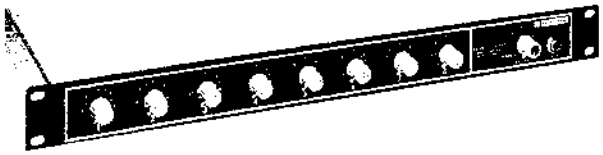
SHURE®
222 HARTREY AVE., EVANSTON, IL. 60204 U.S.A.
MICROPHONES AND ELECTRONIC COMPONENTS
AREA CODE 312/866-2200 • CABLE: SHUREMICRO
TWX: 910-231-0048 TELEX: 72-4381

DATA SHEET

MODEL SR110 AND SR110-2E PROFESSIONAL MONITOR MIXERS

OPERATION AND SERVICE MANUAL



DESCRIPTION

The Shure Model SR110 Professional Monitor Mixer is a rack-mounted, eight-channel, line level mixer, designed as an accessory for the Shure Model SR101 Series 2 Audio Console or SR109 Professional Mixer. It can also be used with similar equipment when a separate stage monitor mixer is desired to be added to a sound reinforcement system. The SR110 can also be used in multi-track recording applications as a recording mix panel or in stereo broadcasting.

Interconnections between the SR110 and the SR101 or SR109 are made through a single multi-pin connector and cable permanently attached to the SR110. The SR110 also contains a matching female multi-pin connector for "stacking" additional SR110s.

The SR110 provides eight high-impedance, unbalanced, line level inputs to its mixing circuitry, and one high-impedance, unbalanced line level input to its output selector switch for monitoring program material. The output of the SR110 is a 600-ohm balanced line level with one three-pin male professional audio connector and two standard ¼ inch three-circuit phone jacks, connected in parallel.

The front panel of the SR110 contains eight rotary volume controls for channel gain, and a combination rotary master volume control/power-off switch. An output selector slide switch, headphones jack and neon power indicator lamp are provided. Silicon transistors and other solid-state devices are used throughout. All components are of the highest quality, and are operated well within their respective ratings to assure maximum reliability under normal use conditions.

The SR110 and SR110-2E are identical except that the SR110 operates from 108-132 Vac, 50/60 Hz, and the SR110-2E operates from either 105-125 or 210-250 Vac, 50/60 Hz (switch-selectable).

SR110 Mixers are supplied with four rack-mounting screws for mounting in standard 19 in. (483 mm) audio equipment racks or in an optional Shure A105A Carrying Case (mounted with an SR109). In addition, the SR110-2E is supplied with a detachable ac line cord (without power plug). The SR110 (only) is listed by Underwriters' Laboratories, Inc., and is listed by Canadian Standards Association as certified.

SPECIFICATIONS

Type ..... All silicon transistor monitor mixer

Number of Input Channels ..... 8 mixed inputs; 1 program input

Power Output ..... +19.2 dBm (LINE LEVEL Output)

Voltage Gain*

- Mixed Inputs** ..... 38 ±2.5 dB (LINE LEVEL Output)
  14.5 ±2.5 dB (PHONES Output)
  −8 ±2 dB (MIX BUS)†
- Program Input** ..... 40 ±2 dB (LINE LEVEL Output)

Frequency Response ..... ±3 dB, 20 Hz-20 kHz (LINE LEVEL Output)

Input Sensitivity ..... 21 mV max. for +4 dBm line level output

Distortion ..... THD less than 1% at +12 dBm, 30 Hz-20 kHz; IM distortion less than 1% at +12 dBm

Noise (300 Hz-20 kHz) ..... −68 dBV max. (MASTER Volume Control down)

- Mixed Inputs** ..... −54 dBV max. (MASTER and channel Volume Controls up)
- Program Input** ..... −58 dBV max. (MASTER Volume Control up)

Hum and Noise (20 Hz-20 kHz) ..... −64 dBV max. (MASTER Volume Control down)

- Mixed Inputs** ..... −50 dBV max. (MASTER and channel Volume Controls up)
- Program Input** ..... −54 dBV max. (MASTER Volume Control up)

Input Clipping Level at 1 kHz ..... 2.5V min. on mixed inputs 1-8 with channel Volume Controls set at max. (input clipping level increases with decreased setting of channel Volume Control)

Input Impedance at 1 kHz:

- Mixed Inputs** ..... 23.5 kilohms
- Program Input** ..... 30 kilohms

*Measurement conditions: Inputs through 150 ohms, LINE LEVEL output terminated in 600 ohms, PHONES output terminated in 8 ohms, MASTER and channel Volume full up.

**OUTPUT SELECTOR Switch position.

†MIX BUS terminated in 5.6k.

27A1291 (SG)

Printed in U.S.A.

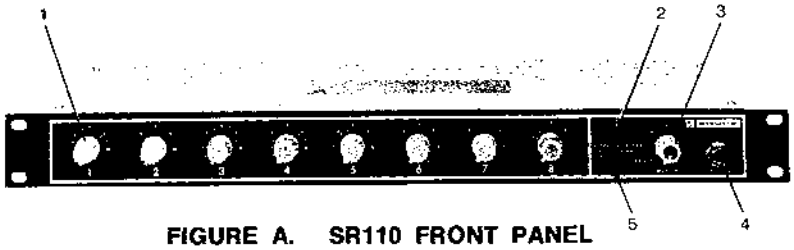


FIGURE A. SR110 FRONT PANEL

Output Impedances:
- Line Level ..... Balanced 120 ohms actual (for use with 600-ohm lines)
- Headphone ..... 12 ohms actual (for use with 4- to 16-ohm headphones)
- Mix Bus ..... 5.6 kilohms

Phasing ..... Pins 1 through 8 of ACCESSORY connector are out of phase with, and pin 9 is in phase with, pin 3 of LINE LEVEL output 3-pin connector, tips of LINE LEVEL and PHONES jacks, and tip of MIX BUS phono pin jack

Controls ..... Channel Volume: rotary, linear taper; MASTER Volume: rotary, audio taper

Operating Voltage ... SR110: 108-132 Vac, 50/60 Hz. SR110-2E: 105-125 or 210-250 Vac, 50/60 Hz.

