KS-20425 AMPLIFIER SYSTEM

TESTS, ADJUSTMENTS, AND OPERATION

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1. GENERAL

1.01 This section outlines the tests and adjustments to be performed on the KS-20425 L1 ▶(Manufacture Discontinued)◀ Amplifier System ▶and KS-20425 L2 Amplifier System◀ and the operating procedures when used for wired music distribution systems.

1.02 This section is reissued to revise Fig. 1, 2, and 3 and to add information covering the L2 amplifier.

1.03 The tests outlined in this section should be made prior to turning the amplifier system over for service and also at yearly intervals. These tests may also be used to locate equipment troubles. If the tests indicate trouble, the entire KS-20425 Amplifier System should be returned to the repair center.

1.04 ▶The input monitoring amplifier is no longer used in the L1 Amplifier System. It was rendered inoperative as the result of certain changes required to improve the output balance of the amplifier.◀

2. RECOMMENDED TEST EQUIPMENT

2.01 The following items of test equipment, or equivalent, are required for tests on the KS-20425 Amplifier System:

(a) J94021A (21A) Transmission Measuring Set (TMS)

(b) J94003A (3A) Noise Measuring Set (NMS)

(c) 600-Ohm Resistor—1/2 Watt

(d) Cords equipped with 305A plugs or equivalent.

2.02 The amplifier covered in this section is a high-quality amplifier with broad frequency range. It is therefore necessary that testing techniques be used with care in order to obtain satisfactory results. Test equipment should be in good working condition and properly calibrated.

3. GAIN-FREQUENCY

3.01 The gain-frequency response of the KS-20425 Amplifier System should be measured in accordance with Chart 1.

CHART 1

GAIN-FREQUENCY TEST

APPARATUS:

1—J94021A (21A) Transmission Measuring Set (TMS) or equivalent

STEP	PROCEDURE
1	Using the front panel jacks, connect the equipment as shown in Fig. 1 with the PWR switch of the amplifier turned OFF.
2	Turn on the 21A TMS and allow warm-up time. Adjust OSC OUTPUT to −25 dBm at 1000 Hz.
3	Set the GAIN control on the amplifier to the maximum clockwise position.
4	Set the 21A DET INPUT to the +10 position.
5	Turn on the amplifier and read the 21A DET. ***Note:*** Test A is for the distribution amplifier, and Test B (L2 only) is for the monitoring amplifier. ***Requirement:*** Test A—The 21A DET should indicate +12 dBm ±2 dB. ***Requirement:*** Test B—The 21A DET should indicate −10 dBm ±2 dB. (This is the DET INPUT dial reading plus the meter indication.)
6	Sweep the 21A OSC frequency from 50 Hz to 10 kHz. ***Requirement:*** Test A—The gain should not change by more than ±0.7 dB from the 1000-Hz gain over the band of frequencies.

