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DYNATRON RADIO LIMITED
MAIDENHEAD, BERKS.
Telephone : Maidenhead 5150 (10 lines)
General Service Information Ext. 20.
Component Orders Ext. 21.

GENERAL DESCRIPTION

The Cordova TRP1 is a portable tape recorder operating on A.C. mains. Radio or record inputs can be reproduced through the Cordova amplifier system. A superimposing facility enables information to be dubbed on to recorded tape. A.F. input and output sockets are incorporated to enable the Cordova to be used as an amplifier or in conjunction with an external amplifier. An external speaker socket is also provided. The TRP1 is fitted with a Collaro 'Studio' tape deck and a record/playback amplifier providing a power output of $1\frac{1}{2}$ watts.

TECHNICAL DATA

Mains Voltage :	200/250V 50 c/s A.C. only.
Valves :	EF86 Pre-amplifier. ECC83 A.F. Amplifier. ECL82 A.F. Amplifier, Power Amplifier and Oscillator. EM84 Visual Tuning Indicator. OA81 Rectifier. EC1/U800 Mains Rectifier.
Microphone :	Acos Mic. 40.
Tape Deck :	Collaro 'Studio' Twin-track.
Maximum Spool Size :	7 in.
Frequency Response	40 c/s to 12 kc/s.
Speaker :	Elliptical 10" x 4 $\frac{1}{4}$ " 3 ohms.
Power Output :	1.5 watts.
Circuit Matching Impedances :	A.F. Input 500K Sensitivity. 130 mV. Mic. Input 5.0M. Radio Input 500K. A.F. Output 50K at 1kc/s. Extension Speaker 3 ohms.
Dimensions :	Height 8 $\frac{1}{4}$ ", width 16 $\frac{1}{8}$ ", depth 16 $\frac{1}{4}$ ".
Weight :	29 $\frac{1}{2}$ lb. approximately.

CIRCUIT SUMMARY

RECORD

The microphone or A.F. inputs, JK1 and SK1 respectively, are selected by switch wafer SW1/1R and fed via C1 to the grid of voltage amplifier V1. Grid leak bias is employed to reduce hum level to a minimum.

The amplified output from the anode of V1 is fed via the Record Level control RV1 to the grid of voltage amplifier V2A. The signal is then fed to amplifier V2B via a net-

work consisting of R11, R13, R14 and R15 and treble-lift choke L2 which has treble-lift control RV2 connected across it.

When the Speed Selector switch is operated either C7 for 7 $\frac{1}{2}$, C8 for 3 $\frac{1}{2}$ or C9 for 1 $\frac{1}{2}$ i.p.s. is selected, thus providing automatic treble response compensation.

The output from V2B is mixed with the bias signal and fed to the record head L1 via switch wafers SW1/3F and SW1/2F. The bias signal is prevented from reaching the grid of V3A by the inclusion of a 'twin-T' filter comprising R18, R19, R22, C16 and C17.

V2B output is also fed to the grid of V3A which incorporates Tone Control RV3. The anode output of V3A drives the visual indicator V4 via Indicator Sensitivity pre-set control RV4; rectification being achieved by diode D1.

When the Selector switch is set to the Record or the Superimpose position, V3B functions as an oscillator, the output being fed via Record Bias trimmer VC1, through switch wafers SW1/3F and SW1/2F to the record head L1.

On Superimpose operation the circuit functions in the same manner as for record operation except that the erase head is inoperative. Resistor R32 acts as a load for the erase oscillator. The superimposed input can be monitored by connecting a pair of earphones across the A.F. output socket.

PLAYBACK

The signal is fed from L1, selected by SW1/2F, amplified by V1 and fed to Volume control RV1. V2A provides further amplification; the output is fed through R9, R10, R11 and C10 to give bass compensation.

The signal is then fed to the grid of V2B and thence to V3A. The output from the anode of V3A is fed to the grid of V3B which functions as a power amplifier when Selector switch is set to the PLAYBACK or AMPLIFY positions.

The power supply is of conventional design; a full-wave metal rectifier employing R.C. smoothing.

REMOVAL OF UNITS

TAPE DECK & CHASSIS ASSEMBLY

Remove the mains adjustment link and all external plugs connected to the rear panel.

To expose the front securing bolts, raise the handle and remove each brass clip. A recommended method is to insert a broad-bladed screwdriver under the outside edge of the clip and prise it off gently, taking care not to distort the metal. Unscrew the two bolts and remove strap.

