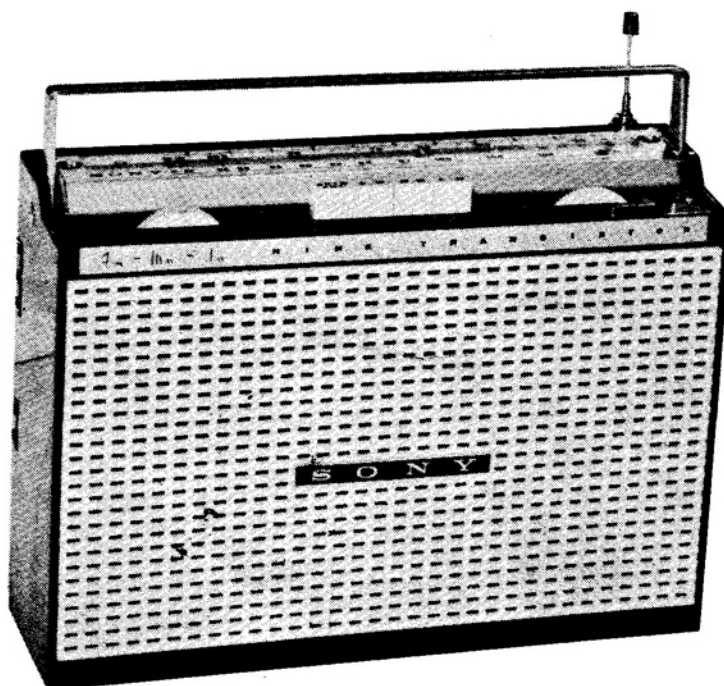


SONY®

SERVICING GUIDE

TFM-951L

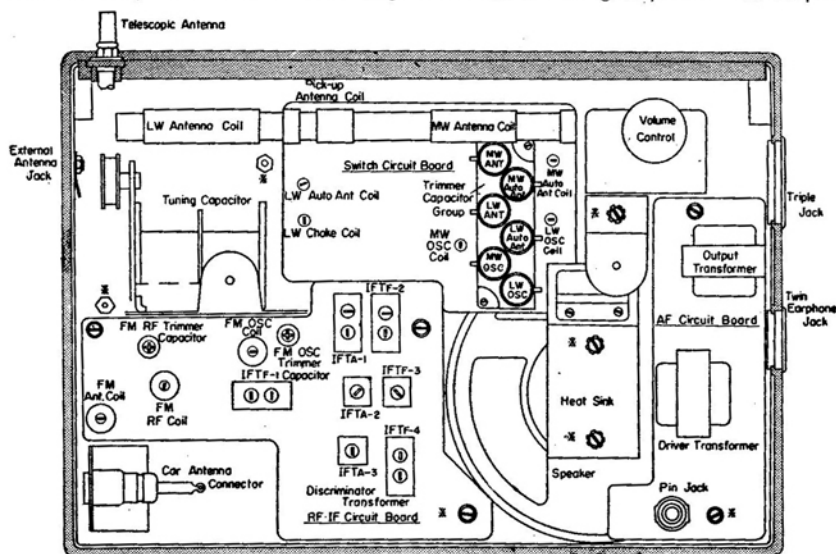


Specifications for TFM-951L

Circuit : 9 Transistor Superheterodyne		MW 50 μ V (620 Kc) with Car Antenna
Frequency Coverage :	FM 85~ 108 MC	20 μ V (1400 Kc) //
	MW 530~1605 Kc	LW 40 μ V (160 Kc) //
	LW 150~ 350 Kc	150 μ V (340 Kc) //
Intermediate		
Frequency :	FM 10.7 Mc	Selectivity : MW 31 dB to 10 Kc off resonance, at 1,400 Kc
	MW 455 Kc	
	LW 455 Kc	
Antenna System : Built-in Ferrite Bar Antenna (MW & LW) Built-in Telescopic Antenna and Terminal for Car Antenna (FM, MW & LW)		LW 30 dB at 10 Kc off resonance, at 340 Kc
Maximum Sensitivity : (at 10mW Output)	FM 10 μ V (86.5 Mc)	Output Power : 550 mW (undistorted)
	10 μ V (105 Mc)	
	MW 100 μ V/m (620 Kc)	Speaker : 4" PM dynamic, 8 Ω
	60 μ V/m (1400 Kc) with Built-in Ferrite Bar Antenna	
	LW 200 μ V/m (160 Kc) //	Battery : Four size "D" Flashlight Batteries (6 Volts)
	150 μ V/m (340 Kc) //	
		Current Drain : 16 mA at zero signal, 230 mA at 550 mW output
		Dimensions : 9-15/16" x 6-15/16" x 3-3/8" (252 x 176 x 85 mm)
		Weight : 5 pounds (2.3 Kg)
		Co'ours : Black, Ivory

