipment, remove patch (1), Fig. 4.
9	At the LMX equipment, connect the RTE, via the 104 KC CARR LEAK IN/MEAS jacks on the 58AT pilot filter set, to the CH BK OUT ALT or GDF OUT ALT jack [patch (2), Fig. 4].
	<p><b>Note:</b> If desired, the correct frequency range can be located via the 104.08 KC PIL IN/MEAS jacks on the 58AT pilot filter set. The measurement is made via the 104 KC CARR LEAK IN/MEAS jacks.</p>
10	Repeat applicable Steps 1 through 6 for Channel 2 of the channel bank under test.
11	At the LMX equipment, remove patch (2), Fig. 4.
12	Repeat applicable Steps 1 through 11 for all other channel banks to be tested.

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## CHART 4

## RECEIVING LEVEL ADJUSTMENT

For proper operation, the outputs from the 12 VF channels of the A6 bank must be of equal level (-3.0 dBm). The gain ADJ controls [(a) on the VF jack panel when the J68929AF channel modems are used, or (b) on the channel modems when the J68929AR or J68954BG channel modems are used] are adjusted to obtain the required output.

**Note:** This chart may be omitted if Charts 5 and 6 or 8 and 9 are to be used at this time.

## APPARATUS

**Sending Test Equipment (STE)** (Section 356-010-500):

Frequency: 63 to 107 kHz

Power: -14 or -15 dBm

Impedance: 135 ohms balanced

**Receiving Test Equipment (RTE):**

**Transmission and Noise Measuring System** (via the MEAS 600Ω TERM jack on the J68929AD A6 VF test, monitor, and talk panel)

**3P7A Cord** (for 600-ohm patches)

**3P20B Cord** (for 135-ohm patches)

STEP	PROCEDURE
1	Adjust the RTE for a measurement of -3 dBm.
2	Adjust the STE as follows: Impedance: 135 ohms balanced Frequency: 107 kHz (Channel 1, Table D) Power: -15.0 dBm (LMX-2) -14.0 dBm (LMX-3)
3	At the LMX equipment, connect the STE to the CH BK IN (LMX-2) or GDF IN (LMX-3) jack [patch (1), Fig. 5].

CHART 4 (Contd)

TABLE D

TEST FREQUENCIES AT CH BK IN OR GDF IN JACK FOR 1-KHZ OUTPUT

CHAN NO.	1	2	3	4	5	6	7	8	9	10	11	12
TEST FREQ (kHz)	107	103	99	95	91	87	83	79	75	71	67	63

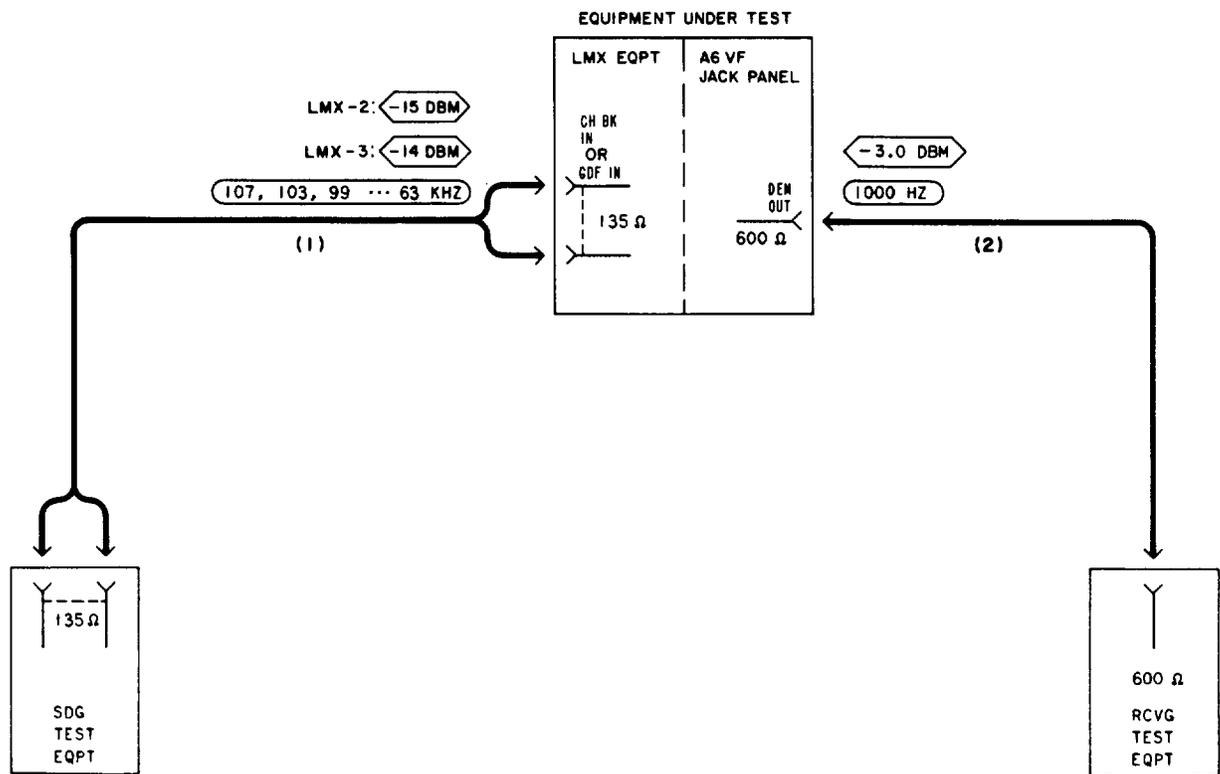


Fig. 5—Patching Diagram—Receiving Level Adjustment

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**CHART 4 (Contd)**

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<b>STEP</b>	<b>PROCEDURE</b>
4	Connect the RTE to the DEM OUT jack for the channel under test [patch (2), Fig. 5].
5	Carefully adjust the corresponding channel gain ADJ control (on the VF jack panel or channel modem, as applicable) to obtain a signal power of -3.0 dBm at the DEM OUT jack.  <b>Note:</b> The ADJ control should produce a change of at least 12 dB when varied from maximum counterclockwise to maximum clockwise.
6	If the adjustment of Step 5 <b>cannot</b> be made,  (a) Replace the channel modem with a spare unit.  (b) Repeat Step 5.  (c) If the adjustment <b>can</b> now be made, repeat applicable steps in Charts 2 and 3.
7	If the adjustment of Step 5 <b>still cannot</b> be made,  (a) Reinsert the channel modem removed in Step 6(a).  (b) Replace the channel bank modem with a spare unit.  (c) Repeat Step 5.  (d) If the adjustment <b>can</b> now be made, repeat applicable steps in Chart 2.
8	Remove patch (2), Fig. 5.
9	Repeat applicable Steps 2 through 8 for Channels 2 to 12 of the channel bank under test.
10	At the LMX equipment, remove patch (1), Fig. 5.
11	Repeat applicable Steps 1 through 10 for all other channel banks to be tested.

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## CHART 5

## FREQUENCY RESPONSE TEST—EQUAL-LEVEL LOOPING

The frequency response of each channel in the A6 channel bank must be such that when the output at 1000 Hz is -3.0 dBm, the output at 200 Hz is within the range of -2.5 to -6.0 dBm.

**Note:** Use this chart *if spare group equipment is available*. If *not*, use Chart 8.

## APPARATUS

**Sending Test Equipment (STE):**

Frequency: 200 and 1000 Hz  
 Power: -26 dBm  
 Impedance: 600 ohms balanced

**Receiving Test Equipment (RTE):**

**Transmission and Noise Measuring System** (via the MEAS 600Ω TERM jack on the J68929AD A6 VF test, monitor, and talk panel)

**3P7A Cords** (for 600-ohm patches)

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

**368A Plug** (75-ohm termination) if spare hybrid coil is used for looping

**Spare Hybrid Coil, 3-dB T Pad** (75-ohm impedance), or **Spare Group Transmitting Trunk** (LMX-2)

or

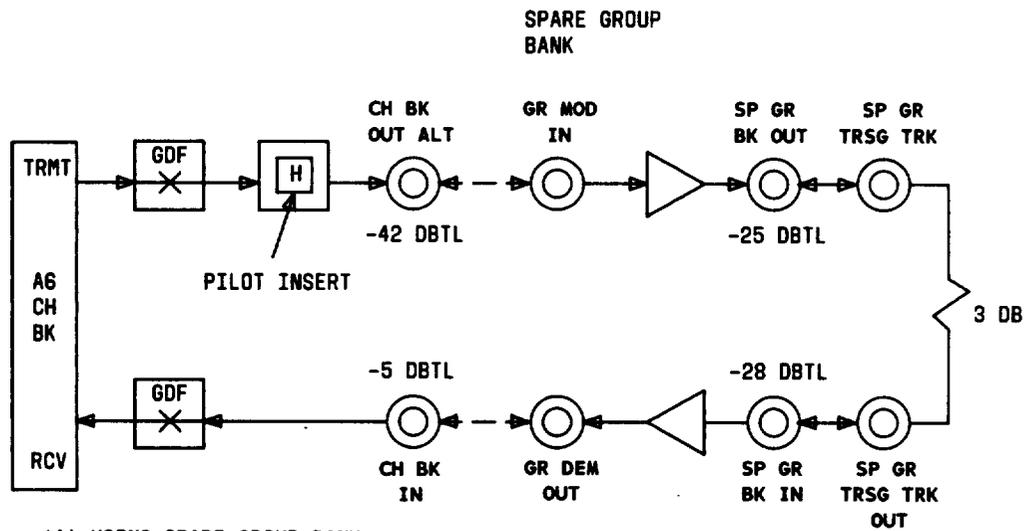
**ED-52536-20 MTCE Group Bank Pad** (LMX-3)

STEP	PROCEDURE
1	Adjust the RTE for a measurement of -3 dBm.

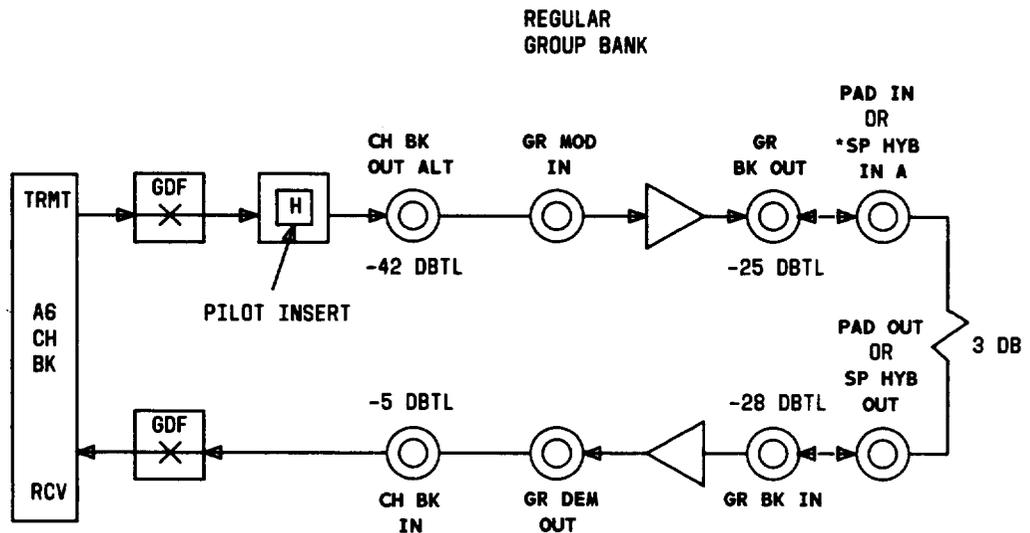
## CHART 5 (Contd)

STEP	PROCEDURE
2	Adjust the STE as follows: Impedance: 600 ohms balanced Frequency: 1000 Hz Power: -26.0 dBm
3	At LMX-2 equipment, make looping connections as shown in Fig. 6(a) or 6(b), as applicable.
4	At LMX-3 equipment, make looping connections as shown in Fig. 7.
5	Connect the STE to the MOD IN jack for Channel 1 of the channel bank under test [patch (1), Fig. 8].
6	Connect the RTE to the DEM OUT jack for the channel under test [patch (2), Fig. 8].
7	Observe that the signal power at the DEM OUT jack is -3.0 dBm.  <b>Note:</b> If the requirement is <i>not</i> met, check the looping connections at the LMX bay. Then, if necessary, adjust the corresponding channel gain ADJ control (on the VF jack panel or channel modem, as applicable) to obtain -3.0 dBm.
8	Set the STE frequency to 200 Hz.
9	Measure and record the signal power at the DEM OUT jack.  <b>Requirement:</b> -2.5 to -6.0 dBm
10	If the requirement of Step 9 is <i>not</i> met, (a) Replace the channel modem under test with a spare unit. (b) Repeat applicable steps in Charts 2 and 3 for the channel under test. (c) Repeat applicable Steps 1 through 9.
11	Remove patches (1) and (2), Fig. 8.
12	Repeat applicable Steps 2 through 11 for Channels 2 to 12 of the channel bank under test.
13	At the LMX equipment, remove looping connections made in Step 3 or 4.
14	Repeat applicable Steps 1 through 13 for all other channel banks to be tested.

