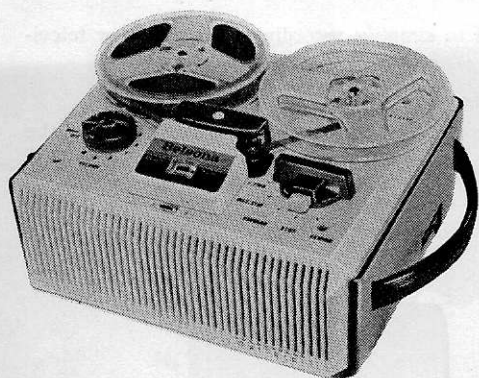
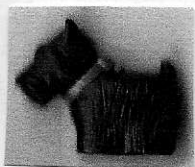




Barney



HITACHI PORTABLE TAPE RECORDER

MODEL TRA-500

SERVICE MANUAL

No. 53

1963

SPECIFICATIONS

VACUUM TUBE.....	2 tubes (12AX7 & 6BM8)	OUTPUT	1 watt (undistorted), 1.5 watt (max).
DIODE	4 diodes (1S314×2, silicon rectifiers)	FREQUENCY	
	1N34A (germanium diode) SE-026	RESPONSE	100 to 8,000 cps. at 3¾ ips.,
	(selen rectifier)		100 to 3,500 cps. at 1⅞ ips.
TAPE SPEED	1⅞ ips & 3¾ ips	INPUT IMPEDANCE.....	Microphone 100 K ohm,
TAPE REEL.....	3" or 5" reel		radio 470 K ohm
RECORDING OR		OUTPUT IMPEDANCE ..	External speaker 8 ohm
PLAYING TIME	90 min. at 3¾ ips, 3 h. at 1⅞ ips,	REWINDING TIME	Within 2 min. (tape No. 5 used)
	(in case that HITACHI LONG-	FAST-FORWARDING	
	PLAY TAPE No. 5 (35μ) is used)	TIME	Within 4 min. (tape No. 5 used)
RECORDING SYSTEM....	AC bias	RECORDING LEVEL	
ERASING SYSTEM	AC erasing	INDICATION	Level indicator
TRACK MECHANISM	Dual-track	MICROPHONE.....	Hitachi dynamic microphone
POWER SOURCE	AC 100V, 50 or 60 cps		(HM-2206)
POWER CONSUMPTION..	Approx. 40 W	CABINET DIMENSIONS..	10⅛" W, 5½" H, 8½" D.
SPEAKER	6½"×3" P.M.	WEIGHT	Approx. 9.9 lbs. (4.4 kg)

ACCESSORIES

Dynamic microphone.....	1	Tape stopping belt.....	1
Power supply cord	1	Head brush	1
Extension cord.....	1	Polishing cloth.....	1
No. 5 reel (empty)	1	Splicing tape.....	1

DESCRIPTION

1. Levelmatic (automatic recording level adjuster-patent pending) with conventional tape recorders, when the input signal swings the pointer of the level indicator into the red level area, distortion increases suddenly. With Belsona Junior 500, however, because of Hitachi's unique levelmatic system, the recording level is automatically adjusted to a proper level even when there is an excessive input signal.

Thus, recordings formerly resulting in failure because of the changing level can now be made very successfully and much more simply.

2. Easy to operate "one-hand-control"
Hitachi's own "one-hand-control" system used so successfully in Hitachi's Belsona 700 is also utilized in the Belsona Junior 500. A single knob controls recording, play back,

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re-winding, erasing, fast forward, instant stop and level matching.

3. Reproduction with natural symphonic tone quality is possible.

Combination of the large speaker (6½"×3") with power output of 1.5W and front acoustical system reproduces well balanced and expanded sound with symphonic tone quality.

4. Suitcase type with carrying handle

The band attached on the side makes transporting of Belsona Junior 500 very simple. A belt on the case bottom is convenient for holding tapes; the electric cord and microphone may be stored inside the upper cover.

5. Highly sensitive dynamic microphone

The highly sensitive dynamic microphone with excellent high frequency characteristics easily captures even the faintest sounds. High accuracy recording head records the natural voice faithfully.