To Remove the Circuit Board from the Cabinet

1. Set the Volume Control "OFF" and Tuning Capacitor to the maximum capacitance position.
2. Loosen two Back Cover Holding Screws.
3. Open the Back Cover.
4. Pull out the Battery Connector Plug.
5. Unscrew two Panel Holding Screws with Philips screw driver. Be careful not to lose the nuts which are securing the Panel Holding Screws from the inside.
6. Remove the panel and pull out the pointer.
7. Remove five screws and two nuts. (Marked ✕ in the Figure below).
8. Remove twin Earphone Jack and Triple Jack by pulling straight up.
9. Unsolder the following wires :
 - a) Black wire at Car Antenna coming from the RF-IF circuit board.
 - b) White wire at Car Antenna coming from the RF-IF circuit board.
 - c) Orange wire at Telescopic Antenna coming from the RF-IF circuit board.
 - d) Orange wire at Telescopic Antenna coming from the Switch circuit board.
 - e) White wire at Ext. Antenna Coil Lug.
 - f) Two wires (a black and a white) at the Speaker terminal.
10. Lift the chassis lightly from the Cabinet holding the frames of Tuning Capacitor and Output Transformer.



Adjustment and Alignment

a) Frequency Coverage

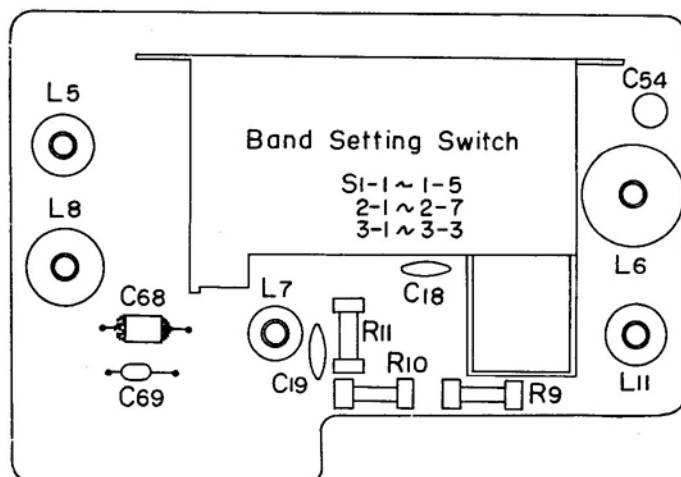
	Lower Limit	Adjust	Upper Limit	Adjust
FM	84 Mc	Core and gap of L ₃	110 Mc	C ₃₋₂
MW	520 Kc	Core of L ₇	1,640 Kc	C ₂₋₅
LW	145 Kc	Core of L ₈	370 Kc	C ₂₋₆

b) Tracking Alignment

	Checking Point	Adjust
FM	86.5 Mc	Core of L ₂
	105 Mc	C ₃₋₁
	620 Kc	Position of L _{4-M}
MW	1,400 Kc	C ₂₋₃
	160 Kc	Position of L _{4-L}
	340 Kc	C ₂₋₄

Mounting Diagram (Parts Side)