Remove the four chassis securing bolts located on the bottom of the cabinet. Grip the two brass pillars on top of the unit and withdraw the complete assembly from the cabinet.

REMOVAL OF TAPE DECK FROM CHASSIS ASSEMBLY

Remove the front plastic escutcheon. Remove Tone and Speed control knobs. Unscrew the nut securing Tone control potentiometer to chassis. Remove earth tag and withdraw the control from its locating hole on the tape deck plate.

Disconnect the orange, red, grey and black leads from the tag strip on top of the chassis.

Disconnect the erase head cable (violet and black) and record/playback cable (red and blue), from the tag strip on top of the chassis.

Disconnect the mains input leads (red and black) from the connector block adjacent to the rear panel.

Unplug PL2 located on top of the main chassis.

A securing bolt is located at each corner of the tape deck plate, remove the bolts and withdraw the deck from the main assembly.

MAIN CHASSIS

The main chassis has been designed and fitted to permit maintenance operations to be carried out in situ.

TEST SPECIFICATION

Test Equipment Required :

- Audio Oscillator.
- Output Meter.
- Valve Voltmeter.
- Avometer Model 7.

NOTE : The position of the pre-set controls VC1, RV2, RV4 and RV5 are clearly marked on the component layout diagram shown at the rear of the manual.

Sensitivity Checks.

Conditions of measurement :

- Volume control at maximum.
- Tone control fully anti-clockwise.
- Output across a 3-ohm N.I.L.
- Speed $7\frac{1}{2}$ i.p.s.

(a) Playback

Set Selector switch to PLAYBACK. Inject a 3 kc/s signal at the junction of C1 and SW1. The input required to produce an output of 1 watt should be 2.4 mV at $7\frac{1}{2}$ i.p.s. ± 2 dB.

(b) Amplifier

Turn Selector switch to AMPLIFIER. Inject a 1 kc/s signal into the A.F. socket. The input required to produce an output of 1 watt should be 120 mV at $7\frac{1}{2}$ i.p.s. ± 2 dB.

(c) Record and Superimpose

Inject a 1 kc/s signal into the microphone socket. The input required to produce 6V output at the anode of V2B (pin 6) should be 1.8 mV. Adjust the 'eye' sensitivity control (RV4) for minimum shadow on the record level indicator.

Transfer the signal to the A.F. socket. The input required to produce 6V output at the anode of V2B should be $100 \text{ mV} \pm 2 \text{ dB}$.

Carry out the above checks on the RECORD and SUPERIMPOSE positions of the Selector switch.

A.F. Output

Turn Selector switch to AMPLIFIER. Inject a 1 kc/s signal at 100 mV amplitude into the A.F. input. The output from the A.F. socket should be $1.3\text{V} \pm 3 \text{ dB}$.

Tone Control

Conditions of measurement :

Selector switch to AMPLIFIER.

Volume control at maximum.

Tone control fully anti-clockwise.

Inject a 10 kc/s signal into the A.F. socket. Adjust the input to produce an output of 100 mW. Turn Tone control fully clockwise; the output should fall by $17 \text{ dB} \pm 2 \text{ dB}$.

Frequency Response

Conditions of measurement :

Volume control at maximum.

Tone control fully anti-clockwise.

Output across a 3 ohm N.I.L.

(a) Amplifier

Turn Selector switch to AMPLIFIER. Inject a 1 kc/s signal into the A.F. socket. Adjust the input to produce an output of 500 mW.

Keeping the input voltage constant, check the frequency response at 60 c/s and 10 kc/s.

Measurements should read as follows :

60 c/s — $10 \text{ dB} \pm 2 \text{ dB}$

1 kc/s — 0 dB

10 kc/s — $1 \text{ dB} \pm 2 \text{ dB}$

(b) Playback

Conditions of Measurement :

Selector switch to PLAYBACK.

Speed switch to $7\frac{1}{2}$ i.p.s.

Pre-set Treble control (RV2) fully anti-clockwise.

Inject a 60 c/s signal into the grid of V1 and adjust the output to produce 500 mW. Switch Tape Speed control to $3\frac{3}{4}$ and $1\frac{7}{8}$ i.p.s. the output should remain constant.

