COLLINS

instruction book

Cedar Rapids Division | *Collins Radio Company, Cedar Rapids, Iowa*

26U-2
Stereo Peak Limiter

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The equipment described herein is sold under the following guarantee:

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(C) Date placed in service
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(E) Nature of trouble
(F) Cause of trouble if known
(G) Part number (9 or 10 digit number) and name of part thought to be causing trouble
(H) Item or symbol number of same obtained from parts list or schematic
(I) Collins number (and name) of unit subassemblies involved in trouble
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(A) Quantity required
(B) Collins part number (9 or 10 digit number) and description
(C) Item or symbol number obtained from parts list or schematic
(D) Collins type number, name and serial number of principal equipment
(E) Unit subassembly number (where applicable)

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26U-2
Stereo Peak Limiter

Cedar Rapids Division | Collins Radio Company, Cedar Rapids, Iowa
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Figure 1-1. 26U-2 Stereo Peak Limiter

section 1

general description

1.1 Purpose of Instruction Book.

The instruction book describes the installation, adjustment, operation and maintenance of the 26U-2 Stereo Peak Limiter. See figure 1-1.

1.2 Purpose of Equipment.

The 26U-2 Stereo Peak Limiter controls the peak amplitude of audio-frequency signals. In transmitter applications, it will prevent overmodulation by limiting the loud audio passages. When used in conjunction with recording equipment or public address systems, it prevents overloading. See block diagram figure 1-2 for application. The 26U-2 is capable of 40-db gain and may be used as a straight amplifier.

1.3 Description.

The 26U-2 mounts in any standard 19-inch relay rack or cabinet. Vertical mounting space of 10-1/2 inches is required. The front portion contains a 16-1/2 by 1-7/8-inch panel that is hinged at the bottom. Two meters along with the meter function switch, and a 0 VU REFERENCE switch are located on the front of the panel. External connections are made at the rear of the unit, which include two barrier strips and an a-c connector. The panel and mounting angles are finished in Collins gray enamel and the chassis is chromate dipped.

The 26U-2 consists of two audio peak limiters in a single package. Each section consists of a push-pull variable gain input stage, a push-pull interstage voltage amplifier, and a push-pull output stage. A bias rectifier provides bias to regulate the gain of the input stage. A self-contained power supply provides the B+ and filament voltages. Each section can operate independently or can be combined for stereo operation. The two meters indicate the functioning of three internal circuits for each channel: INPUT; G.R. (gain reduction); and OUTPUT. In addition, the meters can be switched to two external circuits: G.R. EXT (External) and EXT audio. The two G.R. EXT circuits are included so that the gain reduction of associated circuits can be measured. The EXT audio metering circuit is an extra feature that can be used to measure audio levels in other broadcast audio equipment.

1.4 Equipment Supplied.

The equipment supplied under Collins part number 522-3237-00, consists of the 26U-2 Stereo Peak Limiter complete with tubes, rectifiers (see table 1-1), fuse and a-c plug.

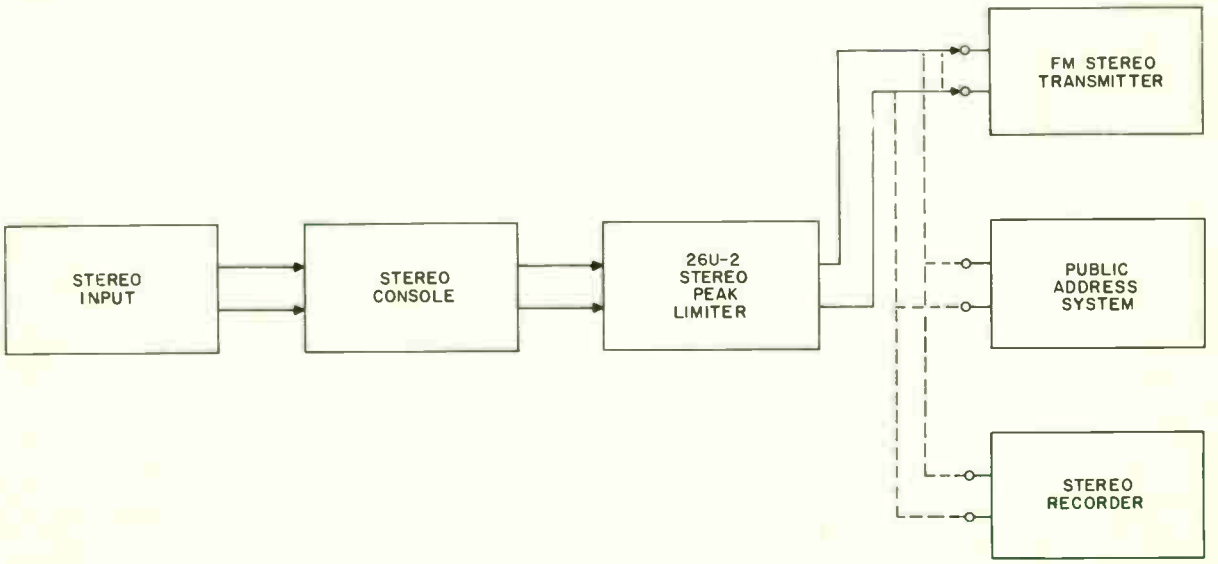

Figure 1-2. 26U-2 Stereo Peak Limiter, Application Block Diagram

TABLE 1-1
TUBE AND RECTIFIER COMPLEMENT

QUANTITY	TYPE	APPLICATION
2	GL-6386	Variable gain input stage
2	12AU7	Interstage voltage amplifier
4	6V6-GTA	Output amplifier
2	6AL5	Bias rectifier
2	0A2	Voltage regulator
4	1N3256	Power rectifier
2	1N459	Blocking diode

1.5 Specifications and Performance Data.

Type of service . . . Continuous unattended operation

Size . . . . . 10-1/2 inches high, 19 inches wide, 10-1/4 inch total depth (9-1/4-inch behind panel)

Weight . . . . . 35 lb (16 kg)

Audible noise . . . . None

Number of units . . . One

Ambient temperature range. . . . . 0°C to +45°C

Ambient humidity range. . . . . Up to 95%

Altitude. . . . . Up to 10,000 feet

Shock conditions . . . Normal handling and transportation

Vibration conditions . Normal handling and transportation

Power source . . . . 115 or 230 volts a-c, 50/60 cycles, single phase. (150 watts at 115 voltage) shipped wired for 115 volts

Input . . . . . 600 ohms, bridged T (ungrounded)

Input level . . . . . -20 dbm to +20 dbm

NOTE

0 dbm equals one milliwatt across 600 ohms.

Output . . . . . 600 ohms Bridged T (ungrounded)

Output level . . . . . -20 dbm to +20 dbm

Response . . . . . ±1.5 db, 50 to 15,000 cps

Distortion. . . . . 1.5% maximum

Output noise. . . . . -50 dbm or less

Crosstalk . . . . . 60 db minimum

Compression ratio . 12 to 1 first 10 db above threshold (See figure 1-3.) (slow release time)

Attack time . . . . . Adjustable 2.0 to 5.0 milliseconds

Release time . . . . Adjustable 1/2 to 3 seconds for 63% recovery

Gain . . . . . 40 db

Controls

Panel mounted . . . Meter Function switch 0 VU REFERENCE

Subpanel controls. . Input level (2)
Output level (2)
Gain Reduction Meter Zero (2)
Gain Reduction Balance (2)
Stereo Mono
Power ON-OFF

Rear chassis controls . . . . . Attack Time (2)
Release Time (2)

Metering . . . . . Two 3-1/2-inch VU meters which can be switched to measure input level, external gain reduction, gain reduction, output level, and external level.

1.6 Fuse.

The 26U-2 is equipped with a 2-ampere 250-volt, receptacle mount fuse with test point in cap, Slo-Blo fuse. Change to a 1-ampere fuse when reconnecting for 230-volt operation.

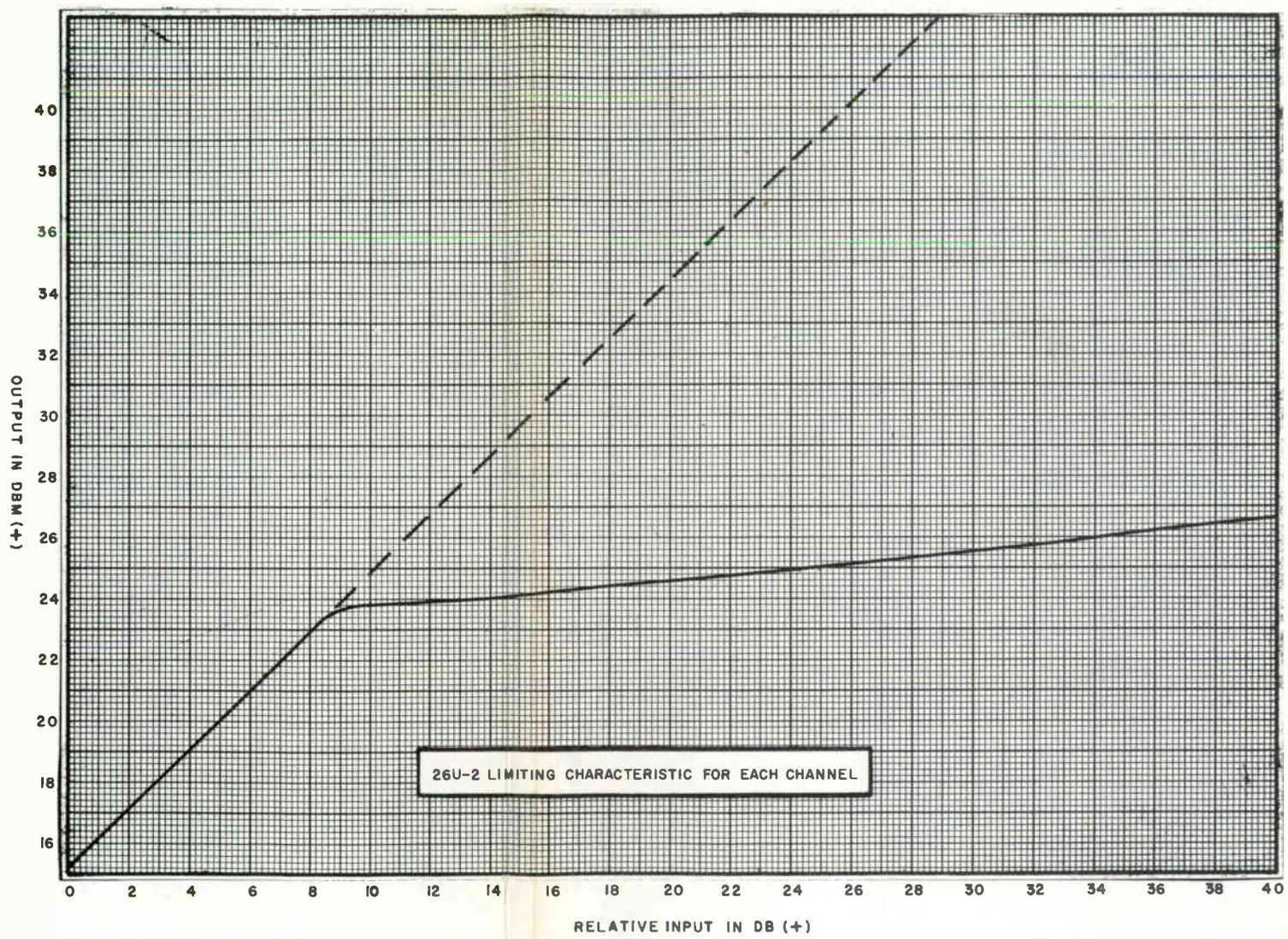

Figure 1-3. 26U-2 Stereo Peak Limiter, Limiting Characteristic Curve

section 2

installation

2.1 Unpacking.

Remove all packing material and search for small packages. Inspect the unit for loose screws or bolts. Be certain that all controls work properly. All claims for damage should be filed promptly with the transportation company. If a claim for damage is to be filed, the original packing case and material must be preserved.

2.2 Mounting.

a. Place the unit in position in a standard 19-inch relay rack cabinet.
b. Secure the unit with hexagonal or roundhead screws and flat washers.
c. Place tubes in sockets.

2.3 Connections.

2.3.1 POWER CONNECTIONS.

When shipped, the unit is connected for 115-volt operation. If 230-volt operation is desired, reconnect the primary of the power transformer as shown on the main schematic diagram (figure 7-1). This puts the two halves of the primary in series. Change to a 1-ampere fuse when reconnecting for use with 230-volts.

2.3.2 AUDIO CONNECTIONS.

All audio connections are made to the barrier-type terminal strip location at the back of the unit near the bottom edge. Use shielded wire for all audio connections to minimize hum pickup. The input and output impedances of the 26U-2 are 600 ohms.

