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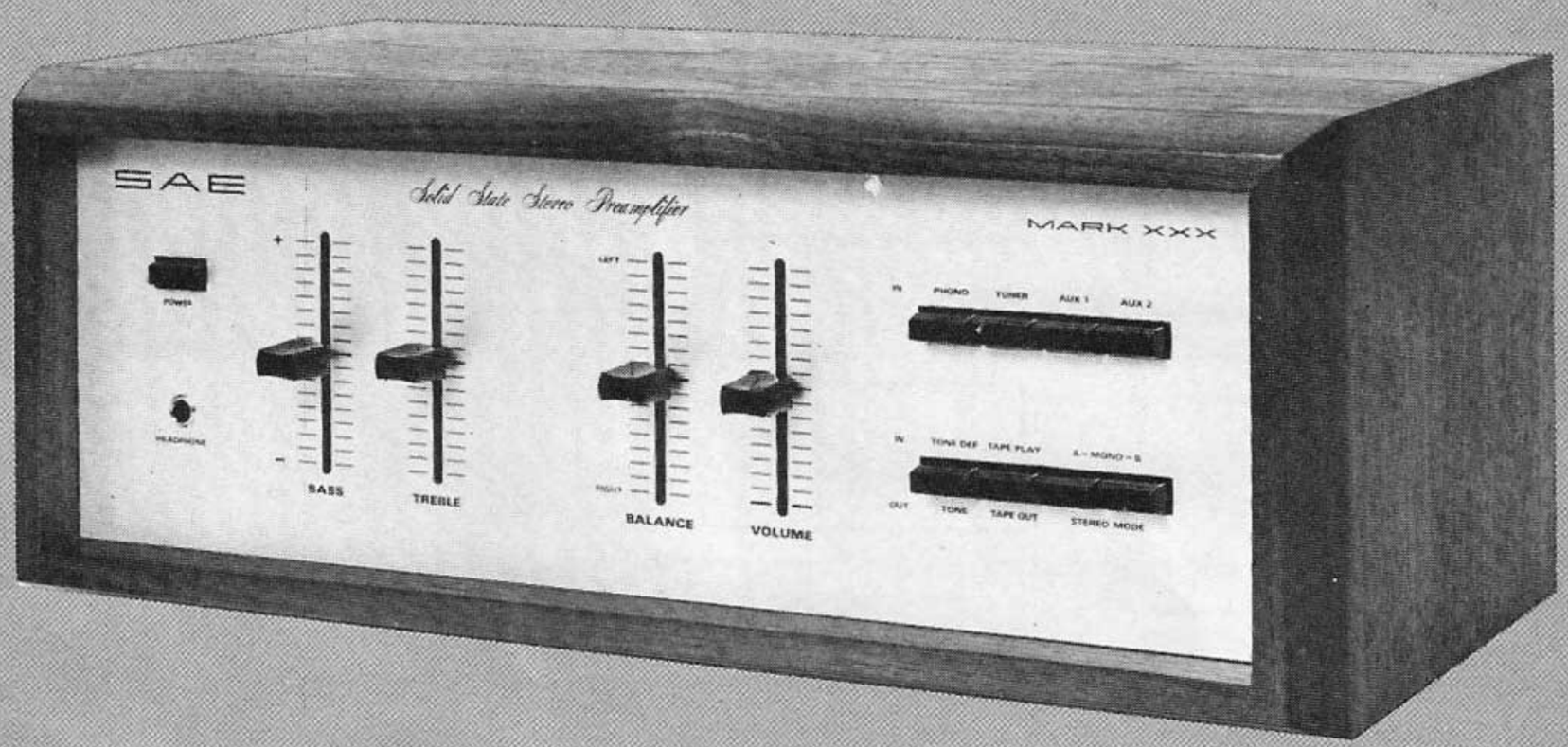
