



Dokorder®

8 TRACK STEREO CARTRIDGE TAPE RECORDER

MC-60

SERVICE MANUAL



SET USING ISO SCREWS

SPECIFICATIONS

Tape speed:	3-3/4 ips (9.5cm/sec.)
Wow & flutter:	Less than 0.3% RMS
Frequency response:	30 – 12,000Hz
S/N ratio:	Better than 47dB
Crosstalk:	Better than 45dB
Input level:	Line input 60mV
	DIN 30mV
Output level:	Line output 0.775V
	DIN 0.775V
Fast forward:	Approx. 3 times normal tape speed
Semiconductors:	12 transistors, 2 IC's, 16 diodes
Power requirements:	115V AC (U.S.A.), 100 – 240V
	(universal type), 50 or 60Hz
Power consumption:	15W
Dimensions:	14-1/2H x 18-1/2W x 8-7/8D inches
	(265 x 376 x 121mm)
Weight:	11 lbs. (5 Kg)

GENERAL DESCRIPTION

The Dokorder Model MC-60 is a 8-track stereophonic cartridge tape record/play deck, incorporating IC-equipped all silicon transistor Amplifier circuit which permit versatile use both recording and playback operation.

Outstanding Features:

FAST forward — PUSH the FAST button, then the tape is wound about three times faster than its normal speed permitting easy spot selection.

PLAY/EJECT — When the tape is in FAST forward, a light push of this switch changes to playback mode again, and pushing the switch further, the cartridge is ejected to stop the operation.

PROGRAM switch — Setting the program switch to AUTO EJECT permit automatic ejection when program four is finished on recording or playback, so program four ends and program one beginning will easily be found by utilizing the FAST forward button. Setting the program switch to CONTINUOUS PLAY, all four programs will be repeated one after another in turn.

Setting the program switch to REPEAT PLAY, each program will be repeated over and over.

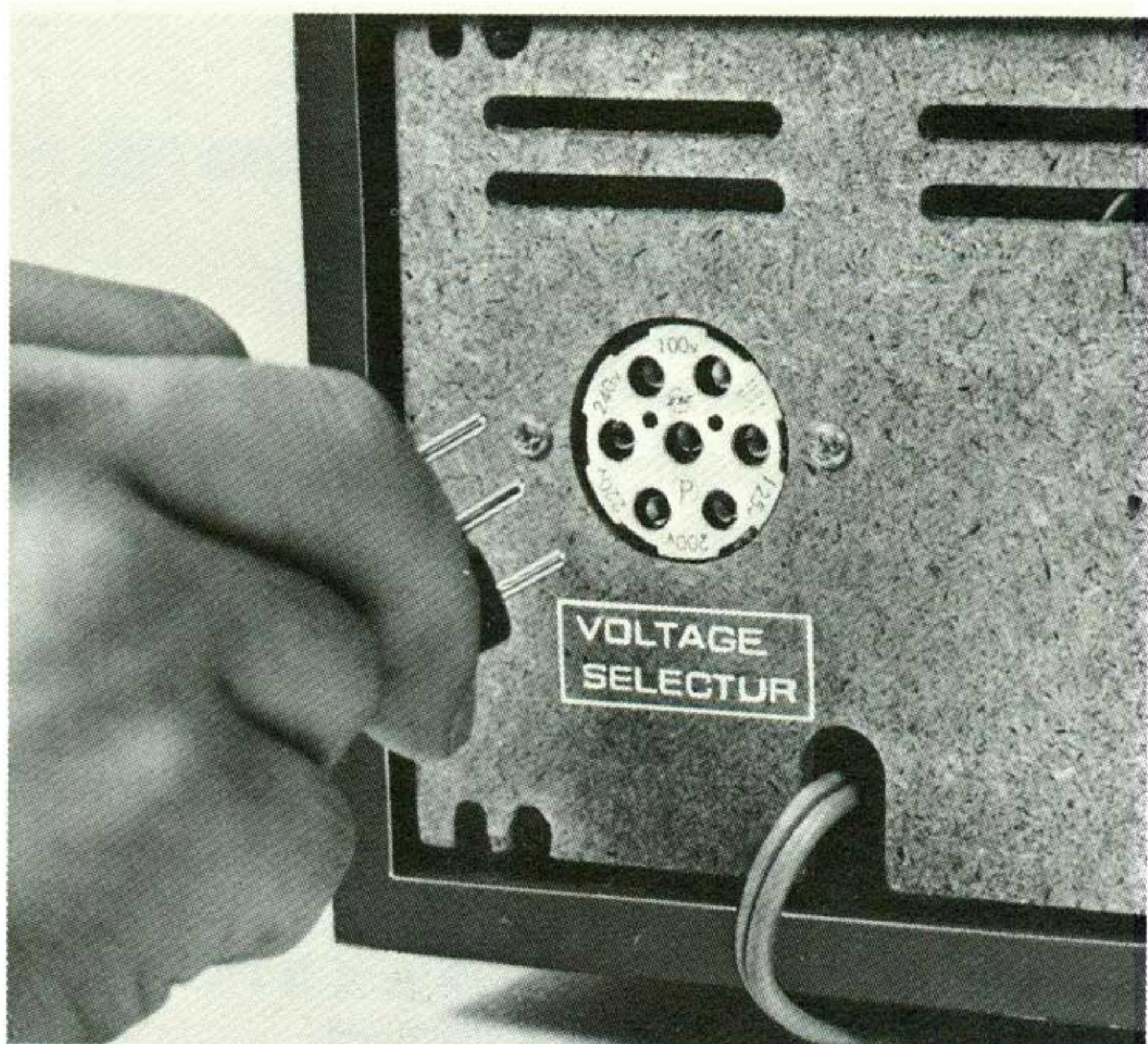
Easy Recording Procedure — Before inserting the cartridge, push the RECORD button, adjust the level Controls, and then insert the cartridge, which permit accurate recording without tape loss.

Digital Program Indicator — The program being reproduced or recorded is digitally indicated in the handsome bright square window in the center of the front panel.

VOLTAGE AND FREQUENCY ADJUSTMENT

Since the model MC-60 incorporates D.C. Motor, there is no necessity of taking any procedures for frequency adjustment.

As for machines sold in U.S.A. are set power supply at 115V only. Except machines sold in U.S.A., are adjustable by simply resetting the voltage selector plug on the rear panel such as 100, 100-115, 125, 200, 220 and 240V.



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Manufacturer reserves right to change design and/or specifications without notice for purpose of improvement.

