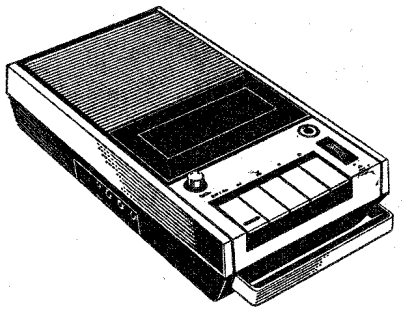
SERVICE INSTRUCTIONS

Murphy

MODEL BA200
BATTERY/MAINS
TAPE RECORDER



SPECIFICATION

GENERAL
Model BA200 is a transistorised mains/battery operated portable monophonic tape recorder, using only tape cassette type C30, C60 or C90 at an operating speed of $1\frac{7}{8}$ in. (4·8 cm) per second. A playing time of 30, 60, or 90 minutes as appropriate is provided using both of the two tracks on the tape.

MAINS SUPPLY
220 to 240 volts a.c. 50 Hz.

BATTERY
Four 1·5V HP11 cells or equivalent. A socket is provided for an external 6 volts d.c. supply, if required.

LOUDSPEAKER
3·54 in. (9 cm) circular. Impedance 8 ohms.

POWER OUTPUT
400 mW at 1000 Hz for 10% total harmonic distortion (with battery supply of 6 volts).

FREQUENCY RESPONSE
150 Hz to 6000 Hz nominal.

SIGNAL/NOISE RATIO (Weighted)
40 dB minimum (reference max. record level).

WOW AND FLUTTER
Less than 0·35% r.m.s.

BIAS OSCILLATOR FREQUENCY
41 kHz approximately.

ERASE CAPABILITY
50 dB minimum at 1 kHz with band pass filter.

REWIND AND FAST WIND TIME
with C60 cassette, less than 120 seconds

INPUT IMPEDANCE
MIC. socket 800 ohms approximately.
AUX. socket 470k ohms approximately.

FUSE
One 800 mA Fast acting.

DISMANTLING

Removing the mechanism assembly from the cabinet.

1 Remove five screws from back of cabinet.
2 Remove two screws marked A in Fig. 1.
3 Remove two studs marked B in Fig. 1.
4 Disconnect Level meter leads and Loudspeaker leads marked C and D in Fig. 1.
5 Disconnect leads to Battery contacts marked E in Fig. 1.

Removing printed circuit board from assembly.

1 Remove two screws marked F in Fig. 1.

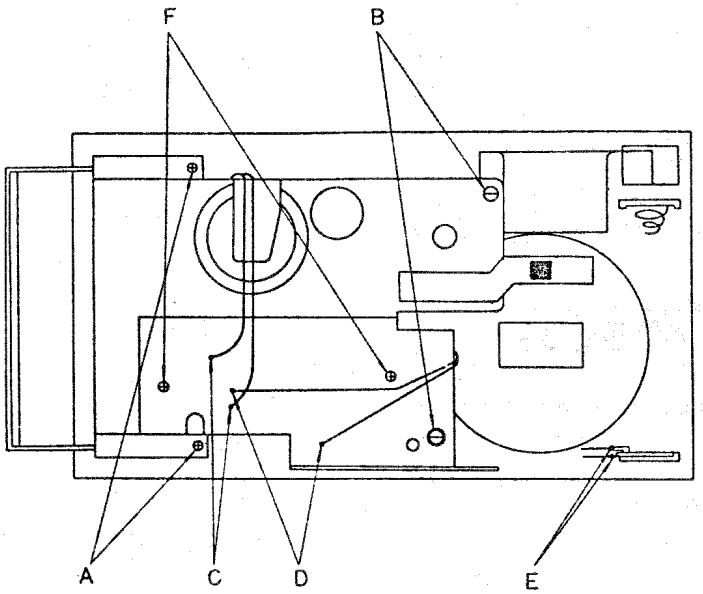


***Fig. 1.** Dismantling diagram.*

ADJUSTMENTS

EQUIPMENT REQUIRED.

1 Valve Voltmeter.

2 Head Azimuth Alignment Cassette (Philips HU 715-12 or equivalent).

3 100 ohms dummy load resistor.