CHART 5 (Contd)



(A) USING SPARE GROUP BANK



(B) USING SPARE HYBRID OR 3-DB PAD

\* TERMINATE SP HYB IN B JACK INTO 75 OHMS

Fig. 6—Typical Channel Bank Equal-Level Looping Arrangements—LMX-2

CHART 5 (Contd)

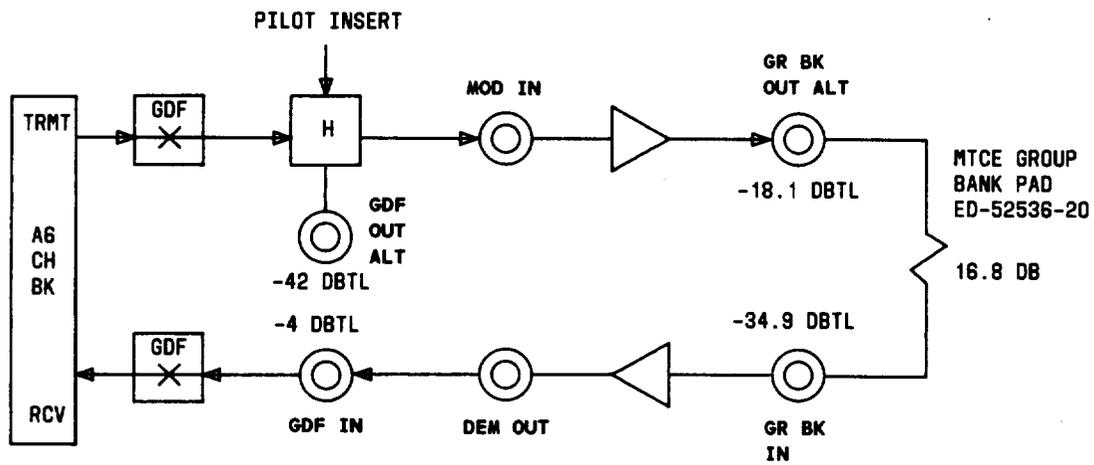


Fig. 7—Typical Channel Bank Equal-Level Looping Arrangement—LMX-3

CHART 5 (Contd)

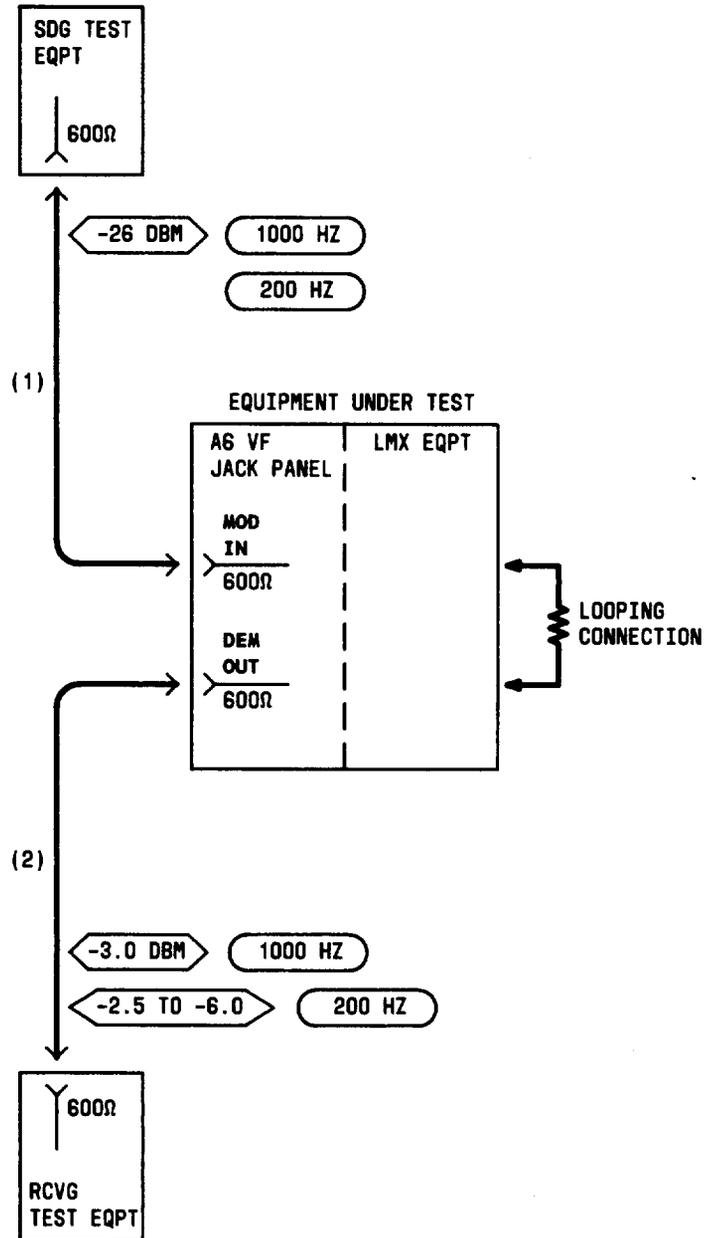


Fig. 8—Patching Diagram—Frequency Response Test—Equal-Level Looping

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CHART 6

NOISE TEST—EQUAL-LEVEL LOOPING

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For proper channel bank operation, the noise level in each channel of the A6 bank must not exceed the limit beyond which it interferes with normal speech.

*Note:* Use this chart *if spare group equipment is available.* If *not*, use Chart 9.

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**APPARATUS**

***Sending Test Equipment (STE):***

Frequency: 100 Hz

Power: -26 dBm

Impedance: 600 ohms balanced

*Note:* The 1000-Hz test tone can be obtained from the Milliwatt Distribution System (via the -26, 1000 $\Omega$ , 600 $\Omega$  jack on the J68929AD A6 VF test, monitor, and talk panel).

***Receiving Test Equipment (RTE):***

***Transmission and Noise Measuring System*** (via the MEAS 600 $\Omega$  TERM jack on the J68929AD A6 VF test, monitor, and talk panel)

***Noise Measuring Set (NMS):***

Range: 29 to 63 dBm

Weighting: C Message and 3 kHz flat

Impedance: 600 ohms balanced

Type: 3A or 3B, or equivalent

***3P7A Cords*** (for 600-ohm patches)

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

***262B Plug*** (600-ohm termination)

***368A Plug*** (75-ohm termination) if spare hybrid coil is used for looping

***Spare Hybrid Coil, 3-dB T Pad*** (75-ohm impedance), or ***Spare Group Transmitting Trunk*** (LMX-2)

or

## CHART 6 (Contd)

## APPARATUS(Cont)

*ED-52536-20 MTCE Group Bank Pad (LMX-3)*

## STEP

## PROCEDURE

**Note 1:** The gain of the transmitting and receiving group equipment should be adjusted as prescribed in applicable sections of the 356 Division.

**Note 2:** The STE and RTE should be calibrated as a test group prior to use at each test frequency.

**Note 3:** If the channel bank under test is equipped with the CFA unit, **be sure** that the RCV FAIL lamp on the CFA unit is extinguished.

**Preparation**

- 1 Adjust the RTE for a measurement of -3 dBm.
- 2 Adjust the STE as follows:
  - Impedance: 600 ohms balanced
  - Frequency: 1000 Hz
  - Power: -26.0 dBm
- 3 At LMX-2 equipment, make looping connections as shown in Fig. 6(a) or 6(b), as applicable.
- 4 At LMX-3 equipment, make looping connections as shown in Fig. 7.
- 5 Connect the STE to the MOD IN jack for Channel 1 of the channel bank under test [patch (1), Fig. 9].
- 6 Connect the RTE to the DEM OUT jack for the channel under test [patch (2), Fig. 9].
- 7 Observe that the signal power at the DEM OUT jack is -3.0 dBm.

**Note:** If the requirement is *not* met, check the looping connections at the LMX bay. Then, if necessary, adjust the corresponding channel gain ADJ control (on the VF jack panel or channel modem, as applicable) to obtain -3.0 dBm.
- 8 Remove patches (1) and (2), Fig. 9.
- 9 Repeat Steps 5 through 8 for Channels 2 to 12 of the channel bank under test.

CHART 6 (Contd)

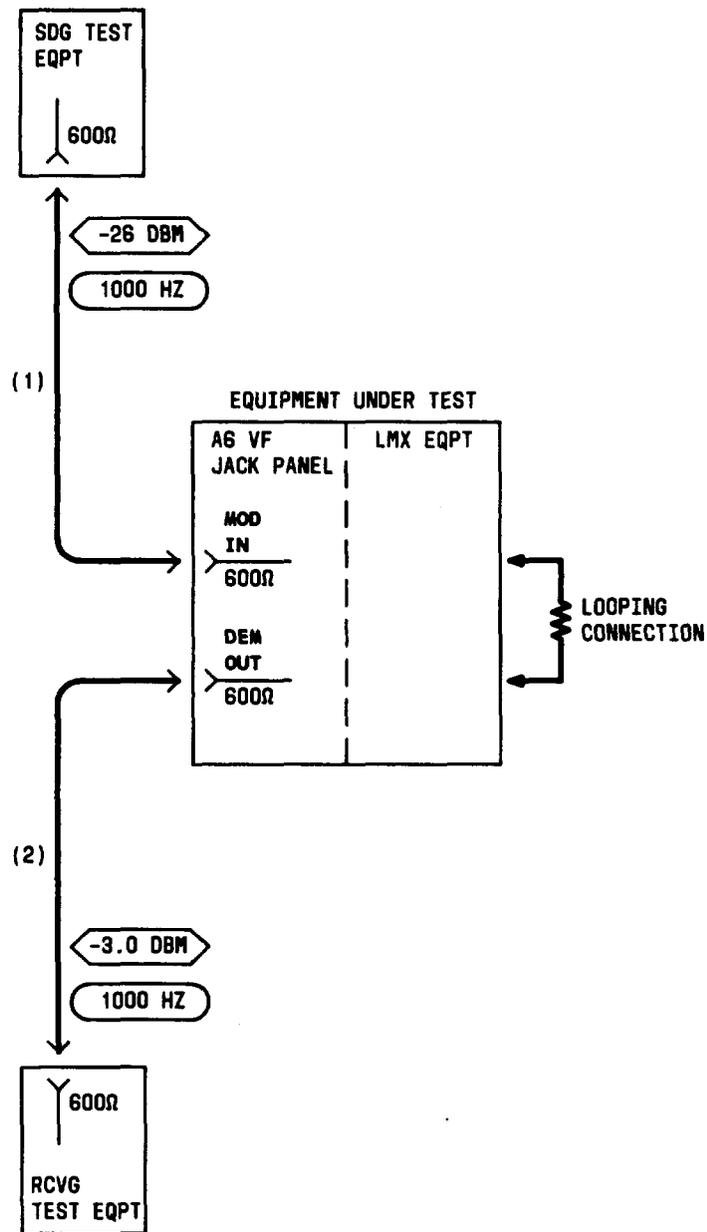


Fig. 9—Patching Diagram—Preparation—Equal-Level Looping

## CHART 6 (Contd)

STEP	PROCEDURE
	<b>Noise</b>
10	Adjust the NMS as follows: Range: Minimum sensitivity (85 dBrn on the 3A NMS) Weighting: C Message Impedance: 600 ohms balanced Damping: DAMP
11	Insert a 262B plug (600-ohm termination) in the MOD IN jack for Channel 1 of the channel bank under test (Fig. 10).
12	Connect the NMS to the DEM OUT jack for the channel under test [patch (1), Fig. 10].
13	Measure the noise at the DEM OUT jack.
	<b>Requirement: If not equipped with 2-Way CFA,</b> Channel 1: 38 dBrnc or less (37 dBrnc is less than 38) Channels 2 to 12: 29 dBrnc or less (28 dBrnc is less than 29) <b>If equipped with 2-way CEA.</b> Channels 1 and 2: 38 dBrnc or less (37 dBrnc is less than 38) Channels 3 to 12: 29 dBrnc or less (28 dBrnc in less than 29)
14	Set the NMS range switch to minimum sensitivity.
15	Set the NMS weighting to 3 kHz flat.
16	Measure the noise at the DEM OUT jack.
	<b>Requirement: If not equipped with 2-Way CFA,</b> Channel 1: 57 dBrn or less (56 dBrn is less than 57) Channel 2: 63 dBrn or less (62 dBrn is less than 63) Channels 3 to 12: 45 dBrn or less (44 dBrn is less than 45) <b>If equipped with 2-Way CFA,</b> Channel 1: 57 dBrn or less (56 dBrn is less than 57) Channels 2 and 3: 63 dBrn or less (62 dBrn is less than 63) Channels 4 to 12: 45 dBrn or less (44 dBrn is less than 45)
17	If the requirements of Steps 13 and 16 are <i>not</i> met, (a) Replace the channel modem under test with a spare unit. (b) Repeat applicable steps in Charts 2, 3, and 5 for the channel under test.

