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SERVICE CHART

1580

New Series

MARCONIPHONE 4210 TAPE RECORDER

Additional copies of this chart price 1s. 6d. post free. Payment with order please to ERT, 40 Bowling Green Lane, London EC1



Take out screw securing moulded head cover. Take out seven screws holding moulded top cover. Lift top cover and ease forward carefully to clear tape deck operating keys.

Chassis removal. Release storage compartment back cover. Remove screw and cup washer securing fibre back panel to chassis. Remove control knobs and tape deck covers as described. Take out two domeheaded screws from each side of the deck top plate.

THREE-SPEED four-track mains recorder employing valves and semi-conductors and having accommodation for 7in. spools.

Mains. 200-250V 50c/s AC only.

Consumption. 60W.

Valves. V1 ECC83 audio preamplifier and amplifier, V2 ECL86 audio amplifier and output, V3 ECC82 bias oscillator.

Transistor. TR1 SE1002 record level indicator amplifier.

Diodes. D1 BY124 pause control click suppression, D2 BY124 stop control click suppression.

Rectifiers. D3 H131/PD9000 selenium bridge rectifier for solenoids and auxiliary supplies, D4 FC144 selenium HT rectifier.

Tape speeds. 1½, 3½ and 7½ips.

Frequency response. 40-7000c/s at 1½ips, 40-14000c/s at 3½ips, 40-18000c/s at 7½ips.

Bias oscillator. 55kc/s.

Speaker. 7 x 4in. 30ohms.

Output. 3W.

Level indicator. Moving coil meter.

Tape deck. Thorn DC43 three-speed four-track.

Spool size. 7in.

Rewind time. 3 min. 20 sec. for 1800ft.

Tape position indicator. Four-digit counter (push-button reset).

Signal-to-noise ratio. 40dB (un-weighted).

Wow and flutter. Better than 0.25 per cent at 1½ips, 0.2 per cent at 3½ips, 0.15 per cent at 7½ips.

Inputs. Radio 1.5mV 68K (pins 1 and 2), PU 1 180mV 200-500K (pins 1 and 2), PU 2 75mV 3M3 (pins 1 and 2).

Outputs. Radio 1V 22K (pins 2 and 3), extension speaker 3ohms.

Auxiliary socket. Remote pause control (pins 1 and 2), 32V 50mA DC (pins 2 and 3), compensated playback outlet 1V at 22K (pins 4 and 7), winding on unselected track of R/P head for playback of stereo tapes, second-track monitoring and slide projector synchronising.

Dimensions. 16½in. wide, 14½in. deep, 7½in. high.