Power Consumption ..... 3 watts max. (Mixer only) 500 watts max. (non-switched ac receptacle) (SR110 only)

Temperature:
- Operating ..... −7° to 54°C (+20° to 130°F)
- Storage ..... −29° to 71°C (−20° to 160°F)

Dimensions ..... 44.4 mm height X 483 mm width X 232 mm depth (1¾ in. X 19 in. X 9⅛ in.)

Weight ..... 3.9 kg (8 lb, 8 oz)

Finish ..... Matte black

Installation ..... Equipped for standard 19 in. (483 mm) audio rack mounting; may be operated in optional A105A Carrying Case (with SR109)

Certifications ..... Listed by Underwriters' Laboratories, Inc.; listed by Canadian Standards Association as certified (SR110 only)

OPERATING INSTRUCTIONS

Functional Description (Refer to Figures A and B)

1. Individual Channel Volume Rotary Controls (Eight) —Control volume of each channel separately.
2. Power-On Indicator Lamp—Indicates ac power is being applied to unit.
3. MASTER Volume Rotary Control/POWER OFF Switch—Adjusts level of total monitor output and applies ac power to power supply.
4. PHONES Output Jack—Provides for connection of stereo or monophonic headphones for monitoring.
5. OUTPUT SELECTOR Slide Switch—Selects between signal mixed in SR110 (MIXED INPUTS) or mixed in SR101 or SR109 (PROGRAM INPUT).
6. MONITOR OUTPUTS/LINE LEVEL Three-Circuit Phone Jacks (Two)—Provide balanced Monitor Mixer output connection to power amplifier or recording equipment.
7. MONITOR OUTPUTS/LINE LEVEL 3-Pin Male Connector—Provides balanced Monitor Mixer output connection to power amplifier or recording equipment.
8. ACCESSORY INPUT AND OUTPUT Cable & Multi-Pin Male Connector—Provides for input connections from Shure SR101 or SR109 or similar equipment.
9. ACCESSORY INPUT AND OUTPUT Multi-Pin Female Connector—Provides for connection of additional parallel-wired (tandem) SR110s.
10. MIX BUS Phono Jack—Provides common mix bus when two SR101s or SR109s and two SR110s are to be operated in a common mix mode.
11. Ac Grounded Line Cord—Connects ac power source to SR110 power supply (SR110 only).
12. Non-Switched Ac Grounded Receptacle—Provides up to 500 watts of non-switched ac power to accessory equipment (SR110 only).
13. AC (MAINS) POWER 3-Pin Connector—Connects unit to ac (mains) power source via supplied line cord (SR110-2E only).
14. VOLTAGE SELECTOR Slide Switch—Selects 105-125V or 210-250V input power (SR110-2E only).

General Operating Instructions

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

1. Using hardware provided, install SR110 securely in standard 19 in. (483 mm) rack or optional A105A Carrying Case (with SR109) prior to making electrical connections.

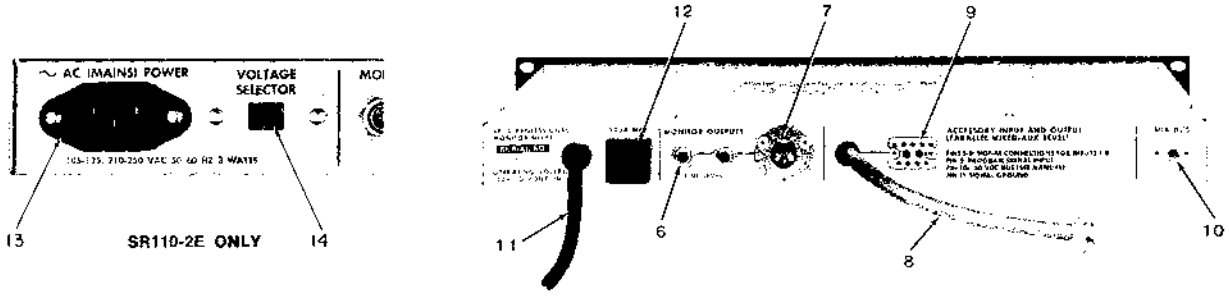


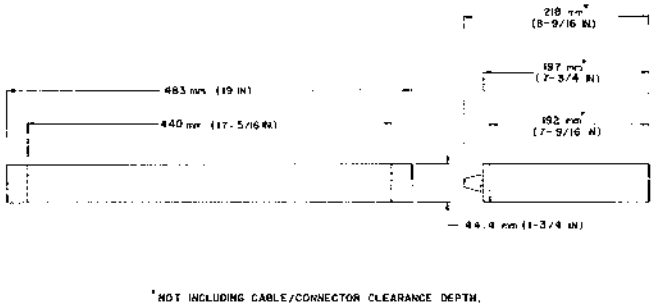
FIGURE B. SR110 REAR PANEL

2. Connect SR110 MONITOR OUTPUTS/LINE LEVEL 3-pin connector and/or phone jacks (7, 6) to power amplifier and/or recording equipment.
3. Connect SR110 ACCESSORY INPUT AND OUTPUT Multi-Pin Male Connector (8) to SR101 or SR109.
4. If additional SR110 is to be used (tandem operation), connect ACCESSORY INPUT AND OUTPUT Multi-Pin Male Connector (8) of second SR110 to ACCESSORY INPUT AND OUTPUT Female Connector (9) of first SR110.
5. If common mix between two SR101s or SR109s and two SR110s is desired, interconnect MIX BUS Phono Jacks (10) of each SR110 and interconnect the link output jacks of the SR101s or SR109s.
6. (SR110-2E only) Move VOLTAGE SELECTOR Switch (14) to 115V or 220V position as required.
7. Connect ac line cord to grounded 108- to 132-volt (SR110), or 105-125V or 210-250V (SR110-2E), 50/60 Hz ac source.
8. Turn on front-panel POWER OFF Switch on MASTER Volume Control (3). Red indicator lamp (2) will light, indicating power is being applied.
9. Adjust SR101 or SR109 and associated power amplifier for desired operating levels.
10. Adjust SR110 and associated power amplifier and/or recording equipment for desired operating levels.
11. Set OUTPUT SELECTOR Switch (5) to MIXED INPUTS or PROGRAM INPUT as desired.