— Band Switch Section —



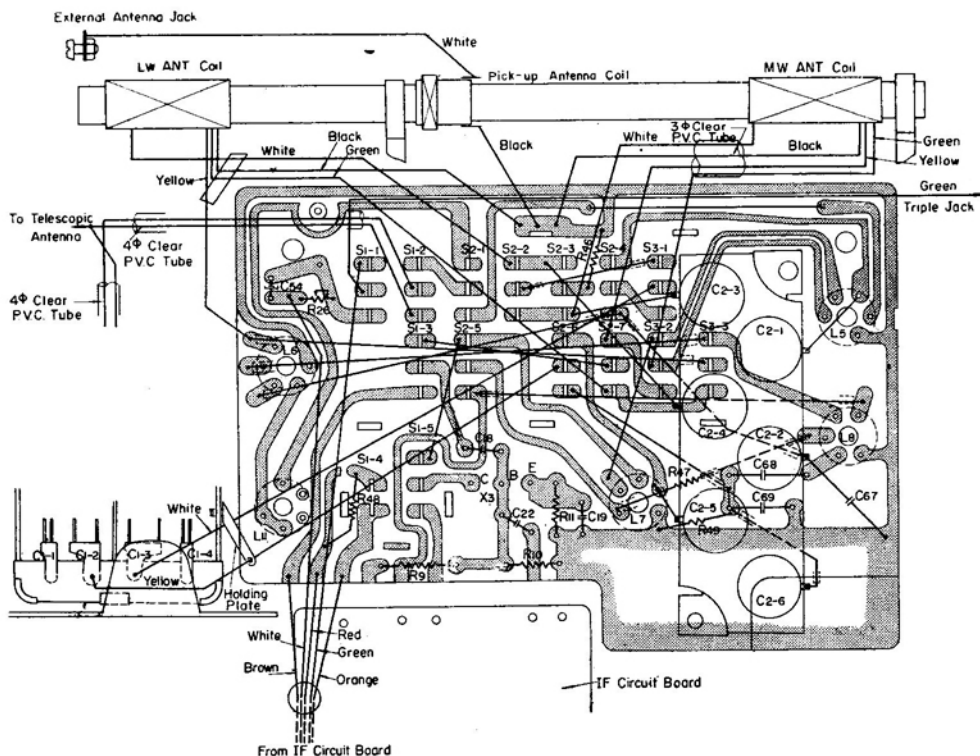
Parts to be mounted on the printed side :

C2 (Trimmer Capacitor Group), L4 (Ferrite Bar Antenna)

C22, C67, R26, R46, R47, R49, X3

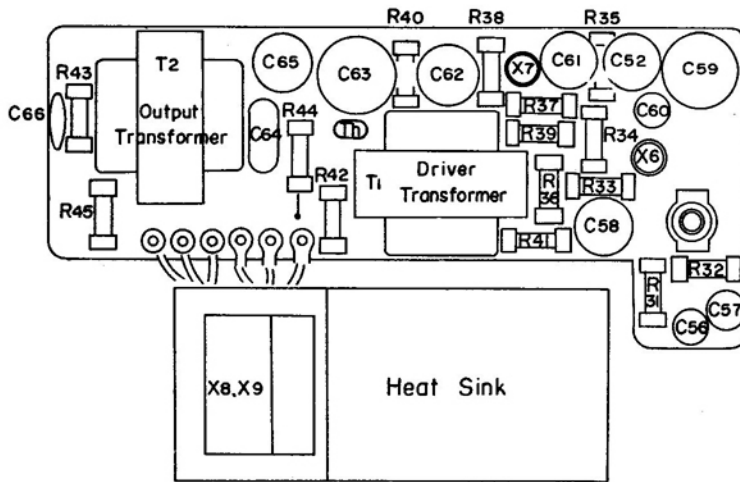
Mounting Diagram (Printed Side)

— Band Switch Section —



Mounting Diagram (Parts Side)