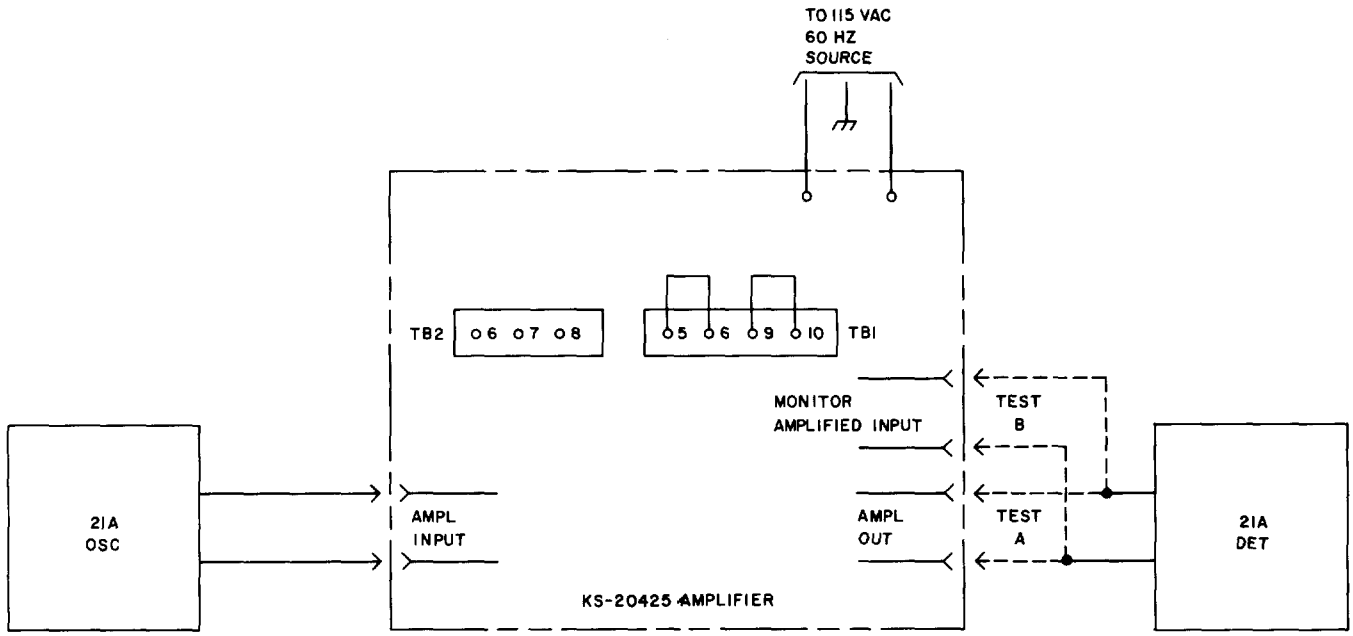

Fig. 1—Setup for Gain-Frequency Test for KS-20425 Amplifier System

4. NOISE

4.01 The noise of the KS-20425 Amplifier System should be measured in accordance with Chart 2.

CHART 2

NOISE TEST

APPARATUS:

1—J94003A (3A) Noise Measuring Set (NMS) or equivalent

1—600-Ohm Resistor

STEP	PROCEDURE
1	Connect the equipment as shown in Fig. 2 with the PWR switch of the amplifier on OFF.
2	Set the GAIN control on the amplifier to the maximum clockwise position.

CHART 2 (Cont)

STEP	PROCEDURE
3	Turn on the 3A NMS (or equivalent).
4	Calibrate the 3A NMS per Section 103-611-100.
5	Turn on the amplifier.
6	For the distribution amplifier, proceed to Step 7.
	For the monitoring amplifier, proceed to Step 11 ♦L2 only.♦
7	Set the FUNCTION selector to 600 Nm.
8	Set the DBRN switch to 85.
9	Connect the NMS to AMPL OUT (Test A) in Fig. 2.
10	Measure signal—NMS indication should not exceed 24 dBrn.
	♦STEPS 11 THROUGH 14 FOR L2 ONLY♦
11	Set the FUNCTION selector to BRDG.
12	Set the DBRN switch to 85.
13	Connect the NMS to MONITOR AMPL OUT (Test B) in Fig. 2.
14	Measure signal—NMS indication should not exceed 30 dBrn.

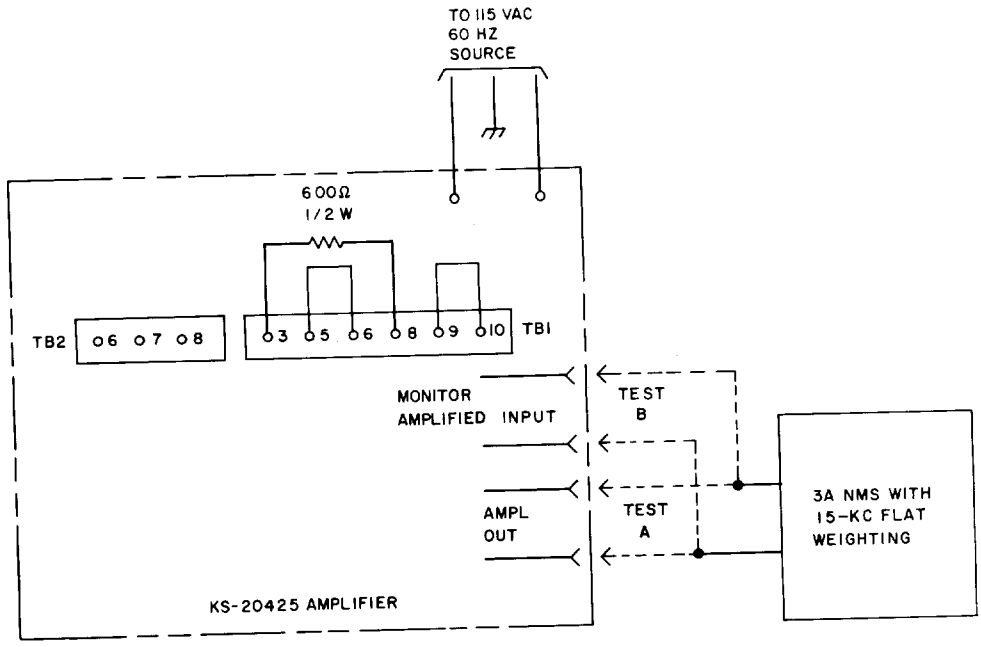

Fig. 2—Setup for Noise Test for KS-20425 Amplifier System

5. EQUALIZATION

Caution: If the preequalization tests outlined in Section 320-145-502 have not been met, do not proceed with the test in Chart 3.