Mounting and Ventilation

The SR110 Professional Monitor Mixer is designed for rack-mounting in a standard 19 in. (483 mm) audio equipment cabinet rack and is supplied with the necessary mounting hardware (see Figure C). If possible, the SR110 should be rack-mounted above its associated SR101 or SR109.

The SR110 may also be operated while mounted in a Shure A105A Carrying Case. The A105A will accept panel heights of 7 in. (178 mm), providing space for one SR110 and one SR109 Professional Mixer.



*NOT INCLUDING CABLE/CONNECTOR CLEARANCE DEPTH.

FIGURE C.
OVERALL DIMENSIONS

No special precautions are required for ventilation. The SR110 may be operated over a temperature range of −7° to 54°C (20° to 130°F) in continuous duty without derating.

Power Supply

The SR110 Professional Monitor Mixer is furnished with a three-conductor power cable and three-prong grounded plug (11). Connect the SR110 to an outlet which supplies 108 to 132 volts ac, 50/60 Hz power. The nominal power consumption at 120 volts under normal operating conditions is 3 watts maximum (0.025 amperes at 120 volts). If extension cords are required to supply power to the SR110, a high-quality, 18-gauge or larger cord should be used.

The SR110-2E is furnished with a three-conductor line cord without a power plug. Obtain a suitable three-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.) Select proper operating voltage (115V for 105-125V supply or 220V for 210-250V supply) using the VOLTAGE SELECTOR Switch (14).

A POWER-OFF Switch located on the front-panel MASTER Volume Control (3) controls the application of ac power to the SR110, and a red indicator lamp (2) indicates the power-on condition.

Functional Circuit Description

The inputs to the SR110 Professional Monitor Mixer enter through the 11-pin male connector located on the cable (8) (see Figure D). The 11-pin female con-

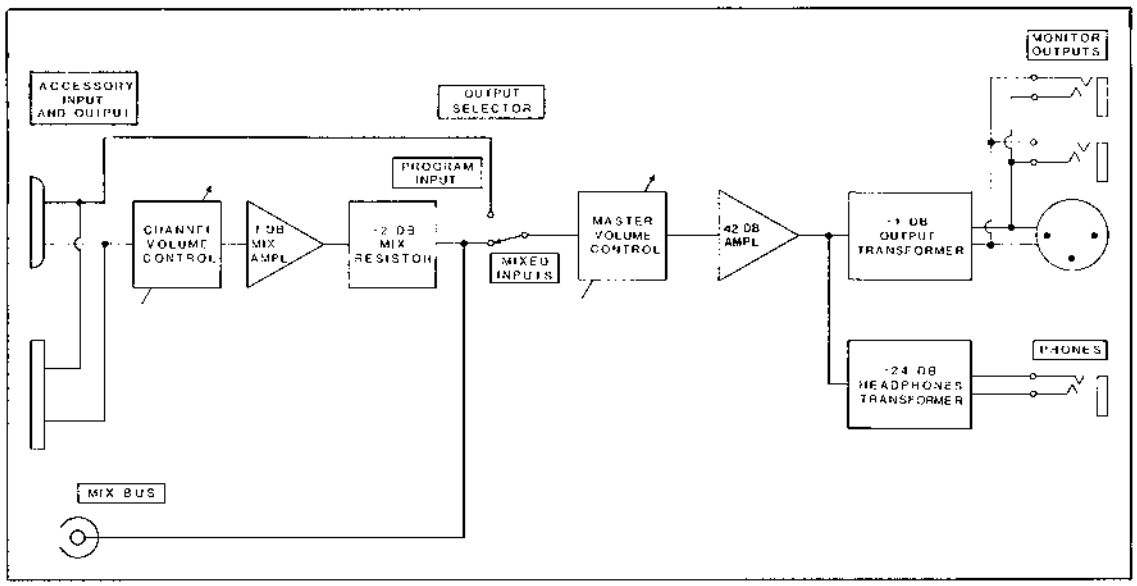


FIGURE D.
SR110 BLOCK DIAGRAM

nector (9) is wired in parallel, and provides connection for additional (tandem) SR110s.

With the OUTPUT SELECTOR Switch (5) in the MIXED INPUTS position, the input signals from the individual channels of the SR101 or SR109 go through the individual channel Volume Controls (1), a −1 dB mixing amplifier, a −2 dB mixing resistor, and the OUTPUT SELECTOR Switch before reaching the MASTER Volume Control (3). With the OUTPUT SELECTOR Switch in the PROGRAM INPUT position, the program input signal from the SR101 or SR109 goes directly through the OUTPUT SELECTOR Switch to the MASTER Volume Control. The MIX BUS Jack (10) is connected after the mixing resistor and before the OUTPUT SELECTOR Switch. The MIX BUS Jack is for parallel operation of two or more SR101 or SR109/SR110 combinations, providing 16 inputs with the OUTPUT SELECTOR Switch in the MIXED INPUTS position.

From the MASTER Volume Control (3), the signal enters a +42 dB amplifier stage. The amplifier output is fed to both line level (−1 dB) and headphone (−24 dB) output transformers. The line level transformer feeds a three-pin professional male audio connector (7) and two standard ¼" three-circuit (stereo) phone jacks (6). The headphone transformer feeds a standard ¼ in. three-circuit (stereo) phone jack (4) designed for use with 8 ohm stereo or monophonic headphones.

Inputs and Outputs

All SR110 inputs enter through the ACCESSORY INPUT AND OUTPUT 11-pin male connector (8). Pins 1 through 8 are the individual channel signals derived from the eight SR101 or SR109 channels (following the equalizer circuits), pin 9 is a total program signal (taken from the SR101 Monitor post link-pre link Switch or SR109 link input jack), pin 10 is the SR101 or SR109 +30 Vdc supply voltage and is not internally connected to the SR110 supply, and pin 11 is ground.

The ACCESSORY INPUT AND OUTPUT 11-pin female connector (9) is wired in parallel with the male connector, and provides for connection of additional (tandem) SR110s.

The MONITOR OUTPUTS/LINE LEVEL connectors consists of one three-pin professional male audio connector (7) and two standard ¼ in. three-circuit (stereo) phone jacks (6). These connectors provide three line level, 600-ohm, balanced outputs to power amplifiers or recording equipment.

