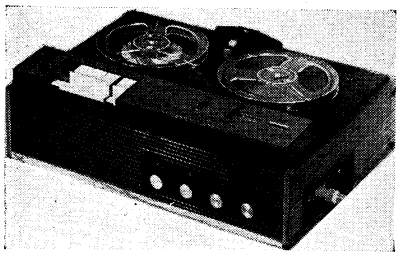
ERT

SERVICE CHART 1583

New Series

PHILIPS EL3558A TAPE RECORDER



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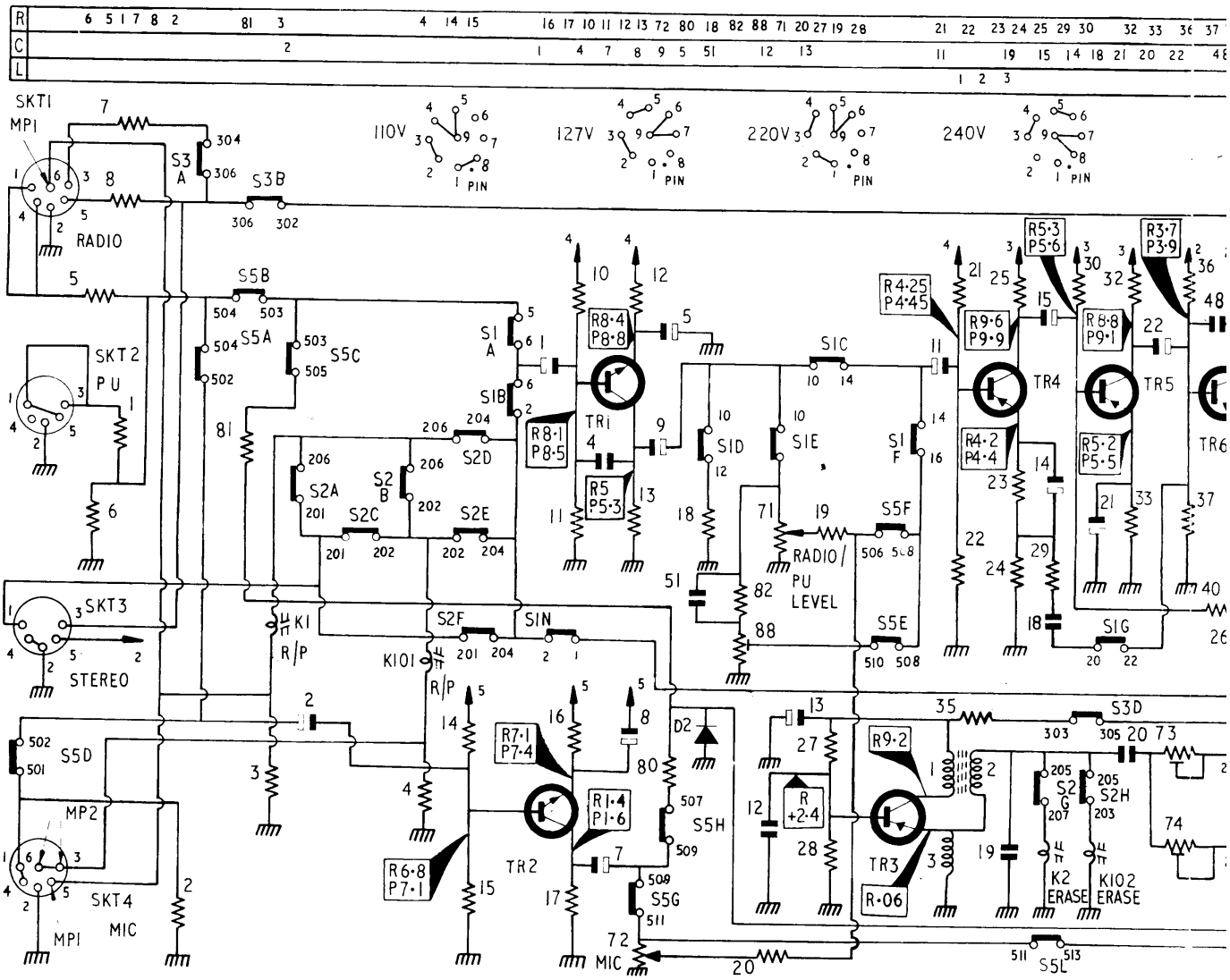
FOUR-TRACK two-speed mains-operated tape recorder employing eleven transistors and three diodes. Recording level may be controlled by automatic or manual operation. There is provision for input signal mixing and monitoring on record.

