

# ICF-C135

## SERVICE MANUAL

Ver 1.0 1999.10

*US Model  
Canadian Model*



### SPECIFICATIONS

- Time display:** 12 hour  
**Frequency range**  
FM: 87.5 – 108 MHz  
AM: 530 – 1710 kHz  
**Speaker:** Approx. 6.6 cm (2 $\frac{5}{8}$  inches) dia., 8 ohm  
**Power output:** 130 mW (at 10 % harmonic distortion)  
**Power requirements:**  
120 V AC, 60 Hz  
For the power back-up function: 9 V DC, one 6F22 battery  
**Battery life:** Approx. 200 minutes, using Sony S-006P(U) battery  
**Dimensions:** Approx. 118 × 120 × 140 mm (w/h/d)  
(4 $\frac{3}{4}$  × 4 $\frac{3}{4}$  × 5 $\frac{5}{8}$  inches) incl. projecting parts and controls  
**Mass:** Approx. 680 g (1 lb 8 oz) not incl. battery

Design and specifications are subject to change without notice.

### FEATURES

- Full power back-up function to keep the clock, the alarm (radio and buzzer) and the radio operating during a power interruption, using a 6F22 battery (not supplied).

FM/AM CLOCK RADIO

SONY®



# SECTION 1 SERVICING NOTES

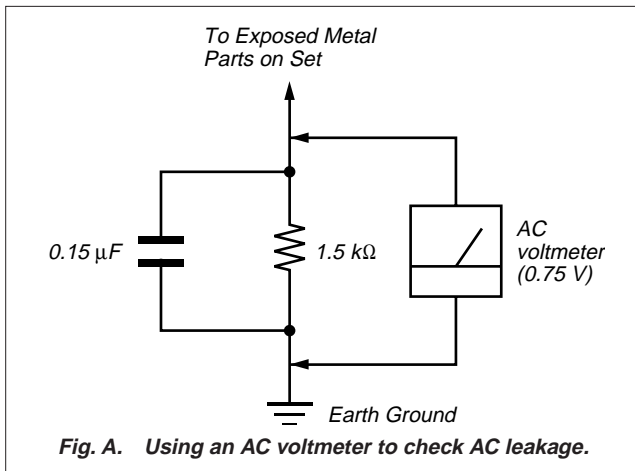
## SAFETY CHECK-OUT

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)



## 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.

## SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK  $\Delta$  OR DOTTED LINE WITH MARK  $\Delta$  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.

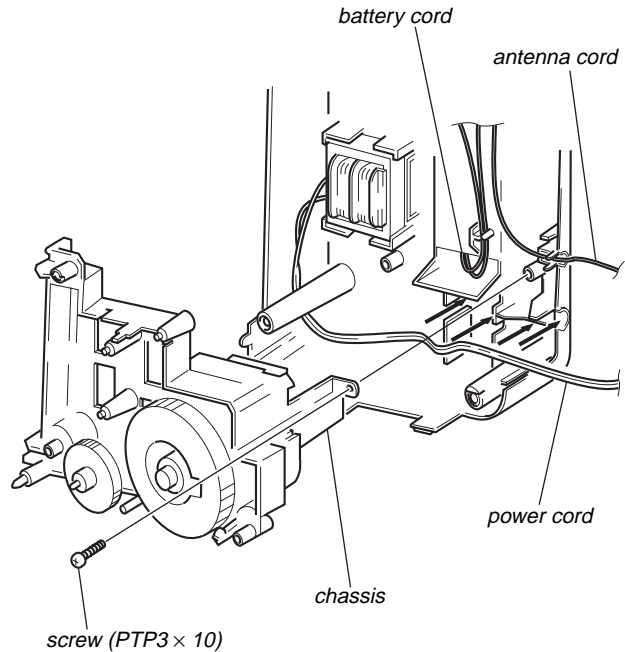
## HOW TO CHANGE THE FM CERAMIC FILTERS

This model is used two ceramic filters of CF1 and CF3.  
You must use same type of color marked ceramic filters in order to meet same specifications.  
Therefore, the ceramic filter must change two pieces together since it's supply two pieces in one package as a spare parts.