NOTE 1 Remove chassis from the cabinet as described in the Dismantling procedure.

2 Set Volume control to maximum.

Head Azimuth Alignment

(a) Connect the Valve Voltmeter across the speaker terminals.

(b) Insert the head azimuth alignment cassette.

(c) Switch the recorder to playback and adjust the spring-loaded screw (to the left hand side of the record/playback head) for maximum reading on the Valve Voltmeter.

Record Bias Adjustment

(a) Switch the recorder to the Record position.

(b) Insert the 100 ohm dummy load resistor between the ground terminal of the record/playback head and the chassis.

(c) Connect the valve voltmeter across the dummy load resistor.

(d) Adjust the variable bias resistor VR2 to obtain a reading of 50mV (500 μA) ±10% on the valve voltmeter.

FAULT FINDING - MECHANICAL

No rewind	Motor rotating	Rewind Reel Holder not rotating	Clean belt with Carbon Tetrachloride or Alcohol. Replace belt.
		Slipping between Relay Idler and Flywheel.	Adjust tension or replace spring.
No Fast Forward.	Motor rotating.	Insufficient pressure between Relay Idler and Take-up Reel Holder.	Adjust tension or replace spring.
		Slipping between Relay Idler and Flywheel.	as above.

PARTS LIST

MECHANISM *see Fig 2*

Reference in Fig. 2	Description	Part Number
15	Back tension spring	AP59069
12	Brake	AP59067
47	Brake arm	AP59080
48	Brake arm spring	AP59081
13B	Brake spring	AP59068
22	Cap reel spindle	AP59071
71	Capstan flywheel	AP59089
100	Clamper A (on main chassis assy.)	AP59099
84	Coil spring	AP59094
116	Erase head	AP59106
75	Flywheel belt	AP59090
76	Flywheel supporting bracket	AP59091
09	Flywheel bearing	AP59066
99	Head azimuth spring	AP59098
85	Head chassis assy.	AP59095
53B	Leaf spring	AP59083
43	Middle base ring	AP59078
44	Middle base assy. (inc. ring).	AP59079
78	Middle pulley spring	AP59092
79	Middle pulley assy.	AP59093
107	Main chassis assy.	AP59103
117	Motor DC	AP59107
104	Motor pulley with screw	AP59102
91	Pinch roller assy.	AP59096
95	Pinch roller spring	AP59097
109	Push button mech. assy.	AP59104
115	Record playback head	AP59105
52	Record arm spring	AP59082
191	Recording safety lever spring	AP59108
23B	Recording safety lever	AP59072
35	Rewind arm assy.	AP59073
38	Rewind pulley	AP59074
16	Reel holder	AP59070
40B	Spacer	AP59076
67	Slide arm assy.	AP59087
70	Slide arm spring	AP59088
101	Slide spring	AP59100
102	Steel ball	AP59101
55	Tension spring	AP59084
56	Tension arm assy.	AP59085
39	Washer	AP59075

