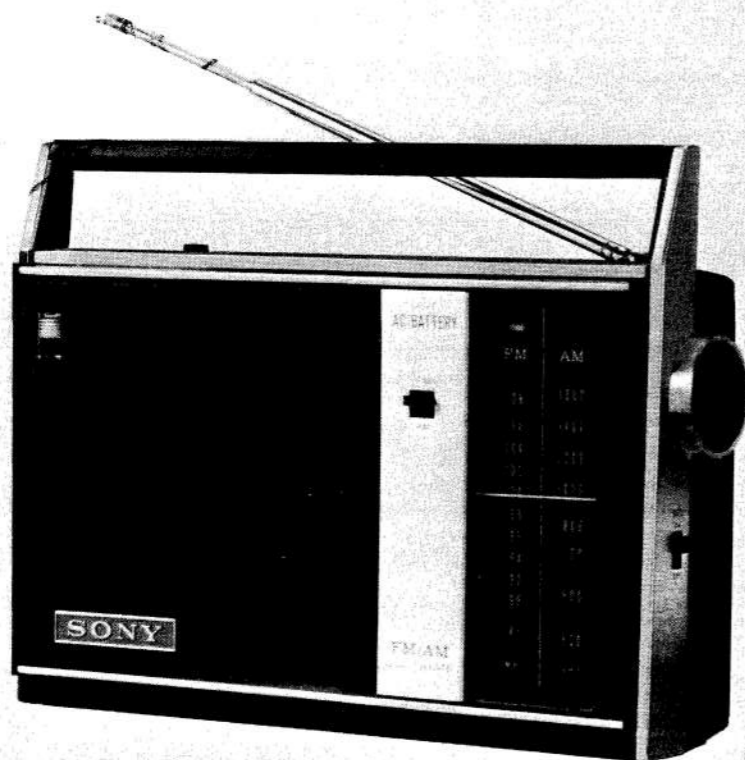


6F-21WA

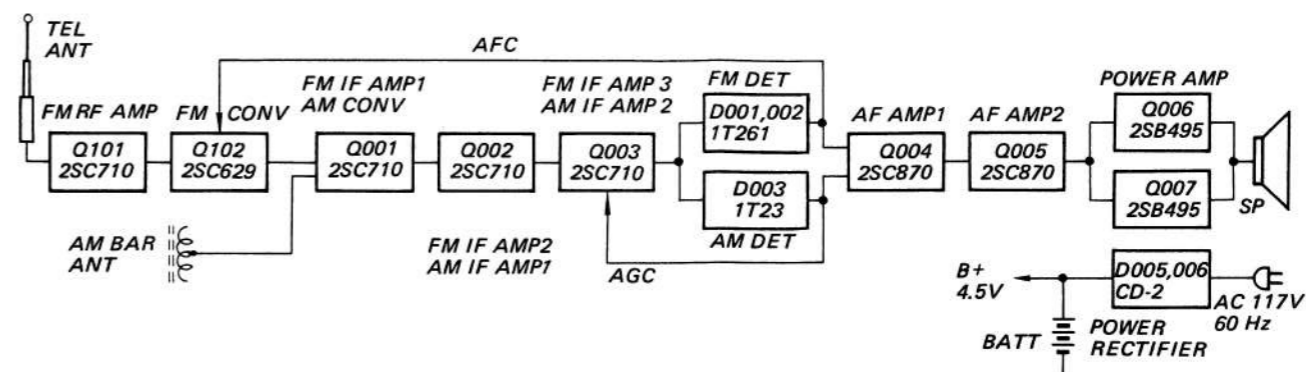
6F-21WA



SPECIFICATIONS

Circuit System:	9-transistor 9-diode superheterodyne
Frequency Coverage:	FM 87 ~ 108 MHz (3.44 ~ 2.78 m) AM 530 ~ 1,605 kHz (566 ~ 187 m)
Intermediate Frequency:	FM 10.7 MHz AM 455 kHz
Antenna System:	FM built-in telescopic antenna AM built-in ferrite bar antenna
Power Requirements:	Three "D" size flashlight batteries, 4.5 V in total or house current ac 117 V
Power Output:	500 mW (undistorted) 800 mW (maximum)
Current Drain:	FM 18 mA, AM 15 mA at zero signal 190 mA at 500 mW output
Maximum Sensitivity: (at 50 mW output)	FM 1.2 μ V AM 40 μ V/m
Selectivity:	22 dB, 10 kHz off resonance at 1,400 kHz
MPX OUT jack:	Impedance 5 k Ω Level 44 mV
AUX IN jack:	Impedance 5 k Ω Level 44 mV
Record-Out jack:	Impedance 1 k Ω Level 1.4 mV
Speaker:	3 5/8" (92 mm), 8 Ω
Dimensions:	8 9/16" (W) x 5 1/4" (H) x 2 5/16" (D) (218 mm x 133 mm x 59 mm)
Weight:	2 1b 10 oz (1.2 kg)

BLOCK DIAGRAM



EXTERNAL VIEW

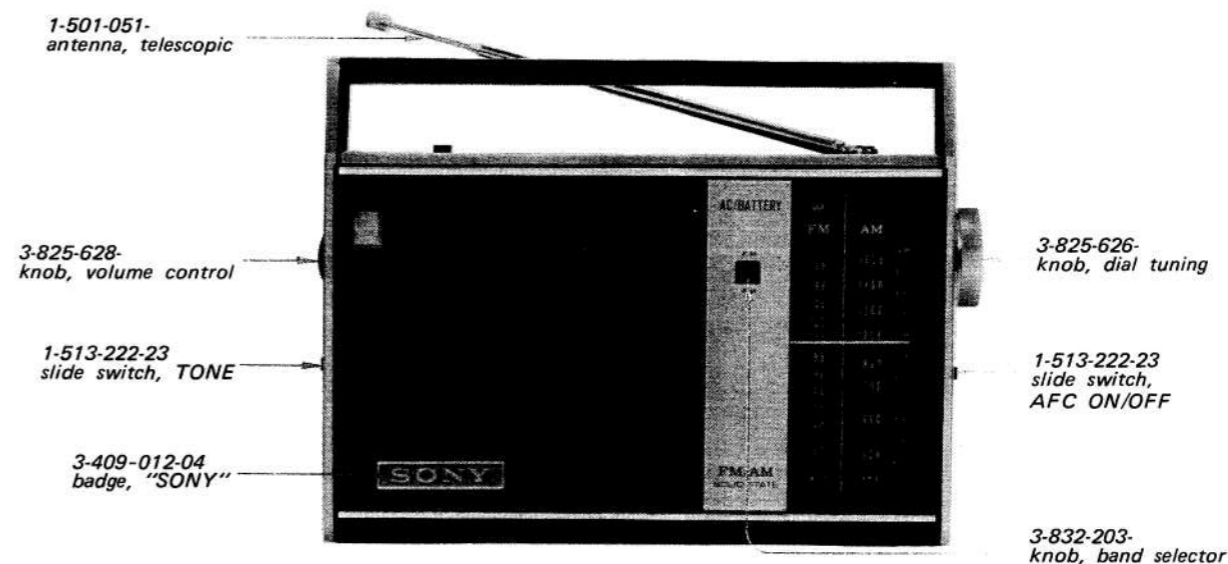


Fig. 1 External view

INTERIOR VIEW

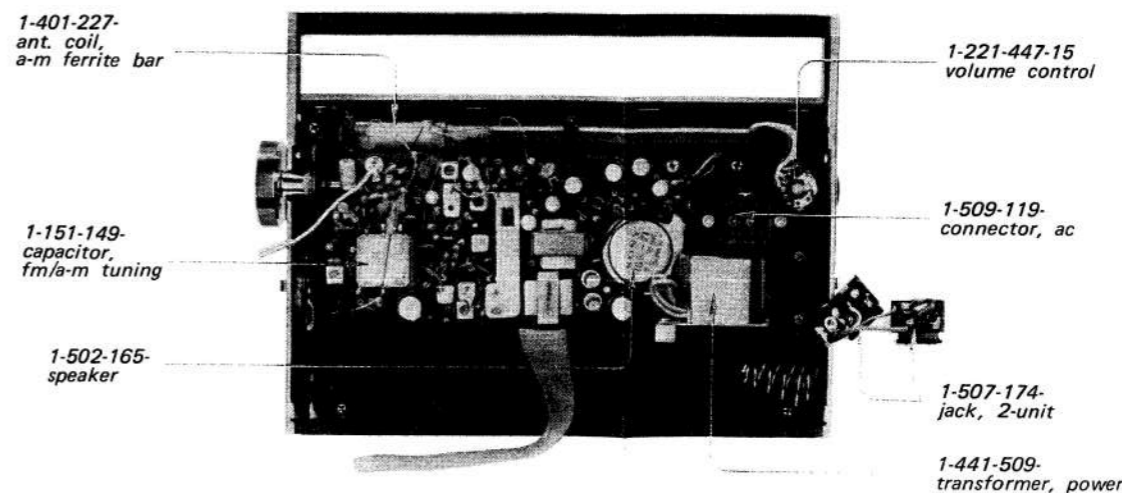
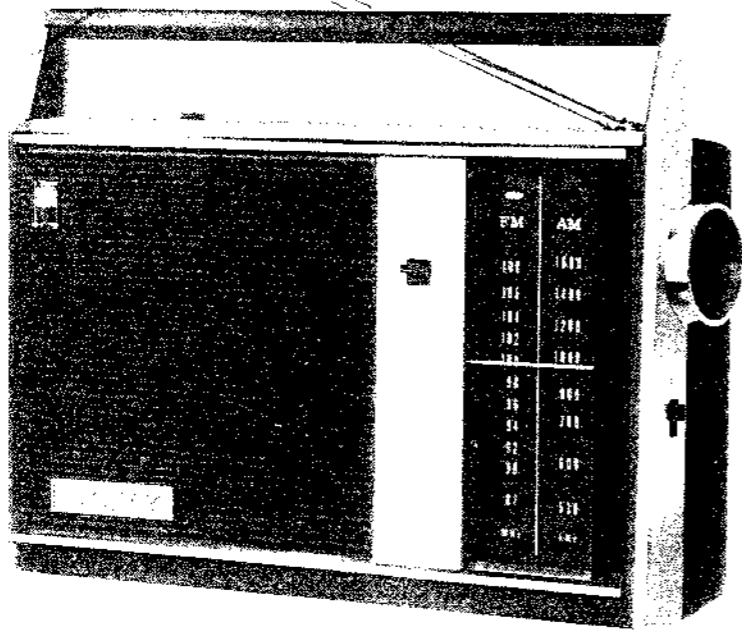


