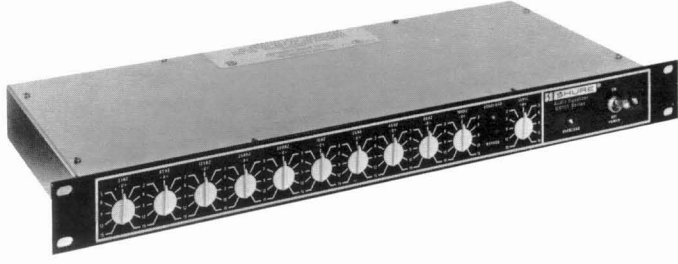


OPERATION AND SERVICE MANUAL



The Shure SR107 Audio Equalizer is a compact, versatile unit designed to provide adjustment of tonal balance on an octave-by-octave basis across the audio frequency range. The SR107 is used in sound system applications for the purposes of feedback control in live performances, playback equalization (correcting for equipment response and/or room acoustics in prerecorded performances), and improvement in the sound quality of live performances. Equipment response correction includes the elimination of such problems as transducer incompatibility, overload at low frequencies (rumble), tape hiss and disc surface noise. The SR107 is a balanced input and output line level device, designed primarily for installation between the audio console or mixer and the power amplifier of the sound system.

DESCRIPTION

The SR107 has ten octave band, minimum phase, combining type filters centered on ISO† preferred frequencies from 31 Hz to 16 kHz. Each filter is adjustable for approximately 15 dB of boost or attenuation. The equalized output is adjustable over a ±15 dB range, and overall gain of up to 20 dB may be introduced to compensate for low input signals. A peak-responding overload light-emitting diode (LED) is provided on the front panel. The SR107 contains both professional three-pin and phone jack input and output connectors, and a phone jack auxiliary output.

The SR107 is designed for maximum simplicity of operation and maintenance. All components are of the highest quality and are operated well within their respective ratings to assure maximum reliability under normal use conditions.

The SR107 and SR107-2E are identical except that the SR107 operates from 108-132 Vac, 50/60 Hz and the SR107-2E operates from either 105-125 or 210-250 Vac, 50/60 Hz (switch-selectable). The SR107-2E is supplied with a detachable ac line cord (without power plug). The SR107 (only) is listed by Underwriters' Laboratories, Inc., and is listed by Canadian Standards Association as certified.

All SR107 units are supplied with four rack-mounting screws for mounting in standard 19-inch (483 mm) audio equipment racks or in optional Shure A30A or A105A Carrying Cases. An optional protective cover, Shure Model A107A, is also available.

SPECIFICATIONS*

- Equipment TypeAll transistor inductorless active equalizer
- Voltage Gain:
 - GAIN Control at UNITY0 dB LINE INPUT to LINE OUTPUT
 - 27 dB LINE INPUT to AUX OUTPUT
 - 50 dB LINE INPUT to MIC OUTPUT
 - GAIN Control at +20 dB+20 dB LINE INPUT to LINE OUTPUT
 - 7 dB LINE INPUT to AUX OUTPUT
 - 30 dB LINE INPUT to MIC OUTPUT
- LEVEL ControlProvides additional gain adjustment of ±15 dB over values given above, EQUALIZER IN mode only.
- Frequency Response ..±2 dB from 30 Hz to 20 kHz, EQUALIZER IN or BYPASS
- Signal to Noise Ratio (20 Hz-20 kHz)Typically 99 dB at maximum output with Filter Controls and LEVEL Control at zero and GAIN Control at UNITY in EQUALIZER IN mode.
- Output Noise, Maximum (300 Hz-20 kHz at LINE OUTPUT) ...
 - 84 dBV (63 μV)
 - 69 dBV (0.50 mV), LEVEL Control at +15, Filter Controls at -15
 - 91 dBV (28 μV), EQUALIZER Switch in BYPASS
- Output Hum and Noise, Maximum (20 Hz-20 kHz at LINE OUTPUT) ...
 - 83 dBV (71 μV)
 - 67 dBV (0.56 mV), LEVEL Control at +15, Filter Controls at -15
 - 88 dBV (40 μV), EQUALIZER Switch in BYPASS
- Input Common Mode Rejection90 dB minimum at 100 Hz
- Clipping Level (30 Hz-20 kHz):
 - Input+18 dBm minimum (+15.8 dBV, 6.2V) GAIN Control at UNITY
 - 2 dBm minimum (-4.2 dBV, 0.62V) GAIN Control at +20 dB

† International Organization for Standardization

* See Page 2

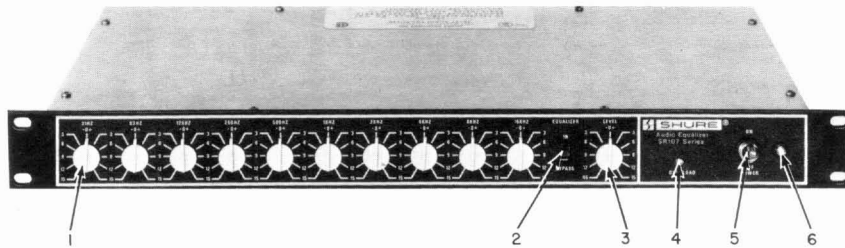


FIGURE 1. SR107 FRONT PANEL

Output +18 dBm minimum (+15.8 dBV, 6.2V) at LINE OUTPUT
 -10.2 dBV minimum (0.31V) at AUX OUTPUT
 -34.2 dBV minimum (19.5 mV) at MIC OUTPUT

Overload Indicator Illuminates 3 dB \pm 1.5 dB before output clipping occurs

Input Impedance 70 kilohms actual, balanced bridging (for use with line level source, 10 kilohms or less.)

Output Impedance:
 MIC OUTPUT 1 ohm actual, balanced (for use with 25- to 600-ohm inputs)
 LINE OUTPUT 115 ohms actual, balanced (for use with 600-ohm lines)
 AUX OUTPUT 630 ohms actual, unbalanced (for use with auxiliary circuits of 600 ohms or more impedance)

Distortion:
 Intermodulation ... 0.25% max. at 12.2 dBm (3.2V) (LINE OUTPUT) with a 60 Hz and 7.0 kHz input at a 4:1 ratio
 Harmonic 1% max. total harmonic distortion at 12.2 dBm (3.2V) (LINE OUTPUT), 30 Hz-20 kHz with Filter Controls at +15, GAIN Control +20 dB and LEVEL Control at +15

Phase Pin 3 and tip contacts of LINE INPUT Connectors are in phase with pin 3 of MIC/LINE OUTPUT and tip contacts of LINE and AUX OUTPUT Connectors

Equalization Filters:
 Center Frequencies Octave spaced from 31 Hz to 16 kHz. Accurate to within \pm 10% of labeled value
 Characteristics ... 15.5 \pm 2 dB boost or attenuation at center frequency
 6.5 \pm 2 dB at maximum boost or attenuation at one-half octave above or below center frequency

Typical filter frequency response characteristics are shown in Figures 5A and 5B. Filters are minimum phase, combining type and electrically isolated.

Operating Voltage and Power SR107: 120 Vac \pm 10%, 50/60 Hz; 6 watts maximum
 SR107-2E: 105-125 or 210-250 Vac, 50/60 Hz; 6 watts maximum

Accessory Power 31 Vdc open circuit, 27 Vdc at 10 mA, maximum

Temperature
 Operating -7°C to 57°C (20°F to 135°F)
 Storage -29°C to 71°C (-20°F to 160°F)

Dimensions 44.4 mm height x 483 mm width x 218 mm depth (1-3/4 in. x 19 in. x 8-9/16 in.) (Figure 3)

Weight 3.5 kg (7 lb, 12 oz)
 Finish Matte black
 Installation Equipped for standard 19 in. (483 mm) audio rack mounting; may be operated in optional A30A or A105A Carrying Case (with other equipment)

Certifications Listed by Underwriters' Laboratories, Inc.; listed by Canadian Standards Association as certified (SR107 only)

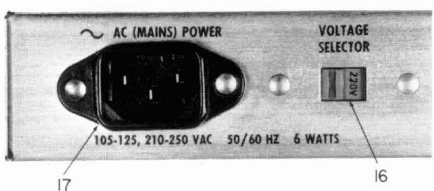
* Measurement conditions unless otherwise specified: Operating voltage 120V, 60 Hz (SR107); 230V, 60 Hz with VOLTAGE SELECTOR Switch in 220V position (SR107-2E); LINE INPUT 1 volt at 1 kHz through 600 ohms; LINE OUTPUT and AUX OUTPUT terminated in 600 ohms, MIC OUTPUT terminated in 150 ohms; GAIN Control at UNITY; Filter Controls and LEVEL Control at zero; EQUALIZER Switch set to IN.

OPERATING INSTRUCTIONS

WARNING

To reduce the risk of fire or electric shock, do not expose this appliance to rain or extreme moisture.

Functional Description (Refer to Figures 1 and 2)
 1. 31 Hz to 16 kHz Filter Controls — Provide \pm 15 dB level adjustment at center frequency of each of ten octave band filters.