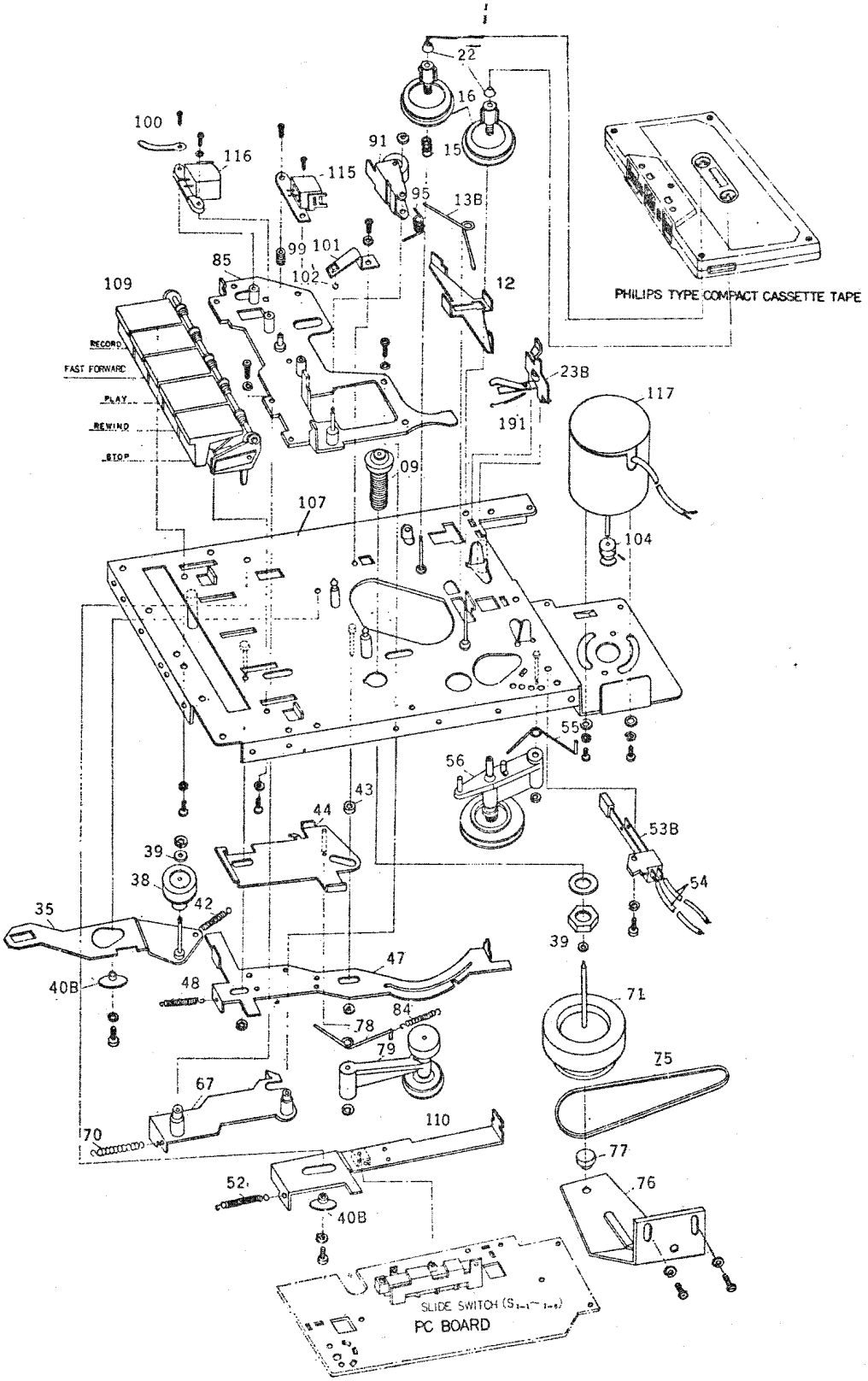