Fig. 2 Interior view

SONY
SERVICE MANUAL

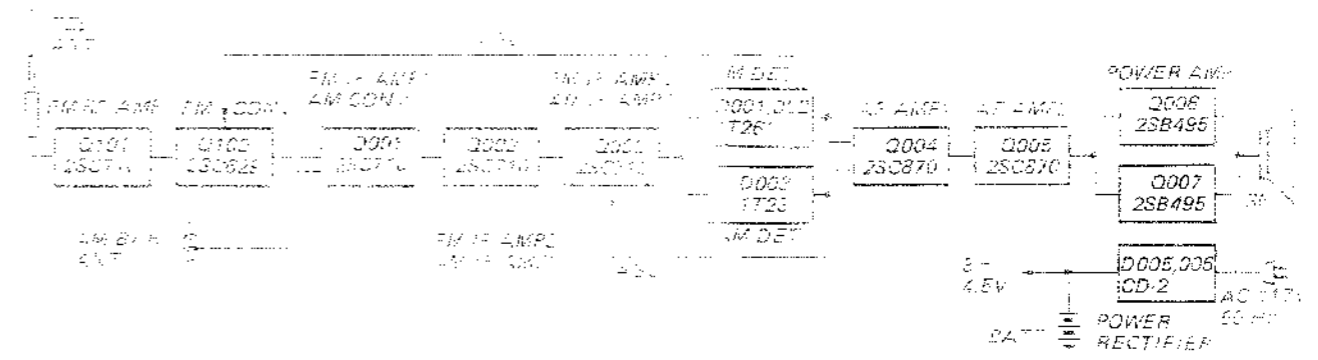
1776



SPECIFICATIONS

Model No. 1776
 Frequency Range: 530-1700 kHz
 Tuning: Manual
 Power Output: 50 mW
 Battery: 4.5V
 Dimensions: 100 x 150 x 40 mm
 Weight: 150 g

BLOCK DIAGRAM



EXTERNAL VIEW

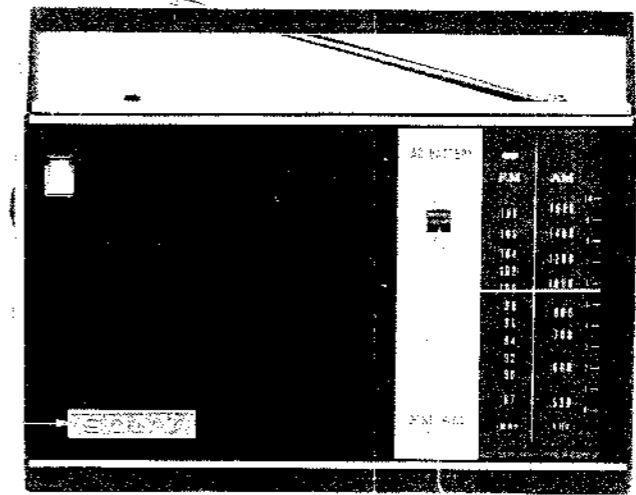
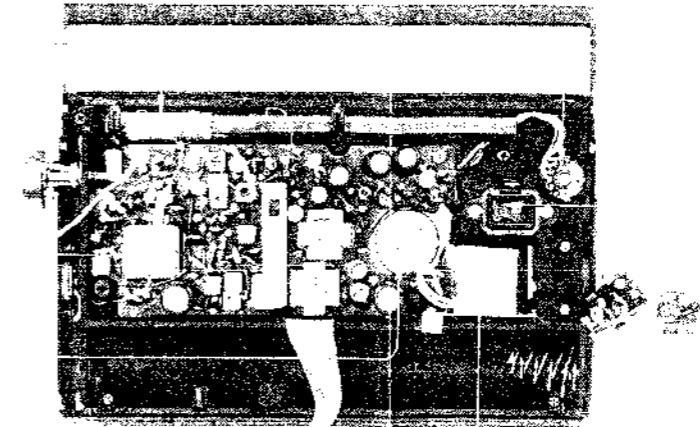


Fig. 1 External view

INTERIOR VIEW



REAR CABINET REMOVAL

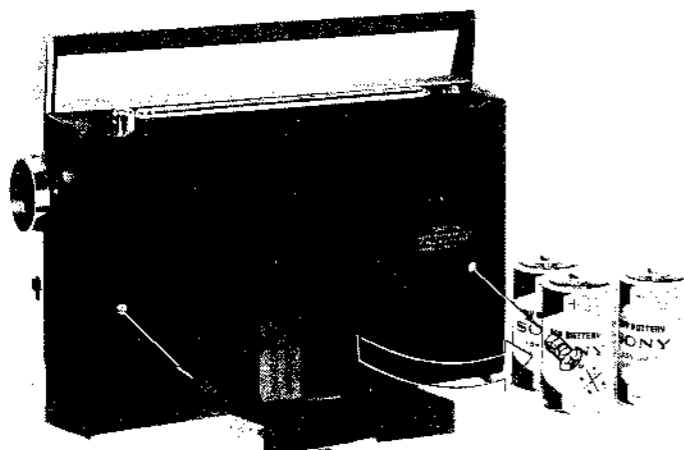


Fig. 3 Rear cabinet removal

1. Open a battery lid and take out batteries.
2. Remove rear cabinet by removing two holding screws marked with X in Fig. 3.
3. Pull out the ant. terminal pin from telescopic ant. terminal piece.

PRINTED CIRCUIT BOARD REMOVAL

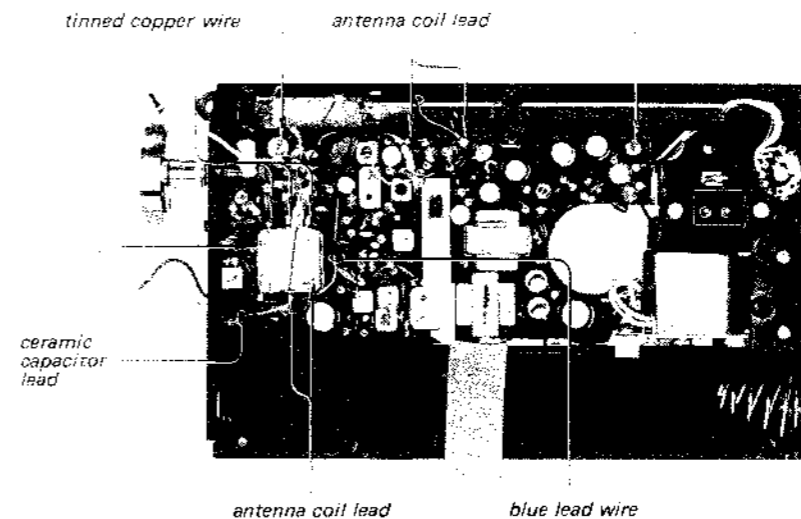


Fig. 5-1 Printed circuit board removal

CHASSIS REMOVAL

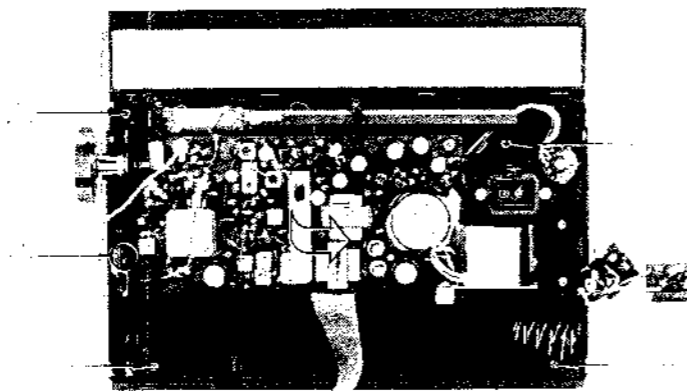


Fig. 4-1 Chassis removal

1. Remove four screws marked with X in Fig. 4-1.
2. Unsolder two TONE switch lead wires marked with X in Fig. 4-1.
3. Remove chassis in the direction shown by the arrow.
4. Unsolder two speaker lead wires shown in Fig. 4-2.

