

# SPECIFICATION

**TAPE DECK:** Thorn type DB42

**TAPE SPEEDS:**  $3\frac{3}{4}$  and  $1\frac{7}{8}$  in/sec

**WOW AND FLUTTER:** Better than 0.2% RMS

**MAXIMUM SPOOL SIZE:**  $5\frac{3}{4}$  inch

**PLAYING TIME (four tracks):**

Long play tape (1,200 feet):

4 hours at  $3\frac{3}{4}$  in/sec, 8 hours at  $1\frac{7}{8}$  in/sec

Double play tape (1,800 feet):

6 hours at  $3\frac{3}{4}$  in/sec, 12 hours at  $1\frac{7}{8}$  in/sec

**FAST WIND TIME:**  $2\frac{1}{2}$  minutes, in either direction, for 850 feet of tape

**POWER SUPPLY:** 200-250 volts AC 50 Hz

**POWER CONSUMPTION:** 60 watts

**AUDIO OUTPUT POWER:** 3 watts speech and music

**FREQUENCY RANGE:** 60—10,000 Hz ( $3\frac{3}{4}$  in/sec)  
60—6,000 Hz ( $1\frac{7}{8}$  in/sec)

**SIGNAL TO NOISE RATIO:** 40db

**POSITION INDICATOR:** Digital type with reset button

**MAGNETIC HEADS:** Standard quarter-track (stacked)  
One Record/Play, one Erase

**INPUT SOCKETS:** Microphone (MIC) 1.5mV into  $10M\Omega$ ; radio (RAD) 1.5V into  $68K\Omega$ , and pickup (PU) 75mV into  $3.3M\Omega$

**OUTPUT SOCKETS:** Low level (RAD) 500mV at  $22K\Omega$ , and external loudspeaker 3 watts at  $3\Omega$ . Note: When the latter is used, the internal loudspeaker is automatically muted

**DIMENSIONS (overall):**  $13\frac{3}{4}$ in  $\times$   $12\frac{3}{8}$ in  $\times$   $6\frac{3}{4}$ in

*The manufacturers reserve the right to vary specifications or use alternative materials as may be deemed necessary or desirable at any time*

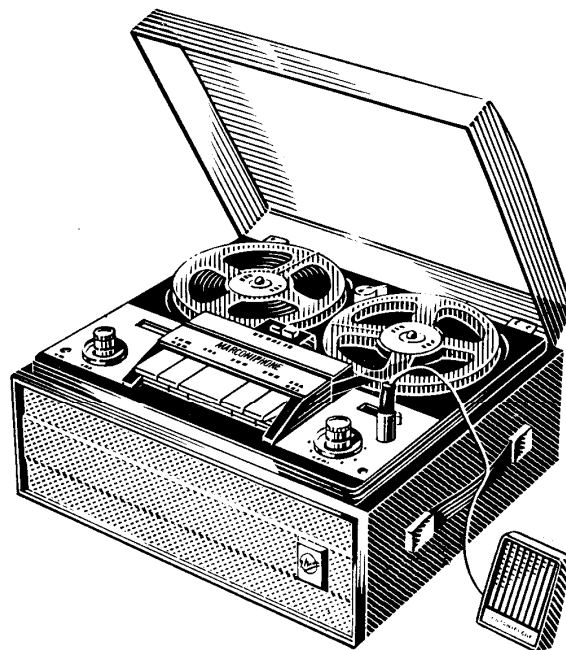
# BRC



## service manual

Price: One Shilling & Sixpence

### MARCONIPHONE 4216



### 2-SPEED 4-TRACK RECORDER

For servicing information on the tape deck please refer to the Thorn DB42/21 Tape Deck Service Manual