Keeping the input voltage constant, adjust the input frequency to 3 kc/s; the output should fall by :

11.5 dB at $1\frac{7}{8}$ i.p.s. $\pm 3 \text{ dB}$

16.0 dB at $3\frac{3}{4}$ i.p.s. $\pm 3 \text{ dB}$

20.5 dB at $7\frac{1}{2}$ i.p.s. $\pm 3 \text{ dB}$

Keeping the input voltage constant adjust the input frequency to 10 kc/s. The output at all three speeds should be the same as for the 3 kc/s readings ± 2 dB.

SETTING-UP PROCEDURE

Oscillator — Preliminary Adjustment

1. Set Bias trimmer (VC1) to maximum. Set Hum Balance (RV5) and Pre-set treble (RV2) potentiometers to their mid positions.
2. Turn Selector switch to RECORD. Depress RECORD key. Connect valve voltmeter to V2 pin 6.
3. Adjust the oscillator core (L3) for minimum output on V/V. Minimum reading must be less than 10.6V A.C.

Bias Adjustment

1. Set record bias trimmer (VC1) to minimum. Using another tape recorder for monitoring purposes, place a reel of tape on the left-hand spool of the recorder under test. Feed the tape past the heads of both decks and wind onto the right-hand spool of the monitor recorder.
2. Inject a 400 c/s signal at 20 mV amplitude in the A.F. IN socket. Start recording and turn VC1 clockwise until the output drops by 1.5 dB from maximum.

Erase Volts

1. Connect a V/V to Tag 2 on SW1/4R (erase head lead). Switch to RECORD; output should be 22V A.C. $\pm 10\%$.
2. Switch to SUPERIMPOSE; the output should fall to zero.
3. Transfer V/V to Tag 10 on SW1/4R and check that the voltage is not less than 20V A.C.

Hum Balance Control

Switch to REPLAY. Set Volume control to maximum and adjust RV5 for minimum hum.

Frequency Response on Record

Conditions of measurement:

Volume and Tone controls at maximum.

Speed switch to $7\frac{1}{2}$ i.p.s.

Selector switch to RECORD.

RV2 at mid-position.

Feed a 20 mV signal into the A.F. socket. Keeping the input constant, record at the following frequencies:—

60 c/s, 400 c/s, 1, 2, 4, 6, 8 and 10 kc/s

Switch to REPLAY and set the Volume control for 500 mW output at 1 kc/s. The recorded frequencies should be within ± 3 dB of 500 mW. Adjust RV2 for optimum response at 10 kc/s.

Repeat the above tests at tape speeds of $1\frac{7}{8}$ and $3\frac{3}{4}$ i.p.s. The highest frequency check required at $1\frac{7}{8}$ i.p.s. is 3 kc/s and 6 kc/s at $3\frac{3}{4}$ i.p.s.

Power Output

1.5 watts output should be obtained for 10% total harmonic distortion at 400 c/s.