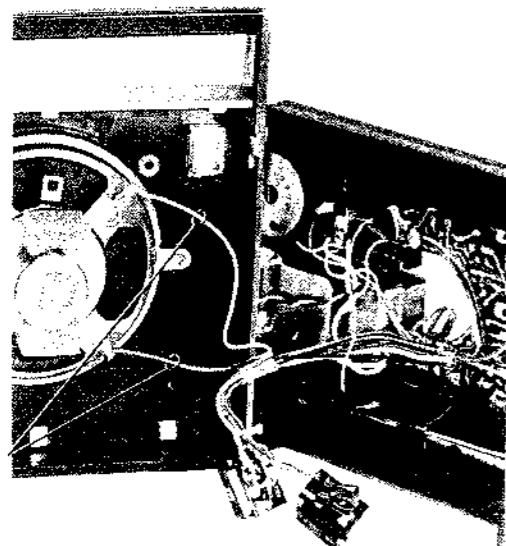


Fig. 4-2 Chassis removal

1. Remove four screws marked with X in Fig. 5-1 and Fig. 5-2.
2. Unsolder four antenna coil leads and a pvc lead wire at tuning capacitor shown in Fig. 5-1.
3. Unsolder a tuning capacitor terminal marked with X and three tinned copper wires shown in Fig. 5-1.
4. Unsolder a ceramic capacitor lead shown in Fig. 5-1.

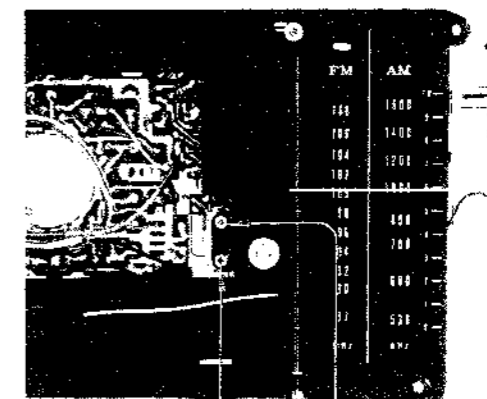


Fig. 5-2 Printed circuit board removal

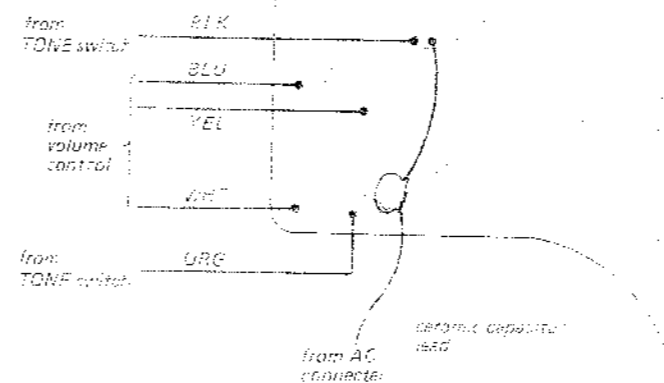


Fig. 5-3 Printed circuit board removal

5. Unsolder three pvc lead wires coming from volume control shown in Fig. 5-3.
6. Unsolder two pvc lead wires coming from TONE switch shown in Fig. 5-3.
7. Unsolder a ceramic capacitor lead coming from AC connector shown in Fig. 5-3.
8. Remove the printed circuit board.

REAR CABINET REMOVAL

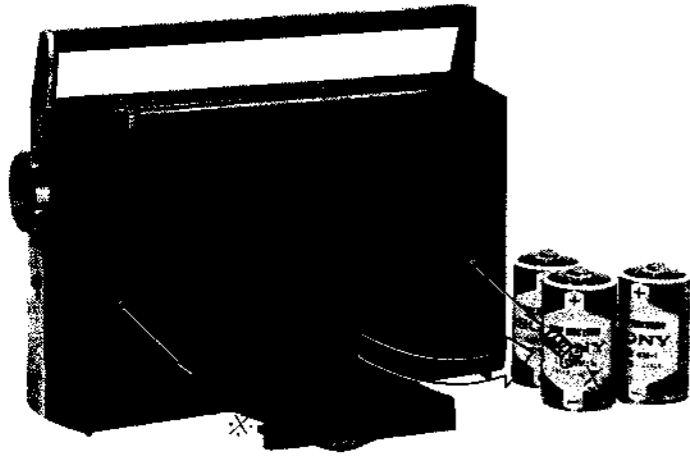


Fig. 3 Rear cabinet removal

1. Open a battery lid and take out batteries.
2. Remove rear cabinet by removing two holding screws marked with * in Fig. 3.
3. Pull out the ant. terminal pin from telescopic ant. terminal piece.

CHASSIS REMOVAL

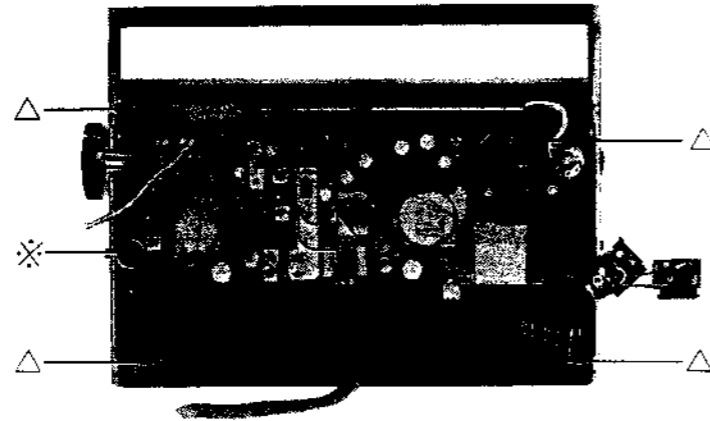


Fig. 4-1 Chassis removal

1. Remove four screws marked with Δ in Fig. 4-1.
2. Unsolder two TONE switch lead wires marked with * in Fig. 4-1.
3. Remove chassis in the direction shown by the arrow.
4. Unsolder two speaker lead wires shown in Fig. 4-2.

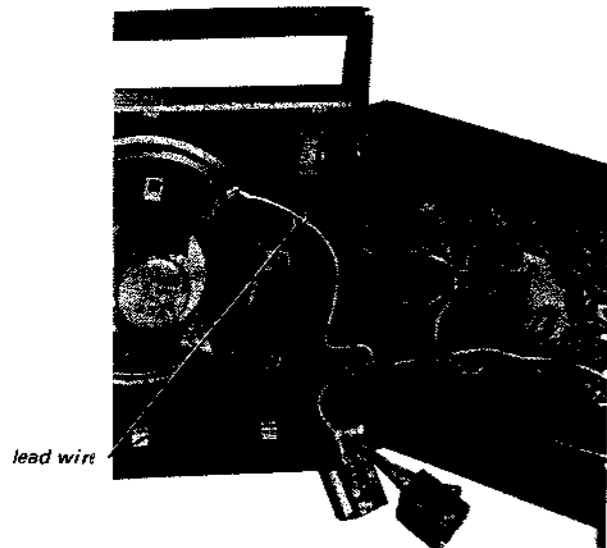


Fig. 4-2 Chassis removal

PRINTED CIRCUIT BOARD REMOVAL

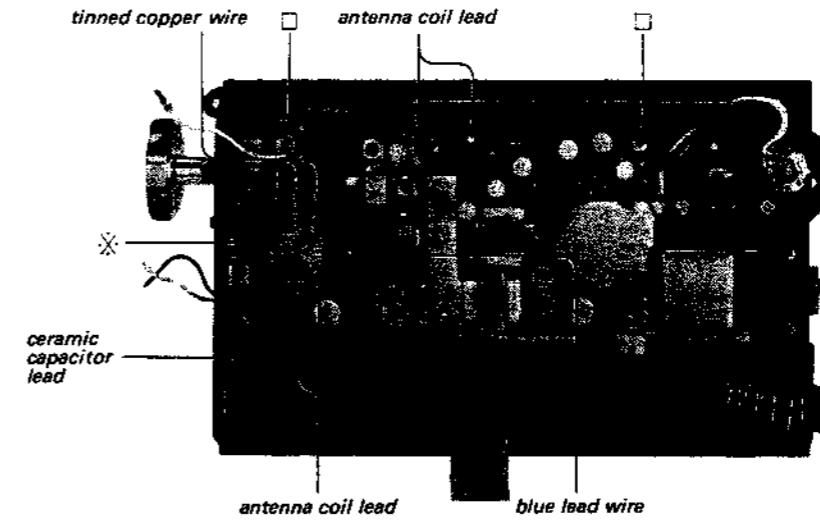


Fig. 5-1 Printed circuit board removal

1. Remove four screws marked with □ in Fig. 5-1 and Fig. 5-2.
2. Unsolder four antenna coil leads and a pvc lead wire at tuning capacitor shown in Fig. 5-1.
3. Unsolder a tuning capacitor terminal marked with * and three tinned copper wires shown in Fig. 5-1.
4. Unsolder a ceramic capacitor lead shown in Fig. 5-1.