6. Trouble-free silicon rectifier circuit.

7. Auxiliary cord to simplify recording from radio or television set.
8. Easy to read and long-lasting levelindicator.
9. The rigid construction and smooth rotation maintain the recorder's high accuracy for long time.

5" RECORDING TAPE

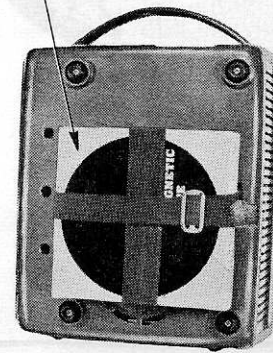


Fig. 1 Tape Storing Belt

BLOCK DIAGRAM

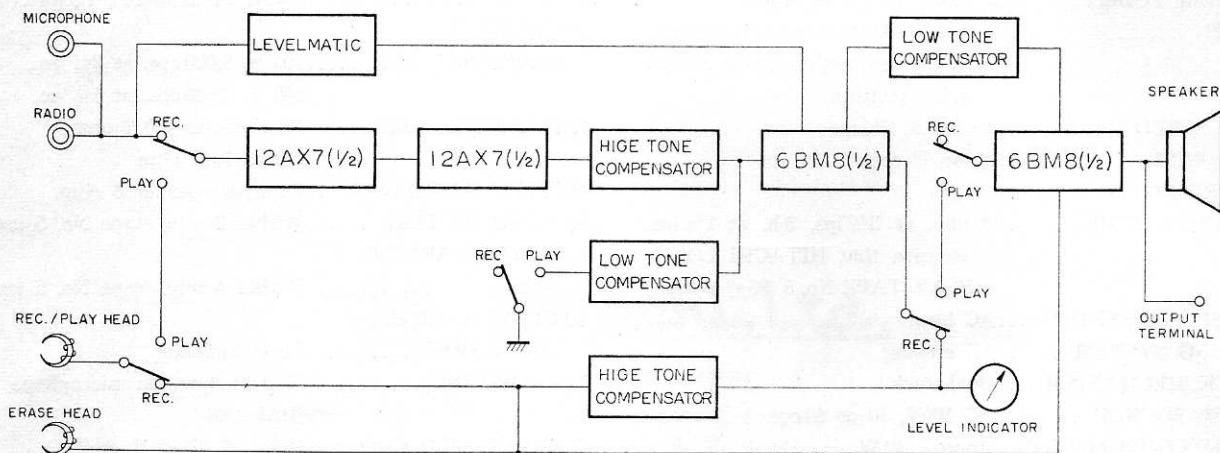


Fig. 2 Block Diagram

CONTROLS

Function selector knob

"One Hand Control" system controls all the action: record, play back, erase, re-wind and fast forward. The center of the recording button (red) indicates positions.