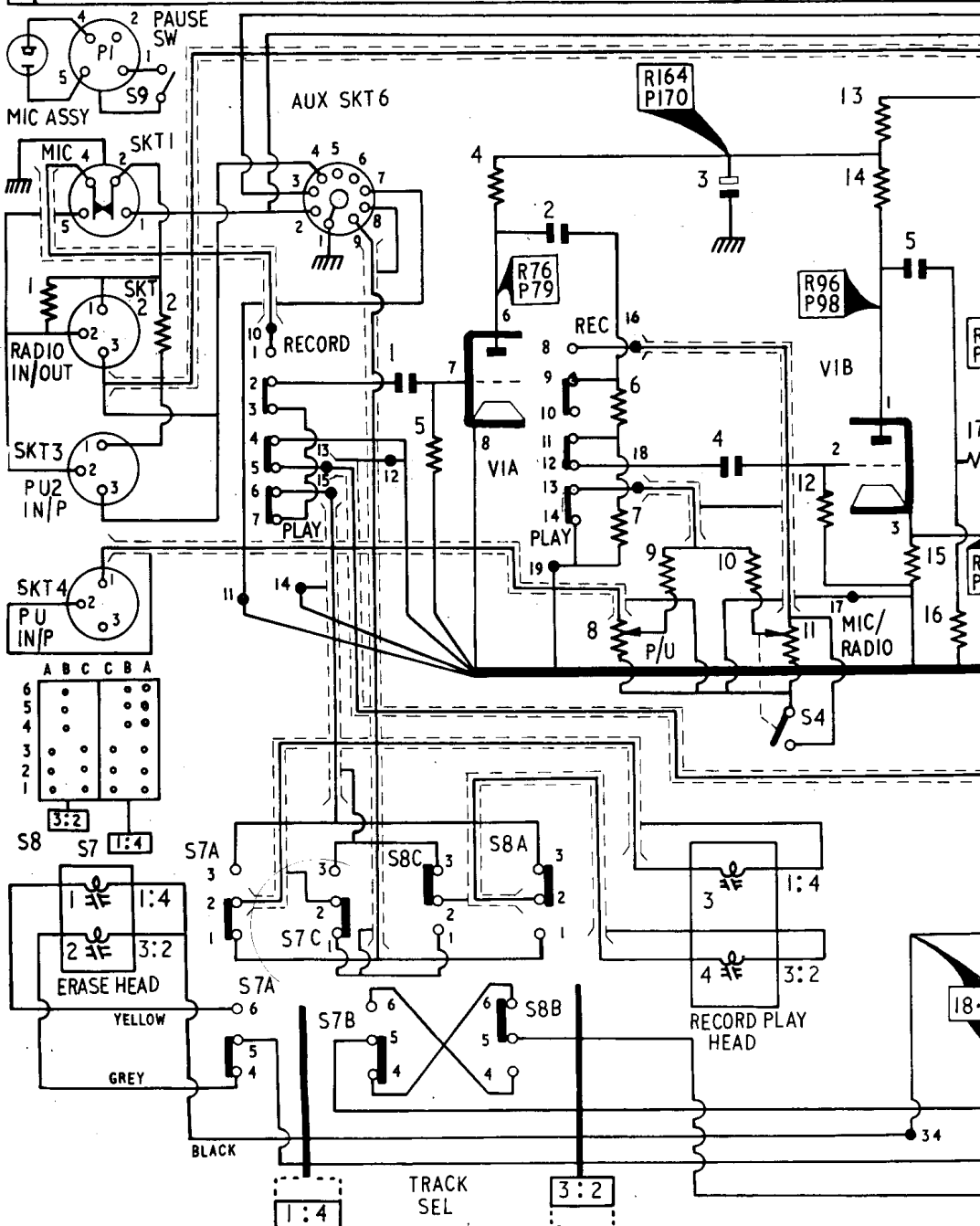
Manufacturer. British Radio Corporation Ltd.

Service departments. British Radio Corporation Ltd., Eley's Estate, Angel Road, Edmonton, London N18. Tel.: Edmonton 3060. Midland depot: 24 Sheepcote Street, Birmingham. Tel.: Midland 5291. Scottish depot: 160/161 Battlefield Road, Glasgow S2. Tel.: Langside 9251/4.

DISMANTLING

Access for service. Pull off speed change and amplifier control knobs.

R	1	2		5	4	6	7	8	9	10	11	12	13	14	15	16
C				1		2			3	4					5	
L	1	2								3	4					



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Chassis removal. Release storage compartment back cover. Remove screw and cup washer securing fibre back panel to chassis. Remove control knobs and tape deck covers as described. Take out two domeheaded screws from each side of the deck top plate.

To allow top of fibre panel to be released from slot in cabinet back rail, lift chassis and move slightly forward. Open split in fibre panel to release mains lead. Lift chassis assembly upward and forward to free mains adjustment plug from fibre back panel. Disconnect speaker lead plugs and withdraw chassis from cabinet.

Printed board removal. Remove chassis as described. With chassis standing on its lefthand edge supported with a block under the lefthand end bracket most meter checks and some component replacements can be carried out. For greater accessibility remove printed panel as follows.