5.01 When equalizing circuits more than one amplifier section in length, each amplifier section should be equalized separately. The section adjacent to the "sending end" should be equalized first. Each succeeding section should be equalized in tandem (series) with those previously equalized. When intermediate amplifiers are involved, the circuit should be equalized through the amplifier. This procedure should be followed through to the "receiving end" of the circuit.

5.02 The gain of the intermediate amplifiers should be adjusted to compensate for the equalized loss of the cable at 1000 Hz. The oscillator should remain at the "sending end" throughout the test in order to simplify the testing operations. Another reason for leaving the oscillator at the "sending end" is that slight corrections can be made in the equalization of each section, if necessary, in order to meet the overall loss-frequency requirements.

5.03 In some instances it may be necessary to make slight readjustments of intermediate equalizers in order to obtain the desired frequency response. All adjustments should be coordinated with the control office.

5.04 In most instances nonloaded cable pairs are used for program circuits. Where program loading is used, special equalizing procedures may be required. In these cases the proper lines of organization should be consulted for instructions on equalizing these facilities.

5.05 In order to make these tests, it will be necessary to establish a talking circuit between the sending and receiving ends of the circuit. A message grade circuit will be satisfactory for this purpose.

CHART 3

5- OR 8-KHZ EQUALIZATION TEST

The procedure for equalizing a single section of a 5- or 8-kHz local program circuit is given below. If more than one section is to be equalized, see 5.01.

Caution: Do not proceed if preequalization requirements have not been met.

APPARATUS:

1—111C or 119C Repeat Coil

2—J94021A (21A) Transmission Measuring Set

STEP	PROCEDURE
1	Strap input transformer on the KS-20425 amplifier for 150 ohms (Z wiring).
2	Connect the equipment as shown in Fig. 3. Note the connection to the repeat coil at the sending end.
3	Set the upper selector switch on the amplifier to the LINE position.
4	Set the lower selector switch on the amplifier to 5 kHz−1 or 8 kHz−1 depending on the required service.
5	Set the COARSE control on the amplifier to the maximum counterclockwise position (zero resistance).
6	Set the FINE control on the amplifier to the maximum clockwise position (100 ohms).
7	Adjust the sending oscillator for 5- or 8-kHz at −5 dBm. (The 21A OSC is a stable instrument whose output power does not change with frequency.)
8	Adjust the GAIN control on the amplifier for an output level of −5 dBm at AMPL OUT jack at receiving end.
9	Adjust the sending OSC for 50 or 80 Hz −5 dBm.

CHART 3 (Cont)

STEP	PROCEDURE
10	Adjust the amplifier FINE control and COARSE control for a −5 dBm reading at receiving end.
11	Adjust the sending OSC for 5 or 8 kHz. If the reading at receiving end has changed more than 0.3 dB, repeat the procedure starting with Step 8.
12	Check the receiving level at intermediate frequencies of 1 kHz and either 3 kHz (for 5 kHz equalization) or 6 kHz (for 8 kHz equalization). ***Requirement:*** The level at the intermediate frequencies should be within the ±1 dB tolerance. ***Note:*** At this point one of three conditions typically exists. The conditions and their remedies are as follows. ***Condition (a):*** The levels at the two intermediate frequencies are within ±1 dB of the 50- or 80-Hz level. This meets the requirement.
13	If condition (a) is not met, see condition (b) or (c) whichever is more applicable. ***Condition (b):*** A hump occurs in the response at one or both of the intermediate frequencies checked. ***Remedy (b):*** Sweep through the frequency band of interest and note the magnitude of the hump. If lower selector switch on the amplifier is at 5 kHz−1 or 8 kHz−1, rotate it one step clockwise and repeat the procedure starting with Step 7. If it is at 5 kHz−2 or 8 kHz−2, rotate it one step counterclockwise, set upper selector switch to the DROP position, and repeat the procedure starting with Step 8. ***Condition (c):*** A dip occurs in the response curve at one or both of the intermediate frequencies checked. ***Remedy (c):*** Sweep through the frequency band of interest, and note the magnitude of the dip. If the magnitude of the dip exceeds that of the hump found with the preceding switch combination, then return to that combination and try the compromise method described below. If the magnitude of the dip is less than that of the hump, then proceed directly to the compromise method below. **COMPROMISE METHOD** If a hump or dip which does not exceed 2 dB in magnitude occurs in the response, proceed with Step 15. If it is greater than 2 dB, proceed to Step 19.
14	Rotate lower selector switch to the position that gives the smaller response deviation.