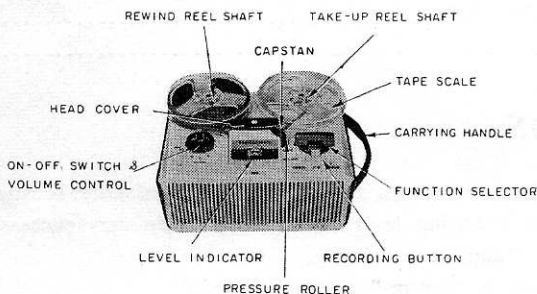


Fig. 3 Front View

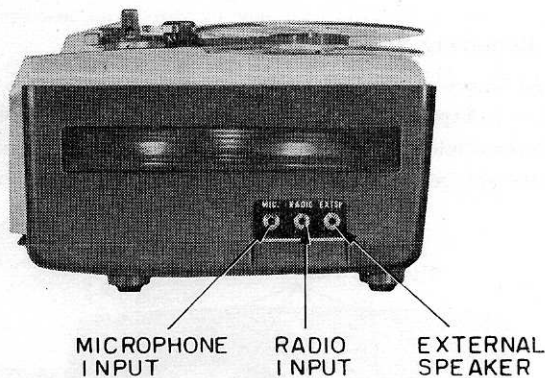


Fig. 4 Right Side View

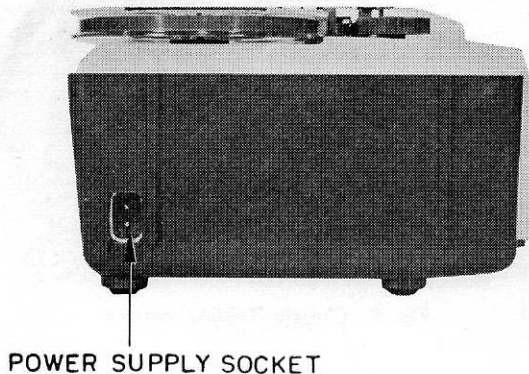


Fig. 5 Left Side View

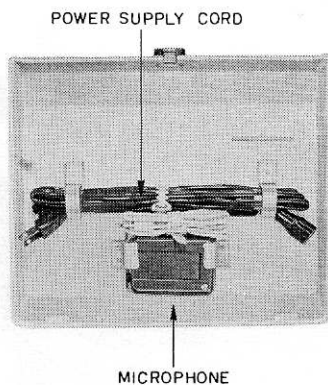


Fig. 6 Upper Lid

Recording button (REC)

When recording, press this button while turning the operating knob to "Play".

ON-OFF switch and volume control knob (VOLUME)

This turns the power on or off, adjusts the recording level and controls the reproduction volume.

Microphone terminal (MIC)

This is the input terminal when recording with use of the microphone.

Radio terminal (RADIO)

Input terminal for use when recording from radio, television set or record player.

External speaker terminal (EXT SP)

This is an output terminal for connection to other speakers and amplifiers for reproduction. Its impedance is 8 Ω .

Selecting tape speed

This is done by changing the capstan. When using at 4.75 mm/sec, remove the head cover and the capstan (turn the screw to the left). Hang the removed capstan collar on the collar hanger at the left of the erasing head.

Storing accessories

The power cord (secured with clips) and microphone can be stored inside the upper cover. Tapes and empty reels can be placed in boxes and fastened to the bottom of the case.

DISASSEMBLY INSTRUCTION

Dismantle the parts when checking or repairing according to the procedure described below.

(1) Removing the upper panel

After removing the volume control and operating knobs, remove the four screws shown in Fig. 7 and lift off the

TOP PANEL HOLDING SCREWS

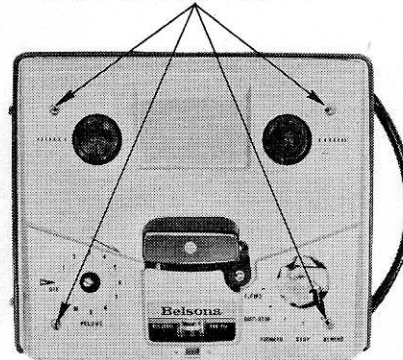


Fig. 7
Panel Holding
Screws

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upper panel. Checking of the interior mechanism is possible in this condition. (Fig. 8)

(2) Drawing out the chassis

Remove the chassis holding screws which also act as rubber supports (Fig. 9) and pull out the chassis. (Fig. 10)

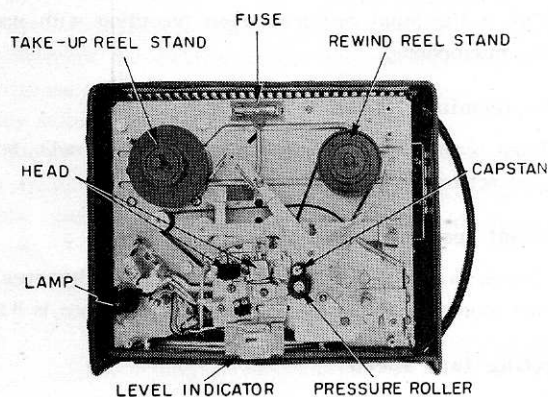


Fig. 8 Interior Mechanism

(3) Removing printed circuit board

As shown in Fig. 11, remove the subchassis on which the jack plate and slide switch are mounted; remove two screws holding the board and (as shown in Fig. 12) remove the jack plate, slide switch and the printed circuit board

