

ICF-5900W

*US Model
Canadian Model
UK Model
AEP Model
E Model*



FM/AM MULTI-BAND RECEIVER

SPECIFICATIONS

Power Requirements: 4.5 V dc, three batteries size D (IEC designation R20)
US and Canadian Model

120 V ac, 60Hz with Sony ac power adaptor AC-110

UK, AEP and E Model

220 – 240V ac (100, 110–127V adjustable)
50/60Hz with optional Sony ac power adaptor AC-3W
AC-456C (West Germany Model)

or 12V car battery with optional Sony car battery cord DCC-127H

Power Output: 1,900mW dc (Total Harmonic Distortion 10%)

Power Consumption: **US and Canadian Model**

6W ac (60Hz) with Sony ac power adaptor AC-110

UK, AEP and E Model

7.4VA (50Hz) 6.8VA (60Hz) with optional ac power adaptor AC-3W

Circuit Systems: FM/MW: Superheterodyne

SW: Dual conversion superheterodyne

Frequency Range: FM: 87.5 – 108 MHz

SW₁: 3.9 – 10 MHz (77 – 30m)

SW₂: 11.7 – 20 MHz (25.6 – 15m)

SW₃: 20 – 28 MHz (15 – 10.7m)

MW: 530 – 1,605 kHz

Antennas: FM/SW: Telescopic antenna, external antenna terminals

MW: Built-in ferrite-rod antenna, external antenna terminal

Speaker: 10 cm (4 inches) dia.

Dimensions: Approx. 223 (W) x 234 (h) x 102 (d) mm

8 $\frac{3}{4}$ (W) x 9 $\frac{1}{4}$ (h) x 4 (d) inches

(Including projecting parts and controls)

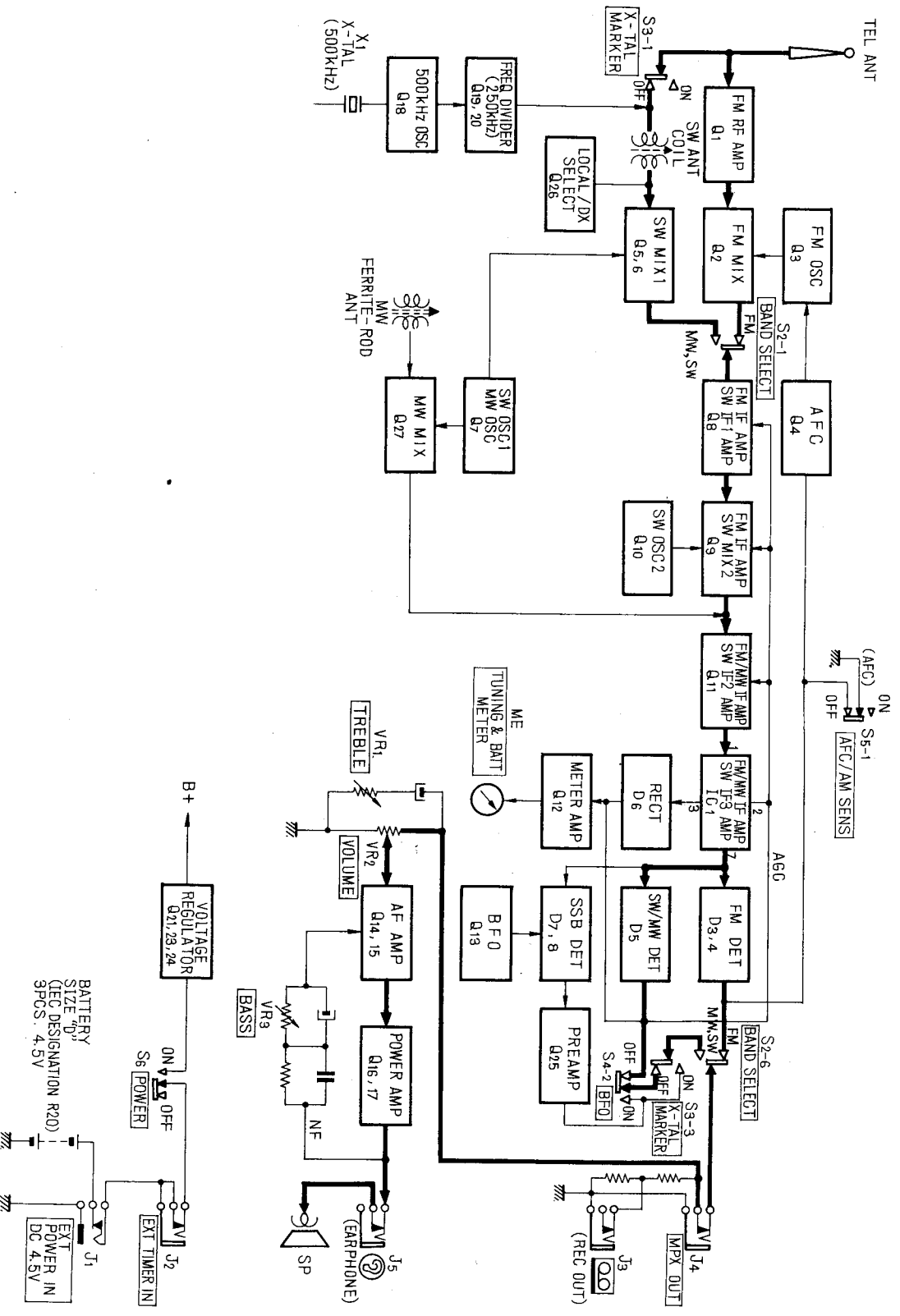
Weight: Approx. 2.2 kg, 4 lb 7 oz

(Including batteries)

SONY[®]
SERVICE MANUAL

SECTION 1 OUTLINE

1-1. BLOCK DIAGRAM



SECTION 2
DISASSEMBLY

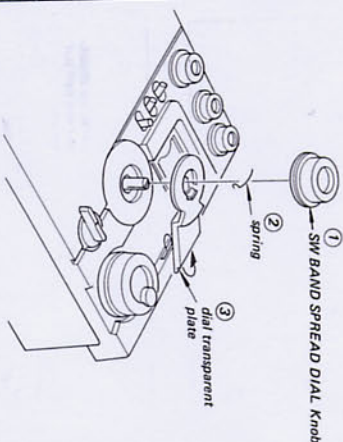
ADJUSTMENT COVER REMOVAL
Remove a screw (B3 x 5).