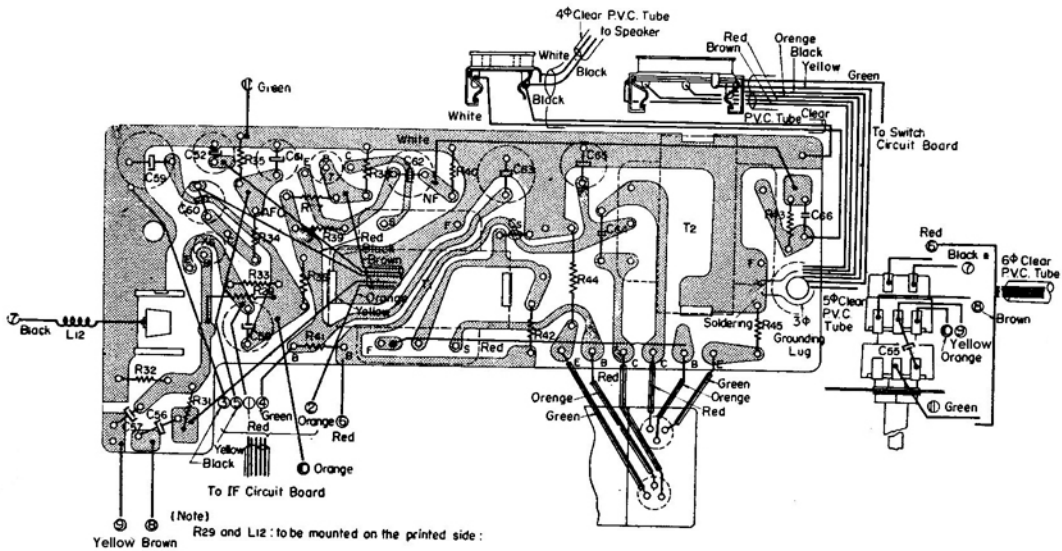
— AF Section —



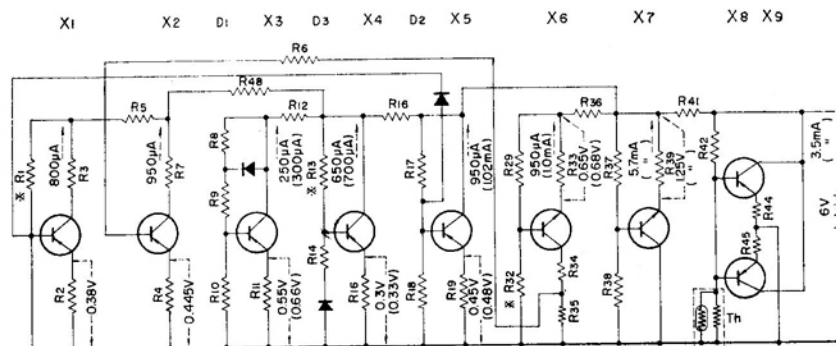
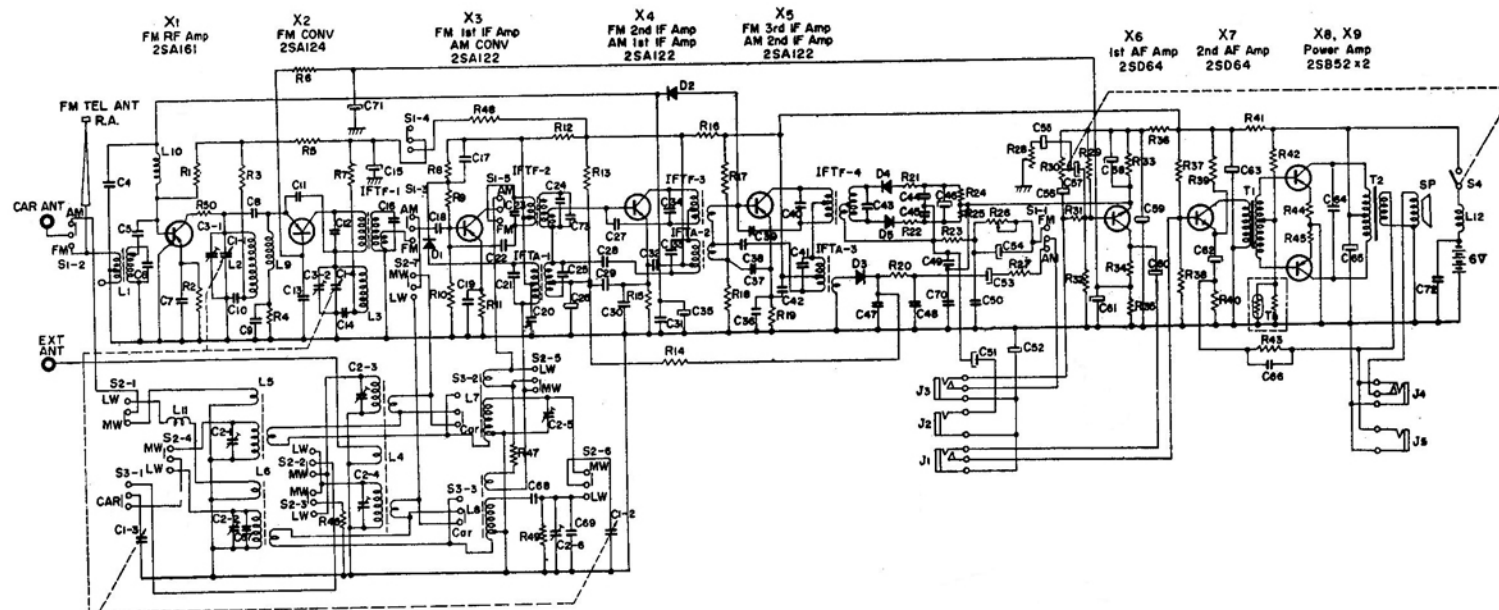
Parts to be mounted on the printed side : L12, R29

Mounting Diagram (Printed Side)

— AF Section —



Schematic Diagram for TFM-951L



Voltage and Current Distribution
Chart at Zero Signal

Note: Values in the parentheses are for AM.