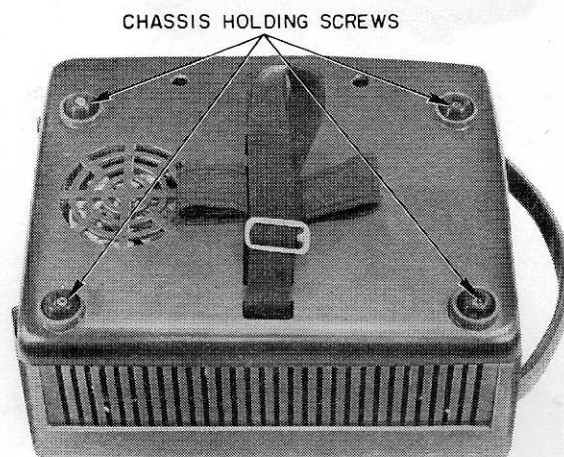


Fig. 9 Chassis Holding Screws

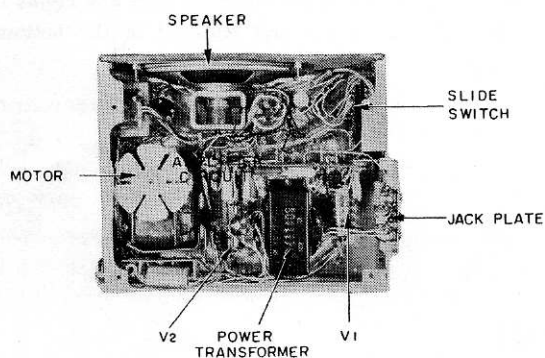


Fig. 10 Chassis Interior

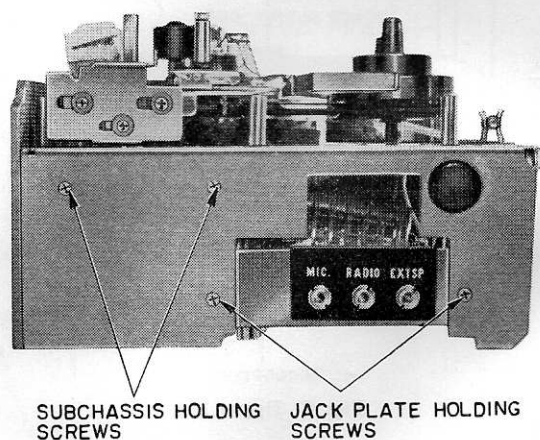


Fig. 11 Chassis Side

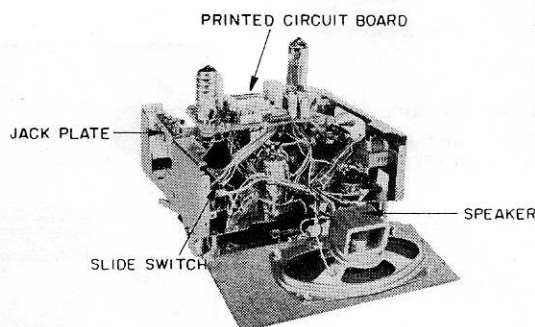


Fig. 12 Removing Printed Circuit Board

together as a unit.

(4) Changing cycles (50 cycles→60 cycles)

As shown in Fig. 13. remove the motor pulley, replace it with a 60-cycle pulley (located at the upper right of the chassis) and re-wire the motor to 60-cycle terminals.

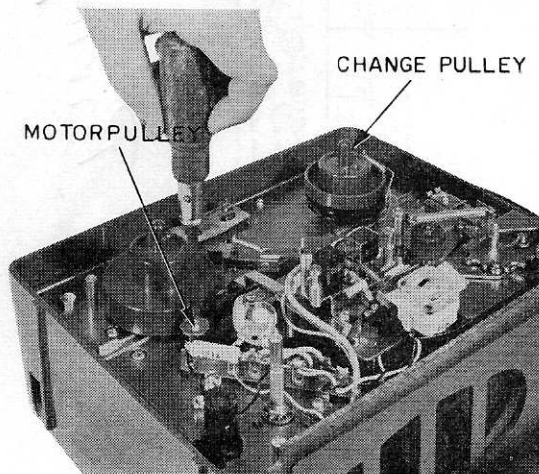


Fig. 13 Cycle Changing

(5) Lubrication

Lubricate the mechanism of this tape recorder according to the table below and Fig. 14. The mechanism is lubricated sufficiently at the factory; take care not to lubricate too much.