### BRITISH RADIO CORPORATION LTD

SERVICE DEPOTS

LONDON: Eley's Estate, Angel Road, Edmonton, N.18

Telephone: 01-807 3060

Ansafone Spares Ordering Service

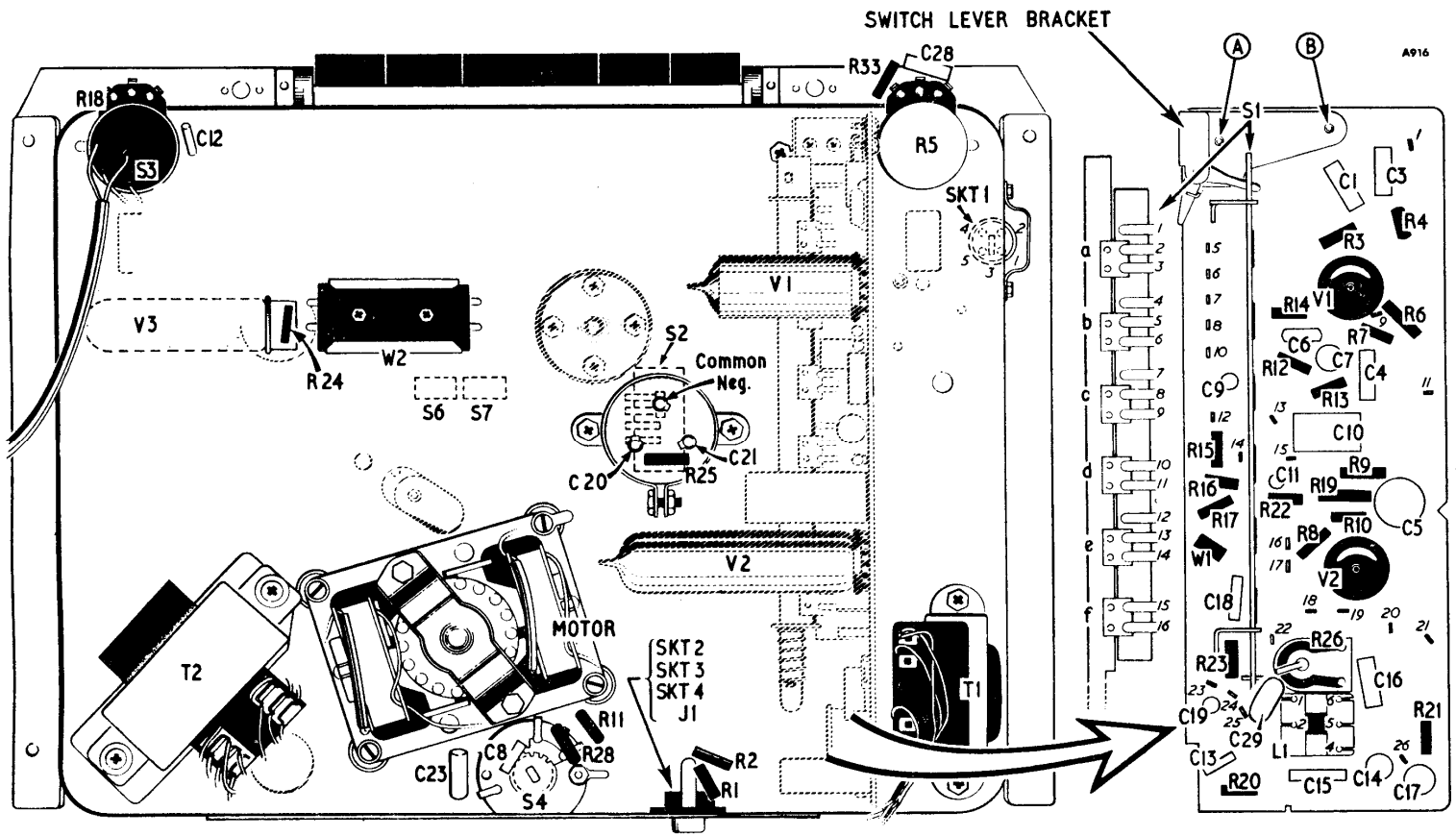
Telephone: 01-807 6332

BIRMINGHAM: 24 Sheepcote Street, 15

Telephone: 021-643 9988

GLASGOW: 160/162 Battlefield Road, S.2

Telephone: Langside 9251/2/3/4



## SERVICING NOTES

### Access for Servicing

**Top Cover Removal.** To gain access to the tape deck for routine cleaning, etc., first pull off the control knobs and moulded head cover, then remove seven screws securing the moulded top cover.