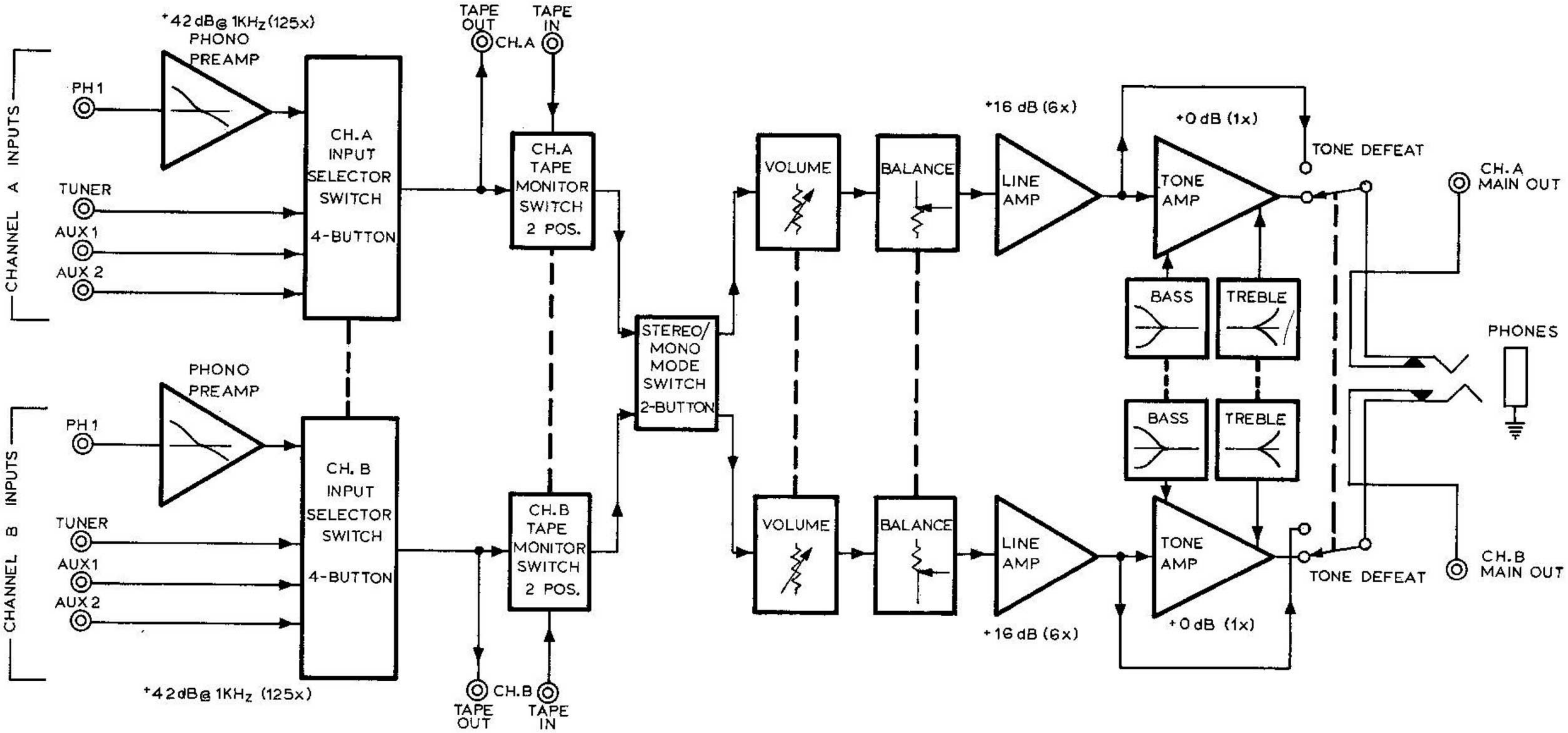
MARK 30
SOLID STATE STEREO PREAMPLIFIER