ELECTRICAL ADJUSTMENT

Item	Signal Source	Output Connection	Mode	Adjustments	Remarks
1. Head Azimuth Adjustment	8 KHz, RCA adjustment tape, RCA-321	VTVM and 47 K Ω resistor in parallel with LINE OUT jack	PLAYBACK	Head azimuth adjusting screw See Fig. 4	Adjust the screw to obtain the maximum reading on VTVM.
2. Playback Level and Meter Level Adjustments	1 KHz, RCA adjustment tape, RCA-323	VTVM and 47 K Ω resistor in parallel with LINE OUT jack	PLAYBACK	L-CH: T-101, R-CH: RT-201, (50K ;B) RT-103, RT-203, (50K ;B) See Fig. 2	1. Adjust RT-101 (L-CH) and RT-201 (R-CH) to obtain 0 dB (0.775V) on VTVM. 2. Adjust RT-103 (L-CH) and RT-203 (R-CH) so that the pointers of level meters stay at 0 VU (100%).
3. Record Bias Adjustment		VTVM to the test point (See Page 9 L-CH: T ₁ , T ₃ , R-CH: T ₂ , T ₄ .)	RECORD	L-CH: L-301, R-CH: L-302 (20mV) See Fig. 3	Adjust L-301 (L-CH) and L-302 (R-CH) to obtain 13mV on VTVM.
4. Bias Trap Coil (for Amp.) Adjustment		VTVM to the test point and ground (See Page 7 L-CH: T ₁ , R-CH: T ₂)	RECORD	L-CH: L-101, R-CH: L-201 (20mV) See Fig. 2	1. Set the volume controls (VR-101 and VR-201) to the maximum. 2. Adjust to obtain the minimum reading on VTVM.
5. Bias Trap Coil (for Amp.) Adjustment		VTVM and 47 K Ω resistor in parallel with LINE OUT jack	RECORD	L-CH: L-103, R-CH: L-203 (20mV) See Fig. 2	1. Set the volume controls (VR-101 and VR-201) to the maximum. 2. Adjust to obtain the minimum reading on VTVM.
6. Record Level Adjustment	1 KHz -20dB (0.15V) to LINE INPUT jack	VTVM and 47 K Ω resistor in parallel to the test point and ground (See Page 7 L-CH: T ₃ , R-CH: T ₄)	RECORD (Cutting bias current. See Fig. 6)	L-CH: T-102, R-CH: RT-202 20K (B) See Fig. 2	1. Set the volume controls (VR-101 and VR-201) to the maximum. 2. Adjust RT-102 (L-CH) and RT-202 (R-CH) to obtain 30 μ V on VTVM.
7. Record Equalizer Adjustment	10 KHz -40dB (7.75mV) to LINE INPUT jack	VTVM and 47 K Ω resistor in parallel to the test point and ground (See Page 7 L-CH: T ₃ , R-CH: T ₄)	RECORD (Cutting bias current. See Fig. 6)	L-CH: L-102, R-CH: L-202 7mH. See Fig. 2,6	1. Set the volume controls (VR-101 and VR-201) to the maximum. 2. Adjust L-102 (L-CH) and L-202 (R-CH) to obtain 60 μ V on VTVM.

- Fig. 2 Adjusting parts locations – PCM-115, Record/Playback Pre-amplifier PC Board –
- Fig. 3 Adjusting parts locations – PCM-116, Power Supply and Bias Oscillator PC Board –
- Fig. 4 Adjusting parts locations – head deck top view –
- Fig. 5 Core Setting of L-102 and L-202
- Fig. 6 Cutting bias current for item 6, 7.

- Notes: 1. Before making the adjustments, be sure to clean the heads with cloth or swab dampered with denatured alcohol and to demagnetize the head with a head-demagnetizer.
2. The adjustments should be made in numerical order.

