

ICF-403L

SERVICE MANUAL

AEP Model

Ver 1.0 1999.07



SPECIFICATIONS

Frequency range:

East European model

FM	65-108 MHz
MW	530-1605 kHz
LW	153-255 kHz

AEP model

FM	87.5-108 MHz
MW	530-1605 kHz
LW	153-255 kHz

Speaker

Approx. 7.7 cm (3 inches) dia., 4 Ω

Output

Ⓞ (earphone) jack (minijack)

Power output

300 mW (at 10 % harmonic distortion)

Power requirements

4.5V DC, three R6 (size AA) batteries
4.5V DC, three LR6 (size AA) batteries
DC IN 4.5V jack accepts: Sony AC-E45HG AC
power adaptor (not supplied)

Dimensions

Approx. 197 × 101 × 45 mm (w/h/d) (7 ⁷/₈ × 4
× 1 ¹³/₁₆ inches) incl. projecting parts and
controls

Mass

Approx. 465 g (16.4 oz) incl. batteries

Design and specifications are subject to change
without notice.

FM/MW/LW 3 BAND RADIO

SONY®



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Flexible Circuit Board Repairing

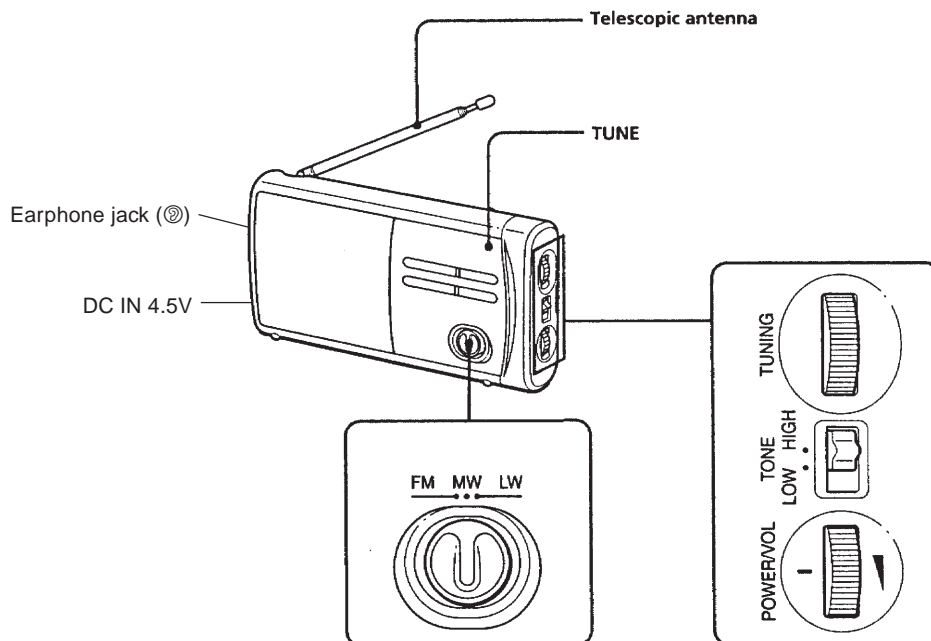
- Keep the temperature of the soldering iron around 270°C during repairing.
- Do not touch the soldering iron on the same conductor of the circuit board (within 3 times).
- Be careful not to apply force on the conductor when soldering or unsoldering.

Notes on chip component replacement

- Never reuse a disconnected chip component.
- Notice that the minus side of a tantalum capacitor may be damaged by heat.

SECTION 1 GENERAL

LOCATION AND FUNCTION OF CONTROLS



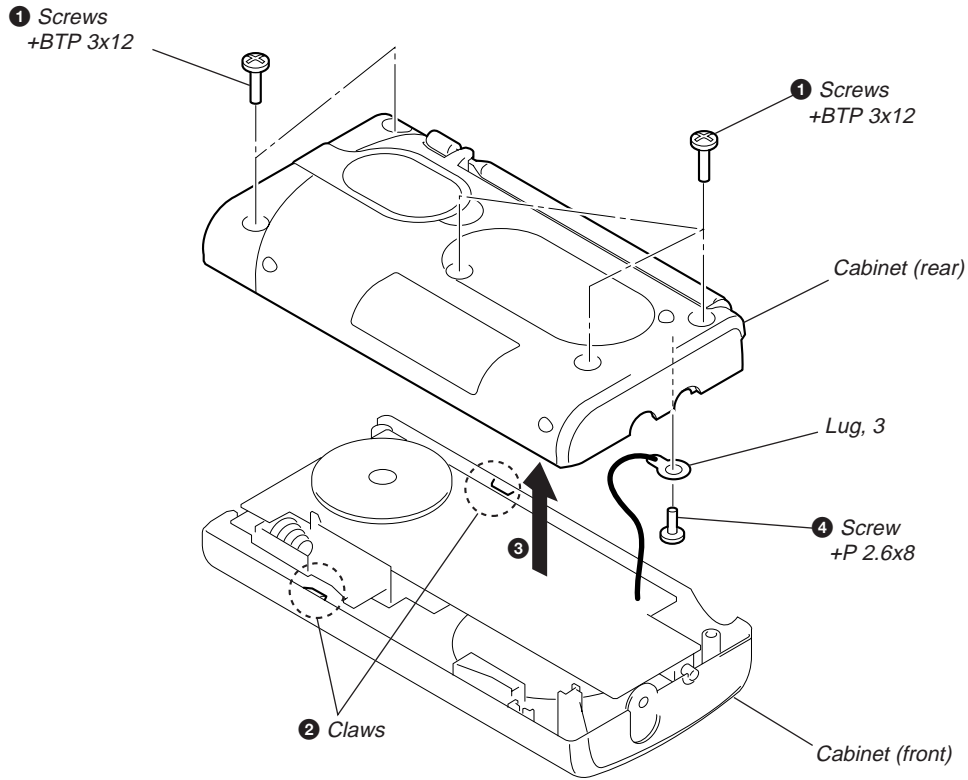
SECTION 2 DISASSEMBLY

● The equipment can be removed using the following procedure.