SERVICE MANUAL



SAE

Components for the Connoisseur



SAE MK 30 PREAMPLIFIER

BLOCK DIAGRAM

SERVICING HINTS

When repairing this SAE product, the following suggestions may be helpful:

1. Determine if the fault is common to both channels. If so, suspect power supply or grounding difficulties. The B+ voltage from the regulated power supply to the amplifier board should be verified to be +42V ±2V. If not, check 43V zener diode D201.

2. Refer to the block diagram. Localize the problem area to either the phono preamplifier stages, the main amplifier, or one of the tone control amplifiers by checking for continuity of signals from Phono Input to Tape Out or Tuner Input to Main Out.

3. If the difficulty is determined to be in the main line amplifier, feed 1.6V RMS at 1KHz into the Tuner Input. This signal should result in 10V RMS out of the Main Output, provided the Volume control is at the maximum clockwise position and the Balance Bass, and Treble controls are all at their mid positions.

4. Apply the output signal to the vertical amplifier of an oscilloscope and the generator input to the horizontal amplifier of the oscilloscope. If the amplifier under test is operating properly, a diagonal straight line should be seen on the oscilloscope.

5. If the oscilloscope trace is not straight or is truncated, this would indicate distortion. Now, further isolate the defective stage by referring to the block diagram, schematic, and board layouts. Once the defective stage is localized, measure the DC voltages at the base, emitter, and collector of each of the transistors in the malfunctioning circuit. Especially note that the base-to-emitter voltage on any of the transistors in this amplifier should be approximately 0.6V if they are operating properly.

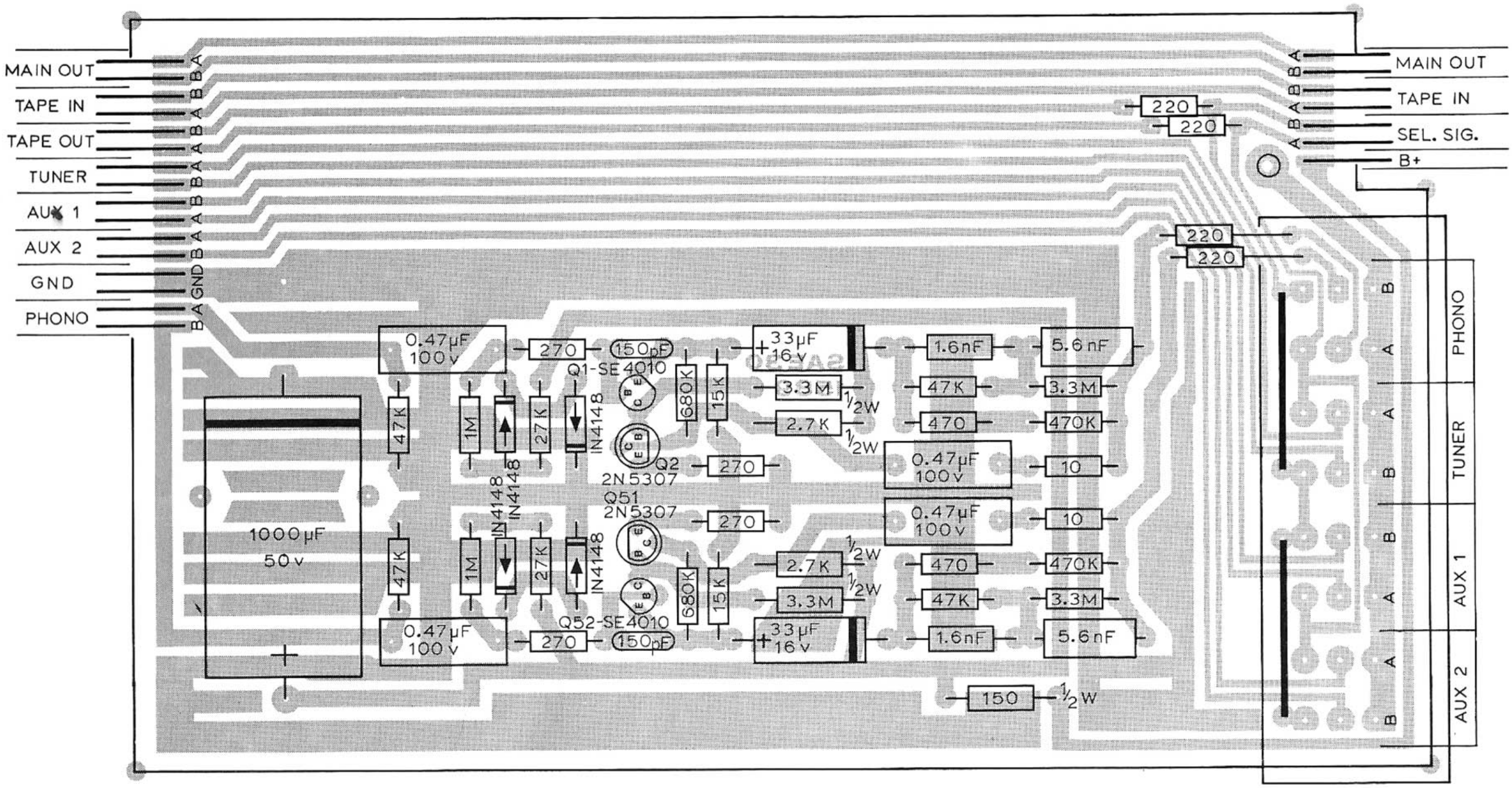
   Any transistors having improper voltage readings should be replaced which will correct the malfunctioning circuit in most instances.