**Chassis Removal.** Remove control knobs and covers as described, then remove two screws from each side of the mechanism top plate. Remove pocket cover and then two screws securing storage compartment backing to the main chassis. The complete assembly (less loudspeaker) can now be lifted from the cabinet. To disconnect the loudspeaker pull the connecting leads from the speaker tags.

**Printed Circuit Board.** To obtain access to components located behind S1a-f, the printed board can be released from its mounting. To do this take out two small self-tapping screws securing the switch lever bracket to the main chassis and release a spring clip fitting into a slot at the other end of the printed board. The assembly can now be eased away from the main chassis.

### Heater Balance

The humdinger (R26) has been set during manufacture and should not be altered unless a valve change is made. If readjustment becomes necessary the procedure given

below must be carefully followed. Whilst setting the adjustment, the chassis must be electrostatically screened particularly around V1.

Take off the tape spools and set the instrument to "Record" with the Tone control set to minimum and the record level control at maximum. Connect a sensitive valve-voltmeter between the junction of C10/C11 and chassis. Place a shorting lead across R20 to prevent the oscillator functioning and plug in a screened dummy microphone connector with a 1,000 pF capacitor strapped across pins 4 and 5.

Allow the machine to warm up for 10 minutes, then adjust R26 for minimum reading on the valve-voltmeter (approximately 50 mV).

### Demagnetization

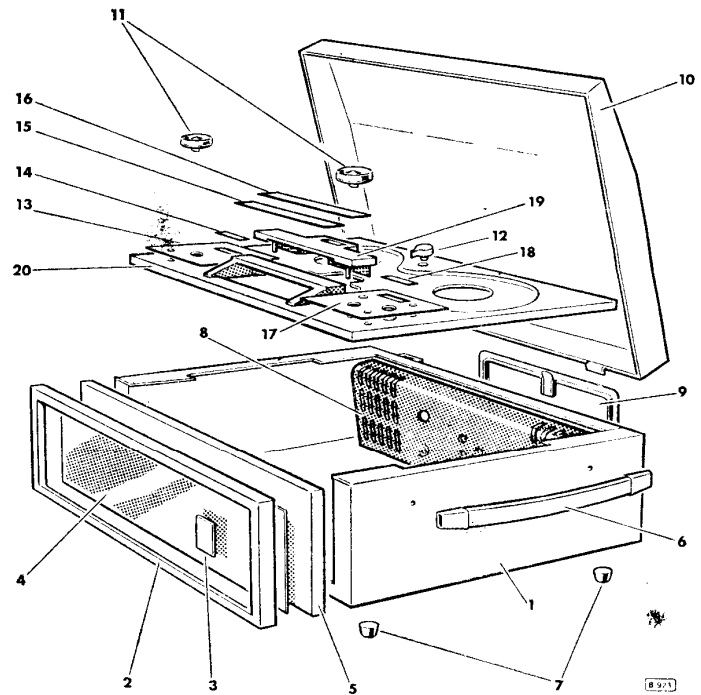
It is important that there is no residual magnetism in the heads or the capstan spindle. This condition, which may arise if magnetized objects are brought near these components or if an ohmmeter is connected to the head windings, leads to an increase in background noise on PLAY. Suitable instruments for providing a demagnetizing field are available from a number of manufacturers.

*Continued on back page*

## Component Locations

V3, R24, SKT1, S2 and S6/7 are located on the tape deck top plate.

NOTE: Accurate positioning of the switch lever bracket on the printed board is necessary for correct switch operation. In cases where the bracket has been removed, the following procedure should be followed for refitting. With the printed board in position on the base plate and the screws "A" and "B" slackened, adjust the printed board relative to the switch lever so that the switch lever arm just touches the baseplate; the screw holes in the printed board are oversize to allow for adjustment. Finally, tighten screws "A" and "B."



