KS-16547-L1 AMPLIFIER
TRANSMISSION TESTS

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1. GENERAL

1.01 This practice outlines the transmission tests to be performed on the KS-16547, L1 Amplifier. The amplifier is designed for use as a distribution amplifier in the 3A, 4A, 6A, 8A and 9A Announcement Systems as well as for Central Office Group Alerting Systems.

1.02 The transmission tests outlined in this practice should be performed on the service order. Routine or scheduled transmission tests should not normally be required. However, when the system in which the amplifier is used is tested, the amplifier performance should be checked by measuring the audio output power and frequency response in accordance with the procedure outlined in this practice.

1.03 For the purpose of these tests, the input and output connections should be removed from the amplifier. The power connections should remain on terminal board TB3.

2. RECOMMENDED TEST EQUIPMENT

2.01 The following testing equipment is satisfactory for use in making these amplifier tests. If equipment is available which is electrically equivalent to an item in this list, it will be satisfactory for use.

200CD Oscillator (Hewlett-Packard)	RCA Voltohmyst — Model Junior or Senior
201C Oscillator (Hewlett-Parkard)	304H DuMont Oscilloscope
21A TMS	400-type VTVM (Hewlett-Packard)
AC Voltmeter	KS-15560 or KS-15750 Tube Tester

2.02 There are two points to keep in mind when making transmission tests. The first is that ***GOOD*** equipment should be used and second, it should be ***CALIBRATED PROPERLY.*** If these two things are observed, you are on your way toward making some good tests. Remember, ***POOR TESTS ARE A WASTE OF TIME, EFFORT, AND MONEY.***

2.03 All ac operated test equipment should be allowed to warm up sufficiently. This is important since it has a bearing on the stability of the equipment and accuracy of the test.

2.04 The dc socket voltages should be measured with an RCA Voltohmyst so as not to load the circuit down. The grid and plate circuits, in many instances, are high impedance. Hence, if a volt-ohm-milliammeter is used, erroneous readings will be obtained. This is true even with a 20,000 ohms per volt meter.

2.05 The frequency response of the 21A TMS should be checked over the range of frequencies it is to be used. The response should meet the requirements set forth in the practice for the test set. This will insure better results when making the gain-frequency test.

3. AC LINE VOLTAGE

3.01 The ac line voltage should be measured with a suitable ac voltmeter at the terminals of the amplifier. If possible, the voltage should be measured during the heavy and light power load periods so as to determine the magnitude of the voltage fluctuations. ***REQUIREMENT:*** The voltage should measure 120 ± 10 volts. The ac voltage should be measured at terminal board TB3 of the amplifier as shown in Table I.

TABLE I

TERMINAL NO.	CONNECTION
17	Ungrounded side of ac line
18	Grounded side of ac (110-120 volts)
19	Grounded side of ac (120-130 volts)

4. ELECTRON TUBE TEST

4.01 All electron tubes should be tested using a standard KS tube tester. The tubes should meet all their requirements.

5. GAIN-FREQUENCY TEST

5.01 The test setup for measuring the gain of the amplifier is shown in Fig. 1. Chart I outlines the step procedure to be followed when

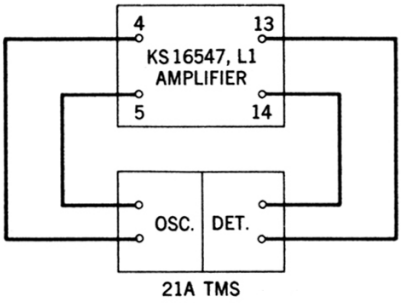

Fig. 1 – Test Setup for Gain-Frequency Test

making this test. The oscillator output in Step 6 of the procedure is measured to insure that the amplifier will deliver the proper output with the minimum input voltage requirement. The procedure may vary slightly depending on the testing equipment used.

CHART I

STEP	PROCEDURE	REMARKS
1	Connect 21A and amplifier to ac power.	
2	Set OSC to 1 kc.	
3	Connect circuit as shown in Fig. 1.	
4	Turn GAIN control of amplifier to maximum.	