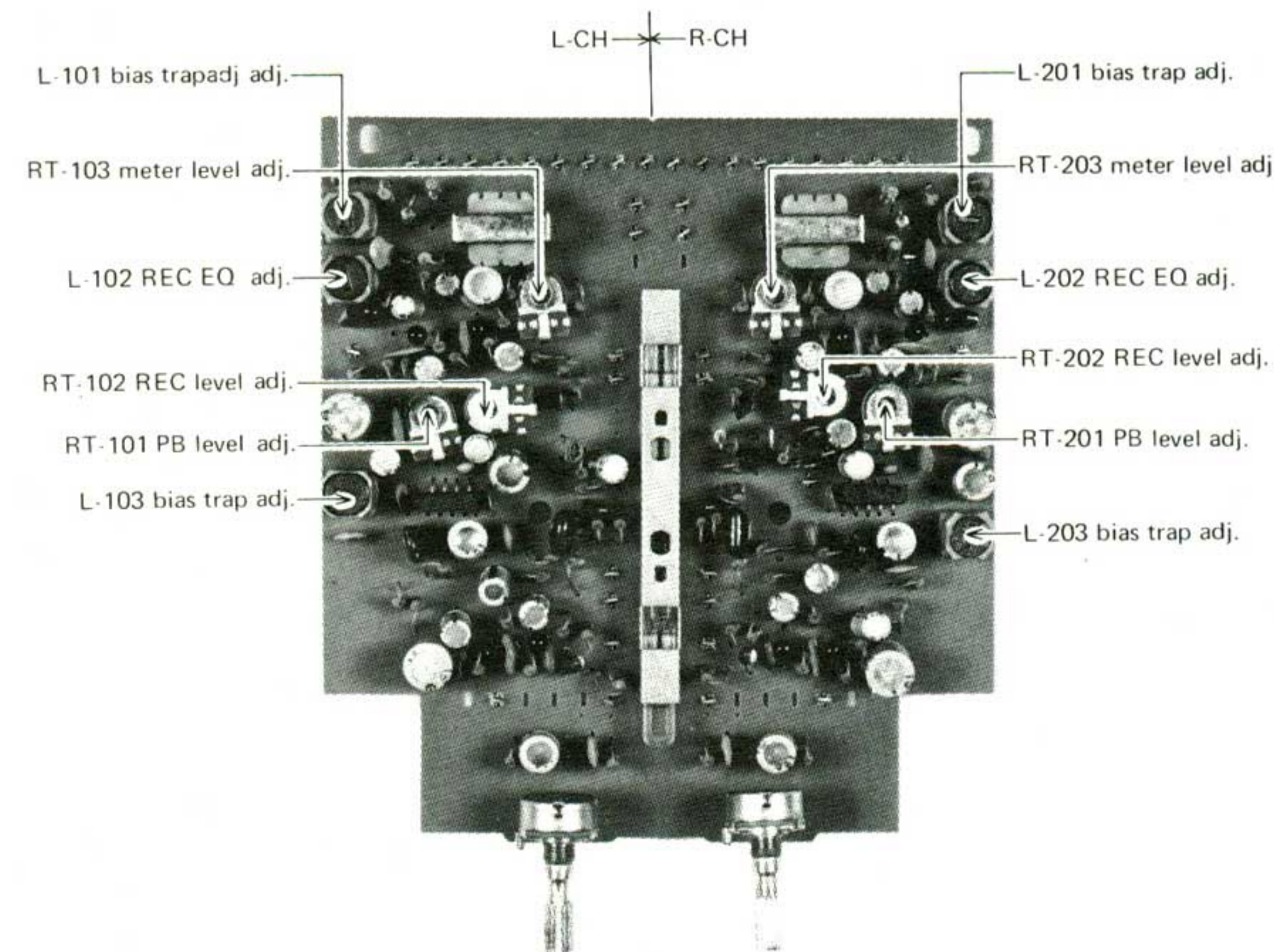


Fig. 2

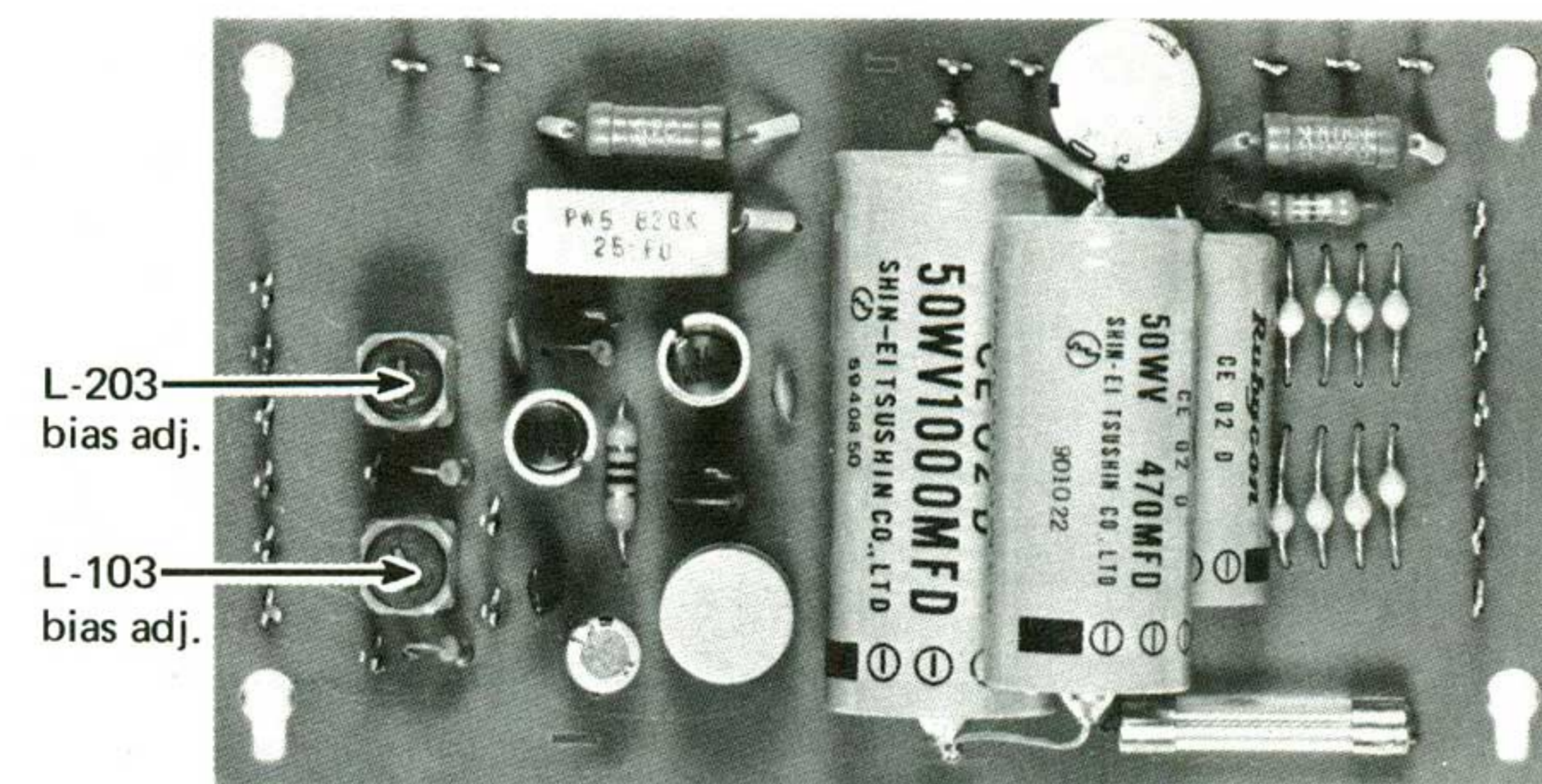


Fig. 3