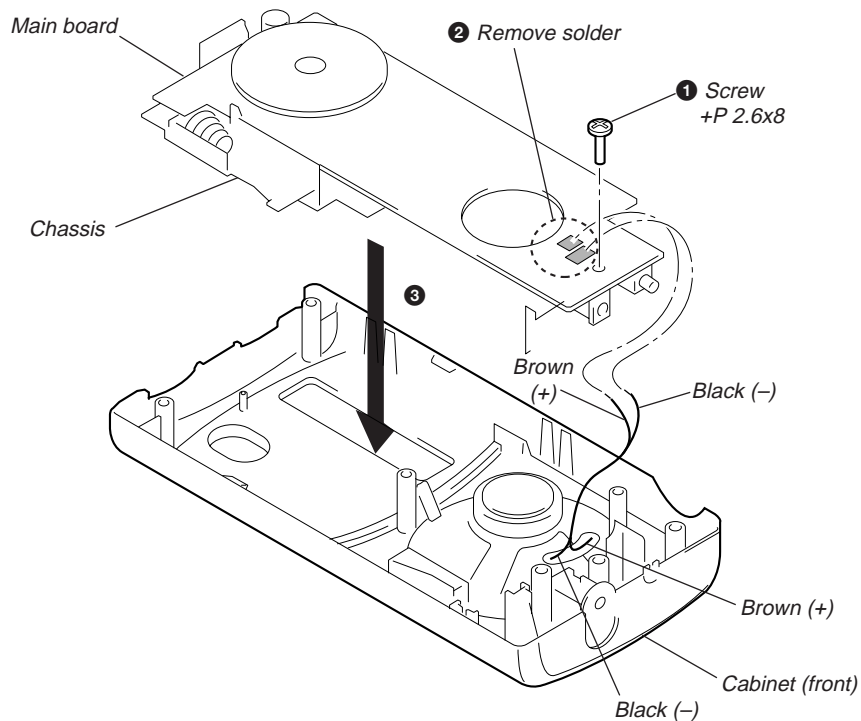
Set → Cabinet (Rear) → Cabinet (Front) → Main board, Chassis

Note : Follow the disassembly procedure in the numerical order given.

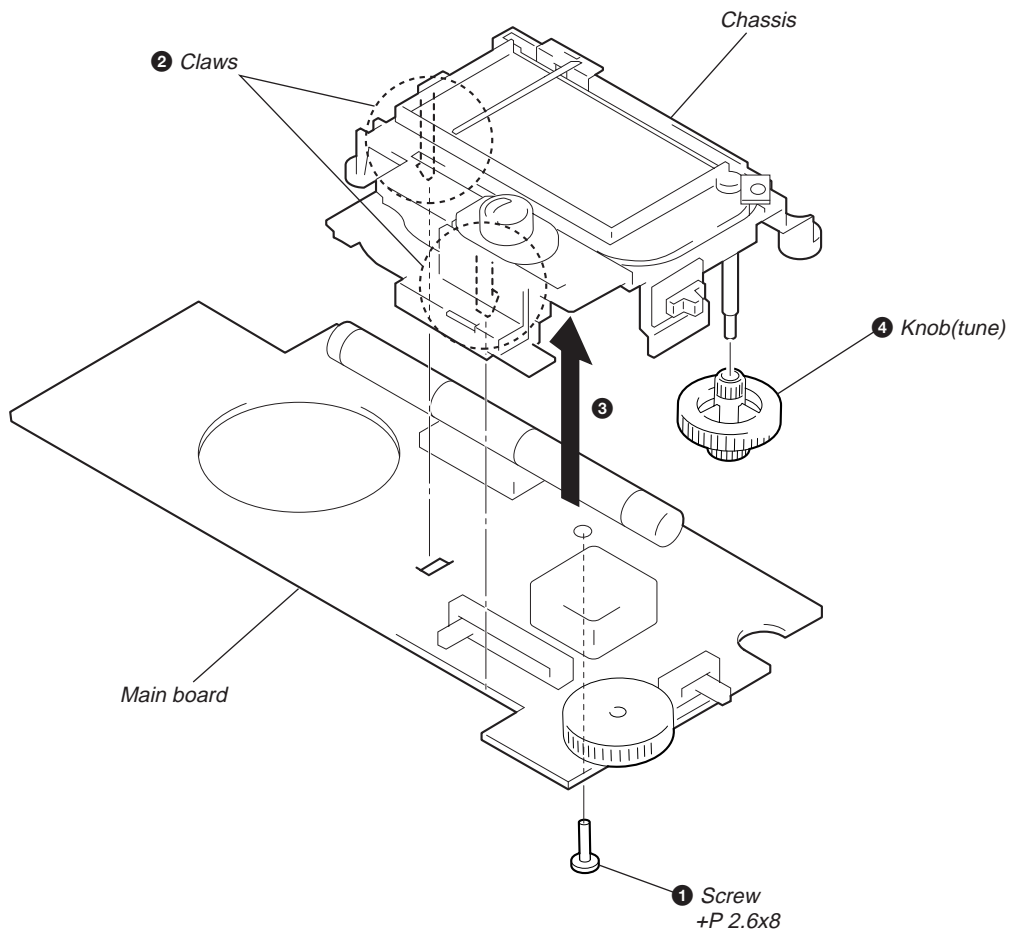
2-1. CABINET (REAR)



2-2. CABINET (FRONT)