- SW FREQUENCY SCALE ADJUSTMENT
- SW OSC 2 ADJUSTMENT
- MARKER ADJUSTMENT

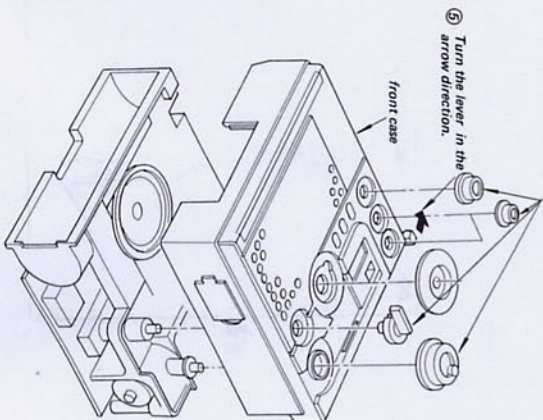
REAR CASE REMOVAL
Remove four screws (TA, P3 x 52).

- SW TRACKING ADJUSTMENT
- SW MIXER 1 ADJUSTMENT
- SW OSC 2 ADJUSTMENT
- MARKER ADJUSTMENT

FRONT CASE REMOVAL

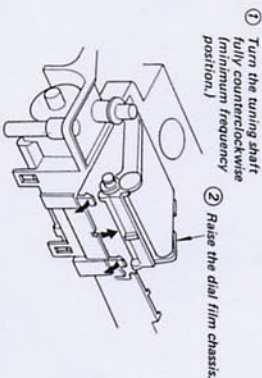


④ TONE Knobs, dial scale, MAIN TUNING and BAND SELECT Knobs.

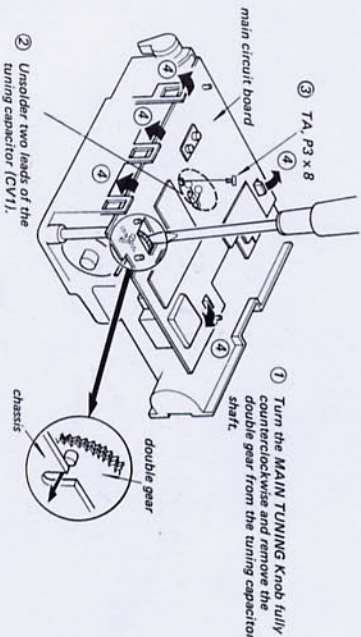


- FM IF ADJUSTMENT
- FM FREQUENCY COVERAGE ADJUSTMENT
- FM TRACKING ADJUSTMENT
- AM IF ADJUSTMENT
- MW FREQUENCY COVERAGE ADJUSTMENT
- MW TRACKING ADJUSTMENT
- BFO ADJUSTMENT

DIAL FILM CHASSIS REMOVAL

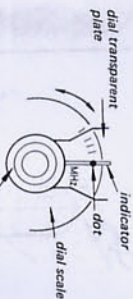


MAIN CIRCUIT BOARD (1) REMOVAL



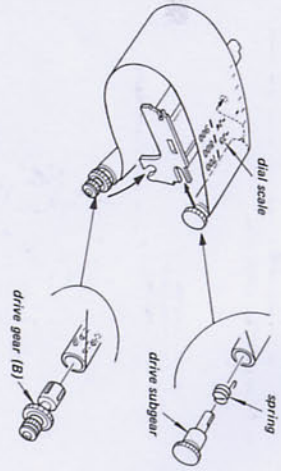
SETTING OF SW BAND SPREAD DIAL

1. Turn the SW BAND SPREAD DIAL knob fully counterclockwise and secure it with hand.
2. Turning the dial scale, match the dot to the indicator.



SW BAND SPREAD DIAL knob

DIAL FILM ATTACHMENT (1)



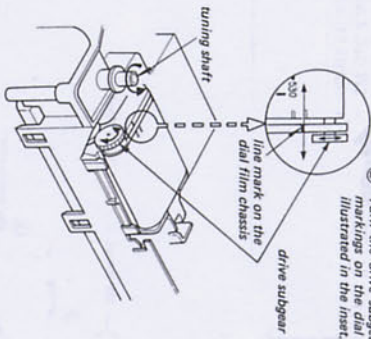
2 Pull the drive gear (B) in the direction of A and turn it clockwise to eliminate any slack of the dial film. Holding the dial film not to be unwound, further turn the gear about 90° clockwise to wind up the spring.



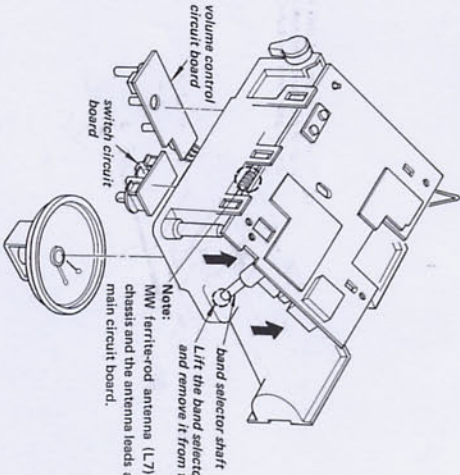
DIAL FILM POSITIONING

1 Turn the tuning shaft fully counterclockwise and hold it not to turn clockwise.

2 Turn the drive subgear so that the markings on the dial film place as illustrated in the insert.

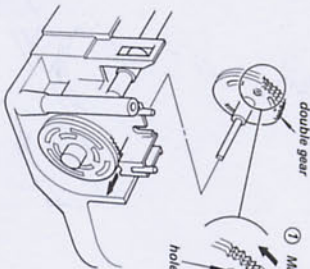


MAIN CIRCUIT BOARD (2) REMOVAL

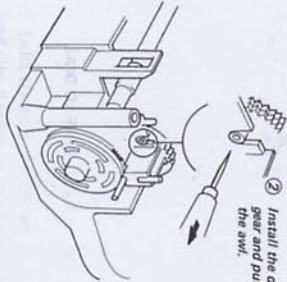


Note:
 MNV ferrite-cod antenna (L7) is mounted on the chassis and the antenna leads are connected to the main circuit board.
 Lift the hand selector shaft and remove it from the main chassis.

DOUBLE GEAR INSTALLATION

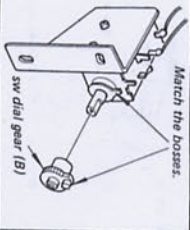


1 Match the holes.



2 Install the double gear and pull out the awl.

SW DIAL GEAR (B) INSTALLATION



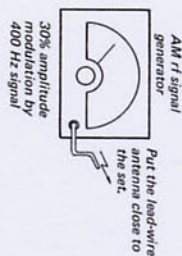
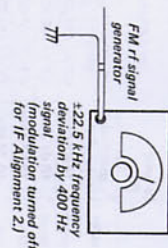
Match the bosses.