2.3.2.1 INPUT. Under normal conditions the 26U-2 can be fed from a floating input because the input circuit is not grounded. Connect the input line to terminals 1 and 2 of TB1 and TB2.

2.3.2.2 OUTPUT. Under normal conditions the 26U-2 can be fed into a nongrounded load because the output circuit is not grounded. If used in this manner, the center tap of the transmitter input transformer must not be grounded.

2.3.3 EXTERNAL METER CONNECTIONS.

Meters M1 and M2 can meter two external circuits. METER FUNCTION switches S1A, S1B, S1C, and S1D, has two positions that are wired to the external connectors TB1 and TB2. One position, G.R. EXT, can be connected to an associated amplifier to measure the gain reduction obtained in that amplifier. The other position, EXT, can be used to indicate audio level in 600-ohm circuits. To use in the external circuit, connect terminals 3 and 4 of TB1 and/or TB2 to one (and/or two) 600-ohm audio circuits of less than +27 VU. The meters indicate audio levels of -16 VU to +27 VU using AT1A and AT1B attenuators in the 26U-2 as meter multipliers. For example, with the 0 VU REFERENCE attenuator set at 24, 0 VU reading on the meters will be 24 volume units. The meter reads up to +3 VU; hence the meter reading will be +27 volume units at +3 VU.

CAUTION

When measuring signals of unknown level, be sure to preset the 0 VU REFERENCE attenuator to OFF, and gradually advance the attenuator as needed.

2.4 Initial Adjustments.

Determine the level of the audio signal being delivered to the input of the 26U-2 with the studio equipment in normal operation. The 212E-1, 212G-1 and 212F-2 consoles, as do most modern consoles, supply +8 VU to the line when the console VU meter reads 0 VU. Normal studio program operation would be with the console VU meter peaking at 0 VU or 100 on the percent scale.

If the input level to the 26U-2 is too high to allow good control range of the INPUT LEVEL control, the input pads consisting of R14, R15, R16, R114, R115, and R116 can be changed to allow more or less suppression. See table 2-1 for the values in ohms and loss in db.

NOTE

A program waveform with a high peak is a complex wave and is read in volume units. The usual conception is to assume that the peaks are 10 db above the sine wave peaks. When testing with a sine wave, it is normal to test at a level 10 db higher than the normal volume unit level.

TABLE 2-1
RESISTANCE VALUES FOR
600-OHM FIXED PADS

LOSS IN DB	R14 (R114) R15 (R115)	R16 (R116)
0	0	OPEN
3	103	1703
6	199	803
10	312	422
15	419	220
20	490	121

2.4.1 ADJUSTMENT PROCEDURE, STEREO OPERATION.

a. Set the two INPUT LEVEL and OUTPUT LEVEL controls to off position (ccw position), set the METER switch to EXT, set the 0 VU REFERENCE attenuator to OFF, and set the STEREO MONO switch to STEREO.

b. Turn on the equipment, and after a 5-minute stabilization period, turn the METER switch to G.R. Adjust the two G.R. ZERO controls until the METER indicates 0 on the DB GAIN REDUCTION scale with no audio input to the 26U-2.

NOTE

Always allow stabilization period before zeroing gain reduction.

c. Feed equal 1-kc signals from an HP-200AB Audio Oscillator into both sides of the input to the 26U-2. Check and adjust, if need be, by positioning the METER switch to INPUT.

d. Set the METER FUNCTION switch to G.R. and gradually advance the two INPUT LEVEL controls until the meter readings indicate the desired limiting (3 to 5 db is normal).

e. With the two OUTPUT LEVEL controls still turned ccw, turn on the transmitter and adjust for normal r-f output. Adjust the modulation monitor carrier input controls in the normal manner, being sure to adjust the tuning controls accurately to a peak before adjusting the monitor gain control.

f. Set the indicator on the monitor for 95-percent modulation.

g. Gradually increase the 26U-2 OUTPUT LEVEL controls until the indicator registers 95-percent modulation. This will result in normal limiting of peaks.

NOTE

A periodic check should be made to ensure the equality of output of the two channels.

h. Set the attack time (R52, R152) and release time (R48, R148). An attack time of 3 milliseconds and a release time of 2.5 seconds are commonly used for all-around operation. Refer to paragraph 5.1.4 for a method to use in checking the attack and release times of the 26U-2.

i. If the limiting action of either or both channels has a tendency to produce a thump, refer to paragraph 5.1.3.2 for the method of setting the G.R. BAL controls to prevent this condition.

2.4.2 ADJUSTMENT PROCEDURE, MONO OPERATION.

Set the STEREO MONO switch to MONO. The procedure for adjustment is the same as that for stereo. Either or both channels may be used.

section 3

operation

3.1 Description of Controls.

3.1.1 PANEL CONTROLS. (See figures 3-1 and 3-2.)

a. POWER ON-OFF. This switch is inserted in series with the power line to the power transformer. When it is in the OFF position, both sides of the line are disconnected from the power transformer.

b. INPUT LEVEL. These two controls are used to adjust the audio input to the 26U-2. Set these controls to obtain the desired degree of gain reduction as shown on the DB GAIN REDUCTION scale of the meter when the METER switch is in the G.R. position.

c. OUTPUT LEVEL. These two controls adjust the audio output level of the 26U-2. The setting of these controls depends upon the requirements of the transmitter (or stereo recorder) with which the 26U-2 is used. For normal operation these controls should be set for 95-percent modulation. See paragraph 2.4.1 for explanation of method of setting this control.

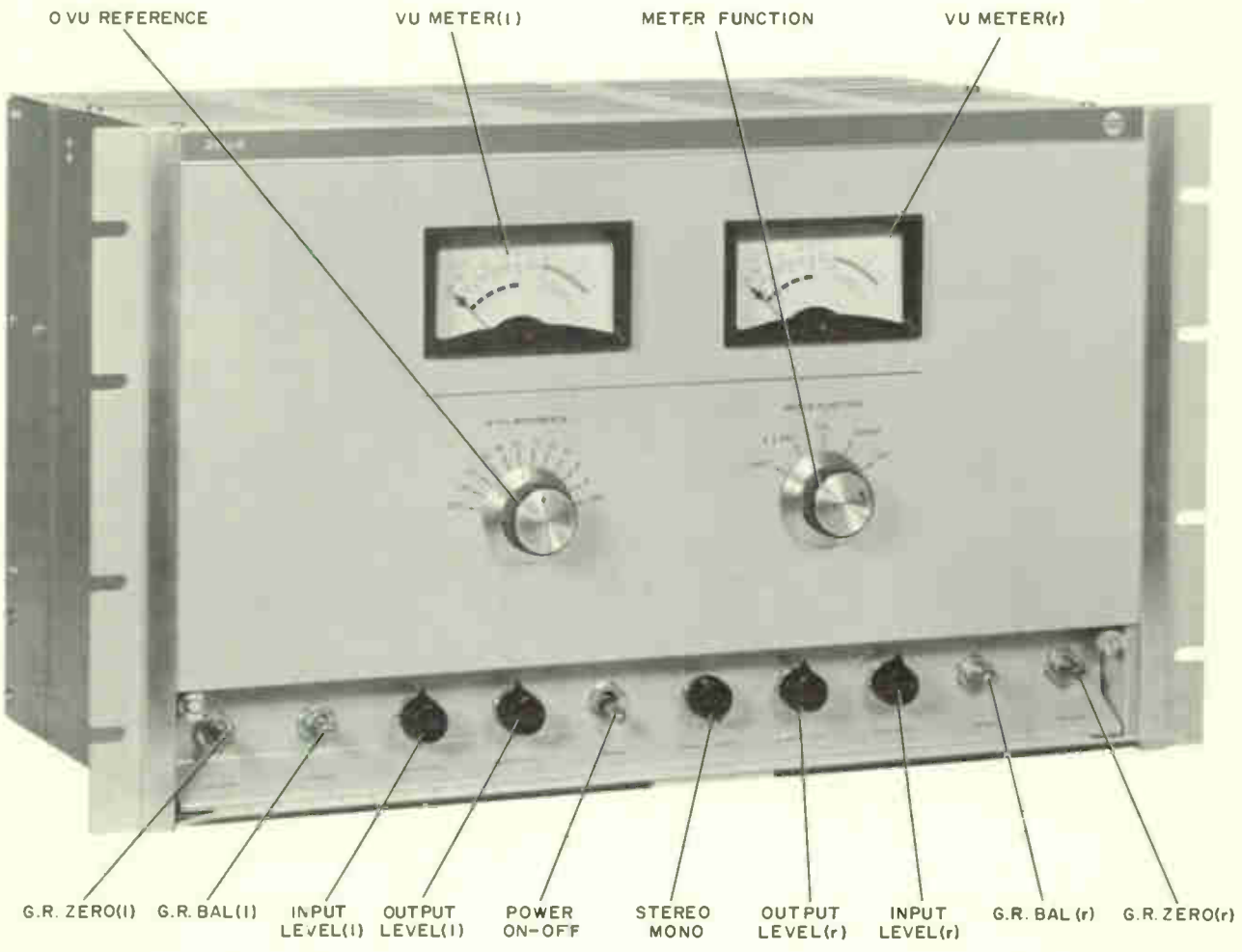

Figure 3-1. 26U-2 Stereo Peak Limiter Operation Controls, Front View

Figure 3-2. Operational Controls, Rear View

d. METER FUNCTION Switch. This switch selects the circuits to be read on the meter. In the INPUT position, the meter reads audio level at the input terminals of the 26U-2. In the G.R. position, the meter reads the value of gain reduction on the DB GAIN REDUCTION scale of the meter. In the OUTPUT position, the meters read the audio level at the output terminals of the 26U-2. The G.R. EXT and EXT positions of the switch are for external circuits and, if used, are connected by the customer.

e. 0 VU REFERENCE. This attenuator is used to vary the amount of attenuation in series with the two meters when the meters are used to measure audio levels. It contains a switch which breaks the circuit to the meter when placed in the OFF position. The attenuator is calibrated in steps of 2 db. The calibration of the attenuator is correct only when the meter is indicating 0 on the VU scale. The 0 VU REFERENCE attenuator is not used when the meter is reading gain reduction.

CAUTION

When measuring audio signals of unknown levels, start with the 0 VU REFERENCE attenuator set to OFF, and gradually advance the control as needed. This will prevent pinning the meter and possibly damaging it.

f. STEREO MONO. Positioning this switch will allow either stereo operation or two separate monaural limiters.

g. G.R. ZERO. The gain reduction zeros for both channels are used to reference the two meters. To ensure proper positioning, turn the METER FUNCTION switch to G.R. and adjust the two G.R. ZEROS until the meters read 0 on the DB GAIN REDUCTION scale with no signal.

h. G.R. BAL. The function of these controls is that of equalizing the signal into the sides of the push-pull amplifiers. Adjustment of these controls is described in paragraph 5.1.3.2.

3.1.2 INTERNAL CONTROLS.

The internal controls present consist of two ATTACK TIME potentiometers and two RELEASE TIME potentiometers, and are mounted in the rear of the chassis. These controls are to be set by the station engineer. (See figure 3-2.) Instruction for this procedure is found in paragraph 5.1.4.

3.2 Routine Operation (Stereo Operation).

a. Turn on the 26U-2 and allow for a 5-minute warmup period. Turn the STEREO MONO to STEREO.

b. Turn the METER FUNCTION switch to G.R., and with no input signal, check to see if the meters read 0 on the DB GAIN REDUCTION scale. If not, adjust the two G.R. ZERO controls for 0 indication on the meters. The 0 VU REFERENCE attenuator should be set at OFF.

c. Turn the METER FUNCTION switch to G.R., feed program material into the 26U-2 from the console at normal level, and check to see that both channels are limiting to same required value (usually 3 to 5 db). If not, follow the adjustment procedure given in paragraph 2.4.1.

d. Assuming that the transmitter has been warmed up and the modulation monitor correctly calibrated to 95-percent modification, check to see that the indicator is showing proper modulation. If not, follow the adjustment procedure given in paragraph 4.2.1.

e. Change the METER FUNCTION switch to OUTPUT, and adjust the 0 VU REFERENCE attenuator to the setting that results in a comparable reading of the 26U-2 meters and the console VU meters at the audio signals below the threshold of the limiter. Periodic checks of the output balance between channels should be made with an audio oscillator.

3.3 Routine Operation (Mono Operation).

a. Turn the STEREO MONO switch to MONO. The same procedure as illustrated for stereo operation may now be used.

NOTE

Paragraph 2.4 contains detailed information on adjusting the equipment for operation. Once the equipment is adjusted per paragraph 2.4, the information in paragraph 3.2 should be sufficient for routine operation. It should also be noted that periodic checks of output level equality should be made with an audio oscillator as illustrated in paragraph 2.4.1.