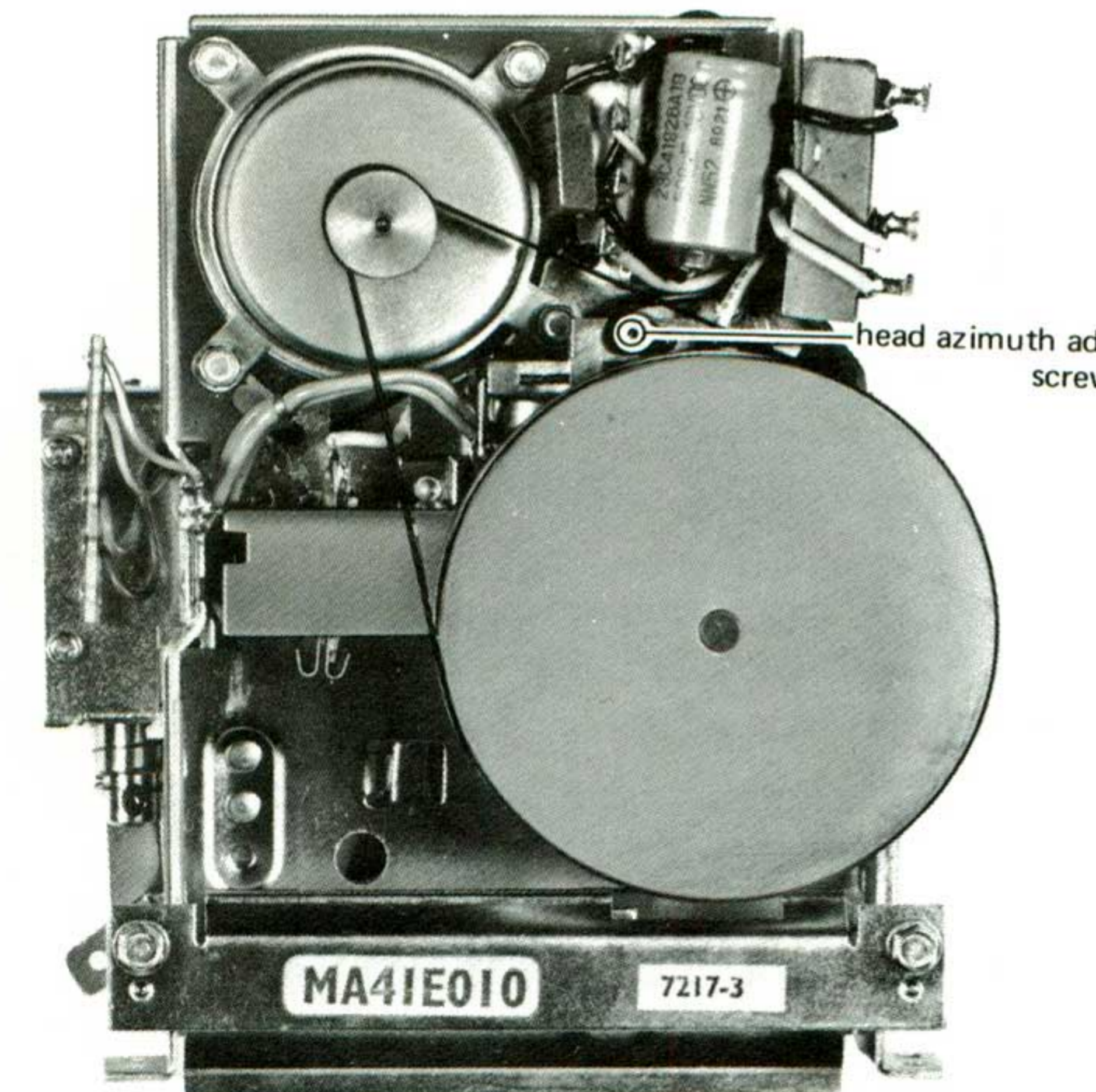


Fig. 4

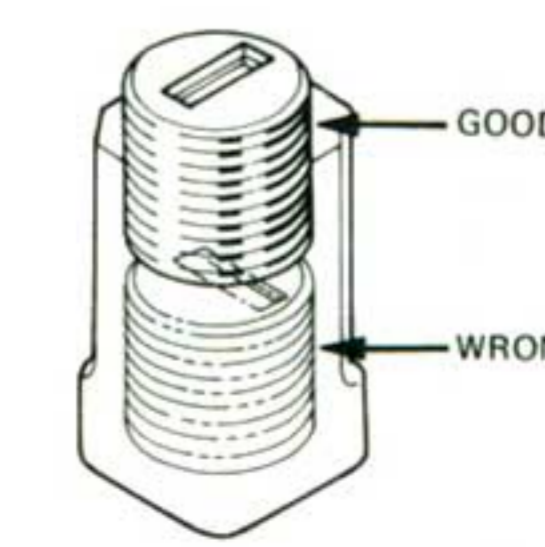


Fig. 5