SECTION 3
ELECTRICAL ADJUSTMENTS

FM/AM SECTION

SETTING:
AFC/AM SENS switch : OFF/LOCAL
BAND SELECT switch : MW or FM

• Repeat the procedures in each adjustment several times, and the frequency coverage and tracking adjustments should be finally done by the trimmer capacitors.



109.5 MHz (108 MHz)	CT1
86.5 MHz (87.5 MHz)	L4

Adjust for a maximum reading on VOM ①.

FM TRACKING ADJUSTMENT

(1: in West Germany

86.5 MHz (87.5 MHz)	L6
109.5 MHz (108 MHz)	CT2

Adjust for a maximum reading on VOM ①.

FM FREQUENCY COVERAGE ADJUSTMENT

(1: in West Germany

MW/SW SECOND IF ALIGNMENT	
Adjust for a maximum reading on VOM ①.	
455 KHz (468 KHz)	IFT3

(1: UK model)

MW TRACKING ADJUSTMENT	
L7	620 KHz
CT3	1,400 KHz

MW FREQUENCY COVERAGE ADJUSTMENT	
CT4	1,680 KHz
L11	520 KHz

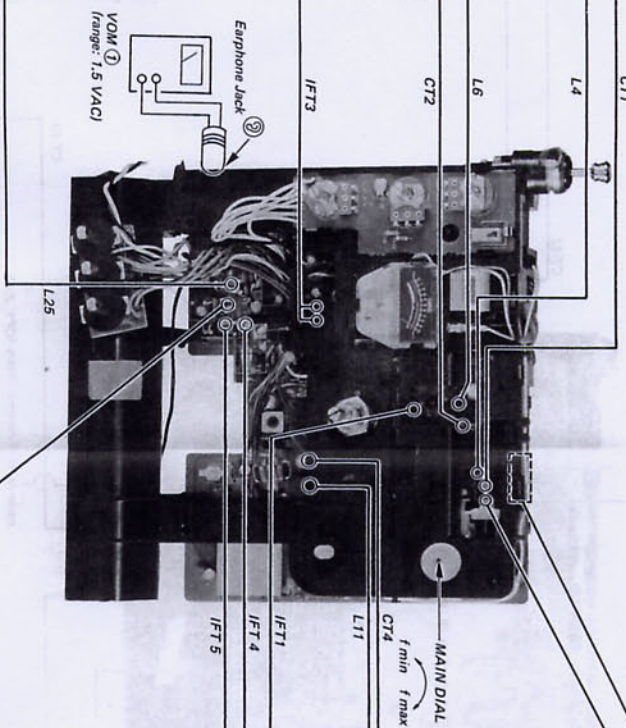
FM I.F. ALIGNMENT 1 (*Specified Center Freq. with modulation)
Adjust for a maximum reading on VOM ①.

IFT 1	
IFT 4	
IFT 5	

CERAMIC FILTERS	
Color	*Specified Center Freq.
green	10.61 MHz
black	10.64 MHz
blue	10.67 MHz
red	10.70 MHz
orange	10.73 MHz
white	10.76 MHz
yellow	10.79 MHz

FM I.F. ALIGNMENT 2 (*Specified center freq. with modulation)
Adjust for OV reading on VOM ②.

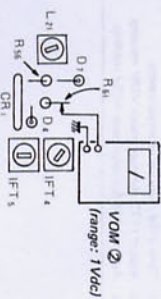
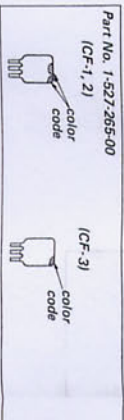
IFT 5	
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BFO ADJUSTMENT
Setting : BFO switch : ON
BAND SELECT switch : MW
no modulation

Procedure :
1. Tune the set to 1,400 KHz.
2. Adjust L25 for zero beating (*).
Note : Zero beating means the point that the beating just disappears.

Note:
The color code of the ceramic filters (CF-1, 2, 3) should coincide with those on the circuit board.



double
jill out

SW SECTION (1)

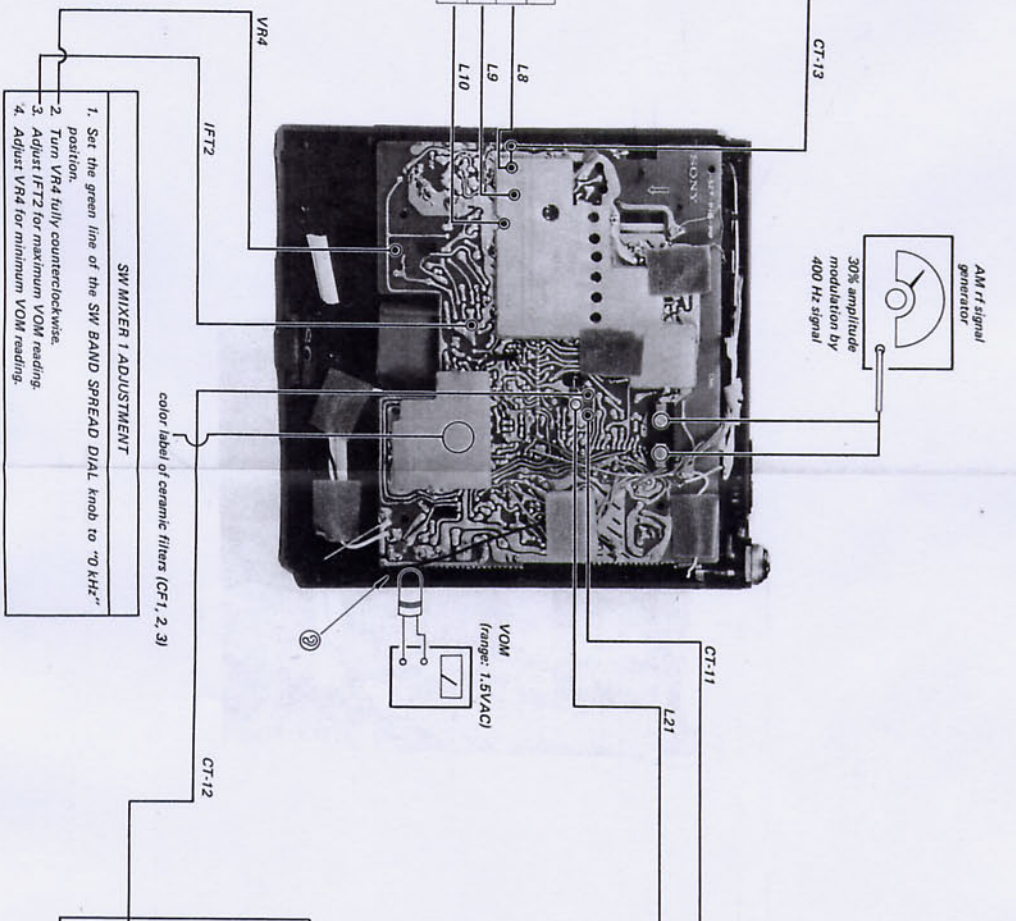
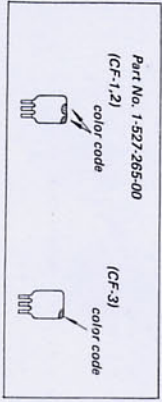
SETTING: OFF/LOCAL
 AF/CAM SENS Switch: SW1
 BAND SELECT Switch: OFF
 X-TAL MARKER Switch: OFF
 BFO Switch: OFF
 MAIN TUNING: f min