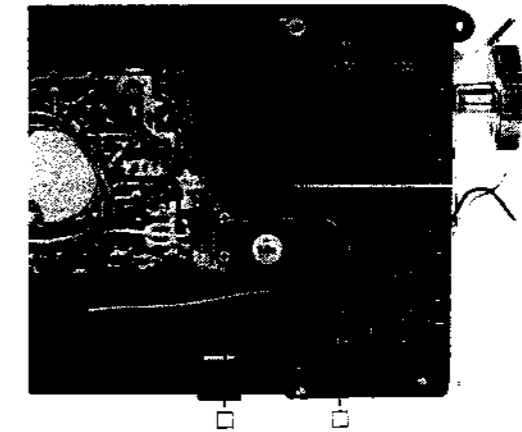


Fig. 5-2 Printed circuit board removal

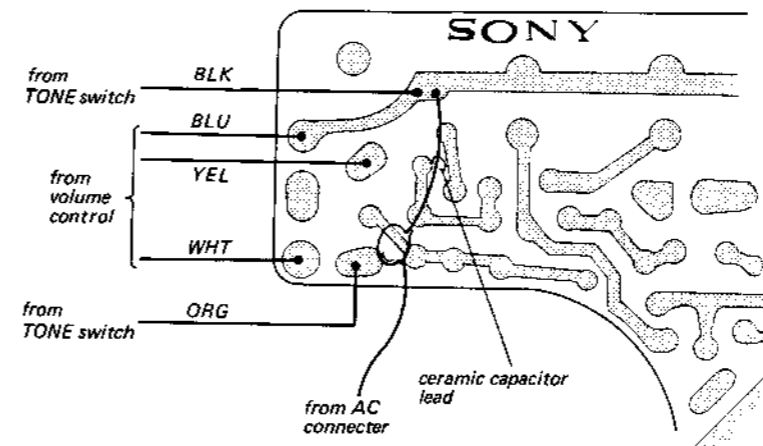


Fig. 5-3 Printed circuit board removal

5. Unsolder three pvc lead wires coming from volume control shown in Fig. 5-3.
6. Unsolder two pvc lead wires coming from TONE switch shown in Fig. 5-3.
7. Unsolder a ceramic capacitor lead coming from AC connector shown in Fig. 5-3.
8. Remove the printed circuit board.

DIAL CORD STRINGING

1. Turn tuning capacitor at fully counterclockwise position.
2. After stringing the dial cord, attach the pointer to dial cord and set it to specified position shown in Fig. 6-1.

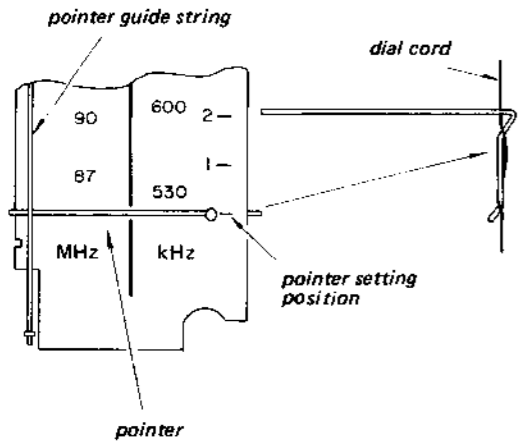


Fig. 6-1 Pointer setting

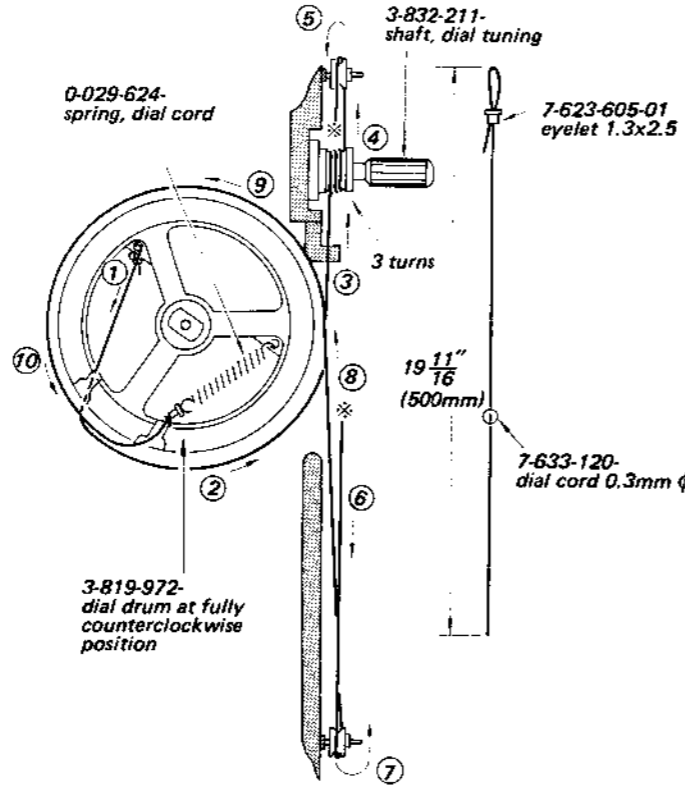


Fig. 6-2 Dial cord stringing

FM IF ALIGNMENT

Sweep Generator Connection	Sweep Generator Frequency	Oscilloscope Connection	Adjust	Remarks
See Fig. 7-3.	10.7 MHz sweep width: approx. 500 kHz	MPX OUT jack	IFT F101 IFT F001 IFT F002 IFT F003 IFT F004 See Fig. 7-5.	band selector FM Adjust to obtain the maximum amplitude and standard "S" curve shown in Fig. 7-2.

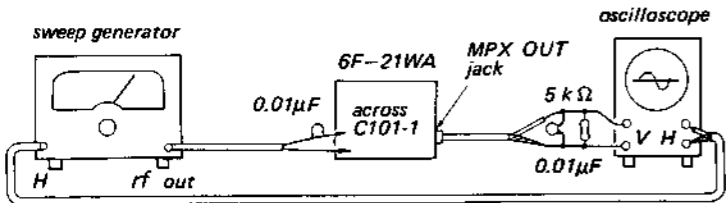


Fig. 7-1 Fm i-f alignment setup

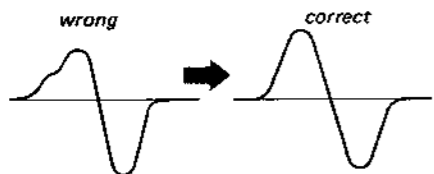


Fig. 7-2 Discriminator response "S" curve

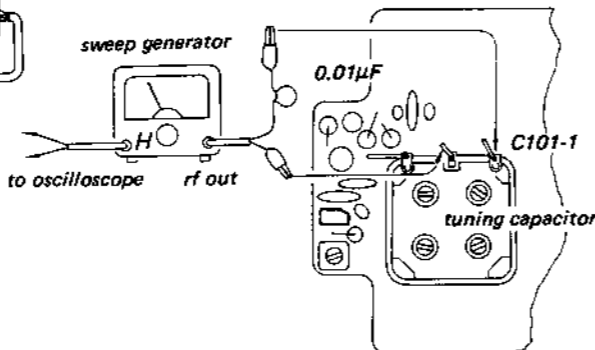


Fig. 7-3 Sweep generator connection

FREQUENCY COVERAGE AND TRACKING ADJUSTMENT

Adjusting Item	RF Signal Generator Coupling	RF Signal Generator Frequency	Receiver Dial Setting	VTVM Connection	Adjust	Remarks
FM Frequency Coverage	Connect RF Signal Generator to ant. terminal pin directly.	86 MHz (400 Hz 22.5 kHz fm)	fully downward	to earphone jack with 8 Ω load resistor in parallel	fm osc. coil L104	volume control max. TONE switch H AFC switch OFF band selector FM Adjust for maximum meter reading.
		109.5 MHz (400 Hz 22.5 kHz fm)	fully upward		fm osc. trimmer CT101-2	
FM Tracking	- ditto -	86 MHz (400 Hz 22.5 kHz fm)	tune to 86 MHz signal	- ditto -	fm rf coil L102	
		109.5 MHz (400 Hz 22.5 kHz fm)	tune to 109.5 MHz signal		fm rf trimmer CT101-1	
AM Frequency Coverage	loop antenna See Fig. 7-4.	520 kHz (1,000 Hz 30% a-m)	fully downward	- ditto -	a-m osc. coil L002	Same as above except specified band selector AM
		1,680 kHz (1,000 Hz 30% a-m)	fully upward		a-m osc. trimmer CT001-2	
AM Tracking	- ditto -	620 kHz (1,000 Hz 30% a-m)	tune to 620 kHz signal	- ditto -	a-m ant coil L001	
		1,400 kHz (1,000 Hz 30% a-m)	tune to 1,400 kHz signal		a-m ant. trimmer CT001-1	

