

**Resistors**

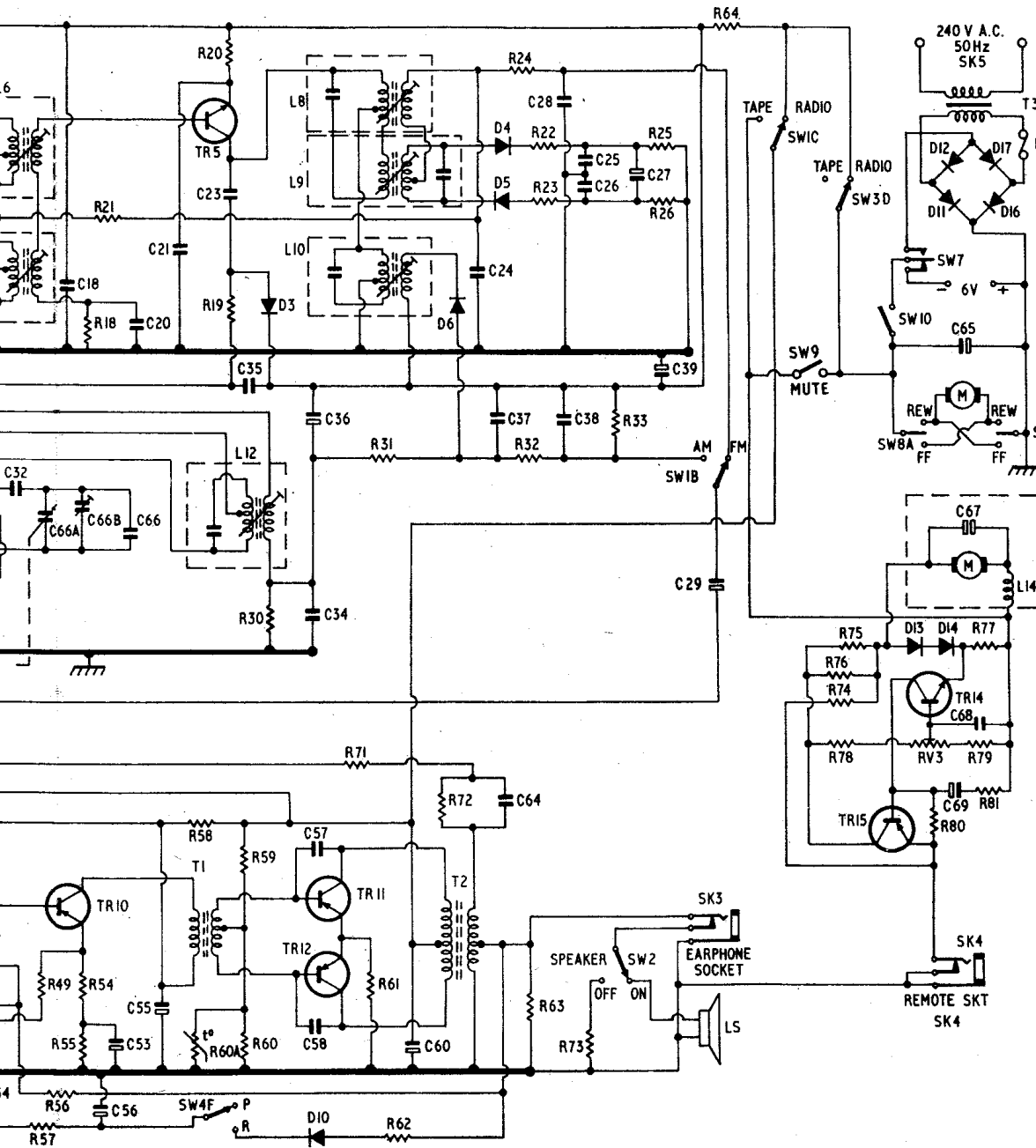
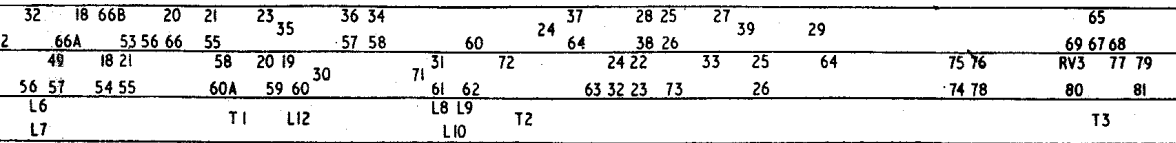
R1	560Ω	B2
R2	6.8kΩ	B2
R3	68kΩ	B2
R4	2.7kΩ	B2
R5	15kΩ	B2
R6	22kΩ	B2
R7	2.7kΩ	B1
R8	470Ω	B1
R9	270Ω	B1
R10	180kΩ	B1
R11	180Ω	B1
R12	470Ω	B1
R13	100kΩ	B1
R14	33kΩ	B1
R15	270Ω	A1
R16	470Ω	A1
R17	27kΩ	A1
R18	180kΩ	A2
R19	15kΩ	A2
R20	1kΩ	A2
R21	560kΩ	A2
R22	1kΩ	A2
R23	1kΩ	A1
R24	1.2kΩ	A2