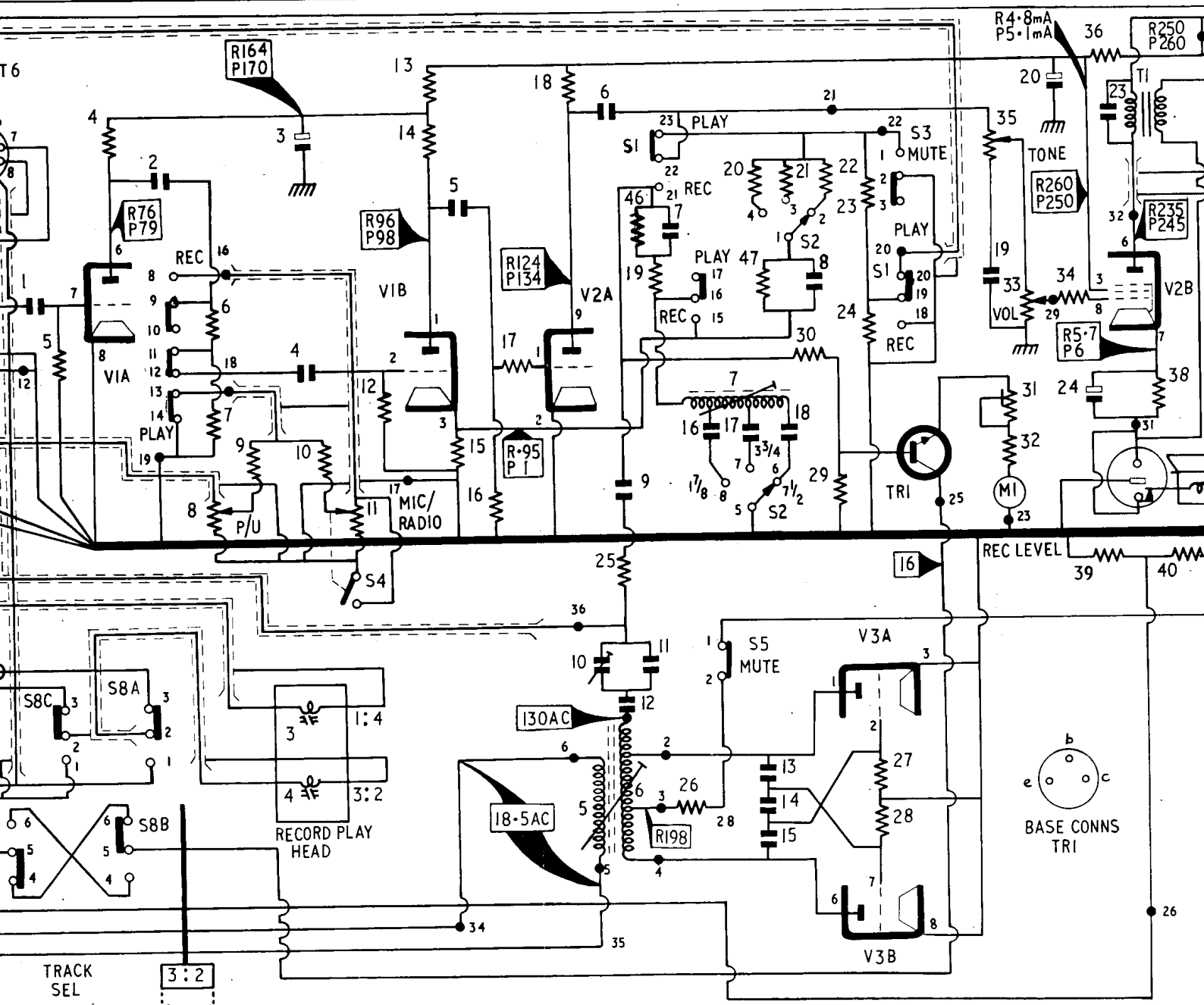
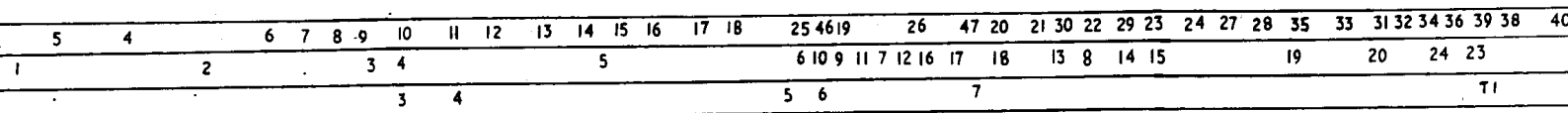
Detach circlip and washer from stud on Record switch link. Remove four screws and washers securing printed board. Spring one end bracket outward to release the board. Panel may now be hinged outwards to extent of the wiring.