The MIX BUS Phono Jack (10) provides a common connection when two SR101s or SR109s and two or more SR110s are to be operated in a common mix mode (16 channels). If more than two SR110s are used "Y" adapters can be used to connect the additional MIX BUS Jacks.

The PHONES Jack (4) is a standard ¼ in. three-circuit (stereo) phone jack designed for use with 8-ohm stereo or monophonic headphones.

Stage Monitor

To use the SR110 as a stage monitor mixer (in conjunction with the SR101 or SR109), connect the ACCESSORY INPUT AND OUTPUT male connector (8) to the SR101 or SR109 ACCESSORY OUTPUT/AUX LEVEL female connector (see Figure E). Turn up the individual channel Volume Controls (1) to be monitored on stage; turn the remaining channel Volume Controls to 0 (off). With the OUTPUT SELECTOR Switch in the MIXED INPUTS position and the MONITOR OUTPUTS connected to the stage monitor power amplifier input, a separate mix of inputs can be provided for stage monitoring. The SR110 monitors the SR101 or SR109 individual channels after the SR101 or SR109 channel input attenuator, volume and equalizer controls.

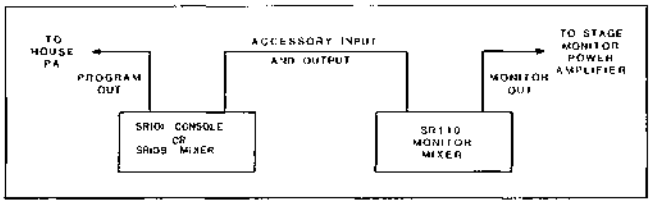


FIGURE E.
STAGE MONITOR CONNECTIONS

With the OUTPUT SELECTOR Switch in the PROGRAM INPUT position the stage monitor has the same mix as the SR101 or SR109. The program outputs of the SR101 or SR109 are used for the "house" PA system.

Broadcast Line, House PA and Stage Monitor

If the SR101 or SR109 is to be used to feed a broadcast line for radio or TV audio, and separate house PA and stage monitor systems are required, a number of SR110s may be connected as shown in Figure F. The program output of the SR101 or SR109 feeds the broadcast line, the monitor output of the first SR110 feeds a stage monitor power amplifier, and the monitor output of the second (parallel-wired) SR110 feeds the house system power amplifier. Note that since the ACCESSORY INPUT AND OUTPUT Connectors (8, 9) of the SR110 are in parallel, up to eight SR110s may be parallel-connected.

The individual channels that are *not* to be fed to the stage monitor or house PA can be left off by turning their Volume Controls (1) to 0 (off).

Stereo or Multi-Channel Tape Recording

A set-up similar to that described under *Broadcast Line* above can be used to record a stereo tape or for stereo broadcasting. The monitor output from one SR110 is connected to one input of the tape recorder and the other SR110 to the remaining input. This set-up permits the user to select the desired mix on each recording channel. For recording on more than two channels, additional SR110s can be added as desired.

16-Channel Mixer

For applications requiring the use of more than eight channels, two SR101s or SR109s can provide a 16-channel mixing system by connecting their LINK OUTPUT Jacks. Monitoring of all 16 channels can be accomplished by connecting two SR110s to the SR101s or SR109s as shown in Figure G. The male ACCES-

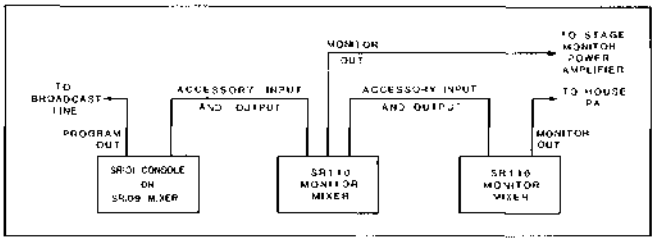


FIGURE F.
BROADCAST LINE CONNECTIONS

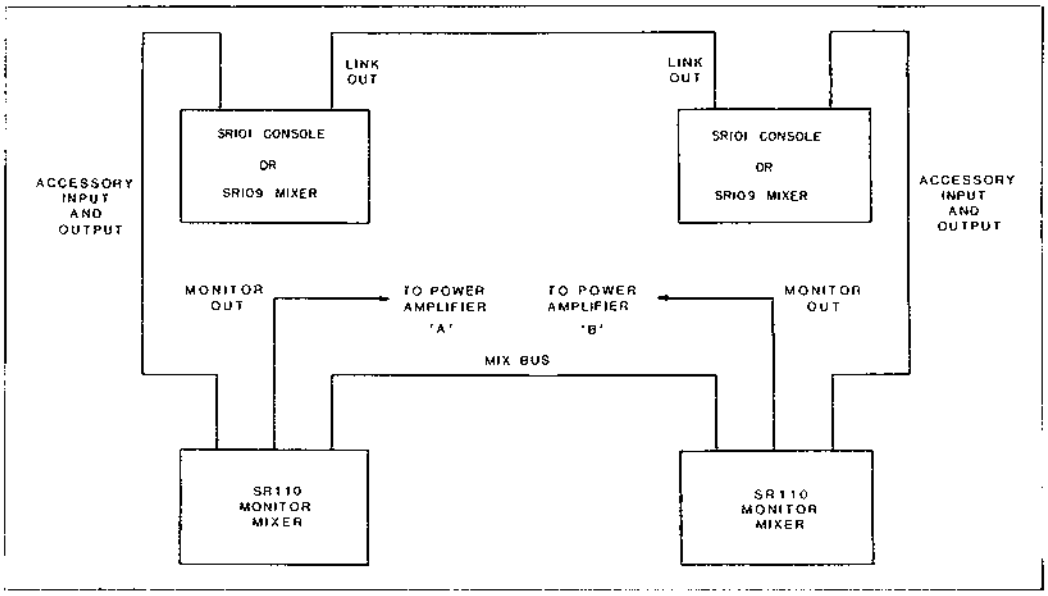


FIGURE G.
16-CHANNEL MIXER CONNECTIONS

SORY INPUT AND OUTPUT Connector (8) of each SR110 is connected to the female ACCESSORY OUTPUT/AUX LEVEL Connectors of the SR101s or SR109s. The SR110s are connected through their MIX BUS Connectors (10). With this set-up, all 16 channels are available at each SR110. The MASTER Volume Controls (3) of each SR110 are independent of each other, and varying one MASTER Control will not affect the output of the other. Each SR110 output is fed to its own power amplifier.