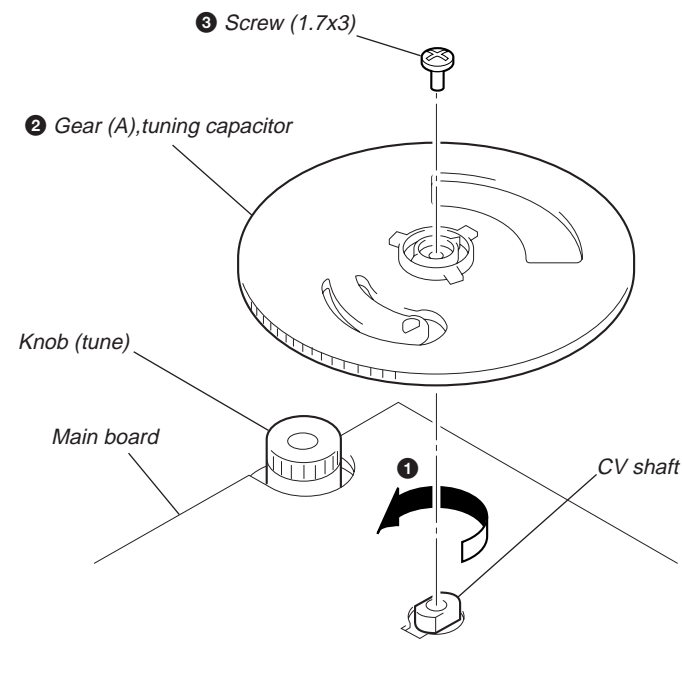
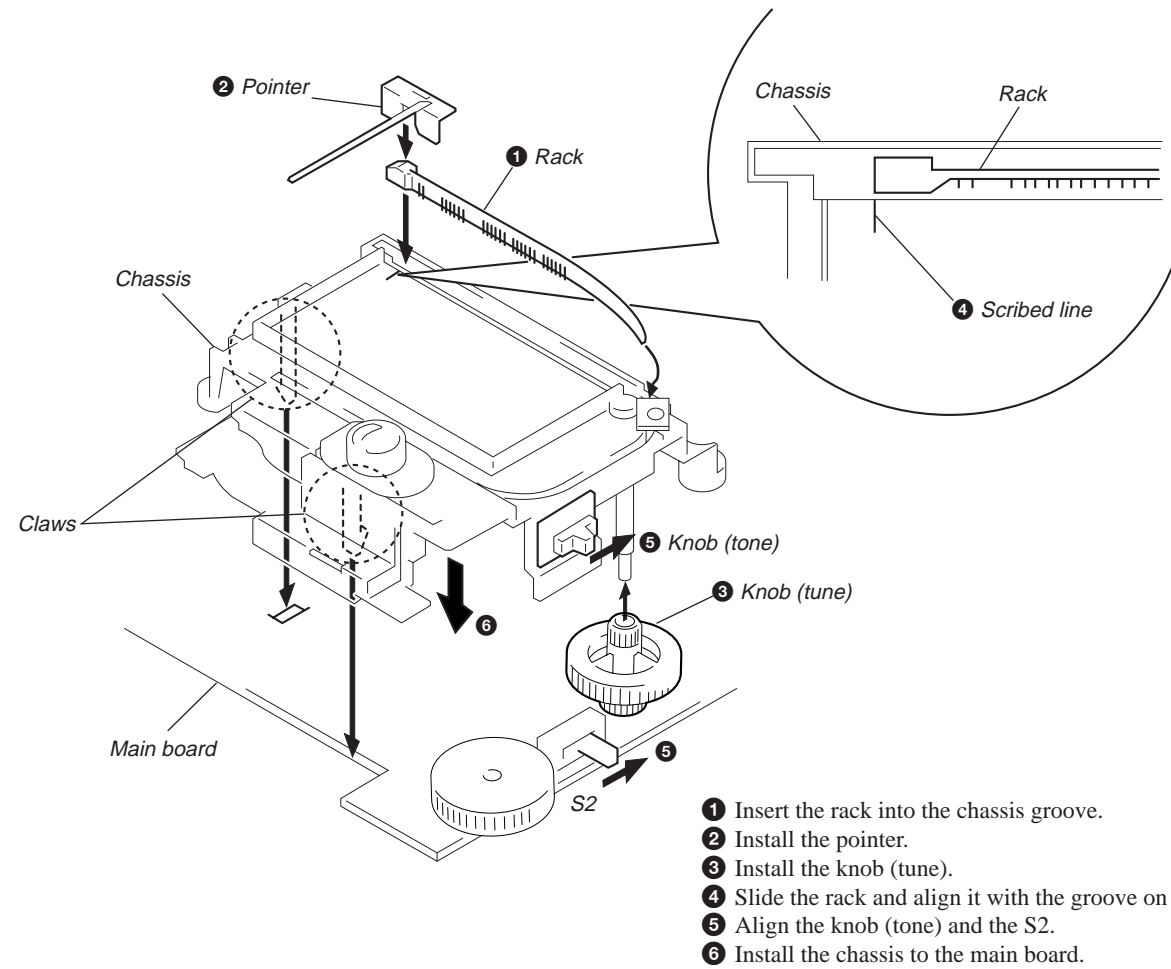


2-3. MAIN BOARD, CHASSIS



SECTION 3 DIAL POINTER INSTALLATION

Note : Follow the installation procedure in the numerical order given.



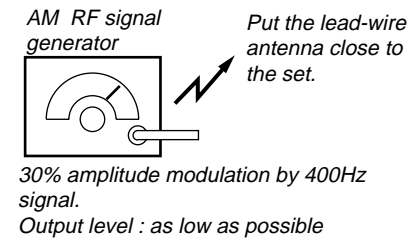
SECTION 4 ELECTRICAL ADJUSTMENTS

TUNER SECTION

MW/LW Section

Procedure :

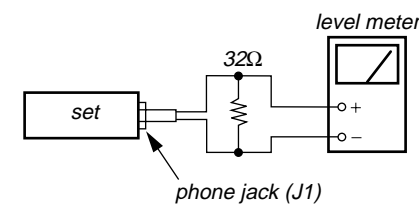
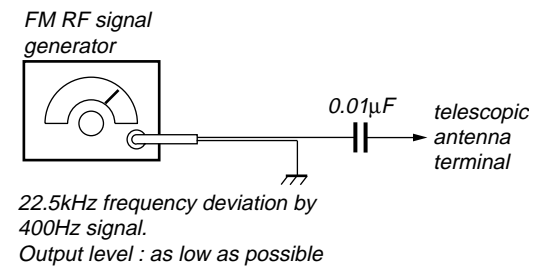
BAND : MW/LW
VOLUME : MIN



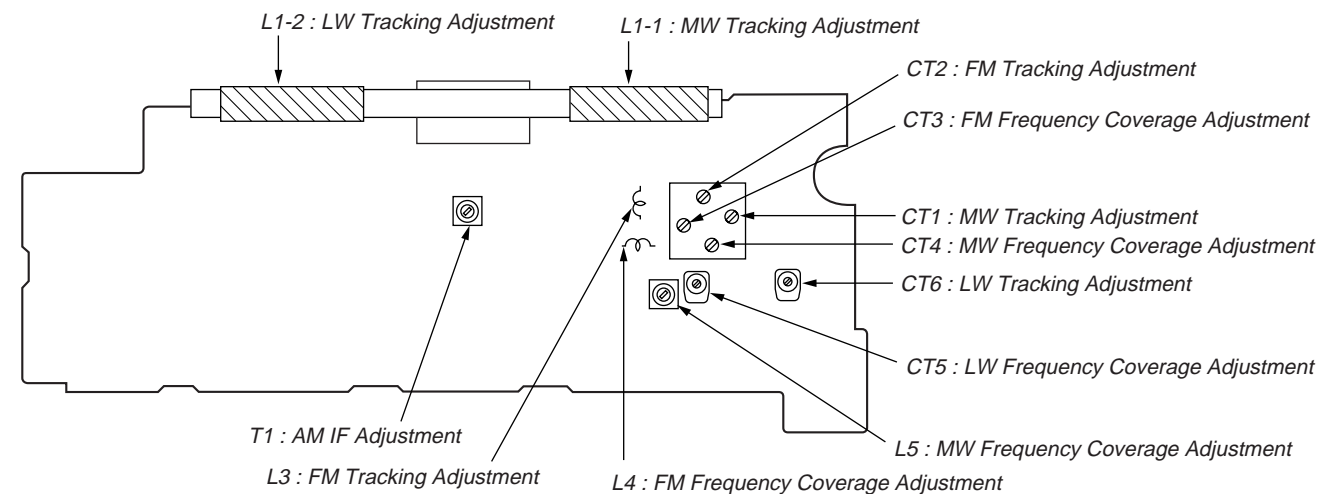
FM Section

Procedure :