- MARKER LEVEL ADJUSTMENT**
1. BAND SELECT switch: SW3
 2. X-TAL MARKER Switch: ON
 3. Turn the MAIN TUNING Knob to tune in 28MHz and adjust for zero beating.
 4. Adjust CT13 so that the TUNING & BATT METER reads within 5 - 6.

SW TRACKING ADJUSTMENT

4.0 MHz	SW1	L8
12.0 MHz	SW2	L9
21.0 MHz	SW3	L10

Note:
 The color code of the ceramic filters (CF 1, 2, 3) should coincide with those on the circuit board.



- SW MIXER 1 ADJUSTMENT**
1. Set the green line of the SW BAND SPREAD DIAL knob to "0 KHz" position.
 2. Turn VR4 fully counterclockwise.
 3. Adjust IFT2 for maximum VOM reading.
 4. Adjust VR4 for minimum VOM reading.

SW OSC 2 ADJUSTMENT
 (After this adjustment, perform MARKER adjustment.)

Ceramic Filter	specified center Freq.	fully counterclockwise Position (⊖ side)	fully clockwise Position (⊕ side)
green	10.61 MHz	CT-11 (10.76 MHz)	L21 (10.46 MHz)
black	10.64 MHz	CT-11 (10.79 MHz)	L21 (10.49 MHz)
blue	10.67 MHz	CT-11 (10.82 MHz)	L21 (10.52 MHz)
red	10.70 MHz	CT-11 (10.85 MHz)	L21 (10.55 MHz)
orange	10.73 MHz	CT-11 (10.88 MHz)	L21 (10.58 MHz)
white	10.76 MHz	CT-11 (10.91 MHz)	L21 (10.61 MHz)
yellow	10.79 MHz	CT-11 (10.94 MHz)	L21 (10.64 MHz)

Specification: 300 KHz ±3 KHz

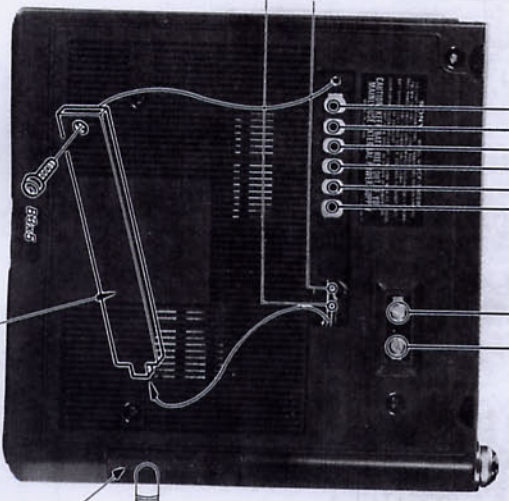
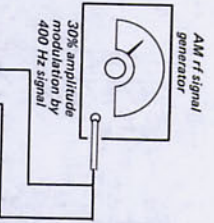
Note:
 1) Adjust L21 for the maximum level and set it to the peak position in the counterclockwise direction.
 2) Do not adjust L21 to the image frequency.

- MARKER ADJUSTMENT**
 This adjustment should be performed after the SW OSC 2 adjustment.
1. Set the green line of the SW BAND SPREAD DIAL knob to "0 KHz" position.
 2. Set BFO switch to ON and X-TAL MARKER switch to OFF.
 3. Tune the set to the specified center frequency of fm i-f circuit and adjust AM r.f. signal generator for zero beating.
 4. Set X-TAL MARKER switch to ON and increase the output level of the AM r.f. signal generator to 100 dB.
 5. Adjust CT-12 for zero beating.
 6. Change the frequencies of the AM r.f. signal generator and confirm that the noise of beating does not vary. If necessary, repeat step 3 to 6 again.

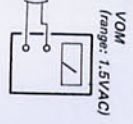
SW SECTION (2)

SETTING : SW BAND SPREAD DIAL : 0 KHZ
 AFC/AM SENS switch : OFF/LOCAL
 BFO switch : OFF
 X-TAL MARKER switch : OFF

SW FREQUENCY SCALE ADJUSTMENT		
Adjust for a maximum reading on VOM.		
SW3	21.0 MHz	L14
	27.5 MHz	CT-10
SW2	12.0 MHz	L13
	19.5 MHz	CT-9
	9.5 MHz	CT-8
SW1	4.0 MHz	L12



MARKER ADJUSTMENT (See page 10.)
 (CT-12)
 SW OSC 2 ADJUSTMENT (See page 10.)
 (CT-11)



