KRIESLER
AUSTRALASIA PTY. LIMITED

TECHNICAL ADVISORY SERVICE
SERVICE SHEET NO. 125

BOX 107 P.O. CARINGBAH N.S.W. 524-0444

PLEASE CIRCULATE TO YOUR SERVICE DEPARTMENT

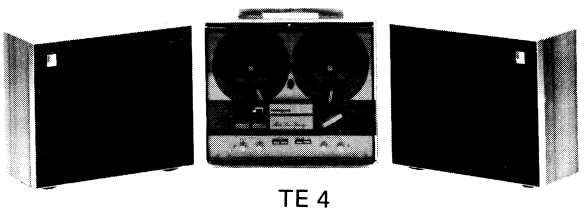
STEREOPHONIC TAPE RECORDERS

DESCRIPTION

Model TE 2 — This is a 19 transistor, 11 diode Stereo/Mono Tape Recorder housed in a vinyl covered timber cabinet with metal trim and suitable for 200v to 275v A.C. 50 Hz mains operating supplies. Primary tapped at 220v A.C.
Model TE 3 — Is the same control unit as the TE 2 plus two matching speakers which fit together in one carrying unit.
Model TE 4 — Is the same mechanical and electrical control unit as the TE 2/3 housed in an oiled teak timber cabinet with two extension speakers in matching timber cabinets. These speakers differ from the TE 3 and do not fit together for carrying.


TE 2


TE 3


TE 4

TECHNICAL SPECIFICATION

Heads:
1 x Play/Record Type — 1 x Erase Type

Speeds:
1-7/8, 3¾, 7½ IPS — Speed Change: Stepped pulley

Drive:
Capstan — Tracks: Stereo-Two, Mono-Four

Reel Size:
Maximum 7″ — Indexing: 3 unit digital counter

Fast Rewind:
6.5 ft. per sec. approx. — Fast Forward: 5.7 ft. per sec. approx.

Motor:
240v. Shaded pole. — Deck Assembly: Part No. 90-9114

Bias:
A.C. 96 KHz ± 4 KHz — Erase: A.C. 96 KHz ± 4 KHz

Power Input:
50 watts — Power Output: 3w rms per channel

Tone Range:
Bass ± 10db at 100 Hz, Treble ± 10db at 10 KHz

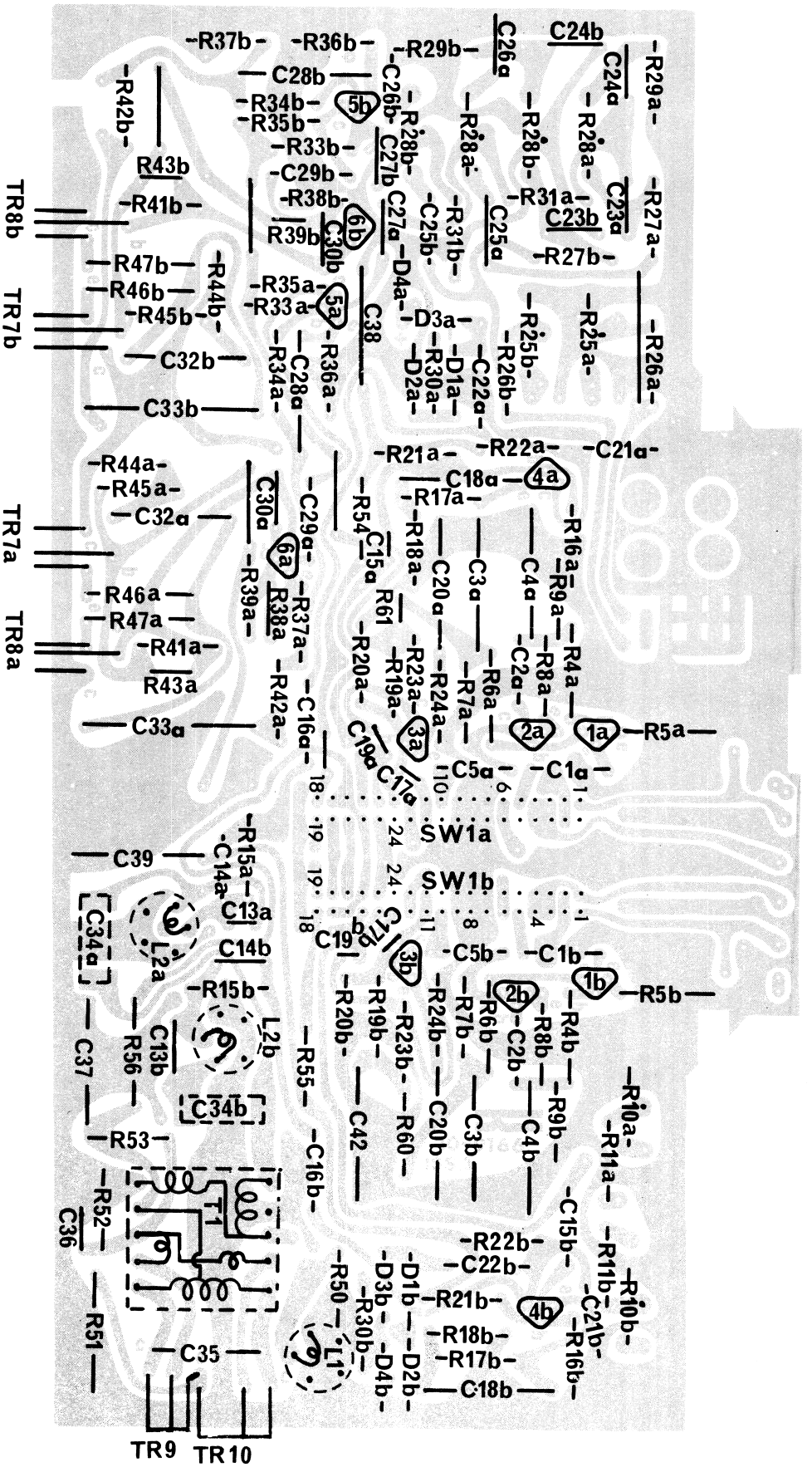
Inbuilt Speakers:
2 x 75S 1 Magnavox single cone, one per channel TE 2/3
2 x 525 M.S.P. single cone, one per channel TE 4

