CIRCUIT ORDER OR TRUNK ORDER TESTS—TESTING METHODS

CHANNEL NET GAIN AND FREQUENCY RESPONSE CHARACTERISTICS

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1. GENERAL

1.01 This section provides methods and requirements for making channel net gain and frequency response measurements of the carrier systems listed in this section.

1.02 This section is reissued for the following reasons:

(a) To revise the frequency response requirements to conform to Bell System Standards.

(b) To bring the section up to date.

Since this issue covers a general revision, arrows ordinarily used to indicate changes have been omitted.

1.03 In order to meet direct distance dialing (DDD), extended area service (EAS), and data-type services such as TWX, WATS, and DATA-PHONE®, it is extremely important that the carrier channels be capable of transmitting the frequencies used for data transmission.

2. APPLICATION OF CIRCUIT ORDER OR TRUNK ORDER TESTS

2.01 Channel net gain at 1000 Hz should be accurately measured and correctly adjusted in both directions of transmission on all channels of carrier telephone systems. Frequency response measurements at 400, 2800, and upper test frequencies (UTFs) should also be measured to determine whether the frequency response characteristics of the channels are within specified requirements.

2.02 Measurements should be made between voice-frequency patch bays as shown in Fig. 1. The 1000-Hz net gain of each channel is measured between the transmitting terminal ***MOD IN*** jack (−16 dB transmission level point) and the receiving terminal ***DEM OUT*** jack (+7 dB transmission level point).

2.03 The 1000-Hz tone output of each channel should be adjusted to exactly +7 dBm at the receiving terminal by varying the gain-adjusting potentiometer on the channel demodulator amplifier or equivalent control. The gain adjustment provided in the gain-adjusting potentiometer normally takes care of inequalities in the equalization of the high-frequency line and for variations which may occur in the gain of the receiving terminal equipment.

2.04 The net gain measured between carrier system terminals depends upon the 1000-Hz transmission levels used at the voice-frequency patch bay in which the channels terminate. The nominal net gain at 1000 Hz is 23 dB.

2.05 Channel net gain and frequency response measurements on N1, O, and ON carrier systems with built-in 3700-Hz signaling should be measured in the "off-hook" condition as outlined in Section 362-305-512. When ***thru channel units*** are used to interconnect N1, O, or ON channels, follow the test procedures outlined in Section 362-310-501.

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3. CHANNEL NET GAIN AND FREQUENCY RESPONSE TESTS

STEP	PROCEDURE

CHANNEL NET GAIN MEASUREMENTS

Measurements should not be made unless it has been established that initial circuit order, lineup, or routine tests have been completed on the carrier system involved and that the high-frequency line meets its operating requirements. The phrase "high-frequency line" includes line pilots of type K or similar systems and line, group, and supergroup pilots on L-type carrier.

TRANSMITTING TERMINAL OFFICE

1 As indicated by (1) in Fig. 1, send 1000 Hz at −16 dBm by patching from the ***MOD IN*** jack at the channel being tested to the ***1000 − 16 600Ω*** jack.

RECEIVING TERMINAL OFFICE

2 As indicated by (2) in Fig. 1, patch the ***DEM OUT*** jack of the channel being tested to the ***TST 600Ω*** jack and measure the received power.

Requirement: The measured test power at the ***DEM OUT*** jack should be +7 dBm.

Note: If the requirement is not met, adjust the ***GAIN ADJ*** potentiometer (***REC*** potentiometer on N1, O, and ON systems) associated with the channel under test to bring the measurement to the exact value of +7 dBm. N1, O, and ON systems must meet the requirements of Section 362-305-512 at E1 & E2 jacks.

Caution: When the GAIN ADJ or REC potentiometer setting is changed, move the sliding contact back and forth past the point of final adjustment several times to minimize contact noise and to stabilize the final setting.

FREQUENCY RESPONSE MEASUREMENTS—TRANSMITTING TERMINAL OFFICES

As shown in Fig. 1, a KS-19260 or equivalent voice-frequency oscillator is used to provide the source of testing power for making frequency response measurements.

3 As indicated by (1A) in Fig. 1, send test frequencies of 1000 Hz, 400 Hz, 2800 Hz, and UTFs at −16 dBm by patching from the ***MOD IN*** jack of channel being tested to the ***OSC OUT*** jack.

Note: The oscillator should be calibrated to provide an output of −16 dBm each time the frequency is changed.

STEP	PROCEDURE

The UTF depends upon the type of carrier telephone system as follows:

TYPE OF SYSTEM	UPPER TEST FREQUENCY (UTF)	BSP – SECTION REFERENCE
K	3200 Hz	355-010-500 & 356-015-500
L1 & L3	3200 Hz	356-015-500
N1, O & ON	3000 Hz	362-305-512 & 362-310-501
N2	3100 Hz	362-800-505
N3	3200 Hz	362-900-505
T1	3000 Hz	Appropriate 365-XXX-XXX

FREQUENCY RESPONSE MEASUREMENTS—RECEIVING TERMINAL OFFICES

4 As indicated by ② in Fig. 1, patch the ***DEM OUT*** jack of channel being tested to the ***TST 600Ω*** jack and measure received power at 1000 Hz, 400 Hz, and 2800 Hz, and UTFs.

Requirement 1: Do not change the GAIN ADJ or REC potentiometer.