## CHART 6 (Contd)

STEP

PROCEDURE

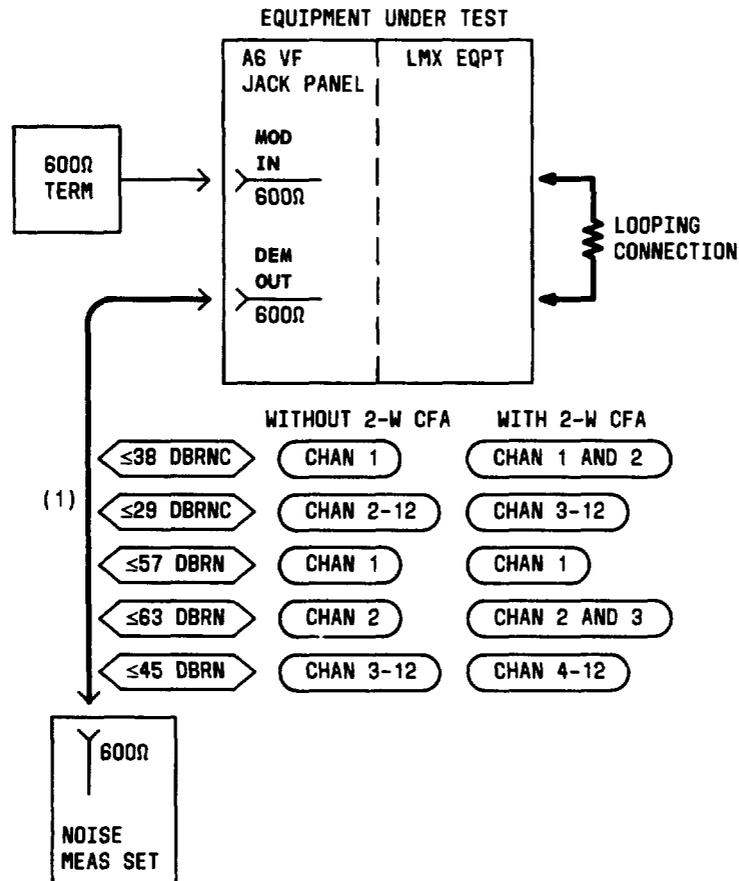


Fig. 10—Patching Diagram—Noise Test—Equal-Level Looping

(c) Repeat applicable Steps 1 through 16.

18 If the requirements of Steps 13 and 16 **cannot** be met,

(a) Reinsert the channel modem replaced in Step 17(a).

(b) Replace the channel bank modem under test with a spare unit.

(c) Repeat applicable steps in Chart 2 for Channels 1 to 12.

(d) Repeat applicable Steps 1 through 16.

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**CHART 6 (Contd)**

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<b>STEP</b>	<b>PROCEDURE</b>
19	If the requirements of Steps 13 and 16 <i>still cannot</i> be met, (a) Reinsert the channel bank modem replaced in Step 18(a). (b) Check the LMX equipment and make necessary repairs. (c) Repeat applicable Steps 1 through 16.
20	Set the NMS range switch to minimum sensitivity.
21	Remove patch (1), Fig. 10.
22	Remove the 262B plug inserted in Step 11.
23	Repeat applicable Steps 10 through 22 for Channels 2 to 12 of the channel bank under test.
24	At the LMX equipment, remove looping connections made in Step 3 or 4.
25	Repeat applicable Steps 1 through 24 for all other channel banks to be tested.

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CHART 7

CROSSTALK TEST—EQUAL-LEVEL LOOPING

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For proper channel bank operation, the crosstalk in each channel of the A6 bank must not exceed the limit beyond which it interferes with normal speech. This test is performed via two cross-looped (frogged) channel banks, with test tone applied to one VF channel and measured in both adjacent channels.

*Note:* Use this chart *if spare group equipment is available*. If *not*, use Chart 10.

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**APPARATUS**

***Sending Test Equipment (STE):***

Frequency: 1000, 3000, and 5000 Hz

Power: -16 and -26 dBm

Impedance: 600 ohms balanced

*Note:* The 1000-Hz test tone can be obtained from the Milliwatt Distribution System (via the -26, 1000 $\Omega$ , 600 $\Omega$  jack on the J68929AD A6 VF test, monitor, and talk panel).

***Receiving Test Equipment (RTE):***

***Transmission and Noise Measuring System*** (via the MEAS 600 $\Omega$  TERM jack on the J68929AD A6 VF test, monitor, and talk panel)

***Noise Measuring Set (NMS):***

Range: 38 to 45 dBrn

Weighting: C Message

Impedance: 600 ohms balanced

Type: 3A, 3B, or equivalent

***3P7A Cords*** (for 600-ohm patches)

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

***368A Plug*** (75-ohm termination) if spare hybrid coil is used for looping

***Spare Hybrid Coil, 3-dB T Pad*** (75-ohm impedance), or ***Spare Group Transmitting Trunk*** (LMX-2)

or

## CHART 7 (Contd)

## APPARATUS(Cont)

*ED-52536-20 MTCE Group Bank Pad (LMX-3).*

STEP	PROCEDURE
	<p><b>Note 1:</b> See Fig. 11 and ensure that all required looping and test connections are understood before proceeding with this test.</p> <p><b>Note 2:</b> The transmitting channel (in <i>looped</i> bank) is designated B<sub>T</sub> and is the <i>disturbing</i> channel in which tone is sent. Adjacent receiving channels (in <i>looping</i> bank) are designated A<sub>R</sub> and C<sub>R</sub> and are the <i>disturbed</i> channels in which crosstalk is measured.</p> <p><b>Note 3:</b> The gain of the transmitting and receiving group equipment should be adjusted as prescribed in applicable sections of the 356 Division.</p> <p><b>Note 4:</b> The STE and RTE should be calibrated as a test group prior to use at each test frequency.</p> <p><b>Note 5:</b> If the channel bank under test is equipped with the CFA unit, <b>be sure</b> that the RCV FAIL lamp on the CFA unit is extinguished.</p> <p><b>Preparation</b></p> <p>1 Adjust the RTE for a measurement of -3 dBm.</p> <p>2 Adjust the STE as follows:</p> <p style="padding-left: 40px;">Impedance: 600 ohms balanced</p> <p style="padding-left: 40px;">Frequency: 1000 Hz</p> <p style="padding-left: 40px;">Power: -26.0 dBm</p> <p>3 At LMX-2 equipment, make looping connections as shown in Fig. 12(a) or 12(b), as applicable.</p> <p>4 At LMX-3 equipment, make looping connections as shown in Fig. 13.</p> <p>5 Connect the STE to the MOD IN jack for Channel 1 of the <i>looped</i> channel bank under test [Test A, Table E and patch (1), Fig. 14].</p> <p>6 Connect the RTE to the DEM OUT jack for the <i>looping</i> bank for the channel under test [Test A, Table E and patch (2), Fig. 14].</p> <p>7 Observe that the signal power at the DEM OUT jack is -2.8 to -3.2 dBm.</p>

CHART 7 (Contd)

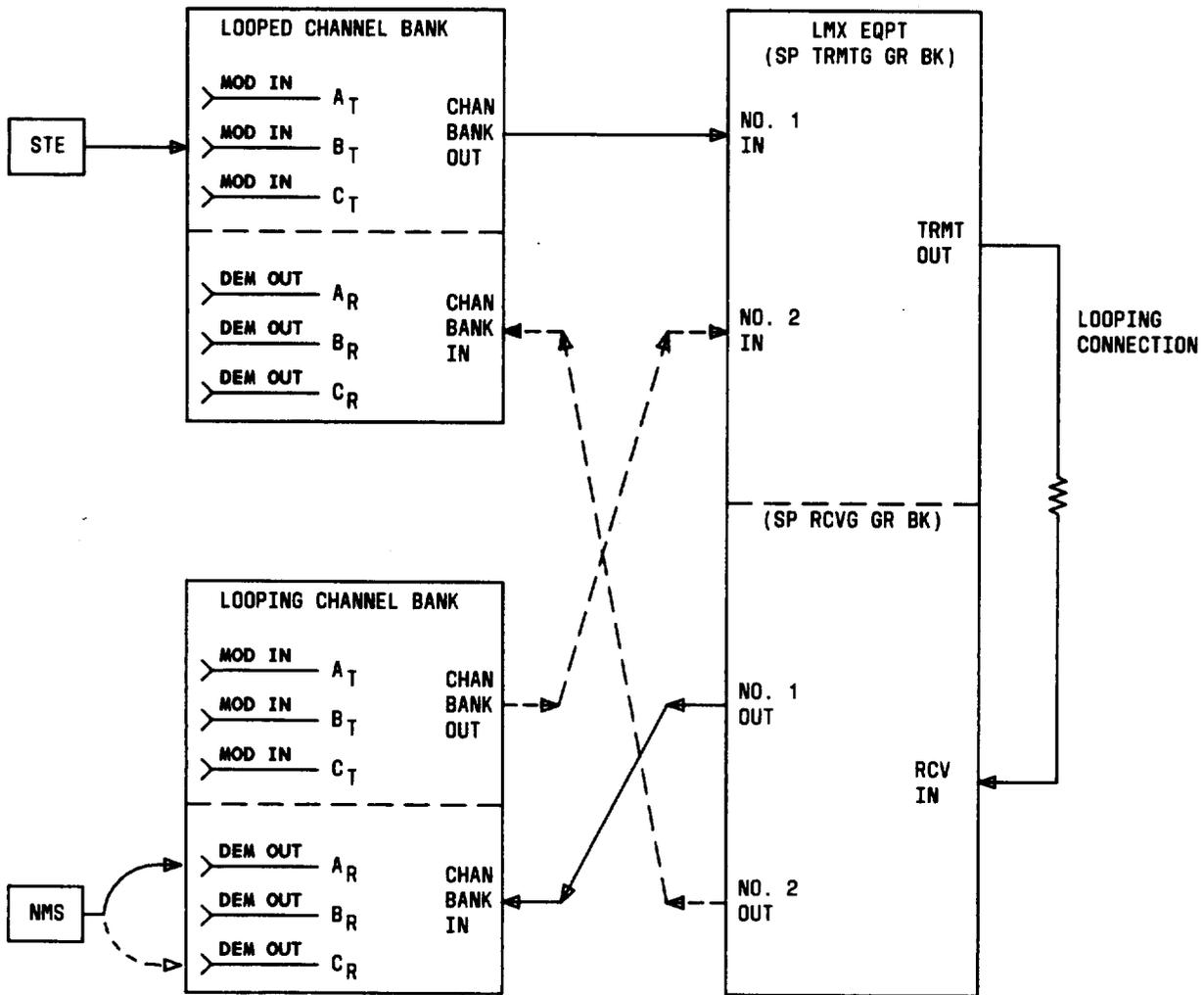
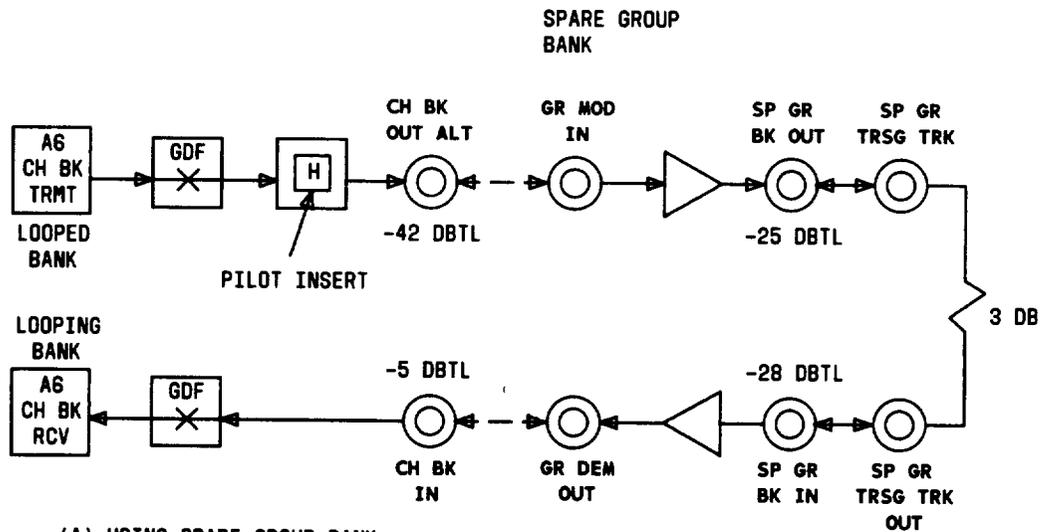
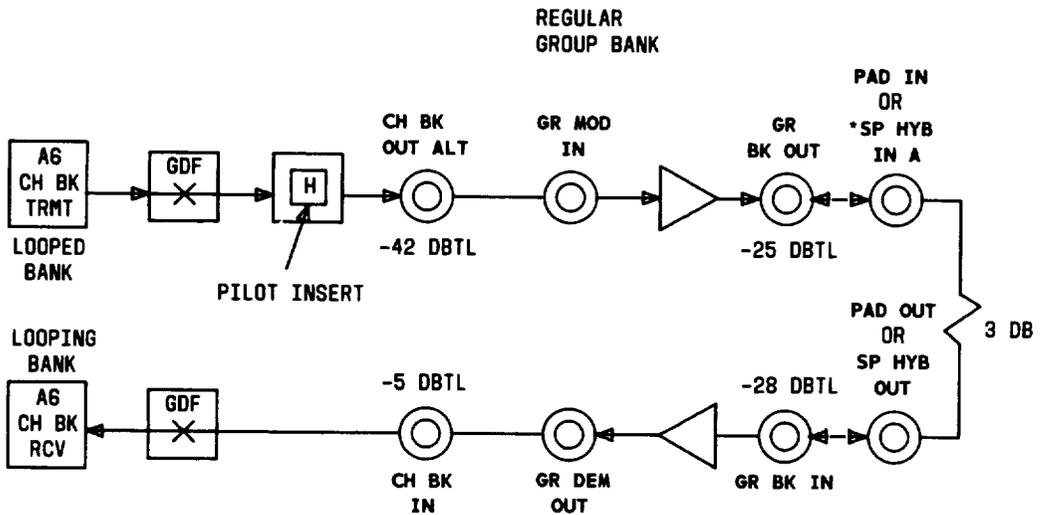


Fig. 11—Channel Bank Under Test Cross-Looped (Frogged) Via Another Bank (Looping Bank)—Typical Connections for Equal-Level Looping