Level Meters:
150 uA full modulation, colour coded dial scale

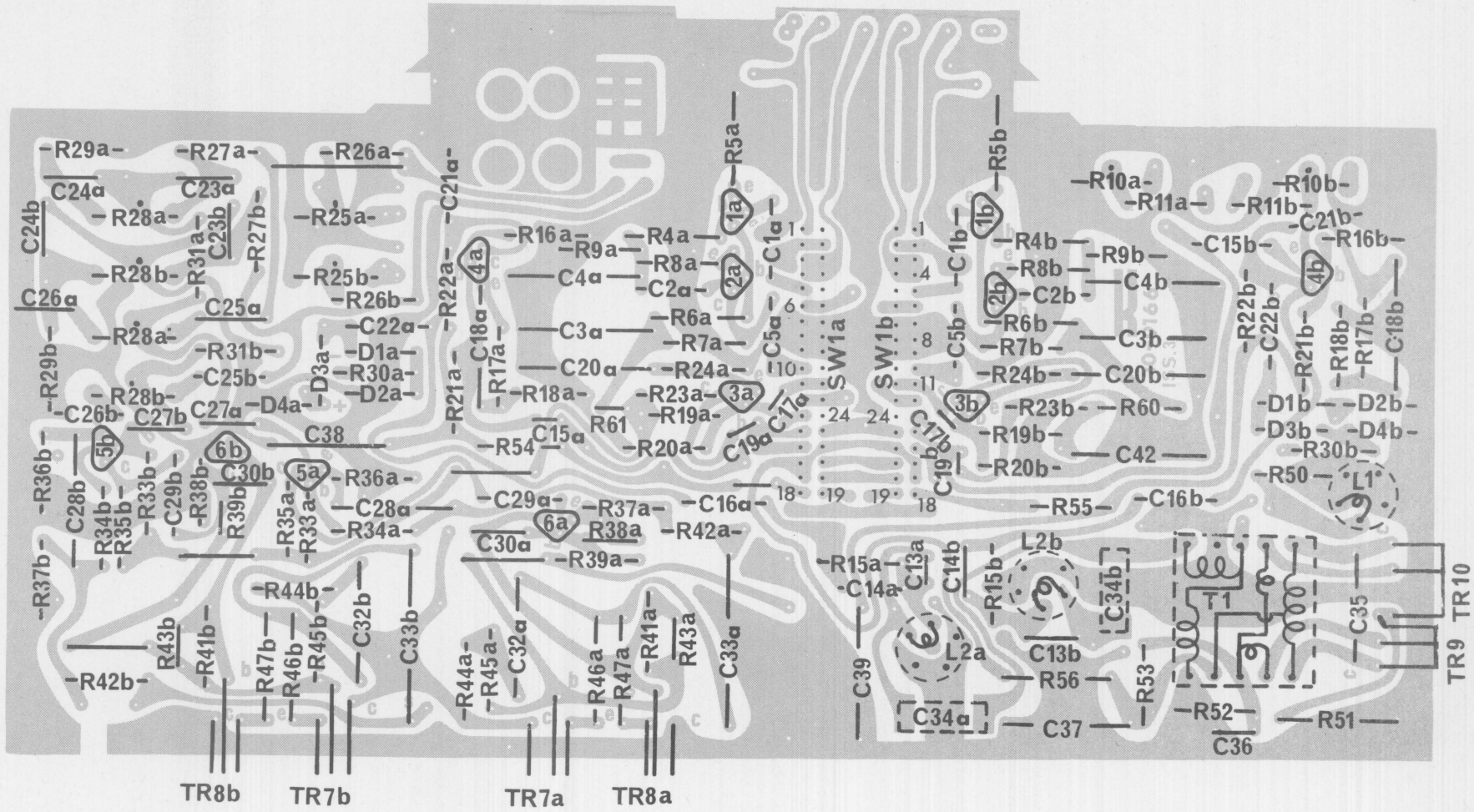
Jack Sizes	Function	Impedance	Levels
6mm	L & R Pre-amp inputs	200 ohms	200 uV to 8 mV rms
6mm	L & R Pre-amp outputs	3 K ohms	300 mV off fully mod. tape
6mm	L & R Monitor	8 ohms	3 watts rms
6mm	Stereo Headphones	100 ohms attenuator	(60 mW100 Ω load) (25 m W 10 Ω load)
3.5mm	L & R Aux. inputs/Record	25 K ohms	20 mV to 20 V rms
Phone connector	External Pick-up	500 K ohms	300 mV to 10 V rms

External speakers: TE 3: 8 PIX Twin Cone and 3 TC tweeter
TE 4: 6 WR Twin Cone and 3 TC tweeter

Dimensions:	Height	Width	Depth	Weight
TE 2/3 Console	14¼″	16″	9″	29½ lbs.
TE 3	(14¼″	16″	9″)	16½ lbs. total
(Ext. spkrs)	(with both boxes hinged together)			
TE 4	(14¼″	16″	6¾″)	11½ lbs. each box
	(	each box	)	
TE 4 Console	14¼″	16″	9″	28½ lbs.



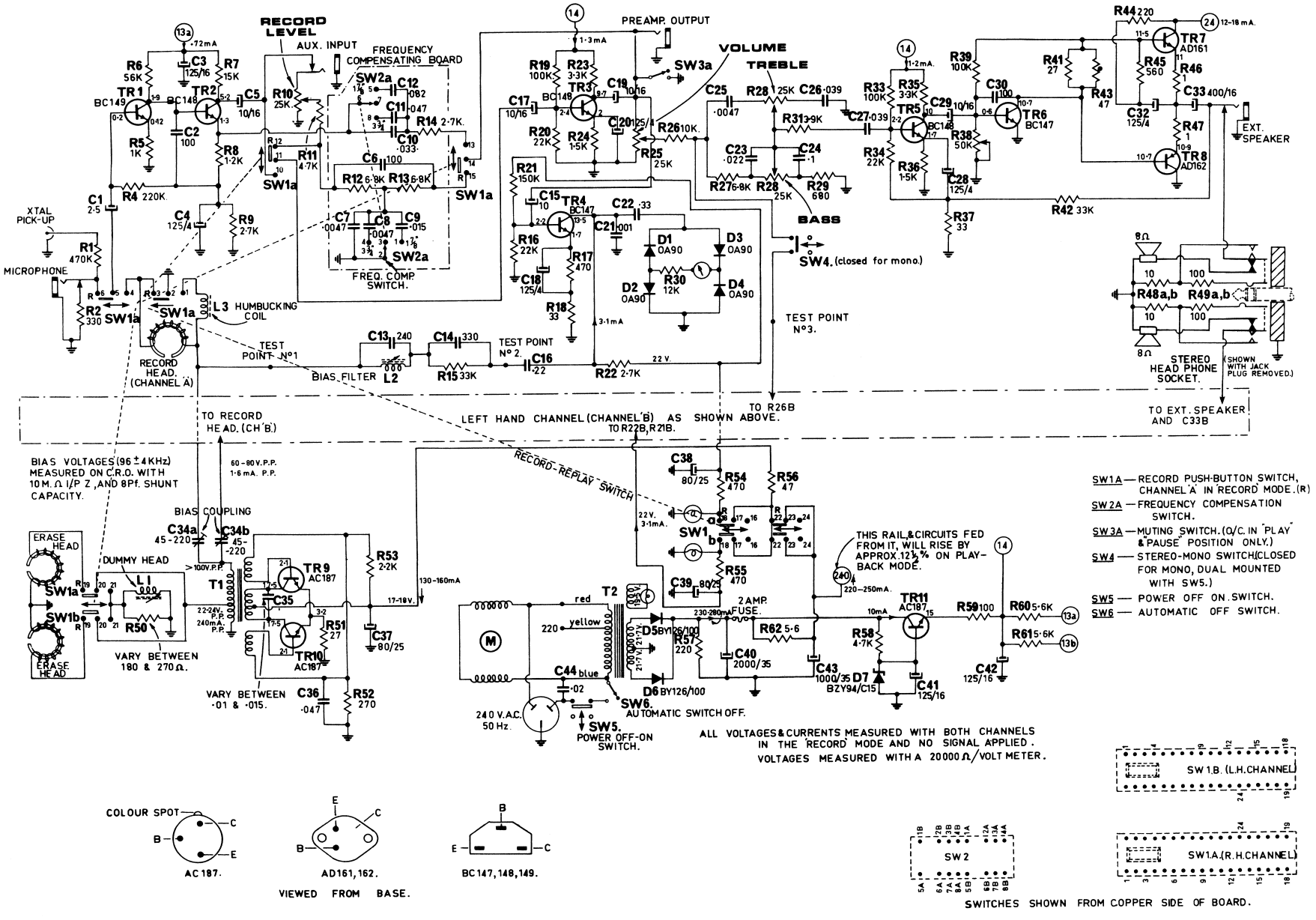
COMPONENT LAYOUT VIEWED FROM COPPER SIDE OF BOARD.

