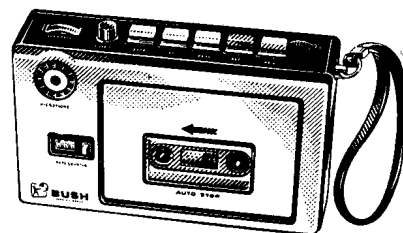


BUSH | MURPHY

SERVICE INFORMATION

BUSH MODEL BT8504 PORTABLE TAPE RECORDER



SPECIFICATION

GENERAL

The BT8504 is a two track monophonic portable cassette tape recorder designed to record and playback using the $1\frac{7}{8}$ per second Compact Tape Cassettes.

BATTERY

Four HP7 or sealed equivalents.

EXTERNAL D.C. SUPPLY

A socket is fitted for operating the instrument from an external 6 volts d.c. supply.

CURRENT CONSUMPTION

Record or playback 100mA.

POWER OUTPUT

200mW.

LOUDSPEAKER

Frame size 57mm (2.24in.) circular.

SIGNAL/NOISE RATIO (Record/playback)

38 dB.

FREQUENCY RESPONSE

125 Hz - 6300 Hz +3 -8 dB w.r.t. 1000 Hz.

RECORD LEVEL

Automatic control.

AUTO-STOP FACILITY

Mechanical auto-stop switches off instrument at end of tape on Record and Playback only.

WOW AND FLUTTER

0.35%

FASTWIND AND REWIND TIME

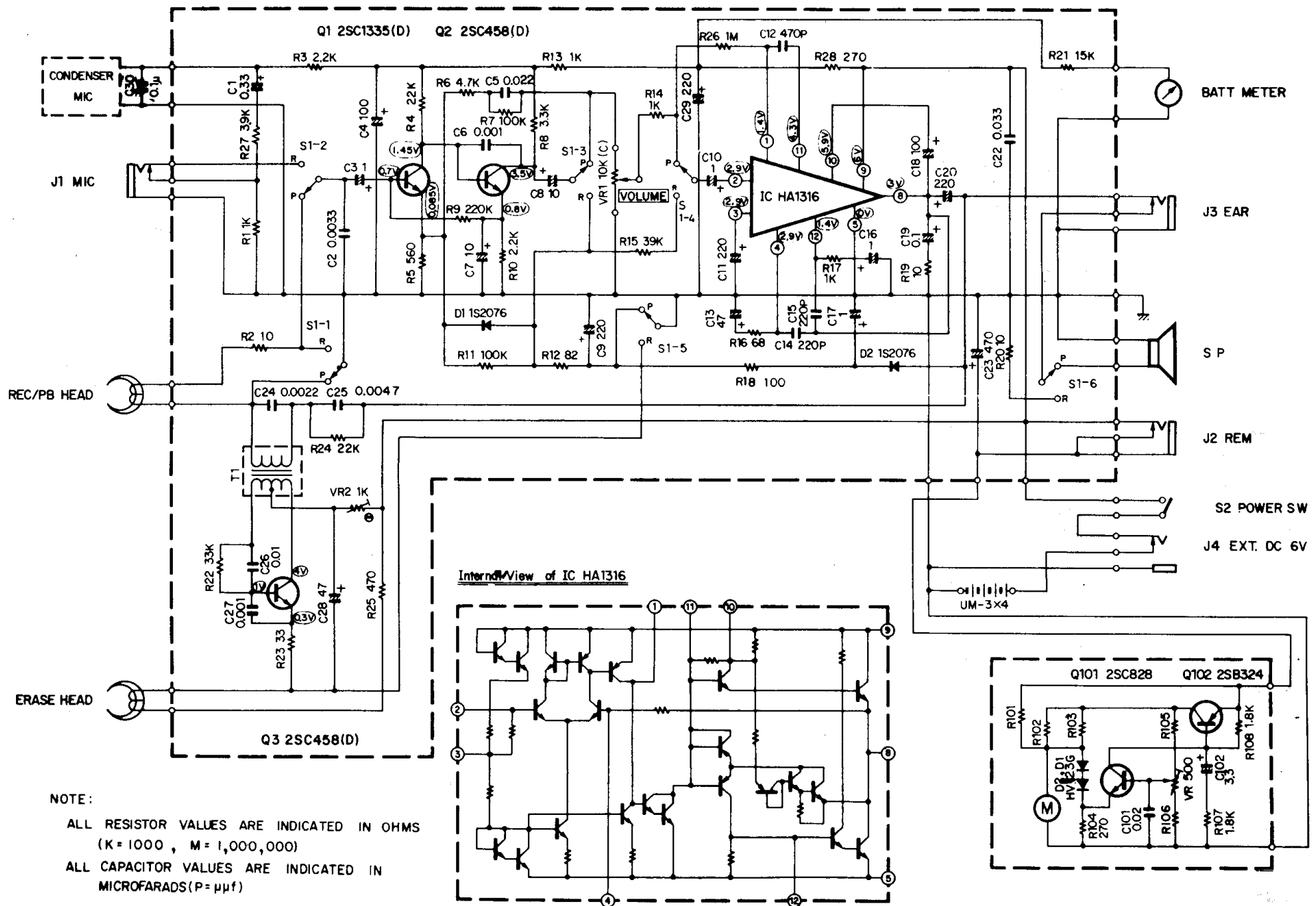
approximately 160 secs with C60 cassette.