CHART I (Cont)

STEP	PROCEDURE	REMARKS
5	Adjust OSC output until DET (TMS) reads +30 dbm.	
6	With OSC setting same as in Step 5 above, patch OSC OUT jacks to DET IN jacks. Read DET (TMS).	***Requirement:*** −33 ± 2 dbm
7	Reconnect circuit as shown in Fig. 1.	Don't change OSC output.
8	Adjust OSC for 50 and 10,000 cycles. Record DET (TMS) readings.	***Requirements:*** See Table II

TABLE II

FREQUENCY	AMPLIFIER OUTPUT
50 cycles	$+30\ ^{+0}_{-3}$ dbm
1,000 "	+30 dbm
10,000 "	$+30\ ^{+1}_{-2}$ dbm

6. NOISE TEST

6.01 The amplifier noise should be measured in accordance with the test setup shown in Fig. 2. A DET (TMS) is used to measure the unweighted noise instead of the 2B or 3A Noise Measuring Set for the sake of convenience. The readings obtained are arbitrary readings and are not true noise levels since a DET (TMS) is not a direct replacement for a noise measuring set. Chart II outlines the step procedure for the test.

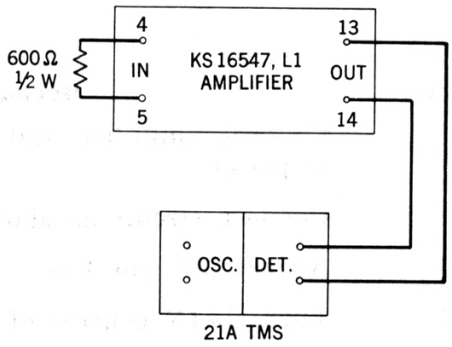

Fig. 2 – Test Setup for Noise Test

CHART II

STEP	PROCEDURE	REMARKS
1	Connect the 21A and amplifier to ac power.	
2	Connect circuit as shown in Fig. 2.	
3	Turn GAIN control of amplifier to maximum.	
4	Read DET (TMS).	***Requirement:*** −37 dbm, max.

7. DISTORTION TEST

7.01 The distortion test should be made using the test setup shown in Fig. 3. Chart III outlines the step procedure for the test.

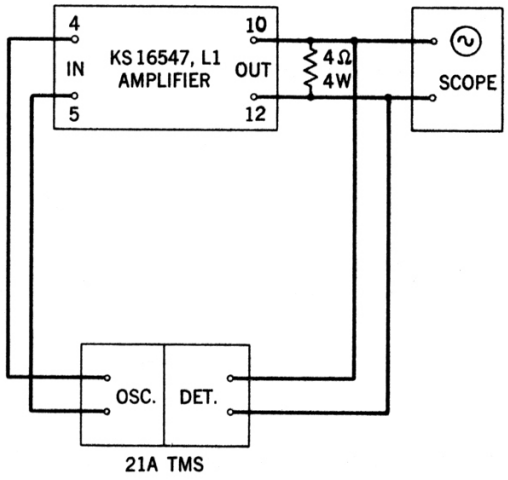

Fig. 3 – Test Setup for Observing Distortion

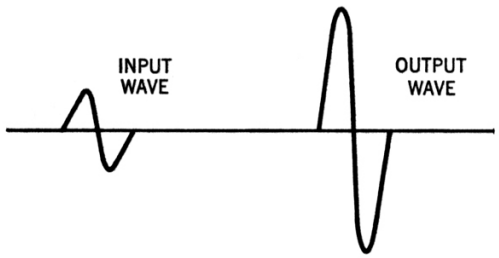

Fig. 4 – Comparison of Input and Output Waveshapes (Distortion)

CHART III

STEP	PROCEDURE	REMARKS
1	Connect amplifier and test equipment to ac power.	
2	Connect circuit as shown in Fig. 3.	
3	Adjust OSC for 1 kc.	
4	Turn GAIN control of amplifier to maximum.	
5	Adjust OSC output for +14 db on DET (TMS).	
6	Observe output waveshape.	*Requirement:* Output waveshape shall appear the same as input wave except for amplitude. See Fig. 4.