Hum

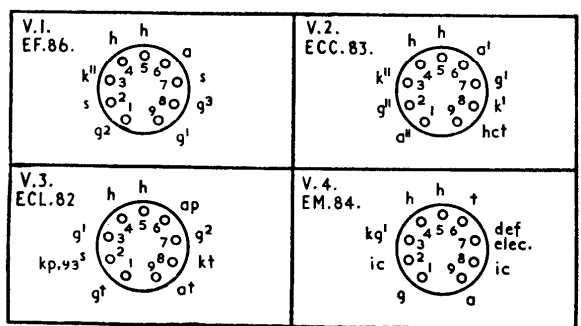
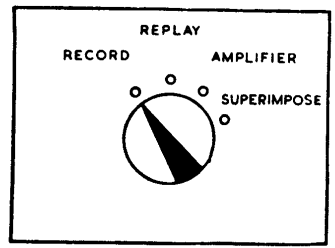
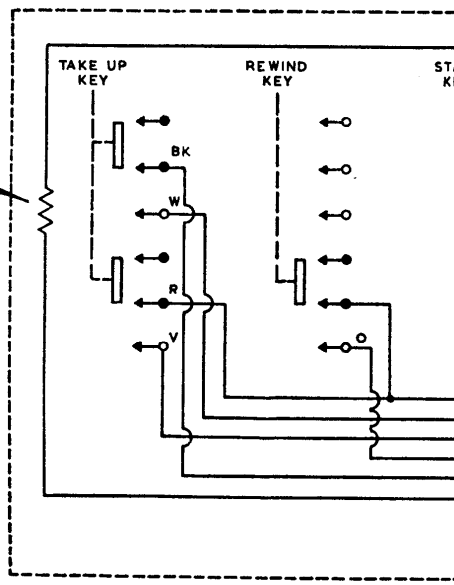
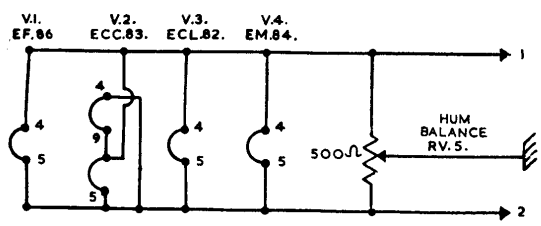
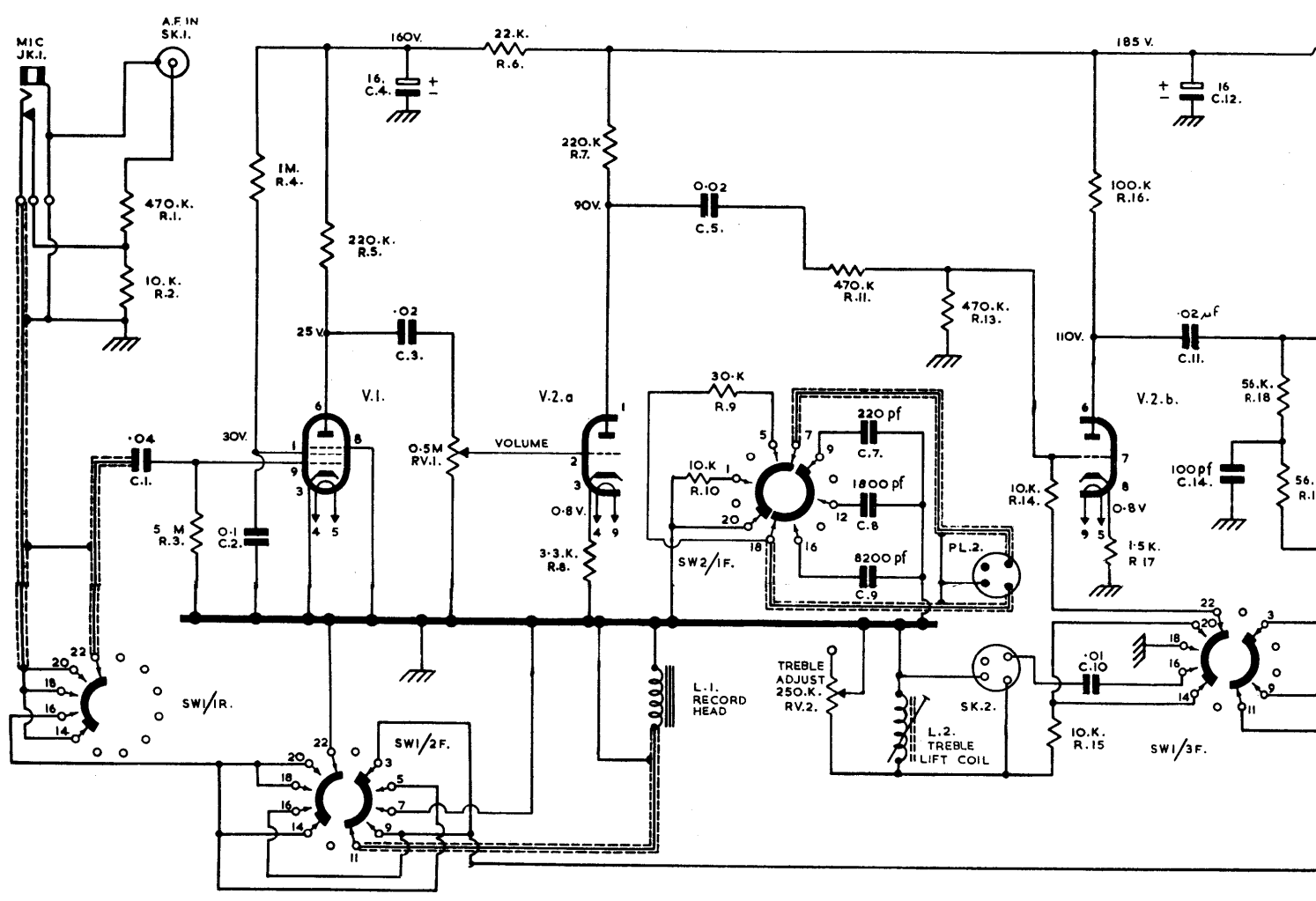
With the Volume control at maximum inject a 1 kc/s signal into the A.F. socket. Start recording at $7\frac{1}{2}$ i.p.s., and adjust the input until the level indicator is almost closed.