Mark 1	Mark 2	Center frequency
red	—	10.70MHz
blue	—	10.67MHz
orange	—	10.73MHz
black	—	10.64MHz
white	—	10.76MHz
white	white	10.75 MHz
yellow	—	10.79 MHz

## CORD DRESSING (POWER, ANTENNA, BATTERY)

- 1) Connect the power cord, antenna cord, and battery cord as shown in the figure.
- 2) Mount the chassis with screws (PTP3 × 10).  
Note: Tighten completely the screws (PTP3 × 10).

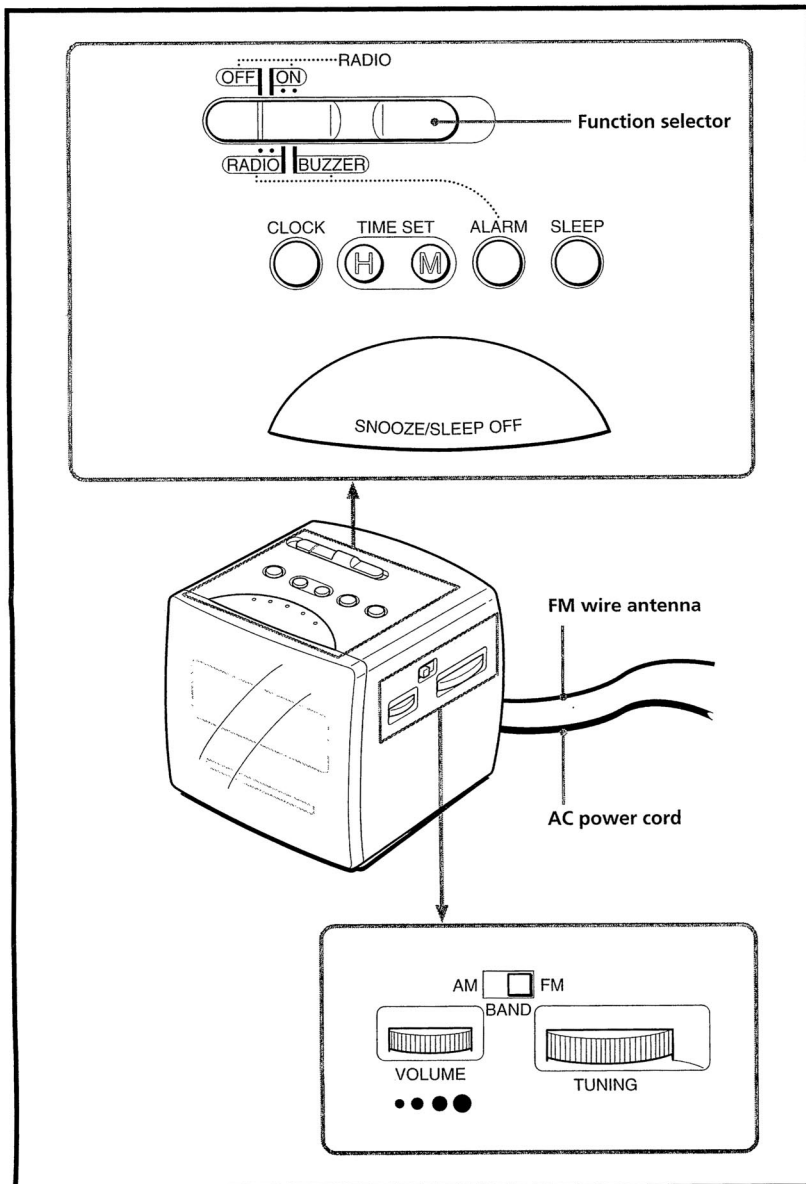


## ATTENTION AU COMPOSANT AYANT RAPPORT À LA SÉCURITÉ!

LES COMPOSANTS IDENTIFIÉS PAR UNE MARQUE  $\Delta$  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 2 GENERAL

This section is extracted from instruction manual.



### Setting the Clock

1. Plug in the unit.  
The AM indicator and "12:00" will flash in the display.
2. To set the hour, while holding down the **CLOCK** button, press the **TIME SET H** button. When the correct hour appears in the display, release the **CLOCK** button.
3. To set the minute, while holding down the **CLOCK** button, press the **TIME SET M** button. When the correct minute appears in the display, release the **CLOCK** button. The clock will begin to operate.

- Each press on the **TIME SET H** or **TIME SET M** button advances the displayed number by one.
- The minute digits advance to "00" after "59". The hour digits do not advance by pressing the **TIME SET M** button.
- To adjust the time exactly to the second, release the **TIME SET M** button simultaneously with the radio or telephone time signal.