SR107-2E ONLY

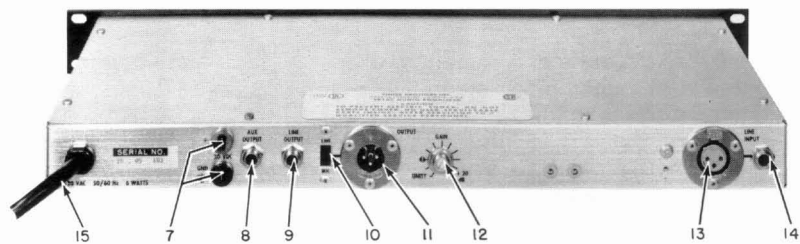


FIGURE 2. SR107 REAR PANEL

2. EQUALIZER IN/BYPASS Slide Switch — Disables filters and LEVEL Control in BYPASS position and returns gain of Equalizer (LINE INPUT to LINE OUTPUT) to value determined by rear-panel GAIN Control.
3. LEVEL Control — Operative only in EQUALIZER IN mode. Provides adjustment of Equalizer output level of ± 15 dB to compensate for changes in gain resulting from Filter adjustments.
4. OVERLOAD LED — Provides peak signal visual indication when peaks in output signal approach actual clipping level of output amplifier.
5. POWER ON/OFF Switch — Controls ac power to unit.
6. Power-On Indicator Lamp — Indicates ac power is being applied to unit.
7. 30 Vdc Accessory Power Jacks — Provide 31 Vdc open circuit (27 Vdc at 10 mA max.) for accessory equipment.
8. AUX OUTPUT Phone Jack — Provides unbalanced low-impedance output for connection to audio console or amplifier-mixer link input.
9. LINE OUTPUT Phone Jack — Provides balanced or unbalanced line level output to power amplifier.
10. MIC/LINE Slide Switch — Connects line level or low-impedance microphone level signal to 3-pin OUTPUT Connector.
11. OUTPUT 3-Pin Male Connector — Provides balanced output at either line level or low-impedance microphone level as selected by MIC/LINE switch. May be unbalanced externally.
12. GAIN Control — Provides gain adjustment range from UNITY to +20 dB to accommodate various input and output requirements. Operates in both EQUALIZER IN and BYPASS modes.
13. LINE INPUT 3-Pin Female Connector — Provides balanced bridging, high-impedance input connection from audio console or mixer-preamplifier. May be unbalanced externally.
14. LINE INPUT Phone Jack — Provides balanced or unbalanced bridging, high-impedance input connection from audio console or mixer-preamplifier.
15. Ac Grounded Line Cord — Connects unit to ac power source (SR107 only).
16. VOLTAGE SELECTOR Slide Switch — Permits selection of 105-125 or 210-250 Vac 50/60 Hz operation (SR107-2E only).
17. AC (MAINS) POWER 3-Pin Connector — Connects unit to ac (mains) power source via supplied line cord (SR107-2E only).

General Operating Instructions

The SR107 Audio Equalizer is primarily intended for connection in a sound system between the output of an audio console or mixer-preamplifier and the input to the power amplifier(s). A typical installation provides a line level input to the Equalizer and utilizes its line level output to drive the power amplifier. In a system using a limiter or compressor between the mixer and power amplifier, the SR107 should be connected between the limiter or compressor and power amplifier to achieve best signal-to-noise performance.

An alternate location for the SR107 is between the Link Out and Link In jacks of a console or mixer equipped with these jacks. The SR107 can provide satisfactory operation at the lower signal levels characteristic of this location and is equipped with an auxiliary output of appropriate level for the Link In connection. In the follow-

ing general operating procedure, variations in connection for Link operation are indicated where applicable.

1. Using hardware provided, install SR107 Audio Equalizer securely in standard 19 in. (483 mm) rack or optional A30A or A105A Carrying Case prior to making electrical connections.
2. Connect audio console or mixer-preamplifier line level output to SR107 LINE INPUT 3-pin connector or phone jack (13, 14). (For Link use, connect link output of console or mixer to either SR107 LINE INPUT Connector.)
3. Connect SR107 LINE OUTPUT phone jack or 3-pin OUTPUT Connector (9, 11) to power amplifier input. If 3-pin connector is used, place MIC/LINE Switch in LINE position. (For Link use, connect SR107 AUX OUTPUT (8) to link input of console or mixer.)
4. Place all Filter Controls (1) and LEVEL Control (3) in zero position. Move EQUALIZER IN/BYPASS Switch (2) to BYPASS. Set GAIN Control (12) to UNITY. (For Link use, set GAIN Control to +20 dB.)
5. SR107: Connect ac line cord (15) to grounded 108-132V, 50/60 Hz ac source. SR107-2E: Move VOLTAGE SELECTOR Switch (16) to 115V or 220V position as appropriate. Attach suitable 3-pin male power plug to ac line cord and insert chassis connector into AC (MAINS) POWER Connector (17). Connect ac line cord to grounded 105-125V or 210-250V, 50/60 Hz ac source.
6. Position speakers in desired operating locations and aim for uniform coverage of audience area. Position microphones (if used) as required by performance or application involved. Basic precautions relative to microphone and speaker locations should be observed to reduce feedback potential. Set all tone controls in audio console or mixer to their zero or flat position. Set output phase switch (if any) to 0° or in-phase condition.
7. Apply power to sound system. Place POWER ON/OFF Switch (5) in ON position. Power-On Indicator Lamp (6) will go on, indicating operation of unit.
8. Using voice, program material or tone generator (such as Shure Model A15TG) for input to sound system, increase console or mixer output level until SR107 OVERLOAD Indicator (4) flickers. Increase volume control on power amplifier until amplifier clipping distortion is evident. OVERLOAD Indicator now indicates onset of clipping in both SR107 and power amplifier. NOTE: This step does not apply to Link operation.
9. Using voice or program material as source, adjust console or mixer output to provide desired sound level in room. (For Link use, adjust individual channel volume controls for desired mix and set to level that will cause only occasional flickering of SR107 OVERLOAD Indicator on peaks of high level program material.) If microphones are used as sound source, satisfactory sound level may not be possible due to feedback. In this case, set volume to stable point just below feedback level.
10. Operation of SR107 such that OVERLOAD Indicator flickers slightly, on only the loudest program peaks, is recommended. This will maximize signal-to-noise ratio, but will generally not result in audible distortion since Indicator threshold is 3 dB below actual clipping level. Operating with OVERLOAD Indicator always off may result in less than optimum signal-to-noise performance.

If OVERLOAD Indicator is flashing brightly or on constantly, operating level is too high and will cause distortion, and may result in less than full power output from the sound system.

11. Set EQUALIZER Switch to IN position. Adjust Filter Controls for particular equalization objective. See procedures for feedback control, and playback and live performance equalization in following sections. While adjusting Equalizer Filter Controls, use LEVEL Control to maintain desired volume in room. Do not attempt equalization beyond bandwidth limits of sound system. For best results, keep number of Filter Controls used to a minimum, and adjust each control no more than required.
12. After equalization, perform listening check of audience area to be sure that sound quality is satisfactory throughout room.

Mounting and Ventilation

The SR107 Audio Equalizer is designed for rack-mounting in a 483 mm (standard 19 in.) audio equipment rack and is supplied with the necessary mounting hardware (see Figure 3).

The SR107 may also be operated while mounted in a Shure A30A or A105A Carrying Case. The A30A has a panel height capacity of 88.9 mm (3½ in.) for two SR107s or one SR107 and one other unit of 44.4 mm (1¾ in.) height. The A105A has a panel height of 178 mm (7 in.) and will accommodate up to four units with panel heights equal to that of the SR107.

No special precautions are required for ventilation. The SR107 may be operated over a temperature range of -7° to 57°C (20° to 135°F) in continuous duty without derating.

Power Supply

The SR107 is furnished with a three-conductor power cable and three-prong grounded plug (15). Connect the SR107 to an outlet which supplies 108 to 132 volts ac, 50/60 Hz power. The maximum power consumption at 120 volts under normal operating conditions is 6 watts (0.05 amperes at 120 volts). If extension cords are required, a high-quality, 18 gauge or larger cord should be used.

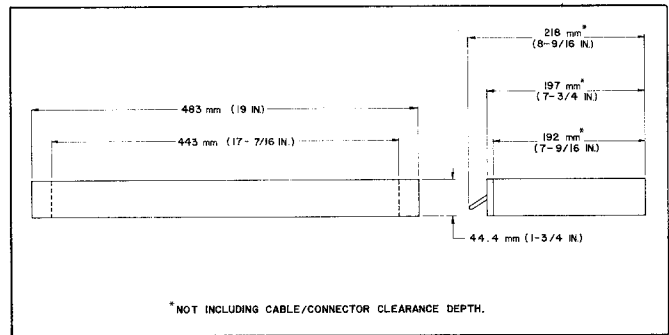


FIGURE 3.
OVERALL DIMENSIONS

The SR107-2E is furnished with a three-conductor detachable line cord without a power plug. Obtain a suitable 3-pin male power plug and attach it to the line cord. The plug should be installed by qualified service personnel. (Brown lead goes to "hot" or "live" terminal, blue lead to neutral terminal, and green/yellow lead to ground or earth terminal.) Connect the equipment end of the line cord to the AC (MAINS) POWER Connector (17) on the rear panel of the SR107-2E. Select the proper operating voltage (115V for 105-125V supply or 220V for 210-250V supply). Maximum power consumption at either operating voltage is 6 watts.

A POWER ON-OFF toggle switch (5) on the front panel controls the application of ac power to the SR107 and a red indicator lamp (6) indicates the power-on condition.

Functional Circuit Description

Input connections to the SR107 Audio Equalizer are made through either a three-conductor (stereo type) phone jack (14) or a three-pin female audio connector (13) (see Figure 4). The connectors are wired in parallel to provide a balanced line level input with either connector. Inserting a two-conductor phone plug into the phone jack will automatically unbalance the input. The input signal is passed through a 6 dB stepdown input transformer to an attenuator. The attenuator provides an additional 11 to 26 dB of loss depending upon the setting of the LEVEL Control (3) described later.