NOTE: On reassembly ensure the S2

RESISTORS

R1	68K	C2
R2	3M3	C2
R4	220K	A1
R5	10M	A1
R6	100K	A2
R7	680K	A2
R8	500K log	D2
R9	220K	D2
R10	100K	D2
R11	500K	D2
R12	2M2	A2
R13	68K	B2
R14	220K	B4
R15	3K3	A2
R16	10M	B3
R17	10K	A3
R18	100K	A3
R19	470K	A2
R20	220K	A2
R21	150K	A2
R22	56K	A2
R23	220K	A2
R24	22K	A2
R25	220K	A3

head
and
tape



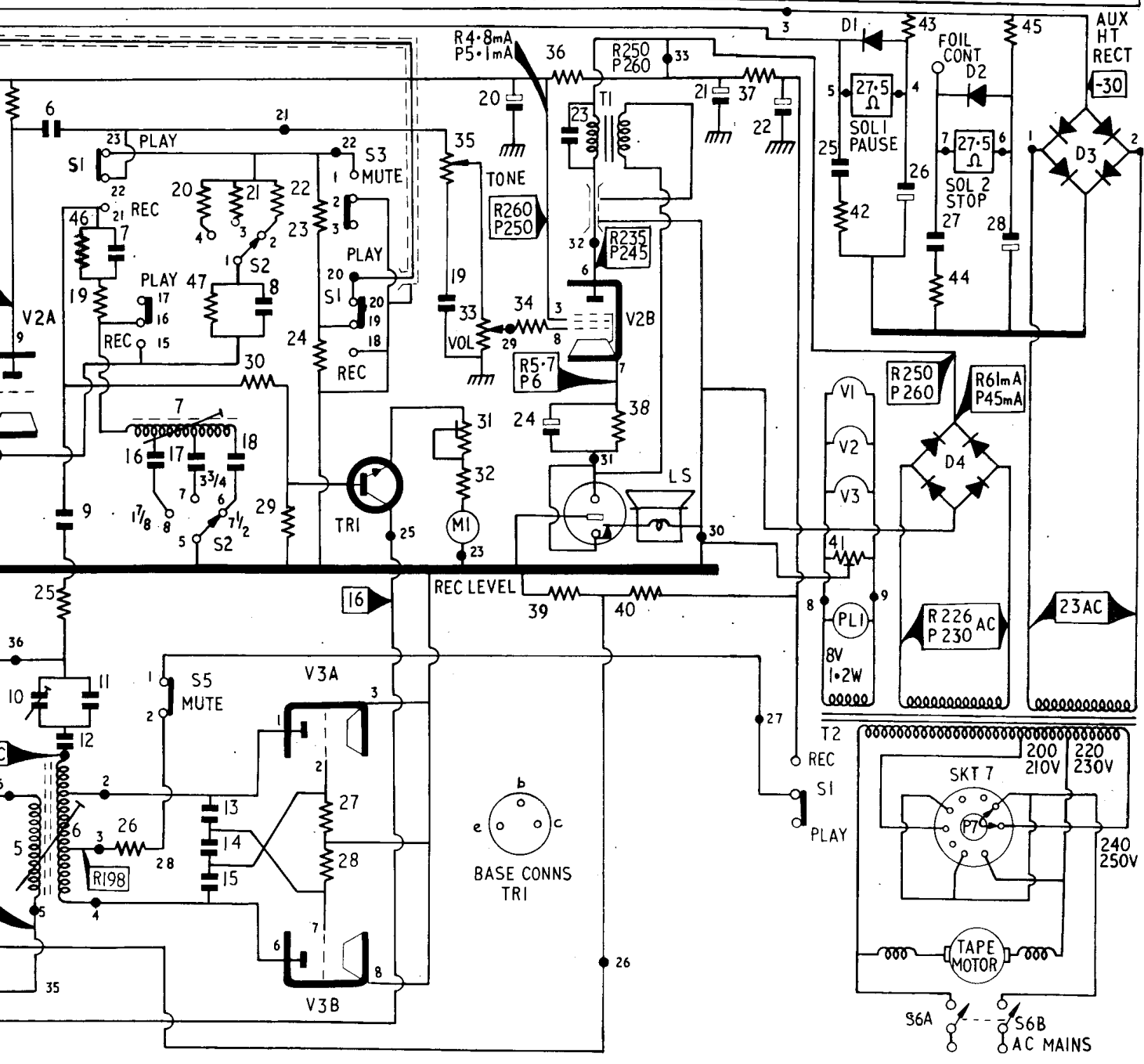
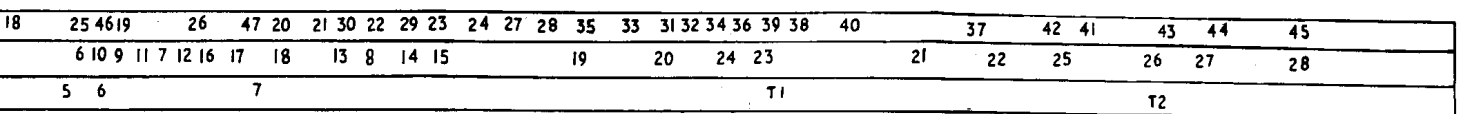
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RESISTORS		CAPACITORS		
R1	68K	C1	100KpF	
R2	3M3	C2	40KpF	
R4	220K	A3	C3	8mF
R5	10M	A2	C4	10KpF
R6	100K	A1	C5	5KpF
R7	680K	A2	C6	50KpF
R8	500K log	A3	C7	3KpF
R9	220K	A1	C8	820pF
R10	100K	A2	C9	40KpF
R11	500K	A3	C10	0.30pF
R12	2M2	A1	C11	50pF
R13	68K	A2	C12	1KpF
R14	220K	A3	C13	6K8pF
R15	3K3	A1	C14	6K8pF
R16	10M	A2	C15	6K8pF
R17	10K	A3	C16	33KpF
R18	100K	A1	C17	6K8pF
R19	470K	A2	C18	2K2pF
R20	220K	A3	C19	220pF
R21	150K	A1	C20	50mF
R22	56K	A2	C21	50mF
R23	220K	A3	C22	8mF
R24	22K	A1	C23	3KpF
R25	220K	A2	C24	50mF
		A3	C25	100KpF
		A1	C26	450mF
		A2	C27	100KpF
		A3	C28	450mF



speed compensation switch spindle and the slide switch operating peg are correctly located.

Electrical assemblies. To avoid risk of breaking trip button when tape recorder is inverted remove complete tape position assembly. Prop recorder chassis on its rear edge.

Unsolder brown and brown/white leads from lampholder, orange lead from tag 34, black lead from tag 35, black and red leads from indicator at tags 23 and 24 respectively, white lead from tape stop foil contact, white screened