SPECIAL OPERATING INSTRUCTIONS

The following information is supplied to enable the user to utilize the SR110 Professional Monitor Mixer in special or custom installations.

Multi-Track Recording Mixing

The SR110 may be used as a submaster or mixdown panel for multi-track recording systems. The input to the SR110 can be a microphone preamplifier, recording console channel output or tape recorder line output.

A single SR110 is used for monophonic systems. Additional SR110s may be added by interconnecting the ACCESSORY INPUT AND OUTPUT Connectors (8, 9) for a multi-track system. For example, for an eight in/four out system, use four SR110s. For a 16 in/4 out system, use 8 SR110s connected in 4 mix bused pairs.

Cable Extension

Should a longer cable length be required between the SR110s and their associated mixer, a length of 12-conductor, shielded cable and connectors may be obtained from Shure Brothers Inc. (see Parts List). Up to 12m (40 ft) may be added between the SR110s and the console or mixer. Refer to the Circuit Diagram (Figure M) for proper cable wiring.

Connecting a VU Meter

An external VU meter may be connected to the SR110 LINE LEVEL output (6) with a series resistor (see Figure H). Use a true VU meter (such as a Simpson 1349) and a resistor connected as shown. The resistor should be a ½-watt carbon, 5%. With a 600-ohm load, 0 VU is +4 dBm.

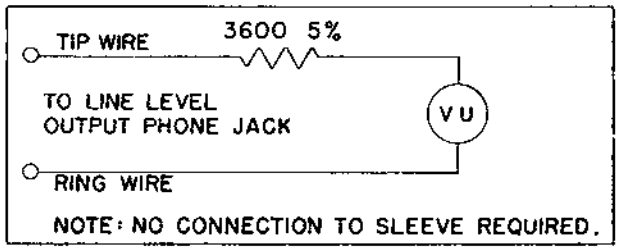


FIGURE H. VU METER CONNECTION

SERVICE INSTRUCTIONS

Service (See Guarantee)

The SR110 Professional Monitor Mixer 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 M). 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 (RKC), 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.

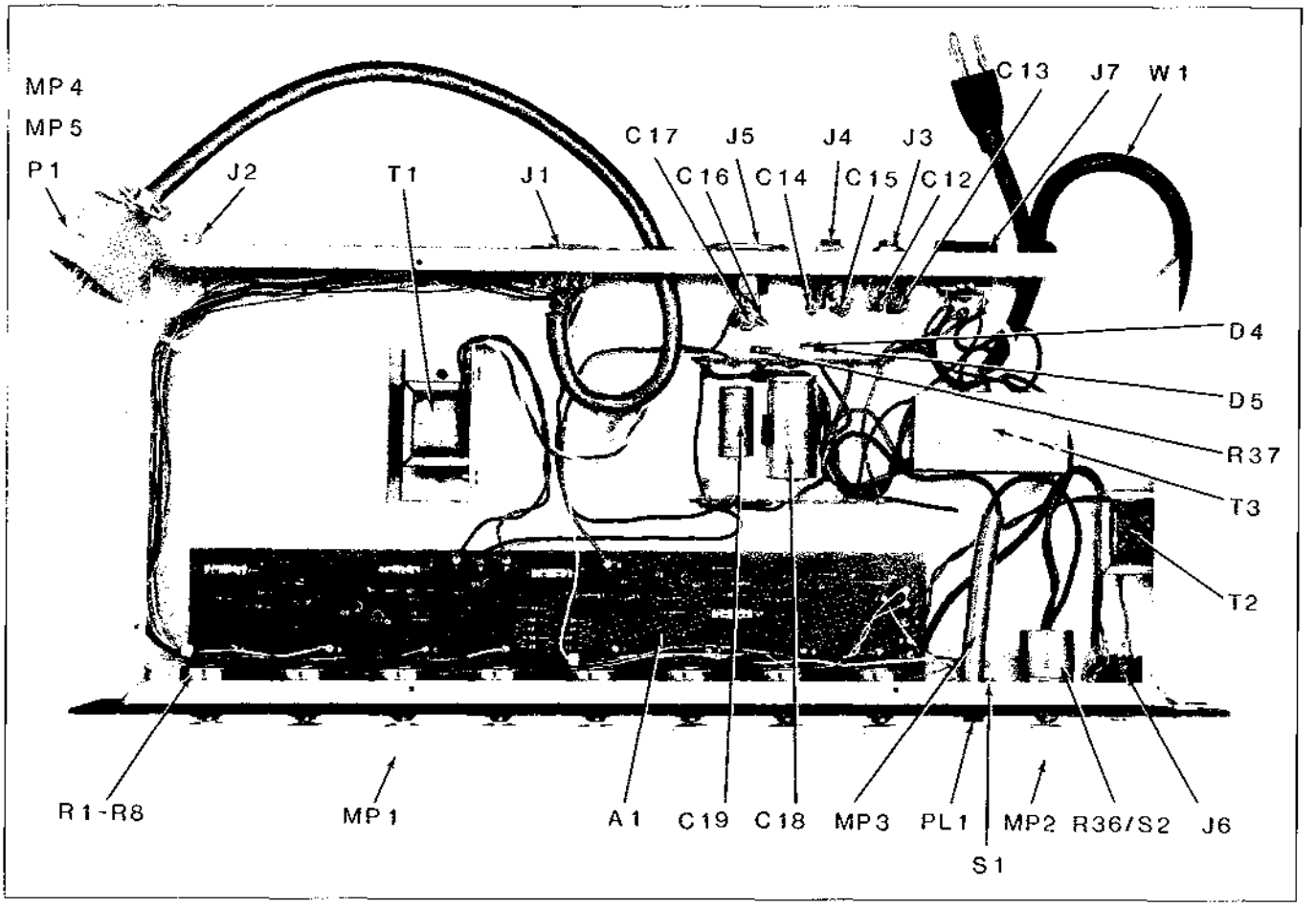


FIGURE J.
SR110 TOP VIEW, COVER REMOVED

Fuse Replacement

The SR110-2E (only) contains a 1/16A, Slo-Blo, wired-in (pigtail) fuse which protects the power transformer. Be sure to replace this fuse only with one of identical value and size.