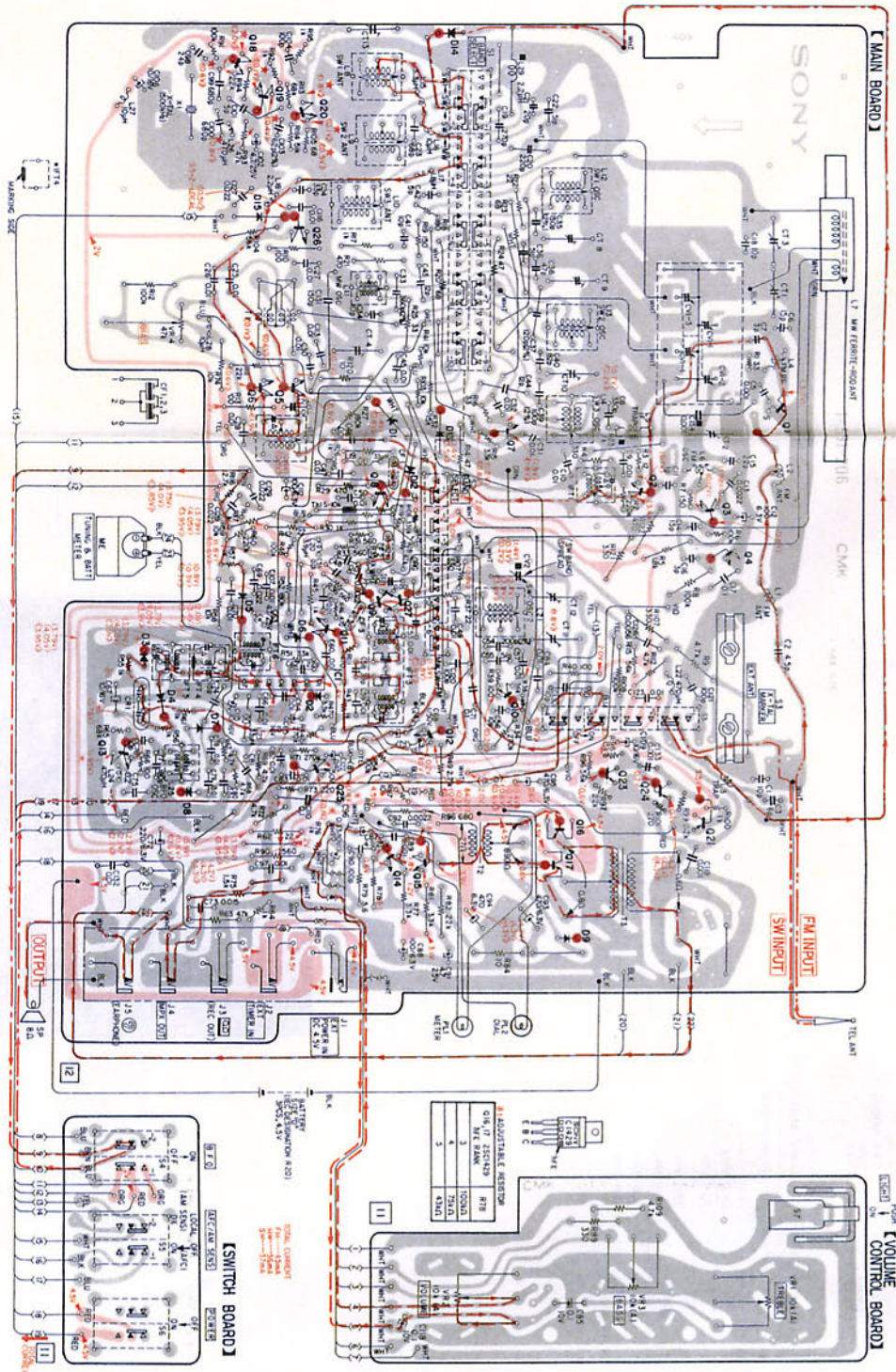
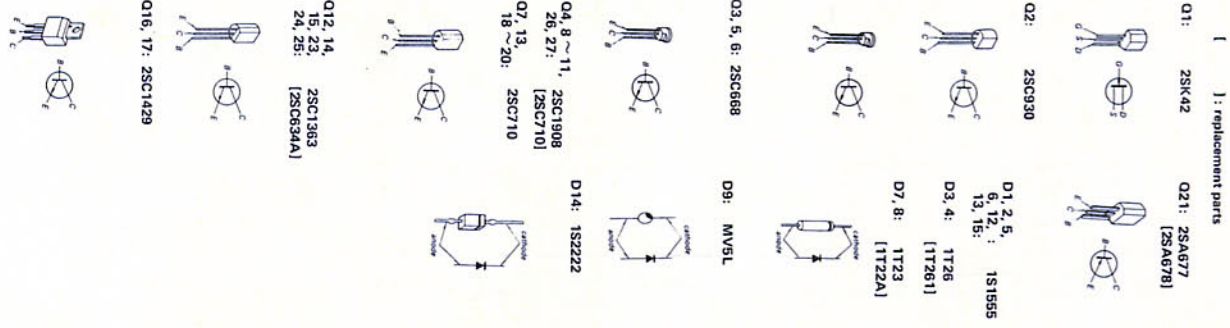
Adjustment Cover

Earphone Jack

SECTION 4
DIAGRAMS

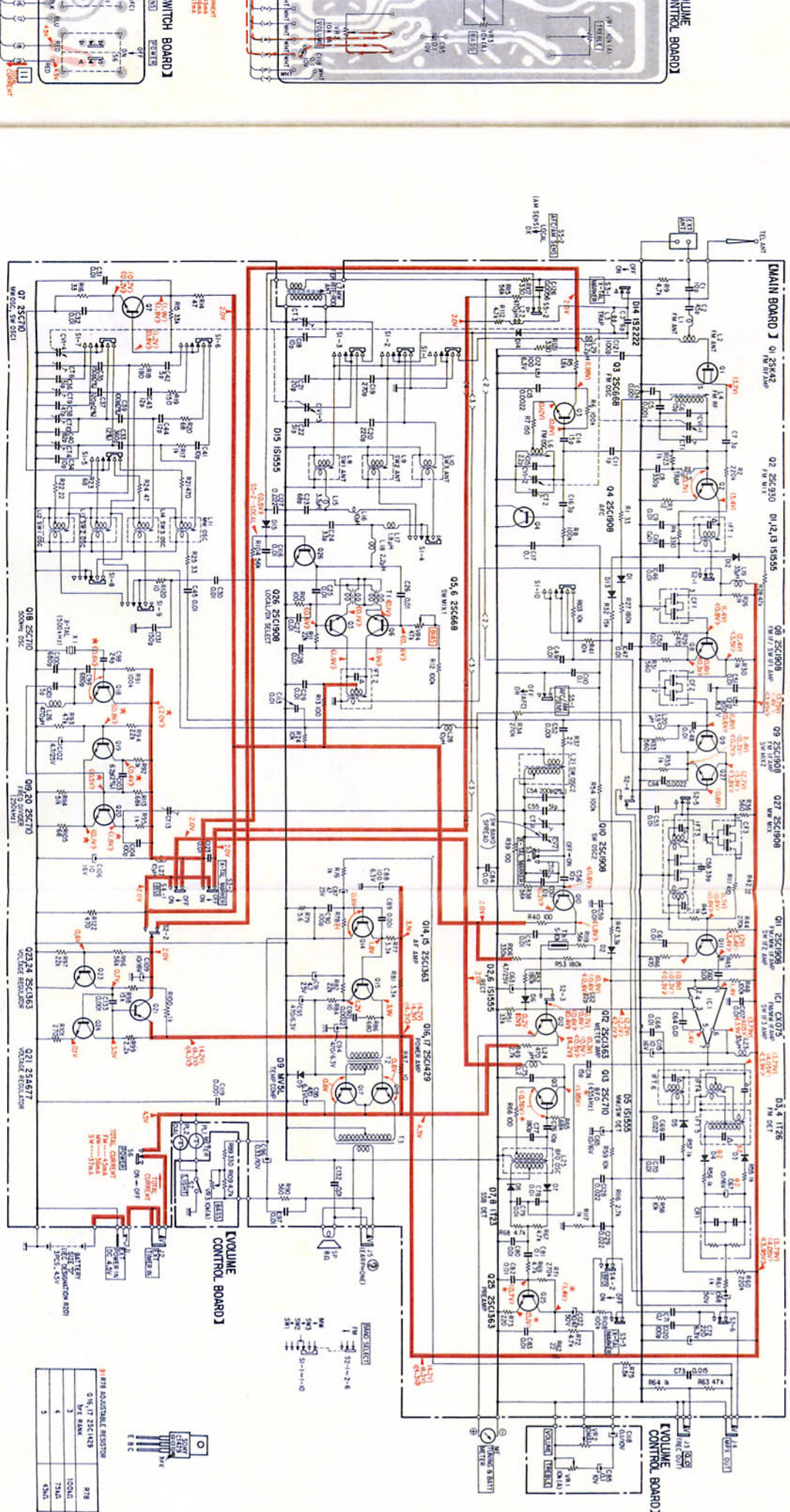
4-1. MOUNTING DIAGRAM — Conductor Side —