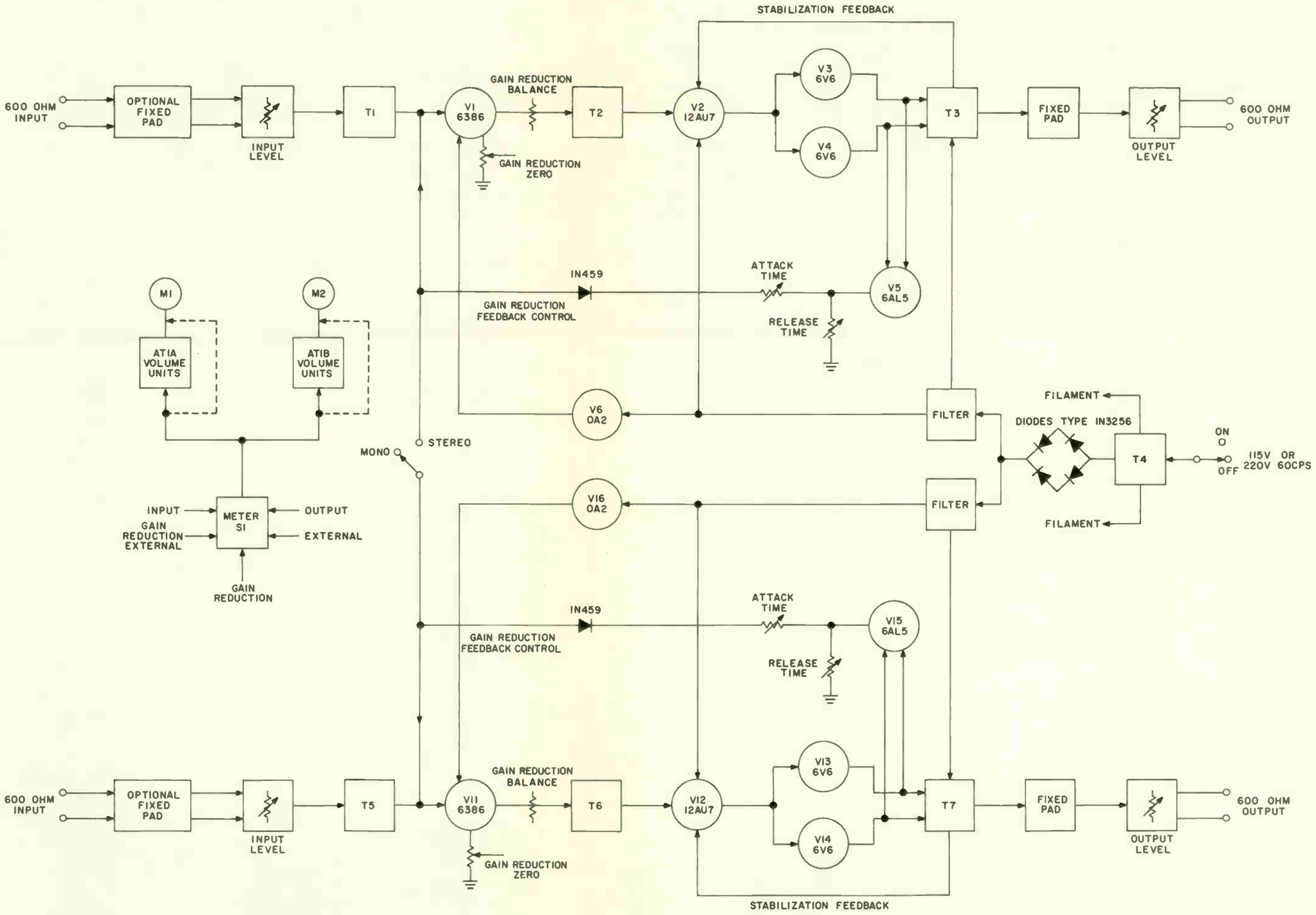

Figure 4-1. 26U-2 Stereo Peak Limiter, Block Diagram

section 4

principles of operation

4.1 General.

The 26U-2 is a stereo limiting amplifier used in broadcast stations to prevent overmodulation. Its use in any audio application will increase the signal-to-noise ratio and lessen the possibility of distortion by limiting the audio peaks. The 26U-2 consists of two, separate, identical, three-stage amplifiers. The first stage of each amplifier is limited automatically by a system which utilizes the audio peaks above a fixed threshold. These audio peaks are taken from the output stage of each amplifier and rectified to produce a negative bias that is fed back to the grids of the input stages. The input and output of each amplifier are both controllable by means of attenuators located on the front panel. Two panel meters are provided for metering three selectable internal circuits and two selectable external circuits. A single self-contained power supply is included in the 26U-2.

4.2 Audio Amplifier Circuits.

Refer to block diagram figure 4-1 and to figure 7-1. Audio enters the 26U-2 at terminals 1 and 2 of both TB1 and TB2, which connect to optional pads (see optional connections). The output of the two pads is fed through INPUT LEVEL attenuators A and B and into the input transformers T1 and T5. The first audio stage of each amplifier, V1 and V11, type GL-6386, is excited in push-pull from the secondary of T1 and T5. The plate voltage for V1 and V11 is obtained by a shunt circuit through current balancing controls R12 and R112. The audio outputs of V1 and V11 are transformer coupled to the grids of V2 and V12. These push-pull intermediate amplifiers are of the type 12AU7 dual triodes. The outputs of V2 and V12 are connected to two sets of two 6V6-GTA tubes, V3, V4, V13, and V14. The plate loads for the two final amplifiers are transformers T3 and T7. One secondary winding, terminals 5 and 6 of T3 and T7, is employed in a negative feedback circuit to the cathodes of V2 and V12 to reduce distortion and improve frequency response characteristics of the amplifiers. The other winding is the output winding and is connected to two 10-db pads and then to the OUTPUT LEVEL attenuators A and B. The attenuators are connected to the terminals 7 and 8 of TB1 and TB2. These terminals are two 600-ohm floating outputs.

4.3 Peak Limiting Control Circuits.

The characteristics of V1 and V11, type GL-6386 tubes, are such that the gain of each tube can be varied by varying the bias to the control grid without producing appreciable distortion. The 26U-2 takes advantage of this feature by using two 6AL5 dual diode tubes, V5 and V15, to rectify the peak audio at the plates of the output tubes, then feeding the voltages thus obtained back to the grids of V1 and V11 as negative bias to reduce the gain of the amplifier during the periods of peak audio. The audio from the plates of the audio output tubes is coupled to the cathodes of the two 6AL5 tubes through the two sets of capacitors C11, C12 and C111, C112. The cathodes of the two 6AL5 tubes are biased with a fixed positive voltage from the regulated portion of the power supply to obtain a threshold below which the two 6AL5 tubes will not pass current. When the audio output level of the 6V6-GTA tubes goes above the threshold bias level, the two 6A15 tubes conduct and rectify the audio peaks. The gain control bias, obtained at the plates of the two 6AL5 tubes, is fed to the grids of V1 and V11 through R52 and R152, the attack time variable resistors. The attack time constant is produced by capacitors C10 and C110 which also filter the audio ripple from the gain control bias. The release time of the gain control bias is adjusted by resistors R48 and R148 which bleed the charge from capacitors C10 and C110 after the 6AL5 tubes stop conducting.

4.4 Power Supply.

The power supply uses a full-wave, bridge-type rectifier circuit. The combination plate and filament transformer T4 drives the four bridge rectifiers CR2, CR3, CR5, and CR6 (see figure 7-1). Resistor R62 is an 18-ohm resistor used as a surge limiter. Capacitor C18 is used to hold the rectified wave at a constant d-c level. Resistors R59, R60, R61, R159, R160, and R161 along with capacitors C15A, C15B, C16A, C16B, C17A, and C17B are connected as filters for each channel to eliminate ripple in the d-c current value. The full output of the power supply is applied to the plates and screens of the output tubes V3, V4, V13, and V14. Regulated 150 volts are obtained by the use of R47, R147, and VR tubes V6 and V16, OA2 gaseous regulators. This regulated 150-volt supply is used for the plates of V1 and V11 and for the threshold bias applied to V5 and V15. The threshold bias is reduced to the proper value by the use of bleeder resistors R53, R54, R153, and R154. Extra filtering and audio decoupling is obtained by the use of capacitors C8, C13, C3, C108, C113, and C103.

4.5 Metering Circuits.

Meters M1 and M2 are panel-mounted, rectifier-type meters calibrated in volume units (vu) and db gain reduction units. The meters are connected to three

internal circuits, INPUT, G.R., and OUTPUT, and to two external circuits G.R. EXT and EXT audio, by the meter switch, S1A, S1B, S1C, and S1D. It should be noted that switch S1A, S1B, S1C, and S1D are connected to a single panel indicator. When the meters are measuring audio, meter multipliers AT1A and AT1B, calibrated in volume units are connected to them. The 0 VU REFERENCE attenuators, AT1A and AT1B, extend the meter calibration in 2 VU steps so that the meters can indicate levels in the range of -16 VU to +27 VU and OFF.

4.6 Stereo-Monaural Option.

The 26U-2 contains optional stereo-monaural operation. When switch S5 is placed in monaural position, the 26U-2 operates as two separate monaural limiters. Positioning S5 to stereo enables both channels to be limited to the same output. Semiconductors CR1 and CR4 are used to prevent feedback into C10 and C110. Such feedback would increase the attack time by effectively lowering C10 and C110.

section 5

maintenance

5.1 Bench Performance Test.

The following procedure can be used to check the results of any service work done on the equipment or to check equipment suspected of being faulty.

5.1.1 TEST EQUIPMENT REQUIRED.

The following test equipment or equivalents are required to perform the specified test:

a. Audio oscillator HP-200AB.
b. Attenuator panel, Daven Ha-740-B with pads.
c. Vtvm HP-410B.
d. Vtvm HP-400D.
e. Distortion analyzer HP-330D.
f. Head phones, high impedance.
g. Oscilloscope, Elco d-c wide band or equivalent.
h. Resistance bridge.

5.1.2 TEST CONDITIONS.

Unless otherwise specified, all test should be performed under the following conditions:

a. Line voltage, frequency and phase: 115 volts (or 230 volts if 26U-2 is so converted) 50/60 cps, single phase.
b. Ambient temperature: Normal studio ambient.
c. Ambient humidity: Normal studio ambient.
d. Ambient atmospheric pressure: Normal studio ambient.
e. Shielding and isolation requirements: The 26U-2 should be tested in an area free from a strong electromagnetic field and have adequate power line shielding.
f. Operational duty cycle: Continuous.
g. Warmup period: Five minutes.
h. Input and output impedance: 600 ohms.

5.1.3 INITIAL ADJUSTMENTS.

5.1.3.1 G.R. ZERO SETTING. Set the METER switch to the G.R. position, and with zero input signal, set the two G.R. ZERO controls, R10 and R110, for 0 reading on the DB GAIN REDUCTION scale of the two meters.

5.1.3.2 G.R. BAL.

a. Set the two OUTPUT LEVEL controls to maximum attenuation (ccw).
b. Set METER switch to INPUT.
c. Set all VU attenuation to 8.
d. Set STEREO MONO switch to MONO.
e. Connect the audio oscillator to one input of the 26U-2 through the Daven attenuator panel with at least 10 db of attenuation inserted. (See figure 5-1.)
f. Set INPUT LEVEL control of channel to be used to CCW position.
g. Apply 1000-cps audio to the input channel being used of the 26U-2 until the meter indicates 0 VU (0 equals +8 VU when 0 VU REFERENCE attenuator is set at 8).
h. Set the METER FUNCTION switch to G.R., and slowly advance the INPUT LEVEL control until threshold is reached (meter reading starts to indicate gain reduction).