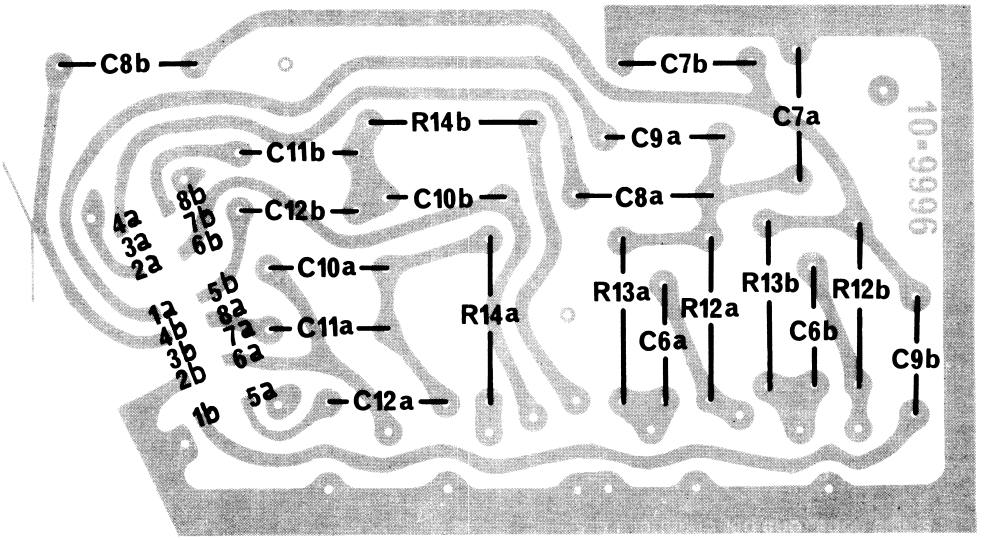


COMPONENT LAYOUT VIEWED FROM COPPER SIDE OF BOARD.

MODEL NO. T.E.2,3&4.

ISSUE 3 (29-8-69)





SERVICE ACCESS

To remove chassis from cabinet

1. Remove four No. 8 Phillips head self tapping screws from back of cabinet and two No. 8 Phillips head screws from base of cabinet.
2. Tilt cabinet forward and allow chassis to slide partially out of cabinet. Disconnect speaker leads, and open stowage compartment end flap.
3. Remove chassis from cabinet, and pull power cord through hole in stowage compartment.

To obtain access to mechanism below front panel.

1. Remove spools, head covers, all knobs.
2. Unscrew four chromium plated countersunk 1/8" whitworth screws.
3. Withdraw front panel.

MAINTENANCE AND LUBRICATION

Routine Maintenance

1. Dust and tape residue accumulated on the surface of the tape guide, the capstan and the pressure roller will cause a loss of positive drive and should be cleaned with a soft cloth dipped in alcohol or premium grade methylated spirit.
2. Clean heads as detailed in the customer's instructions.
3. Other solvents (i.e. thinners and petroleum) are not recommended.

De-Magnetizing the Head

1. The Record/Playback Head may acquire a degree of permanent magnetism after long use, which will increase the noise level and could cause erasure of pre-recorded high frequencies.
2. To de-magnetize the head it is recommended that a Demagnetizer be connected through a variable voltage transformer (e.g. variac) and the voltage wound down slowly to avoid residual magnetism in the head.

Lubrication

Oiling — Recommended once a year or every 1000 hours of use.
Lubricate with Shell G 960.

1. Front and rear motor bearings.
2. Fly wheel bearing.
3. Belt tensioner — take-up reel.

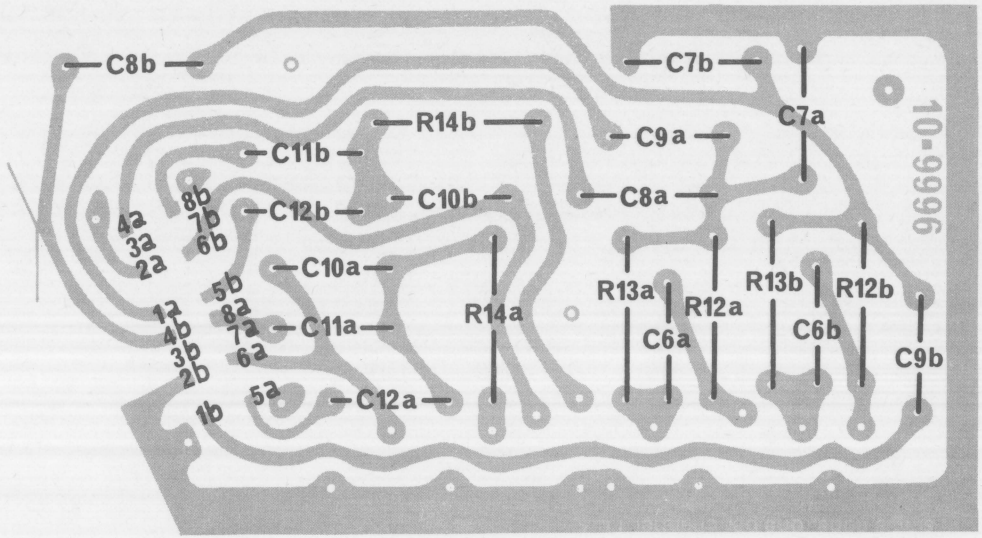
Greasing — Recommended after stripping down or once every two years or 2000 hours of use.
Strip down, clean and grease with Shell Darina II.

4. Pinch roller bearing.
5. Reel spindles (both supply and take-up).
6. Counter pulley shaft (one each located at the front and rear of the deck).
7. Slide bars.
8. Control cams.

CAUTION

Lubricate sparingly, avoid seepage of lubricant to adjacent areas. Take particular care not to lubricate brake or drive components such as belts, friction drives or brake bands. Should these become accidentally smeared, wipe off immediately and scrub with alcohol.

NOTE:— It is recommended that lubrication be carried out after prolonged storage.



SERVICE ACCESS

ELECTRICAL ADJUSTMENTS

Hum Level Adjustment

1. Disconnect motor and short circuit L3 A & B.
2. Connect C.R.O. across left channel speaker voice coil.
3. Load tape, switch to Pause/P.A. in the playback mode, turn volume controls and bass control to maximum.
4. Loosen power transformer mounting screws and swing power transformer left or right to obtain minimum hum level, as indicated on C.R.O.
5. Adopt the same procedure for the right channel, repeat this procedure several times and finally tighten power transformer in the position which gives the lowest hum level compromise for both channels.
6. Reconnect motor and remove short circuits across L3 A & B.
7. Connect C.R.O. across left channel speaker and move L3 B to obtain a minimum *clean* sine wave.
8. Connect C.R.O. across right channel speaker and move L3 A to obtain a minimum *clean* sine wave.
9. Repeat 7 & 9.

Note

1. The hum level is factory adjusted and it is only necessary to re-adjust after changing the record-replay head, power transformer or motor.
2. If C.R.O. is not available adjust audibly, i.e. listen with stereo phones.