EXTERNAL MICROPHONE INPUT

Impedance 220k ohms.

EXTERNAL LOUDSPEAKER INPUT

Impedance 8 ohms.



Specifications & circuits subject to change without notice for improvement.

Fig. 1. Circuit diagram BT8504

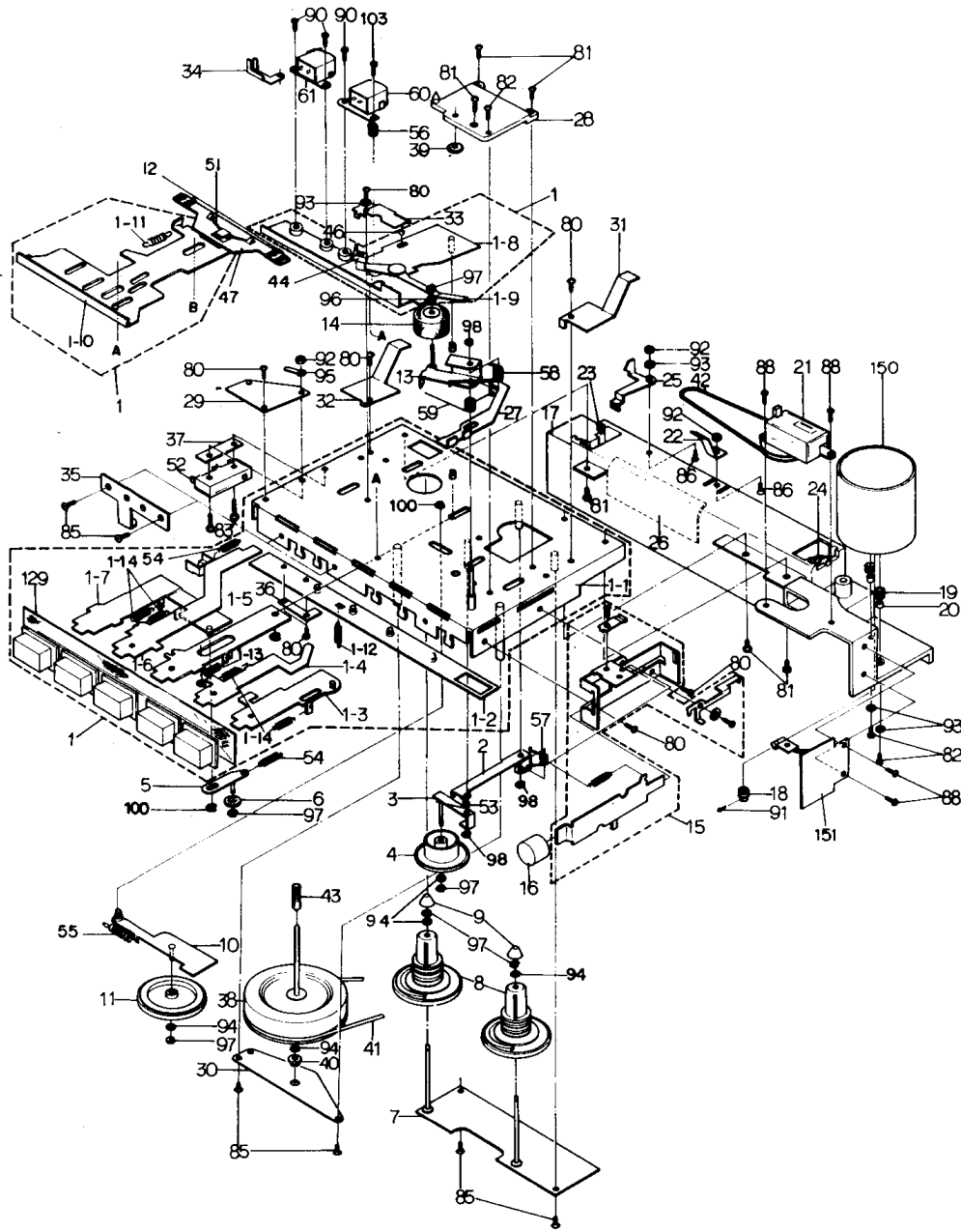


Fig. 2. Mechanical details
For item numbers, refer to page 4.