BAND : FM
VOLUME : MIN



Adjustment Location : Main board (Component side)



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

< > : East European model

AM IF ADJUSTMENT	
Adjust for a maximum reading on level meter.	
T1	455kHz

MW FREQUENCY COVERAGE ADJUSTMENT	
Adjust for a maximum reading on level meter.	
L5	520kHz
CT4	1,650kHz

MW TRACKING ADJUSTMENT	
Adjust for a maximum reading on level meter.	
L1-1	620kHz
CT1	1,400kHz

LW FREQUENCY COVERAGE ADJUSTMENT	
Adjust for a maximum reading on level meter.	
Confirm	145kHz
CT5	260kHz

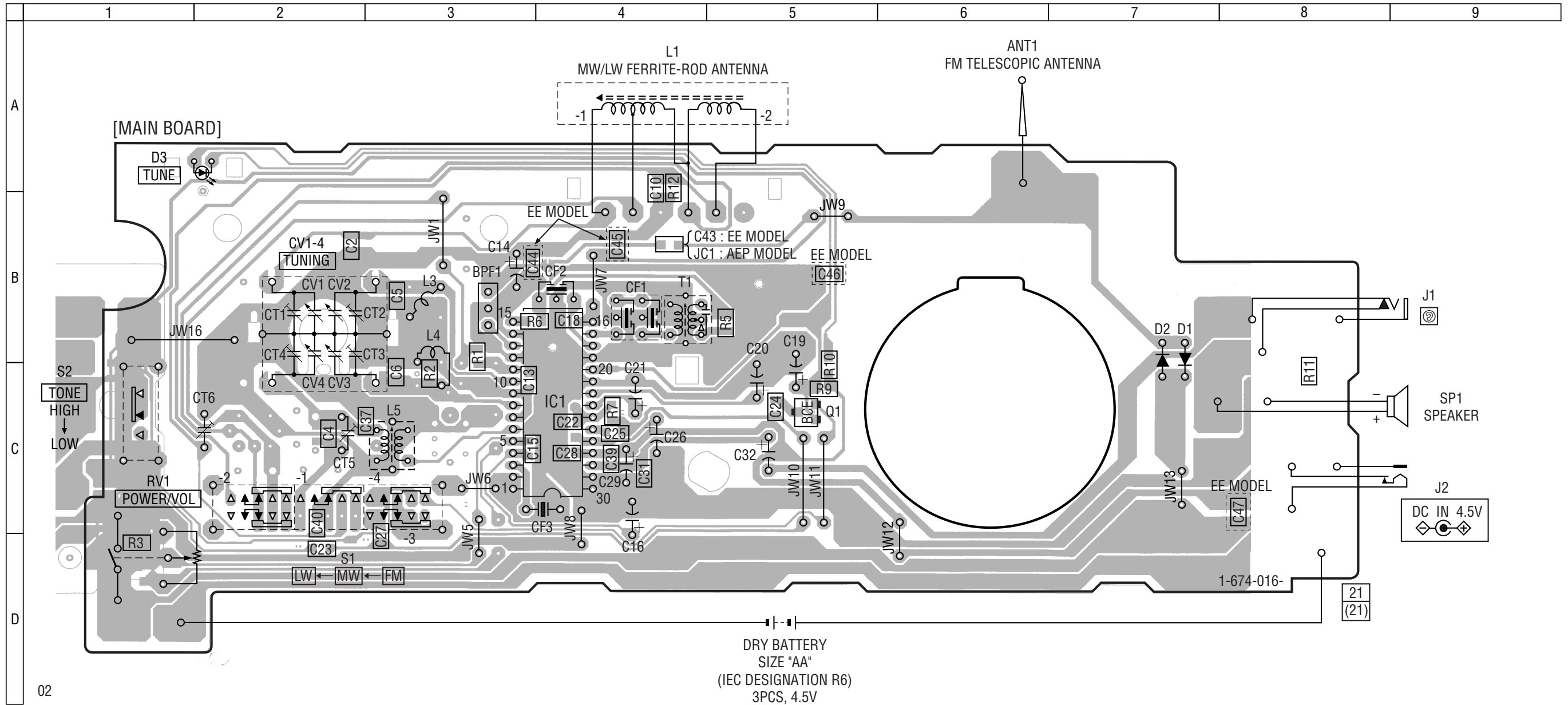
LW TRACKING ADJUSTMENT	
Adjust for a maximum reading on level meter.	
L1-2	160kHz
CT6	240kHz

FM FREQUENCY COVERAGE ADJUSTMENT	
Adjust for a maximum reading on level meter.	
L4	86.5MHz <64.0MHz>
CT3	109.5MHz <109.5MHz>

FM TRACKING ADJUSTMENT	
Adjust for a maximum reading on level meter.	
L3	86.5MHz <68.0MHz>
CT2	109.5MHz <102.0MHz>

