

ICF-780

SERVICE MANUAL

*US Model
Canadian Model
AEP Model*

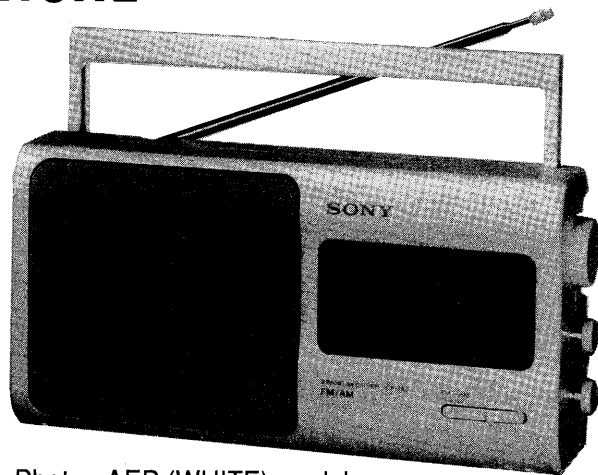


Photo : AEP (WHITE) model

SPECIFICATIONS

Frequency range	FM : 87.5 — 108 MHz (Italian model) 87.6 — 107.5 MHz (AEP model) 87.6 — 108 MHz (US, Canadian model) AM : 526.5 — 1606.5kHz (Italian model) 531 — 1602 kHz (AEP model) 530 — 1710 kHz (US, Canadian model)
Intermediate frequency	FM : 10.7 MHz AM : 455 kHz
Antennas	FM/SW : Telescopic antenna AM : Built-in ferrite bar antenna
Speaker	Approx. 10.2 cm (4 1/8 inches) dia., 8 ohms
Power output	430mW (at 10% harmonic distortion)
Output	Earphone jack (minijack)
Power requirements	With the supplied AC power cord : 220V AC, 50 Hz (AEP, Italian model) : 120V AC, 60Hz (US, Canadian model) With four R6 (size AA) batteries : 6V DC
Battery life	Approx. 35 hours using Sony batteries SUM-3 (NS)
Dimensions	Approx. 255 × 129 × 62.6 mm (w/h/d) (10 1/8 × 5 1/8 × 2 1/2 inches) incl. projecting parts and controls with carrying handle pushed in Approx. 965 g (2 lb 2 oz) incl. batteries
Weight	AC power cord (1)
Supplied accessory	

Design and specifications subject to change without notice.

FM/AM 2 BAND RECEIVER
SONY®

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety check before releasing the set to the customer:

Check the antenna terminals, metal trim, "metallized" knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

LEAKAGE TEST

The AC leakage from any exposed metal part to earth ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 0.5 mA (500 microamperes). Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCA WT-540A. Follow the manufacturers' instructions to use these instruments.
2. A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.
3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The "limit" indication is 0.75 V, so analog meters must have an accurate low-voltage scale. The Simpson 250 and Sanwa SH-63Trd are examples of a passive VOM that is suitable. Nearly all battery operated digital multimeters that have a 2 V AC range are suitable. (See Fig. A)

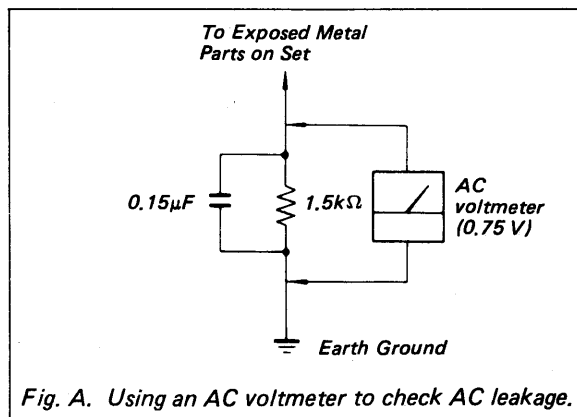
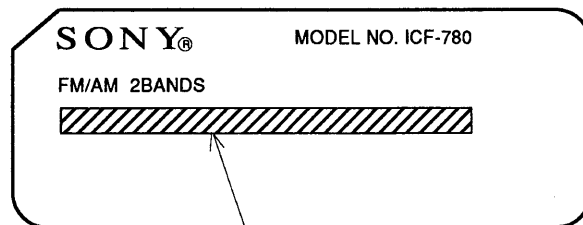


Fig. A. Using an AC voltmeter to check AC leakage.

MODEL IDENTIFICATION

—Specification Label—



US, Canadian model : AC : 120V 60Hz 4W
AEP, Italian model : AC : 220V ~ 50Hz 4W

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK \triangle OR DOTTED LINE WITH MARK \triangle ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

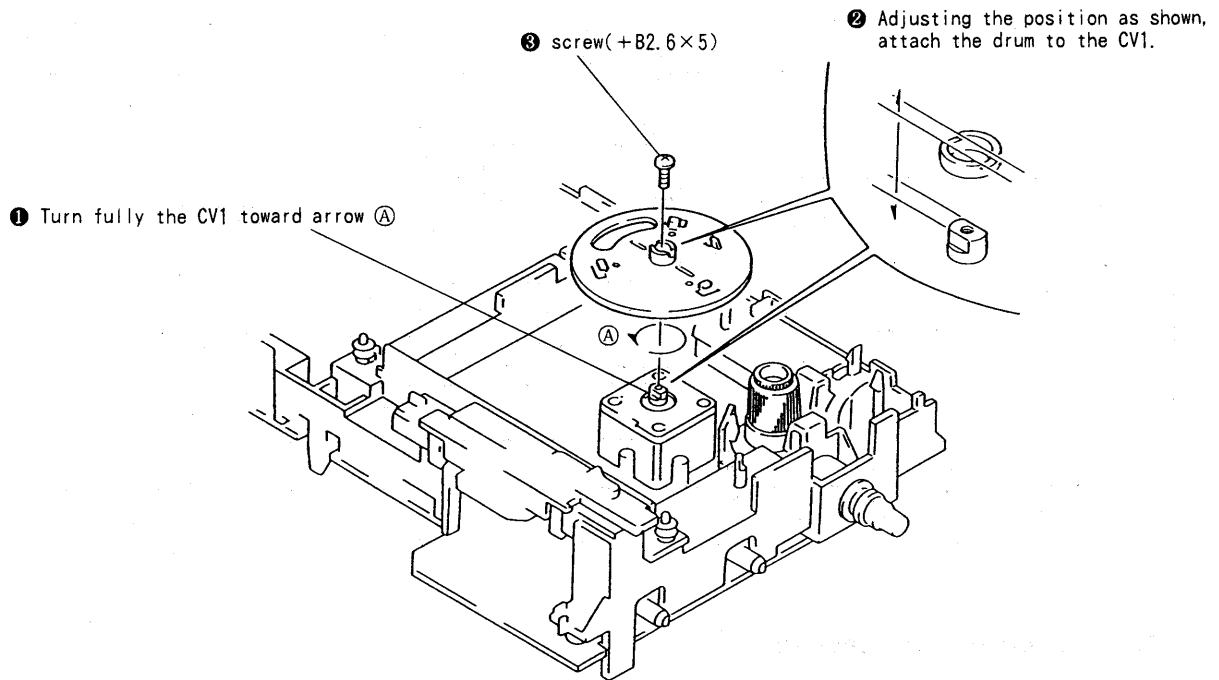
ATTENTION AU COMPOSANT AYANT RAPPORT À LA SÉCURITÉ!