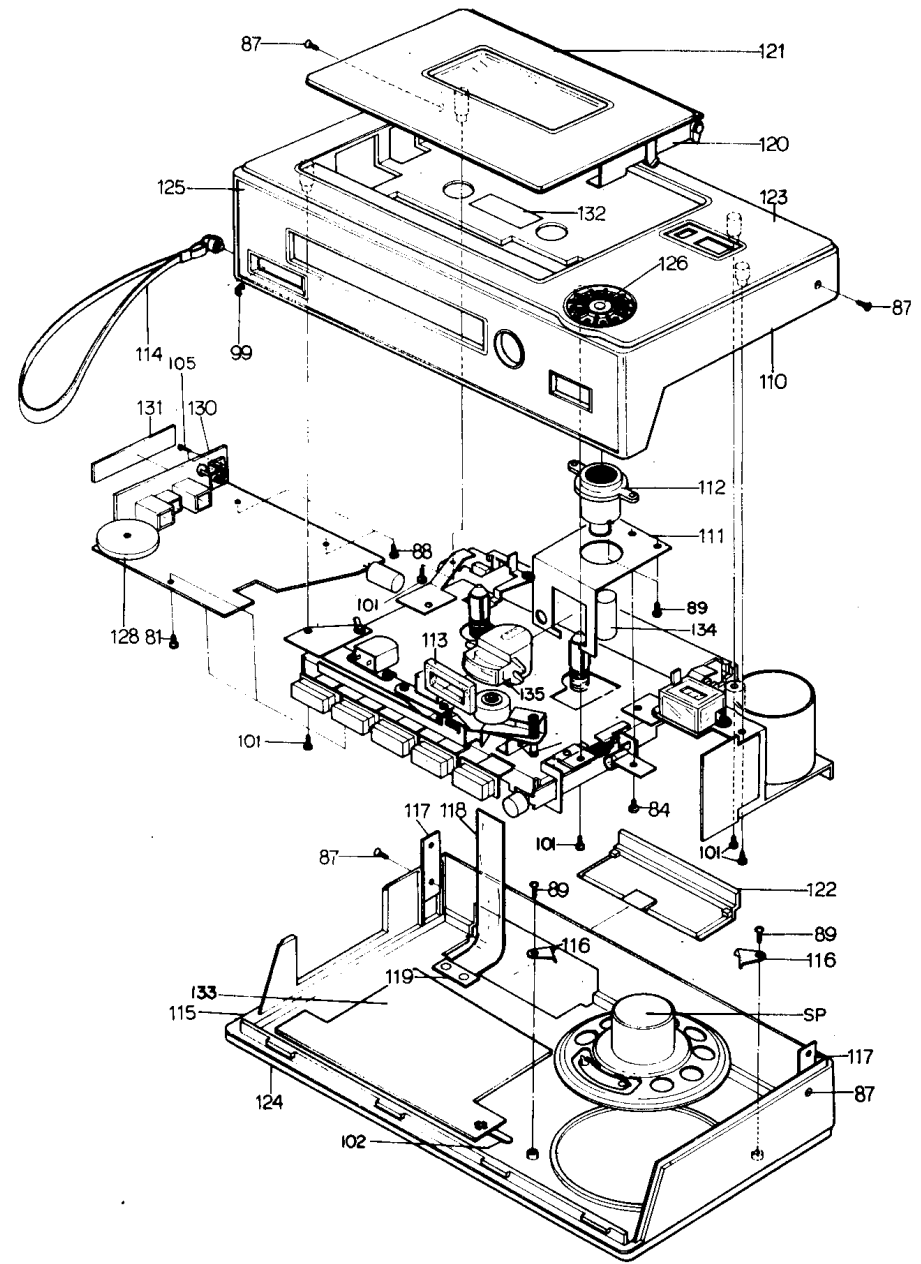


Fig. 3. Mechanical details
For item numbers, refer to page 4.

PARTS LIST—MECHANICAL

Item numbers refer to Figs. 2 and 3.