Printed Circuit Board Removal

The SR110 chassis contains a printed circuit board assembly (see Figure J). The foil side of the board may be made accessible for servicing by disconnecting leads K and L, and removing the eight knobs and nuts securing individual channel Volume Controls R1 through R8 to the front panel. The board may be completely removed by unsoldering the 17 wires fastened to the board. *IMPORTANT:* When disconnecting soldered board connections, make sure each wire is identified for proper reconnection. This may be done by affixing a piece of masking tape marked with the connection or terminal letter to each wire.

Replace cover after servicing.

CIRCUIT BOARD WIRE COLORS

Letter	Wire Color	Letter	Wire Color
A	Brown	J	Orange (2)
B	White/Red	K	Bare
C	Orange	L	Bare (Shield)
D	Yellow	M	Red
E	Green	N	Black
F	Blue	P	Red
G	Purple	R	Red
H	Gray	T	Blue

NOTE: Production variations may result in wire colors differing from those in the table.

Transistor and Diode Removal

All transistors and diodes used in the SR110 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 L).

Transistor and Diode Checking

Defective transistors and diodes 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. Transistors and diodes must be removed from the circuit before testing.

With a known diode orientation, measure the diode resistance in the forward and reverse directions. The lowest meter reading will establish the probe at the cathode end (schematic symbol arrow points to cathode) as 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. If all conditions in the following table are met, the transistor may be con-

sidered 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 L) for transistor lead codes.

Ohmmeter Connections		Ohmmeter Reading	
		NPN	*PNP*
"Plus" Lead	*"Minus" Lead*	*Transistor*	*Transistor*
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.

Service Illustrations

The pages that follow contain a Parts Location Drawing for the printed circuit board (Figure K) and an overall Circuit Diagram (Figure M). Foil circuit paths are shown as shaded areas in Figure K. The Circuit Diagram shows all printed circuit board and chassis-mounted electrical parts.

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.

REPLACEMENT PARTS LIST (See Figures K and M)

Reference Designation	Replacement Kit No.*	Replacement Kit Consists Of:			Commercial Alternate
		Qty.	Part No.	Description	
A1	—	—	90A2171	Printed Circuit Board Assembly (with Potentiometers)	None
C1, C5	—	—	86B636	Capacitor, Electrolytic, 4 μF, 25V	Mallory TNT405U050POA
C2, C11	—	—	86J628	Capacitor, Electrolytic, 50 μF, 35V	Sprague TE1307; CDE NLW 50-50
C3, C6, C9	—	—	86A630	Capacitor, Electrolytic, 5 μF, 35V	Sprague TE1303; CDE NLW 5-50
C8	—	—	86L628	Capacitor, Electrolytic, 250 μF, 40V	None
C10	—	—	86N628	Capacitor, Electrolytic, 100 μF, 25V	Sprague TE1211; Mallory MTA 100F35; CDE NLW 100-25
C18	—	—	86B632	Capacitor, Electrolytic, 1000 μF, 40V	None
C19	—	—	86L628	Capacitor, Electrolytic, 250 μF, 40V	None
D1-D2	RKC79	1	86A403	Silicon Rectifier, 50V, ½A	Motorola 1N4001
D3	—	—	86A415	Diode, Silicon, Computer, 75V	TI or GE 1N4148
D4-D5	RKC21	4	86A404	Silicon Rectifier, 100V, ½A	Motorola 1N4002
F1	—	—	80A297	Fuse, Ac, Slo-Blo, Pigtail, 1/16A (SR110-2E only)	Littelfuse 3.5.062
J1	—	—	95A655	Connector, Female, 11-pin	Amphenol 126-805
J2	—	—	95C450	Connector, Phono Jack, Grounded Shell	Switchcraft 3511A
J3-J4	—	—	90R2600	Connector, Phone Jack, 3-Conductor, Open Circuit	Switchcraft 12B
J5	RK122P	1	95A198	Connector, Male, 3-pin Audio	Switchcraft C3M
J6	—	—	90AM2600	Connector, Phone Jack, 3-Conductor, Two Circuits	Switchcraft 112B
J7	—	—	95B552	Connector, Female, Non-Switched Ac (SR110 only)	None
J7	—	—	95A689	Connector, 3-Pin AC (MAINS) POWER (SR110-2E)	None
L1-L2	—	—	80A250	Ferrite Bead Ring	Stackpole 57-0181; Ferronics 21-031J

*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	
MP1	—	—	90F2085	Knob Assembly, Grey, Individual Channel Volume	None
MP2	—	—	90E2085	Knob Assembly, Black, MASTER Volume/POWER OFF	None
MP3	—	—	44C211	Spring Shield	None
MP4	—	—	90AP2600	Connector Shell for P1	Amphenol 126-946
MP5	—	—	30F481B	Screw, 4-40 x 7/16" (P1)	—
P1	—	—	95A656	Connector, Male, 11-pin (less shell)	Amphenol 126-804
PL1	—	—	90E2600	Lamp, Indicator, Neon	Leecraft 36N1311
Q1	RKC9	4	86C349	Transistor, Silicon, NPN	Motorola 2N5088; TI 2N3711
Q2	RKC12	1	86A336	Transistor, Silicon, NPN	TI TIS97
Q3	—	—	86A348	Transistor, Silicon, Low Power, PNP	Motorola or Fairchild 2N5087
Q4	RKC65	1	86A334	Transistor, Silicon, NPN	TI TIS92
Q5	RKC66	1	86A335	Transistor, Silicon, PNP	TI TIS93
R1-R8	—	—	46A053	Potentiometer, 50K, Channel Volume	None
R36/S2	—	—	46A054	Potentiometer, 50K, MASTER Volume/POWER OFF (SR110)	None
R36/S2	—	—	46A073	Potentiometer, 50k, MASTER Volume/POWER OFF (SR110-2E)	None
S1	—	—	55C112	Switch, Slide, DPDT	Switchcraft 46206LSR
S2	—	—	—	Part of R36	—
S3	—	—	55A116	Switch, Slide, DPDT, VOLTAGE SELECTOR (SR110-2E only)	None
T1	—	—	51B229	Transformer, Output	None
T2	—	—	51C228	Transformer, Headphones	None
T3	—	—	51A253	Transformer, Power (SR110)	None
T3	—	—	51A259	Transformer, Power (SR110-2E)	None
W1	—	—	95A632	Line Cord and 3-Conductor Ac Plug Assembly (SR110)	Belden 17408
W1	—	—	90A1888	Line Cord and 3-Conductor Ac Female Plug Assembly (SR110-2E)	None
—	—	—	15A1202	Cable, 12-Conductor Shielded (specify length)	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.