### Playing the Radio

1. Set the Function selector to **RADIO ON** to turn on the radio and adjust **VOLUME**.
  2. Select **FM** or **AM** and tune in a station using the **TUNING** dial.
- To turn off the radio, set the Function selector to **OFF**.
  - To improve radio reception  
**FM**: Extend the FM wire antenna fully to improve reception.  
**AM**: Reorient the unit for optimum reception. A ferrite bar antenna is built into the unit.

### Setting the Alarm

To set the radio alarm, first tune in a station and adjust the volume.

1. To set the hour for alarm, while holding down the **ALARM** button, press the **TIME SET H** button. When the desired hour appears in the display, release the **ALARM** button.
2. To set the minute for alarm, while holding down the **ALARM** button, press the **TIME SET M** button. When the desired minute appears in the display, release the **ALARM** button.
3. Set the Function selector to **RADIO** or **BUZZER**.

The alarm will come on at the preset time and automatically turn itself off after 119 minutes.

- To shut off the alarm, set the Function selector to **OFF**.  
To sound the alarm at the preset time the next day, set the Function selector to **RADIO** or **BUZZER** again.
- To cancel either alarm, set the Function selector to **OFF**.
- To doze a few more minutes, press **SNOOZE/ SLEEP OFF**.  
The alarm will shut off, but will come on again after about 9 minutes. You can repeat this process as many times as you like.
- To adjust the radio alarm volume, turn **VOLUME**. The buzzer volume is fixed.
- To listen to the radio continuously, set the Function selector to **RADIO ON**.
- To check the preset time, press **ALARM** button.

### Setting the Sleep Timer

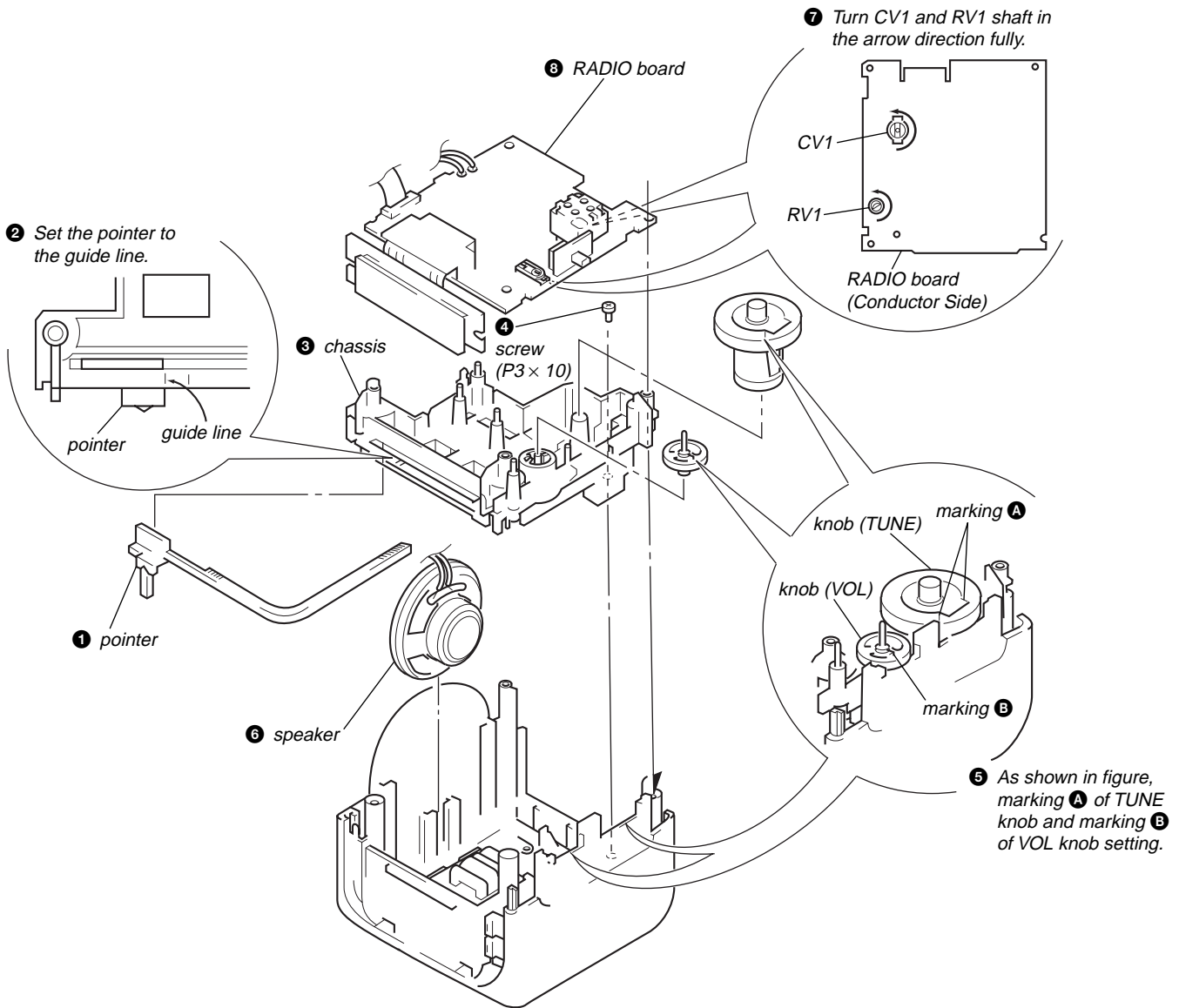
Enjoy falling asleep to the radio using the built-in sleep timer that shuts off the radio automatically at a preset time.