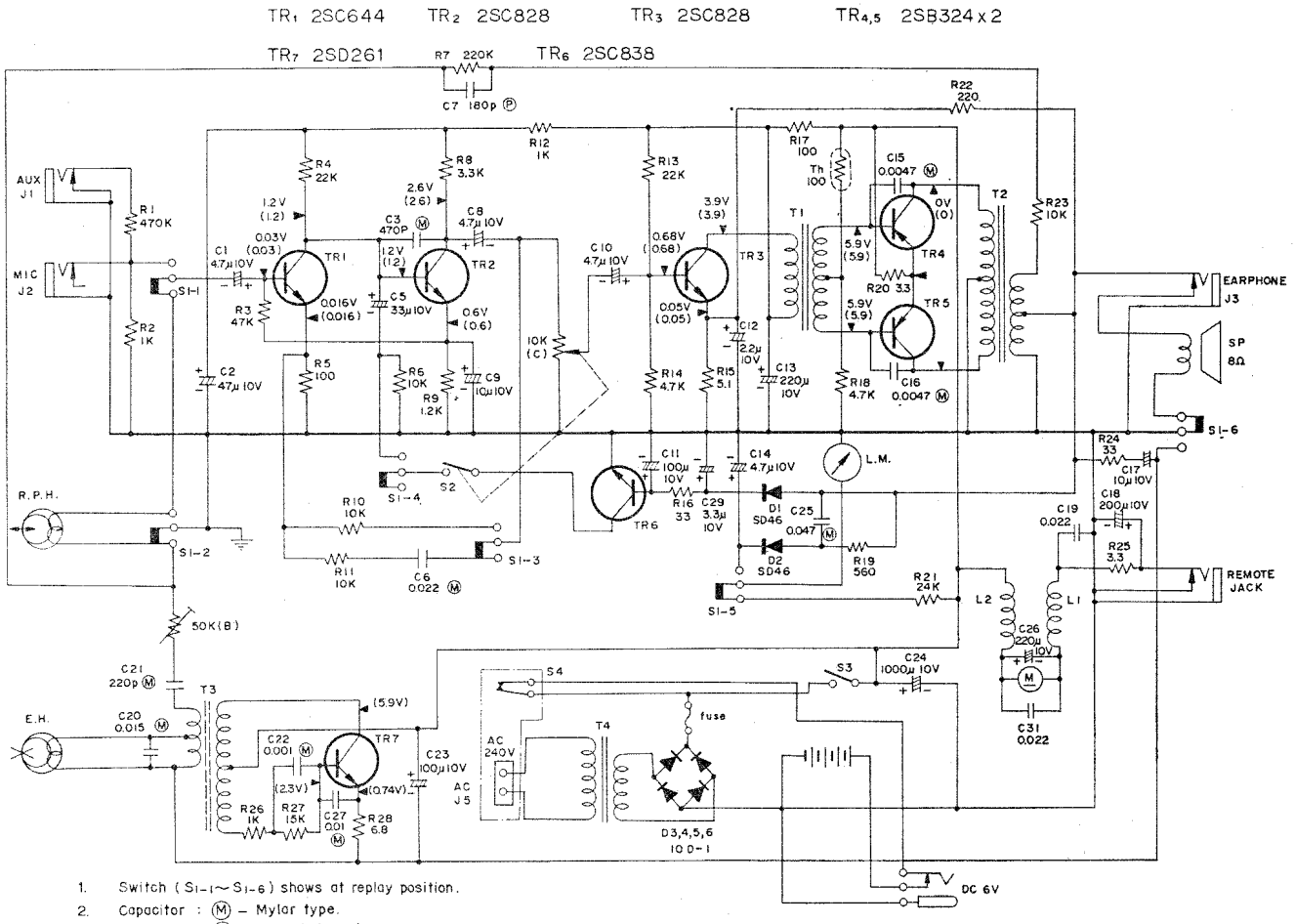