Head Height and Azimuth Adjustment

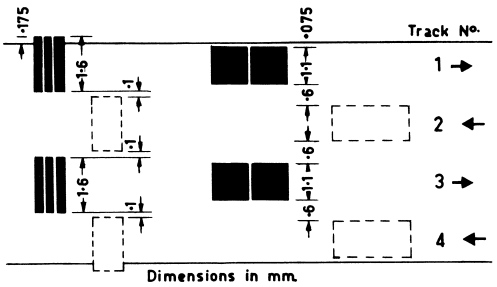
1. Load an alignment test tape (see note "b" below).
2. Connect a VTVM to the left channel ext. amp output socket.
3. Switch to Play/Record, recorder in the playback mode.

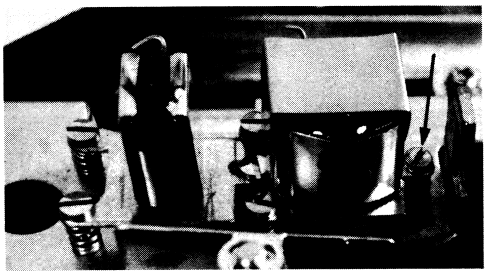
For head height adjustment:—

4. Whilst reading the output on the VTVM, adjust the three screws holding the head baseplate, half a turn in or out, until the signal is clear and reading maximum deflection on the VTVM.

For Azimuth adjustment:—

5. Follow the same procedure except that the single screw on the right is the only one to be adjusted whilst watching for maximum deflection of the VTVM.
6. Adopt the same procedure for the right channel and repeat several times for accurate alignment.





NOTE:—

a) After adjustment make a visual check to see that the face of the head is vertical to the baseplate and has good contact with the tape.

b) It is essential that the alignment tape be to NAB standards. We recommend that this be an Ampex Test Tape — Part No. 01-31321-01.

Record Bias Adjustment

This procedure should only be carried out after Head and Azimuth alignment.

A 1. To check the Record Bias connect an oscilloscope or VTVM (input impedance should exceed 10M ohms in parallel to 10pf) to the black lead on the head. Test Point No. 1 (see circuit).

2. Depress both Record Buttons and switch to Pause/P.A. Adjust trimmer capacitors, C34b (left channel) – C34a (right channel), to provide 70v peak to peak (24.8v rms on the VTVM).

3. Make recording on Phillips LP18 tape and check Record/Play frequency characteristics within $\pm\frac{4}{3}$db at 15 KHz (reference 1 KHz) measured at Pre-amp outputs. Each channel should be within 3db of each other.

Note

Bias voltage may be varied by ± 10% to obtain the above characteristic.

B Should either the Head or Bias Oscillator Transformer be changed repeat procedure A1 to A3 above plus the following:–

4. Measure the oscillator frequency which should be within the range 92 KHz to 100 KHz. If not in this range adjust the value of C35 (.01 to .015).

5. Check peak to peak volts as in A2 above.

6. Connect oscilloscope (or VTVM) between C14 and C16, Test Point No. 2, and adjust L2a (right channel) and L2b (left channel) for minimum output.

7. Repeat operations A2, B4 and B6 for optimum setting.

8. When both channels are adjusted satisfactorily put each channel in Record mode and adjust L1 to show a frequency as close as possible to that obtained in B4 above. The voltage on the head should read approximately the same as in operation A3 above; if not, vary the value of R50 to obtain this value.

Note

In Step 8 of above procedure: The value of R50 is factory set, it should only be necessary to alter this value if the erase head is changed.

Adjustment of Audio Power Amplifier Stages for Symmetrical output

This procedure should be carried out if TR6 (a, b) or TR7 (a, b) and TR8 (a, b) are changed.

1. Switch to Pause/PA in playback MONO mode.

2. Connect 8 ohms dummy loads in place of speakers.

3. Connect C.R.O. across dummy load, inject 1000 Hz from audio generator to test point 3 increase level until clipping occurs as indicated on C.R.O. Adjust R38A and R38B to give symmetrical clipping on right and left hand channel respectively.

Rewind Arm and Brake Adjustments

Rewind Arm

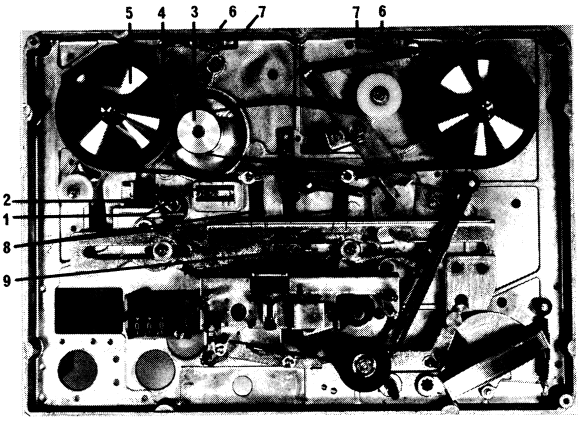
1. Switch to Stop/Tape load.
2. Loosen screw (1) and slide the rewind adjustment arm (2) to clear 0.6mm to 0.8mm between the motor pulley (3) and the rewind drive ring (4) which is located in the supply reel hub (5). Tighten screw (1).

Brake

1. Switch to Stop/Tape load or Pause/PA.
2. Loosen screws (6) and slide adjusting plates (7) until a clearance of 1.5mm to 2mm is obtained between the brake arms (8) and brake linkage plate (9). Tighten screws (6).
3. The correct brake tension is 450 to 500 gram/centimetres measured at the centre of the hubs, anti-clockwise for Supply Reel hub, clockwise for the Take-up hub, and 250 to 300 gm/cm in opposite directions.

Pressure Pads

1. Switch to Play/Record.
2. Check that pressure pads bear evenly on the surface and also over the centre of the record/replay head and erase head gaps.
3. Check pressure required to lift pressure pads off the head, this should be within the range of 60 to 80 grams.



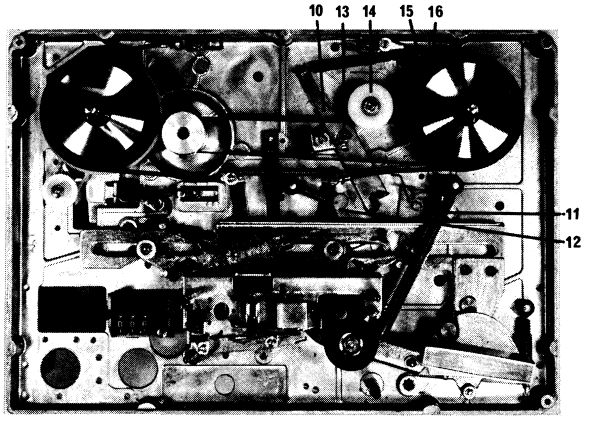
Take-up Torque and Tension Arm Adjustment

Take-up Tension Arm

1. Switch to Play/Record.
2. Adjust the tension arm plate (10) so that the lower end of the arm rests in the centre of the Fast forward linkage arm (11) and the Take-up release arm (12). Tighten screw (13).
3. When the Tape Function Switch is set to Fast Rewind, Stop/Tape Load or Pause/PA the Take-up release arm (12) will push the Take-up tension arm (10) and lift the pulley (14) from the belt, releasing the Take-up hub.

Take-up Torque

1. Switch to Play/Record.
2. Loosen screw (15) and slide adjustment plate (16) along the slot so that the take-up torque at the centre of the take-up reel becomes 240 to 280 gm/cm. Tighten screw (15).