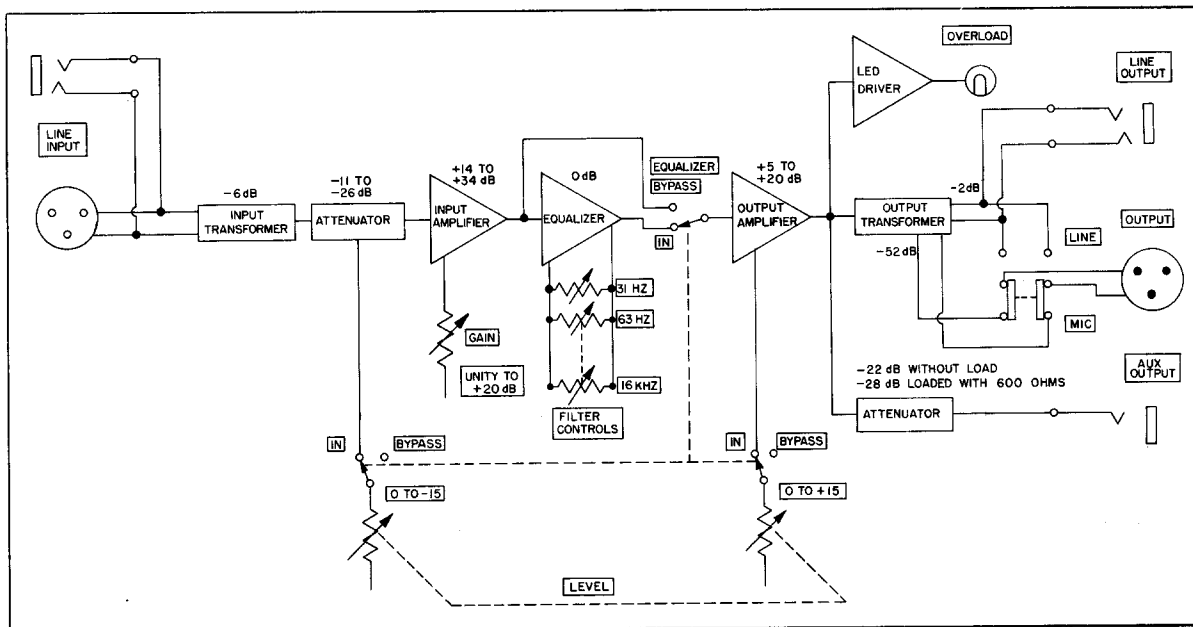


FIGURE 4. SR107 BLOCK DIAGRAM

The next stage is an input amplifier which has a gain of 14 to 34 dB depending on the setting of the rear panel GAIN Control (12). The output of the amplifier is fed to two cascaded differential amplifier stages which comprise the equalizer boost and cut circuitry. The individual active gyrator resonators for 31 Hz, 125 Hz, 500 Hz, 2 kHz and 8 kHz are connected to the first of the differential amplifiers and provide control of these frequency bands. The second amplifier is connected to the 63 Hz, 250 Hz, 1 kHz, 4 kHz, and 16 kHz active resonators for control of the remaining five frequency bands. Each of the ten octave-spaced filters is equipped with a front panel Filter Control (1) which may be adjusted for up to 15 dB boost or cut relative to its zero or flat position (see Figure 5). This configuration of minimum-phase networks assures correct filter characteristic combinations, minimum amplitude ripple, and minimum phase shift.

The output of the second Equalizer differential amplifier is fed to the EQUALIZER IN/BYPASS Switch (2) which selects the input to the line output stage from either the equalizer amplifier in the IN position, or from the output of the input amplifier stage in the BYPASS position.

The Equalizer LEVEL Control (3) provides adjustment of the Equalizer output level over the range of ± 15 dB relative to its zero setting. Reduction in output is accomplished by attenuating the signal input to the input amplifier. An increase in output is produced by changing the gain in the output amplifier. The LEVEL Control operates only when the EQUALIZER IN/BYPASS switch is set to the IN position.

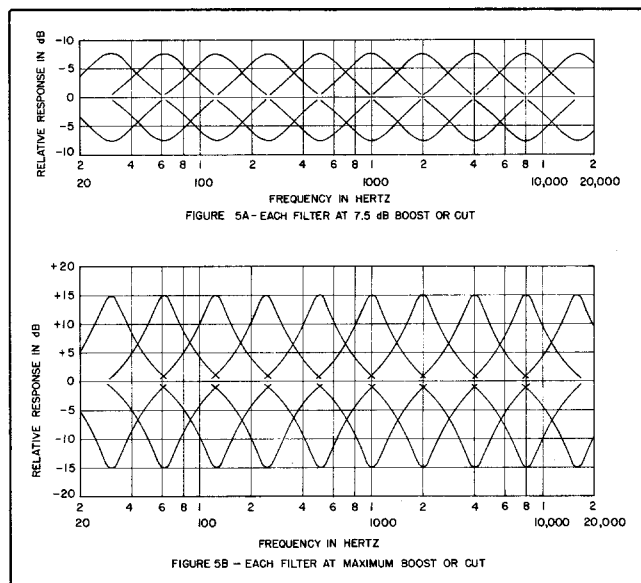


FIGURE 5.
TYPICAL FILTER CHARACTERISTICS

The output amplifier has a gain of 5 to 20 dB depending on the setting of the LEVEL Control, and is capable of delivering +18 dBm through the output transformer to a 600-ohm load at either of the balanced LINE OUTPUT Connectors (9, 11). The three-pin male OUTPUT Connector may be switched from balanced line level to low-impedance microphone level output (50 dB below line level) by means of the MIC/LINE Slide Switch (10) which selects one of two secondary windings on the output transformer. The AUX OUTPUT Phone Jack (8) is supplied with an output signal that is 20 dB below that of the LINE OUTPUT. This is obtained from an attenuator net-

work at the output of the output amplifier. The AUX OUTPUT can be used to feed the link input of an audio console or mixer so equipped.

An LED driver stage connected to the output amplifier illuminates the front panel OVERLOAD LED (4) when the audio signal approaches the output clipping level. The OVERLOAD Indicator operates in both the EQUALIZER IN and BYPASS modes.

Input and Output Connections

Two LINE INPUT Connectors are located on the rear panel of the SR107. A professional, three-pin female audio connector (13) provides a balanced connection from the audio console or mixer-preamplifier. A standard 1/4 in. three-conductor (stereo) phone jack (14) provides either a balanced or unbalanced input connection depending upon the phone plug (three-conductor or two-conductor) used.

The gain of the SR107 can be adjusted by means of the back panel GAIN Control from UNITY to +20 dB in either the EQUALIZER IN or BYPASS modes. The 20 dB gain capability may be used in hi-fi or Link applications to maintain desired signal-to-noise performance through the SR107. It also allows the Equalizer to accommodate a variety of normal input and output levels while maintaining an adequate operating signal-to-noise ratio.

Three output connectors are provided on the rear panel. A professional three-pin male audio OUTPUT connector provides a balanced low-impedance output at either microphone or line level depending upon the setting of the associated MIC/LINE Slide Switch. The LINE OUTPUT Connector is a standard 1/4 in. three-conductor (stereo) phone jack which provides a low-impedance line level output that can be either balanced or unbalanced. The AUX OUTPUT Connector is a standard 1/4 in. two-conductor phone jack providing a low-impedance unbalanced output suitable for connection to a hi-fi power amplifier or the link input of a mixer or audio console. The LINE, microphone level and AUX outputs are isolated and may be used simultaneously.

APPLICATIONS

The primary applications for the SR107 Audio Equalizer are as follows:

1. Feedback Control — Adjustment of sound system frequency response to provide maximum gain before feedback and improved sound quality in a variety of live performance situations. The SR107 is equally adaptable to feedback control functions in either a house sound system or stage monitor (foldback) system.
2. Playback Equalization — Adjustment of audio playback system frequency response to compensate for any variations in electrical or acoustical response that may alter the natural sound of the recorded material.
3. Live Performance Equalization — Adjustment of sound system frequency response to provide a tonal balance appropriate to the performance and to reduce the tendency for feedback.

The following sections present procedures and recommendations for the use of the SR107 in each of these applications. Also included is a section discussing acoustic measurement instrumentation and its use with the SR107.

Feedback Control

In many live performance sound reinforcement applications, feedback is often the limiting factor in achieving

satisfactory sound amplification and coverage. The SR107 Audio Equalizer provides the means for selective suppression of those octave frequency bands in the audio spectrum where feedback is likely to occur. These frequency bands differ from one installation to another depending upon the acoustics of the room, equipment used, and speaker and microphone placement. The range of control of both frequency and amplitude provided in the SR107 is sufficient to accomplish significant feedback suppression without noticeable loss of program material. Proper adjustment of the Equalizer for feedback control is a matter of some experimentation; a general procedure is described here. These procedures for both house and stage monitor live performance sound reinforcement systems assume that the system speakers have a consistent phase relationship and that all microphones used are also wired for consistent phase operation. If necessary, the phase of any balanced microphone line equipped with professional 3-pin connectors can be reversed using a plug-in Shure Model A15PR Phase Reverser.

House System

1. Refer to *General Operating Instructions* for initial connections and setup.
2. Adjust individual mixer volume control for each performer's microphone to level slightly below feedback threshold. If console or mixer is equipped with output phase reversal switch, set to position giving highest gain without feedback. If necessary, reduce setting of master volume control slightly and return to feedback point for each switch position to evaluate switch effect. Operation of this switch will usually affect only low-frequency feedback.
3. Increase LEVEL setting until feedback squeal or ringing is heard. If feedback appears to be high-pitched, one of five mid-to high-frequency Filter Controls (1 thru 16 kHz) will be most effective in eliminating feedback. Each Filter Control should be turned down (counterclockwise) and back to "0" position slowly to determine which is most effective. Control which stops feedback with the least rotation should be turned down *only* so far as necessary to eliminate feedback.
4. If feedback frequency happens to fall between bands covered by two adjacent controls, it may be necessary to turn down both controls slightly to obtain desired feedback suppression.
5. If feedback sound first noted in step 3 was low-pitched, adjustment procedure should be started using low-frequency (31 to 500 Hz) Filter Controls.
6. Having eliminated first feedback condition, increase gain by clockwise rotation of LEVEL Control until feedback is again noted. Repeat steps 3, 4, and 5 to eliminate new feedback condition. This may require adjustment of different Filter Control or a further decrease in control or controls previously turned down.
7. Repeat step 6 until either: (a) volume level of sound system before feedback is sufficient for performance involved, (b) feedback becomes a combination of sounds of various frequencies, or (c) any one Filter Control has been turned all the way down (-15). Adjust LEVEL Control to slightly below point at which final feedback sound occurred.
8. Conduct voice test using each live microphone in sequence. As each microphone is used, listen for ringing. If ringing is noted, attempt to eliminate it by further decrease in appropriate Filter Control or slight decrease in LEVEL Control setting.
9. Perform critical listening check in audience area during talk test or live performance to determine if additional equalization adjustments are necessary to improve sound quality (boost of frequency bands in the 1 kHz to 4 kHz region to improve presence and intelligibility, etc.). Refer to *Live Performance Equalization* for additional information.