Electronic Parts List for TFM-951L

Part No.	Symbol	Description	Part No.	Symbol	Description	Part No.	Symbol	Description
	X ₁	Transistor 2SA161	1-513-111-01	S ₁	Key Switch	1-101-287-00	C ₆	Ceramic 25pF $\pm 5\%$ 50 V
	X ₂	" 2SA124		S ₂		-020-00	C ₇	" 0.005 μ F $\pm 10\%$ 50 V
	X ₃	" 2SA122		S ₃		-049-00	C ₈	" 5pF ± 0.05 pF 50V
	X ₄	" 2SA122		S ₄			C ₉	(StyrcI 500pF)
	X ₅	" 2SA122			Power Switch	1-101-020-00	C ₁₀	Ceramic 0.005 μ F $\pm 10\%$ 50 V
	X ₆	" 2SD64	1-403-230-11	IFT _{F-1}	FM Double Tuned IFT	-049-00	C ₁₁	" 5pF ± 0.5 pF 50V
	X ₇	" 2SD64	-090-11	IFT _{F-2}	"		C ₁₂	(Built in IFT) 50pF
	X ₈	" 2SB52	-089-11	IFT _{F-3}	FM IFT	1-101-020-00	C ₁₃	Ceramic 0.005 μ F $\pm 10\%$ 50 V
	X ₉	" 2SB52	-088-11	IFT _{F-4}	FM Discriminator Transformer	-020-00	C ₁₄	" 0.005 μ F "
	D ₁	Diode IT23	1-403-094-11	IFT _{A-1}	AM Double Tuned IFT	1-121-115-00	C ₁₅	Electrolytic 100 μ F 6 V
	D ₂	" IT261	-093-11	IFT _{A-2}	AM IFT		C ₁₆	(Built in IFT) 20pF
	D ₃	" IT23	-092-11	IFT _{A-3}	"	1-101-021-00	C ₁₇	Ceramic 0.01 μ F $\pm 10\%$ 50 V
	D ₄	" IT261				-020-00	C ₁₈	" 0.005 μ F $\pm 10\%$ 50 V
	D ₅	" IT261	1-423-043-00	T ₁	Driver Transformer	-020-00	C ₁₉	" 0.005 μ F "
			1-427-061-00	T ₂	Output Transformer	-021-00	C ₂₀	" 0.01 μ F "
	CS	Thermistor CS-47					C ₂₁	(Built in IFT) 200pF
1-501-016-01	RA	Telescopic Antenna	1-507-034-11	J ₁	Det Out Jack	1-101-046-00	C ₂₂	Ceramic 2pF ± 0.5 pF 50 V
1-401-107-00	L ₁	FM Antenna Coil		J ₂	Multiplex Out Jack		C ₂₃	(Built in IFT) 50pF
1-425-039-11	L ₂	FM RF Coil		J ₃	Audio In Jack		C ₂₄	(") 20pF
1-405-059-20	L ₃	FM OSC Coil	1-507-030-11	J ₄	Earphone Jack 1	1-121-104-00	C ₂₅	(") 200pF
1-401-106-00	L ₄	MW+LW Ferrite Bar Antenna		J ₅	" 2		C ₂₆	Electrolytic 10 μ F 6V $\pm 10\%$
-104-00	L ₅	MW Antenna Coil (for Car Antenna)	1-502-048-04	SP	Speaker 8 Ω 10cm P.D. S.	1-101-045-00	C ₂₇	Ceramic (0~1pF) ± 0.5 pF 50V
-105-00	L ₆	LW " "		BATT	Battery Size D $\times$ 4, 6 V	-045-00	C ₂₈	" (0~1pF) "
1-405-058-00	L ₇	MW OSC Coil				-021-00	C ₂₉	" 0.01 μ F $\pm 10\%$ 50V
-082-00	L ₈	LW "	1-151-047-00	C ₁	Tuning Capacitor, 4 gang	-021-00	C ₃₀	" "
1-407-006-10	L ₉	FM IF Trap	1-141-122-00	C ₂	Trimmer Capacitor, 6 unit	-021-00	C ₃₁	" "
1-425-038-11	L ₁₀	FM RF Choke Coil	1-141-053-00	C ₃	Cylindrical Trimmer Capacitor		C ₃₂	" "
1-409-010-10	L ₁₁	LW Choke Coil (for Car Antenna)	1-101-021-00	C ₄	Ceramic 0.01 μ F $\pm 10\%$ 50 V	1-121-102-00	C ₃₃	(Built in IFT) 200pF
1-421-006-	L ₁₂	Power Choke Coil	-020-00	C ₅	" 0.005 μ F $\pm 10\%$ 50 V		C ₃₄	(Built in IFT) 50pF
						1-101-021-00	C ₃₅	Electrolytic 30 μ F 6V $\pm 10\%$
							C ₃₆	Ceramic 0.01 μ F $\pm 10\%$ 50V