R25	6.8kΩ	A1
R26	6.8kΩ	A1
R27	12kΩ	B2
R28	56kΩ	B2
R29	1.8kΩ	B2
R30	47kΩ	A2
R31	10kΩ	A1
R32	1kΩ	A1
R33	5.6kΩ	A1
R34	100kΩ	—
R35*	270Ω	—
R36	22kΩ	C4
R37	10kΩ	C4
R38	18kΩ	C4
R39	1kΩ	C3
R40	270Ω	C3
R41	10kΩ	C4
R42	2.7kΩ	C4
R43	1kΩ	C4
R44	10kΩ	—
R45	27kΩ	C3
R46	3.9kΩ	C3
R47	680Ω	C4
R48	10kΩ	C3
R49	27kΩ	C4
R50	56kΩ	C4

R51	18kΩ	C4
R52	2.7kΩ	C4
R53	47Ω	C4
R54	12Ω	C4
R55	270Ω	C4
R56	39kΩ	C4
R57	2.7kΩ	—
R58	220Ω	D3
R59	1.2kΩ	D4
R60	82Ω	D3
R60A	Thermistor	19D46
R61	1.5Ω	—
R62	100Ω	D3
R63	100Ω	D4
R64	150Ω	A2
R65	680Ω	D4
R66*	10kΩ	C4
R67	22kΩ	D4
R68	4.7kΩ	D4
R69	22Ω	D4
R70	22Ω	D4
R71*	33kΩ	D3
R72*	220kΩ	D3
R73	8.2Ω	—
R74	390Ω	E5

**Capacitors**

C1	40pF	B1
C2	20pF	B1
C3	5nF	B1
C4	18pF	B1
C4A	—	—
C4B	—	B2
C5	10pF	B1
C6	4pF	B1
C7	400pF	B1
C8	30pF	B1
C9	5pF	B1
C10	7pF	B1
C11	10pF	B1
C11A	—	—
C11B	—	B2
C12	100pF	B1
C13	7pF	B1
C14	20nF	B1
C15	20nF	B1
C16	20nF	B1
C17	20nF	A1
C18	20nF	A1
C19	20nF	A1
C20	20nF	A1
C21	20nF	A2
C22	20nF	—
C23	7pF	A2
C24	1nF	A2
C25	1nF	A1
C26	1nF	A1
C27	10μF	A1
C28	22nF	A2
C29	1μF	—
C29A	—	—
C29B	—	B1
C30	20nF	B1
C31	10nF	A2
C32	140pF	B1
C33	20nF	A2
C34	20nF	A2
C35	20nF	A2
C36	10μF	A2
C37	10nF	A1
C38	22nF	A1
C39	470μF	A2
C40	220μF	C4
C41*	2.2nF	—
C42	10μF	—
C43	500nF	—
C44	10μF	C3
C45	15nF	—
C46	33μF	C4
C47	10μF	C3
C48	100nF	—
C49	3nF	C3
C50	10μF	—
C51	10μF	C4
C52	100μF	C4
C53	100μF	C4
C54	33μF	D3
C55	220μF	C4
C56	100μF	D3
C57	10nF	D3
C58	10nF	D3
C59	350pF	—
C60	300pF	D4
C61	4.7nF	D4
C62	4.7nF	D4
C63	220μF	D4
C64*	300pF	D3
C65	2200μF	—
C66	220μF	—
C66A	—	—
C66B	—	B2
C67	10μF	—
C68	20nF	E5
C69	3.3μF	E5