Mains. 110, 127, 200-250V AC 50c/s.
Consumption. 40W (total AC mains current 170mA).

Transistors. TR1 AC127, TR2 AC127, TR3 AC128, TR4 AC125, TR5 AC125, TR6 AC126, TR7 AC125, TR8A/B AC128 (matched pair), TR9 AC125, TR10 BCY33 (see Service Notes).
Diodes. D1 OA79, D2 BA100, D3 BA100.
Tape speeds. 1⅞, 3¾ips.
R/P system. Four-track monophonic, left to right.
Frequency response. 1⅞ips 60-8000c/s, 3¾ips 60-15,000c/s.
Output. 1.8W.
Speaker, 8 x 3in.
Level indicator. Moving coil meter.
Tape position indicator. Three-digit, PB reset.
Maximum spool size. 7in.

Rewind time. Three minutes for 1200ft.
Microphone. Type EL3781/00 (moving coil).
Signal-to-noise ratio. Better than 45dB.
Wow and flutter. Less than 0.6 per cent peak-to-peak at 3¾ips.
Inputs. Socket 1 (diode): 2mV into 20K or 150mV into 1.5M using connecting lead EL3768/03 (pins 1/4 and 2). Socket 2 (pickup): 70mV into 680K (pins 1/3/5 and 2). Socket 4 (microphone): 0.2mV into 2K (pins 1/4 and 2).
Outlets. Socket 1 (line): 750mV across 20K (pins 3/5 and 2). Socket 3 (stereo):

Continued overleaf



RESISTORS

R1	680K	C2
R2	3K3	C2
R3	22	B2
R4	22	B2
R5	18K	C2
R6	1K	C2
R7	18K	A2
R8	18K	A2
R9	10K	C2
R10	33K	C2
R11	56K	C2
R12	10K	C2
R13	10K	C2
R14	22K	C2
R15	68K	C2
R16	6K8	C2
R17	4K7	C2
R18	1K8	C2
R19	1K	C1
R20	10K	C1
R21	47K	C2
R22	22K	C3
R23	10K	C3
R24	180	C3
R25	10K	C3
R26	390	C3
R27	33K	—
R28	330	A2
R29	2K7	C3
R30	12K	C3
R32	1K	C3
R33	1K	C3
R34	680	C3
R35	330	A2
R36	27K	B3
R37	6K8	B3
R38	1K2	B3
R39	560	B3
R40	3K9	C3
R41	3K9	C3
R42	470	B2
R43	100	B2
R44	3K9	B3
R45	47	C3
R46	10K	B2
R48	1K8	B1
R49	47K	B2
R50	1K5	B1
R51	1K5	B1
R52	12K	B2
R53	6K8	B1
R54	1K	B2
R55	1K	B1
R56	10K	A1
R57	27K	B3
R58	3K3	B3
R59	470	B2
R60	10	B2
R61	1K8	A1
R62	1K5	B3
R63	1K5	A2
R64	47	A2
R65	270	B2
R66	47	A3
R67	100	B3
R68	3.3-3.9	A3
R69	3.3-3.9	A3
R70	10	—
R71	20K	—
R72	20K	—
R73	50K	A2
R74	50K	A2
R75	20K	—
R76	20K	—
R77	50	A2
R78	50	A3
R79	47	A2
R80	15K	B2
R81	15K	C2
R82	68K	C1
R83	470	B2
R84	10K	B2
R85	100K	B2
R86	1K	B1
R87	100K	C2
R88	20K	C1
R90	2M7	—