## REPLACEMENT PARTS LIST

### Cabinet Assembly

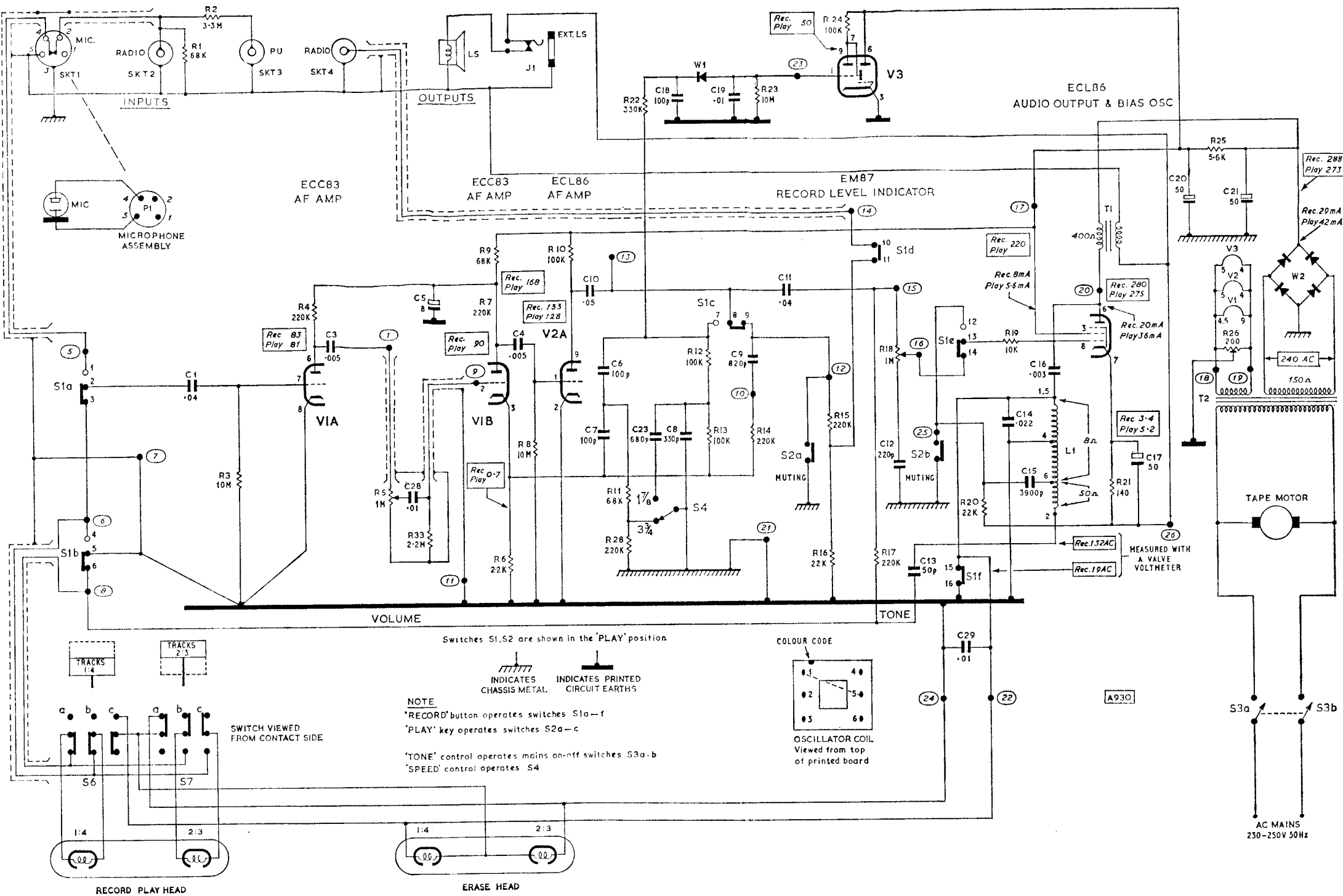
	Part No.
1. Cabinet including items marked *	8M3-411
2.* Speaker grille frame	8A4-105
3.* Emblem (plastic fixing nut 0L6-005)	8A6-026/2
4.* Speaker grille	8A4-104
5.* Cabinet front (nut NFHB04; washer WSPB04)	8A1-076
6.* Handle assembly including fixings	8A9-008/026
7.* Foot (fibre washer 8F7-005; rivet 8K5-007)	8A8-004
8. Storage compartment division panel (screw SZ06RP06/N; cup washer 8L6-003)	8A1-069/002
9. Storage compartment lid (spacing moulding 8C2-003)	8M5-009/001
10. Lid	8C8-042/001
11. Off/Tone or Volume control knob (clip 3L3-027)	8C0-034
12. Speed switch knob (clip 3L3-012; felt washer 8F7-007)	0C0-304/009
13. Off/Tone control escutcheon	8A4-020/054/B
14. Record level indicator window	2Z6-454
15. Piano key escutcheon panel	8A4-020/054/D
16. Head cover panel	8A4-020/054/C
17. Volume control escutcheon	8A4-020/054/A
18. Tape position indicator window	2Z6-453
19. Head cover	8C8-038/004
Head cover retaining clip (outer)	8L3-004
Head cover retaining clip (inner)	3L3-065
20. Top cover	8C8-036/003
Top cover retaining screw	SB04FS06/N
Deck retaining screw	ST06TP06

