

**REPLACING PAGE ADDENDUM**  
*Filing Instructions:*

1. REMOVE FROM THE SECTION THE PAGES NUMBERED THE SAME AS THOSE ATTACHED TO THIS PINK SHEET.
2. INSERT THE ATTACHED PAGES INTO THE SECTION IN THEIR PLACE.
3. PLACE THIS PINK SHEET AHEAD OF PAGE 1 OF THE SECTION.

**KS-19602 L1 AMPLIFIER**

**TESTS**

**1. GENERAL**

**1.001** This addendum supplements Section 024-178-500, Issue 1. The attached page must be inserted in the Section in accordance with the filing instructions above.

**1.002** This addendum is issued to revise the KS-19602 L1 Amplifier, Schematic Diagram.

The following change applies to Part 1 of the Section:

- (a) Fig. 6—Revised

**Attached:**

**Page 5, February 1969, revised**

KS-19602, L1 AMPLIFIER  
TESTS

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TABLE A	
RECOMMENDED TEST INTERVALS	
TEST	INTERVAL
Electron Tube Test	3 months
Gain-Frequency Test	3 months
Noise Test	3 months
Distortion Test	3 months

**1. GENERAL**

**1.01** This section outlines the transmission tests for the KS-19602, L1 amplifier. Information on the recommended frequency of the transmission tests is also included. The KS-19602, L1 amplifier may be used on high quality distribution systems requiring up to 25 watts output. A schematic diagram of the amplifier is shown in Fig. 6.

**1.02** In addition to the tests discussed herein, other tests may be required as a result of trouble reports. The particular tests required in such cases must be determined by the character of the reported trouble.

**2. TEST INTERVALS**

**2.01** Table A gives the recommended test intervals. Each of the tests should be performed before the amplifier is initially placed in service.

**3. APPARATUS REQUIRED**

**3.01** The following apparatus is required for use in performing the tests. Any other equipment available which is electrically equivalent to that listed below can be substituted.

- 1 — KS-15560 or KS-15750 Tube Tester
- 1 — 21A Transmission Measuring Set (TMS) (J94021A)
- 1 — 3A Noise Measuring Set
- 1 — 304H DuMont Oscilloscope
- 1 — Output Pad as described in 6.01
- 1 — 600-ohm Resistor, Type 106A
- 2 — W3AE Shielded Cord equipped with a 241A Plug

*Note:* A Hewlett-Packard 200CD or 201C oscillator and a 400-type VTVM may be used in lieu of the 21A TMS.

**4. PREPARATION**

**4.01** All ac operated test equipment should be allowed to warm up sufficiently before beginning any tests. This is important since it has a bearing on the stability of the equipment and accuracy of the tests. All test equipment should be calibrated before beginning tests.

**4.02** A spare amplifier should be patched in place of the one under test. If a spare amplifier is not available, arrangements must be

made with the subscriber for release of the circuit. The subscriber should be informed of the expected duration of the tests and notified upon their completion.

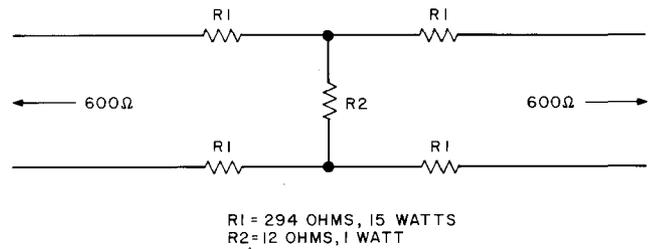
**5. ELECTRON TUBE TEST**

**5.01** All electron tubes should be tested using a KS-15560 or KS-15750 tube tester.

**6. GAIN-FREQUENCY TEST**

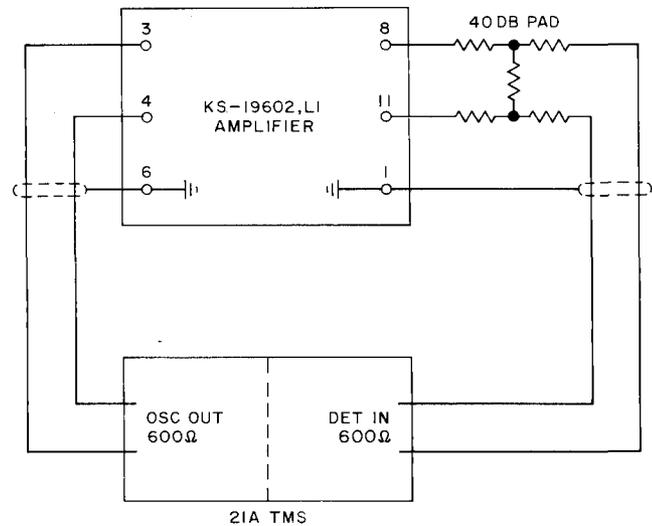
**6.01** If a 21A TMS is used, the full output of the amplifier will exceed the range of the detector. Hence, it will be necessary to pad the output of the amplifier. Fig. 1 shows a suggested 40-db, 600-ohm pad which may be used for this purpose. Actually, any pad value may be used which will bring the amplifier-output within the range of the TMS detector. Noninductive resistors should be used so as not to impair the overall measured response. The suggested pad should be capable of dissipating at least 25 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 21A TMS can be used to measure the pad to determine its loss. Procedures for using the 21A TMS to make this measurement are found in Section 103-221-100.