1. While listening to the radio, set the Function selector to **OFF**.
2. Press **SLEEP**.  
The radio turns on. It will go off after 59 minutes.

- To turn off the radio before the preset time, press **SNOOZE/ SLEEP OFF**.
- Every time you press **SLEEP**, the sleep timer is reset to 59 minutes.
- When you set the Function selector to **RADIO** or **BUZZER**, if the preset alarm time comes while the sleep timer is operating, the radio or buzzer sounds depending on which you set.

# SECTION 3 DIAL POINTER SETTING

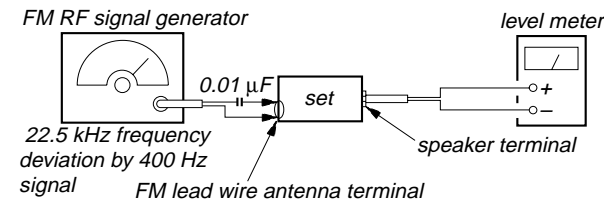
**Note:** Follow the assembly procedure in the numerical order given.



## SECTION 4 ELECTRICAL ADJUSTMENTS

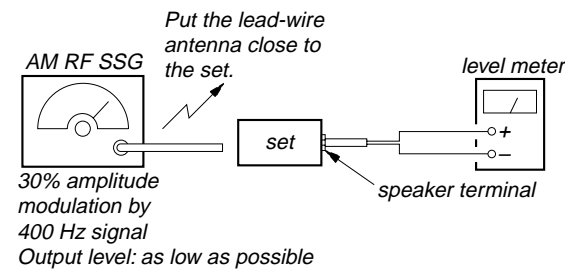
### [FM]

**Setting:**  
BAND switch: FM



### [AM]

**Setting:**  
BAND switch: AM



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

FM FREQUENCY COVERAGE ADJUSTMENT	
Adjust for a maximum reading on level meter.	
L4	CT4
86.5 MHz	109.5 Hz

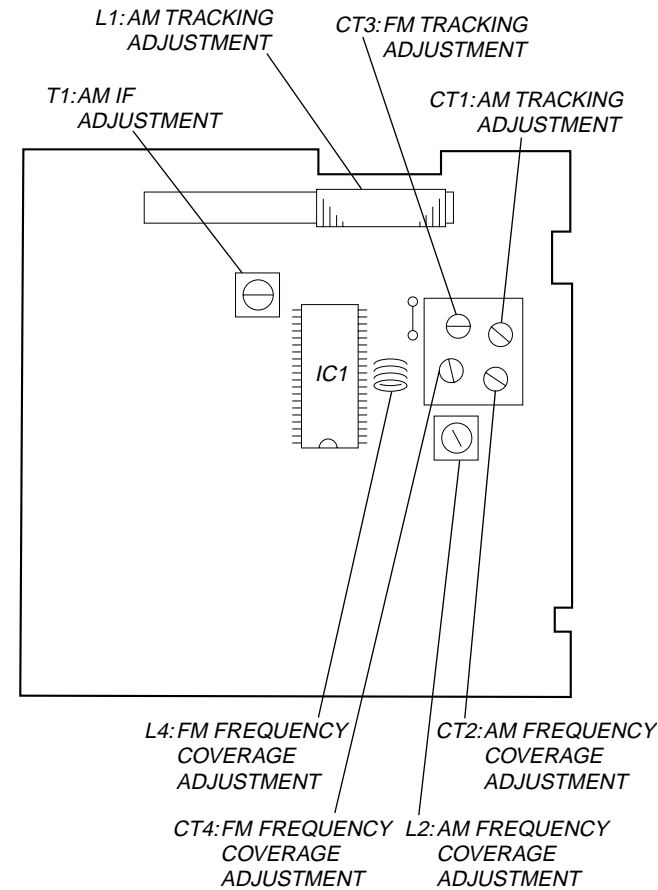
FM TRACKING ADJUSTMENT	
Adjust for a maximum reading on level meter.	
CT3	
Frequency max	