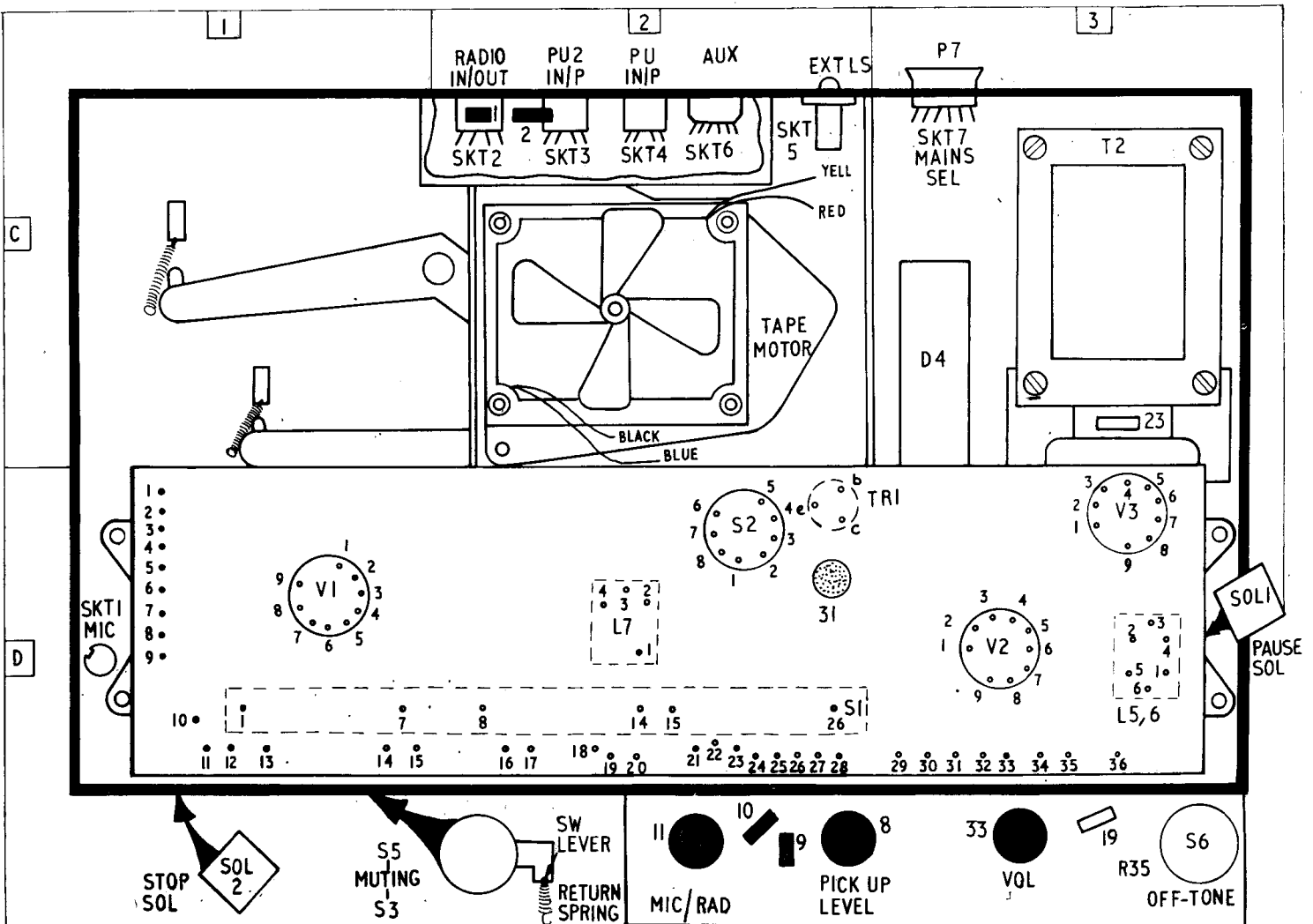
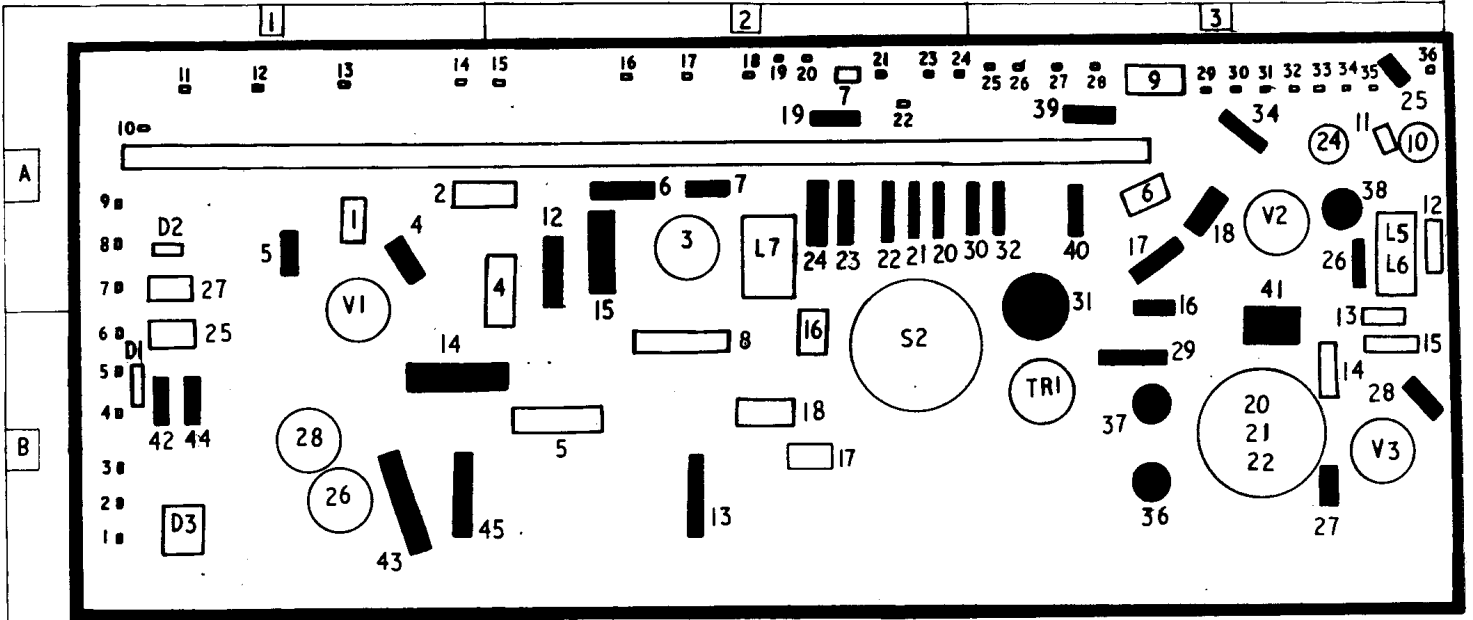
lead (in cableform) from S7A contact 1, screening braid from SC7 contact 1, white screened lead (to track switch S8) from tag 15, screening braid from tag 14, solenoid leads, blue and red leads (track switch) from tags 25 and 26 respectively.