**Introduction**

Model 350 is a combined radio and cassette tape recorder for operation from either 240V 50Hz a.c. mains power supplies or from a 6V d.c. battery supply (four 1.5V cells of type HP11 or equivalent).

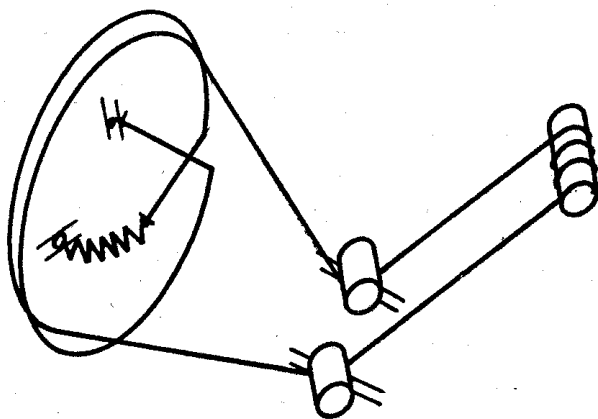
The radio section is an a.m.-f.m. unit covering 530-1620kHz (566-185m) medium wave and 87-109MHz v.h.f.-f.m. The tuner employs six transistors and seven diodes, feeding demodulated a.m. or f.m. signals to the audio section which employs seven transistors and three diodes. The r.f./i.f. circuitry is contained on one printed circuit board, the amplifying and bias oscillator circuitry on another p.c. board. A third p.c. board contains the motor control unit, which has two transistors and two diodes.

Frequency response is 100-8000Hz and the signal/noise ratio better than 45dB, with wow and flutter at better than 0.2% r.m.s. Microphone input sensitivity is 0.7mV. Audio output is 650mV via an 8Ω loudspeaker.

Sockets are provided for microphone (SK2) and auxiliary input (SK1). There is also an output socket (SK3) for the connection of an earphone and for remote control (SK4).

The model 351 employs the same tape recorder and amplifier section, but without the radio unit and associated switching.

*Length of drive cord is 50cm (19.7in)*



**Dismantling**

First remove the three screws recessed in the back cover (or in Model 351, the single screw inside the microphone compartment). Then remove the five screws and studs B (and, in Model 350, the four screws A). The chassis may then be lifted out, untying leads as necessary.

**Mechanical replacements/adjustments**

*Flywheel and drive belt.* – Remove the three screws (22, 23) securing the flywheel bracket assembly (34). The drive belt (43) may then be taken off.