Switch to REPLAY and adjust the volume control for $1\frac{1}{2}$ watts output. Depress the PAUSE key. The output should fall by not less than 45 dB.

STATIC MEASUREMENTS: measured on nominal mains with Avo Model 7

Valve	Electrode	Pin No.	Record	Replay	Instrument Range
V1	Anode	6	25V	25V	1000V D.C.
	Screen	1	30V	30V	1000V „
	Cathode	3	0V	0V	10V „
V2A	Anode	1	90V	90V	1000V „
	Cathode	3	0.8V	0.8V	10V „
V2B	Anode	6	110V	110V	1000V „
	Cathode	8	0.8V	0.8V	10V „
V3A	Anode	9	90V	90V	1000V „
	Cathode	8	0V	0V	10V „
V3B	Anode	6	250V	240V	1000V „
	Screen	7	210V	220V	1000V „
V4	Cathode	2	20.0V	20.0V	100V „
	Anode	9	50V	0V	1000V „
	Deflector Target	7 6	50V 230V	0V 0V	1000V „ 1000V „

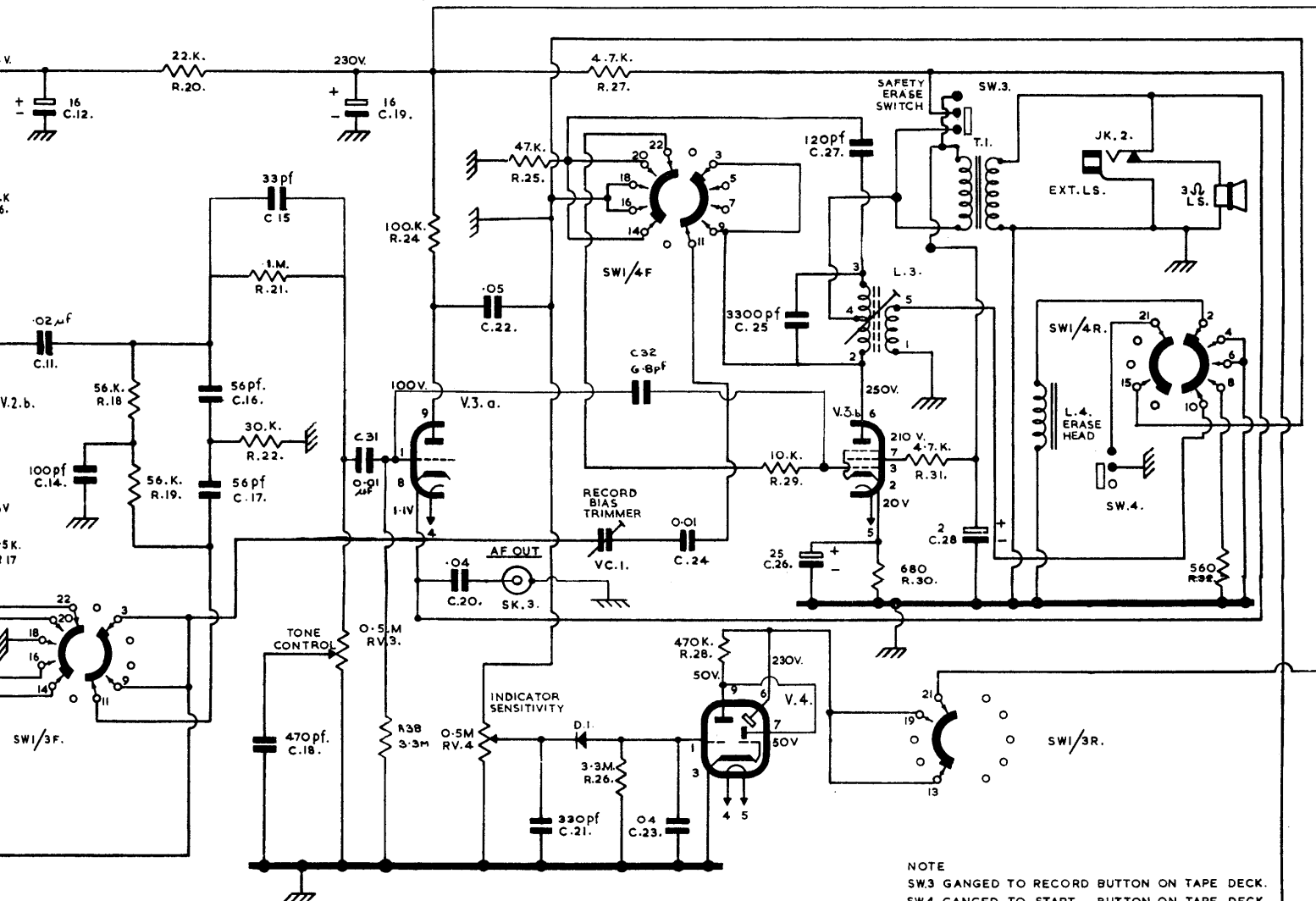
R.	1	3	4	5	6	7	9	11	13	14	16	18
	2					8	10			15	17	19
C.	1	2	4	3			5	7			10	12
								8				11
								9				14
MISC.	JK.1.	SK.1.	V.1.	RV.1.	V.2.a	LI.	RV.2.	L.2.	PL.2.	V.2.b.		SWI/3F
	SWI/1R.		SWI/2F				SW2/1F.		SK.2			