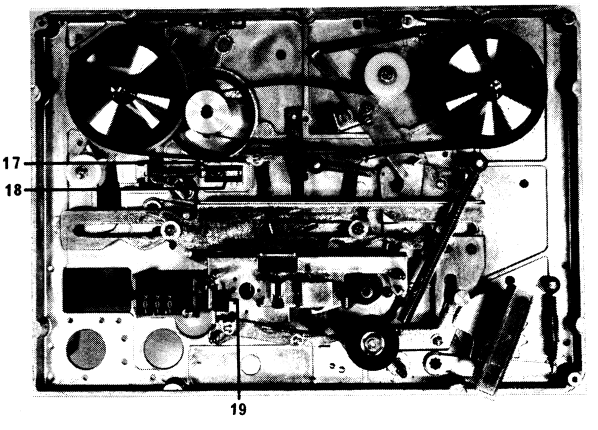


Rewind Torque Adjustment

1. Switch to Fast Rewind.
2. Loosen screw (17) and slide the adjustment plate (18) so that the rewind torque at the centre of the Supply reel hub is 400 to 600 gm/cm.

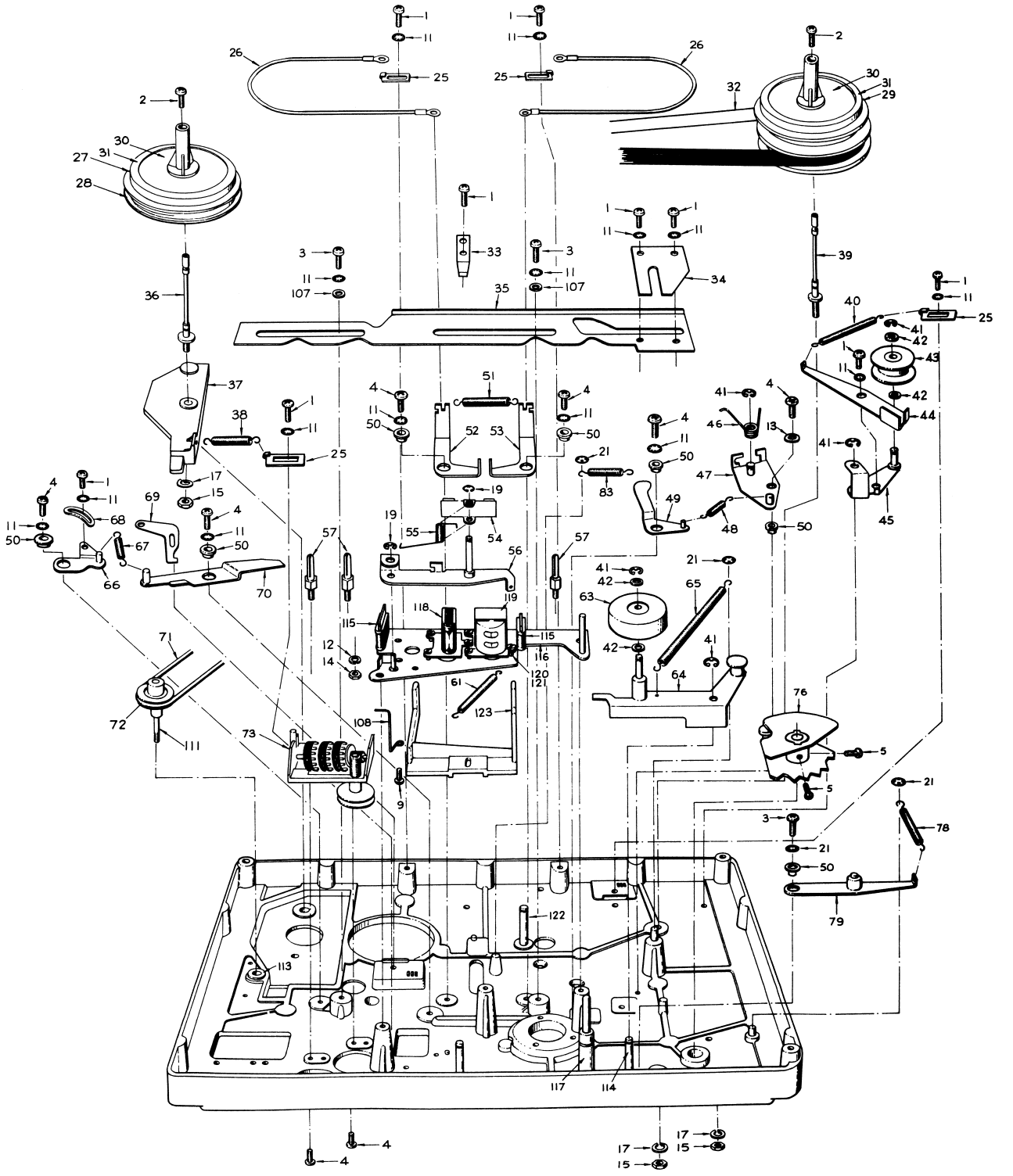
Note

a. Before undertaking torque and tension adjustments switch to Stop/Tape Load and insert a piece of paper between the "Autosafe switch off" pin (19) and the head base so as not to shut off power.
b. After making mechanical adjustments load tape and check deck operation in all modes under operating conditions.