CHART 7 (Contd)



(A) USING SPARE GROUP BANK



(B) USING SPARE HYBRID OR 3-DB PAD

\* TERMINATE SP HYB IN B JACK INTO 75 OHMS

Fig. 12—Typical Channel Bank Equal-Level Cross-Looping Arrangements—LMX-2

## CHART 7 (Contd)

STEP

PROCEDURE

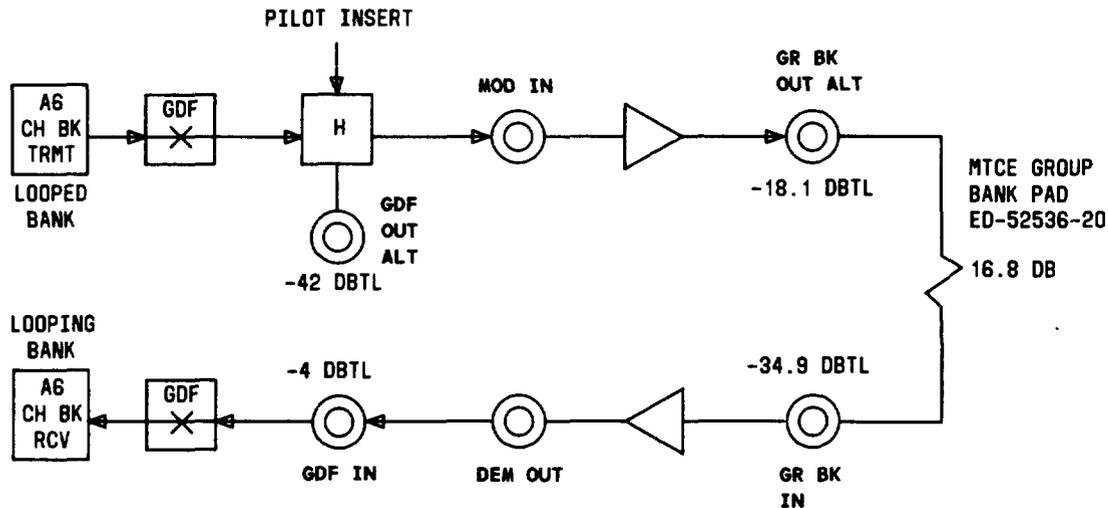


Fig. 13—Typical Channel Bank Equal-Level Cross-Looping Arrangement—LMX-3

**Note:** If the requirement is *not* met, check the looping connections at the LMX bay. Then, if necessary, adjust the corresponding channel gain ADJ control (on the VF jack panel or channel modem, as applicable) to obtain -3.0 dBm.

- 8 Remove patches (1) and (2), Fig. 14.
- 9 Repeat Steps 5 through 8 for Channels 2 to 12 (Tests B through L listed in Table E) of the **looped** channel bank under test.

**Crosstalk**

- 10 Adjust the STE as follows:
  - Impedance: 600 ohms balanced
  - Frequency: 3000 Hz
  - Power: -16 dBm
- 11 Adjust the NMS as follows:
  - Range: Minimum sensitivity (85 dBm on the 3A NMS)

## CHART 7 (Contd)

STEP	PROCEDURE
------	-----------

Weighting: C Message

Impedance: 600 ohms balanced

Damping: DAMP

TABLE E

CROSSTALK TEST CONNECTIONS  
CHANNEL GAIN VERIFICATION (1000 HZ)

TEST	TRANSMIT CHANNEL (LOOPED BANK)	RECEIVE CHANNEL (LOOPING BANK)
	CONNECT STE TO MOD IN JACK OF CHANNEL	CONNECT RTE TO DEM OUT JACK OF CHANNEL
A	1	1
B	2	2
C	3	3
D	4	4
E	5	5
F	6	6
G	7	7
H	8	8
I	9	9
J	10	10
K	11	11
L	12	12

- 12 Connect the STE to the MOD IN jack for Test A in *looped*-bank Channel Br [Table F and patch (1), Fig. 15].
- 13 Connect the NMS to the DEM OUT jack for Test A in *looping*-bank Channel Ar, [(Table F and patch (2), Fig. 15].
- 14 Measure the noise at the DEM OUT jack.  
**Requirement:** 38 dBrnc or less (37 dBrnc is less than 38)
- 15 If the requirement of Step 14 is *not* met,

CHART 7 (Contd)

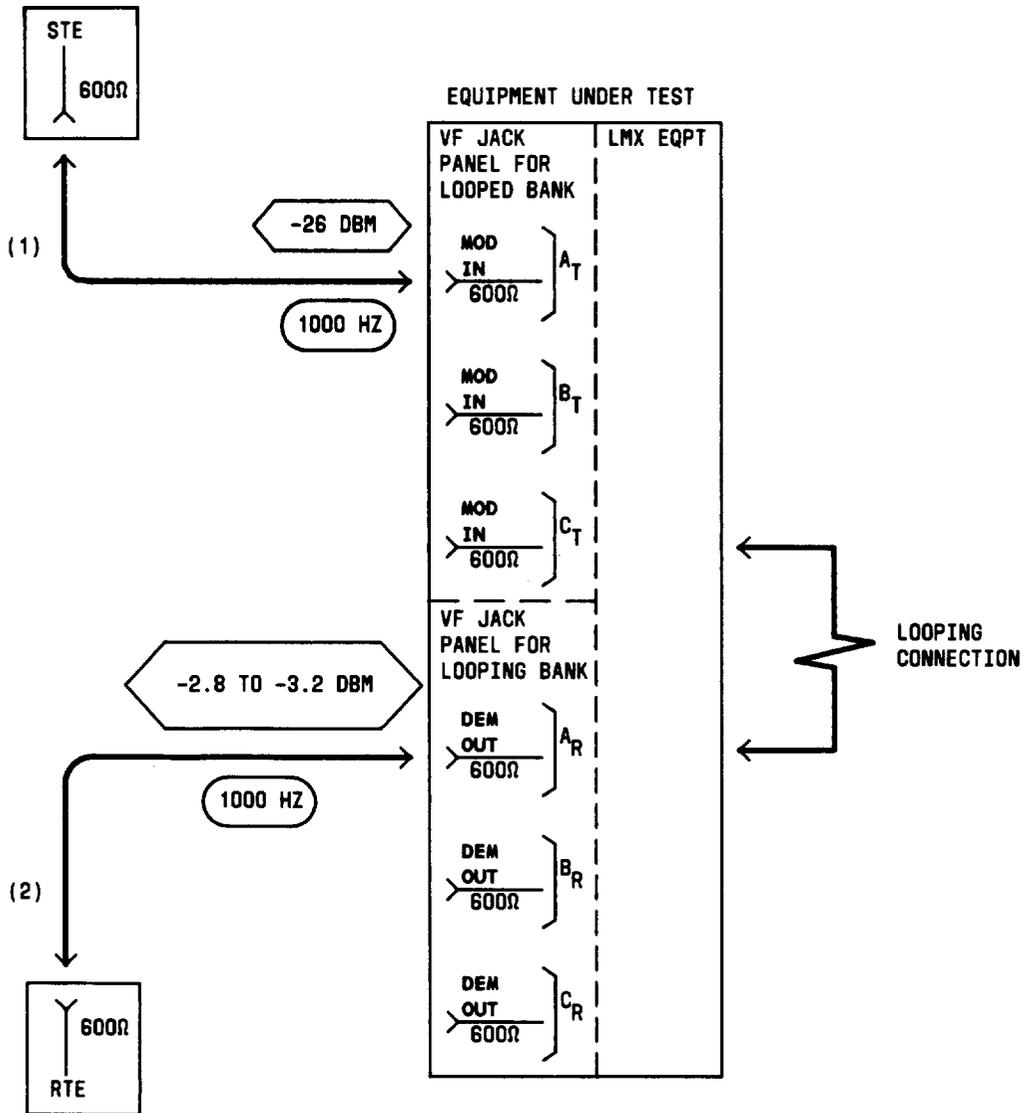


Fig. 14—Patching Diagram—Crosstalk Test—Equal-Level Looping—Channel Gain Verification (1000 Hz)

## CHART 7 (Contd)

STEP	PROCEDURE
------	-----------

TABLE F

**CROSSTALK TEST CONNECTIONS  
LOWER ADJACENT CHANNEL TEST (3000 HZ)**

TEST	TRANSMIT CHANNEL (LOOPED BANK)	RECEIVE CHANNEL (LOOPING BANK)
	CONNECT STE TO MOD IN JACK OF CHANNEL $B_T^*$	CONNECT NMS TO DEM OUT JACK OF CHANNEL $A_R^*$
A	2	1
B	3	2
C	4	3
D	5	4
E	6	5
F	7	6
G	8	7
H	9	8
I	10	9
J	11	10
K	12	11

\* Subscripts "T" and "R" denote VF transmit and receive sections of the indicated channels. For example, in Test A:

Channel  $B_T$  = Channel 2, transmit section

Channel  $A_R$  = Channel 1, receive section

- (a) Replace, with a spare, the channel modem for Channel B ( $B_T$ ).
  - (b) Repeat applicable steps in Charts 2, 3, 5, and 6 for Channel B.
  - (c) Repeat applicable Steps 1 through 14.
- 16 Set the NMS range switch to minimum sensitivity.
- 17 Remove patches (1) and (2), Fig. 15.
- 18 Repeat applicable Steps 12 through 17 for Tests B through K listed in Table F.

CHART 7 (Contd)

STEP

PROCEDURE

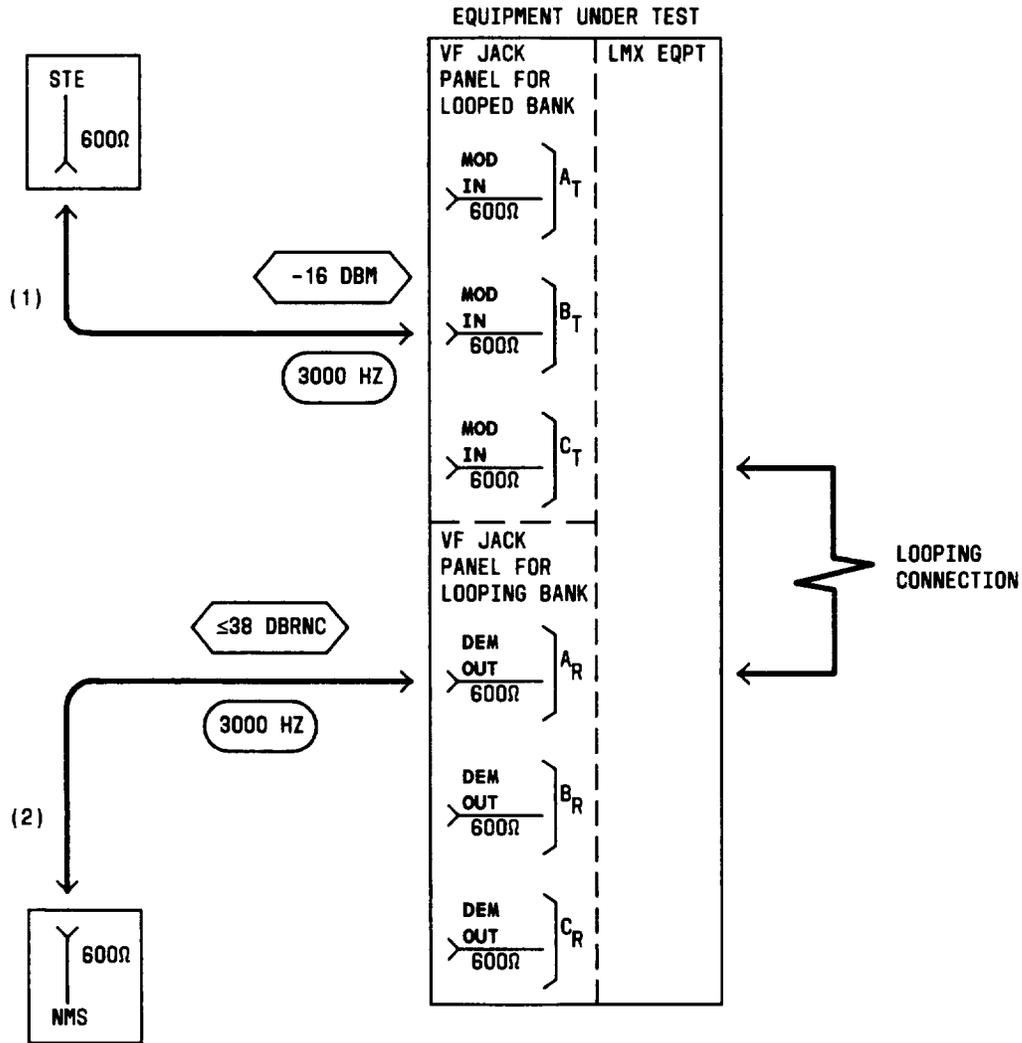


Fig. 15—Patching Diagram—Crosstalk Test—Equal-Level Looping—Lower Adjacent Channel (3000 Hz)

- 19 Connect the STE to the MOD IN jack for Test A in *looped*-bank Channel B<sub>T</sub> [Table G and patch (1), Fig. 16].
- 20 Connect the NMS to the DEM OUT jack for Test A in *looping*-bank Channel C<sub>R</sub> [Table G and patch (2), Fig. 16].