18 20 21 24 25 27 28 29 30 31 37 34 32
 19 22 38 26 23

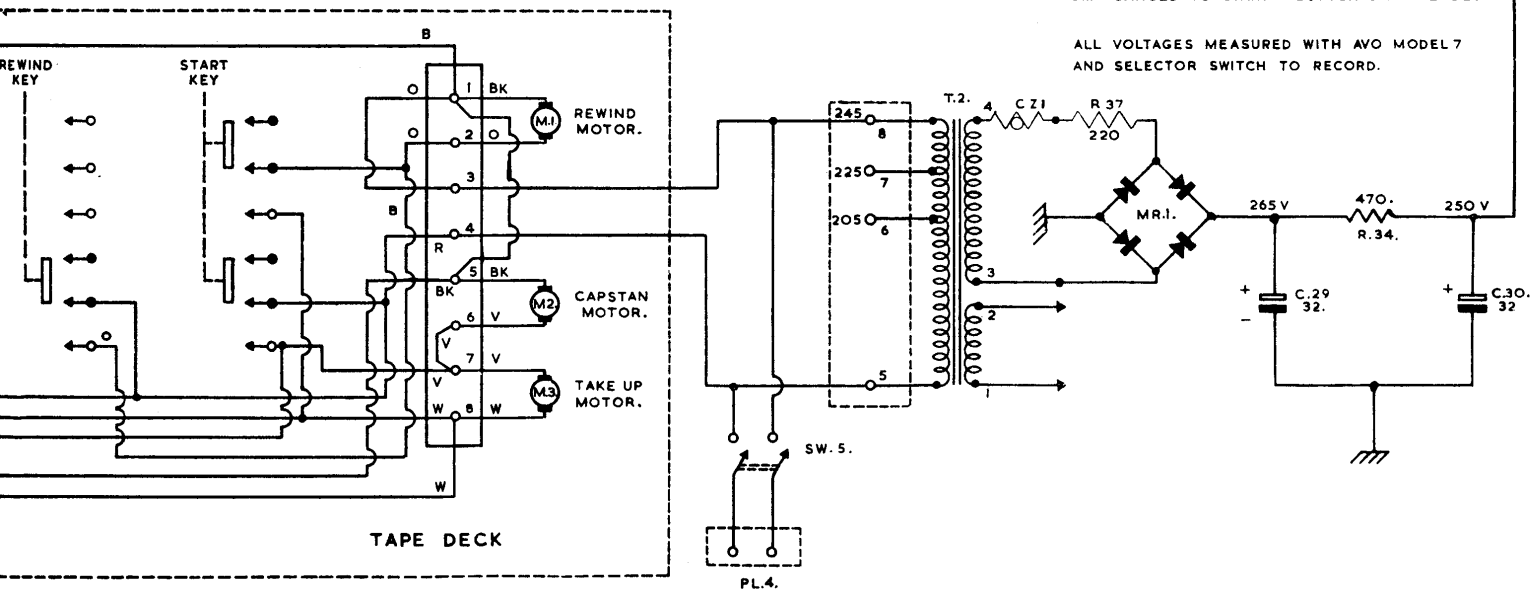
12 14 16 18 19 20 22 21 32 24 25 27 28 29 30
 11 17 15 31 23 26 28 29

SWI/3F RV.3. M.1. VC.1 SWI/4F. T.2. L.3. SW.3. JK.2. LS.
 V.3.a. M.2. D.1. SW.5. V.4. V.3.b. SWI/3R. L.4. SW.4.
 V.3.a. M.3. RV.4. PL.4. V.4. MR.1. SWI/4R.