Stage Monitor System

In a stage monitor system the SR107 is connected between the audio console monitor line output (line level) or the line level output of a monitor mixer and the line level input of the power amplifier used to drive the stage monitor loudspeakers. With this exception the initial set-up of the stage monitor system is the same as that given in *General Operating Instructions*. The number, type and arrangement of microphones and speakers should be the same as used in the performance.

1. If more than one performer's microphone is involved, select lead performer or center stage microphone for use in feedback equalization procedure. NOTE: During this procedure a person must stand in front of or hold the microphone being equalized in a manner similar to that of the performer.
2. Roll off low frequency response of system by adjusting 31 Hz Filter Control to -15, 63 Hz to -10, 125 Hz to -5. This will reduce low frequency noise pickup without affecting intelligibility.
3. Equalize stage monitor system following *House System* procedure, Steps 2 through 7.
4. Conduct voice test for each of remaining microphone positions in sequence using same channel gain setting as for first microphone. (This assumes that all microphones used have essentially the same sensitivity and response.) If feedback or ringing is encountered at any microphone location, try eliminating it by adjustment of nearest speaker position or microphone distance. While performing voice test, check intelligibility of sound from monitor speakers. Intelligibility can usually be improved by boosting frequencies in 1 kHz to 4 kHz range, provided that the feedback threshold is not affected.
5. Check operation of stage monitor system with all performer microphones on (preferably with someone standing in front of or holding each microphone) to determine maximum gain settings before feedback for individual channel and master volume controls.
6. Operate stage monitor system and house system simultaneously at desired volume levels to verify satisfactory performance. If house system console or mixer is equipped with output phase reversal switch, operate switch and check for any improvement in gain before feedback in either house or stage monitor system.

Playback Equalization

The SR107 Equalizer may be used to adjust the overall frequency response, octave by octave, of an audio playback system to compensate for any electrical or acoustical response deficiencies of the system and to provide more natural sound reproduction.

Assuming that good engineering practice has been followed in selecting and installing the loudspeakers for uniform sound coverage, it is necessary to subjectively evaluate the sound quality and to equalize for reasonable audio spectral balance. While no specific procedure can be offered for this type of equalization, the following recommendations should be helpful:

1. Refer to *General Operating Instructions* for connections and setup.
2. Use typical program source and program material.
3. Locate listening position in main audience area so that what is heard is typical of what most of the audience will hear. If practical, the SR107 should be at this location (temporarily) for ease of adjustment.
4. As Filter Control adjustments are made, adjust LEVEL Control to maintain initial volume level, using EQUALIZER IN/BYPASS Switch to compare equalized to unequalized sound level and quality.
5. Bass guitar, string bass or kick bass drum sounds are most affected by 63 Hz and (to a lesser degree) 125 Hz Filter Controls. Avoid excessive boost of these frequencies or low-frequency overload may occur.
6. Power supply hum (60 Hz) and certain types of turntable rumble may be suppressed using 63 Hz Filter Control. The 31 Hz Control may also be helpful for very low frequency turntable sounds.
7. The 8 kHz Filter Control is most effective in controlling "brightness" of the sound, especially affecting speech sibilance and cymbal sounds. The 8 kHz and 16 kHz Filter Controls may also be used to reduce record noise and tape hiss.
8. Vocal performer sound is affected most by variations in the Filter Controls covering the 1 kHz to 4 kHz range.
9. If room resonance is encountered where frequencies in a certain band are accentuated, some adjustment of speaker positions may correct the condition. If this is not practical, experiment with attenuation of the octave bands in the suspect frequency region. The low-frequency octaves (32 through 250 Hz) are often affected by room characteristics. A typical subjective effect is that of a "boomy bass" sound.
10. Use tone controls on the console or mixer (if so equipped) for broadband adjustment of the high or low end of the audio spectrum.

Live Performance Equalization

Equalization of a sound reinforcement system for live entertainment applications is similar to that described in *Playback Equalization* except that microphones and performers constitute the sound source. Utilize this section where applicable in live performance equalization.

In most indoor sound system installations, the SR107 Audio Equalizer is adjusted first for feedback control as previously described. Additional adjustments may then be made to improve sound quality. This second level of adjustment is usually performed during a rehearsal where the performers and musicians are present and the sound aspects of the total performance can be evaluated. It is important to note that this secondary equalization process can affect the feedback threshold previously achieved and should therefore be performed with caution.

If the SR107 was not previously connected to the sound system, refer to *General Operating Instructions* for connection and setup instructions. Preliminary adjustment of the Equalizer can be made using recorded program material typical of the live performance.

The recommendations given in *Playback Equalization* should be considered along with the following:

1. While judgements of sound quality should be made in the main audience area, it is advisable to check a number of locations throughout the area for significant variations in response. If such are en-

countered, speaker location and aiming should be reviewed.

2. Any increase in Filter Control setting (clockwise rotation) previously adjusted for feedback suppression should be done with care. In the case of a reverberant room where an audience would significantly increase the sound absorption, this may be possible.
3. Intelligibility and presence for vocal performances may be improved by slight increases of system response in the 1 kHz to 4 kHz region.
4. Adjustment of the response of a particular microphone must be made through the use of the console or mixer tone controls for that particular channel. If an individual channel exhibits a "hollow" or unnatural sound, the gain of that channel may be near feedback threshold and should be reduced.
5. If the room is acoustically "dead" (carpeted, upholstered seats, acoustic wall treatment), the sound system output may seem deficient in the lower mid-range frequency region. In this case, slight boosting of the frequency bands in the range of 1 kHz to 4 kHz is appropriate. If the room is "live" or reverberant, the sound may seem excessively "bright" and some attenuation of the octave bands at 8 kHz and 16 kHz may provide a more uniform response. In outdoor applications, attenuation of both low and high frequencies may be experienced. Boosting octave bands 125 Hz and below, 8 kHz, and 16 kHz may be helpful but must be performed carefully to avoid excessive amplifier and speaker drive levels.
6. Occasionally a combination of program material and room resonance produces a "boomy" sound in which some low frequencies are accentuated. Attenuation of the 63, 125 or 250 Hz Filter Controls will suppress this characteristic.

Equalization Instrumentation

While the final measure of any equalization effort is a subjective judgement of the quality of the sound delivered to the audience, acoustic measurement instrumentation is available which can be of considerable assistance in more efficient and consistent equalization procedures.

The equipment consists of a pink noise generator (equal sound energy per octave), an equalization analyzer and an omnidirectional analyzer microphone with a known frequency response. The analyzer generally provides a display of input signal amplitude versus frequency in either octave or $\frac{1}{3}$ octave bands for the complete audio spectrum.

In general, equalization analyzer equipment is used to measure sound system performance instead of performing the subjective evaluations previously discussed. Connection, setup and operation of the SR107 remains the same. Recommendations regarding various equalization objectives are also generally applicable. Operation of the analyzer equipment is in accordance with the manufacturer's instructions.

Usually, the analyzer equipment is used first to establish the desired house curve or preferred sound system response characteristic. For playback equalization, the analyzer microphone is located in the main audience area and connected to the equalization analyzer input. The noise generator is connected to the audio console or mixer input and the volume adjusted to provide a sound level sufficiently above the room ambient noise level. The analyzer should be placed close to the SR107 so that as Equalizer adjustments are made, the results are easily observed. Adjustment for a flat response in the

audience area of a large room will usually result in an overly bright sound. Common practice is to adjust for 3 dB per octave rolloff of the high frequencies starting at about 1 kHz. Frequency response is then checked in other locations in the audience area and, if necessary, the Equalizer is readjusted slightly to improve the average response for the entire audience area. Final equalization adjustments are based on listening tests using typical program material.

Equalization of a sound reinforcement system using instrumentation is similar to playback equalization. The sound system is equalized initially to produce the desired house curve with all microphones turned off. The individual microphone volume controls are then increased to the approximate use settings, slightly below the feedback threshold. The SR107 LEVEL Control is then increased slowly while observing the equalization analyzer. As the feedback threshold is approached the analyzer will show a prominent increase in amplitude of the frequency band where feedback is about to occur. The appropriate SR107 Filter Control setting is then reduced until the amplitude increase disappears. This process is continued until the major feedback tendencies have been suppressed and a reasonable sound volume level is being produced. A talk or performance test of each open microphone is then conducted and the quality of the sound produced is sampled by listening in various locations throughout the audience area. Additional equalization adjustments are made based on the listening evaluation and taking care to avoid any significant reduction in the feedback threshold previously achieved.

Equalization of a stage monitor system using analyzer equipment is similar to playback or house system equalization except measurements and evaluation are confined to the performer's stage area. The pink noise generator is connected to the mixer input and the mixer volume adjusted to provide an output from the monitor speakers significantly above the ambient noise level. A person is placed in front of the lead performer's microphone (to simulate performance conditions) and the analyzer microphone is placed next to the person at ear level to sample the sound field in that area. The analyzer microphone output is viewed on the equalization analyzer and initial response adjustments, such as low frequency roll-off, are made. The mixer volume control for the performer's microphone is then set to a stable point slightly below the feedback threshold. The SR107 LEVEL Control is gradually increased until an obvious increase in amplitude over a narrow frequency band is noted on the equalization analyzer. This is the onset of feedback and the appropriate SR107 Filter Control is used to reduce the system response in this area. This process is continued until satisfactory gain before feedback and a desired response is achieved. A voice test of each performer microphone position is made to determine if a similar feedback threshold is attainable. Final adjustment of the SR107 and/or individual channel tone controls (if available) is made to improve quality or intelligibility of the sound presented to the performers.

Connecting a VU Meter

An external VU meter may be connected to the LINE OUTPUT of the SR107 with a series resistor (see Figure 6). Use a true VU meter (such as Simpson 1349) and a resistor connected as shown. The resistor should be 1/2-watt carbon 5%. With a 600-ohm load zero VU is +4 dBm.