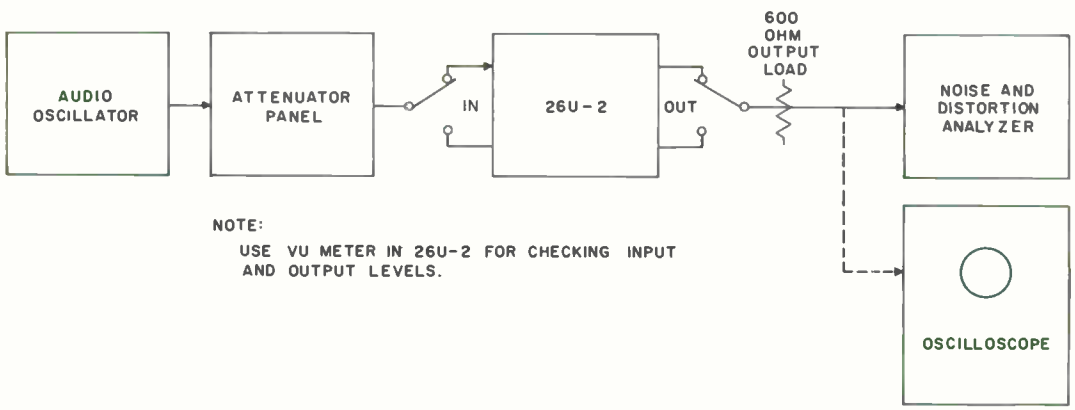

Figure 5-1. Test Setup, Block Diagram

i. Set the METER FUNCTION switch to OUTPUT and the 0 VU REFERENCE attenuator to 8 VU. Advance the OUTPUT LEVEL control until the VU meter indicates 0 VU.

j. Switch out 2- or 3-db attenuation at the Daven attenuator, and note if the output meter has a downward deflection before rising.

k. If the condition of step j is noted R12 (R112), the G.R. BAL potentiometer is not set properly and should be readjusted to a point where no downward kick is present.

l. Make the same check (step j) with a 10-db increase in input signal. If the setting of R12 (R112) has to be changed very much, find a compromise setting that will give a 1/2-db or less downward kick for either a 3- or 10-db increase in signal.

m. Reconnect the input and output to the other channel. Repeat steps e through l.

An oscilloscope may be used to check balance, if desired. Attach the oscilloscope to the amplifier output, and synchronize it to the 1000-cps input so several cycles can be observed. With the 26U-2 set on the verge of compression, remove 10 db of attenuation from the Daven attenuator panel, and observe the pattern. When the 26U-2 is balanced, the change in amplitude with increase will be uniform as shown in figure 5-2. While watching the attack time, switch 10 db of attenuation in and out. Set R12 (R112) for best point of balance. Figure 5-3 is a photograph of a 26U-2 unbalanced to both limits of R12 (R112). The input level was increased from 4 db below threshold to 6 db above threshold. Each division equals 50 milliseconds.

5.1.4 ATTACK AND RELEASE TIME.

The attack and release time can be checked by using an oscilloscope and a 1000-cps input signal. Attach the oscilloscope to the output of one channel of the 26U-2 and synchronize it with the 1000-cps input signal. Set STEREO MONO switch to MONO (see figure 5-1). Set the 26U-2 on the verge of compression, suddenly remove 10 db of attenuation from the Daven attenuator, and observe the attack time. The attack time should be adjustable between 2 to 5 milliseconds with R52 (R152). See figure 5-2 for illustration of a typical unit for attack time. The top view was made with R52 (R152) set for fast attack time. The bottom view was made with R52 (R152) set for slow attack time. The photographs were made of the output level of the 26U-2 with an input change from 4 db below threshold to 6 db into compression. Each division equals 50 milliseconds.

In order to observe release time, quickly insert 10-db attenuation with the Daven attenuator, and observe the time it takes for the waveform to return to its original level on the scope. This release time should be adjustable between 1/2 to 5 seconds for 63 percent recovery with R48 (R148).

Figure 5-4 illustrates release time. In the top photograph R48 (R148) was set for fast release. In the bottom photograph R48 (R148) was set for slow release, and the photographs were made of the output level of the 26U-2 while the input changed from 6 db above threshold to 4 db below threshold. Each division equals one second.

NOTE

For optimum stereo limiting, both the attack time and the release time should be set the same on each channel.

5.1.5 TEST PROCEDURES.

5.1.5.1 FREQUENCY RESPONSE.

a. Run a standard freuqency response after the input has been adjusted to a point 3 db below limiting for

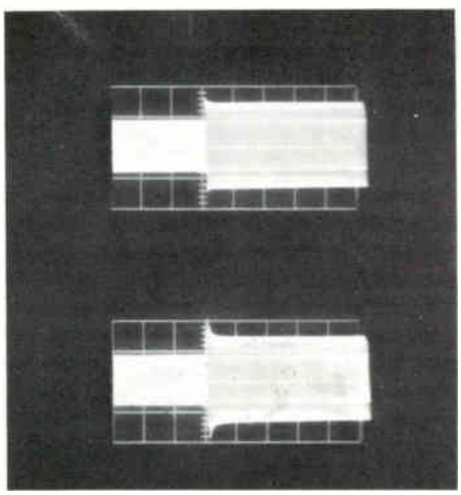

Figure 5-2. 26U-2 Stereo Peak Limiter, Attack Time

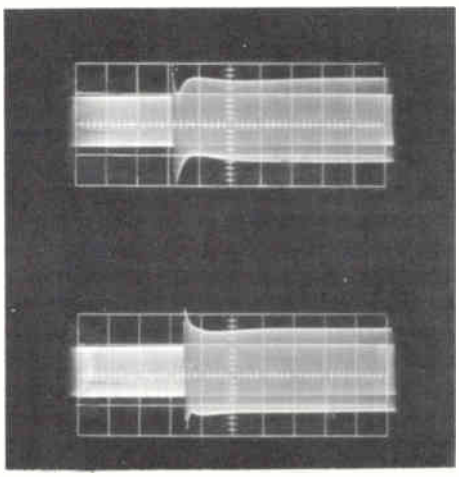

Figure 5-3. 26U-2 Stereo Peak Limiter, Unbalancing

1000 cps and maintained at that level for balance of frequencies. The response should be the same for both channels and should vary not more than ±15 dbm.

b. Repeat step a with the input set at 10 db above the verge of limiting. The response should be the same as listed for a.

5.1.5.2 GAIN.

a. Set the INPUT LEVEL and OUTPUT LEVEL controls to full cw position.

b. Feed audio into the 26U-2, but stay below limiting action as indicated by the DB GAIN REDUCTION scales.

c. Compute gain. The gain should have a value of approximately 40 db.

5.1.5.3 DISTORTION MEASUREMENTS.

a. Adjust the audio input level to 3 db below the point of limiting at 1000 cps and hold constant as the following frequencies are checked for distortion: 50 cps; 1000 cps; and 15,000 cps. The distortion from both channels should be not more than 1 percent at 15,000 cps and 1000 cps or more than 1.5 percent at 50 cps.

b. Repeat step a except for adjusting the input level to 10 db above limiting. The distortion on both channels should be approximately the same or slightly more than that in step a.

5.1.5.4 NOISE LEVEL.

a. Disconnect the audio input to the 26U-2. Connect both input and output terminations to 600-ohm loads, and turn the two INPUT LEVEL and OUTPUT LEVEL controls to full cw. Switch STEREO MONO switch to MONO position and measure output noise. The value of both channels should be less than -50 dbm.

5.1.5.5 COMPRESSION RATIO.

a. Set the ATTACK (R52, R152) and the RELEASE (R48, R148) time controls to slow (ccw).

b. Set the OUTPUT LEVEL attenuator to midrange. With a 1000-cps input signal adjust input level to 1 db above threshold. Increase the signal until the output signal has increased 1 db and find ratio of input level increase/output level increase. Ratio should be 12:1 for slow attack and release times.

c. Repeat for fast attack and release times, i.e., R52, R152, R48, and R148 set at cw position. Ratio should be 9:1.

d. Repeat steps c and b for a 2-db increase in output. Ratio should be 20:2 for slow attack and release times.

5.1.5.6 CROSS CONTROL.

a. With STEREO MONO switch in STEREO, apply a 1000-cps signal at threshold to both channels and set the OUTPUT LEVEL for +20 dbm. Increase the level to one channel 10 db. The gain reduction meters should read the same and output level of the increased channel should now be 20.5 to 22 dbm and the other channel 9 to 13 dbm.

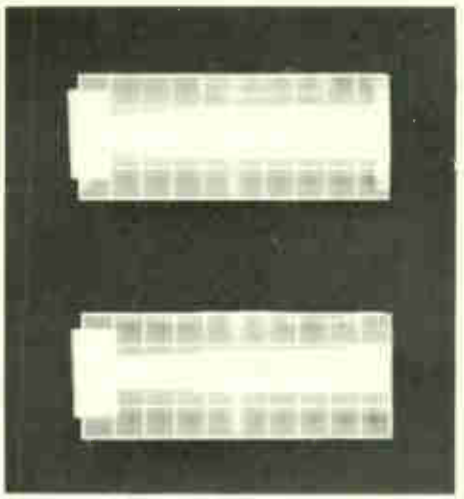

Figure 5-4. 26U-2 Stereo Peak Limiter, Release Time

b. Increase the input to the other channel, and observe output and gain reduction meter readings. These readings should be the same as in step a.

5.1.5.7 CROSS TALK.

a. Set STEREO MONO switch to STEREO and apply a 1000-cps signal at threshold to one channel. Set with OUTPUT LEVEL controls to cw position (maximum), and measure the difference in the output levels. This value should be 60 db or more.

b. Repeat step a for opposite channel. The difference should be 60 db or more.

5.1.5.8 PLATE VOLTAGE. Measure the plate voltage between pin 4 of V4 and chassis when line voltage is at specified value. The value of plate voltage should be not less than 285 volts and not more than 315 volts.

5.2 Maintenance.

5.2.1 TROUBLE SHOOTING.

a. Check fuse. If it is defective, replace with 2-ampere, cartridge-type, Slo-Blo fuse (1-ampere fuse using 230-volt input).

b. Connect 26U-2 to 115 volts 50/60 cps and check to see that filaments are lighting. Absence of power to the filaments will indicate a faulty power transformer (T4).

c. Check voltage to plates of V4 and V14. The value should be between 285 and 315 volts. If the voltage is other than this, the bridge circuit (CR2, CR3, CR5, CR6) of the power supply is probably malfunctioning. The voltage at the output of the bridge rectifier should be 380 volts. If the bridge circuit is okay, check the components of the filter circuits R59, C15A, R159, C16A, etc.

d. Measure the voltages illustrated in table 5-1 with power applied as in normal operation and with 50-cps input signal to cause 10 db of limiting. All voltage readings in table 5-1 are taken with the line voltage

TABLE 5-1. RESISTANCE AND VOLTAGE MEASUREMENTS

TUBE	MEASUREMENT	PIN NUMBER								
		1	2	3	4	5	6	7	8	9
V1, V11 GL-6386	V d-c		1.1	-4.5	119		119	-4.5	1.1	
	V a-c	2.9		0.48	1.1		1.0	0.48		2.8
	Ohms	0.1	195	11 meg	22K		22K	11 meg	190	0.1
V2, V12 12AU7	V d-c	178	0	6.4			175	0	6.4	
	V a-c	5.2	1.5	1.0	2.9	2.9	5.2	1.5	0.95	2.9
	Ohms	50K	9700	800	0.1	0.1	50K	9700	800	0.1
V3, V4, V13, V14 6V6-GTA	V d-c			280	290	0			18.5	
	V a-c		2.9	71.0		5.0		2.9	1.0	
	Ohms		0.1	9600		280K		0.1	470	
V5, V15 6AL5	V d-c	102	-4.5			102		-4.5		
	V a-c	71.0	0.07	2.9	2.9	71.0		0.07		
	Ohms	530K	0.5 meg	0.1	0.1	520K		0.5 meg		
V6, V16 OA2	V d-c		0			148				
	Ohms		0			16K				

NOTES

1. Measurements made between each pin and ground.
2. Resistance measurements made with vom.
3. Voltage measurements made with 50-cps input and 10-db limiting.
4. A-c and d-c measurements made with Hewlett-Packard 410B.

as specified. All resistance measurements are taken with no power applied. All measurements are taken between specified terminal and ground.

e. If trouble still cannot be located, perform resistance continuity checks from input until fault is found.

5.2.2 TUBE REPLACEMENT.

Best results are obtained with the 26U-2 when matched tubes are used in the output stage (V3, V4, and V13, V14). Select replacement tubes that are free from electrical and mechanical noises. Should the characteristics of the type 6386 (V1, V11) change, a thump might appear in the limiting action and be difficult to remove by adjustment of G.R. BAL. Replace the tube and adjust G.R. BAL, using procedure given in paragraph 5.1.3.2.