AM FREQUENCY COVERAGE ADJUSTMENT	
Adjust for a maximum reading on level meter.	
L2	CT2
520 kHz	1,750 kHz

AM TRACKING ADJUSTMENT	
Adjust for a maximum reading on level meter.	
L1	CT1
600 kHz	1,400 kHz

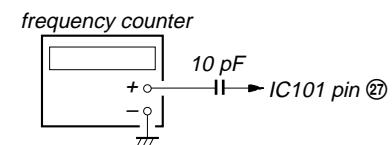
AM IF ADJUSTMENT	
Adjust for a maximum reading on level meter.	
T1	
455 kHz	

• **Adjusting Location:** RADIO board (Component Side)



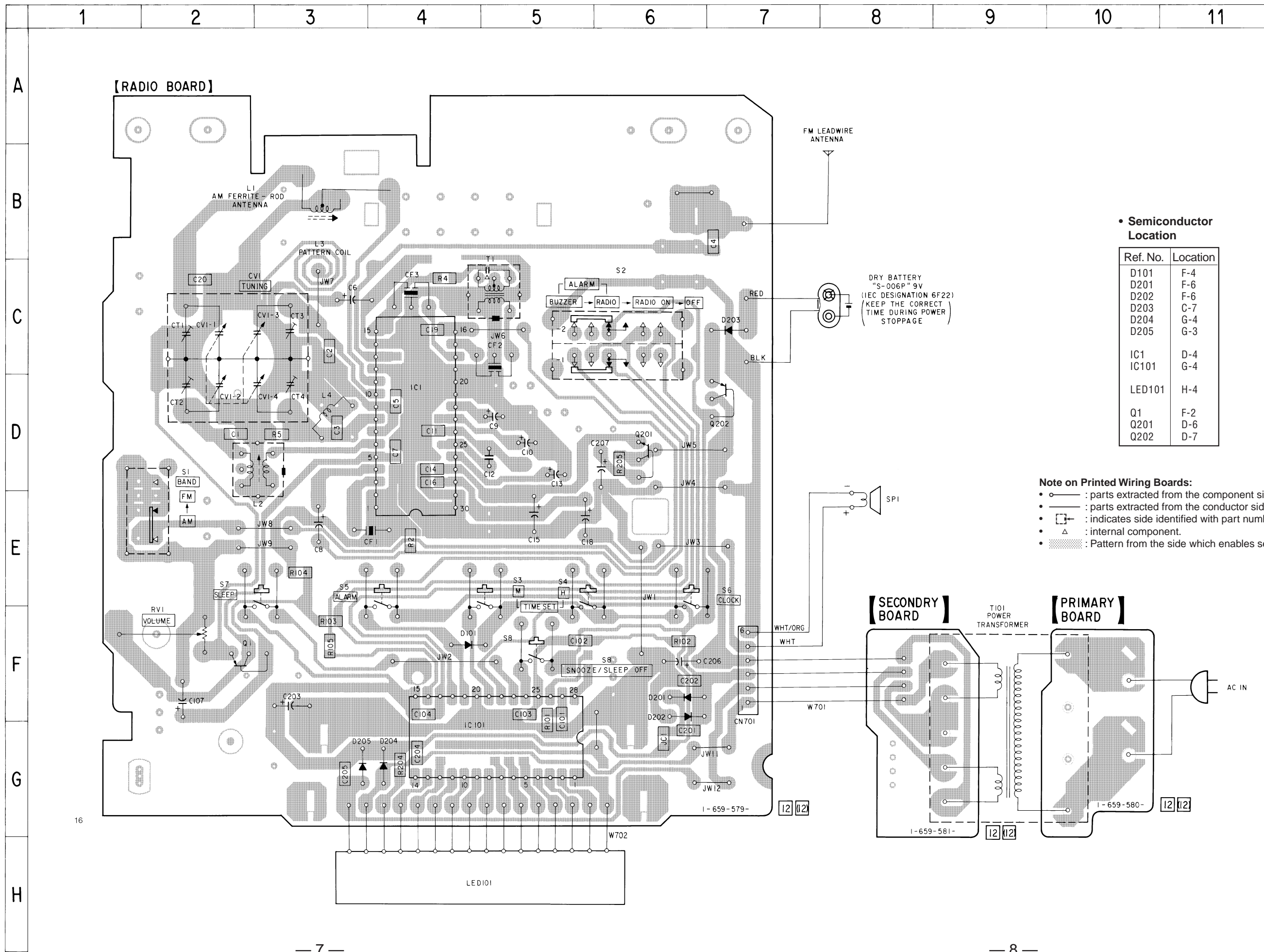
### Clock Frequency Check

Confirm that the reading on the frequency counter is  $900 \pm \frac{200}{100}$  Hz.  
If frequency is higher, change capacitor value of C101.  
If frequency is lower, change resistor value of R101.