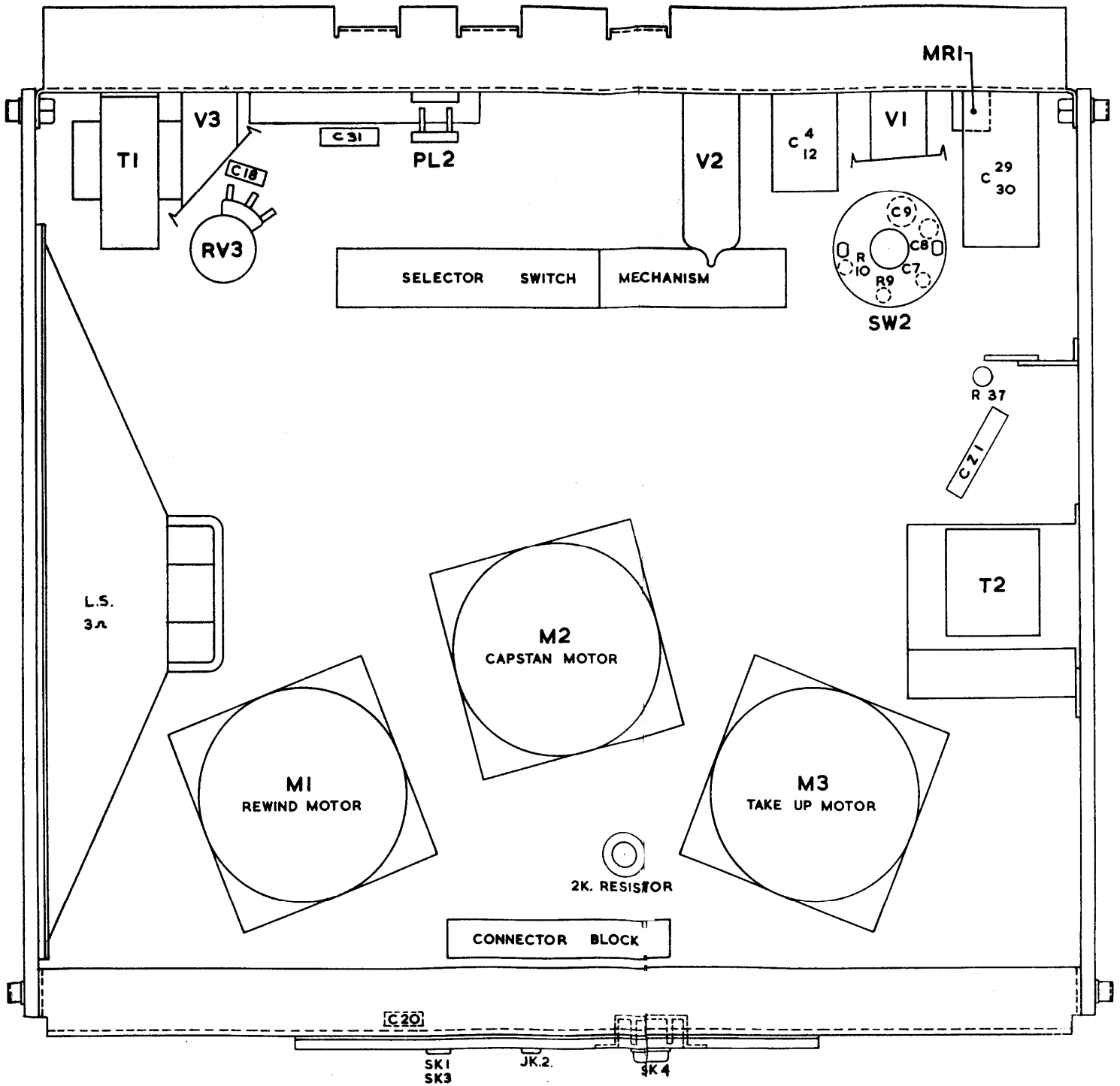
NOTE
 SW3 GANGED TO RECORD BUTTON ON TAPE DECK.
 SW4 GANGED TO START BUTTON ON TAPE DECK.