5.2.3 METER LAMP REPLACEMENT.

The lamps for the VU meters are accessible from the top. These lamps are mounted on a bracket at the inside of the front panel. Remove the top of the 26U-2 unit and replace the lamps with number 47, 6.3-volt, brown-bead, bayonet-base lamps, and replace the top.

section 6

parts list

ITEM	DESCRIPTION	COLLINS PART NUMBER
	26U-2 STEREO PEAK LIMITER	522-3237-00
AT1	ATTENUATOR, VARIABLE: 7500 ohms input, 3900 ohms output nom impedance; 12 steps; 2 vu attenuation per step; Daven Co. part no. 9806	378-0574-00
C1	CAPACITOR, FIXED, ELECTROLYTIC: 24 uf -10% +100%, 50 v dc; Sprague Electric part no. D29328	183-1173-00
C2	CAPACITOR, FIXED, PAPER: 0.1 uf ±20%, 600 v dc	931-5511-00
C3	CAPACITOR, FIXED, ELECTROLYTIC: 40 uf -10% +50%, 450 v dc; Sprague Electric part no. D29679	183-1556-00
C4	CAPACITOR, FIXED, PAPER: same as C2	931-5511-00
C5	CAPACITOR, FIXED, ELECTROLYTIC: same as C1	183-1173-00
C6	CAPACITOR, FIXED, ELECTROLYTIC: same as C1	183-1173-00
C7	CAPACITOR, FIXED, CERAMIC: 10,000 uuf ±20% 500 v dc	913-3013-00
C8	CAPACITOR, FIXED, CERAMIC: 0.1 uf -20% +80%, 500 v dc; Sprague Electric Co. of Wisconsin part no. 41C92	913-3152-00
C9	NOT USED	
C10	CAPACITOR, FIXED, PAPER: 1.0 uf ±20%, 400 v dc; Sprague Electric part no. 161P10504	931-6854-00
C11	CAPACITOR, FIXED, PAPER: same as C10	931-6854-00
C12	CAPACITOR, FIXED, PAPER: same as C10	931-6854-00
C13	CAPACITOR, FIXED, ELECTROLYTIC: 450 v dc, 8 uf -10% +50%	183-1562-00
C14	NOT USED	
C15	CAPACITOR, FIXED, ELECTROLYTIC: dual section; 60 uf both sections -10% +50%, 450 v dc both sections	183-1486-00
C16	CAPACITOR, FIXED, ELECTROLYTIC: same as C15	183-1486-00
C17	CAPACITOR, FIXED, ELECTROLYTIC: same as C15	183-1486-00
C18	CAPACITOR, FIXED, ELECTROLYTIC: 100 uf -10% +100%, 450 v dc	183-1411-00
C19	CAPACITOR, FIXED, PAPER: 0.033 uf ±20%, 200 v dc; Sprague Electric Co. part no. 160P33302	931-5505-00
C20	CAPACITOR, FIXED, PAPER: same as C19	931-5505-00
C21 thru C100	NOT USED	
C101	CAPACITOR, FIXED, ELECTROLYTIC: same as C1	183-1173-00
C102	CAPACITOR, FIXED, PAPER: same as C2	931-5511-00
C103	CAPACITOR, FIXED, ELECTROLYTIC: same as C3	183-1486-00
C104	CAPACITOR, FIXED, PAPER: same as C2	931-5511-00
C105	CAPACITOR, FIXED, ELECTROLYTIC: same as C1	183-1173-00
C106	CAPACITOR, FIXED, ELECTROLYTIC: same as C1	183-1173-00
C107	CAPACITOR, FIXED, CERAMIC: same as C7	913-3013-00
C108	CAPACITOR, FIXED, CERAMIC: same as C8	913-3152-00
C109	NOT USED	
C110	CAPACITOR, FIXED, PAPER: same as C10	931-6854-00
C111	CAPACITOR, FIXED, PAPER: same as C10	931-6854-00
C112	CAPACITOR, FIXED, PAPER: same as C10	931-6854-00
C113	CAPACITOR, FIXED, ELECTROLYTIC: same as C13	183-1562-00
C114	NOT USED	
C115	NOT USED	
C116	NOT USED	
C117	NOT USED	
C118	NOT USED	

ITEM	DESCRIPTION	COLLINS PART NUMBER
C119	CAPACITOR, FIXED, PAPER: same as C19	931-5505-00
C120	CAPACITOR, FIXED, PAPER: same as C19	931-5505-00
CR1	SEMICONDUCTOR DEVICE, DIODE: silicon; Hughes Products Div of Hughes Aircraft Co. part no. 1N459	353-0206-00
CR2	SEMICONDUCTOR DEVICE, DIODE: silicon; hermetically sealed; JETEC type 1N3256	353-3277-00
CR3	SEMICONDUCTOR DEVICE, DIODE: same as CR2	353-3277-00
CR4	SEMICONDUCTOR DEVICE, DIODE: same as CR1	353-0206-00
CR5	SEMICONDUCTOR DEVICE, DIODE: same as CR2	353-3277-00
CR6	SEMICONDUCTOR DEVICE, DIODE: same as CR2	353-3277-00
DS1	LAMP, INCANDESCENT: miniature bayonet base; T-3-1/4 pilot light bulb; 6.3 v, 0.150 amps; General Electric Co. part no. 47	262-3240-00
DS2	LAMP, INCANDESCENT: same as DS1	262-3240-00
F1	FUSE, CARTRIDGE: glass enclosed, 2 amp, 125 v; Littelfuse, Inc. part no. 313002	264-0297-00
F2	FUSE, CARTRIDGE: glass enclosed, time lag; 1 amp, 250 v dc max; Littelfuse, Inc. part no. 313.001 (to be used when rewired for Modification Kit)	264-0295-00
H1	RETAINER, CAPACITOR: carbon steel; 1/16 in. id, 5/8 in. w, 1/8 in. dia mtg hole; Prestole Corp. part no. E 50008-051	139-0090-00
H2	BRACKET, CAPACITOR: steel, 13/16 in. id, 5/8 in. w, 1/8 in. dia mtg hole; Prestole Corp. part no. E 50005-051	139-0088-00
H3	RETAINER, CAPACITOR: metallic, zinc plated finish; 0.625 in. w, 0.937 in. dia, 1.125 in. h; Prestole Corp. part no. E 50007-051	139-0089-00
H4	WASHER, FLAT: rd shape, CRES, passivate finish; 0.120 in. id, 0.375 in. od, 0.018 in. thk	504-0730-003
H5	GROMMET, RUBBER: rubber or synthetic rubber; black finish; 3/8 in. by 7/16 in. by 15/16 in.; MS type MS35489-42	201-0023-00
J1	CONNECTOR, RECEPTACLE, ELECTRICAL: 3 male contacts; 15 amp. at 110 v ac, 10 amp at 250 v ac; Amphenol Borg part no. 160-5	368-0203-00
J2	CONNECTOR, RECEPTACLE, ELECTRICAL: 4 female contacts; 3 amps; Amphenol Borg part no. 77-26	372-2184-00
J3	CONNECTOR, RECEPTACLE, ELECTRICAL: same as J1	372-2184-00
M1	METER, AUDIO LEVEL: -20 thru +3, 0 thru 100 VU, 20 thru 0 db gain reduction, scale markings; 2-1/8 in. by 2-13/16 in. by 3-1/2 in.	456-0060-00
M2	METER, AUDIO LEVEL: same as M1	456-0060-00
MP1	COVER, PEAK LIMITER, TOP: aluminum, med dark gray finish; 0.032 in. thk; 6-1/4 in. by 16-7/16 in.	554-6055-003
MP2	COVER, PEAK LIMITER, BOTTOM: aluminum, med dark gray finish; 0.040 in. thk; 8-1/2 in. by 16-7/16 in.	554-6052-003
MP3	COVER, PEAK LIMITER, REAR: aluminum, med dark gray finish; 0.032 in. thk; 8.406 in. by 16.438 in.	554-6065-003
MP4	DOOR, ACCESS: carbon steel, light gray finish; 0.747 in. thk; 2.547 in. by 16.444 in.	554-6084-003
MP5	HANDLE, DOOR: aluminum, brush finish; 7/16 in. by 11/32 in. by 2 in.	554-6041-003
O1	KNOB: setscrew type, black phenolic, brass insert for 1/4 in. shaft, 13/32 in. by 1 in. dia, 8-32NC-2 setscrew supplied; Harry Davies Moulding Co. part no. 1400	281-0069-00
O2	KNOB: same as O1	281-0069-00
O3	KNOB: same as O1	281-0069-00
O4	KNOB: same as O1	281-0069-00

ITEM	DESCRIPTION	COLLINS PART NUMBER
O5	KNOB: same as O1	281-0069-00
O6	KNOB: black phenolic shell, aluminum skirt, 1.562 in. dia and black plastic setscrew knob w/ metal insert; 1.5625 in. dia, 0.765 in. w o/a	549-1023-003
O7	KNOB: same as O6	549-1023-003
P1	CONNECTOR, RECEPTACLE, ELECTRICAL: heavy duty outlet type with shield cap; three conductors; 125 v, 15 amps, Amphenol Borg part no. 160-8	368-0188-00
P2	CONNECTOR, PLUG, ELECTRICAL: 4 male contacts; 3 amps; Amphenol Borg part no. 70-26	372-2183-00
P3	CONNECTOR, PLUG, ELECTRICAL: same as P2	372-2183-00
R1	NOT USED	
R2	NOT USED	
R3	ATTENUATOR, VARIABLE: two section; 2 w, 600 ohms impedance; 7/8 in. lg shaft; Allen-Bradley Co. part no. 82503	383-0044-00
R4	ATTENUATOR, VARIABLE: same as R3	383-0044-00
R5	RESISTOR, FIXED, COMPOSITION: 620 ohms ±5%, 1/2 w; MIL type RC20GF621J	745-1343-00
R6	RESISTOR, FIXED, COMPOSITION: same as R5	745-1343-00
R7	RESISTOR, FIXED, FILM: 196 ohms ±1%, 1/4 w; MIL type RN65B1960F	705-7062-00
R8	RESISTOR, FIXED, FILM: 90.9 ohms ±1%; 1/4 w; MIL type RN65B90R9F	705-7046-00
R9	RESISTOR, FIXED, FILM: 121 ohms ±1%, 1/4 w; MIL type RN65B1210F	705-7052-00
R10	RESISTOR, VARIABLE, COMPOSITION: 1,000 ohms ±20%, 2 w; MIL type RV4NAXSD102D	380-0671-00
R11	RESISTOR, FIXED, FILM: 1,000,000 ohms, ±1%, 1 w; MIL type RN75B5111F	705-3259-00
R12	RESISTOR, VARIABLE, COMPOSITION: 1,000 ohms ±20%, 2 w; MIL type RV4NAXSD102B	380-0637-00
R13	RESISTOR, FIXED, FILM: same as R11	705-3259-00
R14	NOT USED	
R15	NOT USED	
R16	NOT USED	
R17	RESISTOR, FIXED, FILM: 17,800 ohms ±1%, 1/4 w; MIL type RN65B1782F	705-7156-00
R18	RESISTOR, FIXED, FILM: same as R17	705-7156-00
R19	RESISTOR, FIXED, COMPOSITION: 270 ohms ±10%, 1/2 w; MIL type RC20GF271K	745-1328-00
R20	RESISTOR, FIXED, COMPOSITION: 1000 ohms ±10%, 1/2 w; MIL type RC20GF102K	745-1352-00
R21	RESISTOR, FIXED, COMPOSITION: same as R19	745-1328-00
R22	RESISTOR, FIXED, COMPOSITION: 22,000 ohms ±5%, 2 w; MIL type RC42GF223J	745-5707-00
R23	RESISTOR, FIXED, COMPOSITION: same as R22	745-5707-00
R24	RESISTOR, FIXED, COMPOSITION: 220,000 ohms ±10%, 1/2 w; MIL type RC20GF224K	745-1450-00
R25	RESISTOR, FIXED, COMPOSITION: 100,000 ohms ±10%, 1/2 w; MIL type RC20GF104K	745-1436-00
R26	RESISTOR, FIXED, COMPOSITION: 470 ohms ±10%, 2 w; MIL type RC42GF471K	745-5638-00
R27	RESISTOR, FIXED, COMPOSITION: 2,200 ohms ±10%, 1 w; MIL type RC32GF222K	745-3366-00
R28	RESISTOR, FIXED, COMPOSITION: same as R24	745-1450-00
R29	RESISTOR, FIXED, COMPOSITION: same as R25	745-1436-00
R30	RESISTOR, FIXED, COMPOSITION: same as R26	745-5638-00
R31	NOT USED	
R32	NOT USED	
R33	NOT USED	
R34	RESISTOR, FIXED, COMPOSITION: 2700 ohms ±10%, 1/2 w; MIL type RC20GF272K	745-1370-00
R35	RESISTOR, FIXED, COMPOSITION: same as R34	745-1370-00
R36	RESISTOR, FIXED, COMPOSITION: 1500 ohms ±10%, 1/2 w; MIL type RC20GF152K	745-1359-00
R37	RESISTOR, FIXED, COMPOSITION: same as R36	745-1359-00
R38	RESISTOR, FIXED, COMPOSITION: 300 ohms ±5%, 2 w; MIL type RC42GF301J	745-5629-00
R39	RESISTOR, FIXED, COMPOSITION: same as R38	745-5629-00
R40	RESISTOR, FIXED, COMPOSITION: same as R26	745-5638-00
R41	RESISTOR, FIXED, COMPOSITION: same as R5	745-1343-00
R42	RESISTOR, FIXED, COMPOSITION: same as R5	745-1343-00
R43	ATTENUATOR, VARIABLE: same as R3	383-0044-00
R44	ATTENUATOR, VARIABLE: same as R3	383-0044-00
R45	RESISTOR, FIXED, COMPOSITION: 10 megohms ±10%, 1/2 w; MIL type RC20GF106K	745-1520-00
R46	RESISTOR, FIXED, WIREWOUND: 310 ohms ±5%, 11 w; MIL type RW29V222	746-6087-00
R47	RESISTOR, FIXED, WIREWOUND: same as R46	746-6087-00
R48	RESISTOR, VARIABLE, COMPOSITION: 5,000,000 ohms ±20%, 2 w; MIL type RV4NAXSD505D	380-0681-00
R49	RESISTOR, FIXED, COMPOSITION: 0.47 megohm ±10%, 1/2 w; MIL type RC20GF474K	745-1464-00
R50	RESISTOR, FIXED, COMPOSITION: 0.56 megohm ±10%, 1/2 w; MIL type RC20GF564K	745-1468-00
R51	RESISTOR, FIXED, COMPOSITION: same as R50	745-1468-00
R52	RESISTOR, VARIABLE, COMPOSITION: 25,000 ohms ±20%, 2 w; MIL type RV4NAXSD253B	380-0664-00
R53	RESISTOR, FIXED, COMPOSITION: 47,000 ohms p/m 5%, 2 w; MIL type RC42GF473J	745-5721-00
R54	RESISTOR, FIXED, COMPOSITION; same as R22	745-5707-00
R55	RESISTOR, FIXED, COMPOSITION: 47,000 ohms ±10%, 1/2 w; MIL type RC20GF473K	745-1422-00
R56	NOT USED	
R57	NOT USED	
R58	NOT USED	
R59	RESISTOR, FIXED, WIREWOUND: 270 ohms ±5%, 11w; MIL type RW29V271	746-6147-00
R60	RESISTOR, FIXED, WIREWOUND: same as R59	746-6147-00
R61	RESISTOR, FIXED, WIREWOUND: same as R59	746-6147-00
R62	RESISTOR, FIXED, WIREWOUND: 18 ohms ±5%, 11w; MIL type RW29V180	746-6045-00
R63 thru R104	NOT USED	
R105	RESISTOR, FIXED, COMPOSITION: same as R5	745-1343-00
R106	RESISTOR, FIXED, COMPOSITION: same as R5	745-1343-00
R107	RESISTOR, FIXED, FILM: same as R7	705-7062-00
R108	RESISTOR, FIXED, FILM: same as R8	705-7046-00
R109	RESISTOR, FIXED, FILM: same as R9	705-7052-00
R110	RESISTOR, VARIABLE, COMPOSITION: same as R10	380-0671-00
R111	RESISTOR, FIXED, FILM: same as R11	705-3259-00
R112	RESISTOR, VARIABLE, COMPOSITION: same as R12	380-0637-00
R113	RESISTOR, FIXED, FILM: same as R11	705-3259-00
R114	NOT USED	
R115	NOT USED	
R116	NOT USED	
R117	RESISTOR, FIXED, FILM: same as R17	705-7156-00
R118	RESISTOR, FIXED, FILM: same as R17	705-7156-00
R119	RESISTOR, FIXED, COMPOSITION: same as R19	745-1328-00
R120	RESISTOR, FIXED, COMPOSITION: same as R20	745-1352-00
R121	RESISTOR, FIXED, COMPOSITION: same as R19	745-1328-00
R122	RESISTOR, FIXED, COMPOSITION: same as R22	745-5707-00
R123	RESISTOR, FIXED, COMPOSITION: same as R22	745-5707-00
R124	RESISTOR, FIXED, COMPOSITION: same as R24	745-1450-00
R125	RESISTOR, FIXED, COMPOSITION: same as R25	745-1436-00
R126	RESISTOR, FIXED, COMPOSITION: same as R26	745-5638-00
R127	RESISTOR, FIXED, COMPOSITION: same as R27	745-3366-00
R128	RESISTOR, FIXED, COMPOSITION: same as R24	745-1450-00
R129	RESISTOR, FIXED, COMPOSITION: same as R25	745-1436-00
R130	RESISTOR, FIXED, COMPOSITION: same as R26	745-5638-00
R131	NOT USED	
R132	NOT USED	
R133	NOT USED	
R134	RESISTOR, FIXED, COMPOSITION: same as R34	745-1370-00
R135	RESISTOR, FIXED, COMPOSITION: same as R34	745-1370-00
R136	RESISTOR, FIXED, COMPOSITION: same as R36	745-1359-00
R137	RESISTOR, FIXED, COMPOSITION: same as R36	745-1359-00

