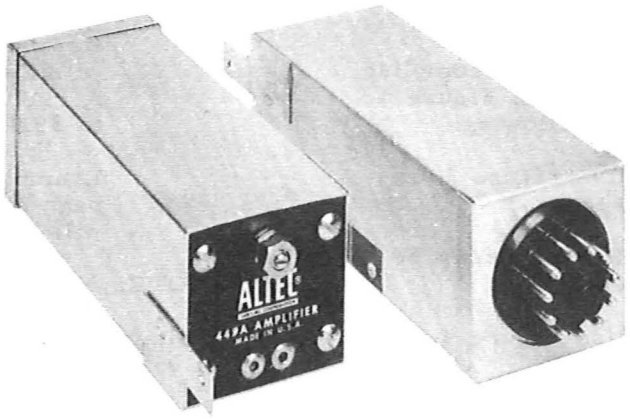
TRANSISTORIZED VOICE FREQUENCY AMPLIFIERS 447A, 449A, 450A, 453A, 455A, 457A (ALTEC) TRANSMISSION TESTS



1. GENERAL

1.01 This section describes the procedure for testing transistorized voice frequency amplifiers (ALTEC).

1.02 The tests described are as follows:

(A) Amplifier 1000-Cycle Maximum Gain Measurement

(B) Amplifier Gain-Frequency Measurement

(C) Noise Test

(D) Amplifier 1000-Cycle Working Gain Adjustment

1.03 The following table is included to assist in determining when these tests are required.

Reason for Test	Tests Required
Initial	A, B, and C
Service Order	D
Routine	A, B, and C
Trouble	Trouble condition will indicate.

1.04 Arrangements for tests on working lines are made with the circuit control, STC or PSC, who will contact the customer for circuit release.

1.05 Transistorized amplifiers are dependent upon the correct polarity of their operating voltage supply. Prolonged incorrect polarity can cause serious damage to the unit. Before inserting the amplifier, check that the positive side (ground) of the supply is on lug 9 and that the negative side (battery) is on lug 8 of the amplifier socket. When an ALTEC assembly (amplifier mounting unit) is used, the positive side (ground) of the supply is connected to the terminal designated + and the negative side connected to the terminal designated -.

1.06 The 447A or 450A amplifiers (two in series or a single unit) which are connected to 48 volt battery have an adjustable voltage dropping resistor arrangement installed in their battery supply lead. Adjust the voltage dropping resistors to obtain 20 volts across lugs 8 and 9 of all amplifier sockets or corresponding battery supply terminals of all ALTEC assemblies associated with a battery supply lead.

1.07 After completion of tests involving maximum gain, restore amplifier to working or minimum gain to eliminate a possible singing condition.

1.08 The field forces should not replace transistors or attempt repair of defective amplifiers.

2. TEST EQUIPMENT

2.01 Obtain test equipment to accomplish the test set-ups shown in Figure 1 through 4 according to the following:

Test A, B, and D - Use Figure 1 or Figure 2.

Test D (ONLY) - Figure 3 may be used.

Test C - Use Figure 4.

2.02 Other Bell System Practice Sections cover use and calibration of the test equipment.

3. AMPLIFIER TEST ACCESS

3.01 Test Jacks Provided - Test access to the amplifier is designated AMP IN and AMP OUT on the jack field.

3.02 Test Jacks Not Provided - Terminals 1 and 2 of terminal strip associated with amplifier mounting unit are designated IN (AMP IN). Terminals 3 and 4 are designated OUT (AMP OUT). Disconnect external wiring from these terminals while making tests.

4. METHOD

4.01 (TEST A) - Amplifier 1000-Cycle Maximum Gain Measurement

Step 1 - Release the shaft lock nut and turn the amplifier potentiometer fully counter-clockwise for minimum gain.

Step 2 - Make test set-up as shown in Figure 1 or Figure 2 depending on the test equipment used.

Step 3 - Apply 1000-cycle testing power, adjusted to a 40 db loss by use of the attenuator, to the amplifier input. Set the TMS for reading O dbm (black O).

Step 4 - Now turn the amplifier potentiometer fully clockwise for maximum gain.

Step 5 - Measure the gain of the amplifier. Maximum gain should be within the limits of 37 ±2 db. A maximum gain from 35.0 db to 39.0 db will be OK.

Example: 35 db gain will appear as -5 dbm and 39 db gain will be -1 dbm on the TMS.

NOTE: No gain in amplifier may indicate reversal of operating voltage supply polarity (see paragraph 1.05).

Step 6 - With a high impedance test receiver, check that 1000-cycle tone is heard across the monitor pin jacks located on the amplifier front panel.

4.02 (TEST B) - Amplifier Gain Frequency Measurements

Step 1 - The procedure is the same as in Test A, except the gain measurements are made at frequencies other than 1000-cycles. The following table shows the gain requirements at each frequency in comparison with the maximum 1000-cycle gain obtained in Test A. The (-) sign means less gain and (+) sign means more gain.

	Frequency (Cycles Per Second)		
	300	2000	3500
db deviation from 1000-cycle maximum gain	±1.0	±0.5	±0.5

4.03 (TEST C) - Noise Test

Step 1 - Make test set-up as shown in Figure 4.

Step 2 - (a) Calibrate the 2B NMS according to instructions located on the face of the test set. After calibration, turn K4 to the F1A position and insert input plug in line jacks.