6. Where only **one** channel of the stereo amplifier is faulty, it is sometimes helpful to use the other channel, which is operating properly, as a model. Either the AC voltages or DC voltages can be compared between the 2 channels to isolate the defective part.

7. If the difficulty is determined to be in the phono preamplifier, feed .08V RMS at 1KHz into a Phono Input. This signal should result in 10V RMS output at the Tape Output. As in step 4, apply the output signal to the vertical amplifier of the oscilloscope and the generator input to the horizontal amplifier of the oscilloscope. If the phono preamplifier under test is operating properly, an undistorted ellipse will be seen on the oscilloscope. Proceed as described in step 5, to further isolate the faulty part. It should be noted that the phono-preamplifier frequency characteristic to provide RIAA equalization results in ±17dB boost at 50Hz (relative to 1KHz) and −13.75dB cut at 10KHz. The low-frequency section of the curve is provided by the 5600pF feedback capacitor and the high-frequency portion by the 1600pF capacitors feeding back to the 470 Ohm 1st-stage emitter load resistor. Noisy operation of one of the phono preamplifier is usually traced to a faulty transistor in the first stage.

NOTE: With AC Power Switch off, B+ is approximately 15V DC.

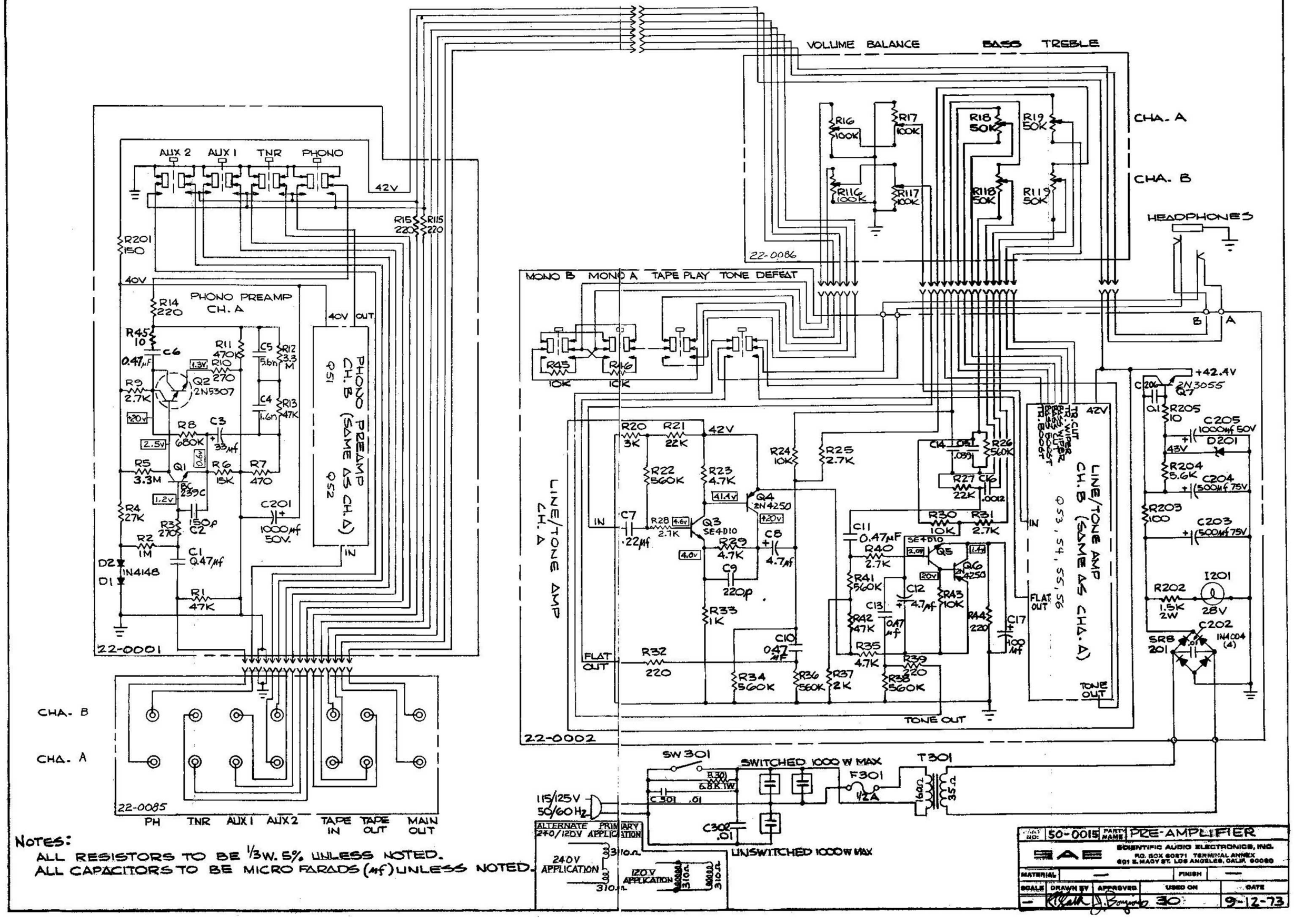
SAE 22-0001 MK 30 PHONO AMP. BD. PARTS LAYOUT
17-0001