ITEM	DESCRIPTION	COLLINS PART NUMBER
R138	RESISTOR, FIXED, COMPOSITION: same as R38	745-5629-00
R139	RESISTOR, FIXED, COMPOSITION: same as R38	745-5629-00
R140	RESISTOR, FIXED, COMPOSITION: same as R26	745-5638-00
R141	RESISTOR, FIXED, COMPOSITION: same as R5	745-1343-00
R142	RESISTOR, FIXED, COMPOSITION: same as R5	745-1343-00
R143	NOT USED	
R144	NOT USED	
R145	RESISTOR, FIXED, COMPOSITION; same as R45	745-1520-00
R146	RESISTOR, FIXED, WIREWOUND: same as R46	746-6087-00
R147	RESISTOR, FIXED, WIREWOUND: same as R46	746-6087-00
R148	RESISTOR, VARIABLE, COMPOSITION: same as R48	380-0681-00
R149	RESISTOR, FIXED, COMPOSITION: same as R49	745-1464-00
R150	RESISTOR, FIXED, COMPOSITION: same as R50	745-1468-00
R151	RESISTOR, FIXED, COMPOSITION: same as R50	745-1468-00
R152	RESISTOR, VARIABLE, COMPOSITION: same as R52	380-0664-00
R153	RESISTOR, FIXED, COMPOSITION: same as R53	745-5721-00
R154	RESISTOR, FIXED, COMPOSITION: same as R22	745-5707-00
R155	NOT USED	
R156	NOT USED	
R157	NOT USED	
R158	NOT USED	
R159	RESISTOR, FIXED, WIREWOUND: same as R59	746-6147-00
R160	RESISTOR, FIXED, WIREWOUND: same as R59	746-6147-00
R161	RESISTOR, FIXED, WIREWOUND: same as R59	746-6147-00
S1	SWITCH, ROTARY: 8 circuit, 5 position, 4 sections; 1 moving, 12 fixed contacts	259-1851-00
S2	SWITCH, ROTARY: 1 circuit, 2 position, 1 section; 1 moving, 2 fixed contacts	259-1852-00
S3	SWITCH, TOGGLE: dpst; 15 amps at 125 v ac, 10 amps at 25 v ac; hardware supplied with switch; Cutler Hammer, Inc. part no. 7561K4	266-0099-00
T1	TRANSFORMER, AUDIO FREQUENCY: 600 ohms, 150 ohms, two center taps, input, 60, 000 ohms output, center tapped; 30 to 15, 000 cps; 1-5/8 in. by 1-5/8 in. by 2-3/8 in.	667-0438-00
T2	TRANSFORMER, AUDIO FREQUENCY: pri 30, 000 ohms, zero ma, sec. 68, 000 ohms zero ma; 1000 rms test voltage; United Transformer Corp no. X-5738	667-0894-00
T3	TRANSFORMER, AUDIO FREQUENCY: 9000 ohms, center tapped input, 3 outputs, 600 ohms series wound, 150 ohms parallel; 0 dbm to +39 dbm output power level; 2-3/8 in. by 2-3/4 in. by 3-13/16 in.	667-0437-00
T4	TRANSFORMER, POWER, STEP-DOWN AND STEP-UP: primary 115 v rms, 230 v rms, secondary 6.3 v rms, CT, 2.5 amps, 6.3 v rms, CT, 2.5 amps, 50/50 cycles frequency, continuous duty cycle	682-0135-00
T5	TRANSFORMER, AUDIO FREQUENCY: same as T1	667-0438-00
T6	TRANSFORMER, AUDIO FREQUENCY: same as T2	667-0894-00
T7	TRANSFORMER, AUDIO FREQUENCY: same as T3	667-0437-00
TB1	TERMINAL BOARD: barrier type strip w/ lug for back connection; 13/32 in. thk by 7/8 in. w by 4-1/8 in. lg; 10 terminals spaced apart 3/8 in.; phenolic insulation; Howard B. Jones part no. 353-18-10-001	367-0018-00
TB2	TERMINAL BOARD: phenolic, w/ 5 solder-lug terminals; 1-7/8 in. lg by 11/16 in. w; Cinch Mfg. Corp. part no. 1542-A	306-0550-00
TB3	TERMINAL BOARD: same as TB2	306-0550-00
TB4	TERMINAL BOARD: phenolic w/ 3 solder-lug terminals; 11/16 in. w by 1-1/8 in. lg; Cinch Mfg. Corp. part no. 1520-A	306-9033-00

ITEM	DESCRIPTION	COLLINS PART NUMBER
TB5	TERMINAL BOARD: same as TB4	306-9033-00
TB6	TERMINAL BOARD: phenolic, 1/16 in. by 3/8 in. by 1-1/2 in., 4 brass solder lug terminals; Cinch Mfg. Corp. part no. 1532-A	306-9032-00
TB7	TERMINAL BOARD: phenolic w/ 4 solder lug terminals; 15/32 in. by 11/16 in. by 1-1/2 in. o/a; Cinch Mfg. Corp. part no. 1909	306-0838-00
TB8	TERMINAL BOARD: w/ 2 solder lugs; 5/8 in. lg, 19/32 in. w; Cinch Mfg. Corp. part no. 332-14-02-210	306-0002-00
TB9	TERMINAL BOARD: same as TB7	306-0838-00
TB10	TERMINAL BOARD: same as TB2	306-0550-00
TB11	TERMINAL BOARD: same as TB1	367-0018-00
TB12	TERMINAL BOARD: same as TB2	306-0550-00
TB13	TERMINAL BOARD: same as TB2	306-0550-00
TB14	TERMINAL BOARD: same as TB4	306-9033-00
TB15	TERMINAL BOARD: same as TB4	306-9033-00
TB16	TERMINAL BOARD: same as TB7	306-0838-00
TB17	TERMINAL BOARD: same as TB7	306-0838-00
TB18	TERMINAL BOARD: 2 brass solder lugs, cadmium plated; 1/16 in. by 3/8 in. by 3/4 in.; Herman H. Smith, Inc. part no. 862	306-0006-00
TB19	TERMINAL BOARD: same as TB4	306-9033-00
TB20	TERMINAL BOARD: same as TB2	306-0550-00
TB21	TERMINAL BOARD: same as TB2	306-0550-00
TB22	TERMINAL BOARD: same as TB8	306-0002-00
TB23	TERMINAL BOARD: same as TB2	306-0550-00
TB24	TERMINAL BOARD: same as TB18	306-0006-00
V1	ELECTRON TUBE: glass envelope; Aeronautical Radio, Inc. part no. 6386	253-0015-00
V2	ELECTRON TUBE: twin triode; Radio Corp. of America part no. 12AU7	255-0199-00
V3	ELECTRON TUBE: beam; Radio Corp. of America part no. 6V6GT	255-0021-00
V4	ELECTRON TUBE: same as V3	255-0021-00
V5	ELECTRON TUBE: twin diode, Tung-Sol Electric, Inc. part no. 6AL5	257-0018-00
V6	ELECTRON TUBE: glass envelope; Radio Corp. of America part no. OA2	257-0052-00
V7	NOT USED	
V8	NOT USED	
V9	NOT USED	
V10	NOT USED	
V11	ELECTRON TUBE: same as V1	253-0015-00
V12	ELECTRON TUBE: same as V2	255-0199-00
V13	ELECTRON TUBE: same as V3	255-0021-00
V14	ELECTRON TUBE: same as V3	255-0021-00
V15	ELECTRON TUBE: same as V5	257-0018-00
V16	ELECTRON TUBE: same as V6	257-0052-00
XDS1	LAMPHOLDER: for use wfth T-3-1/4 miniature bayonet base lamps; MIL type MS90282-3	262-0913-00
XDS2	LAMPHOLDER: same as XDS1	262-0913-00
XF1	FUSEHOLDER: extractor post type; accommodates 1-1/4 by 1/4 3 AG fuses; 11/16 in. by 2-9/32 in.; 1/16 in. locking slug to be furnished; Bussmann Fuse part no. HKP 1/16	265-1002-00
XV1	SOCKET, ELECTRON TUBE: beryllium copper, or phosphor bronze contacts plated w/ silver or gold; Elco Corp. part no. 1520 BC	220-1337-00
XV2	SOCKET, ELECTRON TUBE: same as XV1	220-1337-00
XV3	SOCKET, ELECTRON TUBE: copper base alloy contacts; silver plated; 5/8 in. h, 1-7/64 in. dia, 1-7/8 in. lg o/a dim., excl terminals and contacts; MIL type TS101P01	220-1121-00
XV4	SOCKET, ELECTRON TUBE: same as XV3	220-1121-00
XV5	SOCKET, ELECTRON TUBE: 7 contact, top mounting miniature tube socket; type MFE low loss plastic construction; Sylvania Electric part no. 7470-023	220-1334-00
XV6	SOCKET, ELECTRON TUBE: same as XV5	220-1334-00
XV7	NOT USED	
XV8	NOT USED	
XV9	NOT USED	
XV10	NOT USED	
XV11	SOCKET, ELECTRON TUBE: same as XV1	220-1337-00
XV12	SOCKET, ELECTRON TUBE: same as XV1	220-1337-00
XV13	SOCKET, ELECTRON TUBE: same as XV3	220-1121-00
XV14	SOCKET, ELECTRON TUBE: same as XV3	220-1121-00
XV15	SOCKET, ELECTRON TUBE: same as XV5	220-1334-00
XV16	SOCKET, ELECTRON TUBE: same as XV5	220-1334-00