	Lubricating Points	Lubricant
①	Fitting parts of rewind reel stand and shaft	Spindle oil #60
②	Fitting parts of take-up reel rest and shaft	Spindle oil #60
③	Sliding parts of rewinding arm and plate spring lock	Grease
④	Sliding parts of switch press plate and sub-chassis washer	Grease
⑤	Pressure roller arm roller and pin roller which contact selector cam	Grease
⑥	Fitting parts of pressure roller arm and pressure arm shaft	Spindle oil #60
⑦	Sliding parts of moderating plate and subchassis	Grease
⑧	Fitting parts of flywheel shaft and metal	Turbine oil

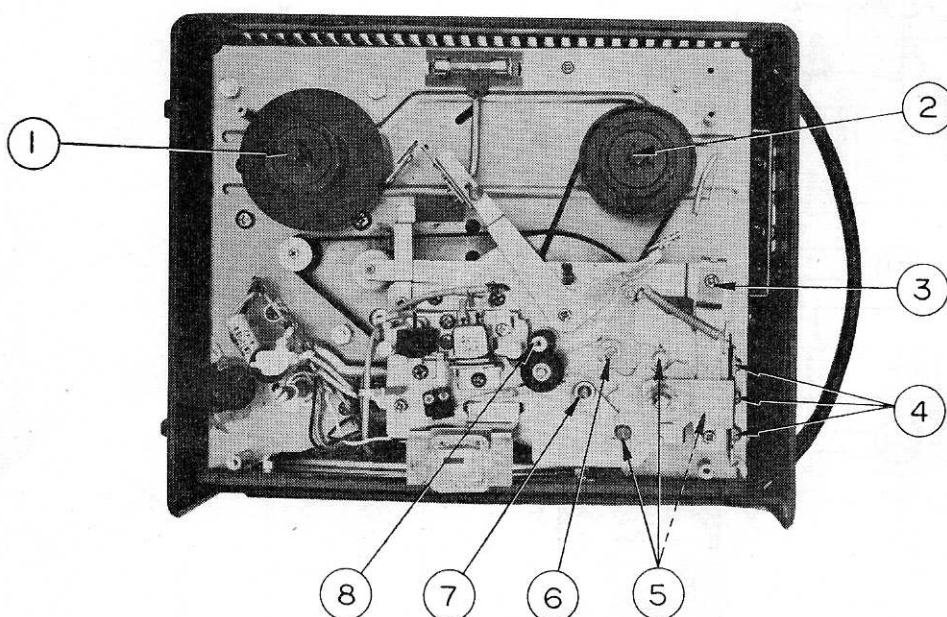
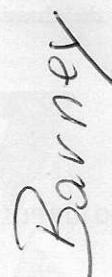