### PRINTED BOARD TAG CONNECTIONS

1. To R5 "live" tag
2. To SKT1 tag 4
3. To lower tag Record/Play head
4. Earthing braid to SKT1
5. To upper tag Record/Play head
6. To junction C28/R33
7. To S2a tag 1
8. To SKT4 "live" tag
9. Earthing braid to C28/R33
10. To R18 "live" tag
11. To R18 centre tag
12. To R24 (V3)
13. To upper tag Erase head
14. To heater supply T2
15. To heater supply T2
16. To T1 (V2B anode supply)
17. To chassis earthing
18. To V3 pin 1
19. To lower tag Erase head
20. To S2b tag 3
21. To T1 secondary

### Chassis Assembly

Recorder unit assembly (RB420)	8M3-418
Printed board assembly	1Z9-305/3
Loudspeaker retaining nut	0L6-005
Recording tape with metal "stop" foil	8D5-008
Recording tape spool	8C8-041
Microphone assembly	8M3-247
Socket panel assembly	8M2-032
Input socket screen	8B1-003
Phono socket strip (insulator 1Z6-533)	856-013
Phono plug	3Z0-398
Radio connecting lead assembly	8M3-367
Record level indicator valveholder	26505
Record level indicator insulating collar	26646
Record level indicator mounting spring	8B5-006
V1 valveholder	8F2-003
V2 valveholder	8F2-004
V1 screening can	8B1-070
V1 valve retainer	0B5-072
V2 valve retainer	0B5-072/2
Microphone socket screen (screw SZ04HP03)	8B1-069
Microphone socket (pillar 7116/10; plug 8F6-018; screw SZ4HP06)	8F6-012
Mains transformer spacer (screw SZ06HP06; washer WD/12L2)	8B0-019
Clip securing C20, C21 (clamp screw SB04CC06; nut NFHB04)	2Z1-124
Clip securing printed board (screw SZ04HP03)	4Z8-457
Printed board bracket (screw SZ06HP04)	26476
Speed-change switch (nut NFHB06)	8E2-006
Record/play switch assembly	8E2-012
Record/play switch spring	8B5-039
Record/play switch lever	8C5-019
Screw securing rectifier W2	SZ04HP04
Mains lead clamp (screw SA06HP12)	8L4-001
Volume control earthing clip	26772
Top cover mounting grommet	2Z6-762

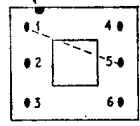


Switches S1, S2 are shown in the 'PLAY' position.