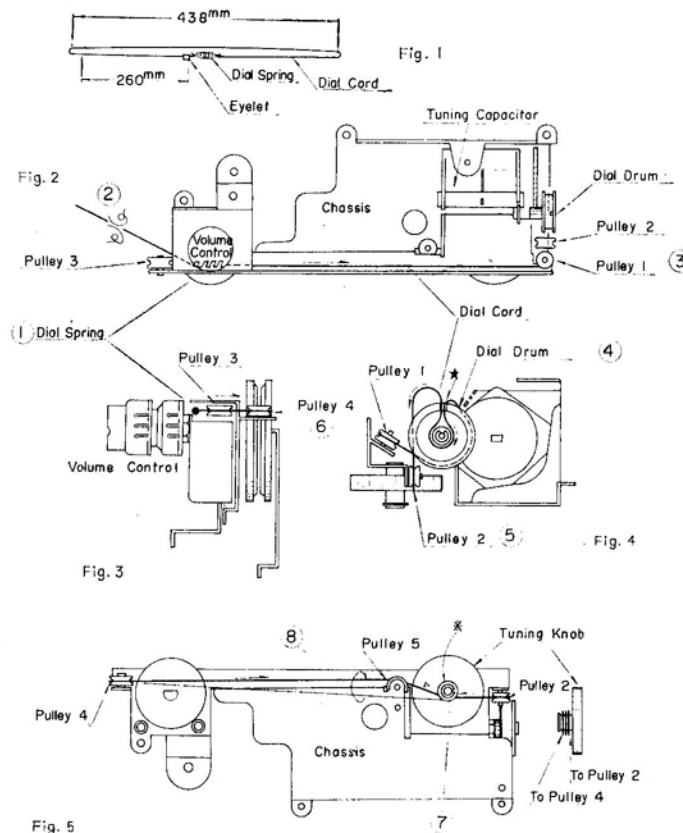
Electronic Parts List for TFM-951L — Continued —