**6.02** The test setup for the gain-frequency test is shown in Fig. 2. The amplifier should be grounded to reduce the possibility of induced noise. The gain-frequency test is performed as follows:



R1 = 294 OHMS, 15 WATTS  
R2 = 12 OHMS, 1 WATT

**Fig. 1 — Output Pad**



**Fig. 2 — Test Setup for Gain-Frequency Test**

STEP	PROCEDURE
1	Connect the amplifier and 21A TMS to ac power.
2	Connect circuit as shown in Fig. 2.
3	Adjust TMS output for 1 kc.
4	Turn both attenuators on amplifier to 0 position for maximum gain.
5	Adjust TMS oscillator output until TMS detector reads 0 dbm.
6	With TMS oscillator setting the same as in Step 5, patch OSC OUT jacks of TMS to DET IN jacks.
<b>Requirement:</b> TMS reads $-26 \pm 2$ dbm.	

STEP	PROCEDURE
7	Without changing output of TMS, reconnect circuit as shown in Fig. 2.
8	Sweep frequency dial of TMS slowly from 20 cycles to 20 kc while observing TMS detector reading.  <b>Requirement:</b> Reading for frequencies 20 to 15,000 cycles should be $0 \pm 0.5$ db. Reading for frequencies 15,000 to 20,000 cycles should be $0 + 0.5$ or $-1.0$ db.

## 7. NOISE TEST

7.01 The test setup for this test is shown in Fig. 3. In the procedures which follow, FLAT WEIGHTING should be used with the 3A noise measuring set. The amplifier should be grounded to reduce the possibility of induced noise.