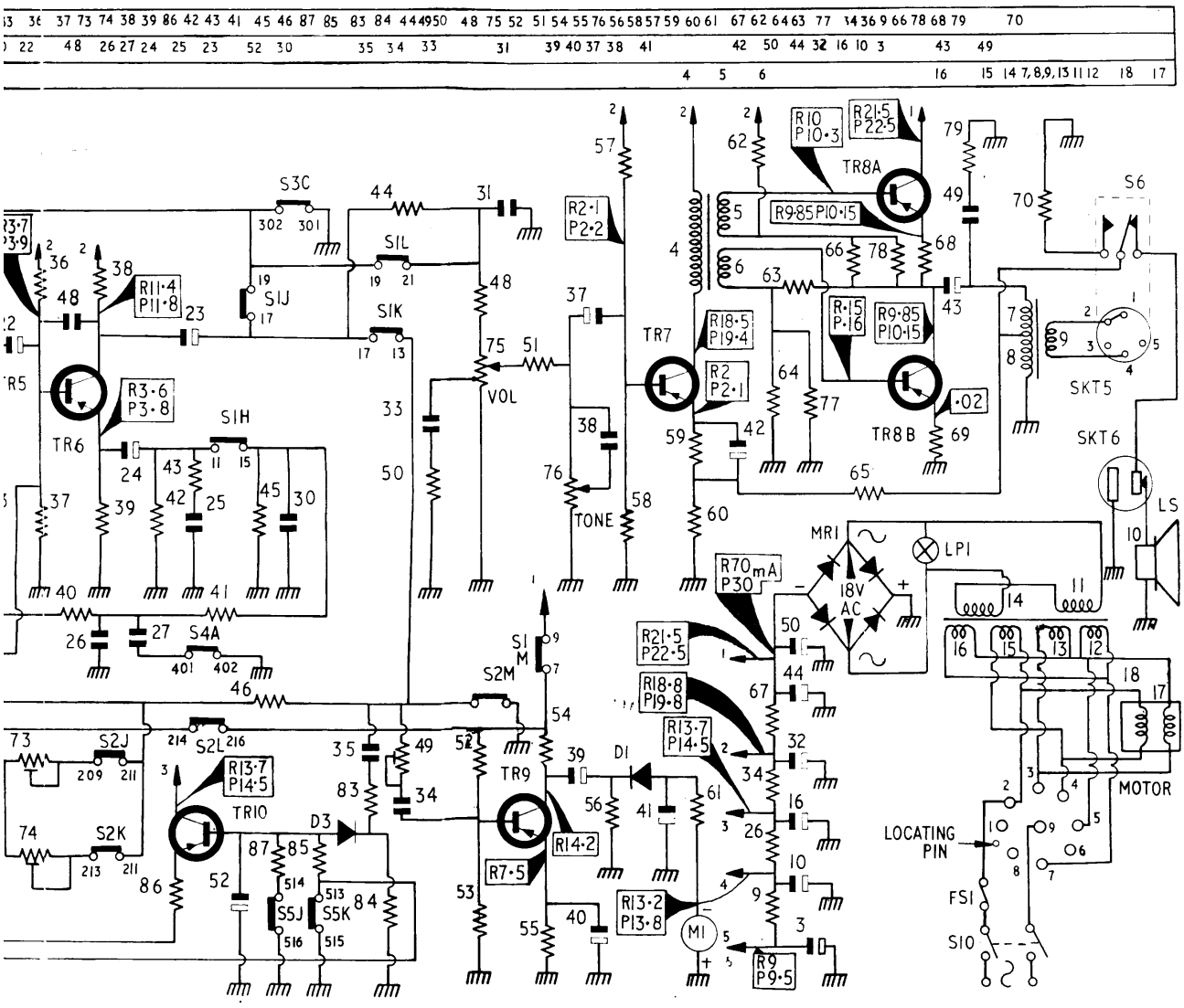
CAPACITORS

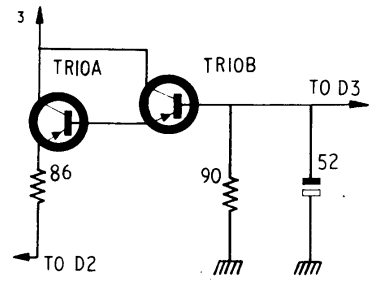
C1	10mF	C2
C2	2.5mF	C2
C3	64mF	C1
C4	18pF	C2
C5	125mF	C2
C7	2.5mF	C2
C8	125mF	C1
C9	2.5mF	C2
C10	80mF	C2
C11	2.5mF	C2
C12	39KpF	A1
C13	80mF	A2
C14	25mF	C3
C15	2.5mF	C3
C16	250mF	C2
C18	33KpF	C3
C19	22KpF	A2
C20	470pF	A2
C21	320mF	C3
C22	2.5mF	C3
C23	10mF	B3
C24	125mF	B3
C25	100KpF	B2
C26	6K8pF	C3
C27	22KpF	C2
C30	100KpF	B3
C31	10KpF	B3
C32	640mF	B3
C33	150KpF	B1
C34	100KpF	B2
C35	100KpF	B3
C37	10mF	B2
C38	180KpF	B1
C39	10mF	B2
C40	25mF	B1
C41	125mF	A1
C42	200mF	B2
C43	250mF	A3
C44	640mF	A3
C48	1K5pF	B3
C49	100KpF	A2
C50	640mF	A3
C51	470pF	C1
C52	320mF	B2