Remove two screws and detach microphone socket assembly. Remove screen (note connections), unsolder wires and withdraw through chassis. Remove two screws securing control panel. Place recorder face down on protected surface. Remove screw to release earth tag

and leads from lefthand end bracket.

Remove circlip and fibre washer securing Record switch link to printed board. Take out four screws and flat washers securing printed board to end brackets. Spring one bracket outward to release printed panel. Remove two screws and distance pieces to release muting switch lever and return spring.

Unsolder earth lead from tag under motor fixing bolt. Remove screw securing mains lead clamp. Detach socket panel assembly. Remove three circlips and flat washers to release motor



assembly, take out two fixing screws to release metal rectifier from chassis.

Remove four screws, felt washers and fibre washers securing mains and output transformers. All electrical assemblies can now be lifted away from the deck.

SERVICE NOTES

Heater balance. Humdinger R41 is set during manufacture and should not require adjustment unless a valve is changed. Readjustment when necessary is carried out as follows. During the operation the chassis must be electrostatically screened, especially around V1.

Remove tape spools. Switch to Record. Set tone control to minimum and record level to maximum. Connect sensitive valve-voltmeter between tag 21 (top end of tone control) and chassis. Short out C41 to prevent bias oscillator functioning.

Plug in screened dummy microphone connector with 1KpF capacitor strapped across pins 4 and 5. Allow machine to warm up for 10 minutes. Adjust R41 for minimum reading on valve-voltmeter (approximately 50mV).