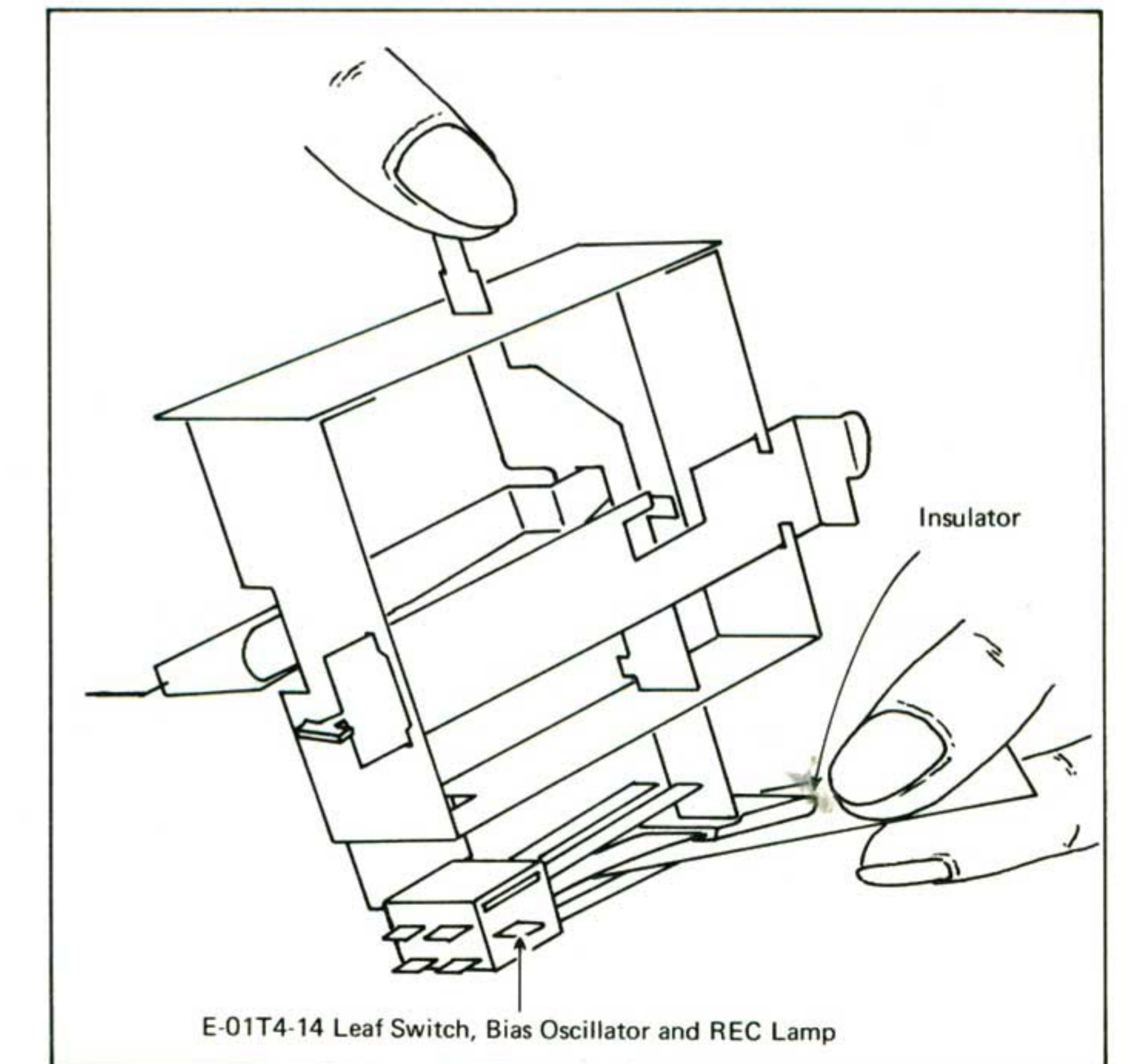
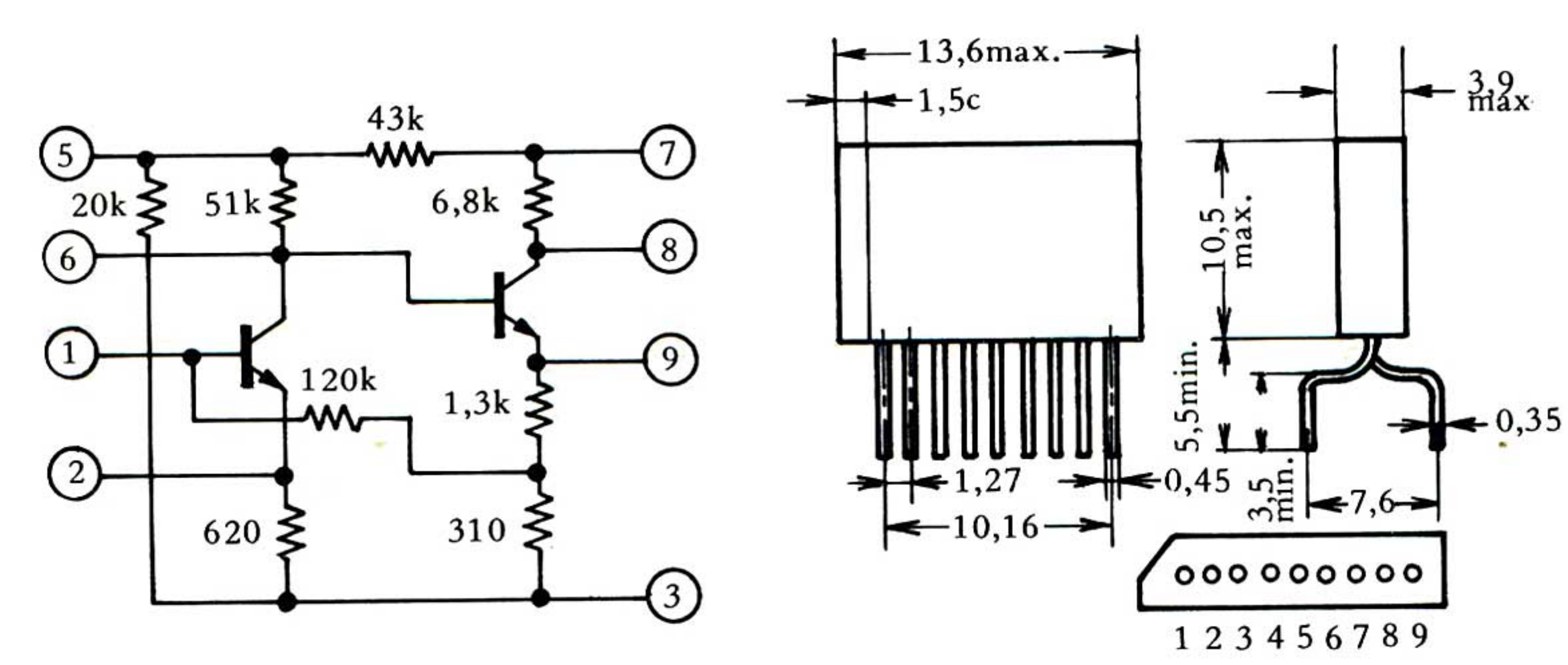
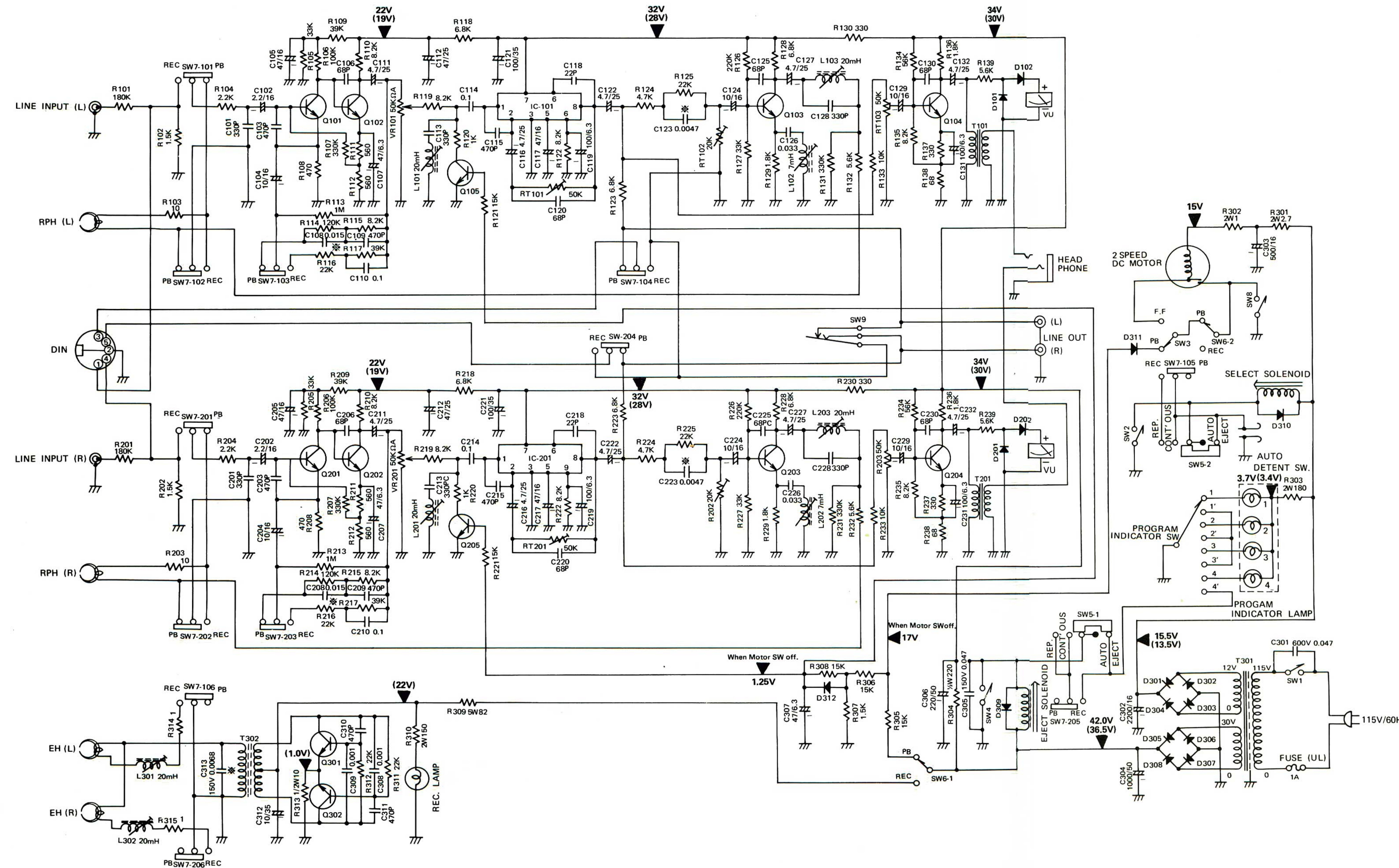