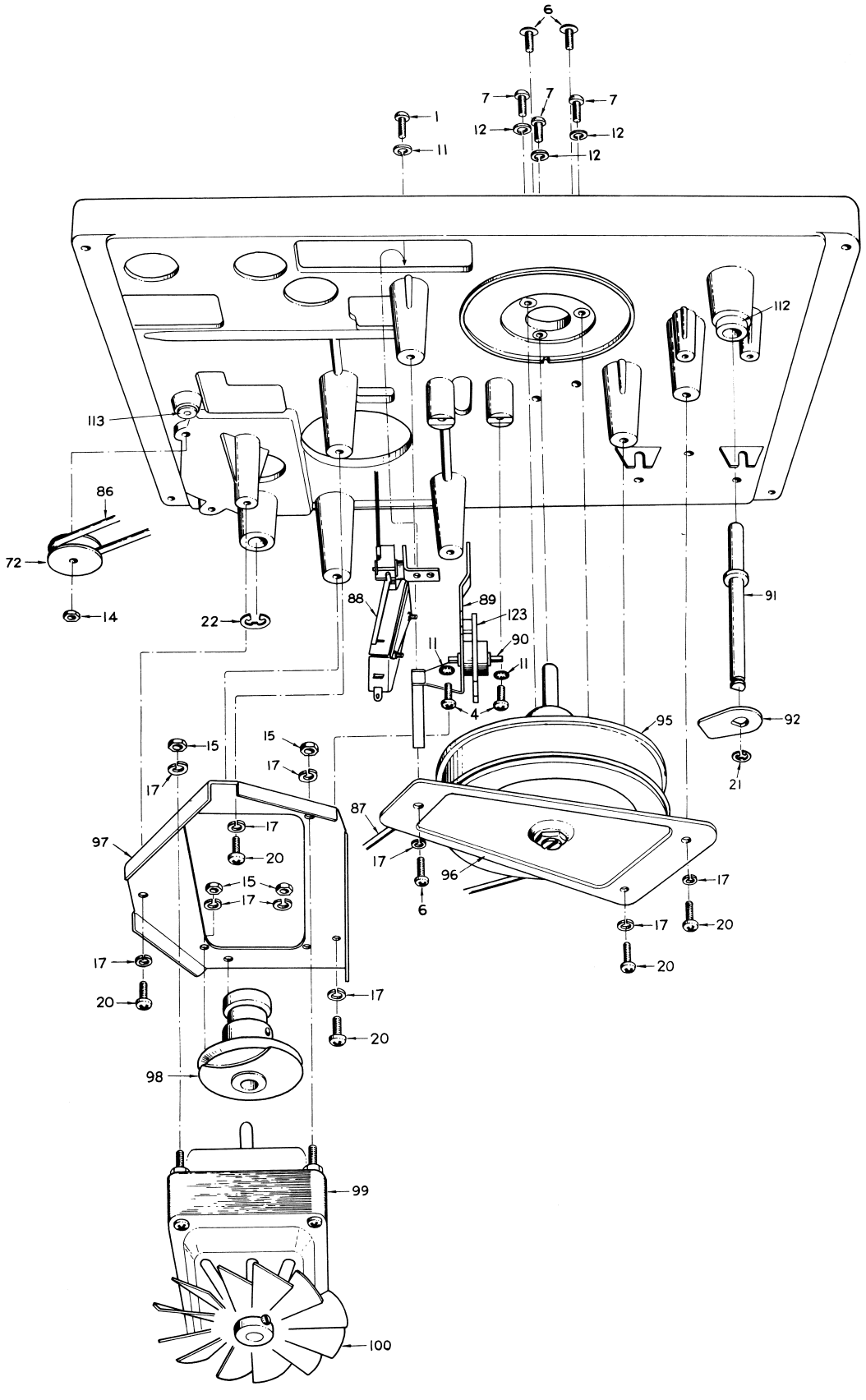
EXPLODED VIEW OF TRANSPORT MECHANISM

Parts below Tape Deck



EXPLODED VIEW OF TRANSPORT MECHANISM

Parts above Tape Deck



DECK PARTS LIST

	Part No.	Description
1	E-12	Screw M 3 x 6 round head phillips
2	E-11	Screw M 3 x 5 round head phillips
3	E-14	Screw M 3 x 10 round head phillips
4	E-59	Screw M 3 x 8 round head phillips
5	E-101	Screw M 4 x 6 round head phillips
6	E-20	Screw M 4 x 10 pan head phillips
7	E-60	Screw M 3 x 12 round head phillips
8	E-55	Screw M 3 x 15 round head phillips
9	E-3	Screw M 2 x 5 cylinder head
11	E-33	Washer 3mm toothed lock
12	E-27	Washer 3mm spring
13	E-30	Washer 3mm steel flat
14	E-22	Nut 3mm hexagonal
15	E-77	Nut 4mm hexagonal
17	E-28	Washer 4mm spring
19	E-53	E-23 E ring
20	E-19	Screw 4 x 10 round head phillips
21	E-132	Stopper 4mm
22	E-133	E-7 E ring
25	C-1201	Take-up spring plate
26	C-1061	Brake wire
27	C-1320	Supply reel hub
28	C-1123	Rewind belt
29	C-1313	Take-up reel hub
30	H-1117	Rub hub spin
31	C-1321	Reel cushion
32	C-1075	Take-up belt
33	C-1240	Speed change arm spring
34	C-1113	Slide arm adjust plate
35	C-1031	Slide arm
36	C-5	Reel hub shaft
37	C-1231	Supply reel hub arm
38	C-1139	Rewind spring
40	C-1294	Tension arm spring
41	E-43	E-3.2 E ring
42	C-116	4mm Mylar washer
43	C-2064	Tension pulley
44	C-1006	Tension arm adjust plate
45	90-9816	Tension arm assembly
46	C-1265	F.F. linkage arm spring
47	90-9817	F.F. linkage arm assembly
48	C-1337	F.F. tension spring
49	C-1021	Tension linkage arm
50	C-1105	Washer A
51	C-1062	Brake spring
52	C-1013	Brake arm left
53	C-1014	Brake arm right
54	90-9824	Tape pad assembly
55	C-1258	Tape pad spring D
56	90-9825	Tape pad arm assembly
57	C-1249	Head cover guide D
61	C-1259	Tape pad arm spring
63	C-1195	Pressure roller
64	90-9820	Pressure roller assembly
65	C-1264	Pressure roller spring
66	C-1262	Rewind arm
67	C-1137	A to switch spring
68	C-1144	Rewind arm adjust plate
69	C-1253	Auto switch linkage plate
70	C-1230	Brake linkage plate
71	C-1053	Counter belt A
72	C-1051	Counter inter pulley
73	C-1055	Tape counter
76	90-9189	Control cam assembly
78	C-1268	Control stopper spring
79	90-9818	Control cam lock plate assembly
86	C-1054	Counter belt B
87	C-1147	Driving belt
88	90-9826	Auto switch assembly
89	90-9827	Speed change arm assembly
90	C-1239	Speed change arm shaft
91	26-9152	Control cam shaft
92	C-1247	Cut off switch cam
95	CA-1007	Fly-wheel assembly
96	C-1343	Fly-wheel plate
97	C-1245	Motor holder C
98	C-1355	Motor pulley F
99	C-1340	Motor
100	C-1172-1	Motor fan
107	C-1106	Washer B
108	C-1256	Auto switch guide
111	C-1052	Counter inter pulley shaft
112	C-1234	Shaft bearing
113	C-1228	Counter inter bearing
114	C-1131	Pressure roller arm shaft
115	C-1084	Tape guide A black
116	90-9821	Head base assembly
117	C-1248	Head cover guide C
118	90-9822	Erase head assembly
119	90-9823	Record/Replay head assembly
120	E-4	Head adjust screw (2 x 8 mm.).
121	C-43	Head adjust spring
122	C-1227	Tension arm shaft
123	20-9193	Tape lifter
124	20-9994	Frequency compensation switch actuator