## CHART 7 (Contd)

STEP

PROCEDURE

TABLE G

CROSSTALK TEST CONNECTIONS  
UPPER ADJACENT CHANNEL TEST (3000 HZ)

TEST	TRANSMIT CHANNEL (LOOPED BANK)	RECEIVE CHANNEL (LOOPING BANK)
	CONNECT STE TO MOD IN JACK OF CHANNEL $B_T^*$	CONNECT NMS TO DEM OUT JACK OF CHANNEL $C_R^*$
A	1	2
B	2	3
C	3	4
D	4	5
E	5	6
F	6	7
G	7	8
H	8	9
I	9	10
J	10	11
K	11	12

\* Subscripts "T" and "R" denote VF transmit and receive sections of the indicated channels. For example, in Test A:

Channel  $B_T$  = Channel 1, transmit section

Channel  $C_R$  = Channel 2, receive section

21 Measure the noise at the DEM OUT jack.

**Requirement:** 45 dBrnc or less (44 dBrnc is less than 45)

22 If the requirement of Step 21 is *not* met,

- (a) Replace, with a spare, the channel modem for Channel C ( $C_R$ ).
- (b) Repeat applicable steps in Charts 2, 3, 5, and 6 for Channel C.
- (c) Repeat applicable Steps 1 through 21.

CHART 7 (Contd)

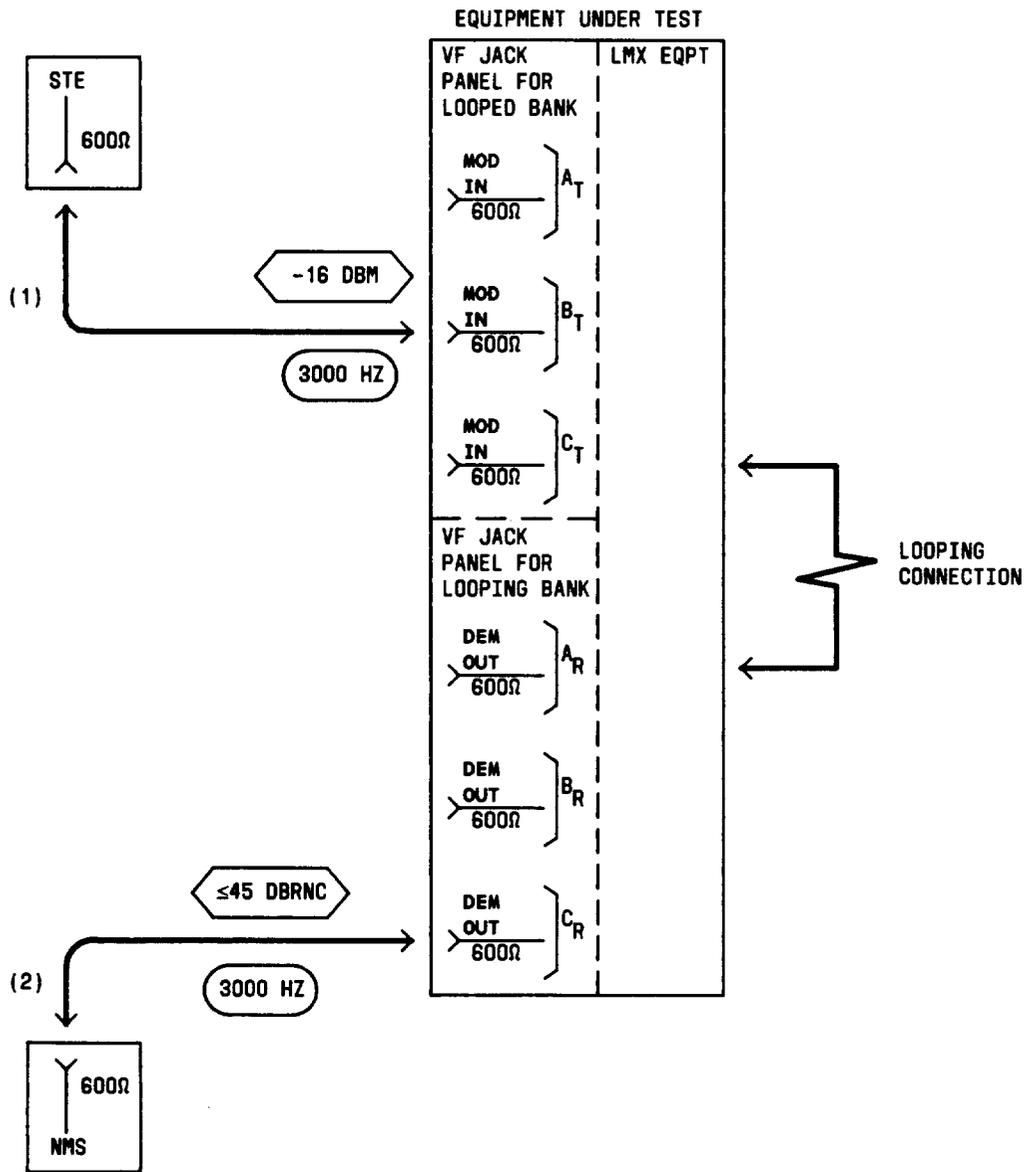


Fig. 16—Patching Diagram—Crosstalk Test—Equal-Level Looping—Upper Adjacent Channel (3000 Hz)

## CHART 7 (Contd)

STEP	PROCEDURE
23	Set the NMS range switch to minimum sensitivity.
24	Remove patches (1) and (2), Fig. 16.
25	Repeat applicable Steps 19 through 24 for Tests B through K listed in Table G.
26	Set the STE to -16 dBm at 5000 Hz.
27	Connect the STE to the MOD IN jack for Test A in <i>looped</i> -bank Channel B <sub>T</sub> [Table H and patch (1), Fig. 17].

TABLE H

**CROSSTALK TEST CONNECTIONS  
UPPER ADJACENT CHANNEL TEST (5000 HZ)**

TEST	TRANSMIT CHANNEL (LOOPED BANK)	RECEIVE CHANNEL (LOOPING BANK)
	CONNECT STE TO MOD IN JACK OF CHANNEL B <sub>T</sub> *	CONNECT NMS TO DEM OUT JACK OF CHANNEL C <sub>R</sub> *
A	1	2
B	2	3
C	3	4
D	4	5
E	5	6
F	6	7
G	7	8
H	8	9
I	9	10
J	10	11
K	11	12

\* Subscripts "T" and "R" denote VF transmit and receive sections of the indicated channels. For example, in Test A:  
 Channel B<sub>T</sub> = Channel 1, transmit section  
 Channel C<sub>R</sub> = Channel 2, receive section

CHART 7 (Contd)

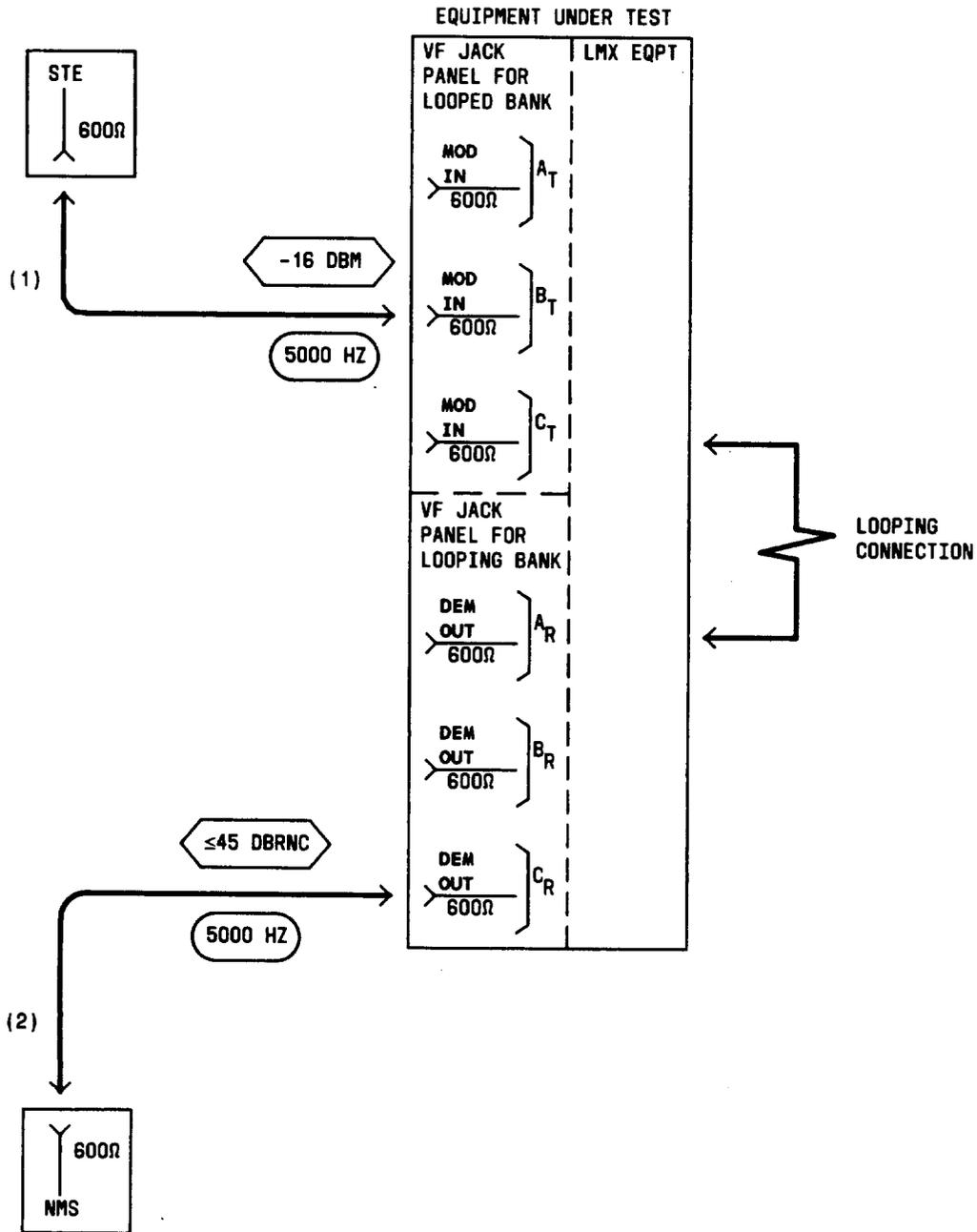


Fig. 17—Patching Diagram—Crosstalk Test—Equal-Level Looping—Upper Adjacent Channel (5000 Hz)

## CHART 7 (Contd)

STEP	PROCEDURE
28	Connect the NMS to the DEM OUT jack for Test A in <i>looping</i> -bank Channel C <sub>R</sub> [Table H and patch (2), Fig. 17].
29	Measure the noise at the DEM OUT jack.  <b>Requirement:</b> 45 dBrnc or less (44 dBrnc is less than 45)
30	If the requirement of Step 29 is <i>not</i> met, (a) Replace, with a spare, the channel modem for Channel B (B <sub>T</sub> ). (b) Repeat applicable steps in Charts 2, 3, 5, and 6 for Channel B. (c) Repeat applicable Steps 1 through 29.
31	Set the NMS range switch to minimum sensitivity.
32	Remove patches (1) and (2), Fig. 17.
33	Repeat applicable Steps 27 through 32 for Tests B through K listed in Table H.
34	At the LMX equipment, remove looping connections made in Step 3 or 4.
35	Repeat applicable Steps 1 through 34 for all other channel banks to be tested.

## CHART 8

## FREQUENCY RESPONSE TEST—UNEQUAL-LEVEL LOOPING

The frequency response for each channel in the A6 channel bank must be checked at 200 and 1000 Hz to ensure proper operation.

**Note:** Use this chart *only if spare group equipment is not available.*

## APPARATUS

***Sending Test Equipment (STE):***

Frequency: 200 and 1000 Hz

Power: -8 dBm

Impedance: 600 ohms balanced

***Receiving Test Equipment (RTE):***

***Transmission and Noise Measuring System*** (via the MEAS 600 $\Omega$  TERM jack on the A6 VF test, monitor, and talk panel)

***3P7A Cords*** (for 600-ohm patches)

***3P20B Cord*** (for 135-ohm patches)

## STEP

## PROCEDURE

**Note 1:** The STE and RTE should be calibrated as a test group prior to use at each test frequency.

**Note 2:** If the channel bank under test is equipped for CFA, ***remove the CFA unit before starting this test.***

1 Adjust the RTE for a measurement of -22 dBm.

2 Adjust the STE as follows:

Impedance: 600 ohms balanced

Frequency: 1000 Hz

Power: -8.0 dBm

CHART 8 (Contd)

STEP	PROCEDURE
3	At the LMX equipment, connect the CH BK OUT ALT (LMX-2) or GDF OUT ALT (LMX-3) jack to the CH BK IN (LMX-2) or GDF IN (LMX-3) jack [patch (1), Fig. 18].
4	Connect the STE to the MOD IN jack for Channel 1 of the channel bank under test [patch (2), Fig. 18].
5	Connect the RTE to the DEM OUT jack for the channel under test [patch (3), Fig. 18].