Fig. 2. Detailed view of mechanism.

See Parts list on Page 2.



1. Switch (S1-1~S1-6) shows at replay position.
2. Capacitor : Ⓜ – Mylar type.
   Ⓟ – Polyethylene type.
   Without suffix – Ceramic type.
3. Voltage shown at each transistor indicates the value to the ground at replay position without signal
   Value at recording position is shown in ( )
   Note : Tester with internal resistance 20kΩ/V should be used.

Fig. 3. Circuit diagram—BA200.

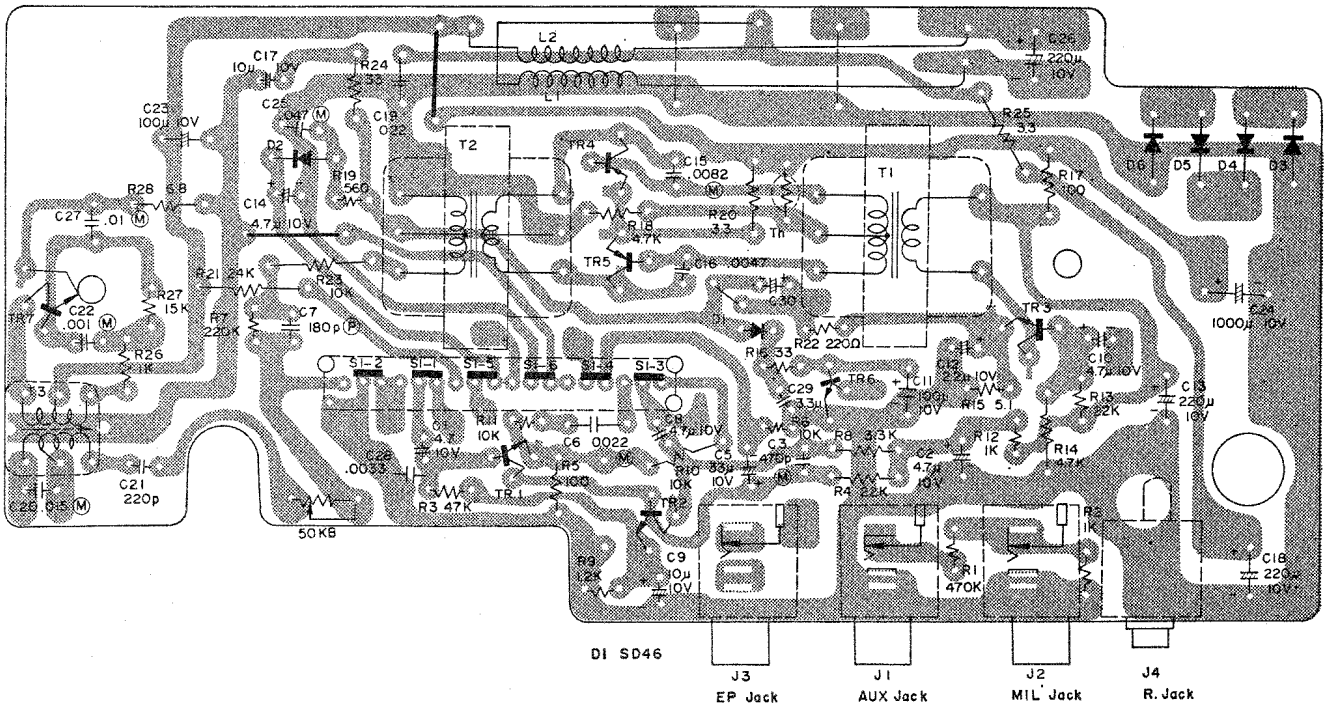


Fig. 4. Component layout.

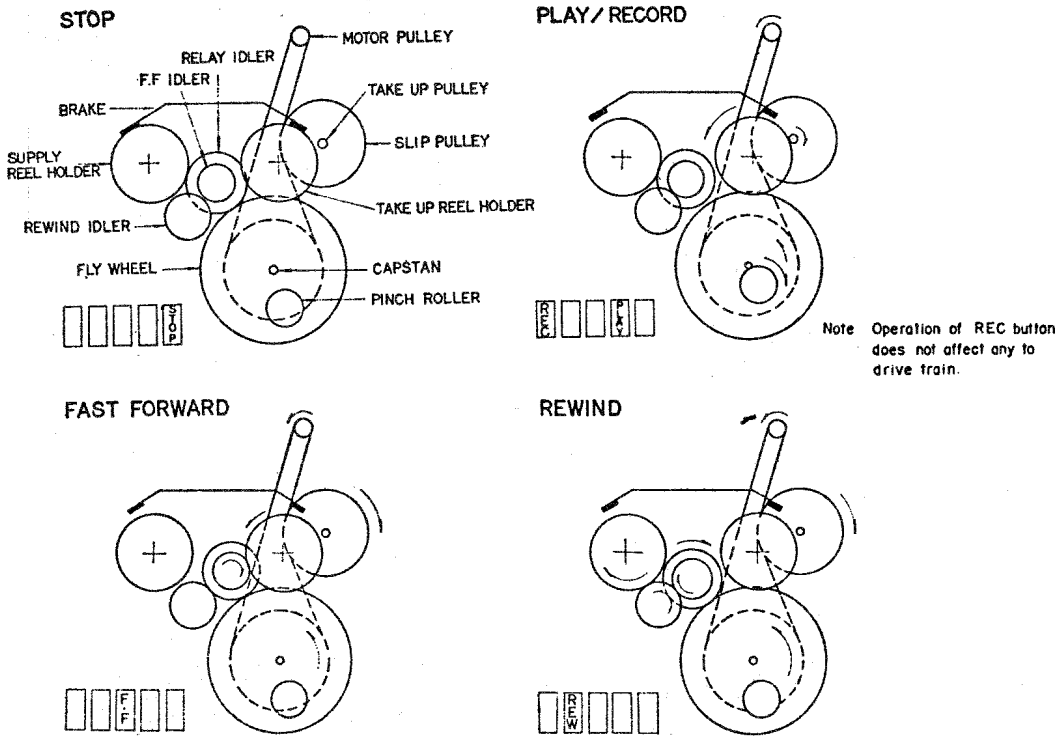


Fig. 5. Drive train mechanism.