ALL VOLTAGES MEASURED WITH AVO MODEL 7
 AND SELECTOR SWITCH TO RECORD.

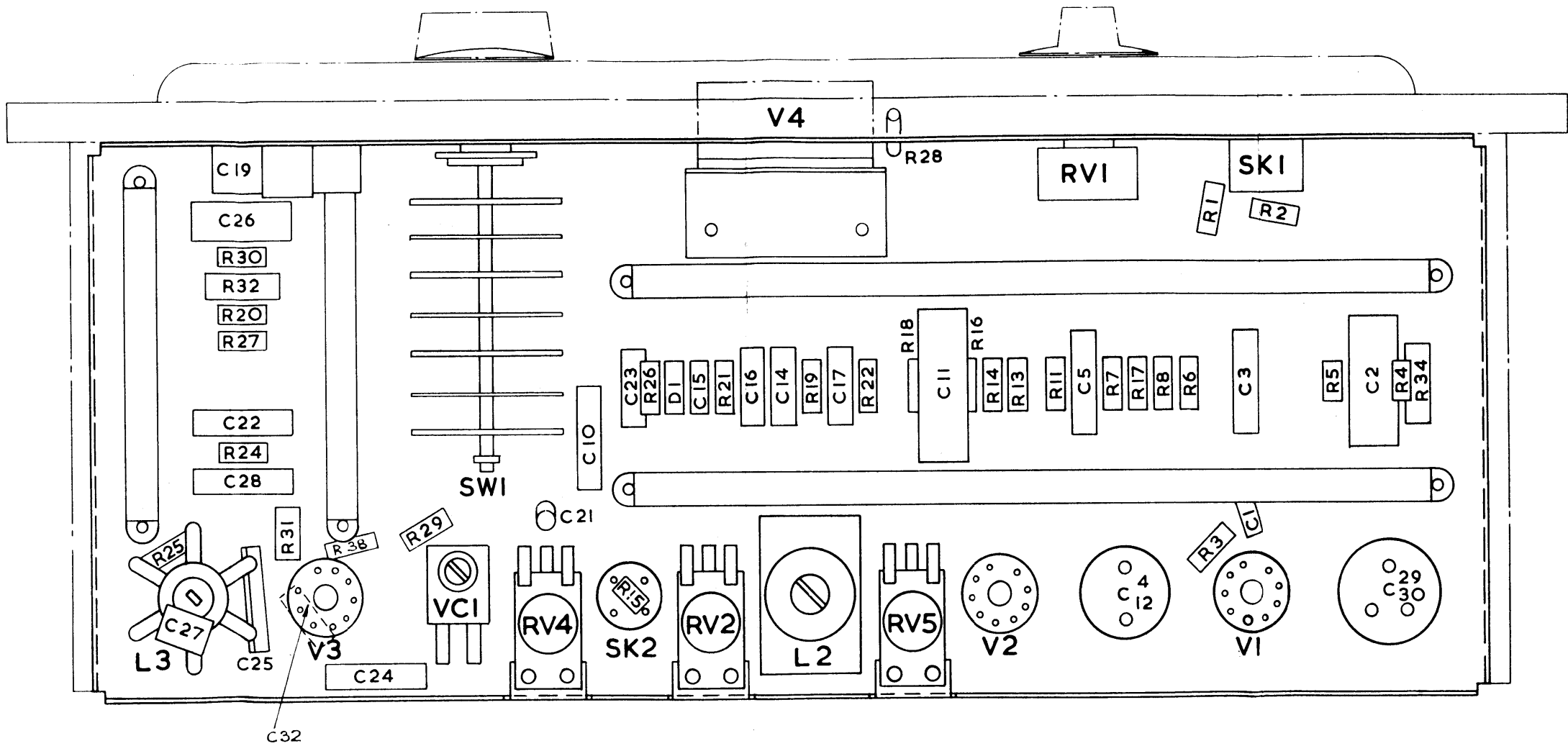


TAPE DECK

PL.4.



UNDERSIDE VIEW



FRONT VIEW OF CHASSIS WITH HANDLE STRAP REMOVED