NOTES TO CIRCUIT DIAGRAM

General

Shure part numbers are not shown in the Parts List accompanying the Circuit Diagram (Figure M) 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 ¼-watt, 10% tolerance unless otherwise specified.

Transistor lead codes are shown in Figure L. 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 SR110 is completely "dead," check the ac power source and power supply output (34V at pin M of printed circuit board). If the output is distorted, low or not present, apply an input signal as described under *Ac Voltage Measurements* below, and determine that the input voltage to the board assembly is correct. If an incorrect ac voltage is found on the board, per-

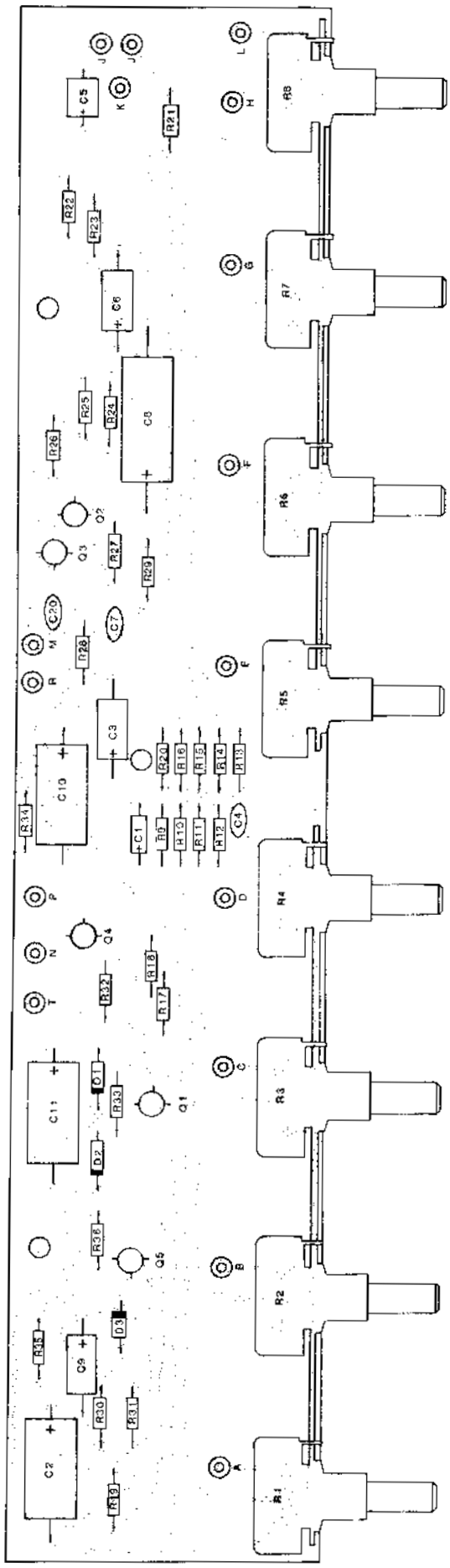


FIGURE K.
PRINTED CIRCUIT BOARD PARTS LOCATION

form *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 (SR110) or 115V or 230V (SR110-2E).
3. Test signal of 40 mV, 1000 Hz applied across pin 1-8 (for desired channel) and ground pin 11 of ACCESSORY INPUT AND OUTPUT connector P1.
4. Measurements made with ac VTVM of 1 megohm or greater input impedance.
5. Load across LINE LEVEL OUTPUTS Connectors J3-J5: 600 ohms total.
6. Ac voltage measurements may vary ±30% from values shown.

DC Voltage Measurements

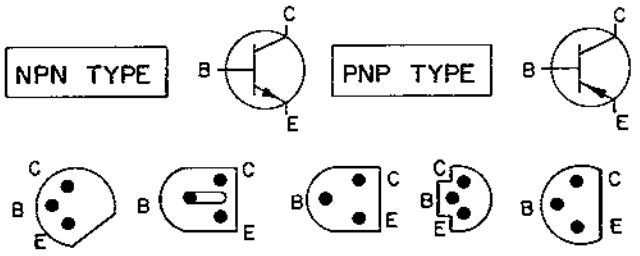
The numbers within elliptical symbols ⬭ on the Circuit Diagram denote the dc voltage at that point under the following test conditions:

1. Voltage measured with respect to chassis unless otherwise indicated.
2. Line voltage: 120V, 50/60 Hz (SR110) or 115V or 230V (SR110-2E).
3. No input signal applied.
4. Dc voltage measurements may vary ±20% from values shown.
5. Measurements made with VTVM of 11 megohms or greater input impedance.

Resistance Measurements

With the ac line cord disconnected from the ac source and the POWER-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 and diodes, see *Transistor and Diode Checking.*



NOTE: ALTHOUGH OUTLINES MAY VARY, LEADS ARE ALWAYS FORMED AS SHOWN ABOVE.

FIGURE L.
TRANSISTOR LEAD CODES

ARCHITECTS' AND ENGINEERS' SPECIFICATIONS*

The Monitor Mixer shall be a rack-mounted, 120-volt, 50/60 Hz line-operated all silicon transistor line level mixer, designed for use with the Shure SR101 Series 2 Audio Console, SR109 Professional Mixer or similar equipment which requires a stage monitor mixer separate from the program mixer. The Monitor Mixer can also be used in multi-track recording applications as a submaster mix panel or mixdown panel. Interconnections between the Monitor Mixer and SR101 or SR109 shall be made through a single multi-pin connector permanently fastened to the Monitor Mixer. A parallel-wired female connector shall provide for interconnection of additional Monitor Mixers.