LES COMPOSANTS IDENTIFIÉS PAR UNE MARQUE \triangle SUR LES DIAGRAMMES SCHÉMATIQUES ET LA LISTE DES PIÈCES SONT CRITIQUES POUR LA SÉCURITÉ DE FONCTIONNEMENT. NE REMPLACER CES COMPOSANTS QUE PAR DES PIÈCES SONY DONT LES NUMÉROS SONT DONNÉS DANS CE MANUEL OU DANS LES SUPPLÉMENTS PUBLIÉS PAR SONY.

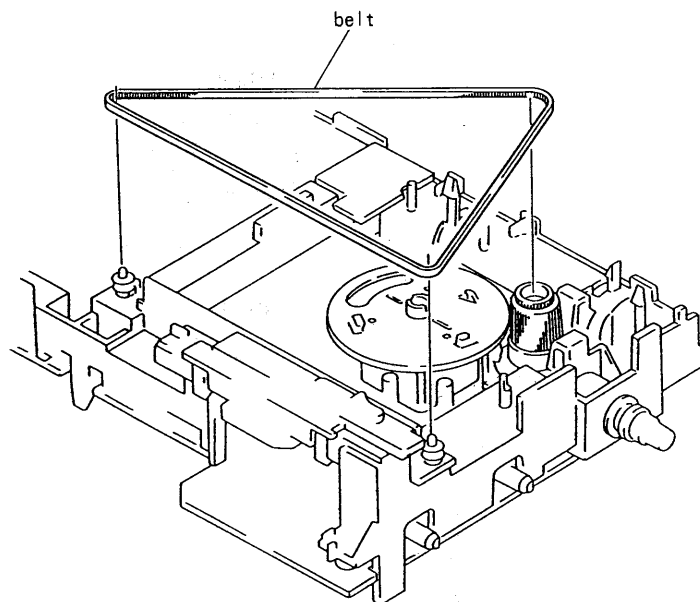
SECTION 1 DIAL POINTER FITTING

Note : Follow the dial pointer fitting procedure in the numerical over given.