Requirement 2: Frequency response readings should be compared with the 1000-Hz gain output obtained in Step 2 and should be within the requirements of Table A.

Note: If the requirements are not met, refer to the BSP reference section for trouble locating procedures.

5 Repeat Steps 1 through 4 for each channel in both directions of transmission.

TABLE A

GAIN-SLOPE DEVIATION (FREQUENCY RESPONSE) RELATIVE TO 1000 Hz

TYPE OF CARRIER	400 Hz	2800 Hz
Type A Channel Bank	within 2.0-dB more and 1.0-dB less loss	within 1.0-dB more and 0.5-dB less loss
N1 Carrier	within 1.5-dB more and 1.0-dB less loss	within 3.0-dB more and 1.0-dB less loss
N2 Carrier	within 1.5-dB more and 1.0-dB less loss	within 2.0-dB more and 1.0-dB less loss
N3 Carrier	within 2.0-dB more and 1.0-dB less loss	within 1.5-dB more and 1.0-dB less loss
O, ON Carrier	within 2.0-dB more and 1.0-dB less loss	within 2.5-dB more and 1.0-dB less loss
D1, D2, or D3 Channel Bank	within 2.0-dB more and 1.0-dB less loss	within 2.0-dB more and 1.0-dB less loss

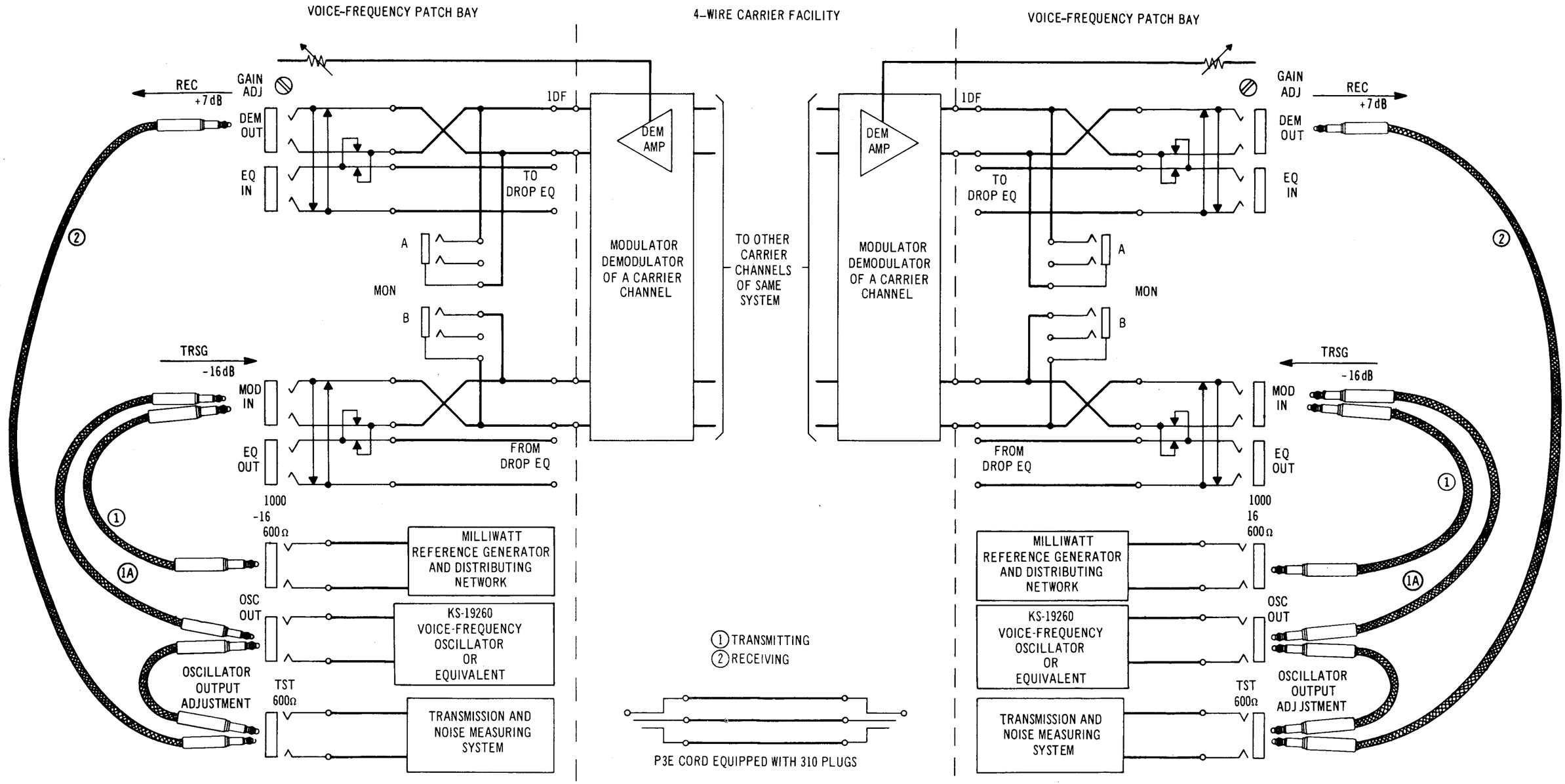

Fig. 1—Channel Net Gain and Frequency Response Measurements