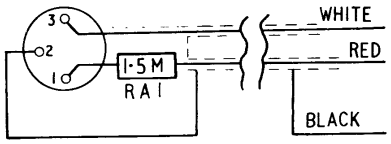
TRANSISTOR VOLTAGES

No.	Type	E	B	C
TR1	AC127	8.4(8.8)	8.1(8.5)	5.0(5.3)
TR2	AC127	7.1(7.4)	6.8(7.1)	1.4(1.6)
TR3	AC128	0.06(0)	+2.4(0)	9.2(0)
TR4	AC125	4.2(4.4)	4.25(4.45)	9.6(9.9)
TR5	AC125	5.2(5.5)	5.3(5.6)	8.8(9.1)
TR6	AC126	3.6(3.8)	3.7(3.9)	11.4(11.8)
TR7	AC125	2.0(2.1)	2.1(2.2)	18.5(19.4)
TR8A	AC128	9.85(10.15)	10.0(10.3)	21.5(22.5)
TR8B	AC128	0.02(0.02)	0.15(0.16)	9.85(10.15)
TR9	AC125	7.5(0)	7.6(0)	14.2(0)
TR10	BCY34S	0(0)	0(0)	13.7(14.5)

Voltages are negative with respect to chassis except where stated otherwise. Voltages measured with 100K/volt meter. First figure is for record, figure in brackets for playback.







0.25mV at 1kc/s across 2K (pins 1 and 2), amplified output (pins 3 and 2). Socket 5 (headphones): 1.5V into 1500 ohms (pins 1/2 and 4). Socket 6 (ext. speaker): 1.8W into 3-7ohms.

Dimensions. 16¼ x 11¾ x 6in.

Weight. 16lb.

Maker. Philips Electrical Ltd.

Service department. Amalgamated Electric Services Ltd., Waddon Factory Estate, Croydon, Surrey. Spare parts orders (normal business hours): Municipal 7311. General service enquiries: Croydon 7722. Automatic message recording service: Croydon 7722.

DISMANTLING

Chassis removal. Pull off four control knobs and speed selector. Remove three ornamental-head screws. Lift off cover plate at the same time releasing modulation meter from clip on underside. Remove four screws securing corners of chassis. Disconnect speaker. Lift out chassis.

Printed circuit removal. Remove four screws and take off base plate. This allows access to print side of panel. To remove panel completely, uncase chassis as described, detach pilot lampholder, unhook spring from actuating arm.

Remove four large securing screws. Untwist two panel retaining wires. Untwist and remove wire securing head leads to the panel mounting bracket. Take out two screws at rear which secure panel.

NOTE: It is recommended that mains input connections on corner of printed panel are insulated when machine is operated in uncased condition.

When reassembling ensure that switch operating bracket engages with end of operating arm, the end of coupling lever fits between prongs of actuating arm and the protrusion of speed control quadrant closes SW4 when switched to 1⅞ips. Check that mounting clip for T8A/B is firmly screwed to chassis.

SERVICE NOTES

Alternative transistors. Transistor T10 may be type BCY33, BCY33S, BCY34, BCY34S or BCY40. In all cases, replacement should be type BCY34S.