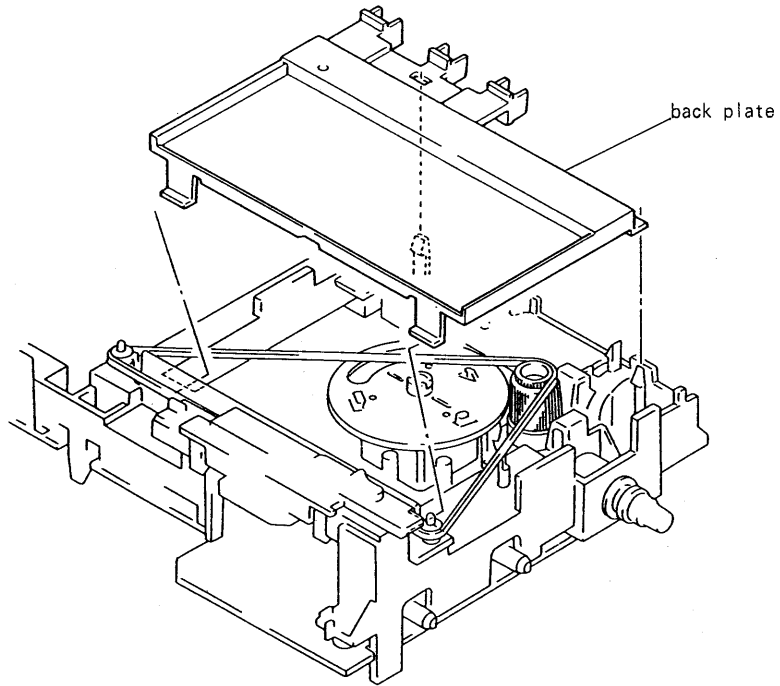
1. INSTALL DRUM



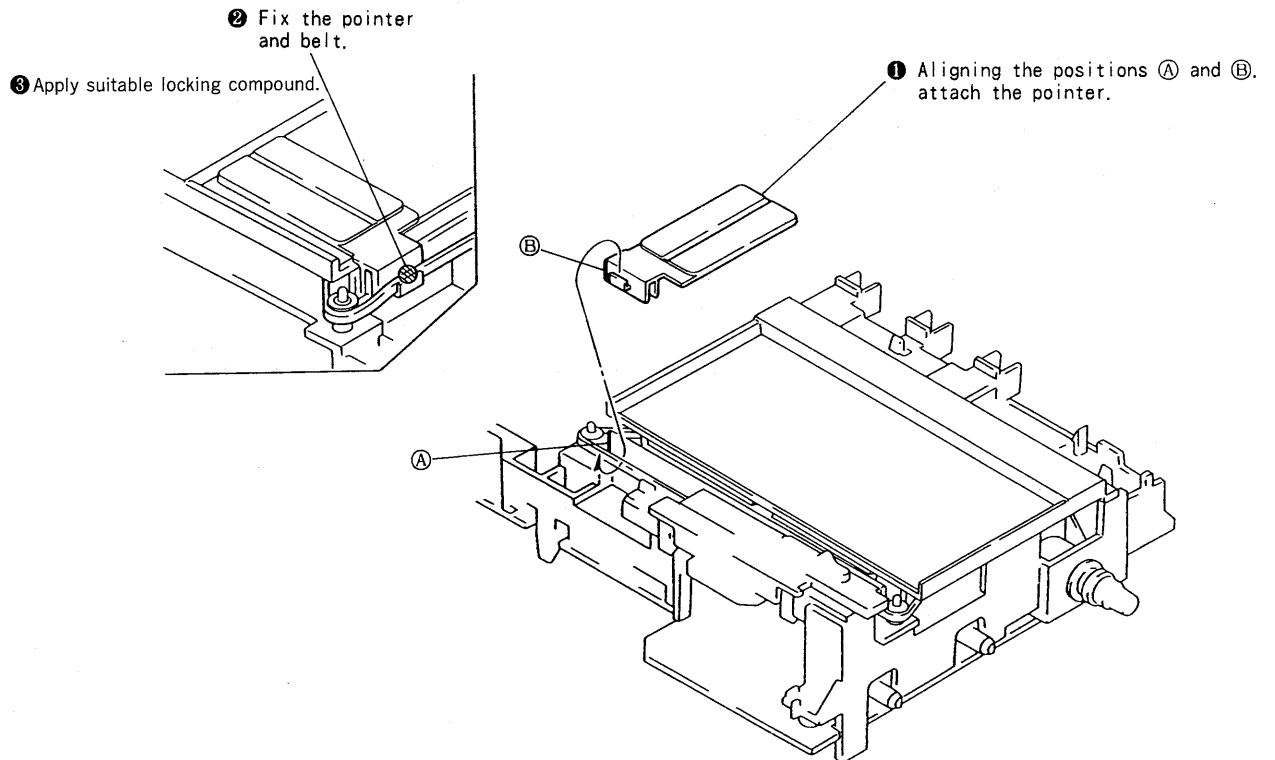
2. INSTALL BELT



3. INSTALL BACK PLATE



4. INSTALL DIAL POINTER

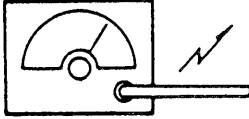


SECTION 2 ELECTRICAL ADJUSTMENT

AM

BAND switch : AM

AM RF signal generator



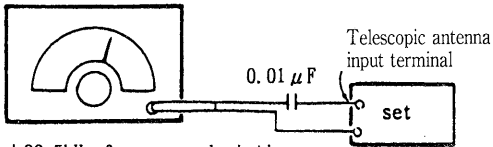
Put the lead wire antenna close to the set.

30% amplitude modulation by 400Hz signal output level: as low as possible.

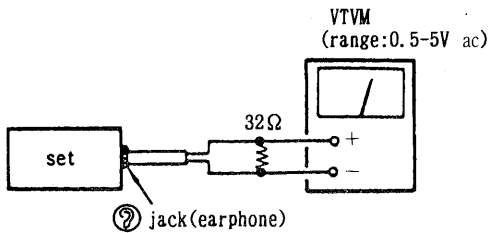
FM

BAND switch : FM

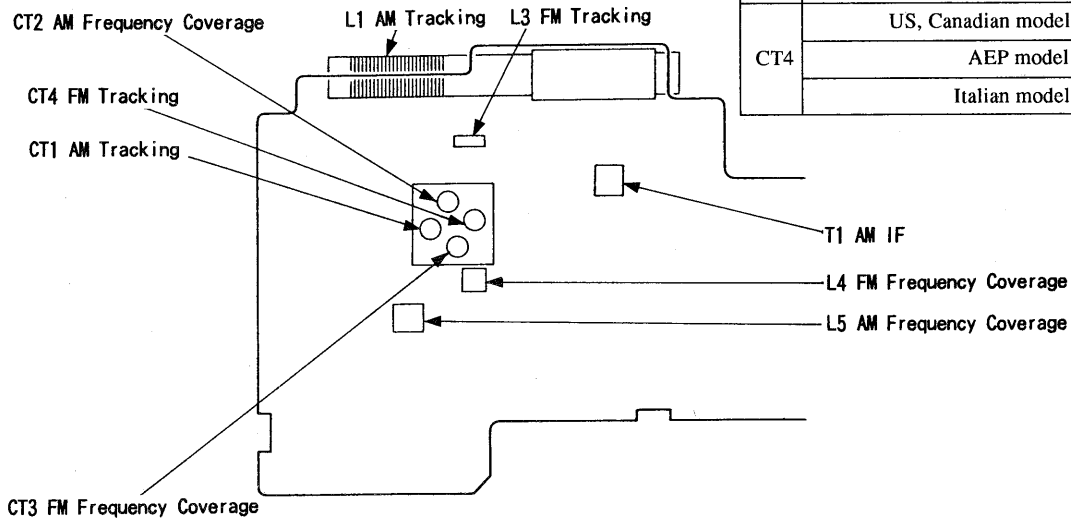
FM RF signal generator



±22.5kHz frequency deviation by 400Hz signal output level: as low as possible.



【Adjustment Location】 MAIN board(conductor side)



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

AM IF ADJUSTMENT

Adjust for a maximum reading on VTVM.

T1	455kHz
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AM FREQUENCY COVERAGE ADJUSTMENT

Adjust for a maximum reading on VTVM

L5	US, Canadian model : 520kHz
	AEP model : 520kHz
	Italian model : 516.5 ± 8kHz
CT2	US, Canadian model : 1,750kHz
	AEP model : 1,650kHz
	Italian model : 1,631.5 ± 20kHz

AM TRACKING ADJUSTMENT

Adjust for a maximum reading on VTVM.

L1	620kHz
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CT1	1,400kHz
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FM FREQUENCY COVERAGE ADJUSTMENT

Adjust for a maximum reading on VTVM

L4	US, Canadian model : 86.5MHz
	AEP model : 87.35MHz
	Italian model : 87.35 ± 0.1MHz
CT3	US, Canadian model : 109.5MHz
	AEP model : 108.05MHz
	Italian model : 108.3 ± 0.2MHz