0	0
1	1C
2	2A
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10
11	11
12	12
13	13
14	14
15	15
16	16
17	17
18	18
19	19
20	20
21	21
22	22
23	23
24	24
25	25
26	26
27	27
28	28
29	29
30	30
31	31
32	32
33	33



- Note**
- indicates parts on the conductor side.
 - indicates lead wire connection on the conductor side.
 - indicates lead wire connection through the component side.
 - B + pattern.
 - FM signal or SW signal path.
 - FM signal path.
 - FM signal path.
- *2: Polarity of D3, D4 and G67 must be opposite to the polarity printed on the circuit board. The value is standard value.

ICF-5900W ICF-5900W



Note:

- All capacitors are in μF unless otherwise noted. 50 or less working voltages are not indicated except for electrolytic type. $\mu = \mu\text{F}$
- All resistors are in Ω , 1/8W, unless otherwise noted. $K = 1,000$ $M = 1,000 K$
- Δ indicates internal components.
- --- indicates B + circuit.
- Voltages are DC with respect to ground unless otherwise noted. Readings are taken under no-signal conditions with a VOM (20K Ω/V).
- --- indicates the adjustment for repair.
- Voltage variations may be noted due to normal production tolerances.
- Voltages between base and emitter are measured with 2.5V range.
- --- indicates designation on the panel.
- --- indicates the adjustment for repair.

Switch Mode:

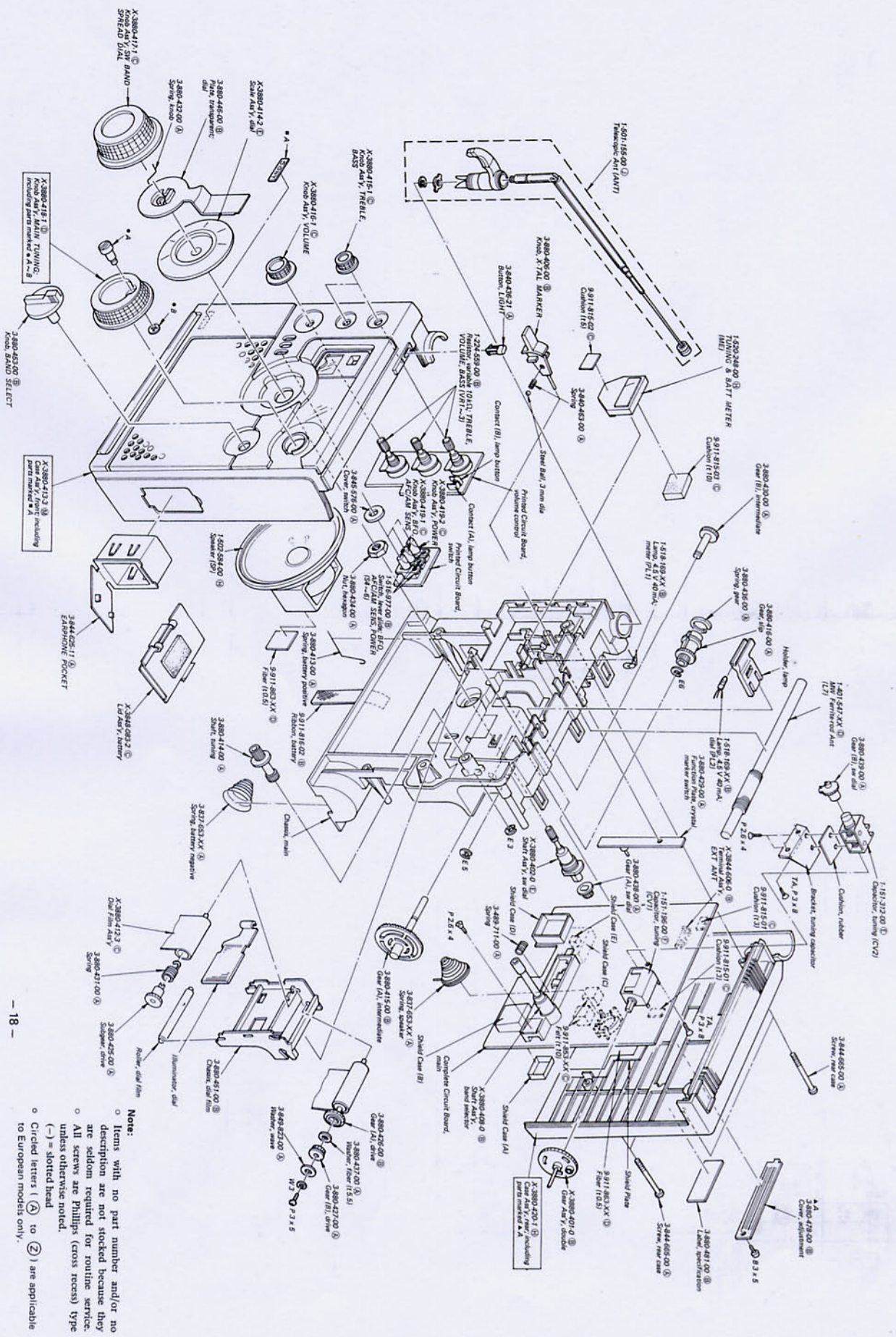
Ref. No.	Switch	Position
S1	BAND SELECT	MW
S2	BAND SELECT	FM
S3	X-TAL MARKER	OFF
S4	BFO	OFF
S5	AFC	OFF
S6	POWER	LOCAL
S7	LIGHT	OFF