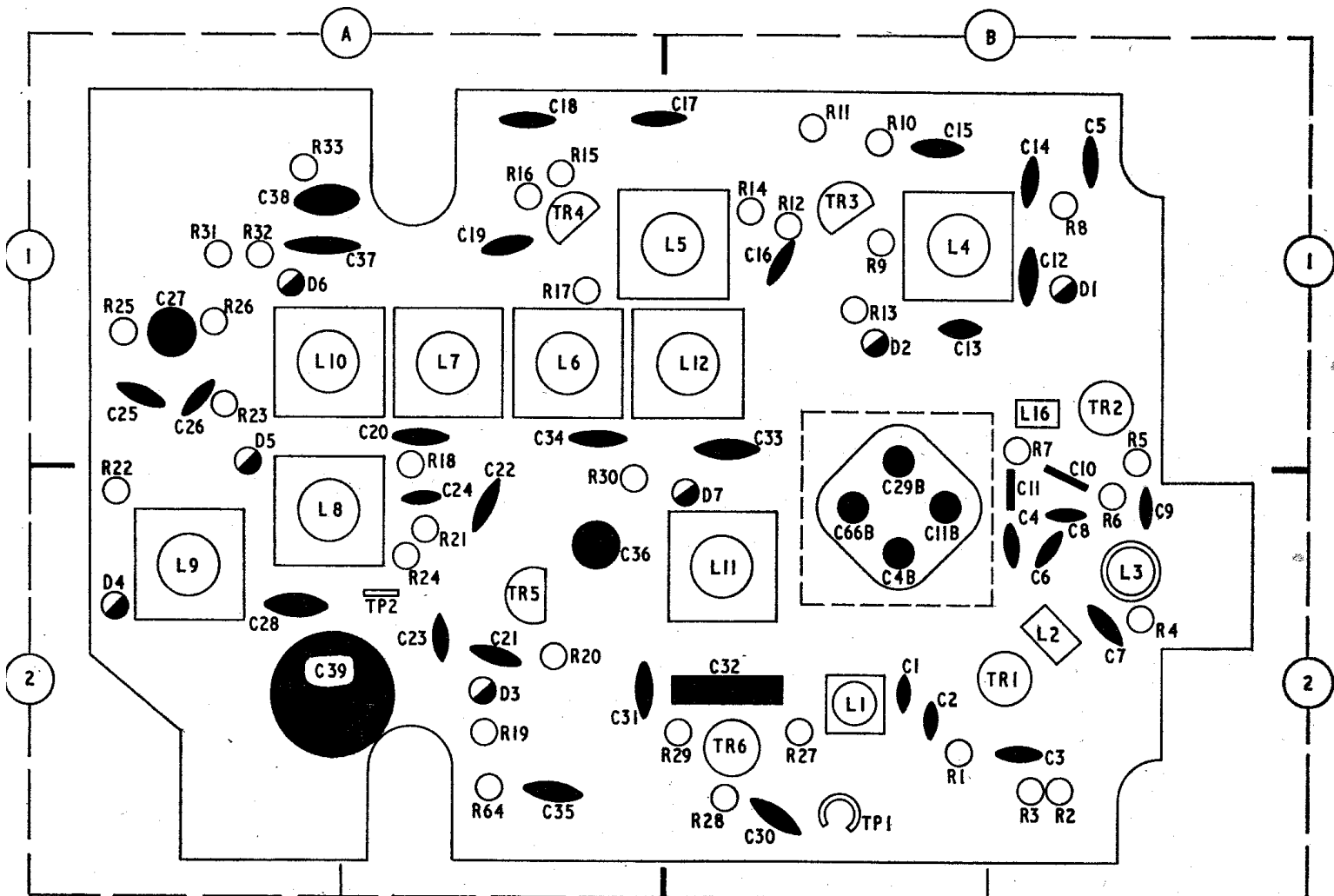
Before reassembly, clean the belt and flywheel. Adjust the flywheel bracket by loosening the three screws and repositioning the bracket with a screwdriver inserted into the appropriate slot.

*Note:* Screws should be sealed after tightening with a sealant or clear nail polish. Rubber parts or other parts which come into contact with rubber parts, should be cleaned with soft lint-free cloth moistened with alcohol.

*Take-up mechanism.* – Remove ring (33), take-up spring (31), ring (19) and washer (18). Reassemble in reverse order.