Fig. 6

SCHEMATIC DIAGRAM



- Notes:**
- All resistors and capacitors are rated in ohm and uF respectively unless otherwise specified.
 - All capacitors 50VV unless otherwise stated.
 - Voltage values are measured to ground with a VTVM in **PLAYBACK** and **RECORD** mode. Variation may be noted because of normal production tolerance. Voltage values on **RECORD** mode are enclosed in parentheses.
 - The position of the switch in this schematic are shown in the following table.

- Q-101, Q-201, Q-102, Q-202 : Transistor, 2SC-693
- Q-103, Q-203, Q-104, Q-204 : Transistor, 2SC-536
- Q-105, Q-205 : Transistor, 2SD-227
- Q-301, Q-302 : Transistor, 2SC-876
- IC-101, IC-201 : Integrated Circuit, LD-3130
- D-301 - D-308 : Silicon Rectifier, SLB01-02
- D-309, D-310 : Silicon Rectifier, 10D-1
- D-311 : Silicon Rectifier, IS-2473
- D-101, D-201, D-102, D202, D-312 : Germanium Diode, 1N-60
- 100/25 : Capacitor, 100uF 25VV
- M : Mylar Capacitor
- C : Ceramic Capacitor
- T : Tantal Capacitor
- * : ±10% (Capacitor)
- * : Quick Blow Type (Fuse)

Switches:

Switch No.	Description	Position
SW1	POWER Switch	OFF
SW2	SELECTOR Switch	OFF
SW3	FAST Switch	Playback
SW4	PLAY/EJECT Switch	OFF
SW6	PROGRAM Switch	AUTO EJECT
SW7	Record/Playback Leaf Switch	Playback
SW7	Record/Playback Slide Switch	Playback
SW8	Motor Switch	OFF
SW9	Muting Switch	ON

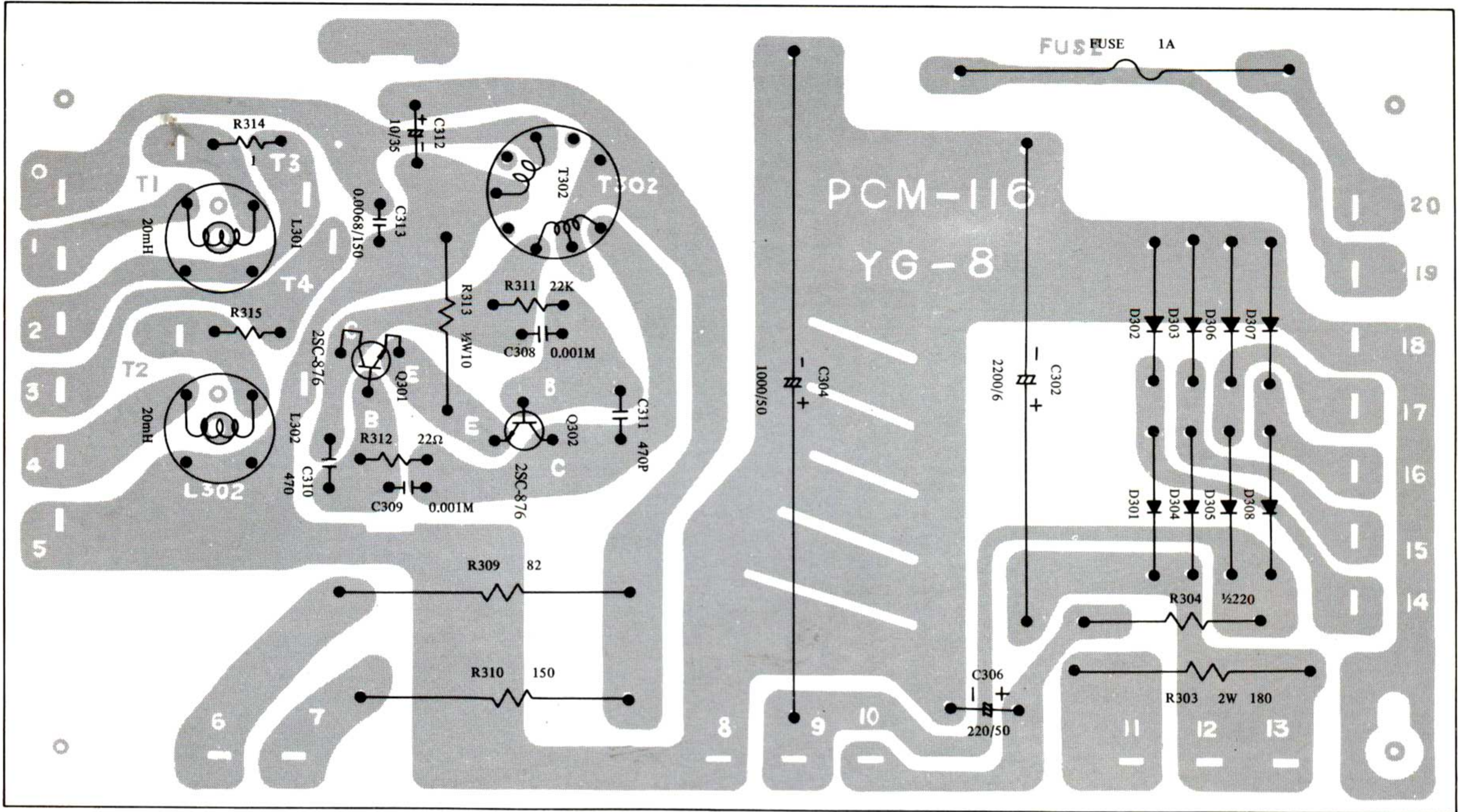
Voltage Chart:

NO.	TRANSISTORS	COLLECTORS		EMITTERS		IC's	
		Playback	Record	Playback	Record	Playback	Record
Q-101, Q-102	2SC-693	1.8V	1.75V	0.03V	0.025V		
Q-102, Q-202	2SC-693	12. V	9.4 V	1.3 V	1.2 V		
Q-103, Q-203	2SC-536	20. V	18. V	3.3 V	2.8 V		
Q-104, Q-204	2SC-536	15. V	13.5 V	4.2 V	3.6 V		
Q-301, Q-302	2SC-876		22. V		1.0 V		
IC-101, IC-201	No. 2					0.06V	0.05V
" , "	No. 5					8.6 V	7.6 V
" , "	No. 6					3.6 V	3.5 V
" , "	No. 8					16.5 V	18 V

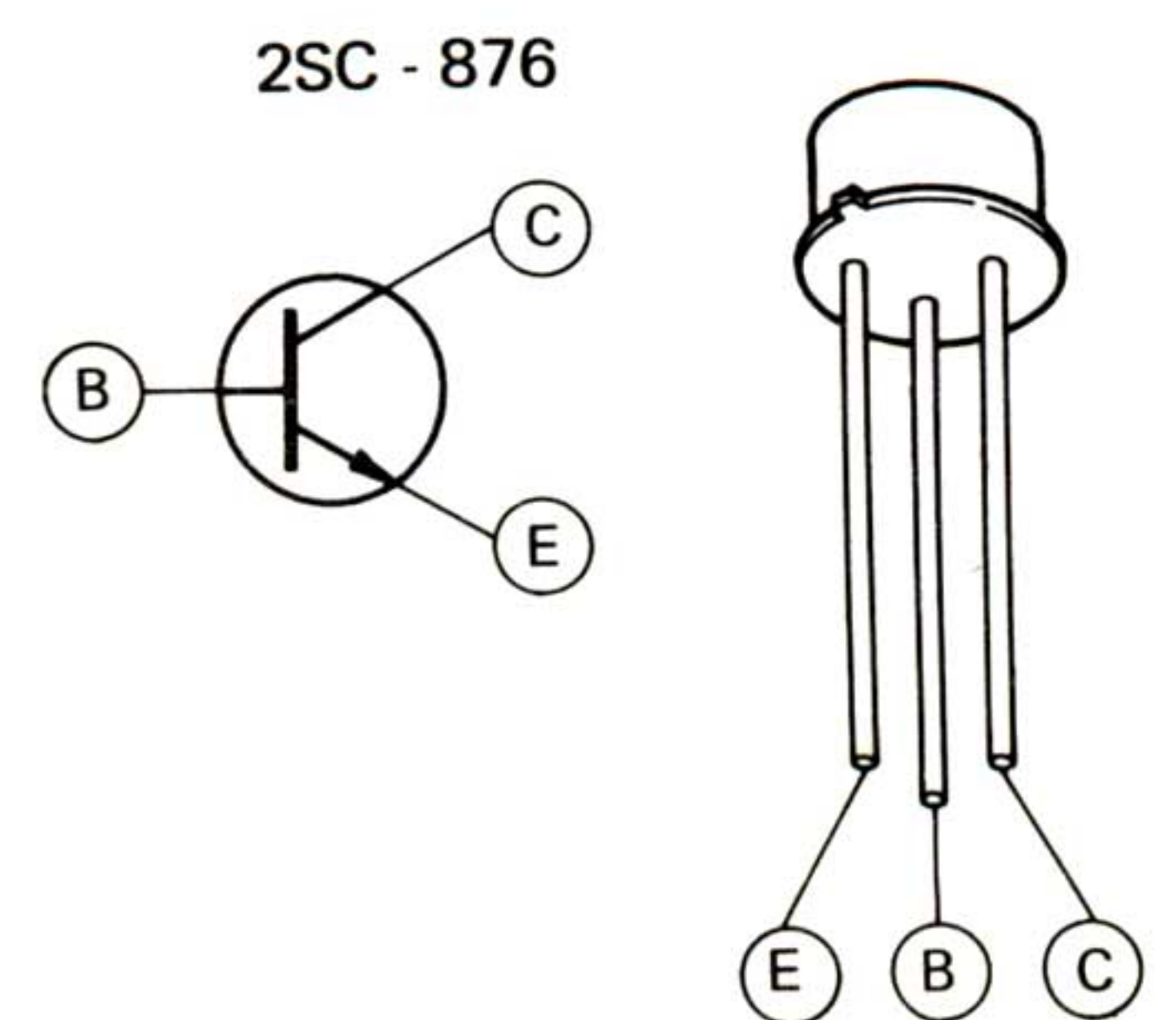
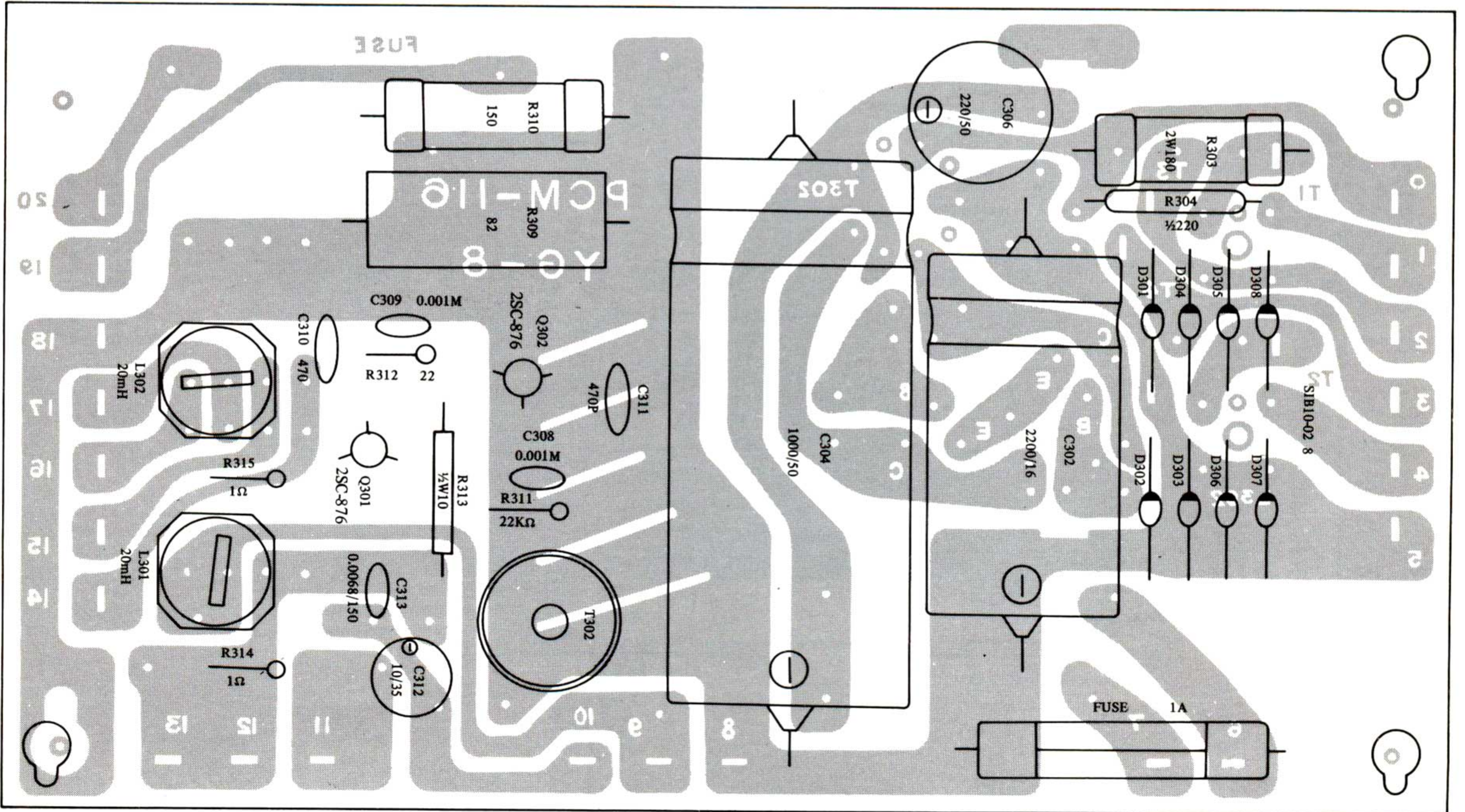
POWER SUPPLY/BIAS OSCILLATOR PC BOARD