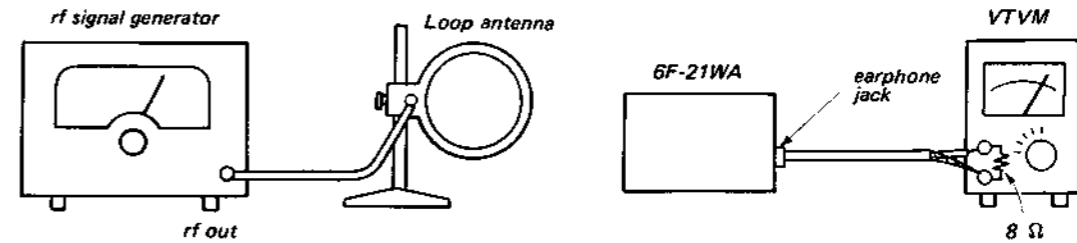


Fig. 7-4 A-m frequency coverage and tracking adjustment

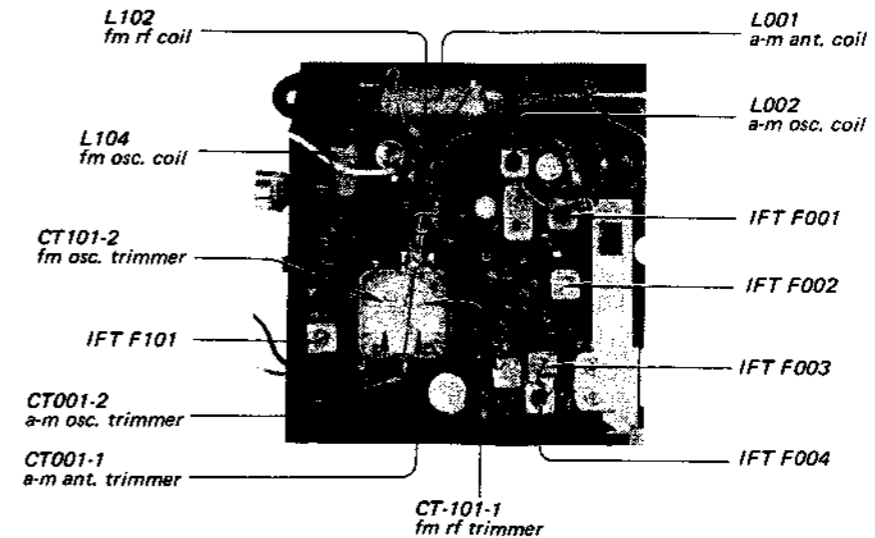
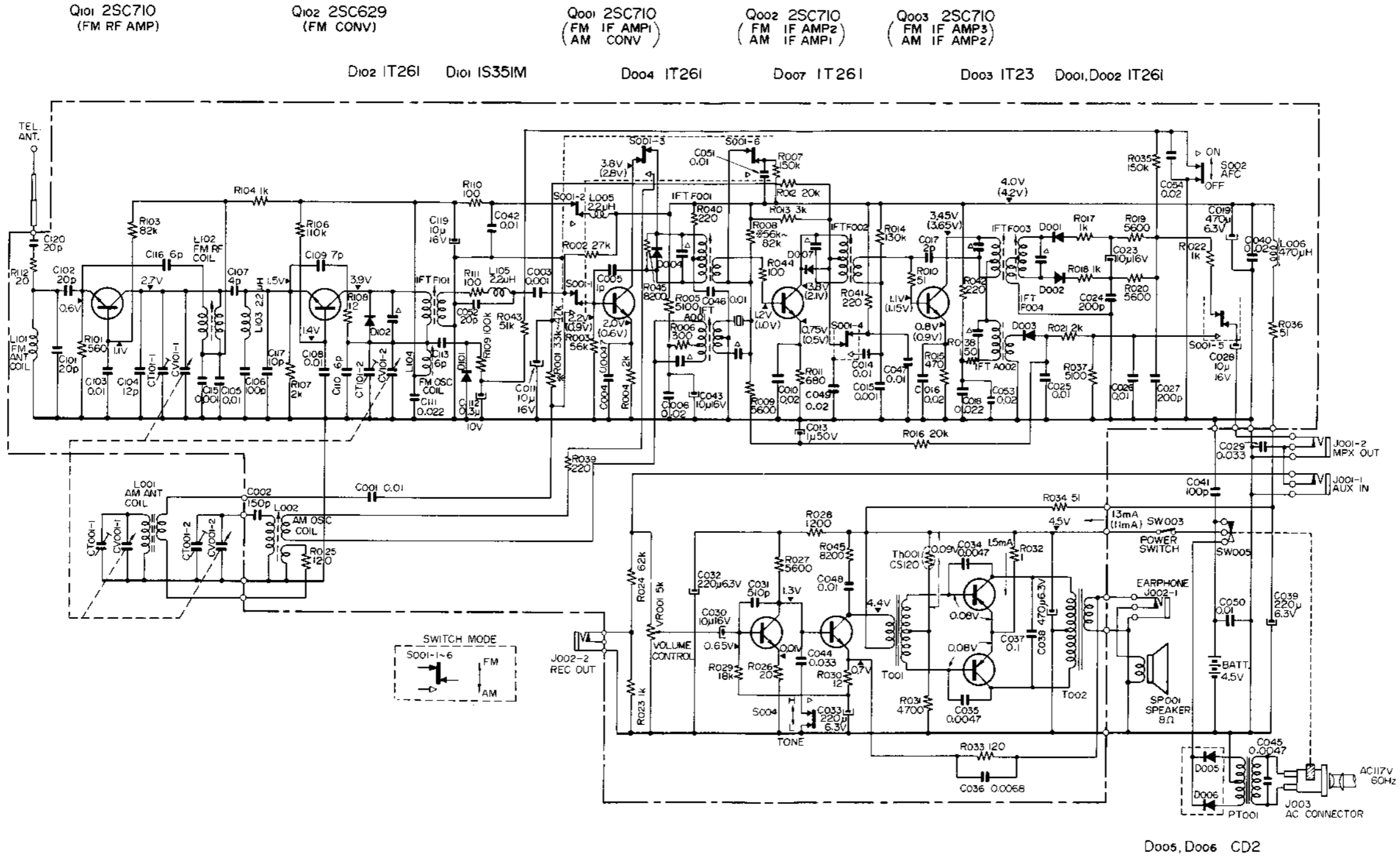


Fig. 7-5 Adjusting parts location

6F-21WA 6F-21WA

SCHEMATIC DIAGRAM



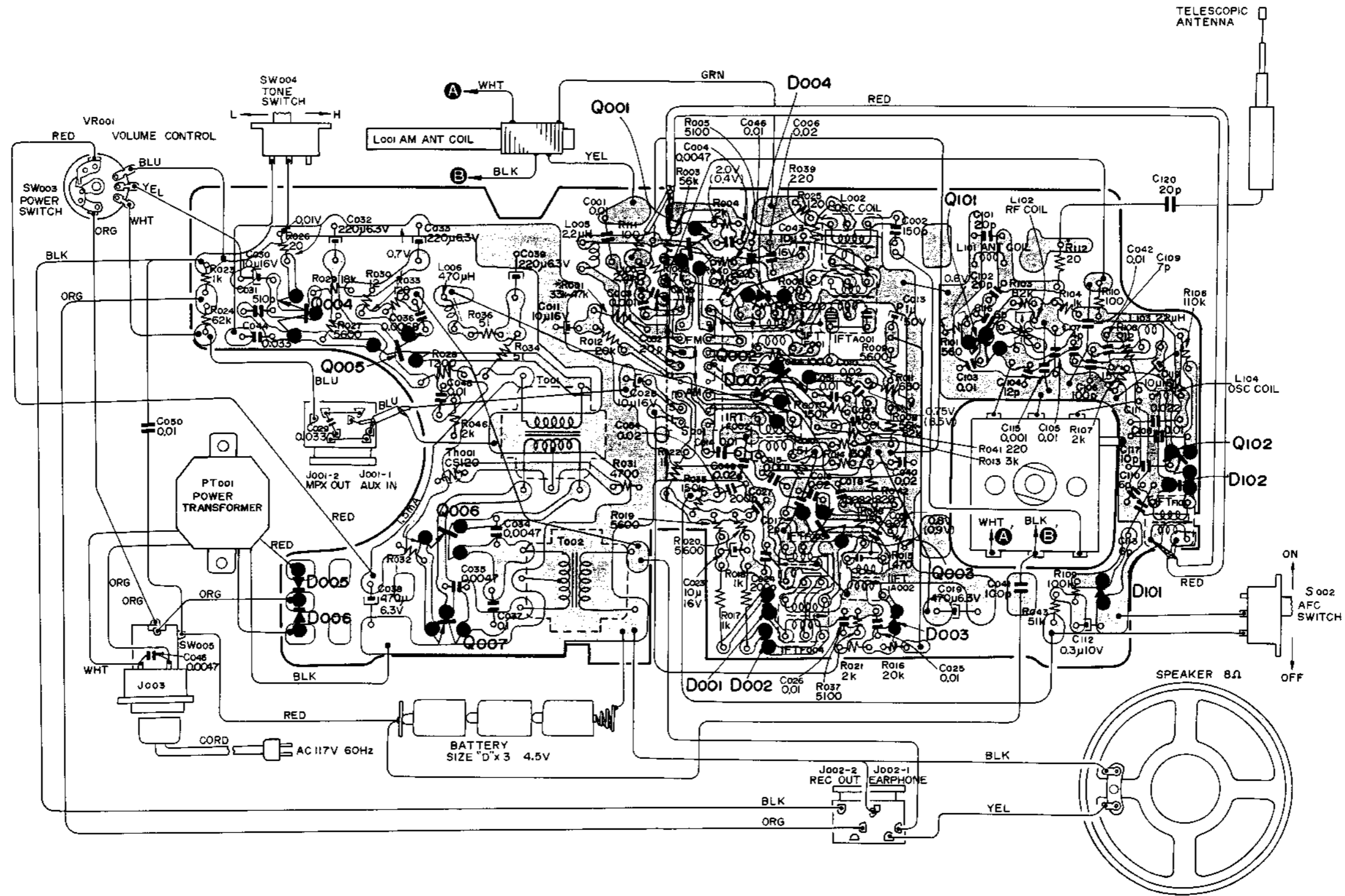
- Note:
1. All resistors and capacitors are in Ω and μF , unless otherwise indicated.
 2. Capacitor marked with Δ is built in i-f transformer and ceramic filter.
 3. Resistor marked with \otimes is to be selected in value.
 4. Voltage value is measured to ground circuit with a dc voltmeter ($20\text{ k}\Omega/V$) and current value is measured with a dc ammeter. Voltage and current values are taken with no radio signal received and the values shown in () are taken with band selector set to AM. Variations may be noted due to normal production tolerances.