INDICATES CHASSIS METAL  
INDICATES PRINTED CIRCUIT EARTHS

**NOTE**  
• 'RECORD' button operates switches S1a-f  
• 'PLAY' key operates switches S2a-c  
• 'TONE' control operates mains on-off switches S3a-b  
• 'SPEED' control operates S4

**COLOUR CODE**



OSCILLATOR COIL  
Viewed from top of printed board

## CIRCUIT DESCRIPTION

The motor and the mains transformer are directly connected to the 230/250V AC mains input voltage. The main HT supply is provided by a full-wave selenium rectifier **W2** and the parallel heater chain is balanced to chassis by a potentiometer **R26** across **T2** heater winding.

### REPLAY

The replay head is switched by **S1a** to the grid of **V1A** (ECC83), the other side of the head winding being earthed through **S1b**. The amplified signal is then fed via the volume control **R5** to the grid of **V1B** which, with **V2A** (ECL86) provides further amplification. A frequency selective negative feedback loop, switched by **S1c**, from **V2A** anode to **V1B** cathode, gives bass boost playback equalization.

**V2A** output is fed to the radio output socket via attenuator **R15/16** and, via **C11** to tone control **R18**.

From the tone control the signal is switched by **S1e** to the grid of **V2B** via grid stopper **R19**. **V2B** operates as the audio output stage with the erase head short-circuited by **S1f**. The secondary of **T1** is connected in the return circuit of the cathode of **V2B** to provide negative feedback.

### RECORD

**V1A** grid is switched to the input sockets by **S1a**. The radio and pickup inputs are automatically cut off when the microphone is in use. **V1A** output is fed via the record level control **R5** to **V1B** grid. **V1B** and **V2A**, the next two stages, have a frequency selective negative feedback circuit switched between them by **S1c**, from anode of **V2A** to cathode of **V1B** to provide treble boost recording equalization.

**V2A** output is fed to the record head via **C10/C11**, and series resistor **R17**. The record head winding is

returned to chassis through **S1b**, its polarity now being reversed. Part of the signal developed at **V2A** anode is rectified by **W1** and fed to the grid of **V3**, the record level indicator which has a fast rise and slow decay characteristic. Power for erasing and recording bias is supplied by **V2B** which is connected as a modified Hartley oscillator when the instrument is switched to "Record".

The oscillator is tuned to approximately 55 KHz and the output is fed to the erase head from part of the winding of **L1** and to the record head through **C13**.

### MUTING

When the mechanism is in the "fast wind" and "off" positions, **V2A** output is shorted to chassis by **S2a**. At the same time **S2b** causes the oscillator output to decay, thus ensuring that the erase head is not left partially magnetized.

# COMPONENT DETAILS

# MISCELLANEOUS

When ordering replacement components please quote Model number and, where possible, include the description or function given with the part number

## CAPACITORS

All 350 volts DC working, 20% tolerance, unless otherwise stated

Ref.	Value	Tol.	Rating	Function	Part No.
C1	.04μF		150V	V1A grid coupling	4M77
C3	.005μF		400V	V1B grid coupling	4M69
C4	.005μF		400V	V2A grid coupling	4M69
C5	8μF	Elec.	275V	V1A-B HT smoothing	0E0-222/01
C6	100pF	10%	}	Part record equalization	8M62
C7	100pF	10%			5M38
C8	330pF	10%			5M39
C9	820pF	10%			5M40
C10	.05μF				5M41
C11	.04μF		150V	Part low frequency attenuator	2M46
C12	220pF			Part tone control circuit	4M78
C13	50pF	10%		Record/Play head tuning and bias feed (record)	4M83
C14	.022μF	5%	400V	Part oscillator tuning	4M79
C15	3900pF		500V	Oscillator grid leak bias	4M80
C16	.003μF		300V AC	Oscillator anode coupling	4M81
C17	50μF	Elec.	12V	V2B cathode bypass	0E0-228/03
C18	100pF		500V	Record level indicator feed decoupling	4M82
C19	.01μF		400V	V3 grid time constant	4M71
C20	50μF	Elec.	300V	HT smoothing	0E0-238/02
C21	50μF	Elec.	300V	HT reservoir	
C23	680pF	10%		Part 1 1/2 in/sec record equalization	5M42
C28	.01μF		400V	Part R5 noise suppression	4M71
C29	.01μF	5%	400V	Part oscillator tuning	5M44