PHONO AMP. BOARD (22-0001)

QTY.	DESCRIPTION	PART NUMBER
	RESISTORS	
All Resistors are ¼W or ½W Carbon Film unless otherwise indicated.		
	CAPACITORS	
2	Cer. Disc. 150pF ±10% 100V GP	07-0011
2	Polystyrene 1600pF ±5% 63V	10-0018
2	Polystyrene 5600pF ±5% 63V	10-0027
4	Mylar 0.47µF ±10% 100V	08-0015
2	Electrolytic 33µF 16V	09-0016
1	Electrolytic 1000µF 50V	09-0044

QTY. OR REF. NO.	DESCRIPTION	PART NUMBER
	SEMICONDUCTORS	
4	Diode, Si IN4148	11-0096
Q1,51	Tstr, Si NPN BC239C/SE4010/5601H	11-0044
Q2,52	Tstr, Darlington, Si NPN 2N5307	11-0021
	MISCELLANEOUS	
1	Switch, 4-Push Button, Interlocking	12-0018
1	Solder Terminal	18-0044
23	Board Connecting Pin	18-0078

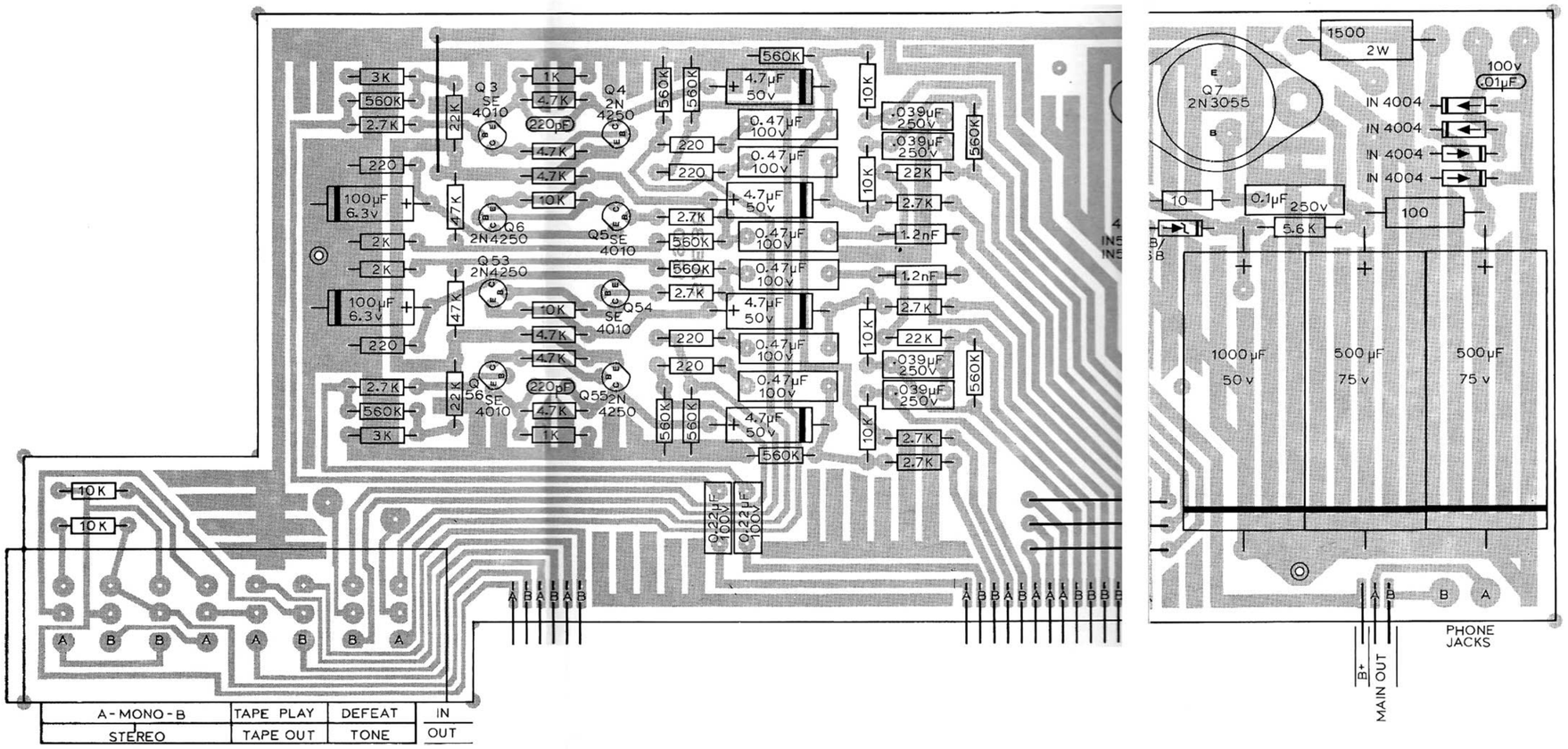


NOTES:
ALL RESISTORS TO BE 1/3W. 5% UNLESS NOTED.
ALL CAPACITORS TO BE MICRO FARADS (mf) UNLESS NOTED.

DWG NO: 50-0015	PART NAME: PRE-AMPLIFIER		
SAE	SCIENTIFIC AUDIO ELECTRONICS, INC. P.O. BOX 60871 TERMINAL ANNEX 601 S. MACY ST. LOS ANGELES, CALIF. 90060		
MATERIAL —		FINISH —	
SCALE —	DRAWN BY R. Keith	APPROVED J. Bongiorno	USED ON 30	DATE 9-12-73

MK 30

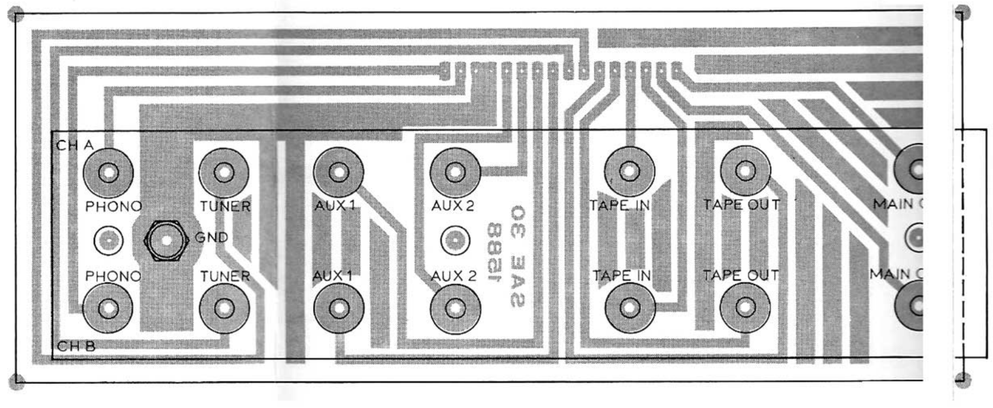
SAE 22-0002 MK 30 MAIN BD. PARTS LAYOUT
17-0002



MAIN BOARD ASSY. (22-0002)