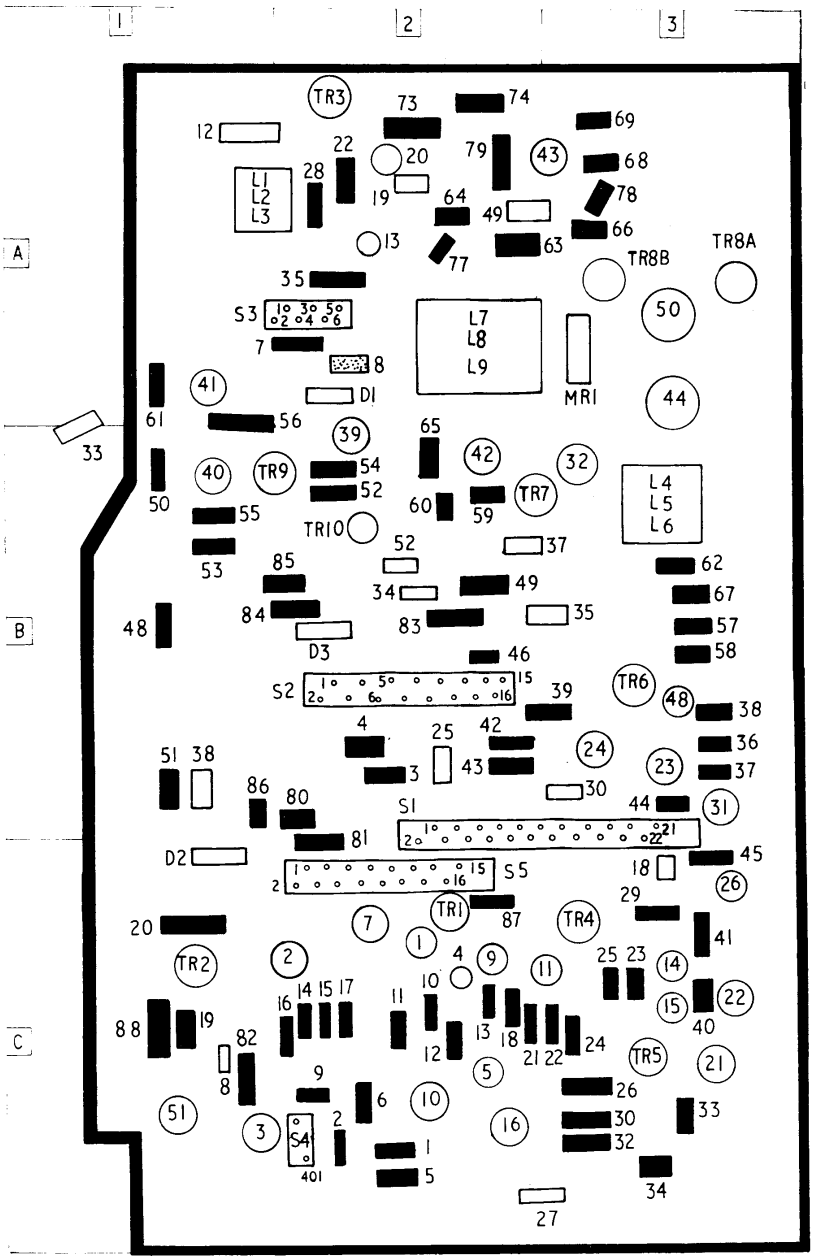
Diode input. To avoid overloading input stage it is essential that the correct lead is used (EL3768/04 when source employs 5-pin DIN socket, EL3768/03 in all other cases). A 1M5 resistor is incorporated in the live lead of EL3768/03, the value of this resistor may be altered, depending on the level of the signal, to obtain satisfactory recordings (see diagram).

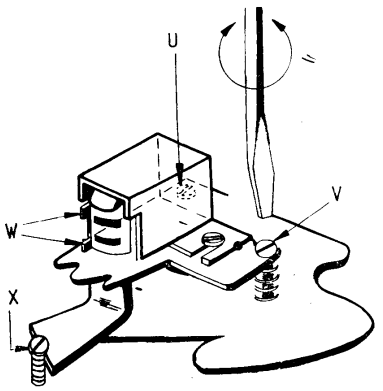
Monitoring. Monitoring during recording can be carried out using internal speaker or headphones. Volume and tone controls are operative, keep microphone as far from the recorder as practicable to avoid acoustic feedback.

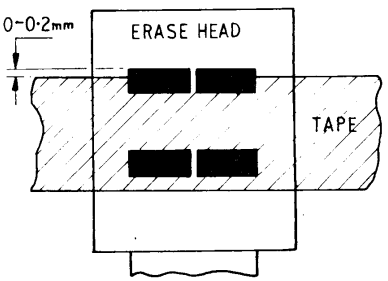
Mains frequency. Conversion from 50- to 60-cycle mains supply is carried out by changing the main drive belt from the lower to the upper groove on the motor pulley.

CLEANING AND LUBRICATING

Regular cleaning of tape heads, guides







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and capstan is necessary to maintain optimum performance. Remove cover to obtain access, then clean parts with soft lint-free cloth moistened with methylated spirits or industrial alcohol.