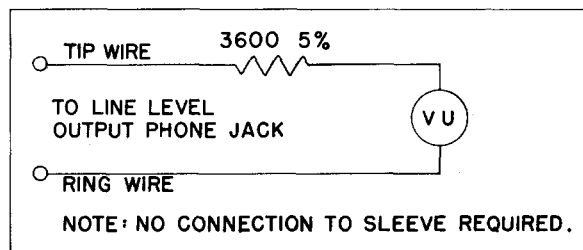


FIGURE 6.
EXTERNAL VU METER

SERVICE INSTRUCTIONS

Service

The SR107 Audio Equalizer uses components of the highest quality, operating well within their respective ratings to assure long life.

WARNING

Voltages in this equipment are hazardous to life.
Refer servicing to qualified service personnel.

Replacement Parts

Parts that are readily available through local electronic parts distributors are not shown on the accompanying Parts List. Their values are shown on the Circuit Diagram (Figure 11). Commercial parts not readily available and unique parts are shown on the Parts List and may be ordered directly from the factory.

The commercial alternates shown on the Parts List are not necessarily equivalents, but are electrically and mechanically similar, and may be used in the event that direct factory replacements are not immediately available. To maintain the highest possible performance and reliability, Shure factory replacement parts should be used. When ordering replacement parts, specify the Shure Replacement Kit Number, description, product model number and serial number.

Cover Removal

To service components inside the chassis, the protective top cover must be removed. This is done by removing eight screws from the top surface and lifting the cover off.

Fuse Replacement

The Equalizer is provided with a wired-in main power fuse F1 which is rated at 1/16A, 250V, Slo-Blo for the SR107 and 1/8A, 250V, Slo-Blo for the SR107-2E. If replacement becomes necessary, replace with identical fuse. Insulating tubing should be used on the fuse leads and to cover the metal end caps of the fuse.

Knob Replacement

All front panel rotary control knobs are pull-off types and are interchangeable.

Ferrite Beads

Ferrite beads are used on the signal leads to all input and output connectors except the AUX OUTPUT. Be sure to replace the ferrite beads wherever they have been removed during servicing.

Printed Circuit Board Removal

The SR107 chassis contains two printed circuit board assemblies, the Amplifier Board and the Equalizer Board identified as A1 and A2 in Figure 7. The foil side of board A1 may be made accessible for servicing by disconnect-

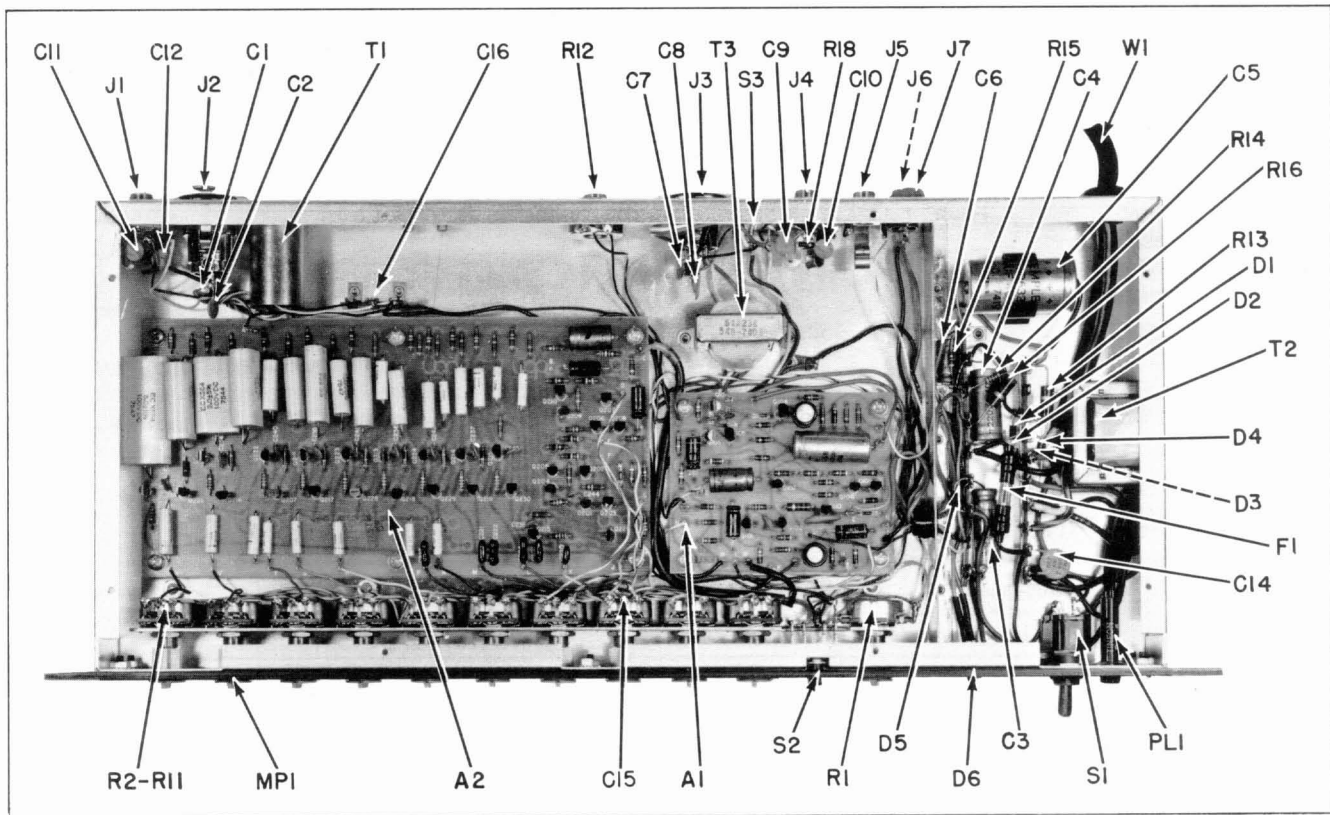


FIGURE 7.
SR107 TOP VIEW, COVER REMOVED

ing the leads from the push-on board terminals S and R, and removing the four Phillips head screws securing the board. The rear edge of the board (side nearest the back panel) can then be raised, tilting the board toward the front panel until it is in an upright position.

The foil side of board A2 may be made accessible in a similar manner by disconnecting the lead from the push-on board terminal A and removing a total of six Phillips head screws securing the board.

Replacement board assemblies are supplied with a number of the interconnecting wires already cut to length and soldered to board terminals. If either of the two boards in the SR107 are to be replaced, the new board assembly should be examined first to determine which leads are already soldered in place. Those leads which are duplicated on the new board assembly should be unsoldered at the point of origin and removed from the chassis along with the board. Note the lead colors and points of connection before unsoldering to avoid confusion when installing the new board. Refer to the Circuit Diagram, Figure 11 for lead identification.

Transistor, Diode and LED Removal

All transistors and diode rectifiers used in the SR107 are mechanically supported by their leads. When replacing these devices, proper lead configurations must be followed. Minimum soldering heat (preferably with a low-wattage soldering iron) should be used to avoid damage to the device. Transistor lead codes are included in the *Notes to Circuit Diagram* (Figure 8).

To replace light-emitting diode (LED) D6, mounted on the front panel, use a long-nose pliers to remove the mounting ring from the rear of the LED. Press against the front-panel projection of the LED lens to force it out the back through the mounting clip. Disconnect the gray and orange leads from push-on terminals G and E, respectively, on printed circuit board A1 and remove the

defective assembly.

To install the new assembly, insert the LED in the mounting collar in the front panel. Slide the mounting ring over the leads and push it firmly onto the mounting collar, securing the LED in the panel.

The Shure replacement LED is supplied with gray and orange leads attached. Thread the leads through the grommet in the shield separating the power supply from the signal circuit components. Connect the gray lead to terminal G and the orange lead to terminal E on board A1.

Active Component Checking

Defective transistors and diode rectifiers may be located by use of a standard ohmmeter such as a Simpson 260. Polarity of the ohmmeter must be verified before these checks are made.

With a known diode orientation, measure the diode resistance in the forward and reverse directions. The lowest meter reading will establish the "minus" probe while the other probe will be "plus." Some ohmmeters are not polarized in this manner with relation to "volts plus probe" and "volts minus probe." With the ohmmeter "plus" probe on the anode end of a diode and the "minus" probe on the cathode end, the ohmmeter should read approximately 2000 ohms or less. With the meter probes reversed, a reading of about 10,000 ohms or more should be obtained. If either of these conditions is not met, the diode should be replaced.

To check transistors, the ohmmeter should be set to the 100- or 1,000-ohm scale. Transistors and diodes must be removed from the circuit before testing. If all conditions in the following table are met, the transistor may be considered free of any major defect; if any of the following conditions are not met, the transistor should be replaced. See *Notes to Circuit Diagram* (Figure 8) for transistor lead codes.

<u>Ohmmeter Connections</u>		<u>Ohmmeter Reading</u>	
<u>"Plus" Lead</u>	<u>"Minus" Lead</u>	<u>NPN Transistor</u>	<u>PNP Transistor</u>
Collector	Emitter	High	High
Emitter	Collector	High	High
Collector	Base	High	Low
Emitter	Base	*	Low
Base	Collector	Low	High
Base	Emitter	Low	*

* Not a significant measurement.

To check the LED OVERLOAD indicator disconnect the orange LED lead from terminal E of the amplifier printed circuit board A1 and connect a 1, 1.5, or 2.2 kilohm

resistor between the +30 Vdc supply and the orange lead (gray lead still grounded). The LED should light when power is applied to the Equalizer. If it does not light it should be replaced. NOTE: Do not check LEDs with an ohmmeter; the ohmmeter may damage the LED or give erroneous readings.

Service Illustrations

The parts location photo (Figure 7) used in conjunction with the overall Circuit Diagram (Figure 11) provides identification of all chassis-mounted assemblies and components. Reference to the overall Circuit Diagram and the Printed Circuit Board Parts Location drawings (Figures 9 and 10) provides the means for quickly locating board-mounted components. Foil circuit paths are shown as shaded areas in Figures 9 and 10.