Q004 2SC870 (AF AMP1) Q005 2SC870 (AF AMP2) Q006, Q007 2SB495 (POWER AMP)

6F-21WA 6F-21WA

MOUNTING DIAGRAM

- Conductor Side -

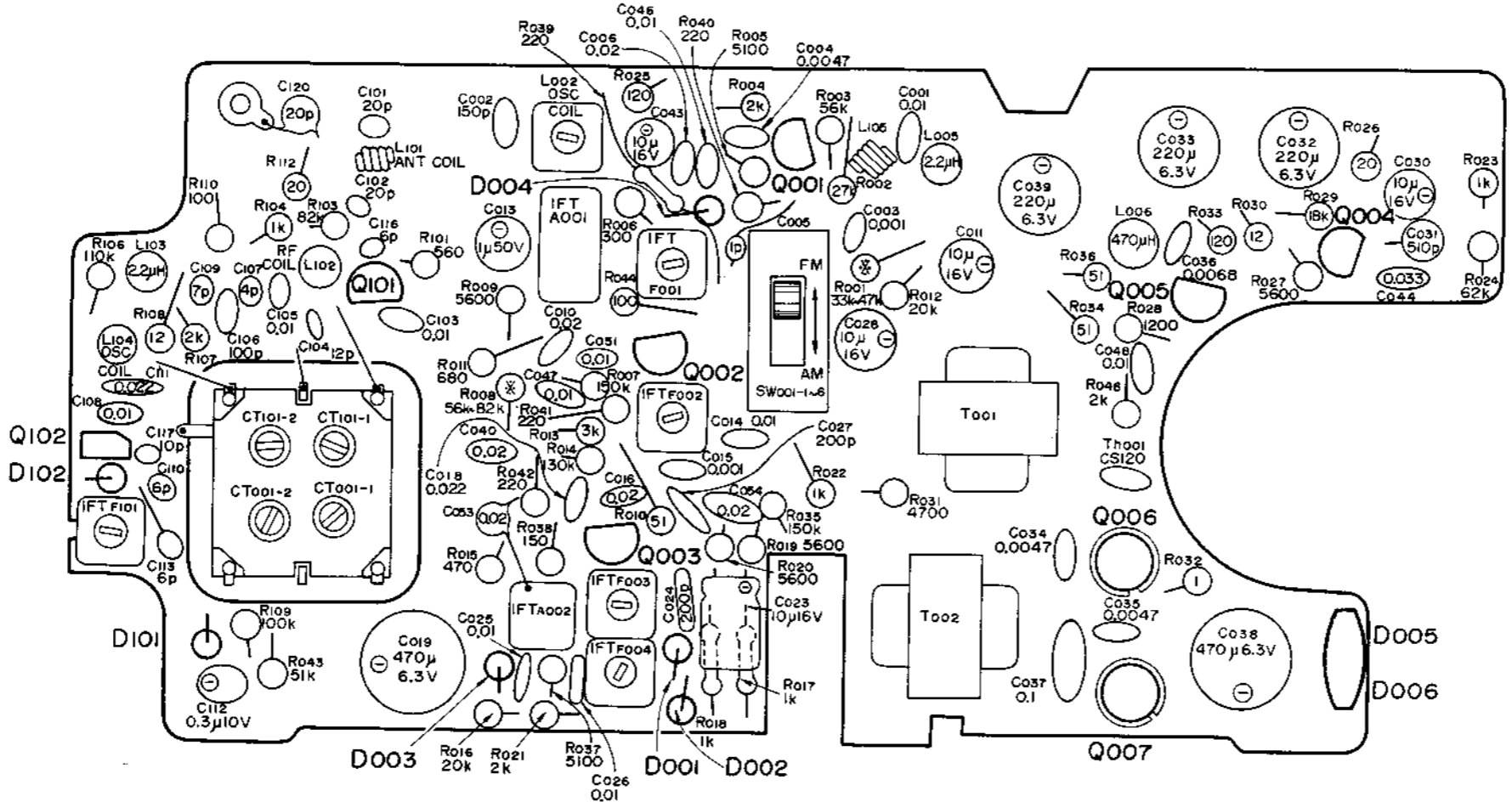


C017, C042, C049, C052, C115, C119,
R045, R111, D007: Mounted on the conductor side.
Resistor marked with ✕ is to be selected in value.

Printed Circuit Board
Part No. 1-539-193-12

6F-21WA 6F-21WA

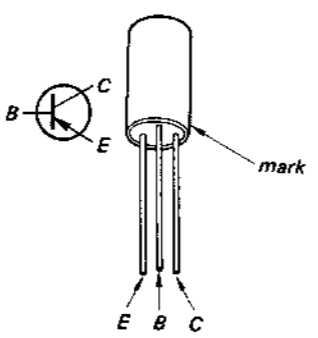
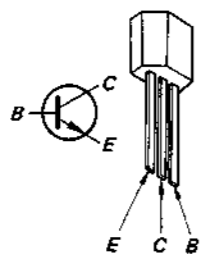
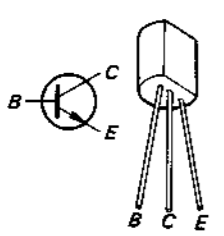
MOUNTING DIAGRAM - Component Side -



- Q101 2SC710
- Q001 2SC710
- Q002 2SC710
- Q003 2SC710
- Q004 2SC710
- Q005 2SC710

Q102 2SC629

Q006 2SB495
Q007 2SB495

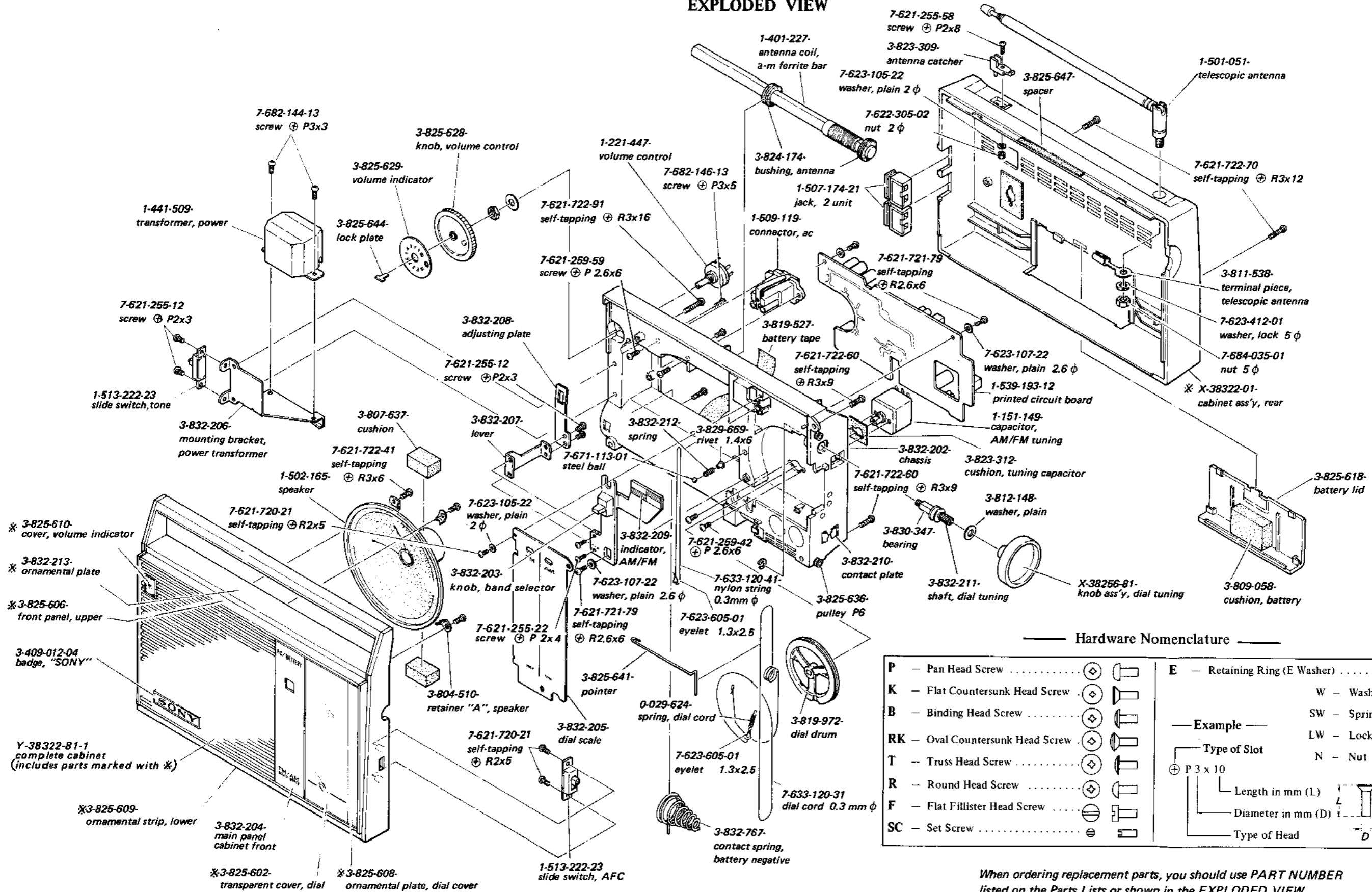


C017, C042, C049, C052, C115, C119,
R045, R111, D007: Mounted on the conductor side.
Resistor marked with * is to be selected in value.