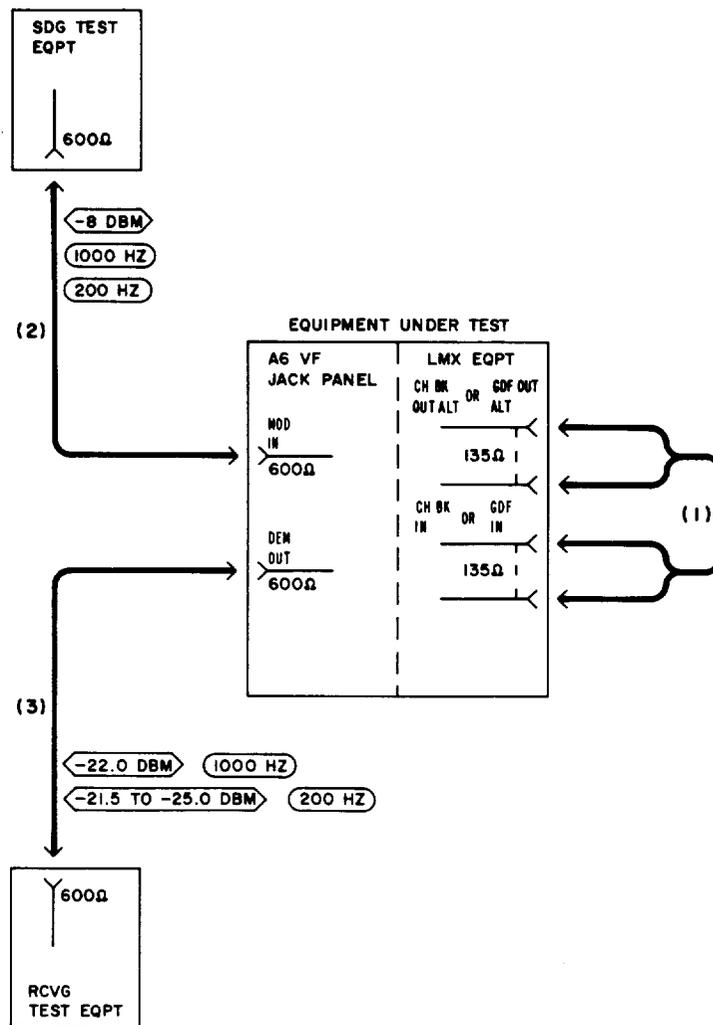


Fig. 18—Patching Diagram—Frequency Response Test—Unequal-Level Looping

## CHART 8 (Contd)

STEP	PROCEDURE
6	Observe that the signal power at the DEM OUT jack is -22.0 dBm.  <i>Note:</i> If the requirement is <b>not</b> met, check the looping connections at the LMX bay. Then, if necessary, adjust the corresponding channel gain ADJ control (on the VF jack panel or channel modem, as applicable) to obtain -22.0 dBm.
7	Set the STE frequency to 200 Hz.
8	Measure and record the signal power at the DEM OUT jack.  <i>Requirement:</i> -21.5 to -25.0 dBm
9	If the requirement of Step 8 is <b>not</b> met,  (a) Replace the channel modem under test with a spare unit.  (b) Repeat applicable steps in Charts 2 and 3 for the channel under test.  (c) Repeat applicable Steps 1 through 8.
10	Remove patches (2) and (3), Fig. 18.
11	Repeat applicable Steps 2 through 10 for Channels 2 to 12 of the channel bank under test.
12	At the LMX equipment, remove patch (1), Fig. 18.  <i>Note:</i> If the channel bank under test is equipped for CFA, <b>reinsert the CFA unit.</b>
13	Repeat applicable Steps 1 through 12 for all other channel banks to be tested.
14	If noise and crosstalk tests are <b>not</b> to be performed, readjust the gain ADJ controls for all channels tested, as prescribed in Chart 4.

## CHART 9

## NOISE TEST—UNEQUAL-LEVEL LOOPING

For proper channel bank operation, the noise level in each channel of the A6 bank must not exceed the limit beyond which it interferes with normal speech.

**Note:** Use this chart *only if spare group equipment is not available.*

## APPARATUS

***Sending Test Equipment (STE):***

Frequency: 1000 Hz

Power: -8 dBm

Impedance: 600 ohms balanced

***Receiving Test Equipment (RTE):***

***Transmission and Noise Measuring System*** (via the MEAS 600 $\Omega$  TERM jack on the A6 VF test, monitor, and talk panel)

***Noise Measuring Set (NMS):***

Range 17 to 27 dBm

Weighting: C Message and 3 kHz flat

Impedance: 600 ohms balanced

Type: 3A or 3B, or equivalent

***3P7A Cords*** (for 600-ohm patches)

***3P20B Cord*** (for 135-ohm patches)

***262B Plug*** (600-ohm termination)

## STEP

## PROCEDURE

**Note 1:** The STE and RTE should be calibrated as a test group prior to use at each test frequency.

**Note 2:** If the channel bank under test is equipped for CFA, ***remove the CFA unit before starting this test.***

## CHART 9 (Contd)

STEP	PROCEDURE
<b>Preparation</b>	
1	Adjust the RTE for a measurement of -22 dBm.
2	Adjust the STE as follows: Impedance: 600 ohms balanced Frequency: 1000 Hz Power: -8.0 dBm
3	At the LMX equipment, connect the CH BK OUT ALT (LMX-2) or GDF OUT ALT (LMX-3) jack to the CH BK IN (LMX-2) or GDF IN (LMX-3) jack [patch (1), Fig. 19].
4	Connect the STE to the MOD IN jack for Channel 1 of the channel bank under test [patch (2), Fig. 19].
5	Connect the RTE to the DEM OUT jack for the channel under test [patch (3), Fig. 19].
6	Observe that the signal power at the DEM OUT jack is -22.0 dBm.  <b>Note:</b> If the requirement is <i>not</i> met, check the looping connections at the LMX bay. Then, if necessary, adjust the corresponding channel gain ADJ control (on the VF jack panel or channel modem, as applicable) to obtain -22.0 dBm.
7	Remove patches (2) and (3), Fig. 19.
8	Repeat Steps 4 through 7 for Channels 2 to 12 of the channel bank under test.
<b>Noise</b>	
9	Adjust the NMS as follows: Range: Minimum sensitivity (85 dBm on the 3A NMS) Weighting: C Message Impedance: 600 ohms balanced Damping: DAMP
10	Insert a 262B plug (600-ohm termination) in the MOD IN jack for Channel 1 of the channel bank under test (Fig. 20).
11	Connect the NMS to the DEM OUT jack for the channel under test [patch (2), Fig. 20].

## CHART 9 (Contd)

STEP

PROCEDURE

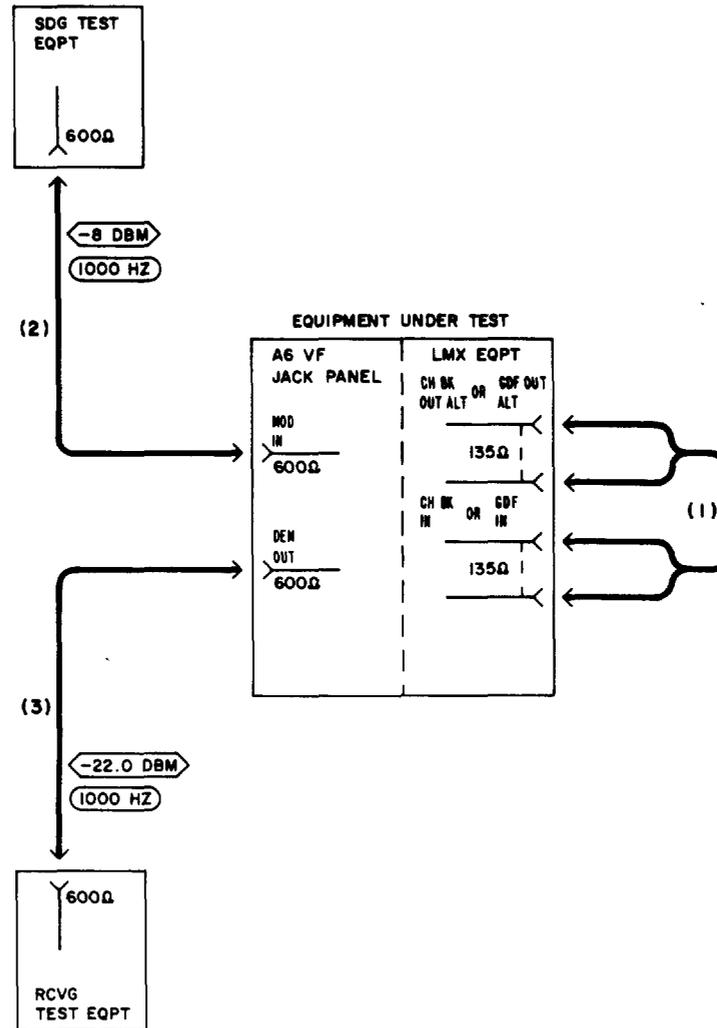


Fig. 19—Patching Diagram—Preparation—Unequal-Level Looping

12 Measure the noise at the DEM OUT jack.

**Requirement:** 17 dBnc or less (16 dBnc is less than 17)

13 Set the NMS range switch to minimum sensitivity.

## CHART 9 (Contd)

STEP

PROCEDURE

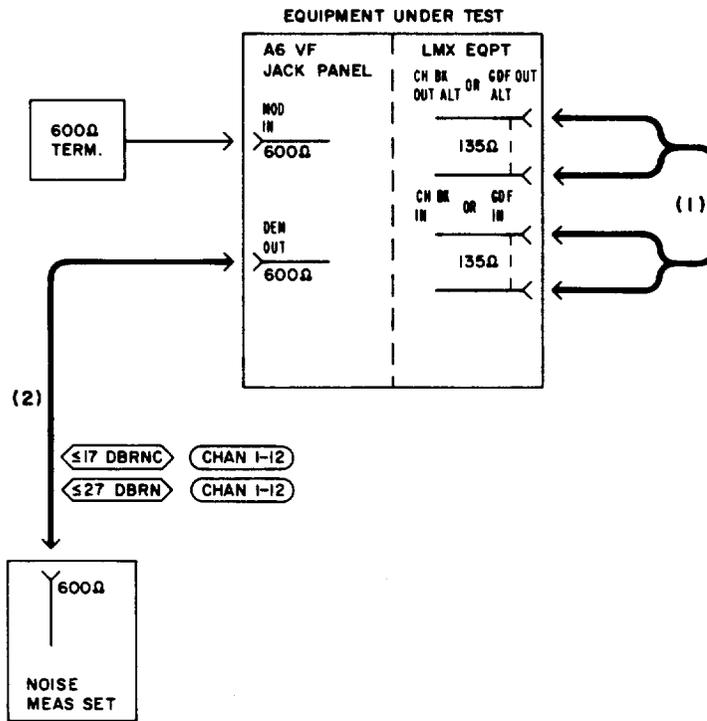


Fig. 20—Patching Diagram—Noise Test—Unequal-Level Looping

- 14 Set the NMS weighting to 3 kHz flat.
- 15 Measure the noise at the DEM OUT jack.
- Requirement:** 27 dBrn or less (26 dBrn is less than 27)
- 16 If the requirements of Steps 12 and 15 are *not* met,
- (a) Replace the channel modem under test with a spare unit.
  - (b) Repeat applicable steps in Charts 2, 3, and 8 for the channel under test.
  - (c) Repeat applicable Steps 1 through 15.
- 17 If the requirements of Step 12 and 15 *cannot* be met,

## CHART 9 (Contd)

STEP	PROCEDURE
	(a) Reinsert the channel modem replaced in Step 16(a).
	(b) Replace the channel bank modem under test with a spare.
	(c) Repeat applicable steps in Chart 2 for Channels 1 to 12.
	(d) Repeat applicable Steps 1 through 15.
18	Set the NMS range switch to minimum sensitivity.
19	Remove patch (2), Fig. 20.
20	Remove the 262B plug inserted in Step 10.
21	Repeat applicable Steps 9 through 20 for Channels 2 to 12 of the channel bank under test.
22	At the LMX equipment, remove patch (1), Fig. 20.
	<b>Note:</b> If the channel bank under test is equipped for CFA, <i>reinsert the CFA unit.</i>
23	Repeat applicable Steps 1 through 22 for all other channel banks to be tested.
24	If crosstalk test is <i>not</i> to be performed, readjust the gain ADJ control for all channels tested, as prescribed in Chart 4.

## CHART 10

## CROSSTALK TEST—UNEQUAL-LEVEL LOOPING

For proper channel bank operation, the crosstalk in each channel of the A6 bank must not exceed the limit beyond which it interferes with normal speech. This test is performed via two cross-looped (frogged) channel banks, with test tone applied to one VF channel and measured in both adjacent channels.

**Note:** Use this chart *only if spare group equipment is not available.*

## APPARATUS

***Sending Test Equipment (STE):***

Frequency: 1000, 3000, and 5000 Hz

Power: -8 dBm

Impedance: 600 ohms balanced

***Receiving Test Equipment (RTE):***

***Transmission and Noise Measuring System*** (via the MEAS 600Ω TERM jack on the A6 VF test, monitor, and talk panel)

***Noise Measuring Set (NMS):***

Range: 17 dBrn

Weighting: C Message

Impedance: 600 ohms balanced

Type: 3A or 3B, or equivalent

***3P7A Cords*** (for 600-ohm patches)

***3P20B Cord*** (for 135-ohm patches)

## STEP

## PROCEDURE

**Note 1:** See Fig. 21 and ensure that all required looping and test connections are understood before proceeding with this test.

**Note 2:** The transmitting channel (in ***looped*** bank) is designated Br and is the ***disturbing*** channel in which tone is sent. Adjacent receiving channels (in ***looping*** bank) are designated AR and CR and are the ***disturbed*** channels in which crosstalk is measured.