REPLACEMENT PARTS LIST (See Figures 7, 9, 10 and 11)

Reference Designation	Replacement Kit No. *	Replacement Kit Consists Of:			Commercial Alternate
		Qty.	Part No.	Description	
CHASSIS-MOUNTED PARTS AND ASSEMBLIES					
A1	—	—	90A2236	Printed Circuit Board Assembly (Amplifier)	None
A2	—	—	90A2239	Printed Circuit Board Assembly (Equalizer)	None
C3	—	—	86G628	Capacitor, Electrolytic, 400 μ F, 15V	Sprague WH11D407G016K
C4	—	—	86L628	Capacitor, Electrolytic, 250 μ F, 40V	CDE BR250-50
C5	—	—	86B632	Capacitor, Electrolytic, 1000 μ F, 40V	Sprague TVA 1316
C6	—	—	86J628	Capacitor, Electrolytic, 47 or 50 μ F, 35V min.	Sprague 30D-TE1200; CDE NLW 50-50
D1-D5	RKC21	4	86A404	Silicon Rectifier, 100V, 1/2A	Motorola 1N4002
D6	RKC133	1	90A1989	Diode Assembly, Light-Emitting	Monsanto MV5023
F1	—	—	80A297	Fuse, AC, 1/16A, 250V, Slo-Blo, Pigtail (SR107)	Littelfuse 315.062
F1	—	—	80A322	Fuse, AC, 1/8A, 250V, Slo-Blo, Pigtail (SR107-2E)	Littelfuse 315.125
J1, J4	—	—	90R2600	Connector, Phone Jack, 3-Conductor, Open Circuit, LINE INPUT and LINE OUTPUT	Switchcraft 12B
J2	RK119P	1	95A482	Connector, Female, 3-Pin Audio, LINE INPUT	Switchcraft C3F
J3	RK122P	1	95A198	Connector, Male, 3-Pin Audio, OUTPUT	Switchcraft C3M

* Parts listed as RKC Kits should be ordered by that kit number. Any orders received for piece parts where RKC Kit number is shown will be shipped in RKC quantities.

REPLACEMENT PARTS LIST - Continued

Reference Designation	Replacement Kit No. *	Replacement Kit Consists Of:			Commercial Alternate
		Qty.	Part No.	Description	
J5	RKC68	1	95B446	Connector, Phone Jack, 2-Conductor, Open Circuit, AUX OUTPUT	Switchcraft 11
J6-J7	RKC105	1 ea.	95A226 95B226	DC Receptacle, Red and Black	None
J8	—	—	95A689	Connector, 3-Pin, AC (MAINS) POWER (SR107-2E)	None
L1-L8	—	—	80A253	Ferrite Bead Ring	Stackpole 57-0180; Ferronics 21-030J
MP1	—	—	90A2594	Knob Assembly, White, Filter Controls and LEVEL	None
PL1	RKC45	1	80A79	Lamp, Indicator	Leecraft 36N1311-6
R1	—	—	46A057	Potentiometer, Center Tapped, Special Taper, 20K, LEVEL	None
R2-R11	—	—	46A76	Potentiometer, Special Taper, 250K, Filter Controls	None
R12	—	—	46A058	Potentiometer, Screwdriver Adjust, Modified Log Taper, 10K, GAIN	None
S1	—	—	90B2600	Switch, Toggle, SPST, POWER ON-OFF (SR107)	Cutler-Hammer 7501K13
S1	—	—	90D2600	Switch, Toggle, SPST, POWER ON-OFF (SR107-2E)	None
S2	—	—	55B119	Switch, Slide, DPDT, EQUALIZER IN-BYPASS	Switchcraft 46206LR
S3	—	—	55C119	Switch, Slide, DPDT, MIC-LINE	Switchcraft 46206LR
S4	—	—	55A116	Switch, Slide, DPDT, VOLTAGE SELECTOR (SR107-2E)	None
T1	—	—	90C2150	Transformer and Shield Assembly, Line Level Input	None
T2	—	—	51A263	Transformer, Power (SR107)	None
T2	—	—	51A270	Transformer, Power (SR107-2E)	None
T3	—	—	51A235	Transformer, Line and Microphone Level Output	None
W1	—	—	95A632	Line Cord and 3-Conductor Ac Plug Assembly (SR107)	Belden 17408
W1	—	—	90A1888	Line Cord and 3-Conductor Ac Female Connector Assembly (SR107-2E)	None

* Parts listed as RKC Kits should be ordered by that kit number. Any orders received for piece parts where RKC Kit number is shown will be shipped in RKC quantities.

REPLACEMENT PARTS LIST - Continued

Reference Designation	Replacement Kit No. *	Replacement Kit Consists Of:			Commercial Alternate
		Qty.	Part No.	Description	

AMPLIFIER (BOARD A1)

C101, C103-C104	—	—	86A630	Capacitor, Electrolytic, 4.7 or 5 μ F, 35V	Sprague 30D-TE-1303; CDE NLW-5-50
C102, C108	—	—	86B629	Capacitor, Electrolytic, 22 μ F, 35V	Sprague 502D-226G050CE10; Mallory MTV-25CD35
C106	—	—	86A646	Capacitor, Electrolytic, 100 μ F, 25V	CDE NLW-100-25; Sprague TE-1211
C109	—	—	86F628	Capacitor, Electrolytic, 400 μ F, 25V	Sprague TVA-1209
D101-D103	—	—	86A415	Diode, Silicon, Computer, 75V	TI or GE 1N4148
Q101, Q103, Q108-Q110	—	—	86A350	Transistor, Silicon, NPN	Motorola 2N5210
Q102, Q104, Q107	—	—	86A348	Transistor, Silicon, Low Power, PNP	Motorola or Fairchild 2N5087
Q105	RKC65	1	86A334	Transistor, Silicon, NPN	TI TIS92
Q106	RKC66	1	86A335	Transistor, Silicon, PNP	TI TIS93

EQUALIZER (BOARD A2)

C201-C202	—	—	86A630	Capacitor, Electrolytic, 4.7 or 5 μ F, 35V	Sprague 30D-TE-1303; CDE NLW-5-50
C203	—	—	50XA330A	Capacitor, Mica, 33 pF, 50V	CDE ED330J03
C204, C222, C223	—	—	50XA271A	Capacitor, Mica, 270 pF, \pm 5%, 50V	CDE ED271J03
C205	—	—	50WA122	Capacitor, Mylar, .0012 μ F, \pm 5%, 100V	CDE WMC08D12**
C206	—	—	50WA472	Capacitor, Mylar, .0047 μ F, \pm 5%, 100V	CDE WMC08D47**
C207, C211	—	—	50WA183	Capacitor, Mylar, .018 μ F, \pm 5%, 100V	CDE MFP-05S18**
C208, C210	—	—	50WA102	Capacitor, Mylar, .001 μ F, \pm 5%, 100V	CDE WMC08D1**
C209, C213	—	—	50WA683	Capacitor, Mylar, .068 μ F, \pm 5%, 100V	CDE MFP-05S68**

* Parts listed as RKC Kits should be ordered by that kit number. Any orders received for piece parts where RKC Kit number is shown will be shipped in RKC quantities.

** Cornell-Dubilier alternate part has \pm 10% tolerance; select to \pm 5% if possible.

REPLACEMENT PARTS LIST - Continued

Reference Designation	Replacement Kit No. *	Replacement Kit Consists Of:			Commercial Alternate
		Qty.	Part No.	Description	
C212, C225, C227	—	—	50WA103	Capacitor, Mylar, .01 μ F, \pm 5%, 100V	CDE MFP-05S1**
C214, C226	—	—	50WA333	Capacitor, Mylar, .033 μ F, \pm 5%, 100V	CDE MFD-05S33**
C215	—	—	50WA274	Capacitor, Mylar, .27 μ F, \pm 5%, 50V	CDE MFP-05P27**
C216	—	—	50WA224	Capacitor, Mylar, .22 μ F, \pm 5%, 100V	CDE MFP-05P22**
C217	—	—	50WA105	Capacitor, Mylar, 1.0 μ F, \pm 5%, 50V	CDE MFP-05W1**
C218, C232	—	—	50WA684	Capacitor, Mylar, .68 μ F, \pm 5%, 50V	CDE MFP-05P68**
C219	—	—	50WA505	Capacitor, Mylar, 5.0 μ F, \pm 5%, 100V	CDE MFP-05W5**
C220	—	—	50XA151A	Capacitor, Mica, 150 pF, \pm 5%, 50V	CDE ED-151J03
C221	—	—	50XA331A	Capacitor, Mica, 330 pF, \pm 5%, 50V	CDE ED-331J03
C224	—	—	50WA222	Capacitor, Mylar, .0022 μ F, \pm 5%, 100V	CDE WMC-08D22**
C228	—	—	50WA393	Capacitor, Mylar, .039 μ F, \pm 5%, 100V	CDE MFP-05S39**
C229-C230	—	—	50WA154	Capacitor, Mylar, .15 μ F, \pm 5%, 100V	CDE MFP-05P15**
C231	—	—	50WA474	Capacitor, Mylar, .47 μ F, \pm 5%, 50V	CDE MFP-05P47
C233	—	—	50WA205	Capacitor, Mylar, 2.0 μ F, \pm 5%, 50V	CDE MFP-05W2**
C245	—	—	86H628	Capacitor, Electrolytic, 80 μ F, 25V	CDE-NLW-75-25
D201	—	—	86A415	Diode, Silicon, Computer, 75V	TI or GE 1N4148
Q201-Q203, Q205-Q208, Q210, Q216-Q220, Q226-Q230	—	—	86A350	Transistor, Silicon, NPN	Motorola 2N5210
Q204, Q209, Q211-Q215, Q221-Q225	—	—	86A348	Transistor, Silicon, Low Power, PNP	Motorola or Fairchild 2N5087

* Parts listed as RKC Kits should be ordered by that kit number. Any orders received for piece parts where RKC Kit number is shown will be shipped in RKC quantities.

** Cornell-Dubilier alternate part has \pm 10% tolerance; select to \pm 5% if possible.

NOTES TO CIRCUIT DIAGRAM

General




Shure part numbers are not shown in the Parts List accompanying the Circuit Diagram (Figure 11) if parts are readily available through local electronics parts suppliers. In these instances, the Circuit Diagram shows only the reference designation and value of the standard parts.