SECTION 5  
DIAGRAMS

5-1. PRINTED WIRING BOARDS

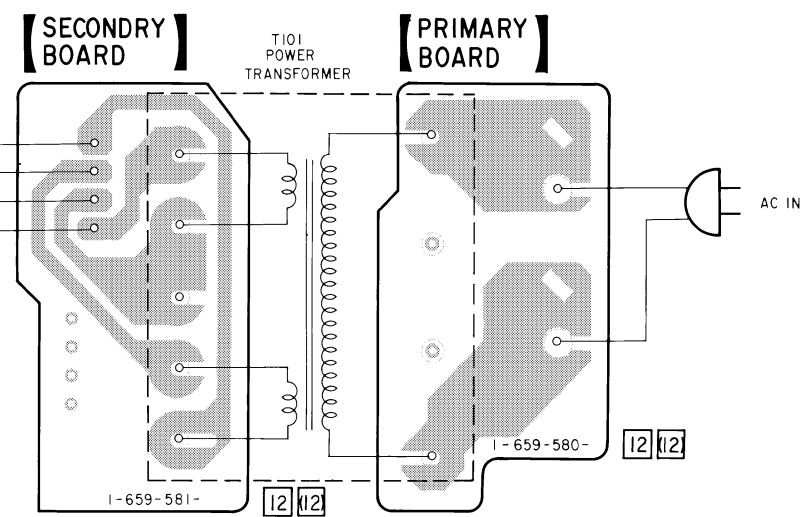


• Semiconductor Location

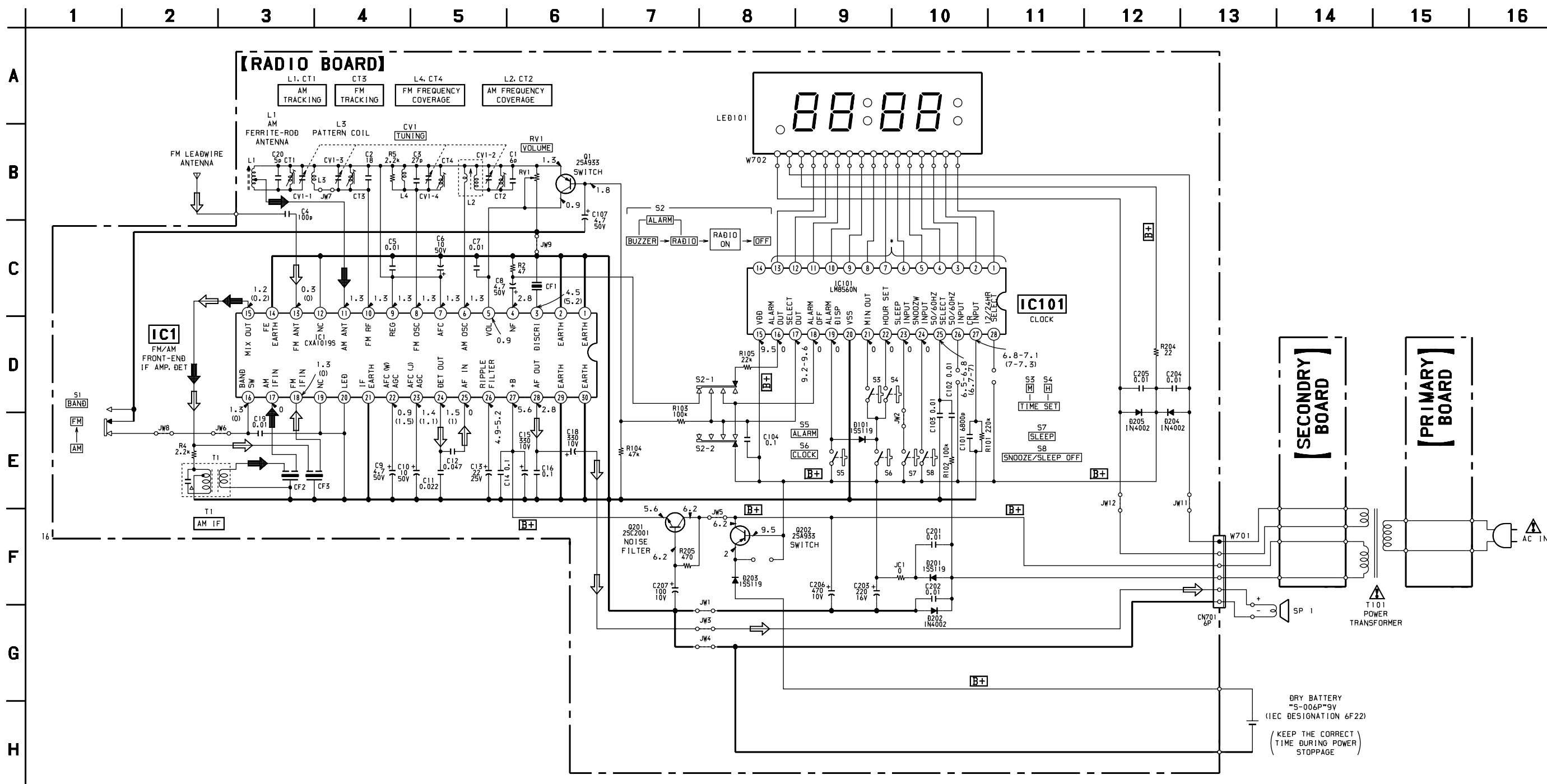
Ref. No.	Location
D101	F-4
D201	F-6
D202	F-6
D203	C-7
D204	G-4
D205	G-3
IC1	D-4
IC101	G-4
LED101	H-4
Q1	F-2
Q201	D-6
Q202	D-7

**Note on Printed Wiring Boards:**

- : parts extracted from the component side.
- ◌ : parts extracted from the conductor side.
- : indicates side identified with part number.
- △ : internal component.
- ▨ : Pattern from the side which enables seeing.