## CHART 10 (Contd)

STEP

PROCEDURE

**Note 3:** The STE and RTE should be calibrated as a test group prior to use at each test frequency.

**Note 4:** If the channel bank under test is equipped for CFA, *remove the CFA unit before starting this test.*

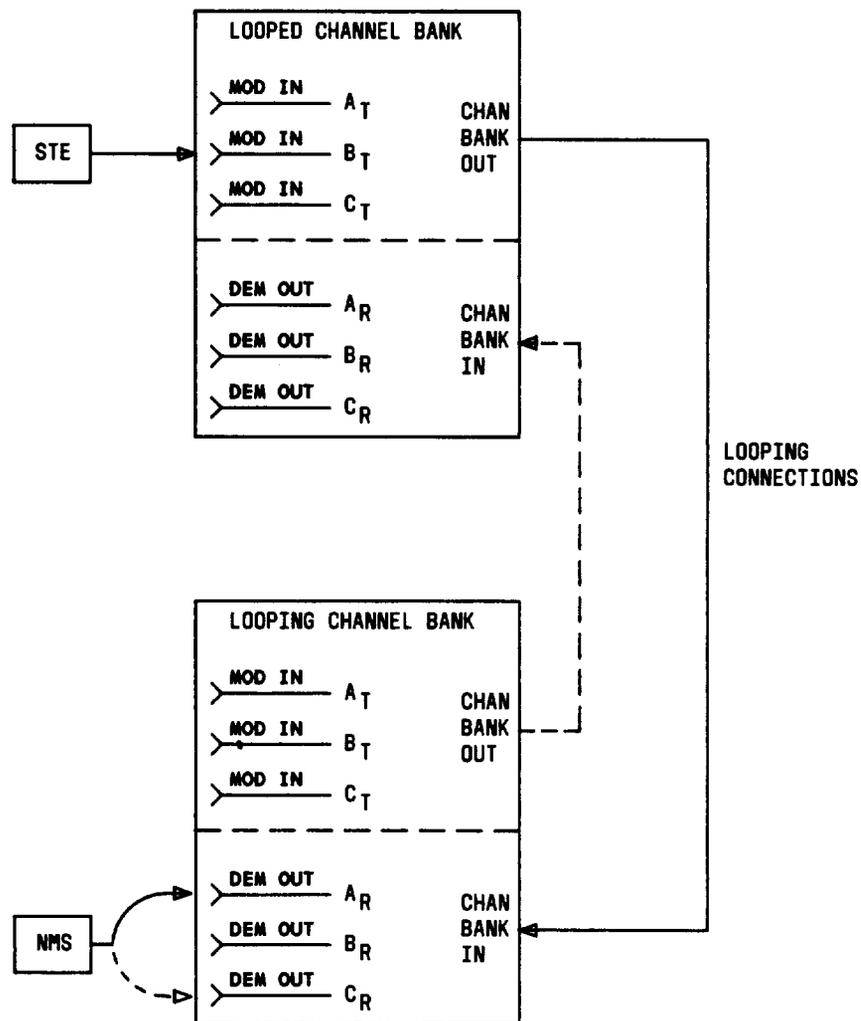


Fig. 21—Channel Bank Under Test Cross-Looped (Frogged) Via Another Bank (Looping Bank)—Typical Connections for Unequal-Level Looping

## CHART 10 (Contd)

STEP	PROCEDURE
------	-----------

**Preparation**

- 1 Adjust the RTE for a measurement of -22 dBm.
- 2 Adjust the STE as follows:
  - Impedance: 600 ohms balanced
  - Frequency: 1000 Hz
  - Power: -8.0 dBm
- 3 At the LMX equipment, connect the CH BK OUT ALT (LMX-2) or GDF OUT ALT (L jack to the CH BK IN (LMX-2) or GDF IN (LMX-3) jack [patch (1), Fig. 22].

TABLE I

**CROSSTALK TEST CONNECTIONS  
CHANNEL GAIN VERIFICATION (1000 HZ)**

TEST	TRANSMIT CHANNEL (LOOPED BANK)	RECEIVE CHANNEL (LOOPING BANK)
	CONNECT STE TO MOD IN JACK OF CHANNEL	CONNECT RTE TO DEM OUT JACK OF CHANNEL
A	1	1
B	2	2
C	3	3
D	4	4
E	5	5
F	6	6
G	7	7
H	8	8
I	9	9
J	10	10
K	11	11
L	12	12

- 4 Connect the STE to the MOD IN jack for Channel 1 of the **looped** channel bank test [Test A, Table I and patch (2), Fig. 22].
- 5 Connect the RTE to the DEM OUT jack for the **looping** bank for the channel und [Test A, Table I and patch (3), Fig. 22].

CHART 10 (Contd)

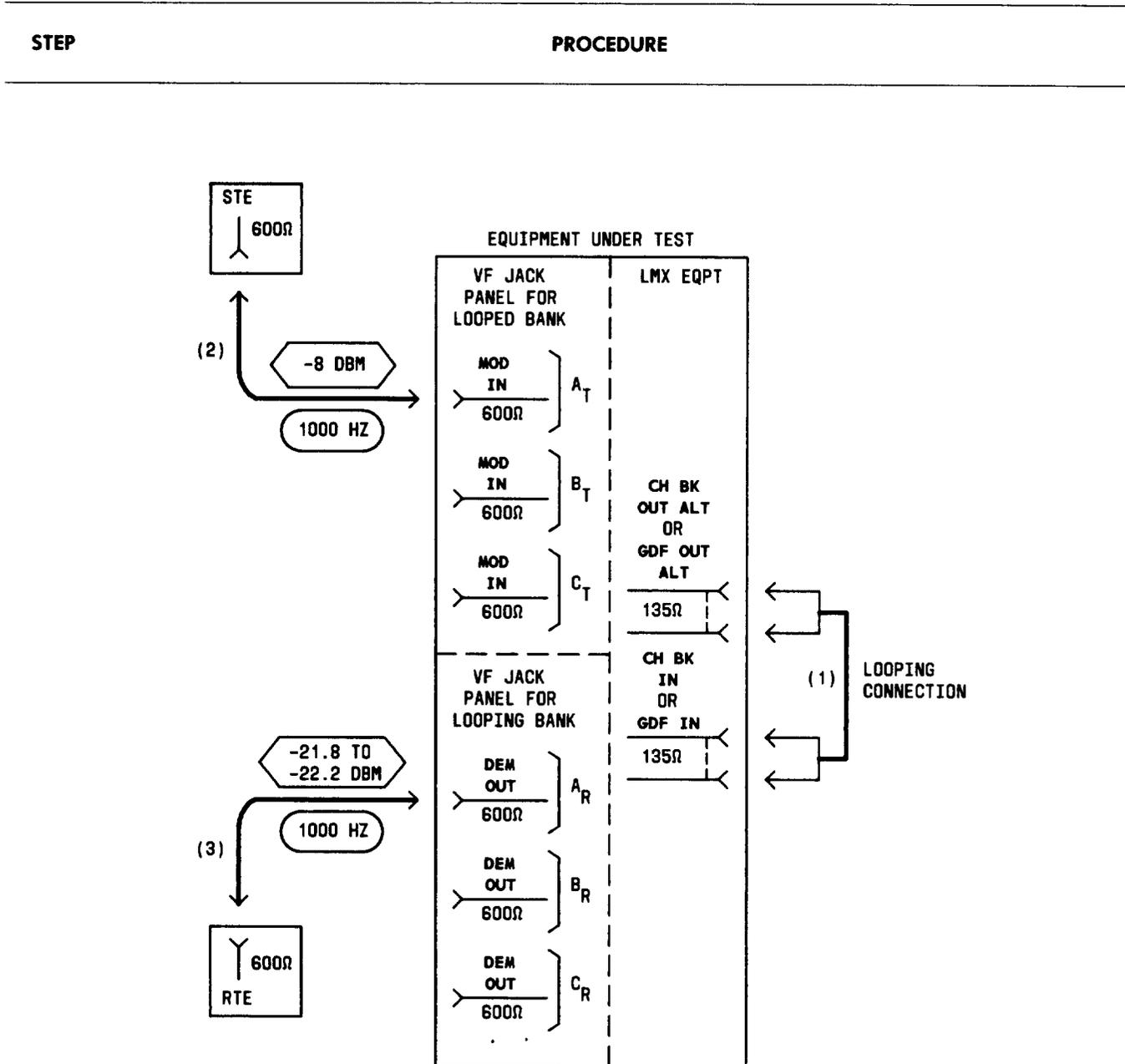


Fig. 22—Patching Diagram—Crosstalk Test—Unequal-Level Looping—Channel Gain Verification (1000 Hz)

- 6 Observe that the signal power at the DEM OUT jack is -21.8 to -22.2 dBm.

**Note:** If the requirement is *not* met, check the looping connections at the LMX bay. Then, if necessary, adjust the corresponding channel gain ADJ control (on the VF jack panel or channel modem, as applicable) to obtain -22.0 dBm.

## CHART 10 (Contd)

STEP	PROCEDURE
7	Remove patches (2) and (3), Fig. 22.
8	Repeat Steps 4 through 7 for Channels 2 to 12 (Tests B through L listed in Table I) of the <i>looped</i> channel bank under test.
	<b>Crosstalk</b>
9	Adjust the STE as follows: Impedance: 600 ohms balanced Frequency: 3000 Hz Power: -8.0 dBm
10	Adjust the NMS as follows: Range: Minimum sensitivity (85 dB <sub>rnc</sub> on the 3A NMS) Weighting: C Message Impedance: 600 ohms balanced Damping: DAMP
11	Connect the STE to the MOD IN jack for Test A in <i>looped</i> -bank Channel B <sub>T</sub> (Table J and patch (2), Fig. 23).
12	Connect the NMS to the DEM OUT jack for Test A in <i>looping</i> -bank Channel A <sub>R</sub> (Table J and patch (3), Fig. 23).
13	Measure the noise at the DEM OUT jack. <b>Requirement:</b> 17 dB <sub>rnc</sub> or less (16 dB <sub>rnc</sub> is less than 17)
14	If the requirement of Step 13 is <i>not</i> met, (a) Replace, with a spare, the channel modem for Channel B (B <sub>T</sub> ). (b) Repeat applicable steps in Charts 2, 3, 8, and 9 for Channel B. (c) Repeat applicable Steps 1 through 13.
15	Set the NMS range switch to minimum sensitivity.
16	Remove patches (2) and (3), Fig. 23.

## CHART 10 (Contd)

STEP	PROCEDURE
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TABLE J

**CROSSTALK TEST CONNECTIONS  
LOWER ADJACENT CHANNEL TEST (3000 HZ)**

TEST	TRANSMIT CHANNEL (LOOPED BANK)	RECEIVE CHANNEL (LOOPING BANK)
	CONNECT STE TO MOD IN JACK OF CHANNEL $B_T$ *	CONNECT NMS TO DEM OUT JACK OF CHANNEL $A_R$ *
A	2	1
B	3	2
C	4	3
D	5	4
E	6	5
F	7	6
G	8	7
H	9	8
I	10	9
J	11	10
K	12	11

\* Subscripts "T" and "R" denote VF transmit and receive sections of the indicated channels. For example, in Test A:  
Channel  $B_T$  = Channel 2, transmit section  
Channel  $A_R$  = Channel 1, receive section

- 17 Repeat applicable Steps 11 through 16 for Tests B through K listed in Table J.
- 18 Connect the STE to the MOD IN jack for Test A in *looped*-bank Channel  $B_T$  [Table K and patch (2), Fig. 24].
- 19 Connect the NMS to the DEM OUT jack for Test A in *looping*-bank Channel  $A_R$ , [Table K and patch (3), Fig. 24].
- 20 Measure the noise at the DEM OUT jack.