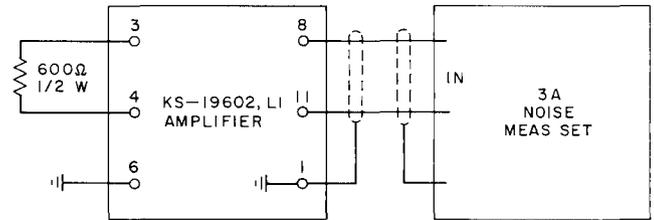


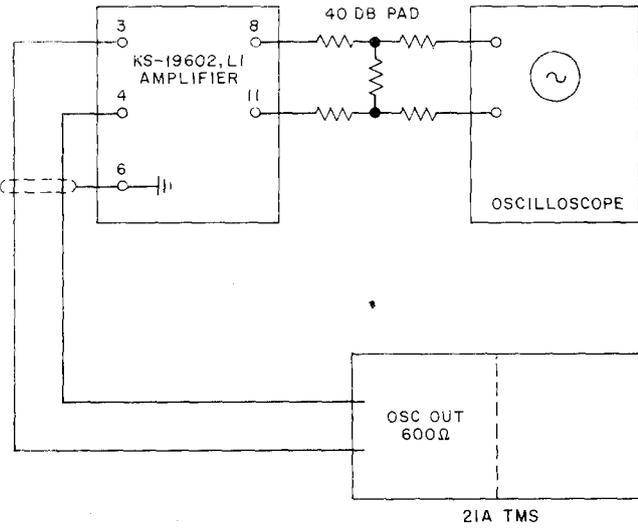
Fig. 3 — Test Setup for Noise Test

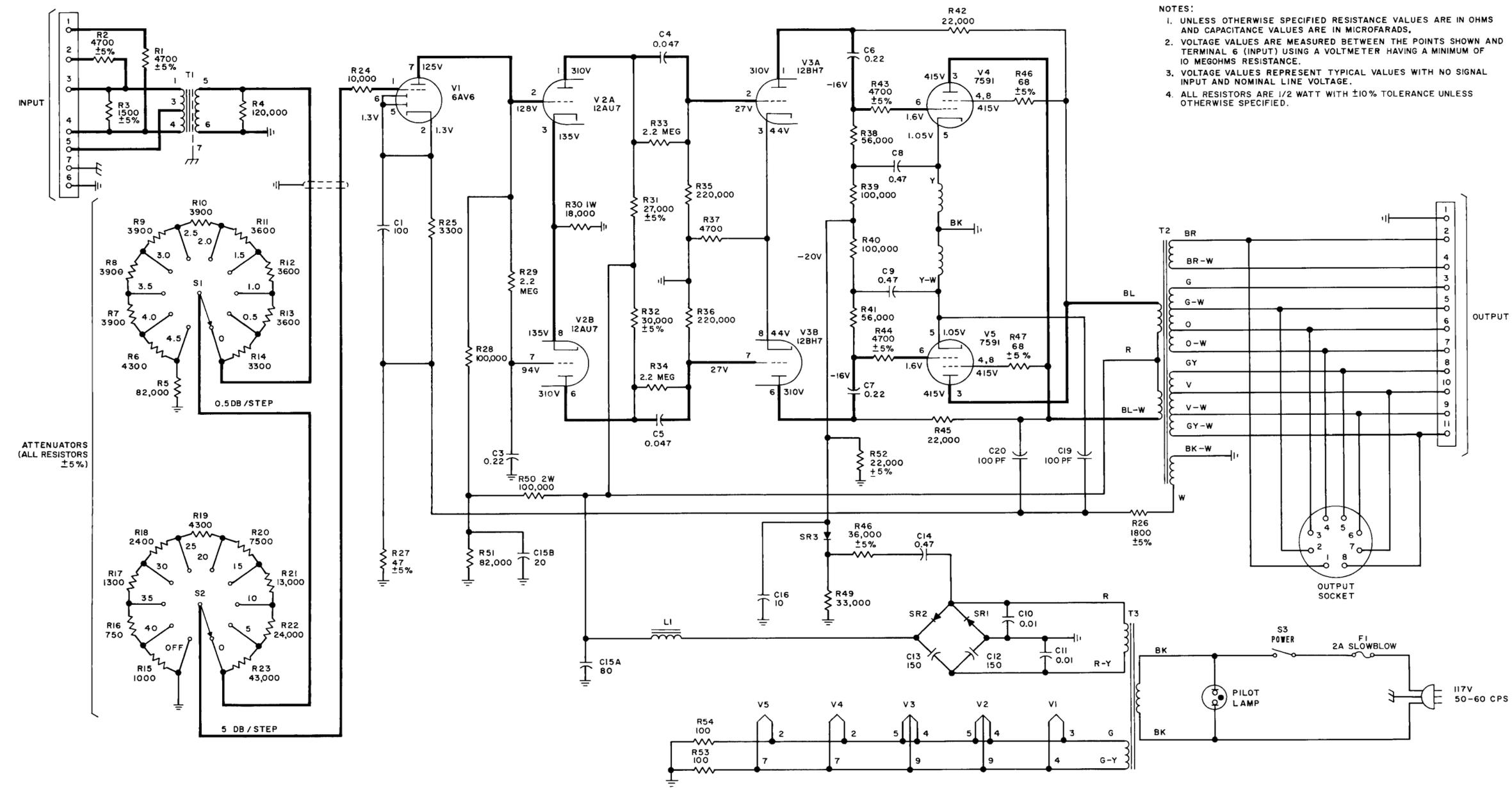
STEP	PROCEDURE
1	Connect amplifier to ac power.
2	Connect circuit as shown in Fig. 3.
3	Turn both attenuators on amplifier to 0 position for maximum gain.
4	Set noise measuring set for FLAT WEIGHTING.  <b>Requirement:</b> Reading should not exceed 46 dbrn.

## 8. DISTORTION TEST

8.01 The test setup for this test is shown in Fig. 4. The distortion test is made with the amplifier set at maximum gain. The test is performed as follows:

STEP	PROCEDURE
1	Connect amplifier, TMS, and oscilloscope to ac power.
2	Connect circuit as shown in Fig. 2.
3	Adjust TMS output for 1 kc.
4	Turn both attenuators on amplifier to 0 position for maximum gain.
5	Adjust TMS oscillator output until TMS detector reads 0 dbm.

STEP	PROCEDURE
6	Without changing settings on TMS, connect circuit as shown in Fig. 4.
7	Observe waveshape on oscilloscope.
	<p data-bbox="370 436 1528 499"><i>Requirement:</i> The output wave shall be the same as the input wave except for amplitude. See Fig. 5.</p> <div data-bbox="565 541 1203 1073" style="text-align: center;">  </div> <p data-bbox="662 1129 1105 1161"><b>Fig. 4 — Test Setup for Distortion Test</b></p> <div data-bbox="565 1224 1203 1381" style="text-align: center;">  </div> <p data-bbox="565 1434 1203 1465"><b>Fig. 5 — Comparison of Input and Output Waveshape</b></p>



- NOTES:
1. UNLESS OTHERWISE SPECIFIED RESISTANCE VALUES ARE IN OHMS AND CAPACITANCE VALUES ARE IN MICROFARADS.
  2. VOLTAGE VALUES ARE MEASURED BETWEEN THE POINTS SHOWN AND TERMINAL 6 (INPUT) USING A VOLTMETER HAVING A MINIMUM OF 10 MEGOHMS RESISTANCE.
  3. VOLTAGE VALUES REPRESENT TYPICAL VALUES WITH NO SIGNAL INPUT AND NOMINAL LINE VOLTAGE.
  4. ALL RESISTORS ARE 1/2 WATT WITH  $\pm 10\%$  TOLERANCE UNLESS OTHERWISE SPECIFIED.

Fig. 6—KS-19602 L1 Amplifier, Schematic Diagram