SECTION 5
DIAGRAMS

5-1. PRINTED WIRING BOARDS

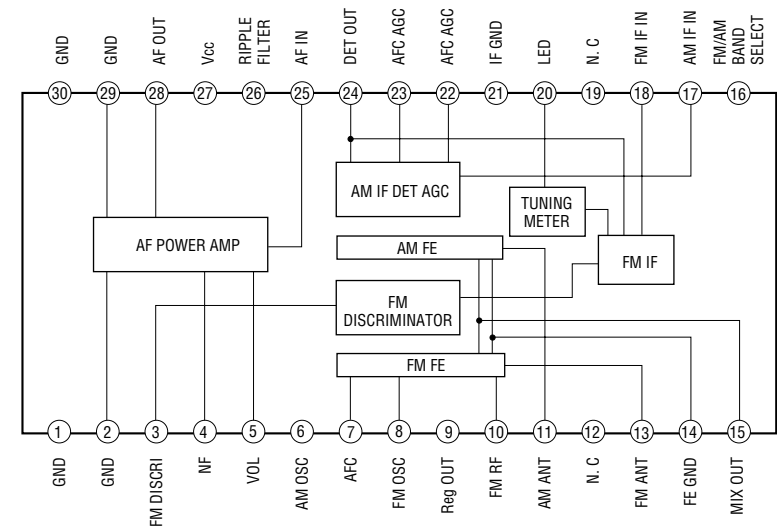


● Semiconductor Location

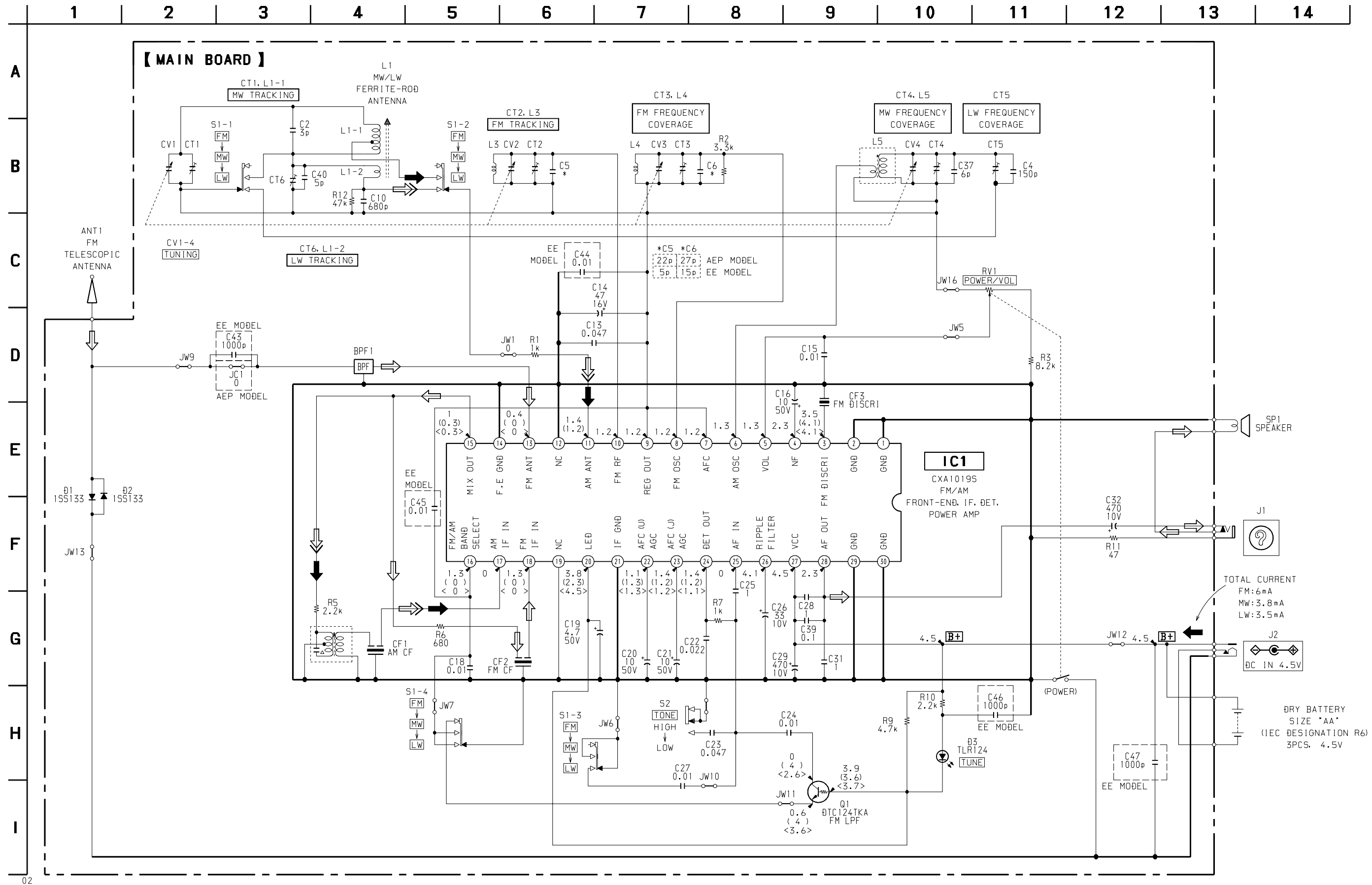
Ref. No.	Location
D1	B-7
D2	B-7
D3	A-2
IC1	C-4
Q1	C-5

Note:
 ○ : parts extracted from the component side.
 ▨ : Pattern from the side which enables seeing.
 • Abbreviation
 EE : East European

● IC Block Diagram.
IC1 CXA1019S



5-2. SCHEMATIC DIAGRAM



Note:

- All capacitors are in μF unless otherwise noted. pF: μF 50 WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and $\frac{1}{4}W$ or less unless otherwise specified.
- Δ : internal component.
- B+**: B+ Line.
- : adjustment for repair.

- Power voltage is dc 4.5V and fed with regulated dc power supply from battery terminal (J2).
- Voltages are dc with respect to ground under no-signal (detuned) conditions.
- no mark: FM
- (): MW
- < >: LW

- Voltages are taken with a VOM (Input impedance 10 M Ω). Voltage variations may be noted due to normal production tolerances.
- Signal path.
- \Rightarrow : FM \Rightarrow : MW \Rightarrow : LW
- Abbreviation
- EE: East European