*Cassette holder.* – Open cassette holder and remove mechanical chassis cover (2); also cassette spring (24) from holder bracket (25). Detach ring (23) and the cassette holder shaft (27) from the holder bracket (25). Reassemble in the reverse order.

*Fast rewind motor.* – Remove the cassette holder as described above. Then remove, in the following order, FR drive belt (67), screw (22), spring washer



# 3091

EKCO 350 & 351

**Record/Playback Head azimuth.** – Insert a 5kHz test tape into the recorder and connect a valve voltmeter across the volume control. Switch the recorder to the playback mode and adjust azimuth spring (81) for maximum output. Seal the screw (78) in position after adjustment.

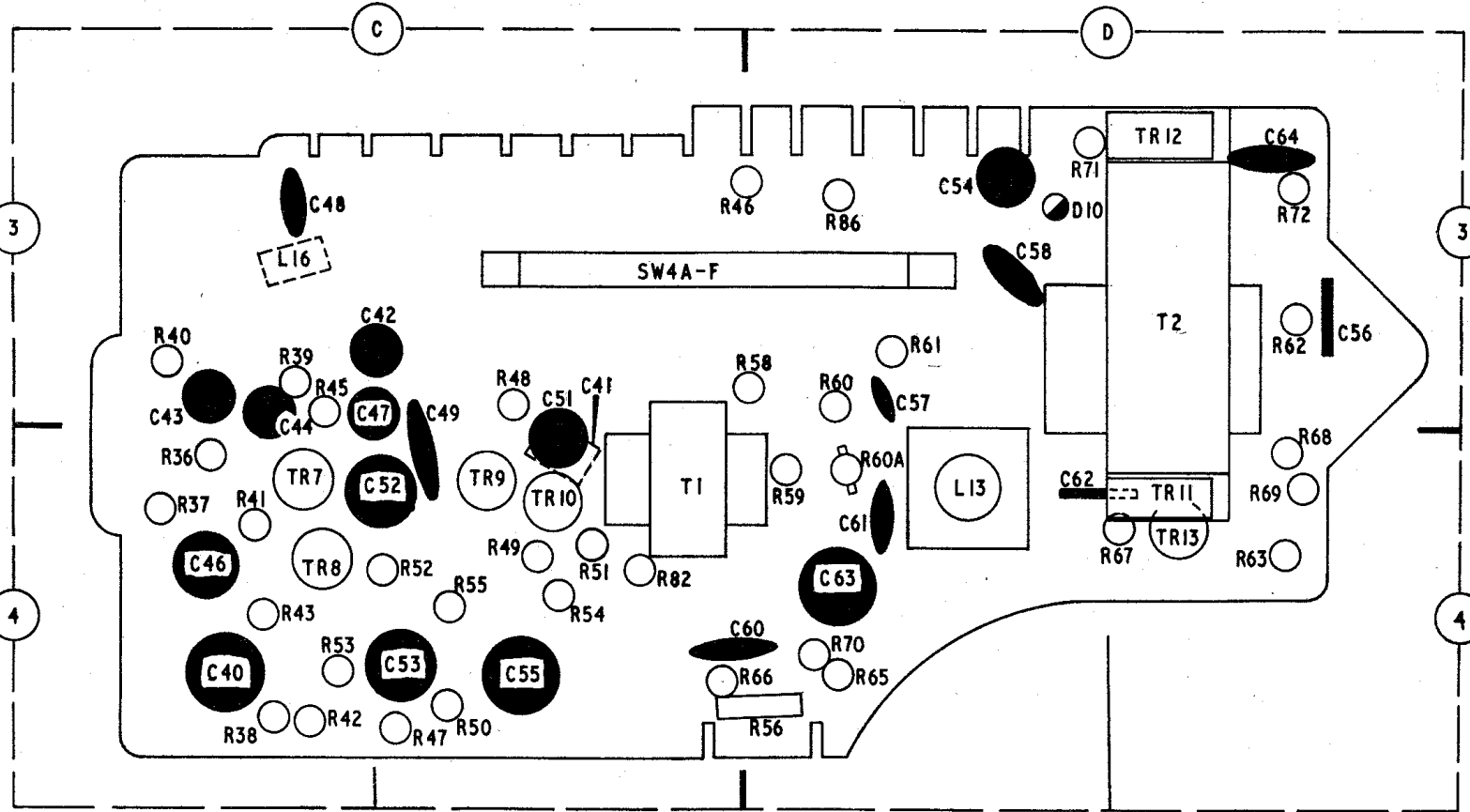
**Pressure roller assembly.** – Depress the play button and adjust the position of