Item No.	Description	Part Number	Item No.	Description	Part Number	Item No.	Description	Part Number
1	Switch mechanism complete	AP94981	37	Switch spacer	AP95031	112	Microphone holder	AP95053
1-1	Chassis	AP94982	38	Flywheel	AP95032	113	Packing for tuning meter	AP95054
1-2	Lock plate lever	AP94983	39	Bearing—upper flywheel	AP95033	114	Hand strap	AP95055
1-3	Lever, push switch—Stop	AP94984	40	Bearing—lower flywheel	AP95034	115	Bottom moulding, part of assembly of cabinet bottom AP95123	AP95056
1-4	Lever, push switch—Fast Forward	AP94985	41	Belt—capstan	AP95035	116	Speaker clamp (2)	AP95057
1-5	Lever, push switch—Play	AP94986	42	Belt—counter	AP95036	117	Cabinet plate (2)	AP95058
1-6	Lever, push switch—Record	AP94987	43	Take-up pulley	AP95037	118	Battery ribbon	AP95059
1-7	Lever, push switch—Rewind	AP94988	44	Tension pick-up	AP95038	119	Clamp for battery ribbon	AP95060
1-8	Sub-chassis, Head and Pinch roller	AP94989	45	Rubber tube	AP95039	120	Cassette holder moulding; part of assembly of cassette holder AP95125	AP95061
1-9	Lever, auto-stop	AP94990	46	Steel ball	AP95040	121	Cassette holder trim; part of assembly of cassette holder AP95125	AP95062
1-10	Slide plate	AP94991	47	Brake arm	AP95041	122	Battery lid	AP95063
1-11	Spring	AP94992	51	Spring—brake arm	AP95042	123	Top trim, part of assembly of cabinet top AP95124	AP95064
1-12	Spring	AP94993	52	Micro switch	AP95043	124	Bottom trim, part of assembly of cabinet bottom AP95123	AP95065
1-13	Spring	AP94994	53	Spring—Fast forward lever	AP95044	125	Control panel trim, part of assembly of cabinet top AP95124	AP95066
1-14	Spring (4)	AP94995	54	Spring (2)	AP95045	126	Microphone trim, part of assembly of cabinet top AP95124	AP95067
2	Fast forward lever assembly	AP94996	55	Spring—clutch	AP95046	128	Knob, Volume control	AP95068
3	Idler lever assembly	AP94997	56	Spring—Head azimuth	AP95047	129	Cloth, under push buttons	AP95069
4	Fast forward idler	AP94998	57	Spring—Fast forward lever	AP95048	130	Socket nameplate, part of assembly of jack socket plate AP95126	AP95070
5	Rewind lever assembly	AP94999	58	Spring—Pinch roller	AP95049	131	Socket mounting plate, part of assembly of jack socket plate AP95126	AP95071