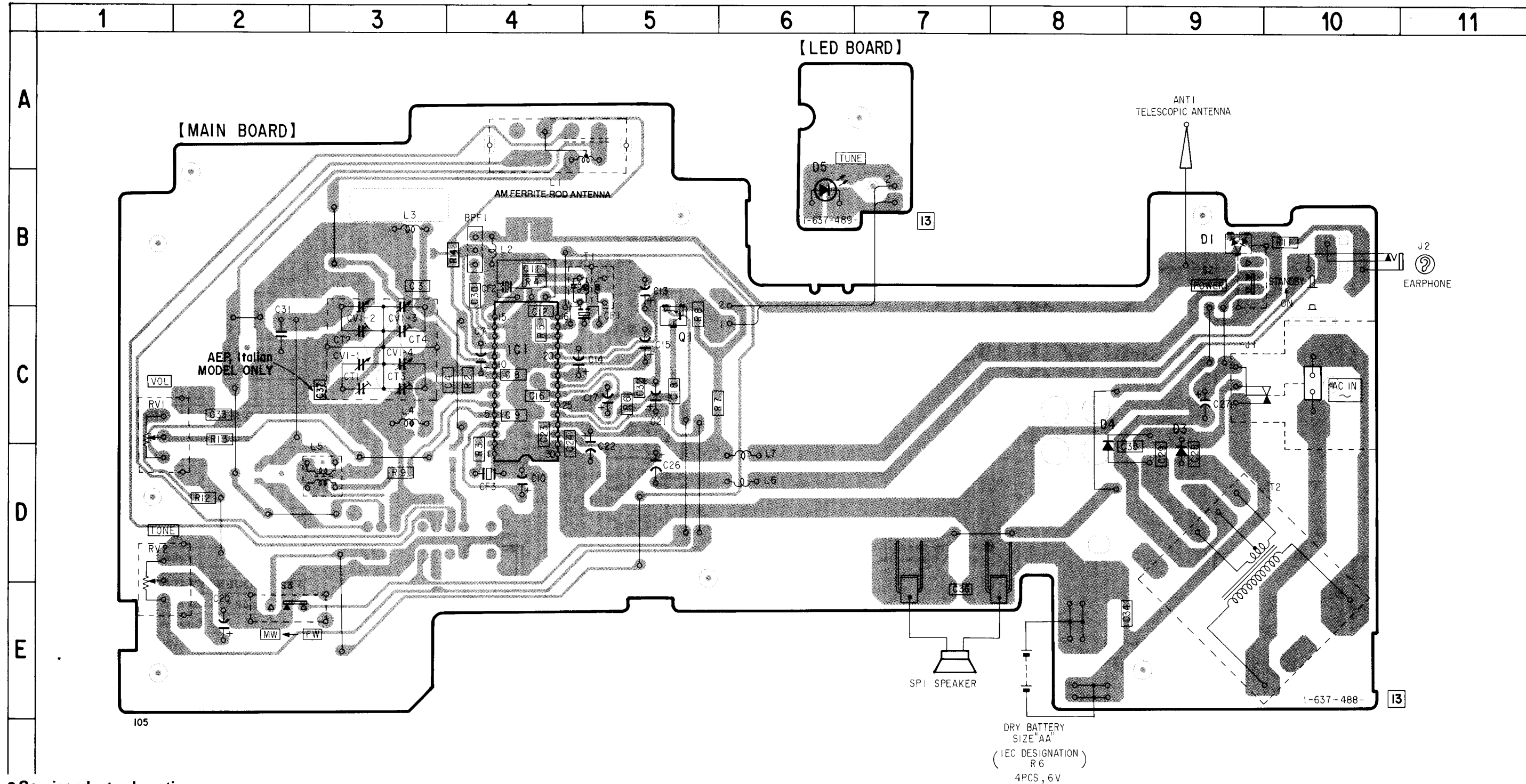
FM FREQUENCY COVERAGE ADJUSTMENT

Adjust for a maximum reading on VTVM

L3	US, Canadian model : 86.5MHz
	AEP model : 87.35MHz
	Italian model : 87.35 ± 0.1MHz
CT4	US, Canadian model : 109.5MHz
	AEP model : 108.05MHz
	Italian model : 108.3 ± 0.2MHz

SECTION 3 DIAGRAMS

3-1. Printed Wiring Boards



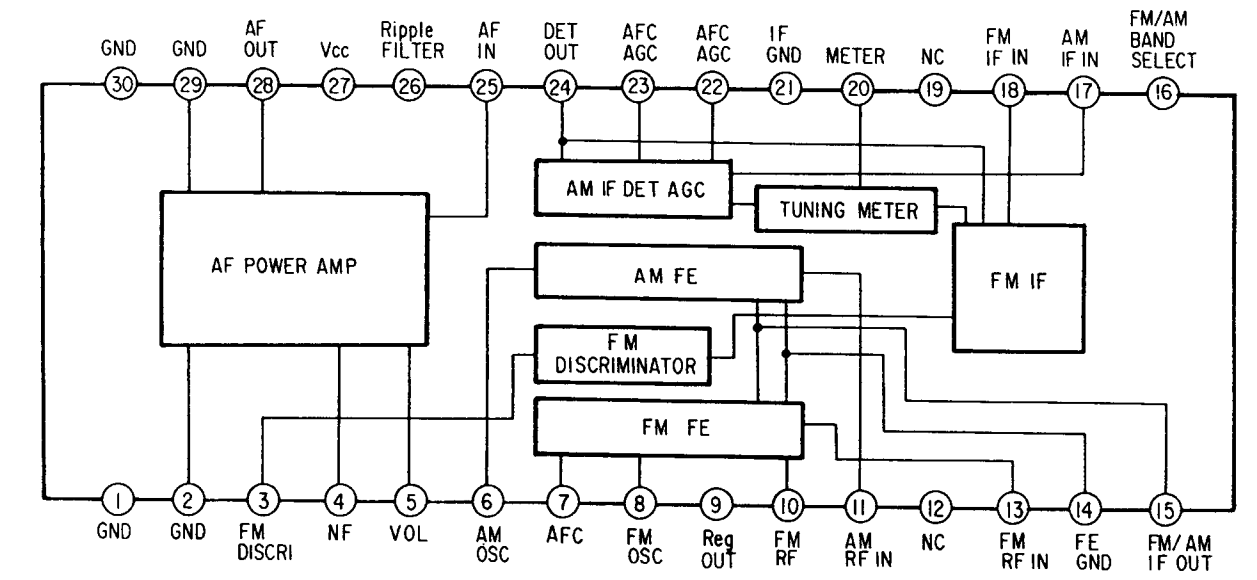
• Semiconductor Locations

Ref. No.	Location
D 1	B-9
D 3	D-9
D 4	D-8
D 5	B-6
IC 1	C-4
Q 1	C-5

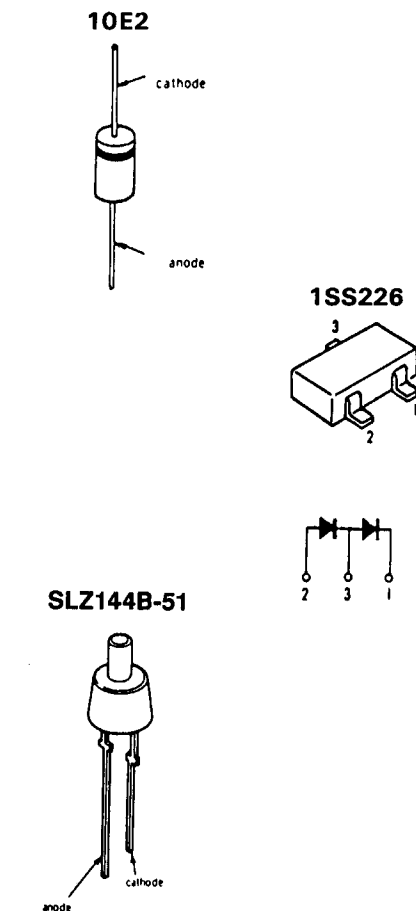
Note:
○ : parts extracted from the component side.