Fig. 14 Lubrication Points

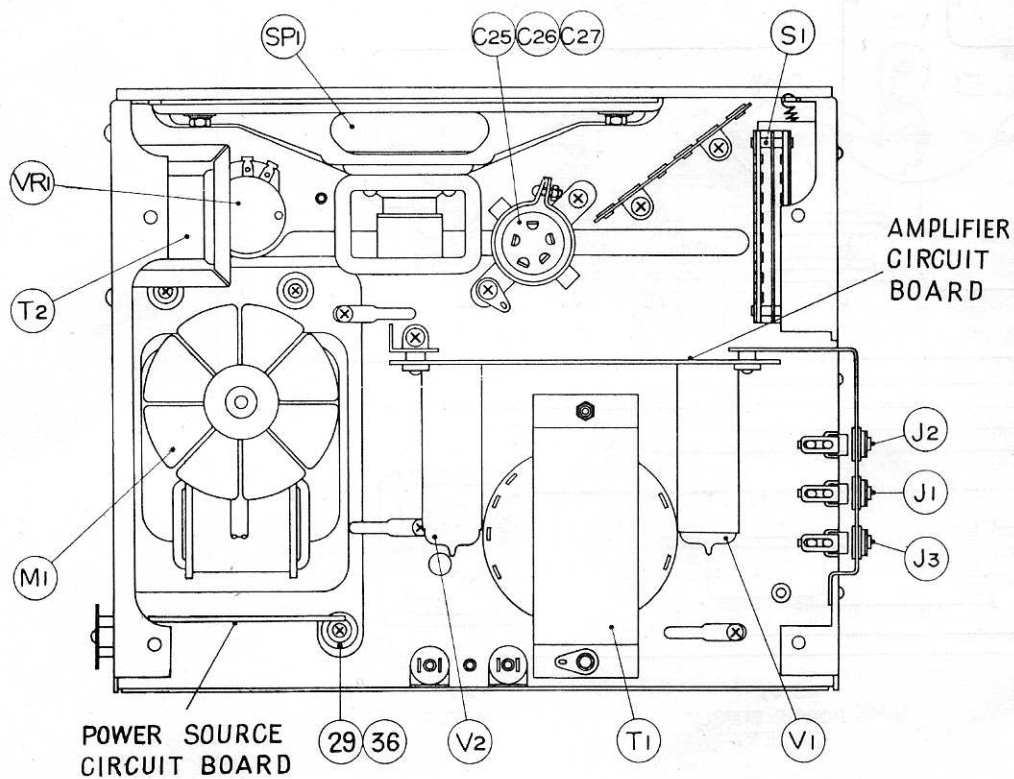
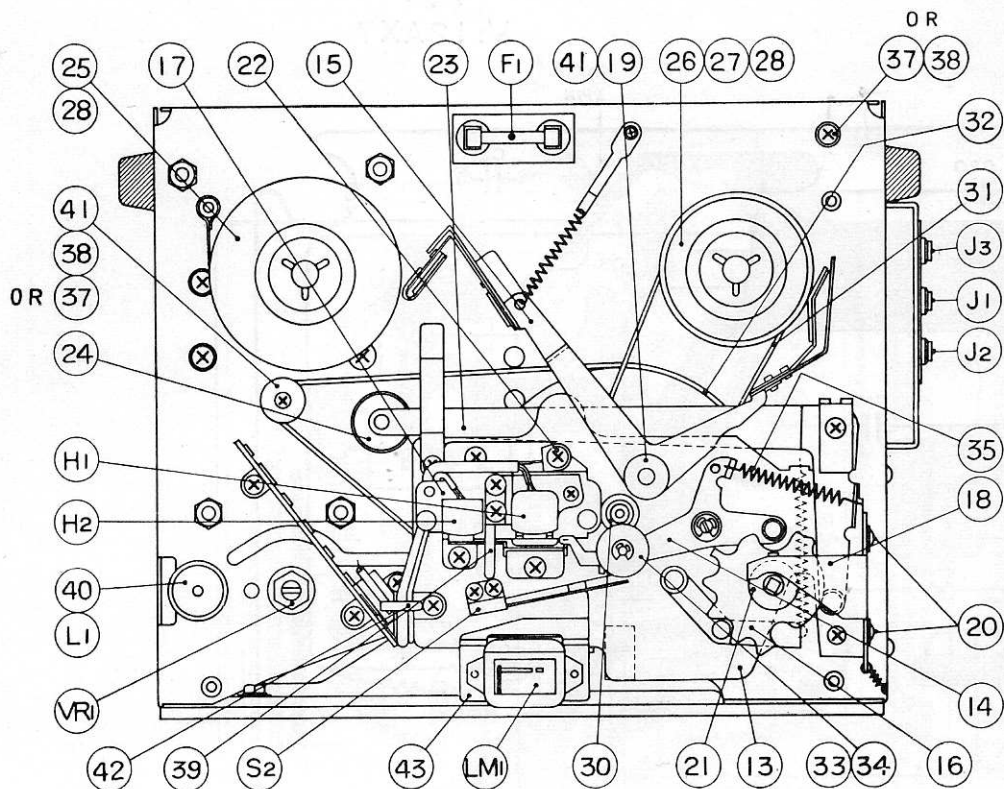
(6) Precautions in handling

This set is constructed so that its interior is well ventilated to eliminate the effects of temperature rise. When using it on rugs or blankets, etc., the ventilation (for cooling) becomes poor and will cause malfunctions. Be sure not to obstruct the ventilation holes on the case bottom plate.