6	Rewind idler	AP95000	59	Spring—Release lever	AP95050	132	Tape mirror, part of assembly of cabinet top AP95124	AP95072
7	Reel base plate	AP95001	60	Record/playback head	AP9505079	133	Shield plate, part of assembly of cabinet bottom AP95123	AP95073
8	Reel (2)	AP95002	61	Erase head	AP95080	134	Microphone, internal	AP95074
9	Reel cap (2)	AP95003	80	Screw—2mm × 3mm panhead	AP94313	135	Level meter	AP95075
10	Take-up clutch assembly	AP95004	81	Screw—2mm × 5mm panhead	AP93698	150	Motor	AP95078
11	Take-up idler	AP95005	82	Screw—2mm × 7mm panhead	AP95104			
12	Rubber pad for brake (2)	AP95006	83	Screw—2mm × 12mm	AP54894			
13	Pinch roller lever	AP95007	84	Screw—2.6mm × 4mm Truss head	AP95105			
14	Pinch roller	AP95008	85	Screw—2mm × 4mm countersunk	AP93983			
15	Up lock plate assembly	AP95009	86	Screw—2mm × 6mm Flat head	AP91242			
16	Eject button	AP95010	87	Screw—2.6mm × 4mm Flat head	AP95111			
17	Moulding, battery box and motor mounting	AP95011	88	Screw—2mm × 5mm Self tapping	AP91381			
18	Motor pulley	AP95012	89	Screw—2.6mm × 6mm Self tapping	AP58374			
19	Rubber bush—motor mounting (2)	AP95013	90	Screw—2mm × 3mm slotted	AP95113			
20	Collar (2)	AP95014	91	Screw—2mm × 3mm grub	AP95107			
21	Tape counter	AP95015	92	Nut—2mm dia.	AP93701			
22	Push spring—cassette holder	AP95016	93	Washer—2mm dia. flat	AP93703			
23	Battery terminal plate + (2)	AP95017	94	Washer—plastic	AP95108			
24	Battery terminal spring - (2)	AP95018	95	Tag, terminal	AP95109			
25	Safety lock lever	AP95019	96	Washer—Teflon	AP95110			
26	Battery seal	AP95020	97	E Ring—1.5mm dia.	AP92705			
27	Release lever	AP95021	98	E Ring—2mm dia.	AP92975			
28	Cassette support	AP95022	99	E Ring—3mm dia.	AP92989			
29	Chassis mounting bracket	AP95023	100	E Ring—2.5mm dia.	AP93531			
30	Flywheel bearing plate	AP95024	101	Screw—2mm × 5mm Panhead	AP93698			
31	Spring	AP95025	102	Tag, terminal	AP95112			
32	Spring	AP95026	103	Screw—2mm × 5mm	AP95106			
33	Screen spring	AP95027	105	Screw—2mm × 5mm	AP95114			
34	Lead clamp—record head	AP95028	110	Top moulding, part of assembly of Cabinet top AP95124	AP95051			
35	Amplifier bracket	AP95029	111	Tuning meter bracket	AP95052			
36	Switch lever	AP95030						

Miscellaneous items not listed above.