Head adjustment. Head adjustment should be necessary only when the manufacturer's original settings have been disturbed. Provision is made for both vertical (height) and horizontal (azimuth) adjustment. Height can be adjusted by turning the two mounting screws to compress the leaf spring on which the head is mounted. Azimuth adjustment is achieved by complementary adjustments to the mounting screws.

Set the height of the R/P head visually so that the upper edge of the top track head gap is level with the upper edge of the tape. Set tape transport keys at neutral, thread tape so that it runs *behind* the tape guide (on right of R/P head) to give sufficient tape contact on the head for observing the height setting.

Whilst making adjustments keep the tape taut by turning the take-up spool by hand. Return the tape to its normal position before running the mechanism. Test recordings should be made and track positions checked with Indicator magnetic ink or similar.

To readjust azimuth, play back a standard four-track azimuth tape with output meter connected to recorder. Adjust R/P head for maximum output, using volume control to keep output as low as possible for more precise adjustment.

As the erase head is accurately located by two rails and a pip moulded into the mount no adjustment is provided. To replace the head push it out to the rear.

PRESET ADJUSTMENTS

The following adjustments are carried out during manufacture and will not require further attention unless the preset or an associated component is replaced.

Level meter calibration. R31 will need to be reset if R29, R30, R32, TR1 or the meter is replaced. Connect valve-voltmeter between tag 21 (top end of tone control) and chassis. Depress Record key. Apply 1kc/s signal from audio oscillator via 100KpF capacitor between tag 10 (mic input to V1A) and chassis. Alternatively the signal can be injected to any input socket.

Adjust input signal level to give reading on output meter of 8V RMS. Ad-

just R31 until record level meter registers exactly on the junction of the red and black sections of the scale. The meter will now register peak modulation at this point.

Bias level. C10 will need readjustment if C11 or the R/P head is replaced. Insert a close tolerance 100ohms resistor in series with, and directly connected to, the earthy tag of R/P head. Connect a valve-voltmeter across this resistor. Set C10 initially to give a bias current of 240 μ V (24mV across resistor).

At a level 20dB below peak recording level, make a frequency response recording at 3 $\frac{1}{2}$ ips. Playback, and check that response at 14kc/s is within \pm 3dB with reference to the level at 1kc/s. If the level is not within this limit C10 must be readjusted. If response is too high, alter C10 to increase bias, if response is too low, alter C10 to decrease bias.

If it is found necessary to increase the bias current beyond the limits 200/

300 μ V (20-30mV across 100ohms resistor) to obtain frequency response level within \pm 3dB then it is likely that the head is faulty or some other defect exists in the recorder. Misalignment of L7 could be the cause. Any such defect must be attended to first, then C10 adjusted in accordance with instructions.

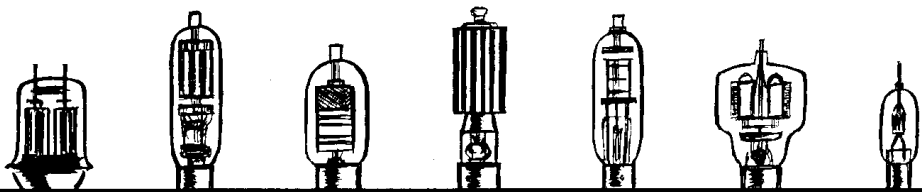
Record equalisation. Replacement of C18 will necessitate the readjustment of L7. Connect a valve-voltmeter between tag 21 (top end of tone control) and chassis. Depress Record key only and set Speed Change knob to 7 $\frac{1}{2}$ ips.

Inject 18kc/s signal from audio oscillator via 100KpF capacitor between tag 10 (mic input to V1A) and chassis. Alternatively any input socket can be used for injecting the signal. Adjust the core of L7 for maximum output.

Erase oscillator. Replacement of erase head will necessitate retuning oscillator coil L6. Tuning should be checked and if necessary readjusted to 55kc/s.

Pinnacle

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