QTY. OR REF. NO.	DESCRIPTION	PART NUMBER
	RESISTORS	
	All Resistors are ¼W or ½W Carbon Film unless otherwise indicated.	
	CAPACITORS	
2	Cer. Disc. 220/200pF ±10% 500v	07-0014
2	Polystyrene 1200pF ±5% 63/125V	10-0015
1	Cer. Disc. .01µF +80%,-20% 100/50V	07-0023
4	Mylar .039µF ±10% 250V	08-0002
1	Mylar 0.1µF ±10% 250V	08-0009
2	Mylar 0.22µF ±10% 100V	08-0012
6	Mylar 0.47µF ±10% 100V	08-0015
4	Electrolytic 4.7µF 50V	09-0005
2	Electrolytic 100µF 63V	09-0026
2	Electrolytic 500µF 75V	09-0039
1	Electrolytic 1000µF 50V	09-0044
	SEMICONDUCTORS	
4	Diode, Silicon IN4004	11-0094
1	Diode, Zener IN5876B/5751B 43V ±5%	11-0105
Q3,5,53,55	Tstr, Si, NPN SE4010/5601H/BC237B	11-0044
Q4,6,54,56	Tstr, Si, PNP 2N4250/BC307B/24122	11-0117
Q7	Tstr, Si, NPN 2N3055	11-0002
	MISCELLANEOUS	
1	Switch, 4-Push Button, Individual Latch	12-0016
2	Solder Terminal	18-0044
23	Board Connecting Pin	18-0078

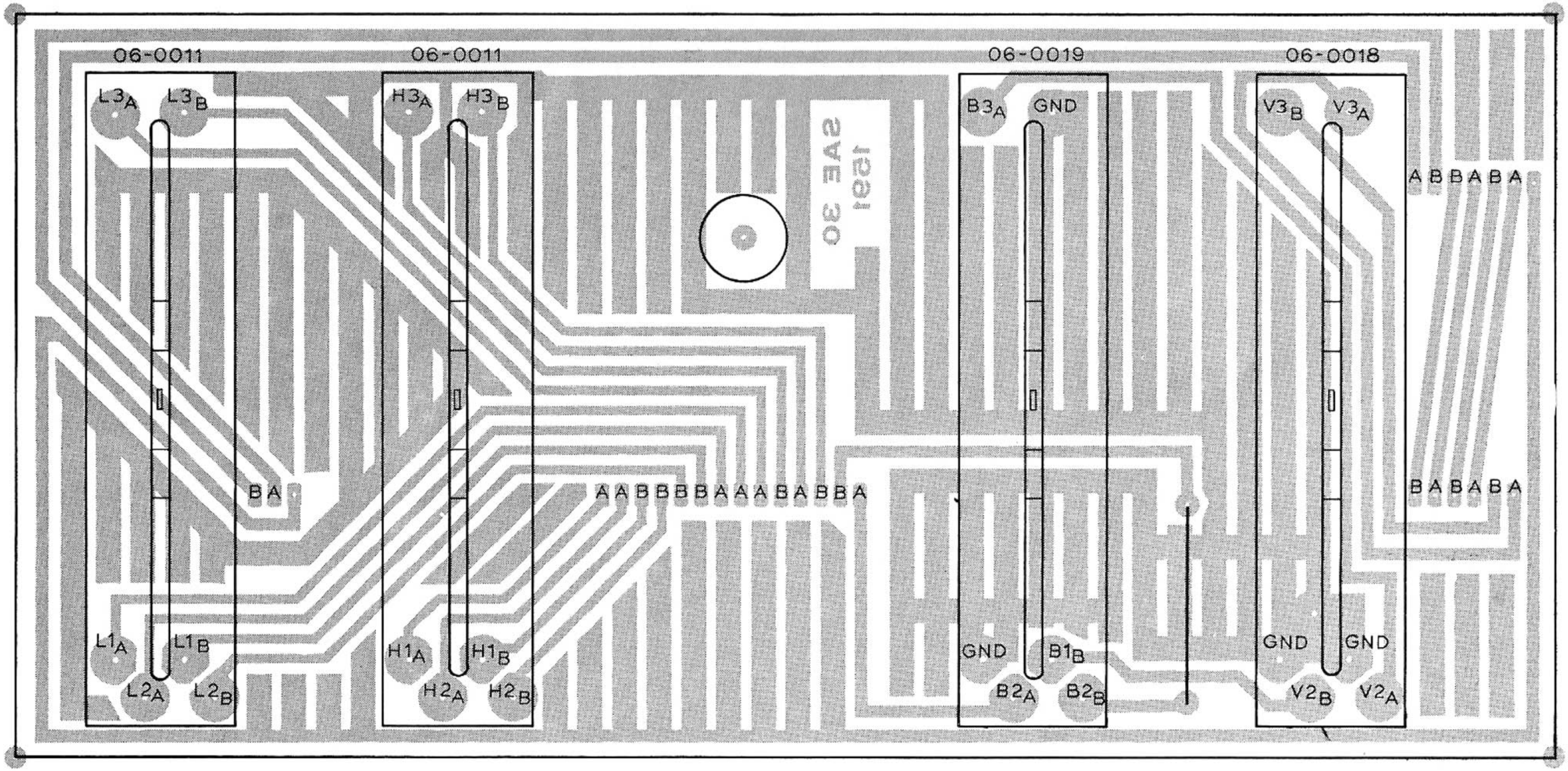
SAE 22-0085 MK 30 INPUT-OUTPUT CONNECTING BD. PARTS LAYOUT
17-0010