Printed Circuit Board
Part No. 1-539-193-12

6F-21WA 6F-21WA

EXPLODED VIEW



Hardware Nomenclature

P	— Pan Head Screw	
K	— Flat Countersunk Head Screw	
B	— Binding Head Screw	
RK	— Oval Countersunk Head Screw	
T	— Truss Head Screw	
R	— Round Head Screw	
F	— Flat Fillister Head Screw	
SC	— Set Screw	
E	— Retaining Ring (E Washer)	
W	— Washer	
SW	— Spring Washer	
LW	— Lock Washer	
N	— Nut	

Example

— Type of Slot

⊕ P 3 x 10

— Length in mm (L)

— Diameter in mm (D)

— Type of Head

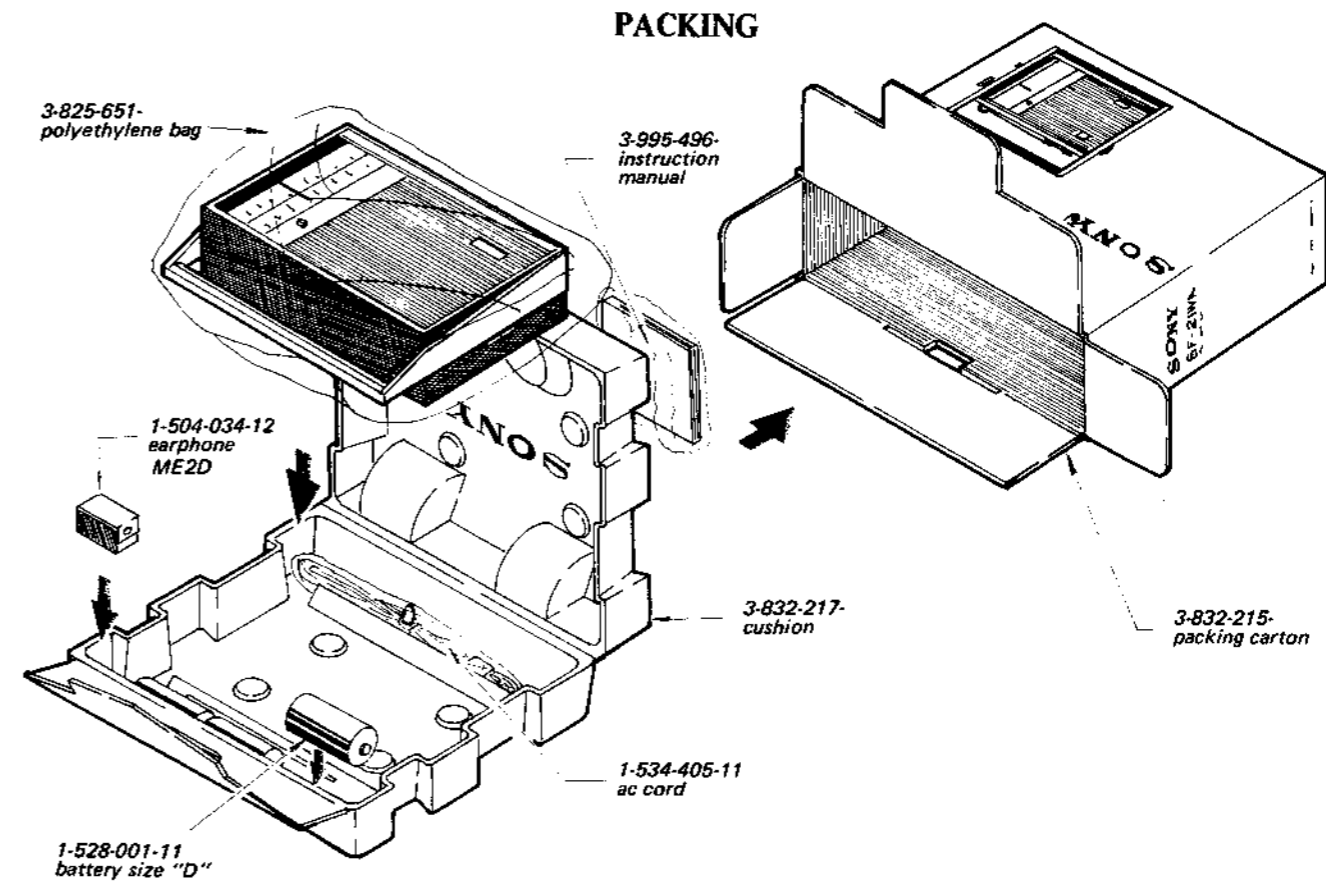
When ordering replacement parts, you should use PART NUMBER listed on the Parts Lists or shown in the EXPLODED VIEW. The symbol number should not be used for ordering purposes.

ELECTRICAL PARTS LIST

Symbol No.	Part No.	Description	Symbol No.	Part No.	Description
Semiconductors					
Q001		transistor 2SC710	R004	1-244-680	2 kΩ ± 5% 1/4W
Q002		transistor 2SC710	R005	1-244-690	5100 Ω ± 5% 1/4W
Q003		transistor 2SC710	R006	1-244-660	300 Ω ± 10% 1/4W
Q004		transistor 2SC870	R007	1-244-725	150 kΩ ± 10% 1/4W
Q005		transistor 2SC870		1-244-715	56 kΩ ± 5% 1/4W
Q006		transistor 2SB495		1-244-716	62 kΩ ± 5% 1/4W
Q007		transistor 2SB495	*R008	1-244-717	68 kΩ ± 5% 1/4W
Q101		transistor 2SC710		1-244-718	75 kΩ ± 5% 1/4W
Q102		transistor 2SC629		1-244-719	82 kΩ ± 5% 1/4W
D001		diode 1T261	R009	1-244-691	5600 Ω ± 5% 1/4W
D002		diode 1T261	R010	1-244-642	51 Ω ± 10% 1/4W
D003		diode 1T23	R011	1-244-669	680 Ω ± 10% 1/4W
D004		diode 1T261	R012	1-244-704	20 kΩ ± 5% 1/4W
D005		diode CD-2	R013	1-244-684	3 kΩ ± 5% 1/4W
D006		diode CD-2	R014	1-244-724	130 kΩ ± 10% 1/4W
D101		diode 1S351M	R015	1-244-665	470 Ω ± 10% 1/4W
D102		diode 1T261	R016	1-244-704	20 kΩ ± 5% 1/4W
Th001	8-691-001-11	thermistor CS120	R017	1-244-673	1 kΩ ± 5% 1/4W
Coil and Transformer					
L001	1-401-227-	ant. coil, a-m ferrite bar	R018	1-244-673	1 kΩ ± 5% 1/4W
L002	1-405-306-	osc. coil, a-m	R019	1-244-691	5600 Ω ± 5% 1/4W
L003		--- discarded ---	R020	1-244-691	5600 Ω ± 5% 1/4W
L004		--- discarded ---	R021	1-244-680	2 kΩ ± 5% 1/4W
L005	1-407-182-	micro inductor 2.2 μH	R022	1-244-673	1 kΩ ± 5% 1/4W
L006	1-407-1580-	micro inductor 470 μH	R023	1-244-673	1 kΩ ± 5% 1/4W
L101	1-401-228-	ant. coil, fm	R024	1-244-716	62 kΩ ± 10% 1/4W
L102	1-425-373-	rf coil, fm	R025	1-244-651-	120 Ω ± 10% 1/4W
L103	1-407-182-	micro inductor 2.2 μH	R026	1-244-632-	20 Ω ± 10% 1/4W
L104	1-425-533-	osc. coil, fm	R027	1-244-691-	5600 Ω ± 10% 1/4W
L105	1-401-219-	loading coil	R028	1-244-675-	1200 Ω ± 10% 1/4W
IFT F001	1-403-243-15	transformer, fm i-f	R029	1-244-603-	18 kΩ ± 5% 1/4W
IFT F002	1-403-244-15	transformer, fm i-f	R030	1-244-627-	12 Ω ± 10% 1/4W
IFT F003	1-403-272-15	discriminator, prim.	R031	1-244-685-	3300 Ω ± 5% 1/4W
IFT F004	1-403-273-15	discriminator, sec.	R032	1-244-601-	1 Ω ± 5% 1/4W
IFT A001	1-403-163-21	transformer, a-m i-f	R033	1-244-651-	120 Ω ± 10% 1/4W
IFT A002	1-403-137-	transformer, a-m i-f	R034	1-244-642-	51 Ω ± 10% 1/4W
IFT F101	1-403-242-15	transformer, fm i-f	R035	1-244-725-	150 kΩ ± 10% 1/4W
T001	1-423-077-	transformer, driver	R036	1-244-642-	51 Ω ± 10% 1/4W
T002	1-427-128-	transformer, output	R037	1-244-690-	5100 Ω ± 10% 1/4W
PT001	1-441-509-	transformer, power	R038	1-244-653-	150 Ω ± 10% 1/4W
General					
CV101	1-539-193-12	printed circuit board	R039	1-244-657-	220 Ω ± 10% 1/4W
SW001	1-513-274-	capacitor, fm/a-m tuning	R040	1-244-657-	220 Ω ± 10% 1/4W
RV001	1-221-447-15	slide switch, band selector	R041	1-244-657-	220 Ω ± 10% 1/4W
TEL ANT	1-501-051-	volume control	R042	1-244-657-	220 Ω ± 10% 1/4W
SP	1-502-165-21	antenna, telescopic	R043	1-244-714-	51 kΩ ± 10% 1/4W
	1-506-108-	speaker	R044	1-244-649-	100 Ω ± 10% 1/4W
J003	1-509-119-11	terminal pin, antenna	R045	1-244-695-	8200 Ω ± 5% 1/4W
J001	1-509-119-11	connector, ac	R101	1-244-667-	560 Ω ± 10% 1/4W
J002	1-507-174-22	jack, 2-unit AUX IN, MPX OUT	R102		--- discarded ---
J003	1-507-174-22	jack, 2-unit record out, earphone	R103	1-244-719-	82 kΩ ± 5% 1/4W
J003	1-509-119-11	connector, ac	R104	1-244-673-	1 kΩ ± 10% 1/4W
SW002	1-513-222-23	slide switch, AFC ON/OFF	R105		--- discarded ---
SW004	1-513-222-23	slide switch, TONE	R106	1-244-722-	110 kΩ ± 5% 1/4W
	1-534-405-	ac cord	R107	1-244-680-	2 kΩ ± 5% 1/4W
Resistor (carbon)					
*R001	1-244-707-	27 kΩ ± 5% 1/4W	R108	1-244-627-	12 Ω ± 5% 1/4W
	1-244-708-	30 kΩ ± 5% 1/4W	R109	1-244-721-	100 kΩ ± 10% 1/4W
	1-244-709-	33 kΩ ± 5% 1/4W	R110	1-244-649-	100 Ω ± 10% 1/4W
	1-244-710-	36 kΩ ± 5% 1/4W	R111	1-244-649-	100 Ω ± 10% 1/4W
	1-244-711-	39 kΩ ± 5% 1/4W	R112	1-244-632-	20 Ω ± 5% 1/4W
R002	1-244-707-	27 kΩ ± 5% 1/4W	Capacitor		
R003	1-244-715-	56 kΩ ± 10% 1/4W	C001	1-101-072-	0.01 μF 25 V ceramic
			C002	1-107-135-	150 pF 50 V silvered mica
			C003	1-101-918-	0.001 μF 50 V ceramic
			C004	1-105-829-12	0.0047 μF 50 V mylar
			C005	1-101-951-	1 pF 50 V ceramic
			C006	1-101-073-	0.02 μF 25 V ceramic
			C007		built-in i-f transformer
			C008		built-in i-f transformer
			C009		built-in i-f transformer
			C010	1-101-073-	0.02 μF 25 V ceramic