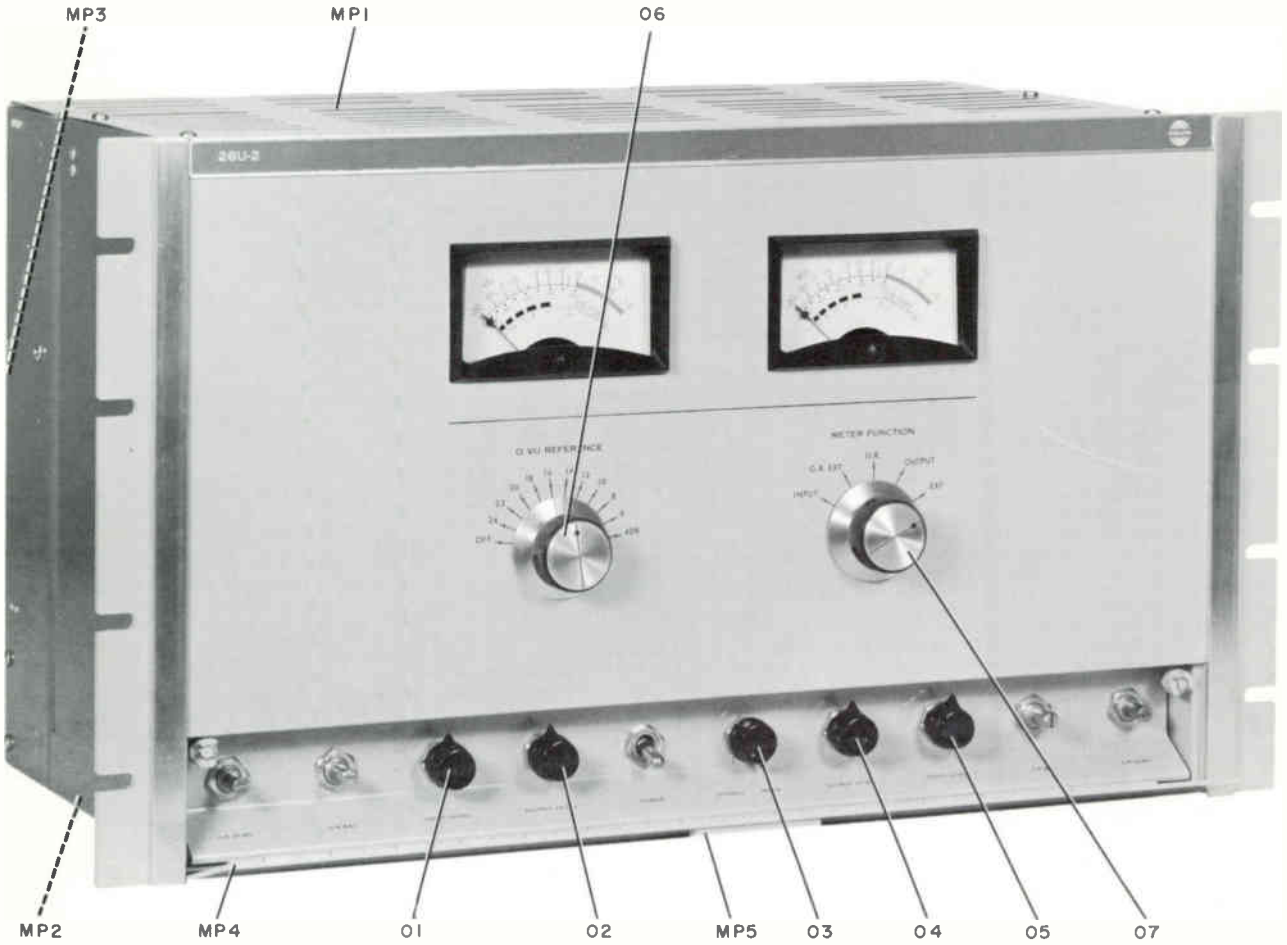

Figure 6-1. 26U-2 Stereo Peak Limiter, Front View, Subpanel Cover Lowered

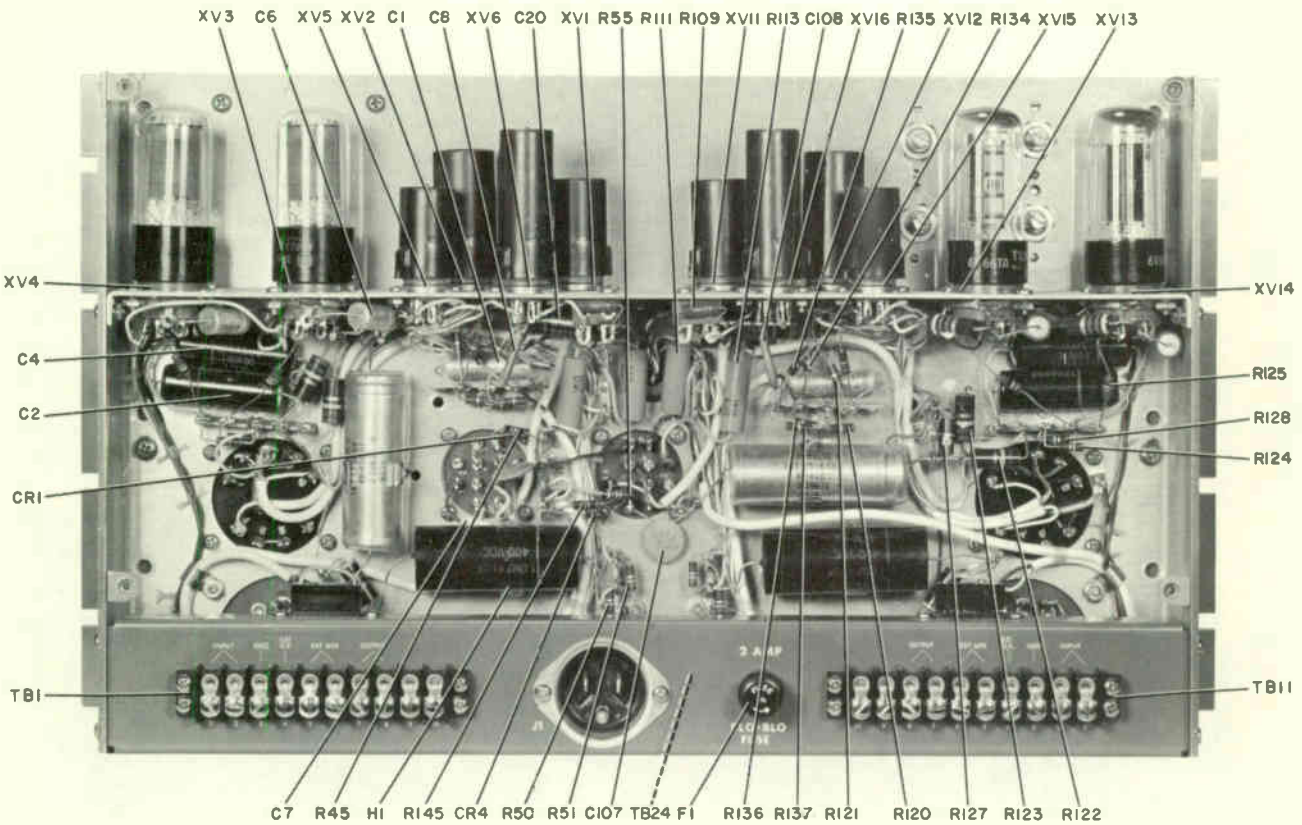

Figure 6-2. 26U-2 Stereo Peak Limiter, Inside Back View

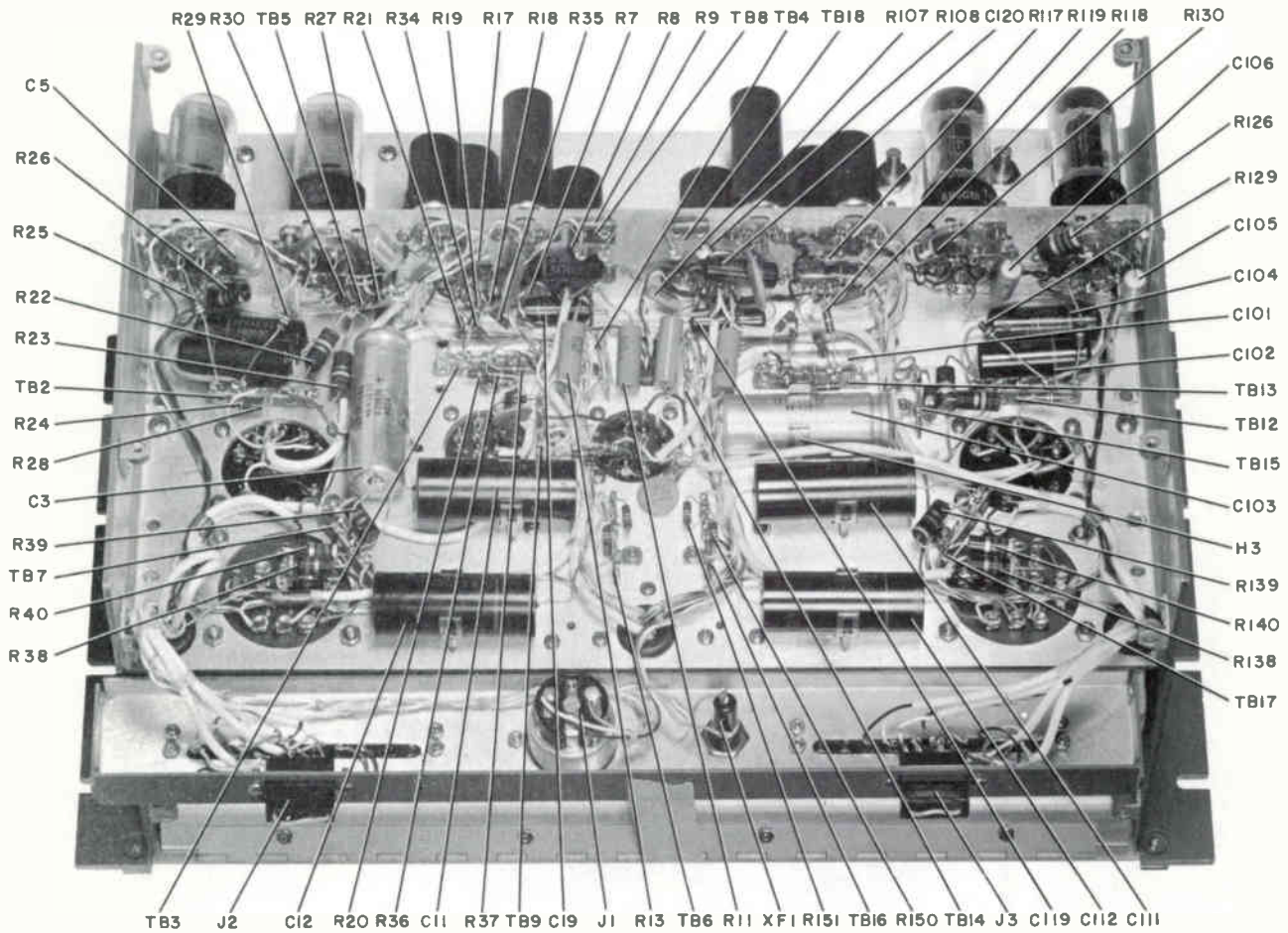

Figure 6-3. 26U-2 Stereo Peak Limiter, Inside Rear View with Terminal Panel Lowered