Power Supply/Bias Oscillator PC Board

— Conductor Side —



— Component Side —



SERVICE PARTS LIST**MODEL MC-60**

PARTS NO.	DESCRIPTION	USER PRICE US\$
UNIVERSAL TYPE ONLY		
E-11T2-02	Power Transformer, Universal type	11.60
E-41C2-04	Voltage Selector Socket	1.25
E-41B5-52	Voltage Selector Plug	1.00
115V (FOR U.S.A.) ONLY		
E-11T1-02	Power Transformer, for 115V only	9.10
POWER SUPPLY AND BIAS OSCILLATOR SECTION		
E-41C2-10	AC Power Cord (2m), with Plug	1.15
E-11T1-05	PCM-116, Power Supply and Bias Oscillator PC Board Assy	12.70
E-42R1-08	Fuse (lamp), AC Power (Pig-tail type)	0.85
E-11T4-13	Coil, Bias Oscillator (OC-60)	1.50
E-11T4-14	Coil, Bias Trap (CH-20)	1.50
E-01R1-03	Lamp, Pilot	1.10
E-01R1-02	Rubber Bushing, Pilot Lamp	0.15
E-01R1-05	Push Button Switch, SELECTOR	2.50
E-01T1-06	Slide Switch, Automatic Program	1.30
E-01T1-14	Channel Indicator, Program	9.50
E-01T1-11	Power on-off Lever Switch	2.80
M-01T1-02	Switch Holder Assy, FAST and PLAY/EJECT	14.00
M-01T2-03	Coil Spring, Push Lever, FAST and PLAY/EJECT	0.10
M-01T2-04	Coil Spring, Cam Lever	0.10
M-01T2-08	Coil Spring Releasing Lever, FAST and PLAY/EJECT	0.10
E-01T2-11	Leaf Switch, FAST	1.00
E-01T2-13	Leaf Switch, PLAY/EJECT	1.00
M-01T1-04	Switch Holder Assy, RECORD	14.00
M-01T4-10	Spring, Push or Releasing Lever	0.10
E-01T4-14	Leaf Switch, Bias Oscillator and REC Lamp	1.60
E-01T4-16	Leaf Switch, Muting	1.60
RECORD/PLAYBACK PRE-AMPLIFIER SECTION		
E-01T1-23	PCM-115, Record/Playback Pre-amplifier PC Board Assy	34.80
E-53B1-02	Output Transformer (5K ohm: 8 ohm), Headphone	0.70
E-01T6-10	Variable Resistor (50K ohm)	0.40
E-01T6-11	Variable Resistor (20K ohm)	0.40
E-01T6-03	Slide Switch (CL-212E), RECORD Switch	3.50
E-51B2-02	DIN Socket	0.70
E-51B2-05	Line Input-Output Socket Panel Assy	1.80
E-01T1-19	Level Meter	5.50
E-01T6-15	50K ohm Variable Resistor, VOLUME Control	1.00
E-52B1-16	Jack, Stereo Headphones	1.40
E-01T6-14	Peaking Coil, 7mH	1.50
E-01T6-03	Integrated Circuit, (LD-3130)	3.20

PARTS NO.	DESCRIPTION	USER PRICE US\$
TRANSPORT MECHANISM SECTION		
M-01T7-01	Cartridge Transport Mechanism Complete Assy, with Record/ playback/Erase Head	61.20
M-72D3-05	Drive Belt	5.20
E-01T7-03	Motor Assy	21.20
E-74D0-13	Solenoid, Channel Selector	5.00
E-01T7-04	Solenoid, Cartridge Eject	8.20
E-01T7-05	Head, Record/Playback/Erase	23.80
M-72D3-03	Flywheel	3.61
E-72D4-02	Micro Switch (40B040160G02)	1.92
E-71D1-06	Tape Sensor Assy	1.03
CASE, PANEL AND ETC		
C-21T1-02	Wooden Case	19.00
M-81R1-03	Rubber Foot	0.15
C-21T1-01	Front Panel Assy	22.30
C-81D6-02	Record Lamp Shade (Red)	0.17
C-21T2-11	Cartridge Slot Frame Assy	3.18
C-21T6-01	Volume Knob	0.25
C-21T1-05	Push Button RECORD, FAST or PLAY/EJECT	0.20
C-21T1-06	Push Button SELECTOR	0.20
C-21T1-03	Rear Board	0.80
SEMICONDUCTORS		
2SC-876	Transistor, 2SC-876	2.00
2SC-693	Transistor, 2SC-693	1.00
2SC-536	Transistor, 2SC-536	1.00
2SD-227	Transistor, 2SD-227	1.00
VO6B	Silicon Diode, VO6B	0.45
IN-60	Germanium Diode IN-60	0.30
RESISTORS		
	Resistor WW 82 ohm 5W	2.50
	All Resistors Not Listed Above	0.20
CAPACITORS		
	Electrolytic Capacitor 1000uF 50WV	2.30
	Electrolytic Capacitor 2200uF 16WV	1.00
	Electrolytic Capacitor 220uF 50WV	0.50
	Capacitor, Oil Tubular 0.047uF 600WV	1.00
	All Capacitor Not Listed Above	0.25



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