Symbol No.	Part No.	Description	Symbol No.	Part No.	Description
C011	1-121-347-	10 μF 16 V electrolytic	C043	1-121-342-	220 μF 6.3 V electrolytic
C012		--- discarded ---	C044	1-105-414-12	0.033 μF 50 V mylar
C013	1-121-347-	10 μF 16 V electrolytic	C045	1-115-071-	0.0047 μF 600 V metalized paper
C014	1-101-072-	0.01 μF 25 V ceramic	C046	1-101-072-	0.01 μF 25 V ceramic
C015	1-103-665-	390 pF 50 V styrol	C047	1-101-072-	0.01 μF 25 V ceramic
C016	1-101-073-	0.02 μF 25 V ceramic	C048	1-105-833-12	0.01 μF 35 V mylar
C017	1-101-952-	2 pF 50 V ceramic	C049	1-101-073-	0.02 μF 25 V ceramic
C018	1-105-837-12	0.022 μF 50 V mylar	C050	1-101-072-	0.01 μF 25 V ceramic
C019	1-121-342-	470 μF 6.3 V electrolytic	C051	1-101-072-	0.01 μF 25 V ceramic
C020		built-in i-f transformer	C052	1-101-864-	200 pF 50 V ceramic
C021		built-in i-f transformer	C053	1-101-073-	0.02 μF 25 V ceramic
C022		built-in i-f transformer	C054	1-101-073-	0.02 μF 25 V ceramic
C023	1-121-347-	10 μF 16 V electrolytic	C101	1-101-864-	20 pF 50 V ceramic
C024	1-107-138-	200 pF 50 V silvered mica	C102	1-101-864-	20 pF 50 V ceramic
C025	1-105-833-12	0.01 μF 35 V mylar	C103	1-101-072-	0.01 μF 25 V ceramic
C026	1-105-821-12	0.001 μF 50 V mylar	C104	1-101-961-	12 pF 50 V ceramic
C027	1-107-138-	200 pF 50 V silvered mica	C105	1-101-072-	0.01 μF 25 V ceramic
C028	1-121-347-	10 μF 16 V electrolytic	C106	1-101-896-	100 pF 50 V ceramic
C029	1-105-414-12	0.033 μF 50 V mylar	C107	1-101-954-	4 pF 50 V ceramic
C030	1-121-347-	10 μF 16 V electrolytic	C108	1-101-072-	0.01 μF 25 V ceramic
C031	1-103-668-	510 pF 50 V styrol	C109	1-101-957-	7 pF 50 V ceramic
C032	1-121-295-	220 μF 6.3 V electrolytic	C110	1-101-956-	6 pF 50 V ceramic
C033	1-121-295-	220 μF 6.3 V electrolytic	C111	1-105-837-12	0.022 μF 50 V mylar
C034	1-105-829-12	0.0047 μF 50 V mylar	C112	1-127-021-	0.3 μF 10 V aluminum solid
C035	1-105-829-12	0.0047 μF 50 V mylar	C113	1-101-956-	6 pF 50 V ceramic
C036	1-105-831-12	0.0068 μF 50 V mylar	C114		built-in i-f transformer
C037	1-105-417-12	0.1 μF 35 V mylar	C115	1-101-918-	0.001 μF 25 V ceramic
C038	1-121-342-	470 μF 6.3 V electrolytic	C116	1-101-956-	6 pF 50 V ceramic
C039	1-121-347-	10 μF 16 V electrolytic	C117	1-101-965-	10 pF 50 V ceramic
C040	1-101-073-	0.02 μF 25 V ceramic	C118		--- discarded ---
C041		--- discarded ---	C119	1-121-347-	10 μF 16 V electrolytic
C042	1-101-072-	0.01 μF 25 V ceramic	C120	1-101-864-	20 pF 50 V ceramic

Note: Resistor marked with * is to be selected in value.



SONY CORPORATION

SERVICE MANUAL SUPPLEMENT

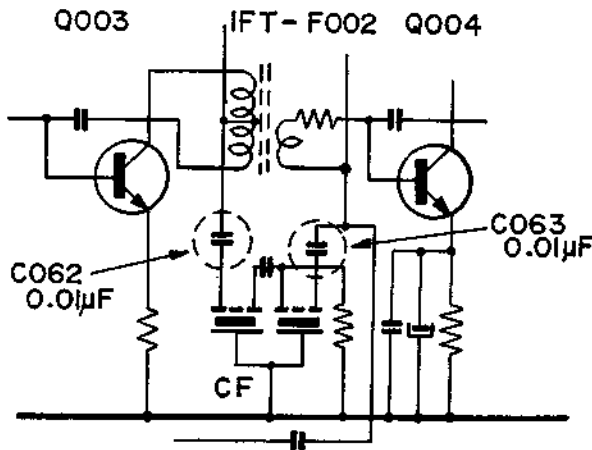
NO 1.
JUN. '69

Applicable Serial No: 17,001 and later

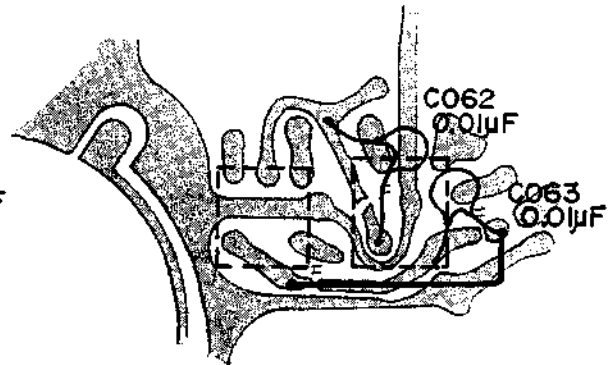
Subject: Minor change of Model 6F-21L

1. Addition of Capacitors C062 and C063

Ceramic capacitors C062 and C063 are added to prevent the ceramic filter from dc current leakage.



Schematic diagram



Mounting diagram (conductor side)
IF-AF circuit board

Note:

1. Three portions of the conductor marked with # are cut.
2. C062 and C063 are mounted on the conductor side.

Parts added: Ceramic capacitor 0.01 μ F 1-101-141.....2 pcs.

2. Change of Ceramic Filter

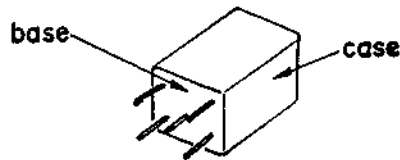
The ceramic filter and its coupling capacitor C020 are changed.

Parts changed:

Description	Former	New
Ceramic filter	1-403-161-11	1-403-161-12 or 1-403-153-13
Ceramic capacitor C 020	68 pF 1-101-888-	56 pF 1-101-884-

Note: Color identification of ceramic filter

- 1-403-161- case: black
base: red or black
- 1-403-153- case: red
base: black



Ceramic Filter

3. Change of Power Transistors

Power transistors Q007 and Q008, their heat-sinks and the base biasing resistor R 035 are changed.

Parts changed:

Description	Former	New
Transistor Q007, Q008	2SB383	2SB495
Resistor R035	3.3 k Ω 1/4 W 1-244-685-	5.1 k Ω 1/4 W 1-244-690-
Heat-Sink	3-822-634-02	3-824-751-01

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