All capacitor values are shown in microfarads unless otherwise designated. All non-electrolytic capacitors are 100 working volts dc or more unless otherwise specified. Electrolytic capacitors are shown in microfarads x volts.

All resistor values are shown in ohms ($k=1000$). Resistors are 1/4-watt, 10% tolerance unless otherwise specified.

Transistor lead codes are shown in Figure 8. Acceptable replacements are shown in the Parts List.


The following ground symbols denote:

Chassis Ground 
 Circuit Ground 
 Printed Circuit Board Ground 

Troubleshooting

A general troubleshooting process is as follows: If the SR107 is completely "dead," check the ac power source, fuse and power supply output (30 Vdc at pin V or T of printed circuit board A1). If the Power Indicator Lamp is on but the output is distorted, low or not present, apply an input signal as described under Ac Voltage Measurements below and determine that the input and output voltage for each board assembly is correct. If an incorrect ac voltage is found at either board output, perform Dc Voltage Measurements as described below to isolate the problem area.

AC Voltage Measurements

The numbers within rectangular symbols  on the Circuit Diagram denote the ac voltage at that point under the following test conditions:


1. Voltage measured with respect to chassis unless otherwise indicated.
2. Line Voltage: 120V, 50/60 Hz (SR107) or 230V, 50/60 Hz with VOLTAGE SELECTOR Switch in 220V position (SR107-2E).
3. All front panel Filter Controls at zero except 1 kHz Control at -15. LEVEL Control at zero; EQUALIZER Switch set to IN. GAIN Control at UNITY.
4. Input 1 volt at 1 kHz through 600 ohms. LINE OUTPUT terminated in 600 ohms. AUX OUTPUT not loaded.

5. Measurements made with ac VTVM of 1 megohm or greater input impedance.

NOTE: Measurements of voltage (*) at collector of Q203 and Q208 made with 22 kilohm isolation resistor at tip of VTVM probe.

6. Ac voltage measurements may vary $\pm 20\%$ from values shown.

DC Voltage Measurements

The number within elliptical symbols  on the Circuit Diagram denotes the dc voltage at that point under the following test conditions:

1. Voltages measured with respect to chassis unless otherwise indicated.
2. Line voltage: 120V, 50/60 Hz (SR107) or 230V, 50/60 Hz with VOLTAGE SELECTOR Switch in 220V position (SR107-2E).
3. No input signal applied.
4. Dc voltage measurements may vary $\pm 20\%$ from values shown.
5. Measurements made with VTVM of 10 megohms or greater input impedance.

NOTE: Measurements of voltage at collector Q208 made with 22 kilohm isolation resistor at tip of VTVM probe.

Resistance Measurements

With the ac line cord disconnected from the ac source and the POWER ON-OFF Switch in the OFF position, the following ohmmeter measurements may be made.

1. Transformers may be checked for continuity of each winding.
2. To test transistors, diodes or the LED, see Active Component Checking.