Carrying case	AP95094
Earphone	AP95090
Erase plug	AP95091
Heat sink for Q102	AP95102
Jack socket (2), microphone/earphone	AP96083
Jack socket, remote	AP95084
Jack socket, 6V d.c.	AP95085
Knob (4), push button, silver	AP94979
Knob, push button, red	AP94980
Loudspeaker	AP95088
Microphone, external	AP95098
Slide switch S1	AP95087

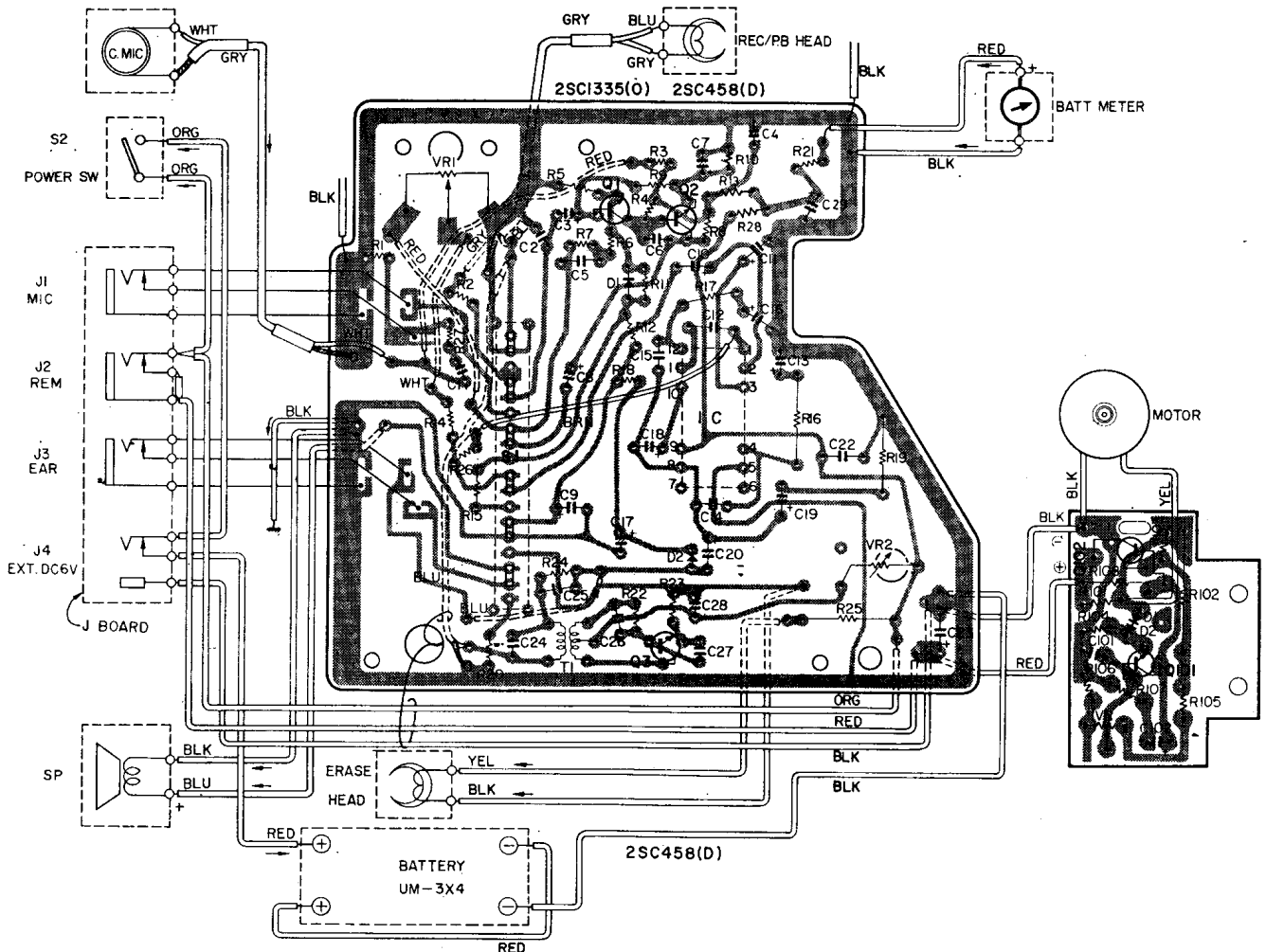


Fig. 4. Component and wiring layout

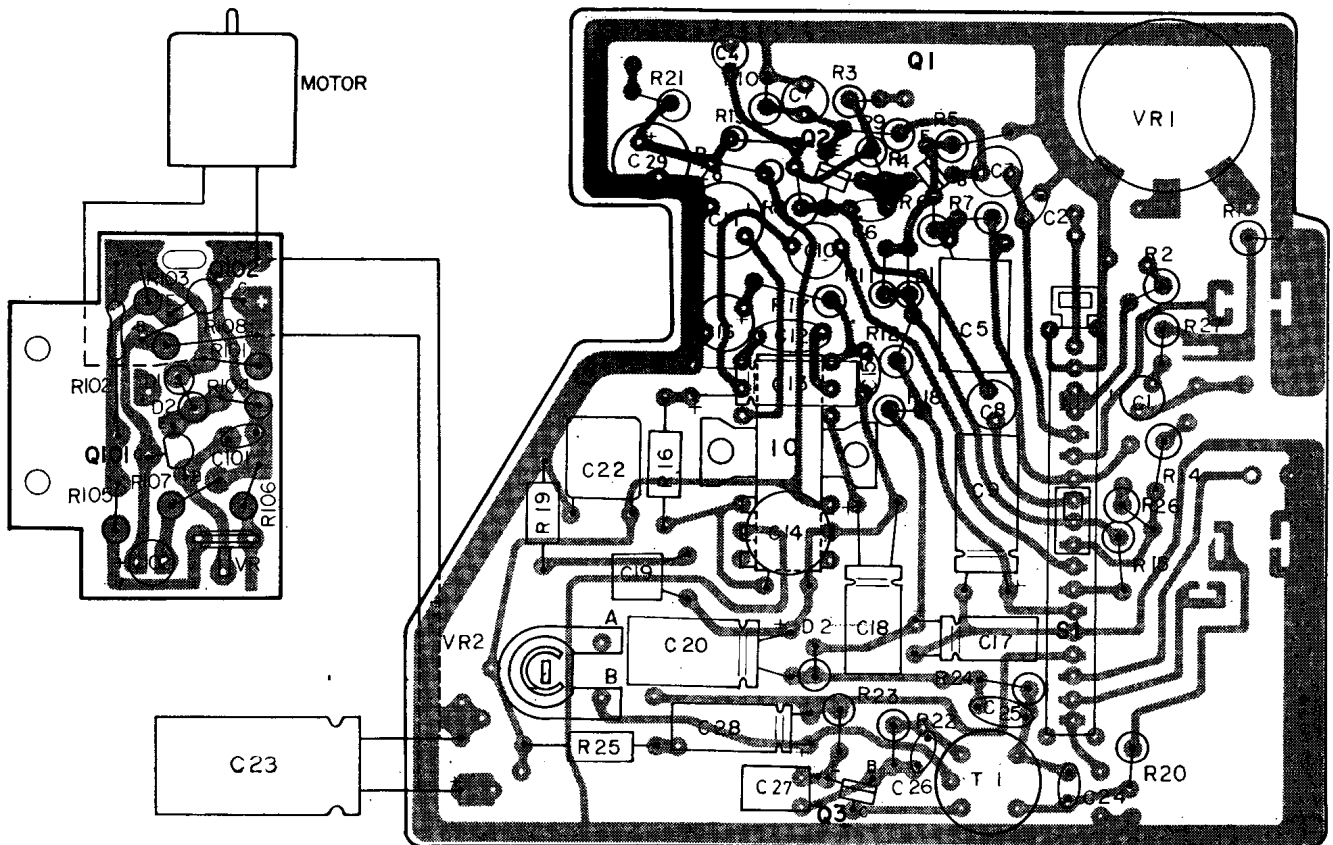


Fig. 5. Component and wiring layout

PARTS LIST

ELECTRICAL

ABBREVIATIONS: C—ceramic, A—aluminium, P—plastic,
E—electrolytic.

