BSM # 8218

KS-16622-L1 AMPLIFIER
TRANSMISSION TESTS

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1. GENERAL

1.01 This section outlines the transmission tests and requirements for the KS-16622, L1 Amplifier. This amplifier may be used on high quality distribution systems requiring up to 30 watts output. The section is reissued to include the figures which were omitted in the previous issue.

2. RECOMMENDED TEST EQUIPMENT

2.01 The following test equipment is satisfactory for use in making these amplifier tests. Any other equipment available which is electrically equivalent to an item in this list can, of course, be used.

200CD Oscillator (Hewlett-Packard)	2B or 3A Noise Measuring Set
201C Oscillator (Hewlett-Packard)	304H DuMont Oscilloscope
21A TMS (J94021A)	400-Type VTVM (Hewlett-Packard)
Volt-Ohm-Milliammeter KS-14510	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*** test 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 frequency response of the oscillator 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 oscillator. The oscillator output should be constant at all frequencies or a correction factor should be applied.

3. AC LINE VOLTAGE TEST

3.01 The ac line voltage should be measured with a suitable ac voltmeter at the terminals of the amplifier. These terminals are located on the center terminal strip under the front

cover. The connections should be made in accordance with Table I below.

TABLE I

TERMINAL NO.	CONNECTION
19	Grounded side of ac (120-130V)
20	Grounded side of ac (110-120V)
21	Ungrounded side of ac
22	Chassis Ground

If possible, the voltage should be measured during the heavy and light power load periods to determine the line voltage fluctuations.

Requirement: The voltage should measure 120 ± 10 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-frequency response is shown in Fig. 1. Chart I outlines the step procedure to be followed when making the test. The procedure may vary slightly depending on the testing equipment used.

5.02 If a 21A TMS is used, the full output of the amplifier will exceed the range of the detector. Hence, it will be necessary to pad the output of the amplifier. Fig. 2 shows a suggested 40 db, 600-ohm pad which may be used for this purpose. Actually, any pad value may be used which will bring the amplifier output within range of the DET(TMS). Non-inductive type resistors should be used so as not to impair the over-all response measured by the DET(TMS). The suggested pad should be capable of dissipating at least 30 watts of power. A 15-watt resistor manufactured by the Ohmite or Ward-Leonard Company, or equivalent, may be used for R1. A one-watt resistor should be used for R2. The pad should be accurately measured to determine its loss.

5.03 The amplifier should be grounded for this test. This should reduce the possibility of induced noise in the amplifier.

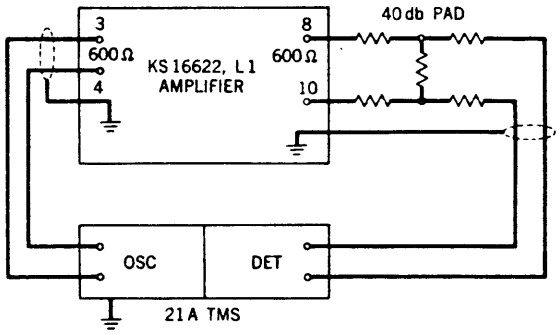

Fig. 1 — Test Setup for Gain-Frequency Test

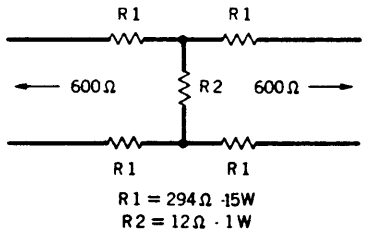

Fig. 2 — Output Pad

6. NOISE TEST

6.01 The noise test should be made in accordance with the test setup shown in Fig. 3. The procedure is outlined in Chart II. ***FLAT WEIGHTING*** should be used with the 2B or 3A Noise Measuring Set.

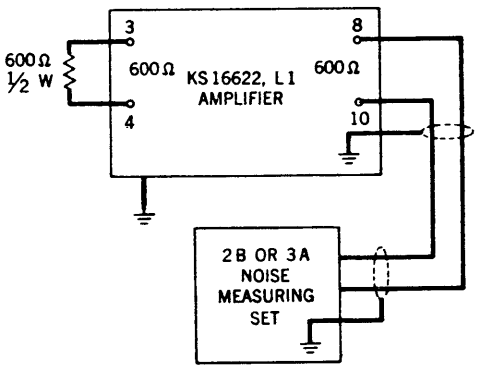

Fig. 3 — Test Setup for Noise Test

CHART I

Step	Procedure	Remarks
1	Connect the amplifier and 21A TMS to ac power.	
2	Connect circuit as shown in Fig. 1.	
3	Adjust OSC for 1KC.	
4	Turn both ATTENUATORS of amplifier to 0 position.	This is maximum gain.
5	Adjust OSC output until DET(TMS) reads 0 dbm.	
6	With OSC setting same as in Step 5, patch OSC OUT jacks of 21A TMS to DET IN jacks. Read DET(TMS).	***Requirement:*** -21.5 ± 2.0 dbm.
7	Without changing output of OSC, reconnect circuit as shown in Fig. 1.	
8	Sweep frequency dial of OSC SLOWLY from 20 to 20KC and observe DET(TMS) reading.	***Requirement:*** Output for all frequencies should be 0 ± 1 dbm.

CHART II

Step	Procedure	Remarks
1	Connect amplifier to ac power.	
2	Connect circuit as shown in Fig. 3.	
3	Turn both ATTENUATORS of amplifier to 0 position.	This is maximum gain.
4	Set noise meter for ***FLAT WEIGHTING.***	
5	Set HUM ADJ control of amplifier for minimum noise on noise meter.	
6	Read noise set.	***Requirement:*** Reading should not exceed 45 dbrn.

7. DISTORTION TEST

7.01 The distortion of the amplifier should be observed in accordance with the test setup shown in Fig. 4. Chart III outlines the step procedure for this test.

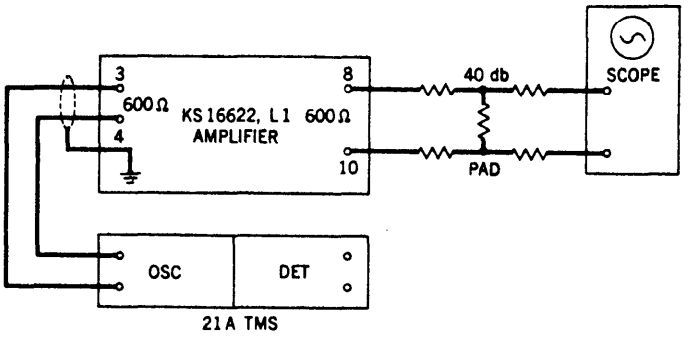

Fig. 4 — Test Setup for Observing Distortion

CHART III

Step	Procedure	Remarks
1	Connect amplifier, 21A TMS and oscilloscope to ac power.	
2	Connect circuit as shown in Fig. 1.	
3	Adjust OSC for 1KC.	
4	Turn both ATTENUATORS of amplifier to 0 position.	
5	Adjust OSC for DET(TMS) reading of 0 dbm.	
6	Without changing settings of OSC, connect circuit as shown in Fig. 4.	
7	Observe waveshape on oscilloscope.	The output wave shall be the same as the input wave except for amplitude. See Fig. 5.

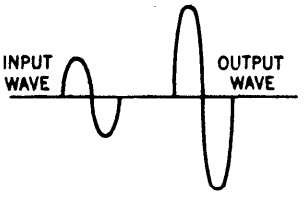

Fig. 5 — Comparison of Input and Output Waveshape (Distortion)