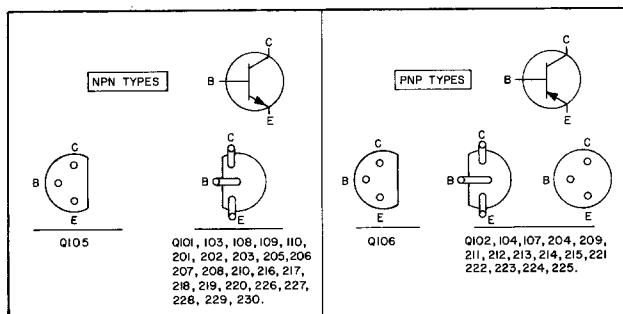


FIGURE 8.
TRANSISTOR LEAD CODES

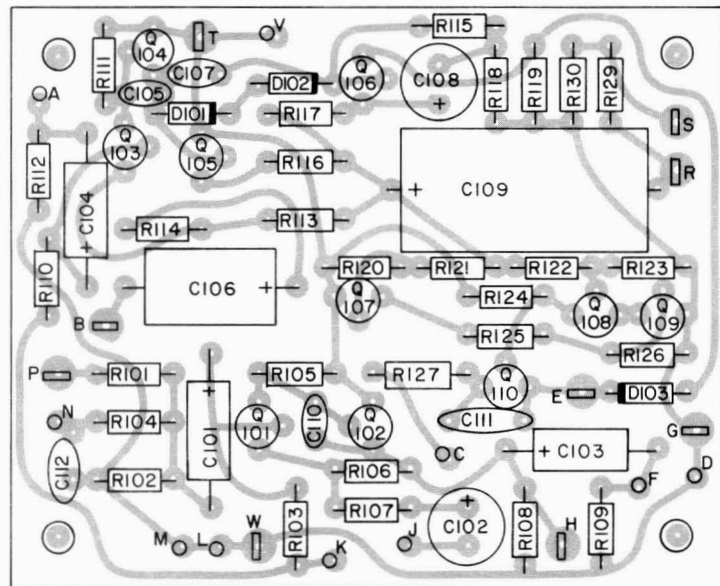


FIGURE 9.
AMPLIFIER CIRCUIT BOARD
PARTS LOCATION

2236-3/680-4

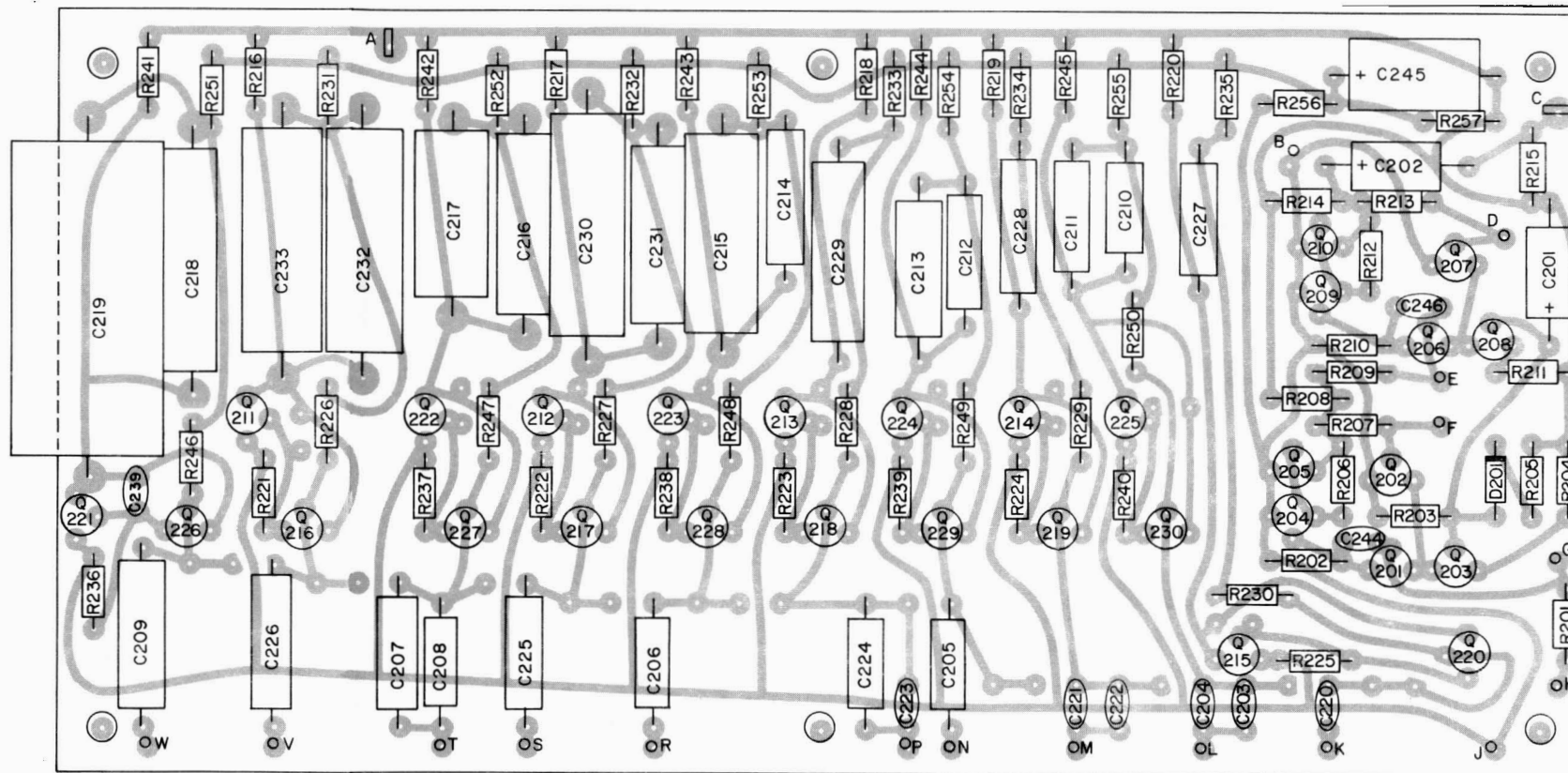


FIGURE 10.
EQUALIZER CIRCUIT BOARD
PARTS LOCATION

2239-6/699-1

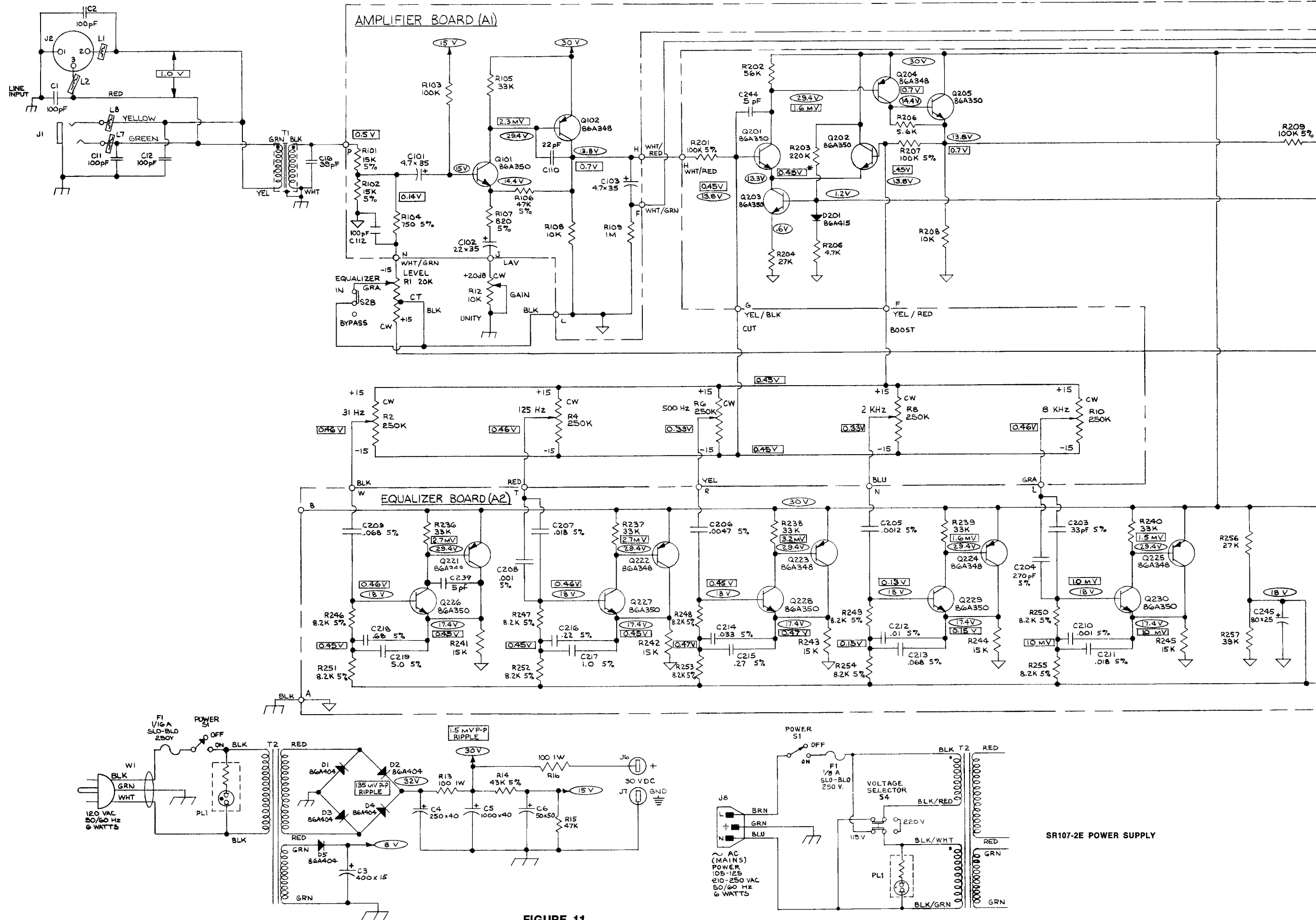
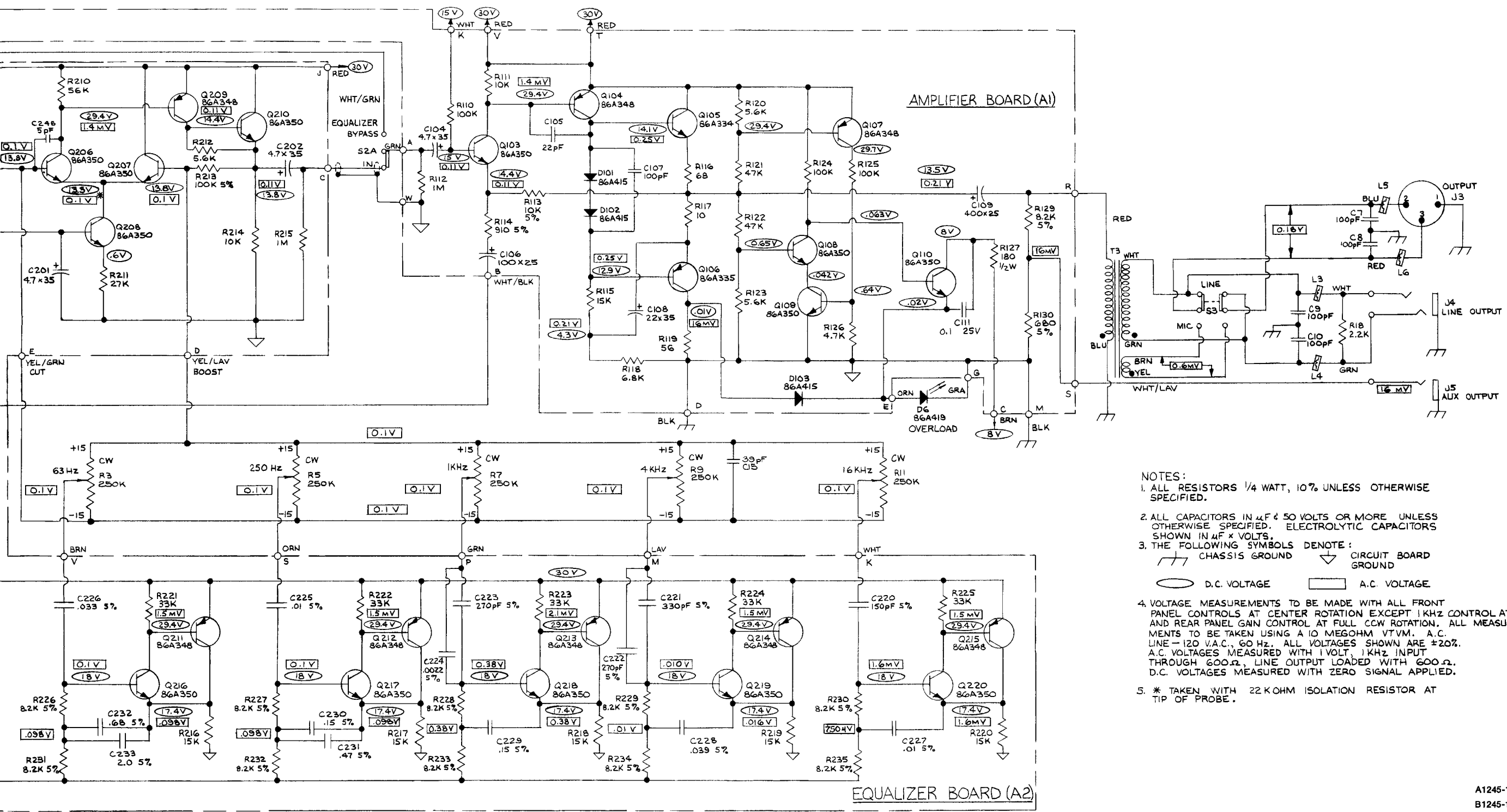


FIGURE 11.
SR107 AUDIO EQUALIZER CIRCUIT DIAGRAM



A1245-11-12
B1245-11-9

FIGURE 11.
SR107 AUDIO EQUALIZER CIRCUIT DIAGRAM

ARCHITECTS' AND ENGINEERS' SPECIFICATIONS*

The Audio Equalizer shall be a rack-mounted 120-volt, 50/60 Hz line-operated all silicon transistor active audio frequency equalizer for use as a component of a sound system to adjust the overall system frequency response.

The Equalizer shall contain a total of ten octave band, minimum phase, combining type filters extending over the frequency range of 31 Hz to 16 kHz. Each shall be adjustable for approximately 15 dB of boost or attenuation. The equalized output shall be adjustable over a ± 15 dB range.

The Equalizer shall include a switch to disconnect the equalization circuitry and permit operation in a bypass mode. Gain in either the equalizer in or the bypass mode shall be adjustable from unity to approximately 20 dB through the use of a rear-panel control.

The Equalizer shall be equipped with a peak-responding overload indicator to provide a visual indication approximately 3 dB before output clipping occurs in either equalizer in or bypass operation. The overload indicator shall be a light-emitting diode (LED) mounted in the front panel.

* All specifications apply to Model SR107-2E except for the operating voltage range which is 105-125 or 210-250 volts, 50/60 Hz ac for this model.

The Equalizer shall have a high-impedance balanced input suitable for operation from a line level source of 10 kilohms or less. Two parallel-wired LINE INPUT connectors, a three-pin female professional audio type and a three-conductor ¼-inch phone jack, shall be provided. Outputs shall include: a three-pin male professional audio OUTPUT connector switchable by means of a MIC/LINE slide switch to line level or microphone level output, a LINE OUTPUT three-conductor ¼-inch phone jack, and an AUX OUTPUT two conductor ¼-inch phone jack. The microphone and line level outputs shall be balanced and low impedance. The auxiliary output shall be unbalanced and low impedance.

A POWER ON-OFF Switch and power-on indicator lamp shall be provided on the front panel.

The Equalizer shall be enclosed in a metal housing designed for rack-mounting in a standard 19-inch (483 mm) audio equipment rack, or mounting in an accessory vinyl-covered wood portable case. Overall dimensions shall be 44.4 mm (1-3/4 inch) in height, 483 mm (19 inch) in width, and 218 mm (8-9/16 inch) in depth. The weight shall be no more than 3.5 kg (7 lb, 12 oz).

Any Equalizer not meeting all of the above specifications shall be deemed unacceptable under this specification. The Audio Equalizer shall be a Shure Model SR107.

GUARANTEE

This Shure product is guaranteed in normal use to be free from electrical and mechanical defects for a period of one year from date of purchase. Please retain proof of purchase date. This guarantee includes all parts and labor. This guarantee is in lieu of any and all other guarantees or warranties, express or implied, and there shall be no recovery for any consequential or incidental damages.

SHIPPING INSTRUCTIONS

Carefully repack the unit and return it prepaid to:
Shure Brothers Incorporated
Attention: Service Department
1501 West Shure Drive
Arlington Heights, Illinois 60004

If outside the United States, return the unit to your dealer or Authorized Shure Service Center for repair. The unit will be returned to you prepaid.