CAPACITORS

Ref.	Value	Rating (volts)	Type	Part Number
C1	0.33 μ F	25	A	AP95116
C2	0.0033 μ F		P	AP92474
C3	1 μ F	50	E	AP91348
C4	100 μ F	10	E	AP93070
C5	0.33 μ F	50	P	AP91016
C6	0.001 μ F	50	C	AP93193
C7	10 μ F	16	E	AP93597
C8	10 μ F	16	E	AP93597
C9	220 μ F	6.3	E	AP94257
C10	1 μ F	50	E	AP91348
C11	220 μ F	6.3	E	AP94257
C12	470pF	50	C	AP94062
C13	47 μ F	10	E	AP92882
C14	220pF	50	C	AP59587
C15	220pF	50	C	AP59587
C16	1 μ F	50	E	AP91348
C17	1 μ F	50	E	AP91348
C18	100 μ F	10	E	AP93070
C19	0.1 μ F	25	A	AP95115
C20	220 μ F	6.3	E	AP94257
C22	0.33 μ F	50	P	AP91016
C23	470 μ F	10	E	AP93430
C24	0.0022 μ F	50	P	AP92802
C25	0.0033 μ F		P	AP92474
C26	0.01 μ F	50	P	AP91848
C27	0.001 μ F	50	C	AP93193
C28	47 μ F	10	E	AP92882
C29	220 μ F	6.3	E	AP94257
C101	0.02 μ F	50	C	AP93673
C102	3.3 μ F	25	E	AP58224

RESISTORS—All 10% 0.25W

Ref.	Value (ohms)	Part Number
R1	1k	AP93370
R2	10	AP93360
R3	2.2k	AP93873
R4	22k	AP94119
R5	560	AP93619
R6	4.7k	AP93377
R7	33k	AP92719
R8	3.3k	AP93872
R9	220k	AP93624
R10	2.2k	AP93873
R11	100k	AP93180
R12	82	AP94114
R13	1k	AP93370
R14	1k	AP93370
R15	39k	AP93863
R16	68	AP94113
R17	1k	AP93370
R18	100	AP93616
R19	10	AP93360
R20	10	AP93360

RESISTORS—Continued

Ref.	Value (ohms)	Part Number
R21	15k	AP94118
R22	33k	AP92719
R23	33	AP94112
R24	27k	AP93864
R25	470	AP93618
R26	1M	AP57878
R27	3.9k	AP93376
R28	270	AP93365
R101-R106	see note below	
R104	270	AP93365

NOTE.—The following resistors may be within the values shown as required to satisfy the motor control circuit specification.

R101	470 to 680	$\frac{1}{4}$ W
R102	4.7 to 6.8	$\frac{1}{2}$ W
R103	5.6 to 100	$\frac{1}{4}$ W
R105	1.5k to 2.2k	$\frac{1}{2}$ W
R106	3.3k to 4.7k	$\frac{1}{2}$ W

RESISTORS—variable

Ref. No.	Value	Description	Part Number
VR1	10k	volume control	AP95081
VR2	1k		AP95082
VR100	500		AP95103

TRANSISTORS

Ref.	Type	Part Number
Q1	2SC1335	AP95118
Q2	2SC458	AP95119
Q3	2SC458	AP95119
Q101	2SC828	AP95121
Q102	2SB324	AP58943

DIODES

Ref.	Type	Part Number
D1	1S2076	AP95117
D2	1S2076	AP95117
D101	HV23G	AP95122
D102	HV23G	AP95122

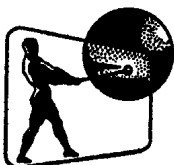
INTEGRATED CIRCUITS

Ref.	Type	Part Number
1C	HA1316	AP95120

TRANSFORMER

Ref.	Function	Part Number
T1	Oscillator transformer	AP96508

THE SERVICE DEPARTMENT



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