(b) Calibrate the 3A NMS according to instructions shown in the lid of the test set. Make tests with 600 ohm input and C message weighting.

Step 3 - Turn amplifier potentiometer fully clockwise for maximum gain and measure noise.

Step 4 - The noise shall not exceed the following values:

(a) With a 2B NMS the requirement is 13 db (dial + meter reading). This is equivalent to 20 dba.

(b) With a 3A NMS the requirement is 26 dbRN (dial + meter reading).

4.04 (TEST D) - Amplifier 1000-Cycle Working Gain Adjustment

Step 1 - Release the shaft lock nut and turn the amplifier potentiometer fully counter-clockwise for minimum gain.

Step 2 - Make test set-up shown in Figure 1, 2, or 3 depending on the test equipment used.

Step 3 - Apply 1000-cycle testing power, adjusted to a loss equal to the value of the required gain, to the amplifier input (see circuit order card or other information). Set the TMS for reading O dbm (black O).

NOTE: When using a 5A attenuator and the required gain includes tenths of a db, set attenuator for a loss equal to the next greater whole db.

Example: for 7.7 db gain, set 5A for 8 db loss.

Step 4 - Adjust the amplifier potentiometer to give O dbm on the TMS.

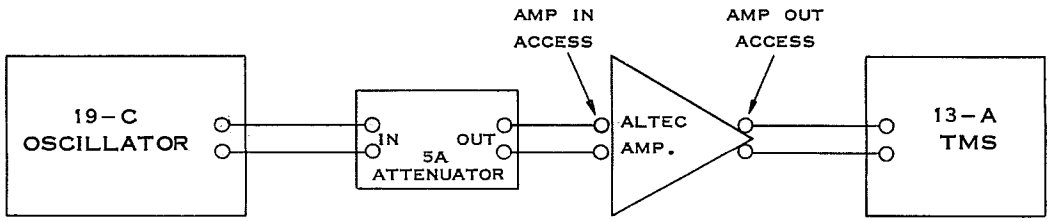
NOTE: When the 5A attenuator is used and the required gain includes tenths of a db (see Step 3), adjust the amplifier potentiometer to give a loss on the TMS equal to the difference between the required gain and the attenuator setting.

Example: (8 db loss in attenuator)-(7.7 db required gain) = 0.3 db loss. Set to a loss of 0.3 db on the TMS.

Step 5 - Tighten the shaft lock nut, making sure that this operation does not change the gain setting.

5. RECORDS

5.01 All measurements should be recorded for future reference.



A299.499
C43.912
E37.927
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FIGURE 1

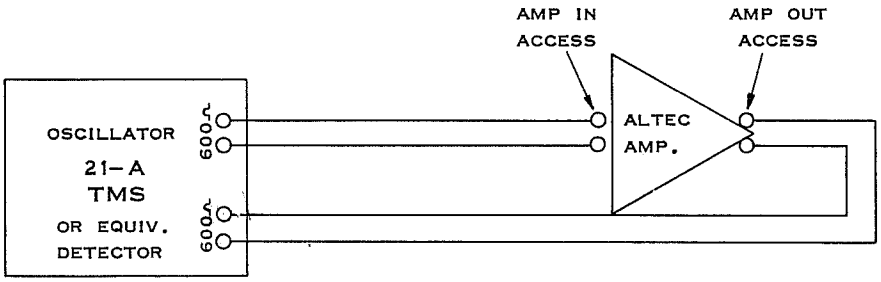

FIGURE 2

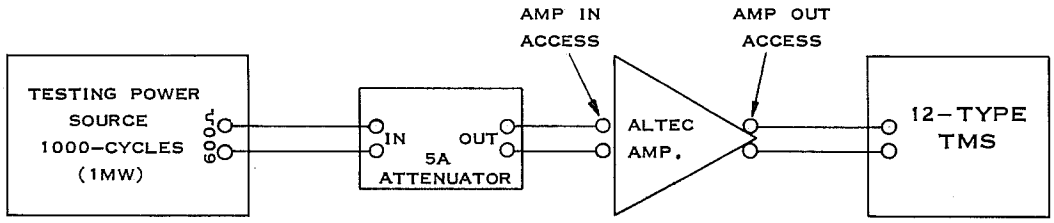

FIGURE 3

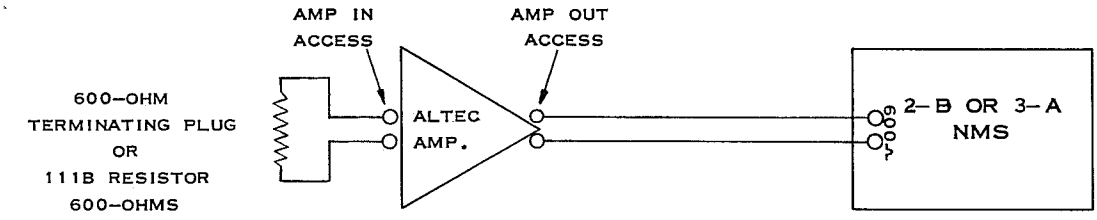

FIGURE 4

NOTE – USE PATCH CORDS OR WIRE TO CONNECT EQUIPMENT.

TRANSMISSION MEASURING SET (TMS)
NOISE MEASURING SET (NMS)