Part No.	Symbol	Description	Part No.	Symbol	Description	Part No.	Symbol	Description
1-101-021-00	C ₃₇	Ceramic 0.01 μ F $\pm 10\%$ 50V	1-103-009-00	C ₆₈	Styrol 170pF $\pm 10\%$	1-203-065-00	R ₂₄	5.6K Ω RD $\frac{1}{4}$ l $\pm 5\%$
-045-00	C ₃₈	" (1pF ± 0.5 pF 50V)	-080-00	C ₆₉	" 15pF $\pm 20\%$	-065-00	R ₂₅	5.6K Ω "
-046-00	C ₃₉	" (2pF ")	1-101-021-00	C ₇₀	Ceramic 0.01 μ F $\pm 10\%$ 50V	1-221-348-00	R ₂₆	*Adjustable Resistor 50K Ω
-130-00	C ₄₀	" 12pF "	1-119-019-00	C ₇₁	Electrolytic 100 μ F 3V $\pm 10\%$			Carbon Resistor
	C ₄₁	(Built in IFT) 200pF	1-101-020-00	C ₇₂	Ceramic 0.005 μ F $\pm 10\%$ 50V	1-203-046-00	R ₂₇	4.7K Ω RD $\frac{1}{4}$ l $\pm 5\%$
1-101-021-00	C ₄₂	Ceramic 0.01 μ F $\pm 10\%$ 50V	-049-00	C ₇₃	" 5pF ± 0.5 pF 50V	1-221-118-11	R ₂₈	Volume Control 5K Ω VR
	C ₄₃	(Built in Discriminator) 80pF				1-203-155-00	R ₂₉	Carbon Resistor
1-101-030-00	C ₄₄	Ceramic 200pF $\pm 5\%$ 75V			*Carbon Resistor			5.1K Ω RD $\frac{1}{4}$ l $\pm 5\%$
-030-00	C ₄₅	"	1-203-005-00	R ₁	27K Ω RD $\frac{1}{4}$ l $\pm 5\%$	1-221-118-11	R ₃₀	Volume Control 5K Ω VR
1-121-102-00	C ₄₆	Electrolytic 30 μ F 6V $\pm 20\%$	-026-00	R ₂	470 Ω "			Carbon Resistor
1-101-021-00	C ₄₇	Ceramic 0.01 μ F $\pm 10\%$ 50V	-024-00	R ₃	330 Ω "	1-203-083-00	R ₃₁	22K Ω RD $\frac{1}{4}$ l $\pm 5\%$
-022-00	C ₄₈	" 0.02 μ F "	-026-00	R ₄	470 Ω "	-085-00	R ₃₂	* 39K Ω "
-021-00	C ₄₉	" 0.01 μ F $\pm 10\%$ 50V	-018-00	R ₅	220 Ω "	-157-00	R ₃₃	680 Ω "
-022-00	C ₅₀	" 0.02 μ F "	-031-00	R ₆	1K Ω "	-049-00	R ₃₄	2.2K Ω "
1-121-104-00	C ₅₁	Electrolytic 10 μ F 6V $\pm 10\%$	-031-00	R ₇	1K Ω "	-031-00	R ₃₅	1K Ω "
-115-00	C ₅₂	" 100 μ F 6V "	-064-00	R ₈	4.7K Ω "	-026-00	R ₃₆	470 Ω "
-106-00	C ₅₃	" 5 μ F 6V "	-091-00	R ₉	36K Ω "	-058-00	R ₃₇	3.3K Ω "
-131-00	C ₅₄	" 3 μ F 6V "	-069-00	R ₁₀	10K Ω "	-131-00	R ₃₈	7.5K Ω "
-181-11	C ₅₅	" 2 μ F 6V $\pm 20\%$	-049-00	R ₁₁	2.2K Ω "	-018-00	R ₃₉	220 Ω "
-106-00	C ₅₆	" 5 μ F 6V $\pm 10\%$	-018-00	R ₁₂	220 Ω "	-001-00	R ₄₀	5.1 Ω "
-115-00	C ₅₇	" 100 μ F 6V "	-097-00	R ₁₃	* 56K Ω "	-154-00	R ₄₁	75 Ω "
-115-00	C ₅₈	" 100 μ F 6V "	-065-00	R ₁₄	5.6K Ω "	-044-00	R ₄₂	2K Ω "
-123-00	C ₅₉	" 200 μ F 6V "	-026-00	R ₁₅	470 Ω "	-018-00	R ₄₃	220 Ω "
-106-00	C ₆₀	" 5 μ F 6V "	-145-00	R ₁₆	47 Ω "	-584-00	R ₄₄	3 Ω "
-111-00	C ₆₁	" 100 μ F 3V "	-130-00	R ₁₇	18K Ω "	-584-00	R ₄₅	3 Ω "
-115-00	C ₆₂	" 100 μ F 6V "	-058-00	R ₁₈	3.3K Ω "	-010-00	R ₄₆	82 Ω "
-161-00	C ₆₃	" 500 μ F 6V "	-026-00	R ₁₉	470 Ω "	-011-00	R ₄₇	100 Ω "
1-105-015-00	C ₆₄	Mylar 0.1 μ F $\pm 20\%$	-049-00	R ₂₀	2.2K Ω "	-011-00	R ₄₈	100 Ω "
1-121-115-00	C ₆₅	Electrolytic 100 μ F 6V $\pm 10\%$	-024-00	R ₂₁	330 Ω "	-122-00	R ₄₉	75K Ω "
1-101-021-00	C ₆₆	Ceramic 0.01 μ F $\pm 10\%$ 50V	-024-00	R ₂₂	330 Ω "	-011-00	R ₅₀	100 Ω "
1-103-130-00	C ₆₇	Styrol 12pF $\pm 5\%$ 50V	-031-00	R ₂₃	1K Ω "			