• IC Block Diagram

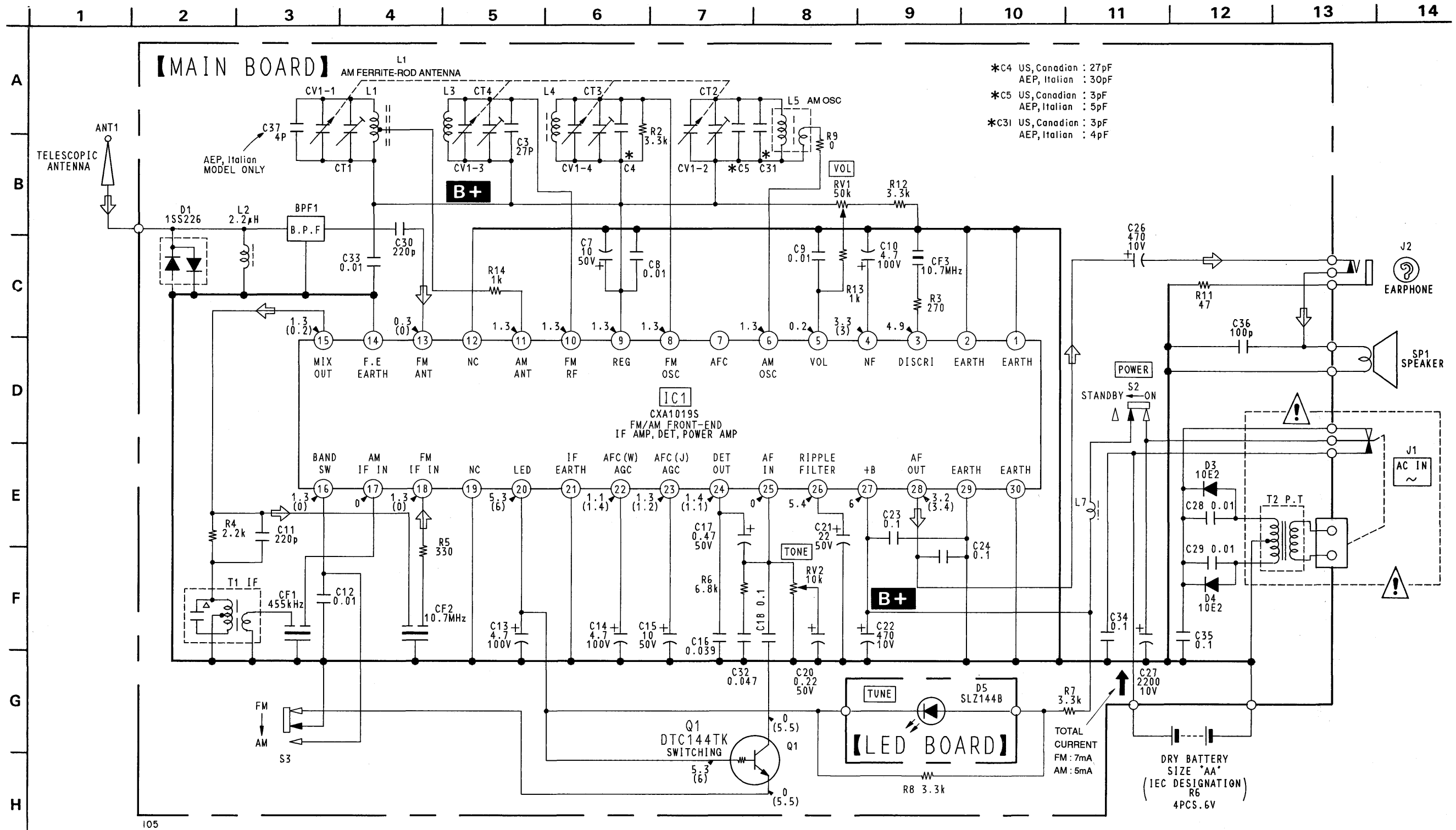
IC 1
CXA1019S



• Semiconductor Lead Layouts



3-2. Schematic Diagram



*C4 US, Canadian : 27pF
AEP, Italian : 30pF

*C5 US, Canadian : 3pF
AEP, Italian : 5pF

*C31 US, Canadian : 3pF
AEP, Italian : 4pF

Note:

- All capacitors are in μF unless otherwise noted. pF: $\mu\mu\text{F}$ 50WV 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.

The components identified by mark Δ or dotted line with mark Δ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque Δ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.
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- B+** : B+ Line
- Voltage is dc with respect to ground under no-signal (detuned) conditions.
no mark: FM
(): AM
- Voltages are taken with a VOM (input impedance 10M Ω). Voltage variations may be noted due to normal production tolerances.
- Signal path.
 \Rightarrow : FM

SECTION 4 EXPLODED VIEWS

NOTE:

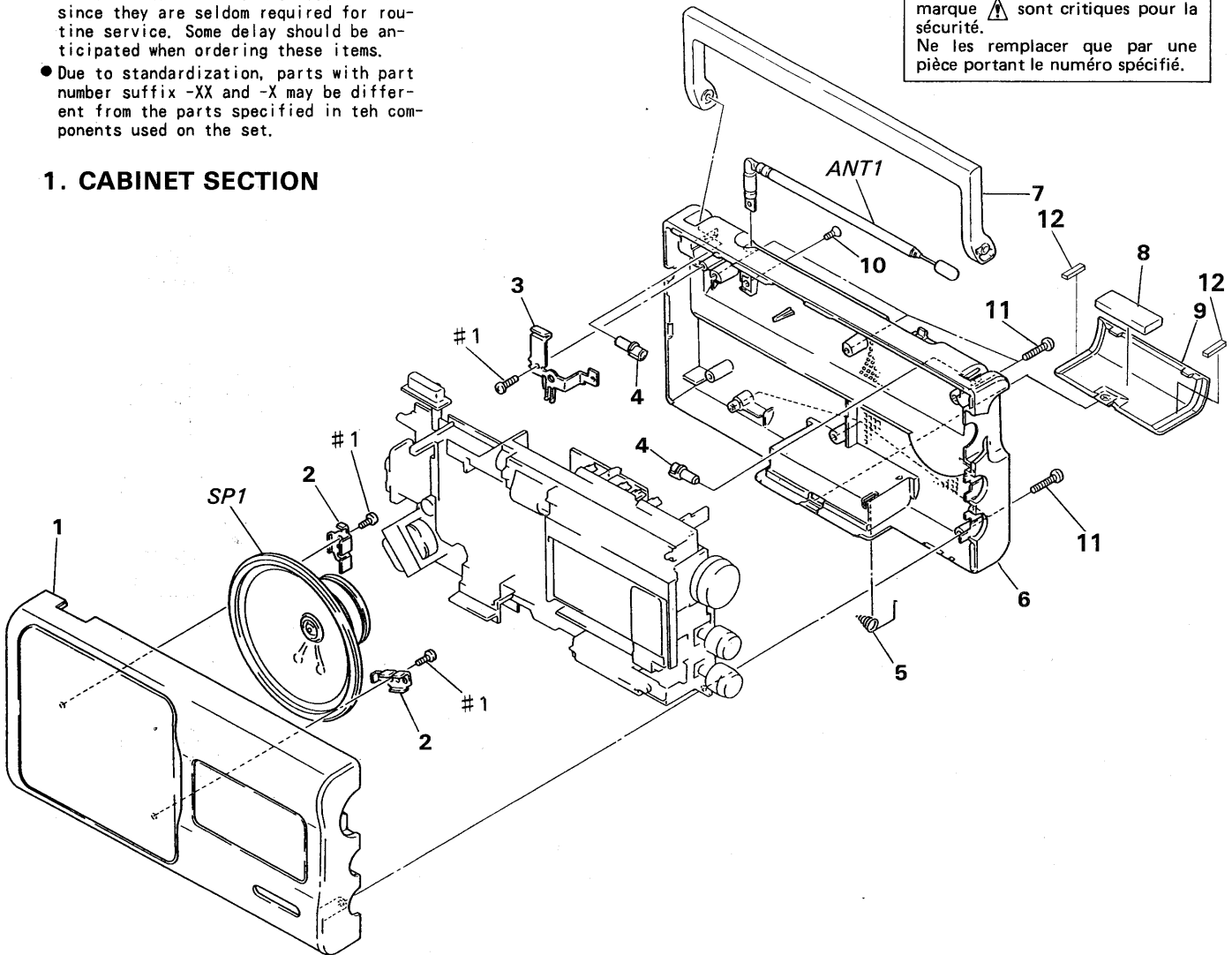
- The mechanical parts with no reference number in the exploded views are not supplied.
- The construction parts of an assembled part are indicated with a collation number in the remark column.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Due to standardization, parts with part number suffix -XX and -X may be different from the parts specified in the components used on the set.

- Color Indication of Appearance Parts
Example:
KNOB, BALANCE (RED)... (WHT)

↑
Parts' Color
↑
Cabinet's Color
- Screw(#mark) list is given in the last of this parts list.

The components identified by mark or dotted line with mark are critical for safety. Replace only with part number specified.

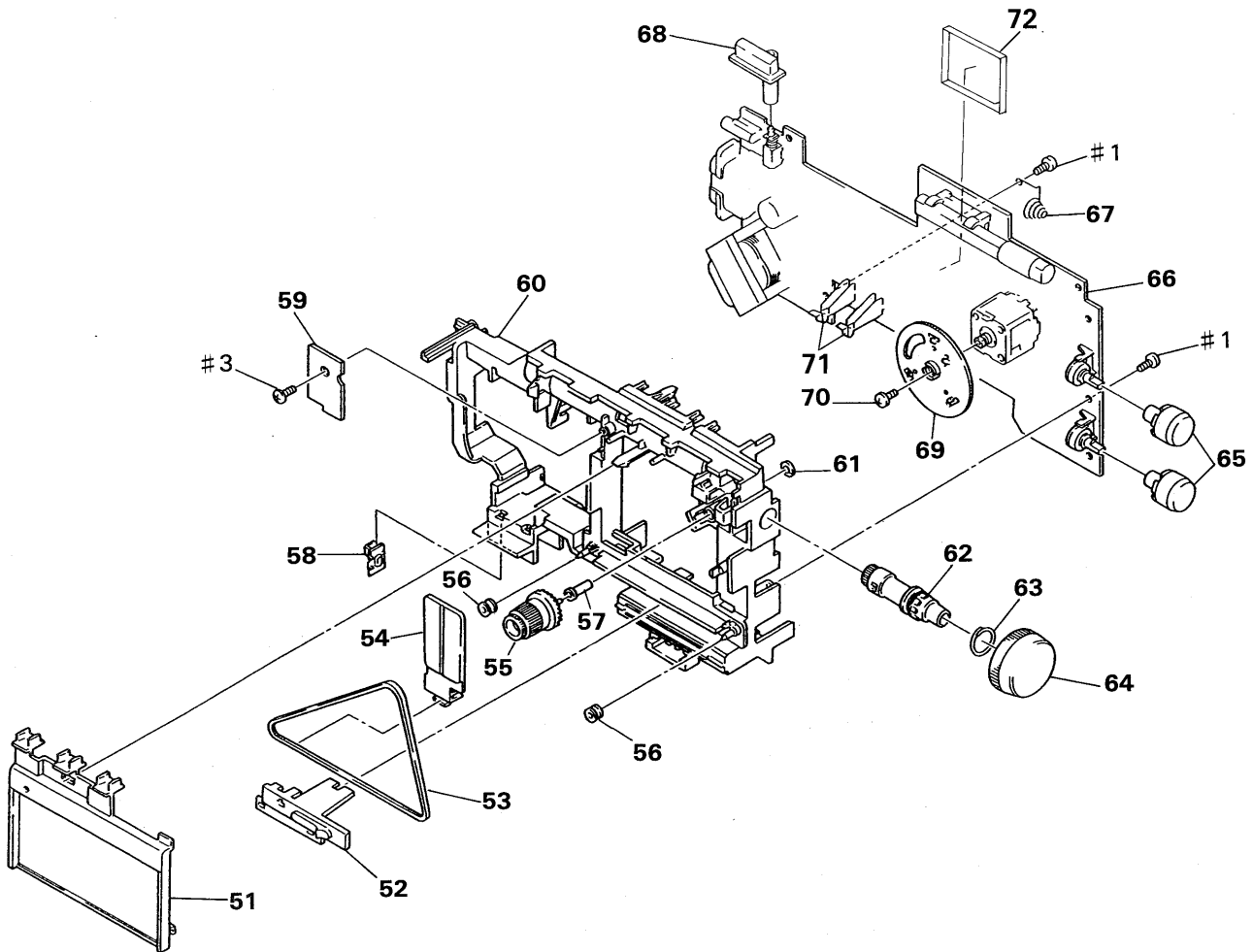
Les composants identifiés par une marque sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.