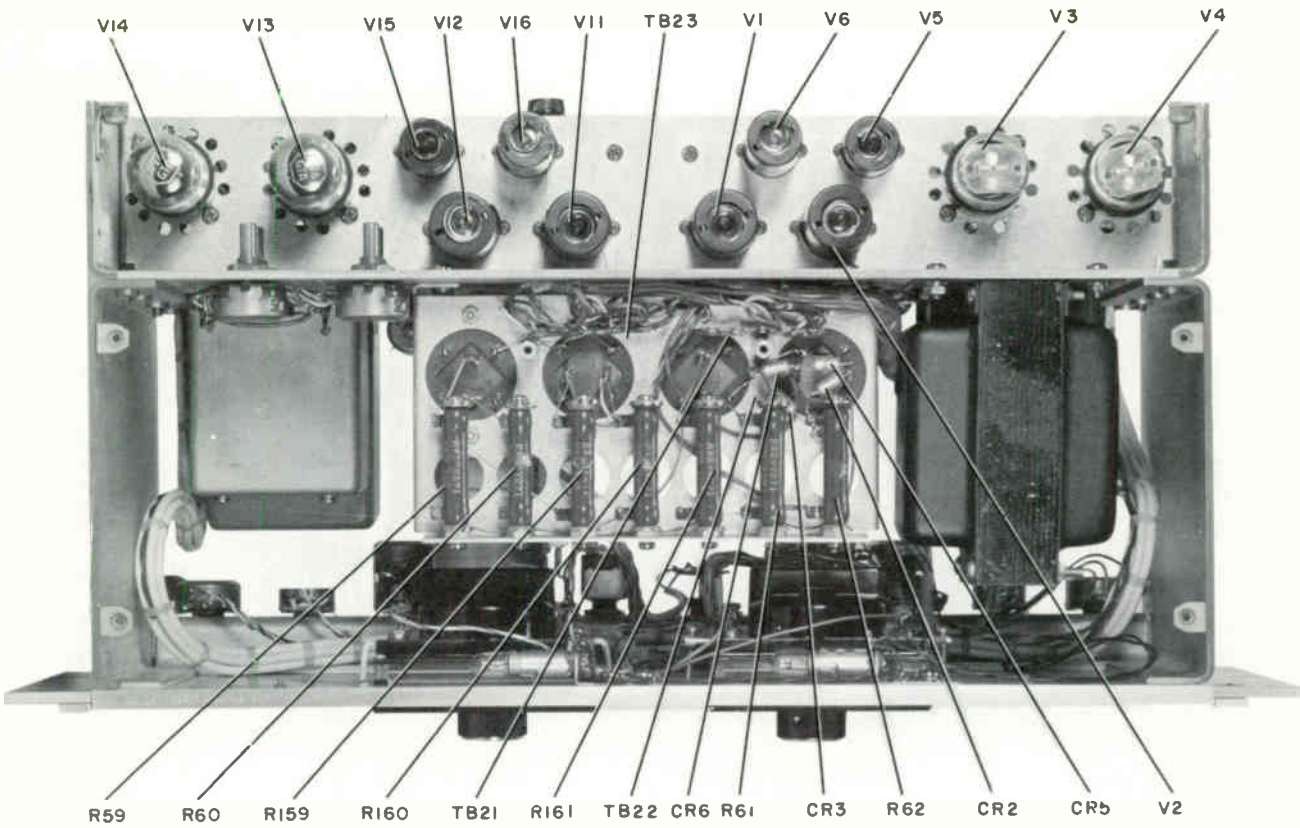

Figure 6-4. 26U-2 Stereo Peak Limiter, Top View

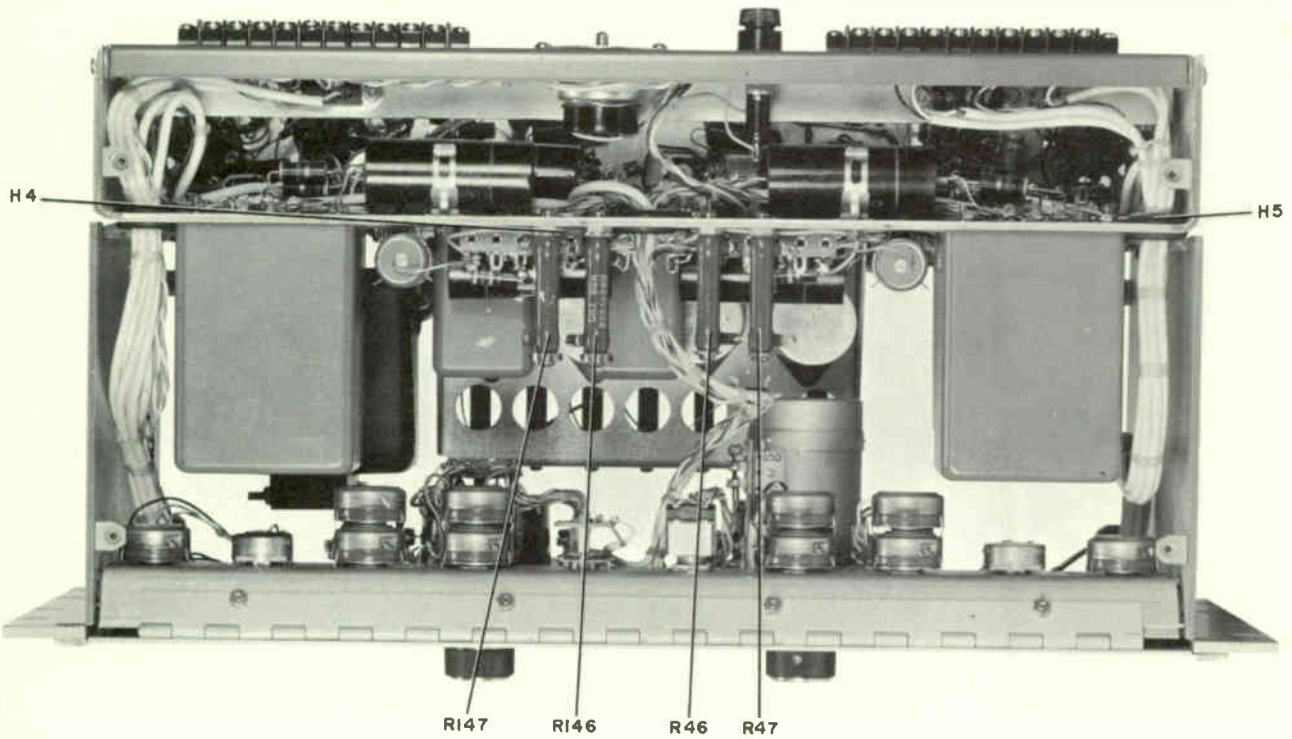

Figure 6-5. 26U-2 Stereo Peak Limiter, Bottom View

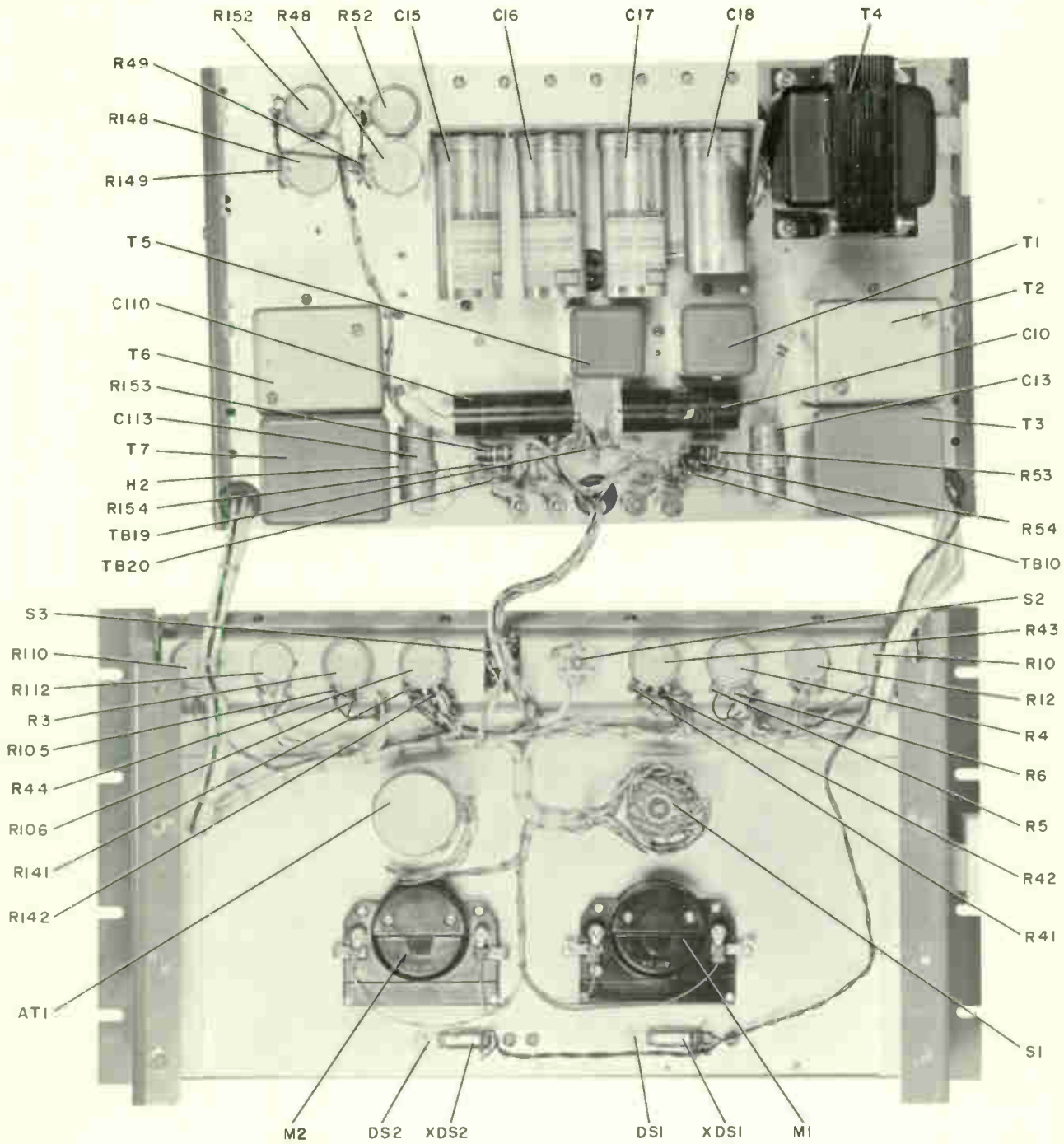

Figure 6-6. 26U-2 Stereo Peak Limiter, Module Separated at Center

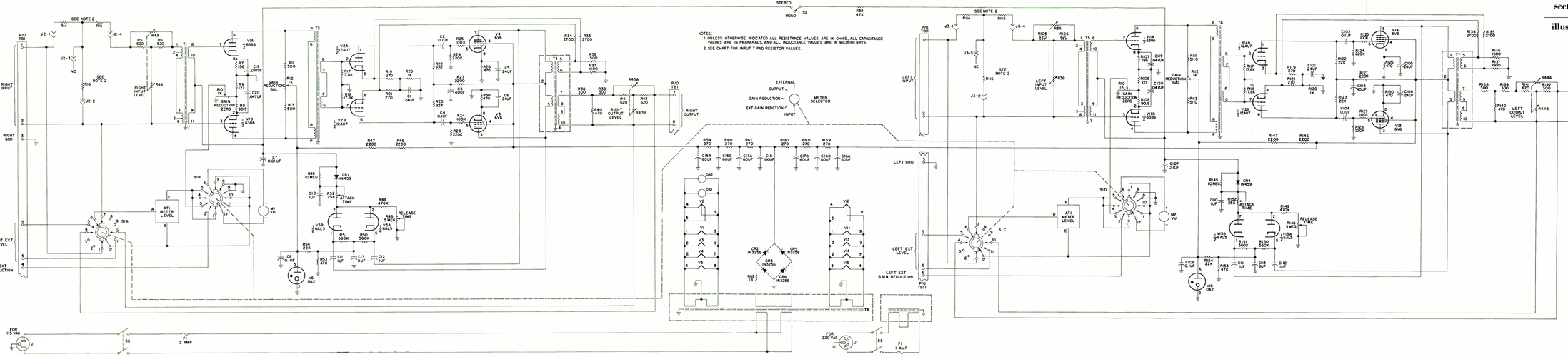

Figure 7-1. 26U-2 Stereo Peak Limiter, Schematic Diagram

COLLINS