## INDUCTORS AND TRANSFORMERS

Ref.	Description	Part No.
L1	Bias osc. coil assembly	8D0-002
T1	Audio output transformer	8D3-007
T2	Mains transformer	8D3-020

Ref.	Description	Part No.
S1a-f	Record/Play switch (return spring 8B5-039)	8E2-012
S2a-c	Muting switch	8E2-005
S3a-b	Mains On/Off switch	with R18
S4	Speed compensation switch (nut NFHB06)	8E2-006
S6-7	Track selector switch (push-button 0X0-850)	26472/2
LS	Loudspeaker, 7in x 3 1/2in.—3Ω impedance (nut 0L6-005)	8E3-007/001
W1	Record level rectifier	8E9-008
W2	HT rectifier	8E9-005
SKT1	Microphone input socket	8F6-012
SKT2	Radio input socket	} Socket strip 8M2-032
SKT3	PU input socket	
SKT4	Radio output socket	
J1	Extension LS jack	

## RESISTORS

All 1/4 watt carbon, 20% tolerance, unless otherwise stated

Ref.	Value	Tol.	Rating	Function	Part No.
R1	68KΩ	10%		Radio input and part pickup attenuator	2A05
R2	3.3MΩ			Part pickup attenuator	8A54
R3	10MΩ			V1A grid leak	6A15
R4	220KΩ	10%	Low noise	V1A anode load	8A55
R5	1MΩ	Log. Pot		Volume control	8E1-008/21
R6	2.2KΩ	10%	1/2W	V1B cathode bias and NFB injection	3A87
R7	220KΩ			V1B anode load	1A95
R8	10MΩ			V2A grid leak	1A90
R9	68KΩ		1/2W	HT smoothing	5A24
R10	100KΩ			V2A anode load	1A44
R11	68KΩ	10%	}	Part record equalization	2A05
R12	100KΩ	10%			1A68
R13	100KΩ	10%			1A68
R14	220KΩ	10%			5A61
R15	220KΩ				1A95
R16	22KΩ		}	Radio output attenuator	4A93
R17	220KΩ				Constant current record signal feed
R18	1MΩ	Lin. Pot.		Tone control	8E1-008/22
R19	10KΩ		1/2W	V2B grid stopper	7A24
R20	22KΩ			Oscillator grid leak	1A56
R21	140Ω	10%	1/2W	V2B cathode bias	8A56
R22	330KΩ			W1 stand-off	8A57
R23	10MΩ			V3 grid leak and W1 load	6A15
R24	100KΩ			V3 anode load	5A34
R25	5.6KΩ		1/2W	HT smoothing	9A17
R26	200Ω	Preset		Heater balance	1Z3-187/2
R28	220KΩ	10%		Part 1 1/2 in/sec record equalization	5A57
R33	2.2MΩ			Part R5 noise suppression	7A90

## SERVICE NOTES—continued

### Head Adjustment

Provision is made on the head mounting for horizontal adjustment (azimuth) of the RECORD/PLAY head.

Adjustment becomes necessary only when the manufacturer's setting has been disturbed. The head can be "rocked" on its mounting by making adjustments to the two mounting screws, one of which is fitted with a compression spring. To readjust, play back a standard azimuth tape with an output meter connected. Adjust the RECORD/PLAY head for maximum output using the volume control to keep the output level as low as possible.

NOTE: Avoid overtightening the mounting screws as this may cause distortion of the head mounting.

### Microphone

Due to difficulty in reassembling and possibility of damage to the crystal element, it is suggested that no servicing is carried out on the microphone. In the event of any fault developing in this component, it should be returned to the nearest Service Depot.

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