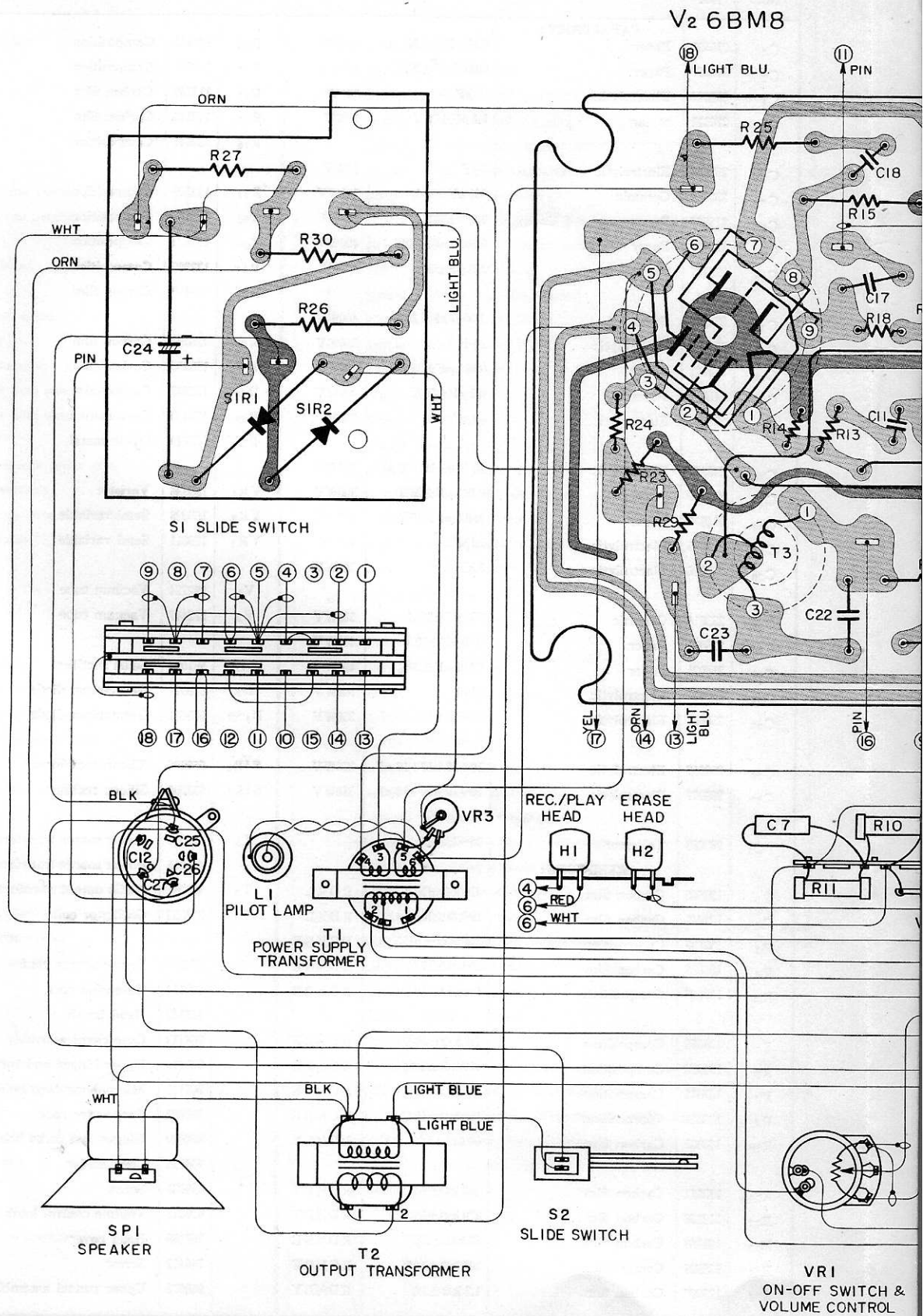


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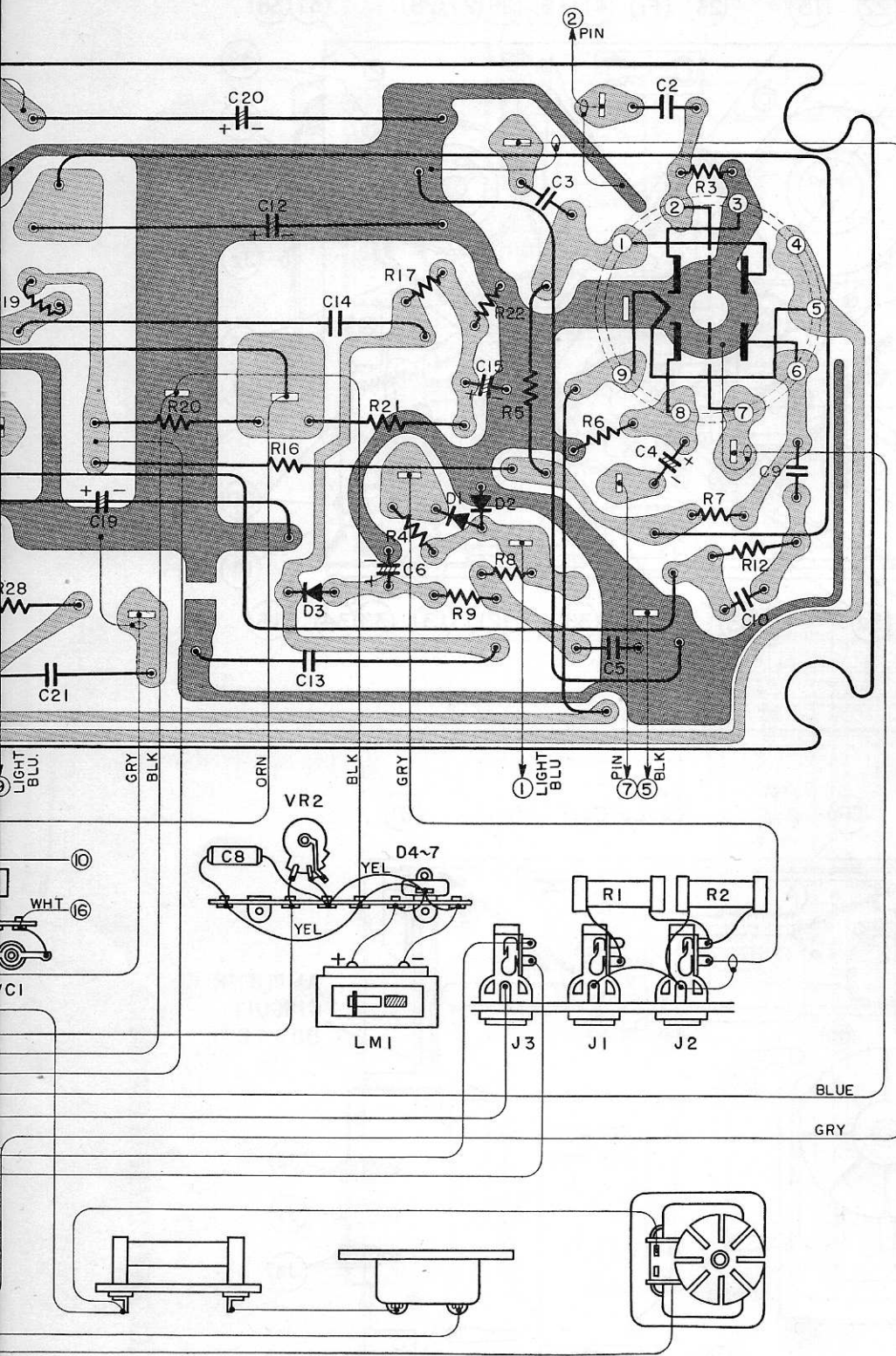
MECHANICAL PARTS VIEW



CIRCUIT BOARD DIAGRAM



V112AX7



F1
FUSE

AC J1
POWER SUPPLY
CONSENT

M1
MOTOR