CHART 3 (Cont)

STEP	PROCEDURE
15	Using the COARSE and FINE controls, reset the 50- or 80-Hz level to equal the 5- or 8-kHz level plus or minus one half the magnitude of the hump or dip, respectively (increase level for dip and decrease level for hump). ***Note:*** This adjustment will yield a response characteristic with deviations as great as 1 dB.
16	Check the response at the required intermediate frequencies.
17	If the compromise method fails to yield satisfactory results, proceed to Step 18.
	EQUALIZATION WITH Y WIRING
18	Strap the input transformer for 600 ohms (Y wiring). Remove the Z wiring from the input transformer.
19	Starting with Step 3, repeat the equalization procedure.
20	When satisfactory equalization has been obtained, record all settings.

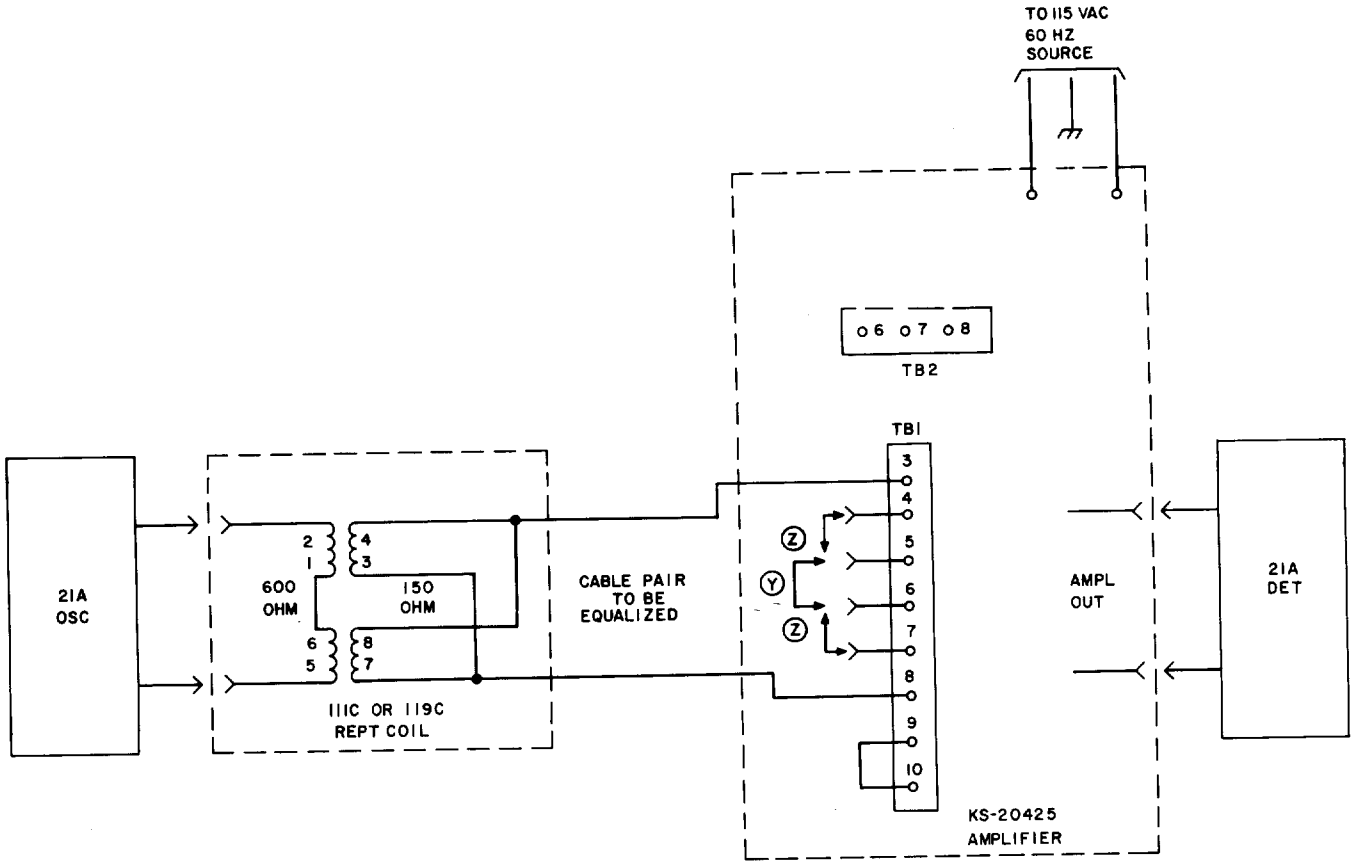

Fig. 3—Test Setup for Equalizing a Single Section Using the KS-20425 Amplifier System