the pressure roller spring (85), using one of the four holes on the sub-chassis, so that the force of the pressure roller in the direction of the arrow is between 350-450g.

### Circuit alignment

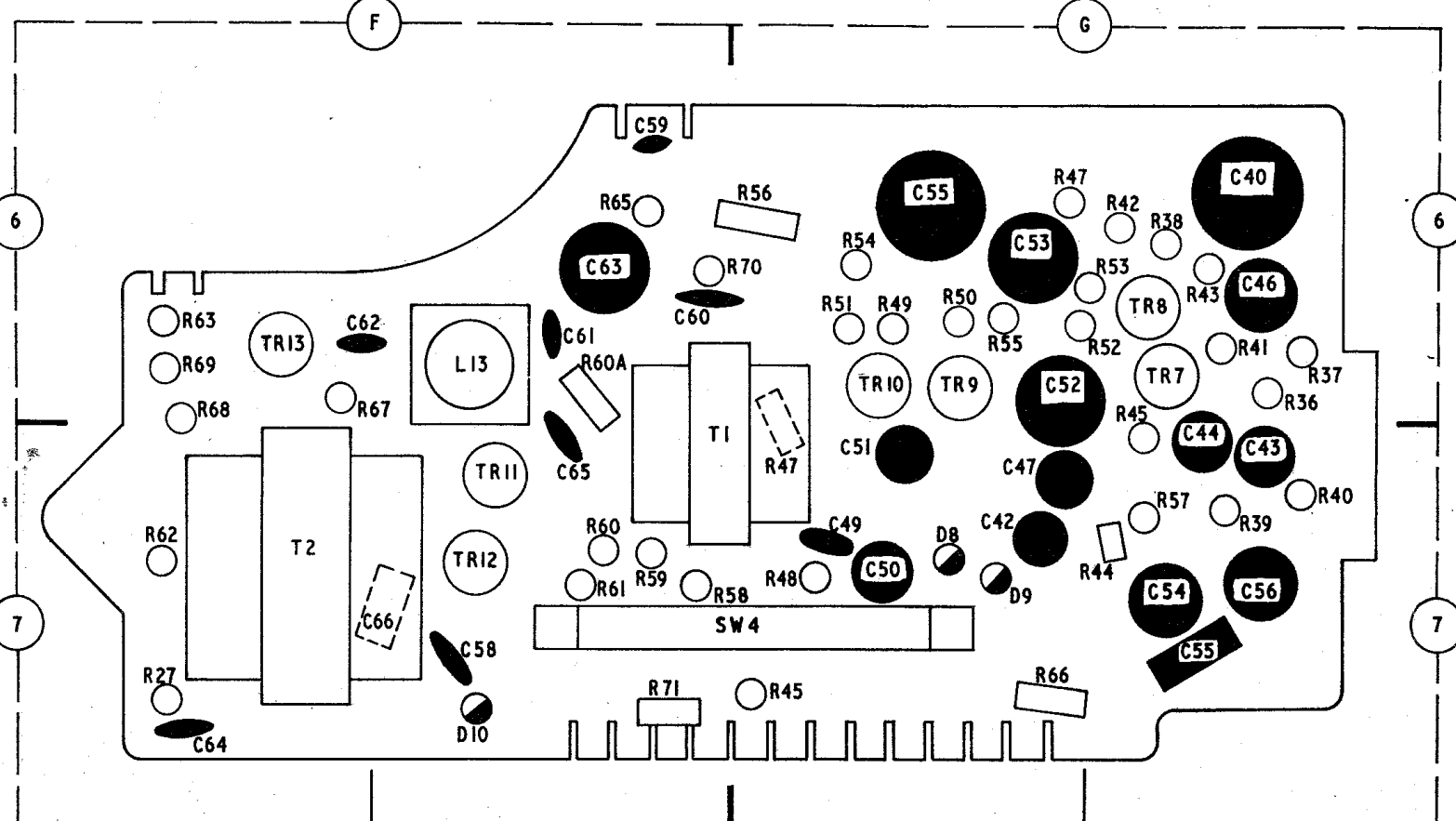
**Equipment required.** – A.m. signal generator covering 470kHz to 1400kHz with 30% modulation; f.m. sweep