The Monitor Mixer shall contain eight high-impedance, unbalanced, line level inputs to its mixing circuitry, and one high-impedance, unbalanced, line level input to its OUTPUT SELECTOR Switch for monitoring program material. The Monitor Mixer outputs shall consist of one three-pin male professional audio connector and two standard ¼ inch three-circuit phone jacks. Each shall be a line level, 600-ohm, balanced output. The Monitor Mixer shall contain a MIX BUS phono connector for interconnecting Monitor Mixers.

The Monitor Mixer output circuit balanced 600-ohm line shall have an output rated at +12 dBm at less than 1% distortion with a minimum clipping level of 19.2 dBm. The Monitor Mixer shall have a voltage gain of 40 ±2 dB (program input) and a maximum input sensitivity of 21 mV for a +4 dBm program output.

The input channel clipping level at 1 kHz shall be 2.5V minimum and shall increase with channel settings below 12.

The Monitor Mixer shall be enclosed in a metal, rack-mounting enclosure housing with a scuff-resistant vinyl-covered front panel. The dimensions shall be 44.5 mm in height, 483 mm in width, and 232 mm in depth (1¾ in. x 19 in. x 9⅛ in.). The weight shall not be more than 3.9 kg (8 lb, 8 oz).

The front panel shall contain eight rotary individual channel Volume Controls, one rotary MASTER Volume Control/POWER-OFF Switch, a power-on indicator lamp, an OUTPUT SELECTOR Switch, and a PHONES Jack. A non-switched ac receptacle rated for 500 watts maximum load shall be provided on the rear panel.

Any Monitor Mixer not meeting all of the above specifications shall be deemed unacceptable under this specification. The Monitor Mixer shall be a Shure Model SR110.

* All specifications apply to SR110-2E except: operating voltage is 105-125 or 210-250 volts; non-switched ac receptacle is not provided.

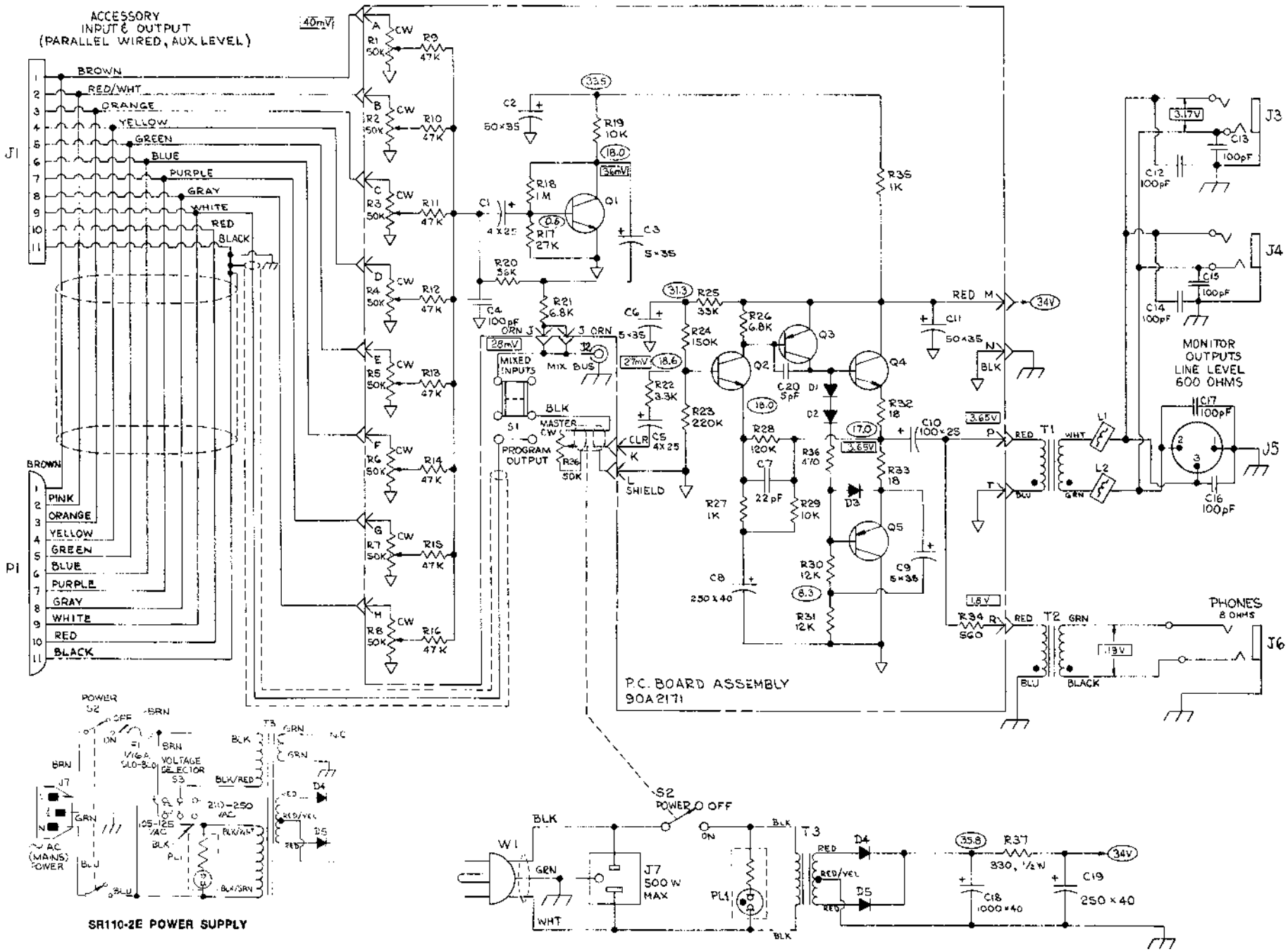


FIGURE M.
SR110 PROFESSIONAL MONITOR MIXER CIRCUIT DIAGRAM

A1238-11-3
B1238-11-1


SHURE