Ref. No.	Part No.	Description	Remark
1	X-3362-624-1	CABINET (FRONT) ASSY (BLACK)	(AEP)
1	X-3362-625-1	CABINET (FRONT) ASSY (WHITE)	(AEP)
1	X-3362-626-1	CABINET (FRONT) ASSY (BLACK)	(Italian)
1	X-3362-629-1	CABINET (FRONT) ASSY (WHITE)	(Canadian)
1	X-3364-524-1	CABINET (FRONT) ASSY (GRAY)	(US)
2	3-364-730-01	CLAW, SPEAKER	
3	3-363-360-01	SPRING, HANDLE	
4	3-363-372-01	SHAFT (HANDLE)	
5	3-363-363-01	SPRING, PLUS. MINUS	
6	3-365-427-11	CABINET (REAR) (NO. 1) (WHITE)	(Canadian)
6	3-365-427-21	CABINET (REAR) (NO. 1) (GRAY)	(US)
6	3-365-428-31	CABINET (REAR) (NO. 1) (BLACK)	(AEP, Italian)
6	3-365-428-41	CABINET (REAR) (NO. 1) (WHITE)	(AEP)

Ref. No.	Part No.	Description	Remark
7	3-363-379-01	HANDLE (BLACK)	(AEP, Italian)
7	3-363-379-11	HANDLE (WHITE)	(Canadian, AEP)
7	3-363-379-21	HANDLE (GRAY)	(US)
8	9-911-815-02	CUSHION	
9	X-3362-879-1	LID ASSY, BATTERY CASE (BLACK)	(AEP, Italian)
9	X-3362-877-1	LID ASSY, BATTERY CASE (WHITE)	(Canadian, AEP)
9	3-363-392-21	LID, BATTERY CASE (GRAY)	(US)
10	3-364-994-11	SCREW (+K) (3X6), NYLOK	
11	3-376-003-01	SCREW (+PTP) (3X20)	
12	3-831-441-XX	CUSHION (5)	
ANT1	1-501-362-11	ANTENNA, TELESCOPIC	
SP1	1-544-406-11	SPEAKER	

2. CHASSIS SECTION



Ref. No.	Part No.	Description	Remark
* 51	3-363-391-01	PLATE, BACK	
52	3-363-394-01	KNOB (B) (2 BAND) (BLACK) (US, AEP, Italian)	
52	3-363-394-11	KNOB (B) (2 BAND) (WHITE) (Canadian, AEP)	
53	3-363-369-01	BELT	
54	3-363-377-01	POINTER	
55	3-363-373-01	GEAR, MIDWAY	
56	3-304-108-00	PULLEY	
57	3-363-367-01	BEARING	
58	3-363-361-01	TERMINAL BOARD, BATTERY	
* 59	1-637-489-11	PC BOARD, LED	
* 60	3-363-383-01	CHASSIS	
61	3-364-731-01	WASHER, POLY-SLIDER	
62	3-363-375-01	SHAFT (TUNING)	
63	3-363-365-01	RING	

Ref. No.	Part No.	Description	Remark
64	X-3362-904-1	KNOB (T) ASSY (BLACK) (AEP, Italian)	
64	X-3362-905-1	KNOB (T) ASSY (WHITE) (Canadian, AEP)	
64	3-363-374-21	KNOB (T) (GRAY) (US)	
65	X-3362-907-1	KNOB (CONTROL) ASSY (BLACK) (AEP, Italian)	
65	X-3362-908-1	KNOB (CONTROL) ASSY (WHITE) (Canadian, AEP)	
65	3-363-393-21	KNOB (CONTROL) (GRAY) (US)	
* 66	A-3661-203-A	MOUNTED PCB (HAND), MAIN (AEP)	
* 66	A-3661-248-A	MOUNTED PCB (HAND), MAIN (Italian)	
* 66	A-3661-479-A	MOUNTED PCB (HAND), MAIN (US, Canadian)	
67	3-363-364-01	SPRING, MINUS	
68	3-363-371-11	BUTTON (POWER)	
69	3-363-387-01	DRUM (A)	
70	3-364-941-11	SCREW (+B) (2.6X5), NYLOK	
71	3-363-359-01	PLATE, CONTACT, SPEAKER	
* 72	3-364-732-01	PLATE (A), SHIELD	

SECTION 5 ELECTRICAL PARTS LIST

LED **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 and -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

When indication parts by reference number, please include the board name.

The components identified by mark Δ or dotted line with mark Δ are critical for safety. Replace only with part number specified.

Les composants identifiés par une marque Δ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

Ref. No.	Part No.	Description	Remark
*	1-637-489-11	LED BOARD ***** < DIODE >	
D5	8-719-988-88	LED SLZ144B-51 (TUNE)	

*	A-3661-203-A	MOUNTED PCB (HAND), MAIN (AEP)	
*	A-3661-248-A	MOUNTED PCB (HAND), MAIN (Italian)	
*	A-3661-479-A	MOUNTED PCB (HAND), MAIN (US, Canadian) *****	
	3-363-359-01	PLATE, CONTACT, SPEAKER	
*	3-364-732-01	PLATE (A), SHIELD	
BPF1	1-236-022-11	FILTER, BAND PASS < CAPACITOR >	
C3	1-163-103-00	CERAMIC CHIP 27PF 5% 50V	
C4	1-163-103-00	CERAMIC CHIP 27PF 5% 50V (US, Canadian)	
C4	1-163-104-00	CERAMIC CHIP 30PF 5% 50V (AEP, Italian)	
C5	1-163-459-91	CERAMIC CHIP 3PF 0.25PF 50V (US, Canadian)	
C5	1-163-461-91	CERAMIC CHIP 5PF 0.25PF 50V (AEP, Italian)	
C7	1-123-875-11	ELECT 10uF 20% 50V	
C8	1-164-232-11	CERAMIC CHIP 0.01uF 50V	
C9	1-164-232-11	CERAMIC CHIP 0.01uF 50V	
C10	1-124-927-11	ELECT 4.7uF 20% 100V	
C11	1-163-125-00	CERAMIC CHIP 220PF 5% 50V	
C12	1-164-232-11	CERAMIC CHIP 0.01uF 50V	
C13	1-124-927-11	ELECT 4.7uF 20% 100V	
C14	1-124-927-11	ELECT 4.7uF 20% 100V	
C15	1-123-875-11	ELECT 10uF 20% 50V	
C16	1-162-587-11	CERAMIC CHIP 0.039uF 10% 25V	