(23), screw (10), washer (11), brake arm spring (14) and brake arm collar (15). The motor (20) can then be removed. Reassemble in the reverse order.



Above: Audio panel — 351

Below: Audio panel — 350



generator covering 10.7MHz and 86.5-106MHz; standard coupling loop; an oscilloscope; audio output meter (8Ω).

**A.m. alignment.** — Switch to a.m., tune to high frequency end of the band and set the volume control to maximum. Connect output of a.m. generator to coupling loop, placed near to, and coaxial with, the ferrite rod aerial. As the circuits come into alignment, reduce the output from the signal generator and maintain it at as low a level as reasonable to avoid misleading results due to a.g.c. action. Connect output meter across loudspeaker.

Apply a 470kHz signal, 30% modulated, to loop and adjust **L10**, **L7** and **L12**, in that order, for maximum output.

Retune receiver to the low frequency end of the band. Retune signal generator to 525kHz and adjust the core of **L11** for maximum output.

Retune receiver to the high frequency end of the band, tune signal generator to 1650kHz and adjust trimmer **C66B** for maximum output. Tune signal generator to 1400kHz, tune in the signal on the receiver, then adjust trimmer **C29B** for maximum output.

Repeat all the above adjustments until

no further improvement can be obtained.

**F.M. alignment.** — Switch to f.m., tune to the high frequency end of the band, the volume control to be at maximum. Connect oscilloscope to **TP2** (ie junction of **R24/C28**) and connect f.m. generator to **L3** via coupler winding. Inject a signal of 10.7MHz, modulated with sweep, and adjust the cores of **L8**, **L6**, **L5** and **L4**, in that order, for maximum height and symmetry of bandpass curve. Then adjust the core of **L9** for S-curve symmetry.

Disconnect oscilloscope. Transfer generator to **TP1** (f.m. aerial input) and tune receiver to low frequency end of the band. Inject a signal of 86.5MHz and carefully adjust the spacing of **L16** windings for maximum output. Tune receiver to high frequency end of the band, inject a signal of 110MHz and adjust trimmer **C11B** for maximum output. Repeat the **L16** and **C11B** adjustments until no further improvement can be obtained.

Inject signal of 90MHz, tune in signal on receiver, then adjust the spacing of **L2** windings for maximum output. Retune generator to 106MHz, tune in signal on receiver, then adjust trimmer **C4B** for maximum output. Repeat the **L2** and

**C4B** adjustments until no further improvements can be obtained.

**Transistor analysis**

Voltages given in the table below were obtained from data supplied by the manufacturers. They were measured with a 20,000Ω/V test meter and are negative with respect to positive chassis.