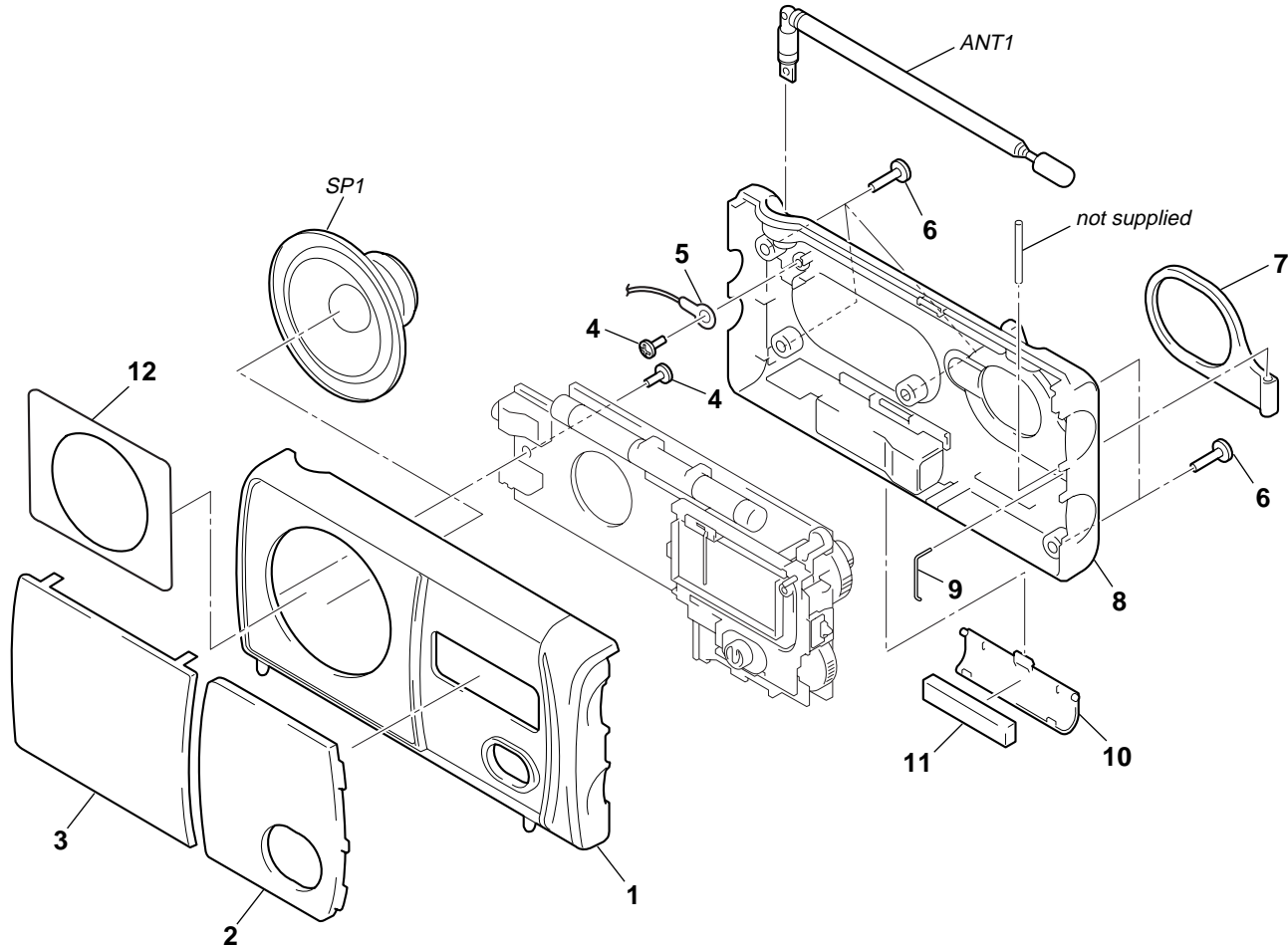
SECTION 6 EXPLODED VIEWS

NOTE :

- -XX, -X mean standardized parts, so they may have some difference from the original one.
- Color indication of Appearance Parts
Example :
KNOB, BALANCE (WHITE) ••• (RED)
↑ ↑
Parts color Cabinet's color
- Items marked " * " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

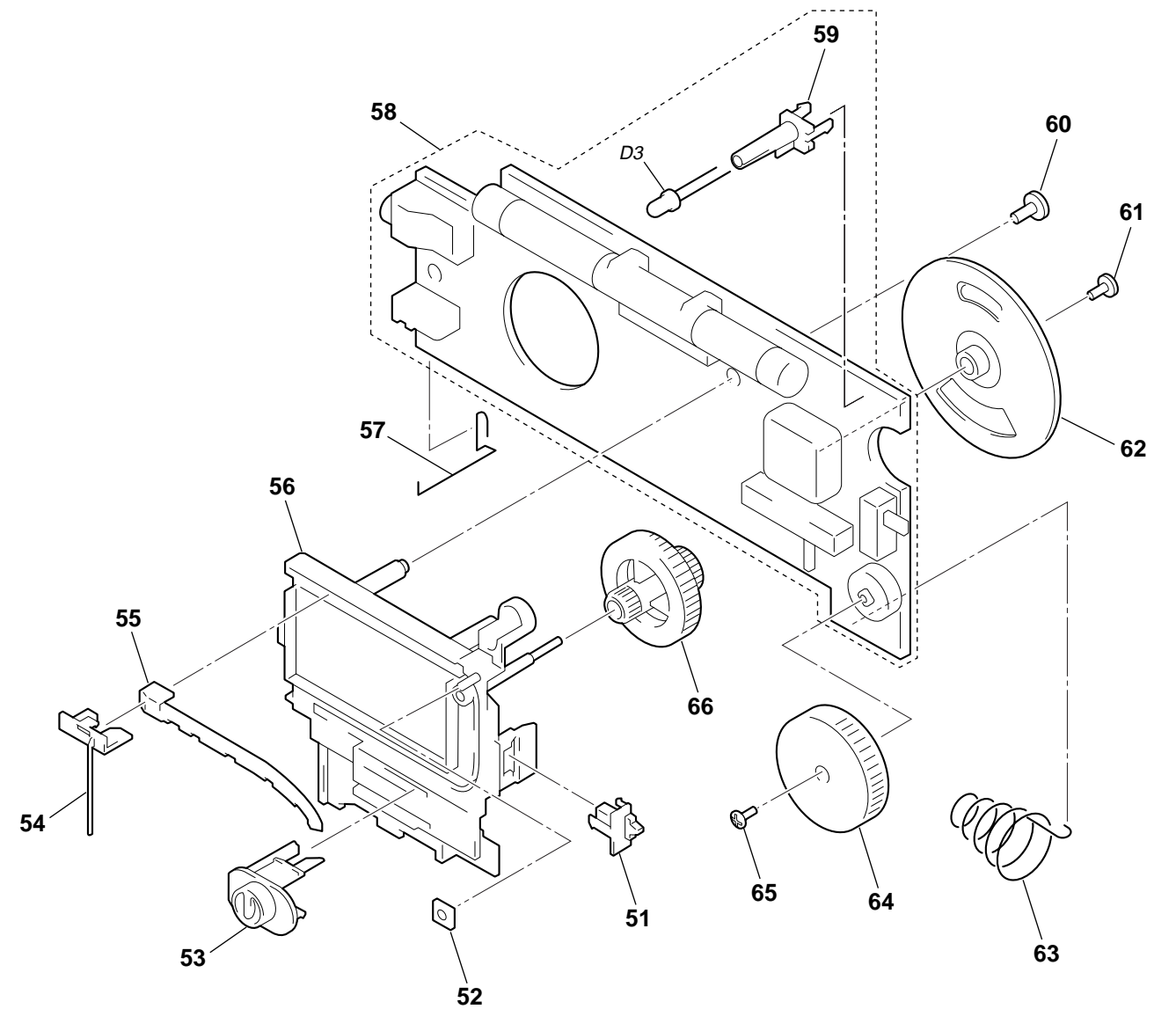
- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware (# mark) list and accessories and packing materials are given in the last of this parts list.
- Abbreviation
EE : East European