1/8W ADDITIONAL RESISTOR

5.0K Ω 250C438	878
100K Ω	100K Ω
10K Ω	10K Ω
1K Ω	1K Ω
5	5

SECTION 5 EXPLODED VIEWS

ICF-5900W ICF-5900W



Note:

- Items with no part number and/or no description are not stocked because they are seldom required for routine service.
- All screws are Phillips (cross recess) type unless otherwise noted.
- (-) = slotted head
- Circled letters (A) to (Z) are applicable to European models only.

ICF-5900W ICF-5900W

SECTION 6 ELECTRICAL PARTS LIST

Note: Circled letters (A) to (Z) are applicable to European models only.

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Ref. No.	Part No.	Description	Ref. No.	Part No.	Description	Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
SEMICONDUCTORS											
Transistors											
Q1	② 2SK42	L1 1-401-526-00 (A) FM Ant	C1	1-102-947-11 (A) 10p	C45 ~51	1-101-923-11 (A) 0.01					
Q2	② 2SC930	L4 1-425-888-00 (B) FM RF	C2	1-101-579-11 (A) 4.5p	C52	1-101-455-11 (A) 0.001					
Q3	② 2SC668	L6 1-405-568-00 (B) FM Osc	C3	1-102-808-11 (A) 6p	C53	1-101-923-11 (A) 0.01					
④ Q4	② 2SC710	L7 1-401-541-XX (A) MW Ferrite-rod Ant	C2	1-102-808-11 (A) 6p	C54	1-107-264-11 (B) 200p					
Q5, 6	② 2SC668	L8 1-401-643-00 (B) SW1 Ant	C3	1-102-074-11 (A) 0.001	C55	1-102-757-11 (A) 51p					
④ Q8 ~11	② 2SC710	L9 1-401-644-00 (B) SW2 Ant	C6	1-102-951-11 (A) 15p	C62	1-102-959-11 (A) 22p					
④ Q12	② 2SC634A	L10 1-401-645-00 (B) SW3 Ant	C7	1-102-936-11 (A) 3p	C63	1-121-395-11 (A) 4.7					
Q13	② 2SC710	L11 1-405-520-00 (B) MW Osc	C8	1-102-820-11 (A) 330p	C64	1-101-923-11 (A) 0.01					
④ Q14, 15	② 2SC634A	L12 1-405-710-00 (B) SW1 Osc	C9, 10	1-101-923-11 (A) 0.01	C65	1-121-651-11 (A) 10					
Q16, 17	② 2SC1429	L13 1-405-711-00 (B) SW2 Osc	C11	1-102-934-11 (A) 1p	C66	1-101-923-11 (A) 0.01					
④ Q18 ~20	② 2SC710	L14 1-405-712-00 (B) SW3 Osc	C12	1-121-413-11 (A) 100	C67	1-121-651-11 (A) 10					
④ Q21	② 2SK478	L15 1-407-184-XX (A) 3.3 μH	C13	1-102-121-11 (A) 0.0022	C68	1-121-391-11 (A) 1					
④ Q23 ~25	② 2SC634A	L16 1-407-157-XX (A) 10 μH	C14	1-102-951-11 (A) 15p	C69	1-105-677-12 (A) 0.022					
④ Q26, 27	② 2SC710	L17 1-407-181-XX (A) 1.8 μH	C15	1-102-751-11 (A) 22p	C70	1-101-923-11 (A) 0.01					
COILS											
All coils are microinductor unless otherwise noted.											
IC1	② CX075	L18 1-407-182-XX (A) 2.2 μH	C16	1-102-936-11 (A) 3p	C71	1-101-797-11 (A) 0.1					
DIODES											
D1, 2	② 1S1555	L19 1-407-163-XX (A) 33 μH	C17	1-101-797-11 (A) 0.1	C72	1-121-419-11 (A) 220					
④ D3, 4	② 1T761	L20 1-407-185-XX (A) 3.9 μH	C18	1-102-947-11 (A) 10p	C73	1-105-675-12 (A) 0.015					
D5, 6	② 1S1555	L21 1-405-713-00 (B) SW Osc 2	C19	1-107-095-11 (A) 270p	C74	1-102-951-11 (A) 15p					
④ D7, 8	② 1T72A	L22 1-407-661-XX (A) 470 μH	C20	1-107-093-11 (A) 220p	C75	1-101-798-11 (A) 0.2					
D9	MV51	L23 1-407-163-XX (A) 33 μH	C21	1-102-958-11 (A) 20p	C76	1-102-947-11 (A) 10p					
D12, 13	② 1S1555	L24 1-407-661-XX (A) 470 μH	C22	1-101-882-11 (A) 51p	C77	1-102-705-11 (A) 180p					
D14	② 1S2222	L25 1-405-714-00 (B) BFO Osc	C23	1-101-888-11 (A) 68p	C78 ~80	1-102-923-11 (A) 0.01					
D15	② 1S1555	L26 1-407-661-XX (A) 470 μH	C24	1-102-963-11 (A) 33p	C81	1-101-797-11 (A) 0.1					
TRANSFORMERS											
Th1	Thermistor	L27, 28 1-407-157-XX (A) 10 μH	C25 ~32	1-101-923-11 (A) 0.01	C82, 83	1-105-673-12 (A) 0.01					
CAPACITORS											
All capacitors are in μF and of ceramic unless otherwise noted. 50 and/or less working voltages are not noted except for electrolytic type. (p = pμF, elect = electrolytic)											
1-800-202-XX (A) S-10K	IFT1	1-403-872-00 (B) FM IFT	C35	1-107-263-11 (B) 150p	C85	1-127-019-11 (A) 0.1					
	IFT2	1-404-021-00 (B) SW IFT	C36	1-102-695-11 (A) 51p	C87	1-121-395-11 (A) 4.7					
	IFT3	1-403-972-00 (B) AM IFT	C37	1-107-262-11 (B) 120p	C88	1-121-424-11 (B) 470					
	IFT4	1-403-959-00 (B) FM Discriminator	C38	1-102-887-11 (A) 47p	C89	1-101-455-11 (A) 0.001					
	IFT5	1-403-953-00 (B) FM Discriminator	C39	1-107-261-11 (B) 100p	C90	1-102-973-11 (A) 100p					
	IFT6	1-403-137-00 (B) AM IFT	C40	1-102-706-11 (A) 82p	C91	1-121-395-11 (A) 4.7					
	T1	1-417-014-31 (B) Balun	C41	1-102-947-11 (A) 10p	C92	1-102-121-11 (A) 0.0022					
	T2	1-423-204-XX (C) Input	C42	1-102-942-11 (A) 5p	C93 ~95	1-121-424-11 (B) 470					
	T3	1-427-306-XX (C) Output	C43, 44	1-102-949-11 (A) 12p	C96	1-127-021-11 (A) 0.33					
					C97	1-105-673-12 (A) 0.01					

④ Due to replacement parts, the descriptions are different from the diagrams.