ELECTRICAL PARTS LIST

R 1 A & B	470 K ohms		±10%		½ watt	
R 2 A & B	330 ohms		±10%		½ watt	
R 4 A & B	220 K		± 5 %		½ watt	I.R.H. Hi - Stab.
R 5 A & B	1 K ohm		± 5%		½ watt	I.R.H. Hi - Stab.
R 6 A & B	56 K ohms		± 5%		½ watt	I.R.H. Hi - Stab.
R 7 A & B	15 K ohms		±10%		½ watt	
R 8 A & B	1.2 K ohms		±10%		½ watt	
R 9 A & B	2.7 K ohms		±10%		½ watt	
R 10 A & B	Record level	control	25 K ohms	32-9170		
R 11 A & B	4.7 K ohms		±10%		½ watt	
R 12 A & B	6.8 K ohms		±10%		½ watt	
R 13 A & B	6.8 K ohms		±10%		½ watt	
R 14 A & B	2.7 K ohms		±10%		½ watt	
R 15 A & B	33 K ohms		±10%		½ watt	
R 16 A & B	22 K ohms		±10%		½ watt	
R 17 A & B	470 ohms		±10%		½ watt	
R 18 A & B	33 ohms		±10%		½ watt	
R 19 A & B	100 K ohms		±10%		½ watt	
R 20 A & B	22 K ohms		±10%		½ watt	
R 21 A & B	150 K ohms		±10%		½ watt	
R 22 A & B	2.7 K ohms		±10%		½ watt	
R 23 A & B	3.3 K ohms		±10%		½ watt	
R 24 A & B	1.5 K ohms		±10%		½ watt	
R 25 A & B	Volume		control	25 K ohms	32-9169	
R 26 A & B	10K		±10%		½ watt	
R 27 A & B	6.8 K ohms		±10%		½ watt	
R 28 A & B	Tone		control	25 K ohms	32-9168	
R 29 A & B	680 ohms		±10%		½ watt	
R 30 A & B	12 K ohms		±10%		½ watt	
R 31 A & B	3.9 K ohms		±10%		½ watt	
R 32 A & B						
R 33 A & B	100 K ohms		±10%		½ watt	
R 34 A & B	22 K ohms		±10%		½ watt	
R 35 A & B	3.3 K ohms		±10%		½ watt	
R 36 A & B	1.5 K ohms		±10%		½ watt	
R 37 A & B	33 ohms		±10%		½ watt	
R 38 A & B	50 K ohms		Pre-set		I.R.H. type P4	
R 39 A & B	100 K ohms		±10%		½ watt	
R 41 A & B	27 ohms		±10%		½ watt	
R 42 A & B	33 K ohms		±10%		½ watt	
R 43 A & B	47 ohms	thermistor	Phillips	B832001/A50E	±10%	
R 44 A & B	220 ohms		±10%		½ watt	
R 45 A & B	560 ohms		±10%		½ watt	
R 46 A & B	1 ohm		±10%		I.R.H. type BW½	
R 47 A & B	1 ohm		±10%		I.R.H. type BW½	
R 48 A & B	10 ohms		±10%		1 watt	
R 49 A & B	100 ohms		±10%		1 watt	
R 50	180 to 270 ohms		±10%		½ watt	
R 51	27 ohms		±10%		1 watt	
R 52	270 ohms		±10%		½ watt	
R 53	2.2 K ohms		±10%		½ watt	
R 54	470 ohms		±10%		½ watt	
R 55	470 ohms		±10%		½ watt	
R 56	47 ohms		±10%		1 watt	
R 57	220 ohms		±10%		I.R.H. PW5	
R 58	4.7 K ohms		±10%		½ watt	
R 59	100 ohms		±10%		½ watt	
R 60	5.6 K ohms		±10%		½ watt	
R 61	5.6 K ohms		±10%		½ watt	
R 62	5.6 ohms		±10%		1 watt	

C 1 A & B	2.5 uf	64 V	electrolytic
C 2 A & B	100 pf	630 V	styroseal
C 3 A & B	125 uf	16 V	electrolytic
C 4 A & B	125 uf	4 V	electrolytic
C 5 A & B	10 uf	16 V	electrolytic
C 6 A & B	100 pf	630 V	styroseal
C 7 A & B	.0047 uf	50 V	styroseal
C 8 A & B	.0047 uf	50 V	styroseal
C 9 A & B	.015 uf	250 V	metalised polyester
C 10 A & B	.033 uf	250 V	metalised polyester
C 11 A & B	.047 uf	250 V	metalised polyester
C 12 A & B	.082 uf	250 V	metalised polyester
C 13 A & B	240 pf	100 V	styroseal
C 14 A & B	330 pf	630 V	styroseal
C 15 A & B	10 uf	16 V	electrolytic
C 16 A & B	.22 uf	250 V	metalised polyester
C 17 A & B	10 uf	16 V	electrolytic
C 18 A & B	125 uf	4 V	electrolytic
C 19 A & B	10 uf	16 V	electrolytic
C 20 A & B	125 uf	4 V	electrolytic
C 21 A & B	.001 uf	100 V	styroseal
C 22 A & B	.33 uf	250 V	metalised polyester
C 23 A & B	.022 uf	250 V	metalised polyester
C 24 A & B	.1 uf	250 V	metalised polyester
C 25 A & B	.0047 uf	50 V	styroseal
C 26 A & B	.039 uf	250 V	metalised polyester
C 27 A & B	.039 uf	250 V	metalised polyester
C 28 A & B	125 uf	4 V	electrolytic
C 29 A & B	10 uf	16 V	electrolytic
C 30 A & B	100 pf	600 V	styroseal
C 32 A & B	125 uf	4 V	electrolytic
C 33 A & B	400 uf	16 V	electrolytic
C 34 A & B	45 to 220 pf trimmer type CWA/9		
C 35	.01 to .015 uf	200 V	styroseal
C 36	.047 uf	25 V	disc ceramic
C 37	80 uf	25 V	electrolytic
C 38	80 uf	25 V	electrolytic
C 39	80 uf	25 V	electrolytic
C 40	2000 uf	35 V	electrolytic
C 41	125 uf	16 V	electrolytic
C 42	125 uf	16 V	electrolytic
C 43	1000 uf	40 V	electrolytic
C 44	.022	1000 V	disc ceramic

T 1	Bias oscillator transformer	18-9199
T 2	Power transformer	18-9159
L 1	Dummy head coil	14-9109
L 2 A & B	Bias trap	14-9108
L 3 A & B	Hum cancelling coil	14-9953
SW 1	Record/Replay switch	MS 2023-12
SW 2	Frequency compensation switch	17-9970
SW 3	Muting switch	90-9910
SW 4)	Stereo/Mono switch and	
SW 5)	power OFF/ON switch	17-9160
SW 6	See deck parts list	

MISCELLANEOUS PARTS LIST

Pilot lamps		24 V 35 mA
Pilot lamp sockets		90-9972
Pilot lamp retaining grommets		90-9971
Record meter		17-9160
Record meter mounting pads		40-9177
Record meter mounting screws	(2mm)	26-9196
Xtal 1/P phono jack		Carr-Fastener 733-23-26
Aux. 1/P jack	(3½mm)	MOJ B1SR
Mic jack	(6mm)	GU 3G
Ext. Amp. jack	(6mm)	GU 4G
Ext. Spkr. jack	(6mm)	GU 3G
Stereo headphone jack	(6mm)	JL 029
Insulating washers for 6mm jacks		.364 ID x .550 OD x .010 leatheroid
Insulating bushes for 6mm jacks		20-9175
Carrying handle		36-9964
Carrying handle insert		16-9124
Carrying handle hinge		90-9965
Carrying handle hinge pin		26-9966
Function control knob		36-9973
Function control knob insert		16-9129
Function control shaft		26-9152
Head cover — upper		20-9974
Head cover — upper insert		16-9127
Head cover — lower		20-9975
Head cover — lower insert		16-9128
Speed change knob		20-9150
Record level knob		26-9154
Volume knob right channel		26-9155
Bass knob		26-9155
Volume knob left channel		26-9153
Treble knob		26-9153
Nylon knob inserts		20-9158
Rubber feet		40-9095
Stowage compartment		20-9179
Stowage compartment lid		16-9187
Stowage compartment surround		20-9123
Stowage compartment end cover		10-9987
Jack panel overlay		16-9144
Jack panel lid		16-9173
Jack panel surround		20-9122
Push button	— black	M.S.P. Series 700 type C
Push button	— insert	16-9989
Spool retainer	— rubber	40-8170
Spool retainer — insert		16-9176
Front panel top overlay		16-9125
Control panel	— aluminium extrusion	16-9120
Control panel	— overlay	16-9126
Specification panel	— overlay	16-9986
Counter window		20-9192
Bezel — orange		20-9162 A
Bezel — red		20-9162 B
End trim (aluminium extrusion) TE 2 cabinet		16-9118
TE 3 speaker box trim (aluminium extrusion)		16-9198
Lid catch TE 2	— lever	16-9131
	— button	26-9156
	— bush	26-9157
Lid catch TE 3 speaker box	— Lever	16-9106
	— button	26-1000
	— bush	26-9157
	— clip	
Chromium hinge assembly for TE 2 and TE 3	— long pin	46-9968
	— short pin	46-9967
Acrylic lid	— TE 4	20-9947
Acrylic lid hinge	— TE 4	20-9949
Lid catch TE 4	— lever	16-9948
	— button	26-9951
	— bush	26-9952
TE 4 Cabinet trim (aluminium extrusion)		16-9945
TE 4 Speaker box trim (aluminium extrusion)		16-9946
Record/Replay mechanical latching assembly		90-9911
Latching drive pin	— nylon	20-9149
Latching drive pin slide	— nylon	20-9148