6-1. CABINET SECTION



Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
1	3-037-016-01	CABINET (FRONT) (BLACK)		7	3-037-024-11	HANDLE (WHITE) (AEP)	
1	3-037-016-11	CABINET (FRONT) (WHITE) (AEP)		8	3-037-017-01	CABINET (REAR) (BLACK)	
2	3-037-026-21	PLATE, TRANSPARENT (AEP)		8	3-037-017-11	CABINET (REAR) (WHITE) (AEP)	
2	3-037-026-31	PLATE, TRANSPARENT (EE)		9	3-037-034-01	SPRING (HANDLE)	
3	3-037-029-01	PANEL(SPEAKER) (BLACK)		10	3-037-019-01	LID,BATTERY CASE (BLACK)	
3	3-037-029-11	PANEL(SPEAKER) (WHITE) (AEP)		10	3-037-019-11	LID,BATTERY CASE (WHITE) (AEP)	
4	7-685-134-19	SCREW +P 2.6X8 TYPE2 NON-SLIT		11	3-372-124-01	CUSHION (BATTERY)	
5	7-623-508-01	LUG,3		12	3-040-489-01	SHEET, SPEAKER (WHITE) (AEP)	
6	7-685-548-14	SCREW +BTP 3X12 TYPE2 N-S		ANT1	1-501-222-81	ANTENNA, TELESCOPIC (FM)	
7	3-037-024-01	HANDLE (BLACK)		SP1	1-529-451-11	SPEAKER (7.7cm)	

6-2. CHASSIS SECTION



Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
51	3-037-023-01	KNOB(TONE) (BLACK)		59	3-037-028-01	HOLDER, LED	
51	3-037-023-11	KNOB(TONE) (WHITE) (AEP)		60	7-685-134-19	SCREW +P 2.6X8 TYPE2 NON-SLIT	
* 52	1-674-032-21	RACK RETAINER BOARD		61	3-364-941-11	SCREW (+B) (2.6X5), NYLOK	
53	3-037-021-01	KNOB(BAND) (BLACK)		62	3-037-027-01	GEAR(A), TUNING CAPACITOR	
53	3-037-021-11	KNOB(BAND) (WHITE) (AEP)		63	3-037-031-01	TERMINAL (-), BATTERY	
54	3-037-025-01	POINTER		64	3-037-020-01	KNOB(VOL) (BLACK)	
55	3-369-170-01	RACK		64	3-037-020-11	KNOB(VOL) (WHITE) (AEP)	
* 56	3-037-018-01	CHASSIS		65	3-880-990-00	SCREW (1.7X3),FLAT,(+) SPECIAL	
57	3-037-030-01	TERMINAL (+), BATTERY		66	3-037-022-01	KNOB(TUNE) (BLACK)	
* 58	A-3663-364-A	MAIN BOARD, COMPLETE (AEP)		66	3-037-022-11	KNOB(TUNE) (WHITE) (AEP)	
* 58	A-3663-383-A	MAIN BOARD, COMPLETE (EE)		D3	8-719-069-94	LED TLR124 (TUNE)	

SECTION 7 ELECTRICAL PARTS LIST

MAIN

NOTE :

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- RESISTORS
All resistors are in ohms
METAL : Metal-film resistor
METAL OXIDE :Metal oxide-film resistor
F : nonflammable
- Items marked “ * ”are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

- SEMICONDUCTORS
In each case, u : μ , for example :
uA.... : μ A.... , uPA.... : μ PA....
uPB.... : μ PB.... , uPC.... : μ PC....
uPD.... : μ PD....
- CAPACITORS
uF : μ F
- COILS
uH : μ H
- Abbreviation
EE : East European

When indicating parts by reference number, please include the board.