Cloth can be wrapped round a thin wood stick to facilitate operation. Metal objects should not be permitted to come into contact with the head faces.

After approximately 500 hours service the head faces, tape guides, capstan, pressure roller, drive belts, grooves in flywheel and pulleys, all friction driven surfaces, brake shoes and braking surfaces of turntables should be cleaned with spirit as described.

Felt pad on pressure pad assembly and inside of both turntables should be cleaned with soft dry brush.

Machines are fully lubricated during manufacture and further attention should be required only after very long periods of service. When it is necessary, or when a part is replaced, apply lubricant sparingly. Oil and grease should be kept away from all driving surfaces.

Upper and lower bearings of motor should be lubricated with motor bearing lubricant. A light oil (Shell Tellus 33) should be applied to turntable spindles, pulley spindles, pressure roller spindle, upper and lower flywheel bearings, speed selector bearings.

All sliding surfaces of control strips, brackets, and switch operating mechanisms should be treated with a light grease, preferably containing graphite.

Ball bearings of righthand brake bracket and plate should be lubricated with light grease (Shell Alvania 2). Sliders of switches SW1, SW2, SW3 and SW5 should have Electrolube No. 2A or Electro-col applied to them.

ELECTRICAL ADJUSTMENTS

Record/playback head. Set auto/manual switch (SW5) to Manual position for all R/P head adjustments.

Height. Remove head screening cover (one screw). Adjust screws U, V and X (see head diagram) so that head face is parallel to tape and height is set so that tape passes smoothly through the jaws of tape guide W. Adjustment may be checked as follows.

Unhook pressure pad assembly spring. Place reel of new DP tape on machine. Hold tape taut across tape guides. Push pressure arm towards tape by hand, checking as tape approaches head that it does not foul head guide W. Pressure pad must not touch tape during this test. Readjust head height until position is satisfactory. Ensure that head remains parallel to tape.

NOTE: Head guide W, attached to head, is accurately positioned during manufacture and no attempt should be made to alter the setting. In the event of the guide being misaligned, damaged or badly worn the complete head should be replaced.

Azimuth. Set tape head height and position as described. Azimuth test tape should be full-width recording of 8kc/s at 3¾ips. Replace head screening cover. Switch to Playback. Place test tape in machine. Connect AC millivoltmeter to pins 2 and 3 (socket 1).

Track 1—adjust screw V for maximum voltage and note reading. Track 3—adjust screw V for maximum meter voltage and note reading. Track 1—without altering adjustment note voltage reading. If difference between first and second readings on track 1 is less than 2dB the azimuth adjustment is correct.

If difference greater than 2dB, switch to Track 1 and readjust screw V for maximum voltage reading. Note reading. Check reading on track 3—without altering adjustment of screw V. Difference in output of 2dB or less is acceptable, if greater the head should be replaced and height and azimuth adjustments repeated. Finally check the tape does not foul tape head guide W.

Meter calibration. Depress red Record key only. Switch to tracks 1-4. Set speed selector to 3¾ips. Turn R71 (pickup/radio record level control) to maximum. Connect AC millivoltmeter to MP1 (socket 4). Apply 1kc/s signal to pins 1 and 2 of socket 1.

Adjust input to give reading on millivoltmeter of 2.8mV. With this level of applied signal the pointer of the record level meter should read within 2mm of the division between red and green segments. Adjust as necessary with R49.

NOTE: In some versions R49 may consist of a fixed resistor with value between 22K and 39K. The resistor should be changed to give correct reading, reducing value increases deflection and vice versa. Remove applied signal and switch to Record. Meter pointer should be deflected up to a maximum of 1mm.

Automatic level control. Depress red Record key only. Switch track selector to 1-4. Turn speed selector to 3¾ips. Switch Auto/manual control to Auto. Short circuit C52. Connect AC millivoltmeter to MP1. Apply 1kc/s signal at 55mV between pins 1 and 2 (socket 2). Adjust R88 for meter reading of 2.8mV. Remove short circuit from C52.

Automatic level check. Adjust R88 as described in previous paragraph. Apply 1kc/s signal at 550mV between pins 1 and 2 (socket 2). Reduce input to 55mV. (20dB). The meter reading will fall but should rise to 1.4mV in one to 4½ minutes.

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