Note: Circled letters (A) to (Z) are applicable to European models only.

Ref. No. Part No. Description

C98	1-102-960-11	(A) 24 p
C99, 100	1-102-116-11	(A) 680 p
C101	1-102-942-11	(A) 5 p
C102	1-121-395-11	(A) 4.7
C103	1-107-259-11	(B) 6.2 p
C104	1-102-973-11	(A) 100 p
C106	1-121-651-11	(A) 10 p
C107	1-101-923-11	(A) 0.01
C109	1-121-651-11	(A) 10
C110	1-101-797-11	(A) 0.1
C112	1-121-413-11	(A) 100
C113	1-101-923-11	(A) 0.01
C114	1-102-121-11	(A) 0.0022
C115	1-121-651-11	(A) 10
C116	1-101-923-11	(A) 0.01
C118	1-127-019-11	(A) 0.1
C119	1-101-455-11	(A) 0.001
C120, 121	1-102-973-11	(A) 100 p
C122	1-121-726-11	(A) 0.47
C123	1-101-923-11	(A) 0.01
C126	1-105-670-12	(A) 0.0056
C127	1-101-924-11	(A) 0.022
C128, 129	1-105-677-12	(A) 0.022
C130	1-107-061-11	(A) 10 p
C131	1-101-361-11	(A) 150 p
C132	1-101-923-11	(A) 0.01
C133, 134	1-102-074-11	(A) 0.001

RESISTORS

Regular-type 1/4 W carbon resistors are omitted. Check the schematic diagram for the resistance values. (K = 1000)

VR1 ~ 3 1-224-539-00 (B) 10 kΩ, variable, TREBLE, VOL UME, BASS

VR4 1-224-647-XX (B) 47 kΩ, adjustable

SWITCHES

S1 1-514-316-00 (B) Slide, BAND SELECT (MW/SW)

S2 1-514-861-XX (B) Slide, BAND SELECT (FM)

S3 1-514-821-21 (C) Slide, X-TAL MARKER

S4 ~ 6 1-516-977-00 (B) Lever Slide, BFO, AFC/AM SENS, POWER

MISCELLANEOUS

ANT 1-501-155-00 (J) Antenna, telescopic

CF1, 2, 3 1-527-265-00 (B) Filter, ceramic

CRI 1-231-202-00 (B) Encapsulated Component

J1 ~ 5 1-507-369-XX (B) Jack, EXT POWER IN DC 4.5 V, EXT TIMER IN, REC OUT, MPX OUT, earphone

ME 1-520-248-00 (B) TUNING & BATT METER

PLL 2 1-518-169-XX (B) Lamp, 4.5 V 40 mA, meter, dial

SP 1-502-584-00 (H) Speaker

XI 1-527-269-51 (K) Crystal, 500 KHz

ACCESSORIES & PACKING MATERIALS

Part No. Description

1-463-129-00 (K) Adaptor, ac plug, AC-110 (US model)

1-463-130-00 (N) Adaptor, ac plug, AC-110 (Canadian model)

1-504-059-11 (C) Earphone, ME-20H

X-3844-608-0 (D) Shoulder Strap Ass'y

X-3880-411-0 (D) Cushion Ass'y, upper

3-880-467-11 (B) Carton

3-880-470-00 (D) Cushion, side

3-880-490-00 (B) Bag, plastic, unit

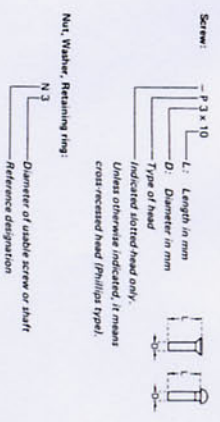
3-993-144-31 (D) Manual, instruction (Canadian model)

3-995-759-21 (B) Manual, instruction (US, Canadian model)

3-995-759-41 (B) Manual, instruction (AEP, UK model)

3-995-759-51 (B) Manual, instruction (E model)

HARDWARE NOMENCLATURE



Reference Designation	Shape	Description	Remarks
SCREWS			
P		pan-head screw	binding head (B) screw for replacement
PWH		pan-head screw with washer face	binding head (B) screw and flat washer for replacement
P5		pan-head screw with spring washer	binding head (B) screw and spring washer for replacement
PSW		pan-head screw with spring and flat washers	binding head (B) screw and spring and flat washers for replacement
R		round-head screw	binding head (B) screw for replacement
K		flat-counterbunk-head screw	binding head (B) screw for replacement
RK		oval-counterbunk-head screw	binding head (B) screw for replacement
B		binding-head screw	binding head (B) screw for replacement
T		trough-head screw	binding head (B) screw for replacement
F		flat-filler-head screw	binding head (B) screw for replacement
RF		filler-head screw	binding head (B) screw for replacement
BV		brake-head screw	binding head (B) screw for replacement

Reference Designation	Shape	Description	Remarks
SELF-TAPPING SCREWS			
TA		self-tapping screw	ex: TA, P 3 x 10
PTP		pan-head self-tapping screw	binding head self-tapping (T A, B) screw for replacement
PTWH		pan-head self-tapping screw with washer face	binding head self-tapping (T A, B) screw and flat washer for replacement
PTTW		pan-head thread-rolling screw with washer face	binding head (B) screw and flat washer for replacement
SET SCREWS			
SC		set screw	ex: SC 2.6 x 4, hexagon socket
SC		hexagon socket set screw	ex: SC 2.6 x 4, hexagon socket
NUT			
N		nut	
WASHERS			
W		flat washer	
SW		spring washer	ex: LW2, internal
LW		internal-tooth lock washer	ex: LW2, internal
LW		external-tooth lock washer	ex: LW2, external
RETAINING RINGS			
E		retaining ring	
D		group-type retaining ring	

SONY