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
*	A-3663-364-A	MAIN BOARD, COMPLETE (AEP)		C37	1-163-089-00	CERAMIC CHIP 6PF	50V
	A-3663-383-A	MAIN BOARD, COMPLETE (EE)		C39	1-163-038-91	CERAMIC CHIP 0.1uF	25V
		*****		C40	1-163-222-11	CERAMIC CHIP 5PF	0.25PF 50V
	3-037-020-01	KNOB (VOL) (BLACK)		C43	1-163-141-00	CERAMIC CHIP 0.001uF	5% 50V(EE)
	3-037-020-11	KNOB (VOL) (WHITE) (AEP)		C44	1-163-031-11	CERAMIC CHIP 0.01uF	50V(EE)
	3-037-027-01	GEAR (A), TUNING CAPACITOR		C45	1-163-031-11	CERAMIC CHIP 0.01uF	50V(EE)
	3-037-028-01	HOLDER, LED		C46	1-163-141-00	CERAMIC CHIP 0.001uF	5% 50V(EE)
	3-364-941-11	SCREW (+B) (2.6X5), NYLOK		C47	1-163-141-00	CERAMIC CHIP 0.001uF	5% 50V(EE)
	3-880-990-00	SCREW (1.7X3),FLAT,(+) SPECIAL				< FILTER >	
		< FILTER >		CF1	1-567-670-11	FILTER, CERAMIC	
BPF1	1-233-452-11	FILTER, BAND PASS (EE)		CF2	1-781-034-11	FILTER, CERAMIC	
BPF1	1-236-839-11	FILTER, BAND PASS (AEP)		CF3	1-577-573-11	FILTER, CERAMIC	
		< CAPACITOR >				< TRIMMER >	
C2	1-163-220-11	CERAMIC CHIP 3PF	0.25PF 50V	CT1	1-141-462-11	CAP, VAR (MW TRACKING) (EE)	
C4	1-163-121-00	CERAMIC CHIP 150PF	5% 50V	CT1	1-151-691-11	CAP, VAR (MW TRACKING) (AEP)	
C5	1-163-222-11	CERAMIC CHIP 5PF	0.25PF 50V(EE)	CT2	1-141-462-11	CAP, VAR (FM TRACKING) (EE)	
C5	1-163-235-11	CERAMIC CHIP 22PF	5% 50V	CT2	1-151-691-11	CAP, VAR (FM TRACKING) (AEP)	
			(AEP)	CT3	1-141-462-11	CAP, VAR (FM FREQUENCY COVERAGE) (EE)	
C6	1-163-103-00	CERAMIC CHIP 27PF	5% 50V	CT3	1-151-691-11	CAP, VAR (FM FREQUENCY COVERAGE) (AEP)	
			(AEP)	CT4	1-141-462-11	CAP, VAR (MW FREQUENCY COVERAGE) (EE)	
C6	1-163-231-11	CERAMIC CHIP 15PF	5% 50V(EE)	CT4	1-151-691-11	CAP, VAR (MW FREQUENCY COVERAGE)(AEP)	
C10	1-163-137-00	CERAMIC CHIP 680PF	5% 50V	CT5	1-141-604-11	CAP, ADJ (LW FREQUENCY COVERAGE)	
C13	1-163-035-00	CERAMIC CHIP 0.047uF	50V	CT6	1-141-604-11	CAP, ADJ (LW TRACKING)	
C14	1-124-589-11	ELECT 47uF	20% 16V			< VARIABLE CAPACITOR >	
C15	1-163-031-11	CERAMIC CHIP 0.01uF	50V	CV1	1-141-462-11	CAP, VAR (TUNING) (EE)	
C16	1-126-964-11	ELECT 10uF	20% 50V	CV1	1-151-691-11	CAP, VAR (TUNING) (AEP)	
C18	1-163-031-11	CERAMIC CHIP 0.01uF	50V	CV2	1-141-462-11	CAP, VAR (TUNING) (EE)	
C19	1-126-963-11	ELECT 4.7uF	20% 50V	CV2	1-151-691-11	CAP, VAR (TUNING) (AEP)	
C20	1-126-964-11	ELECT 10uF	20% 50V	CV3	1-141-462-11	CAP, VAR (TUNING) (EE)	
C21	1-126-964-11	ELECT 10uF	20% 50V				
C22	1-163-037-11	CERAMIC CHIP 0.022uF	10% 25V	CV3	1-151-691-11	CAP, VAR (TUNING) (AEP)	
C23	1-163-035-00	CERAMIC CHIP 0.047uF	50V	CV4	1-141-462-11	CAP, VAR (TUNING) (EE)	
C24	1-163-031-11	CERAMIC CHIP 0.01uF	50V	CV4	1-151-691-11	CAP, VAR (TUNING) (AEP)	
C25	1-164-346-11	CERAMIC CHIP 1uF	16V			< DIODE >	
C26	1-126-966-11	ELECT 33uF	20% 16V	D1	8-719-991-33	DIODE 1SS133T-77	
C27	1-163-031-11	CERAMIC CHIP 0.01uF	50V	D2	8-719-991-33	DIODE 1SS133T-77	
C28	1-164-346-11	CERAMIC CHIP 1uF	16V	D3	8-719-069-94	LED TLR124 (TUNE)	
C29	1-126-925-11	ELECT 470uF	20% 10V			< IC >	
C31	1-164-346-11	CERAMIC CHIP 1uF	16V	IC1	8-752-037-02	IC CXA1019S	
C32	1-126-925-11	ELECT 470uF	20% 10V				

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MAIN

Ref. No.	Part No.	Description	Remark
		< JACK >	
J1	1-770-666-11	JACK (⊙)	
J2	1-580-681-21	JACK,DC(POLARITY UNIFIED TYPE)	(DC IN 4.5V)
		< JUMPER RESISTOR >	
JC1	1-216-295-00	METAL CHIP 0 5%	1/10W (AEP)
		< COIL >	
L1	1-754-083-11	ANTENNA, FERRITE-ROD (LW,MW)	(MW/LW TRACKING)
L3	1-416-800-11	COIL, AIR-CORE (FM TRACKING)	(EE)
* L3	1-422-320-11	COIL, AIR-CORE (FM TRACKING)	(AEP)
L4	1-422-131-00	COIL, FM OSCILLATION (FM FREQUENCY COVERAGE)	(AEP)
L4	1-529-501-11	COIL, AIR-CORE (FM FREQUENCY COVERAGE)	(EE)
L5	1-406-028-00	COIL, OSC (MW) (MW FREQUENCY COVERAGE)	
		< TRANSISTOR >	
Q1	8-729-027-53	TRANSISTOR DTC124TKA-T146	
		< RESISTOR >	
R1	1-216-049-91	RES,CHIP 1K 5%	1/10W
R2	1-216-061-00	METAL CHIP 3.3K 5%	1/10W
R3	1-216-071-00	METAL CHIP 8.2K 5%	1/10W
R5	1-216-057-00	METAL CHIP 2.2K 5%	1/10W
R6	1-216-045-00	METAL CHIP 680 5%	1/10W
R7	1-216-049-91	RES,CHIP 1K 5%	1/10W
R9	1-216-065-91	RES,CHIP 4.7K 5%	1/10W
R10	1-216-057-00	METAL CHIP 2.2K 5%	1/10W
R11	1-216-017-91	RES,CHIP 47 5%	1/10W
R12	1-216-089-91	RES,CHIP 47K 5%	1/10W
		< VARIABLE RESISTOR >	
RV1	1-241-555-11	RES, VAR, CARBON 50K (POWER/VOL)	
		< SWITCH >	
S1	1-771-748-11	SWITCH, SLIDE (FM, MW, LW)	
S2	1-552-370-00	SWITCH, SLIDE (TONE)	
		< TRANSFORMER >	
T1	1-404-790-11	TRANSFORMER, IF (AM IF)	

Ref. No.	Part No.	Description	Remark
		MISCELLANEOUS	*****
* 52	1-674-032-21	RACK RETAINER BOARD	
ANT1	1-501-222-81	ANTENNA, TELESCOPIC (FM)	
D3	8-719-069-94	LED TLR124 (TUNE)	
SP1	1-529-451-11	SPEAKER (7.7cm)	

		ACCESSORIES & PACKING MATERIALS	*****
	3-867-127-11	MANUAL, INSTRUCTION (ENGLISH, FRENCH, GERMAN, SPANISH, DUTCH, ITALIAN, PORTUGUESE) (AEP)	
	3-867-127-21	MANUAL, INSTRUCTION (ENGLISH, FRENCH, SPANISH, POLISH, HUNGARIAN, RUSSIAN, CHINESE, ARABIC) (EE)	