INPUT-OUTPUT CONNECTING BD. ASSY. (22-0085)

QTY.	DESCRIPTION	PART NUMBER
1	Grounding Plate	17-0008
1	Ground Post	18-0055
14	Phono Jack	18-0062

SAE 22-0086 MK30 TONE CONTROL BD. PARTS LAYOUT
17-0011



TONE CONTROL BOARD ASSY. (22-0086)

QTY.	DESCRIPTION	PART NUMBER
2	Slide Pot 50K Ohm (Tone)	06-0011
1	Slide Pot 100K Ohm (Volume)	06-0018
1	Slide Pot 100K Ohm (Balance)	06-0019

MISCELLANEOUS PARTS

QTY.	DESCRIPTION	PART NUMBER
2	Cap. Cer. Disc. .01uF +80%,-20% 1KV	07-0024
1	Fuse AGC ½ Amp	12-0004
1	Switch, Push-Push, AC pwr.	12-0019
1	Transformer (120V)	15-0023
1	Pwr. Transformer (50Hz, 240/120V)	15-0024
1	Pilot Lamp, 28V	16-0005
1	Front Panel, Gold Metal	17-0003
1	Sub Panel, Blk. Metal	17-0004
1	Side Wrap, Blk. Metal	17-0005
1	Top Cover, Blk. Metal,	17-0006B
1	Bottom Cover, Blk. Metal	17-0007B
1	Rubber Gasket, Slide Pot	17-0009
1	Lens, Pilot Lamp	17-0012
1	Fuse Holder	18-0030
1	Phono Jack, Stereo	18-0061
3	AC Receptacle, Blk.	18-0066
1	Line Cord, Strain Relief	18-0072
4	Knob, Blk., Plastic	18-0081
1	Standoff 1½" X #6-32 X ¼"	19-0091
1	Line Cord, Blk.	21-0111

SPECIFICATIONS MARK XXX

FREQUENCY RESPONSE:	High Level Input: ±0.25dB 10Hz to 100KHz Phono Inputs: ±1dB 20Hz to 20KHz
RMS HARMONIC DISTORTION:	Less than .03% 20Hz to 20KHz @2.5V Typical Performance .015%
INTERMODULATION DISTORTION:	(60Hz and 7KHz 4/1, 60Hz and 12KHz 4/1, 60Hz and 2KHz 4/1) Less than .03% at rated output. Typical Performance .015%
SIGNAL-TO-NOISE:	Phono: 72dB below 10mV input. High Level: 90dB below rated output
GAIN AT 1KHz:	Phono: 42dB (Tape Out), 58dB (Main Out) High Level: 16dB
RATED OUTPUT:	2.5 Volts RMS into 100,000 Ohms
MAXIMUM OUTPUT:	9 Volts into 100,000 Ohms
IMPEDANCE:	Phono: 47K Ohms High Level: 100K Ohms Output Source Impedance: 600 Ohms
RECOMMENDED LOAD:	10KOhms Minimum
BASS CONTROL RANGE:	±15dB at 50Hz
TREBLE CONTROL RANGE:	±15dB at 10KHz
CROSSTALK:	-60dB at 1KHz
DIMENSIONS:	15" W X 4.75" H X 8" Deep
POWER CONSUMPTION:	25 watts, 100-125V, 50-60Hz
SHIPPING WEIGHT:	10 Pounds
WALNUT CABINET:	WC-30, not included

Please address all inquiries to:

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P.O. BOX 60271, TERMINAL ANNEX • LOS ANGELES, CALIFORNIA 90060