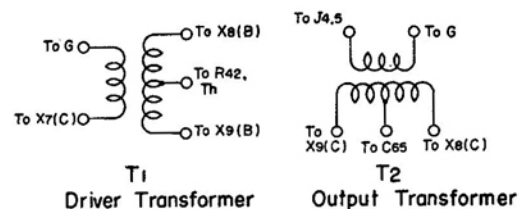
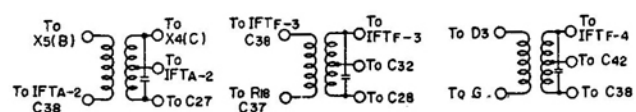
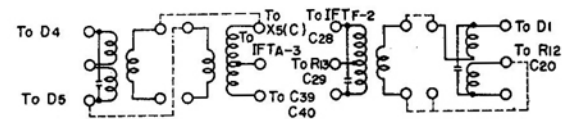
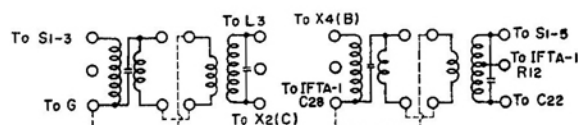
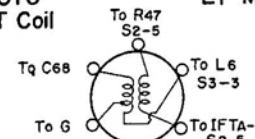
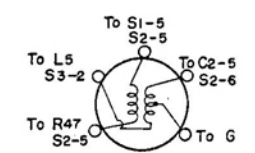
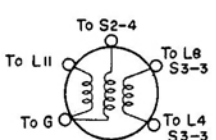
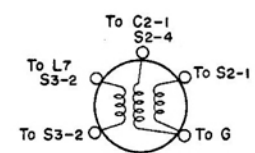
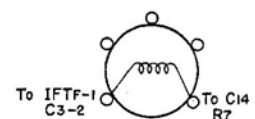
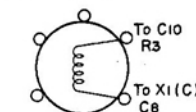
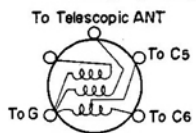
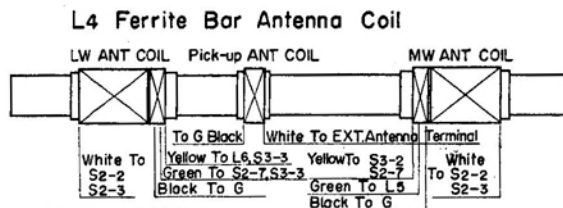
* adjustable resistor

To String the Dial Cord

1. In using a new Dial Cord, make a circle and mark at 260 mm from the eyelet as shown in Fig. 1.
2. Thread and stretch the Dial Cord and put the Dial Spring under the Volume Control as shown in Fig. 2 and Fig. 3. ①
3. Hold one end of the Dial String with a thumb and a finger to prevent getting loose. ②
4. String the Dial Cord as shown by an arrow on the Pulley 1. ③
5. Wind the Dial Cord on the Dial Drum by half turn and match the mark on the Dial Cord to the slit on the Dial Drum as shown.
6. Insert the Dial Cord into the Dial Drum through the slit and make a loop around the internal shaft of the Dial Drum.
7. Set the Tuning Capacitor to the maximum capacitance position.
Take out the Dial Cord from the Dial Drum through the slit and wind it two turns counter-clockwise around the Dial Drum. ④
8. Lead the Dial Cord to the Pulley 2. ⑤
Hold the Dial Cord at the Pulley 2 with a finger.
9. String the Dial Cord, which has been held in the process (3), on the Pulley 3 and 4 and hold it again at the Pulley 4 with a finger. ⑥
10. Wind the Dial Cord, which has been held in the process (8), around the boss of the Tuning Knob three times clockwise. ⑦
The winding of the last turn can be done easily as follows.
While pressing the Dial Cord against the boss of the Tuning Knob with a finger, turn the Tuning Knob clockwise.
11. Lastly string the Dial Cord, which is now in the condition shown by the fine dotted lines, on the Pulley 5 with tweezers. ⑧ (Fig. 5)



SONY CORPORATION



Driver Transformer

	Impedance	DC Resistance
Primary	1 K Ω	50 Ω
Secondary	2 K Ω	99 Ω

Output Transformer

	Impedance	DC Resistance
Primary	70 Ω	3 Ω
Secondary	8 Ω	0.56 Ω