PARTS LIST - ELECTRICAL

CAPACITORS

Ref.	Value (uF)	Value (pF)	Rating (volts)	Part Number
C1	4·7		10	AP59182
C2	47		10	AP59185
C3		470	50	AP59194
C5	33		10	AP59184
C6	·022		50	AP59200
C7		180	50	AP59202
C8	4·7		10	AP59182
C9	10		10	AP59183
C10	4·7		10	AP59182
C11	100		10	AP59186
C12	2·2		10	AP59191
C13	220		10	AP59187
C14	4·7		10	AP59182
C15	·0047		50	AP59196
C16	·0047		50	AP59196
C17	10		10	AP59183
C18	200		10	AP59190
C19	·022		50	AP59192
C20	·015		50	AP59197
C21		220	50	AP59193
C22	·001		50	AP59195
C23	100		10	AP59186
C24	1000		10	AP59188
C25	·047		50	AP59198
C26	220		10	AP59187
C27	·01		50	AP59199
C29	3·3		16	AP59189
C31	·022		25	AP59203

RESISTORS

Ref.	Value (ohms)	Rating (watts)	Part Number
R1	470k	·25	AP59204
R2	1k	·25	AP59205
R3	47k	·25	AP59206
R4	22k	·25	AP59207
R5	100	·25	AP59208
R6	10k	·25	AP59209
R7	220k	·25	AP59210
R8	3·3k	·25	AP59211
R9	1·2k	·25	AP59212
R10	10k	·25	AP59209
R11	10k	·25	AP59209
R12	1k	·25	AP59205
R13	22k	·25	AP59207
R14	4·7k	·25	AP59213
R15	5·1k	·25	AP59214
R16	33	·25	AP59215
R17	100	·25	AP59208
R18	4·7k	·25	AP59213
R19	560	·25	AP59216
R20	3·3	·25	AP59217
R21	24k	·25	AP59218
R22	220	·25	AP59219
R23	10k	·25	AP59209
R24	33	·25	AP59215
R25	3·3	·25	AP59217
R26	1k	·25	AP59205
R27	15k	·25	AP59220
R28	6.8	·25	AP59221

RESISTORS VARIABLE

Ref.	Value (ohms)	Description	Part Number
VR1(C)	10k	Volume control with switch (S2)	AP91416
VR2(B)	50k	Recording bias pre-set	AP59151

TRANSISTORS AND DIODES

Ref.	Type	Part Number
TR1	2SC644	AP58941
TR2	2SC828	AP58942
TR3	2SC828	AP58942
TR4	2SB324	AP58943
TR5	2SB324	AP58943
TR6	2SC838	AP58944
TR7	2SD261	AP91423
D1	SD-46	AP58946
D2	SD-46	AP58946
D3	10D1	AP58947
D4	10D1	AP58947
D5	10D1	AP58947
D6	10D1	AP58947
TH	Thermistor	AP59150

COILS AND TRANSFORMERS

Ref.	Description	Part Number
T1	Drive transformer	AP59146
T2	Output Transformer	AP59147
T3	Oscillator Coil	AP59148
L1	Choke	AP59149
L2	Choke	AP59149

MISCELLANEOUS PARTS LIST

Title	Description	Part Number
Cabinet top	complete assembly	AP91403
Cabinet bottom	complete assembly	AP91402
Cassette case	assembly	AP91412
Handle	assembly	AP91409
Lid	battery	AP91407
Mechanism unit	assembly	AP91410
Microphone with stand		AP59158
Printed circuit board	assembly	AP91411
Push button	assembly	AP91420
Slide switch	S1-6	AP59152

THE SERVICE DEPARTMENT

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