Ref. No.	Part No.	Description	Remark
C17	1-124-902-00	ELECT 0.47uF 20% 50V	
C18	1-164-004-11	CERAMIC CHIP 0.1uF 10% 25V	
C20	1-124-464-11	ELECT 0.22MF 20% 50V	
C21	1-126-233-11	ELECT 22uF 20% 50V	
C22	1-124-472-11	ELECT 470uF 20% 10V	
C23	1-164-004-11	CERAMIC CHIP 0.1uF 10% 25V	
C24	1-164-004-11	CERAMIC CHIP 0.1uF 10% 25V	
C26	1-124-472-11	ELECT 470uF 20% 10V	
C27	1-126-927-11	ELECT 2200uF 20% 10V	
C28	1-164-232-11	CERAMIC CHIP 0.01uF 50V	
C29	1-164-232-11	CERAMIC CHIP 0.01uF 50V	
C30	1-163-125-00	CERAMIC CHIP 220PF 5% 50V	
C31	1-102-936-00	CERAMIC CHIP 3PF 0.25PF 50V (US, Canadian)	
C31	1-164-615-91	CERAMIC CHIP 4PF 5% 50V (AEP, Italian)	
C32	1-163-809-11	CERAMIC CHIP 0.047uF 10% 25V	
C33	1-164-232-11	CERAMIC CHIP 0.01uF 50V	
C34	1-164-004-11	CERAMIC CHIP 0.1uF 10% 25V	
C35	1-164-004-11	CERAMIC CHIP 0.1uF 10% 25V	
C36	1-163-117-00	CERAMIC CHIP 100PF 5% 50V	
C37	1-163-087-00	CERAMIC CHIP 4PF 50V (AEP, Italian)	
< FILTER >			
CF1	1-577-072-11	FILTER, CERAMIC	
CF2	1-567-166-00	FILTER, CERAMIC	
CF3	1-567-166-00	FILTER, CERAMIC	
< TRIMMER >			
CT1-4 } CV1-4 }	1-151-631-11	CAP, VARIABLE	

MAIN

Ref. No.	Part No.	Description	Remark
< DIODE >			
D1	8-719-800-76	DIODE 1SS226	
D3	8-719-200-02	DIODE 10E2	
D4	8-719-200-02	DIODE 10E2	
< IC >			
IC1	8-752-035-29	IC CXA1019S	
< JACK >			
△J1	1-526-818-11	INLET, AC (~AC IN) (US, Canadian)	
△J1	1-526-838-11	INLET, AC 2P (~AC IN) (AEP, Italian)	
J2	1-563-836-21	JACK (EARPHONE)	
< COIL >			
* L1	1-402-536-11	ANTENNA, FERRITE-ROD (AM)	
* L2	1-410-501-11	INDUCTOR 2.2uH	
L3	1-422-342-11	COIL, AIR-CORE	
L4	1-406-431-11	COIL (WITH CORE) (OSC) (AEP, Italian)	
L4	1-460-222-11	COIL (WITH CORE) (OSC) (US, Canadian)	
L5	1-406-028-00	COIL, OSC (AM)	
L7	1-410-294-11	INDUCTOR, MICRO	
< TRANSISTOR >			
Q1	8-729-903-30	TRANSISTOR DTC144TK	
< RESISTOR >			
R2	1-216-061-00	METAL CHIP 3.3K 5% 1/10W	
R3	1-216-035-00	METAL CHIP 270 5% 1/10W	
R4	1-216-057-00	METAL GLAZE 2.2K 5% 1/10W	
R5	1-216-037-00	METAL CHIP 330 5% 1/10W	
R6	1-216-069-00	METAL CHIP 6.8K 5% 1/10W	
R7	1-216-061-00	METAL CHIP 3.3K 5% 1/10W	
R8	1-216-061-00	METAL CHIP 3.3K 5% 1/10W	
R9	1-216-296-00	METAL CHIP 0 5% 1/8W	
R11	1-216-017-00	METAL CHIP 47 5% 1/10W	
R12	1-216-061-00	METAL CHIP 3.3K 5% 1/10W	
R13	1-216-049-00	METAL CHIP 1K 5% 1/10W	
R14	1-216-049-00	METAL CHIP 1K 5% 1/10W	
< VARIABLE RESISTOR >			
RV1	1-241-362-11	RES, VAR, CARBON 50K (VOL)	
RV2	1-241-361-11	RES, VAR, CARBON 10K (TONE)	

Ref. No.	Part No.	Description	Remark
< SWITCH >			
S2	1-571-042-11	SWITCH, PUSH (1 KEY) (POWER)	
S3	1-552-370-00	SWITCH, SLIDE (BAND)	
< TRANSFORMER >			
T1	1-404-341-00	TRANSFORMER, IF	
△T2	1-450-323-11	TRANSFORMER, POWER (US, Canadian)	
△T2	1-450-324-11	TRANSFORMER, POWER (AEP, Italian)	

MISCELLANEOUS			

ANT1	1-501-362-11	ANTENNA, TELESCOPIC	
SP1	1-544-406-11	SPEAKER	

ACCESSORY & PACKING MATERIAL			
△	1-555-234-00	CORD, POWER (AEP, Italian)	
△	1-559-047-11	CORD, POWER (US, Canadian)	
*	3-364-698-01	INDIVIDUAL CARTON (AEP, Italian)	
*	3-373-001-01	INDIVIDUAL CARTON (US, Canadian)	
*	3-364-706-01	CUSHION (R)	
*	3-364-721-01	CUSHION (L)	
	3-752-572-11	MANUAL, INSTRUCTION (ENGLISH, FRENCH, GERMAN, DUTCH, PORTUGUESE) (US, Canadian)	
	3-752-572-41	MANUAL, INSTRUCTION (ENGLISH, GERMAN, SPANISH, ITALIAN, SWEDISH, ARABIC) (AEP, Italian)	

SCREW			

#1	7-685-647-79	SCREW +BTP 3X10 TYPE2 N-S	
#3	7-685-133-19	SCREW +BTP 2.6X6 TYPE2 N-S	

<p>The components identified by mark △ or dotted line with mark △ are critical for safety. Replace only with part number specified.</p>	<p>Les composants identifiés par une marque △ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.</p>
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