**Requirement:** 17 dBrnc or less (16 dBrnc is less than 17)

CHART 10 (Contd)

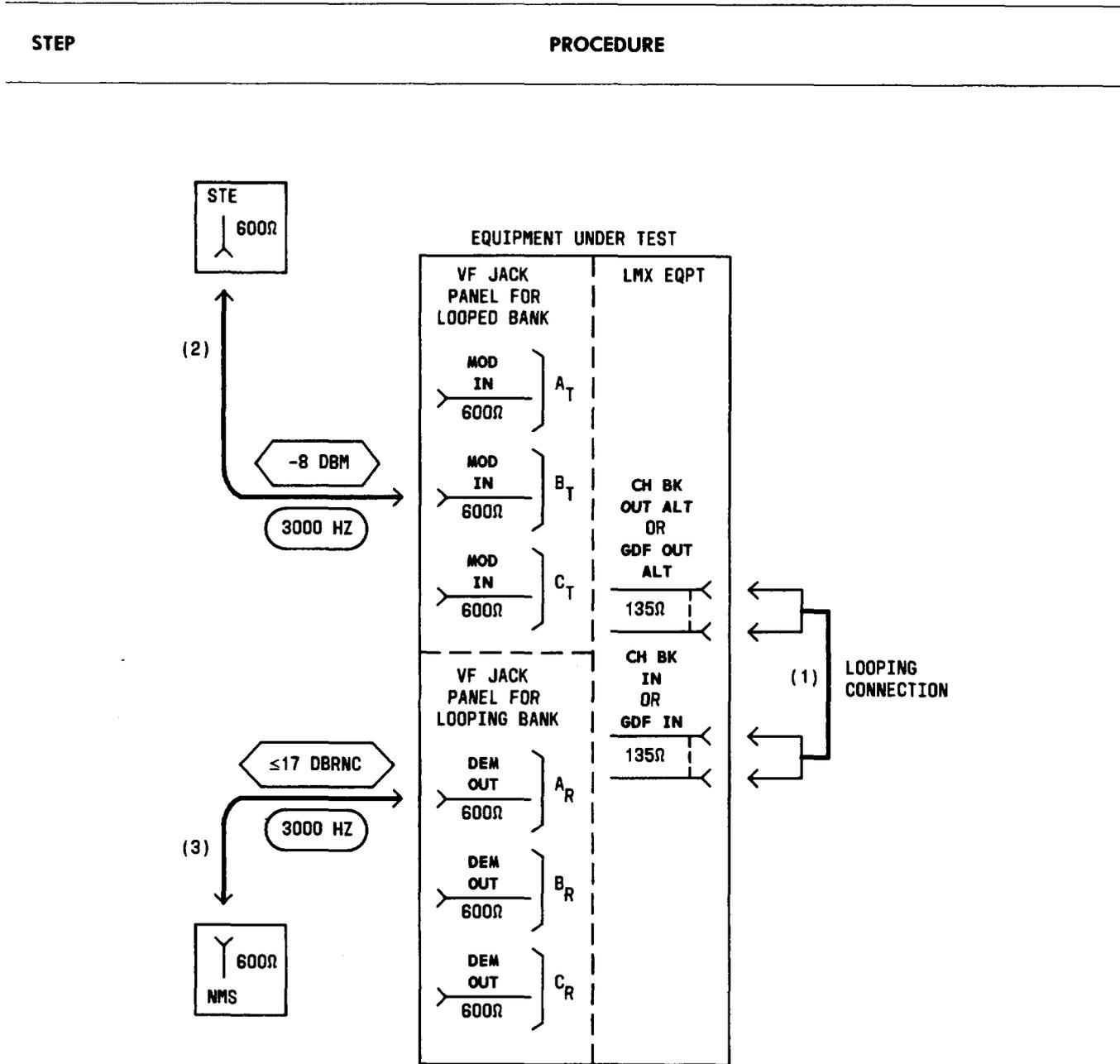


Fig. 23—Patching Diagram—Crosstalk Test—Unequal-Level Looping—Lower Adjacent Channel (3000 Hz)

- 21 If the requirement of Step 20 is *not* met,
- (a) Replace, with a spare, the channel modem for Channel C (C<sub>R</sub>).
  - (b) Repeat applicable steps in Charts 2, 3, 8, and 9 for Channel C.

## CHART 10 (Contd)

STEP	PROCEDURE
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(c) Repeat applicable Steps 1 through 20.

TABLE K

CROSSTALK TEST CONNECTIONS  
UPPER ADJACENT CHANNEL TEST (3000 HZ)

TEST	TRANSMIT CHANNEL (LOOPED BANK)	RECEIVE CHANNEL (LOOPING BANK)
	CONNECT STE TO MOD IN JACK OF CHANNEL $B_T^*$	CONNECT NMS TO DEM OUT JACK OF CHANNEL $C_R^*$
A	1	2
B	2	3
C	3	4
D	4	5
E	5	6
F	6	7
G	7	8
H	8	9
I	9	10
J	10	11
K	11	12

\* Subscripts "T" and "R" denote VF transmit and receive sections of the indicated channels. For example, in Test A:

Channel  $B_T$  = Channel 1, transmit section

Channel  $C_R$  = Channel 2, receive section

- 22 Set the NMS range switch to minimum sensitivity.
- 23 Remove patches (2) and (3), Fig. 24.
- 24 Repeat applicable Steps 18 through 23 for Tests B through K listed in Table K.
- 25 Set the STE to -8 dBm at 5000 Hz.
- 26 Connect the STE to the MOD IN jack for Test A in *looped*-bank Channel Br [Table L and patch (2), Fig. 25].

CHART 10 (Contd)

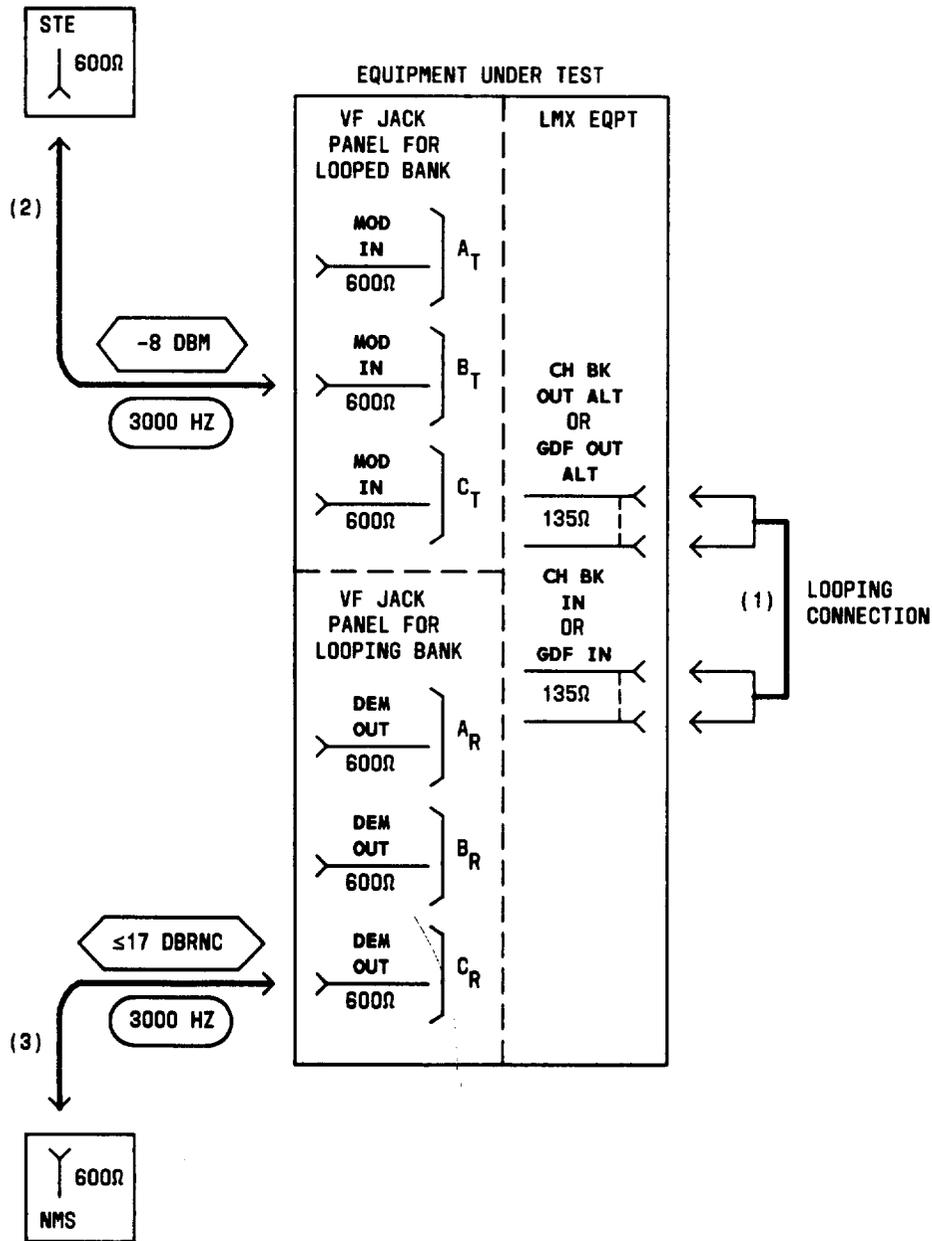


Fig. 24—Patching Diagram—Crosstalk Test—Unequal-Level Looping—Upper Adjacent Channel (3000 Hz)

## CHART 10 (Contd)

STEP	PROCEDURE
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TABLE L

CROSSTALK TEST CONNECTIONS  
UPPER ADJACENT CHANNEL TEST (5000 HZ)

TEST	TRANSMIT CHANNEL (LOOPED BANK)	RECEIVE CHANNEL (LOOPING BANK)
	CONNECT STE TO MOD IN JACK OF CHANNEL $B_T^*$	CONNECT NMS TO DEM OUT JACK OF CHANNEL $C_R^*$
A	1	2
B	2	3
C	3	4
D	4	5
E	5	6
F	6	7
G	7	8
H	8	9
I	9	10
J	10	11
K	11	12

\* Subscripts "T" and "R" denote VF transmit and receive sections of the indicated channels. For example, in Test A:  
Channel  $B_T$  = Channel 1, transmit section  
Channel  $C_R$  = Channel 2, receive section

- 27 Connect the NMS to the DEM OUT jack for Test A in **looping**-bank Channel  $C_R$  [Table L and patch (3), Fig. 25].
- 28 Measure the noise at the DEM OUT jack.
- Requirement:** 17 dBrnc or less (16 dBrnc is less than 17)
- 29 If the requirement of Step 28 is **not** met,
- (a) Replace, with a spare, the channel modem for Channel B ( $B_T$ ).
  - (b) Repeat applicable steps in Charts 2, 3, 8, and 9 for Channel B.
  - (c) Repeat applicable Steps 1 through 28.

CHART 10 (Contd)

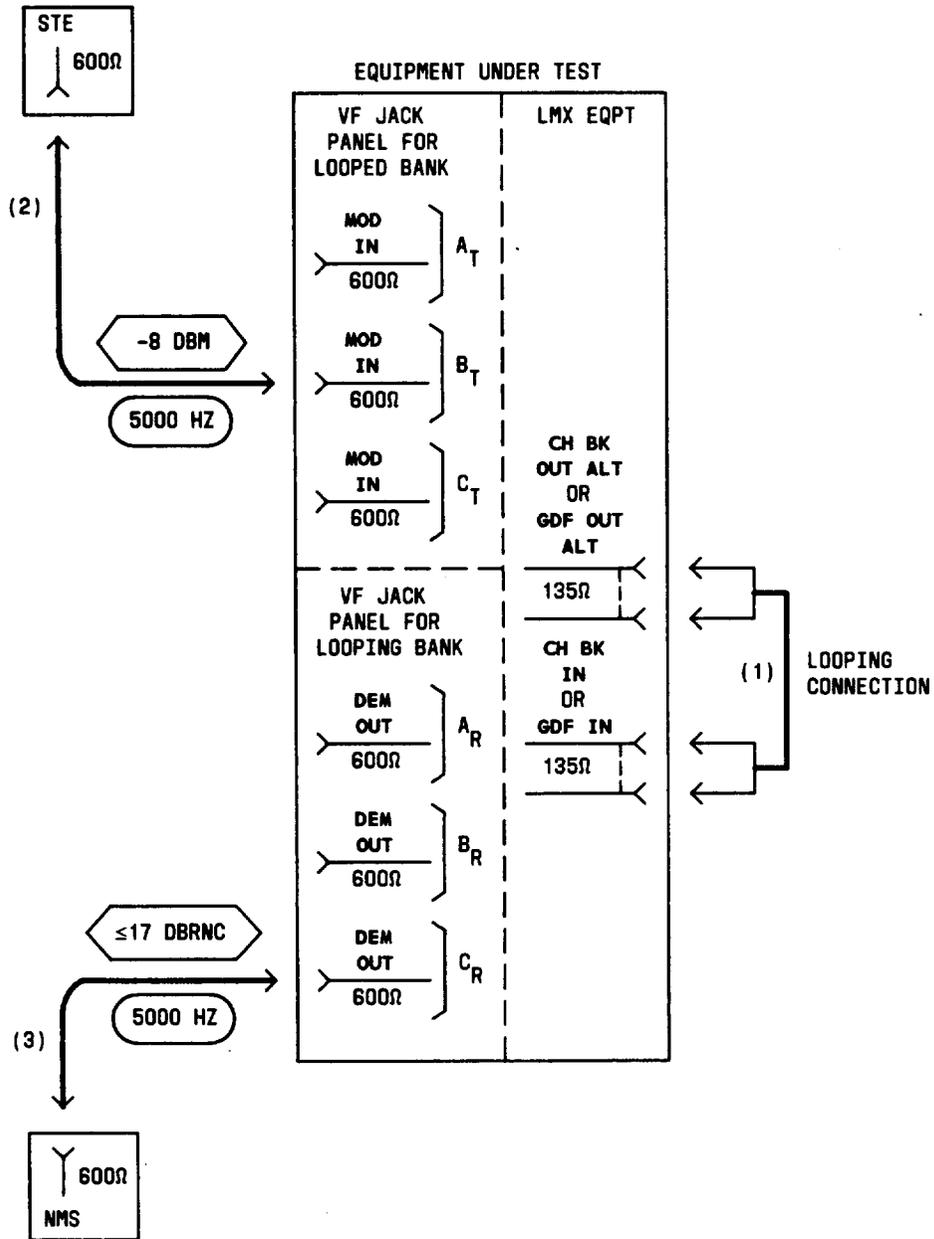


Fig. 25—Patching Diagram—Crosstalk Test—Unequal-Level Looping—Upper Adjacent Channel (5000 Hz)

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**CHART 10 (Contd)**

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<b>STEP</b>	<b>PROCEDURE</b>
30	Set the NMS range switch to minimum sensitivity.
31	Remove patches (2) and (3), Fig. 25.
32	Repeat applicable Steps 26 through 31 for Tests B through K listed in Table L.
33	At the LMX equipment, remove patch (1), Fig. 25.  <i>Note:</i> If the channel bank under test is equipped for CFA, <b><i>reinsert the CFA unit.</i></b>
34	Repeat applicable Steps 1 through 33 for all other channel banks to be tested.
35	Readjust the gain ADJ control for all channels tested, as prescribed in Chart 4.

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