TROUBLE SHOOTING CHART

Symptom	Cause	Remedy
AC cord connected to recorder and control knob set in STOP position, but motor does not revolve	1. Defective AC cord. 2. Loose AC connection at connection block 3. OFF/ON switch inoperative. 4. Auto safe off switch inoperative. 5. Motor is defective.	1. Replace AC cord. 2. Repair loose connection. 3. Replace OFF/ON switch. 4. Check shut off pin and its position. Check mechanism of switch and replace if necessary. 5. Replace motor.
Motor turns on, but tape does not move in any mode.	1. Loose motor pulley.	1. Tighten screw of pulley on motor shaft.
Motor turns on, but capstan does not revolve.	1. Driving belt broken. 2. Slipping motor pulley or flywheel. Greasy driving belt. 3. Flywheel bearing stiff.	1. Replace driving belt. 2. Clean with alcohol, driving belt, flywheel, and motor pulley. 3. Clean and oil.
Rewind mode operates properly, but weak tape transport in Play/Record and Fast Forward modes.	1. Insufficient tension on takeup belt. 2. Greasy takeup belt, motor pulley and/or reel hub.	1. Adjust takeup tension on the belt. 2. Clean with alcohol.
Rewind mode operates properly, but excessive takeup power of tape in both Forward modes	1. Excessive takeup tension on takeup belt. 2. Dirty takeup belt.	1. Adjust takeup tension on the belt. 2. Clean with alcohol, and apply graphite.
Rewind mode operates properly, but no tape transport in Play/Record and Fast forward modes.	1. Takeup belt broken. 2. No takeup tension on takeup belt.	1. Replace takeup belt. 2. Adjust takeup tension on the belt.
Play/Record & Fast forward modes operate properly, but no tape transport in rewind mode.	1. Rewind belt broken. 2. Improper rewind torque. 3. Supply reel hub does not move.	1. Replace rewind belt. 2. Adjust rewind torque. 3. Clean and lubricate moving plate.
Tape counter inoperative.	1. Counter belt broken or worn out. 2. Oily counter belt. 3. Counter pulley shaft stiff.	1. Replace counter belt (A or B) 2. Clean with alcohol. 3. Clean and grease.
Tape spills or insufficient braking.	1. Faulty brake adjustments. 2. Brake spring loose or broken.	1. Adjust brakes. Replace brake wires if necessary. 2. Replace brake spring.
Tape speed slows down in Play/Record mode.	1. Defective bearing of flywheel. 2. Excessive hold-back tension on pressure roller. 3. Improper adjustment of takeup torque.	1. Replace flywheel assembly. Clean dirty bearing and apply oil. 2. Clean dirty roller and apply grease. 3. Adjust takeup tension on takeup belt.
Speed irregularities (wow & flutter) in record or play mode.	1. Pressure roller not making good contact with capstan. 2. Dirty or oily pressure roller and capstan. 3. Irregularities in pressure roller driving surface. 4. Defective bearing of flywheel. 5. Excessive hold-back tension on pressure roller. 6. Tension pulley stiff.	1. Check pressure roller arm spring and replace if necessary. 2. Clean with alcohol. 3. Replace pressure roller. 4. Replace flywheel. Clean and apply oil as required. 5. Clean and apply grease as required. Replace pressure roller. 6. Clean and apply oil as required.
Wow & Flutter in record or play mode on the later part of tape in reel.	1. Excessive hold back tension of supply reel hub. 2. Brakes are not completely releasing. 3. Tension pulley dry.	1. Remove supply reel hub and apply grease to reel hub shaft. 2. Make brake adjustments. 3. Clean and lubricate.
Weak and distorted sound in record or play, and poor erasing.	1. Tape (running the surface of heads) not making good contact with heads.	1. Check and replace tape pad felt. 2. Check and replace tape pad arm spring and adjust tape pressure to heads. 3. Clean heads.
Power On, indicator lights but no record or playback.	1. Defective internal power supply circuit. 2. Dirty Record/Play head.	1. Check the prescribed amplifier voltages provided. 2. Clean with alcohol.
Sufficient record or playback on Left channel but no record or play-back on Right channel.	1. Defective circuit on Right channel. 2. Defective head. 3. Muting switch out of adjustment.	1. Check voltages right channel amplifier. Check lead wire connection for record/play head. Check cord connections to MIC or AUX on right channel. 2. Replace head. 3. Re-adjust muting switch or replace.
Sufficient playback, but weak record on both channels.	1. Bias erase oscillator circuit not working properly. 2. Loose connection or wrong connection of Record input signal.	1. Check bias oscillator circuit and voltage on amplifier. Replace defective component parts as necessary. 2. Repair loose connection or make correct connection of MIC or AUX inputs.

Poor high frequency response in Record or play mode.	1. Dirty Record/Play head. 2. Record/Play head improperly aligned. 3. Improper bias current. 4. Record/Replay head worn.	1. Clean with alcohol. 2. Adjust head alignment. 3. Adjust Bias voltage. 4. Replace head and re-align.
Hum in Record or play mode.	1. Strong induction magnetic field exists around the head. 2. Improper grounding of Recording input or playback output when plug in. 3. Faulty filter capacitors. 4. Hum adjustment incorrect.	1. Do not place fluorescent light amplifier, and/or transformer near the recorder. 2. Check connecting cables and connect in the designated jack. 3. Check and replace faulty capacitors. 4. Refer to electrical adjustments.
Weak erasing or no erase.	1. Defective bias oscillator circuit. 2. Erase head improperly aligned. 3. Defective lead wire connection to erase head. 4. Dirty erase head. 5. Defective erase head.	1. Check bias oscillator circuit and voltage on oscillator circuit. 2. Adjust head alignment. 3. Check connections. 4. Clean with alcohol. 5. Replace erase head.
Sufficient record and playback, but Level meter does not work.	1. Defective meter. Needle of meter sticks. 2. Defective circuit for Level meter.	1. Replace meter. 2. Repair circuit.
Tape reaches to the end, but power is still on.	1. "Auto safe switch off" inoperative.	1. If pin is stayed in On position check switch mechanism. When the pin in Off position replace switch.
While running the tape, "Auto safe switch off" shuts off power.	1. Wrong position of shut off pin.	1. Adjust and correct the position of pin.
Record meter/s show deflection in Stereo record mode with no input signal.	1. Defective bias oscillator circuit. 2. Defective erase head.	1. Check bias oscillator circuit and check circuit alignment (see electrical adjustments). 2. Replace erase head.
Recorder in left channel record mode and left channel meter indicating with no input signal — O.K. in stereo record mode.	1. Defective erase head. 2. L1 defective or out adjustment. 3. R50 incorrect value.	1. Replace erase head. 2. Replace or re-align as necessary (see electrical adjustments). 3. Replace R50 and re-align (see electrical adjustments).