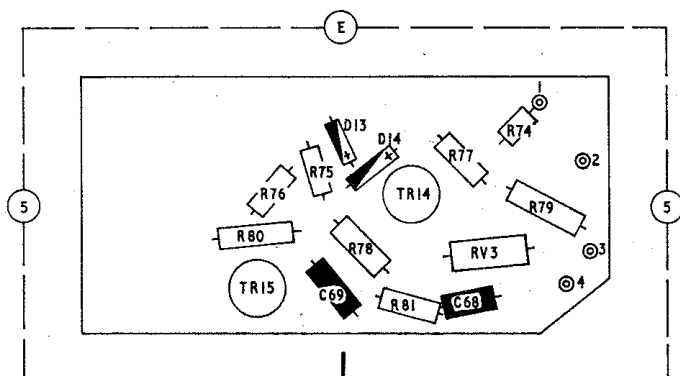
Transistor	Emitter	Base	Collector	
TR1	2SC645C	4.3	3.6	0
TR2	2SC645B	3.5	2.9	0.18
TR3	2SC828B-B	3.9	3.2	0
TR4	2SC829B-Y	4.5*	3.9*	0
TR5	2SC829B-Y	3.2*	2.5*	0
TR6	2SA102BA	0.77	0.87	5.3
TR7	2SB439	0.23	0.3	0.8
TR8	2SB54	0.65	0.8	2.6
TR9	2SB54	0.5	0.62	1.1
TR10	2SB54	0.9	1.1	4.8
TR11	2SB364	0.02	0.21	—
TR12	2SB364	0.02	0.21	—
TR13	S2B54	0.43	0.65	5.5

\* Voltages for TR1-TR2 are f.m. only, voltages for TR6 for a.m. only and voltages for TR3 apply to both a.m. and f.m. operation. The voltages shown for TR4/TR5 are for f.m. only, the a.m. readings being:

TR4	2SC829B-Y	5.0	2.8	0
TR5	2SC829B-Y	3.5	2.8	0

**Key to mechanical parts**

- 1 Cassette Holder Assembly (350)
- 1 Cassette Holder Assembly (351)
- 4 Turntable Cap B
- 6 Turntable Assembly
- 7 Record Lock Spring
- 8 Record Safety Lever
- 14 Brake Arm Spring
- 15 Brake Arm Collar
- 16 Brake Arm Assembly
- 20 Fast-Forward/Rewind Motor
- 21 Drive Motor Assembly (350)
- 21 Drive Motor Assembly (351)
- 24 Cassette Holder Spring - Right (350)
- 24 Cassette Holder Spring (351)
- 26 Stud A
- 27 Cassette Holder Shaft
- 30 Motor Pulley
- 31 Take-Up Mechanism Spring (350)
- 31 Take-Up Mechanism Spring (351)
- 32 Take-Up Mechanism Assembly
- 37 Hook Spring
- 38 Flywheel Bushing
- 40 Record Safety Hook Assembly
- 41 Coupling Bar
- 43 Drive Belt
- 45 Fast/Rewind Plate Spring
- 46 Kick Plate Collar
- 48 Hook Kick Plate
- 49 Fast/Rewind Plate Assembly
- 50 Brake Lever with Pad
- 51 Flywheel
- 52 Brake Lever Spring
- 55 Fast/Rewind Pulley Plate Assembly
- 58 Ballbearing
- 59 Leaf Switch: SW8
- 61 Record Lever Assembly
- 62 Brake Lever Spring
- 63 Record Lever Boss
- 64 Leaf Switch: SW9
- 65 Holder; Sliding Sub-Chassis Assembly
- 66 Fast/Rewind Pulley
- 67 Fast/Rewind Belt
- 68 Cushion Rubber
- 69 Spring; Sliding Sub-Chassis Assembly (350)
- 69 Spring; Sliding Sub-Chassis Assembly (351)
- 72 Roller; Sliding Sub-Chassis Assembly
- 73 Spring; Sliding Sub-Chassis Assembly (350)
- 73 Spring; Sliding Sub-Chassis Assembly (351)
- 74 Back Tension Lever Assembly
- 77 Erase Head
- 80 Record/Playback Head
- 81 Azimuth Adjustment Spring
- 84 Pressure Roller Assembly
- 85 Pressure Roller Spring



Above: Motor control panel