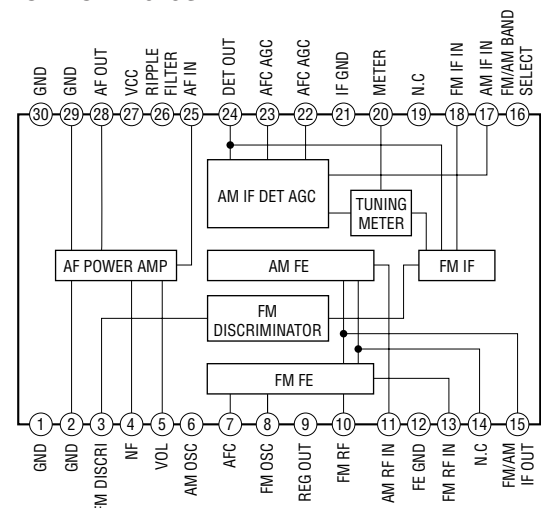


5-2. SCHEMATIC DIAGRAM



• IC Block Diagram

IC1 CXA1019S



Note on Schematic Diagram:

- All capacitors are in  $\mu\text{F}$  unless otherwise noted.  $\text{pF}$ :  $\mu\text{F}$  50 WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in  $\Omega$  and  $1/4\text{W}$  or less unless otherwise specified.
- $\Delta$ : internal component.
- $\square$ : panel designation.

Note:

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

Note:

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

- $\square$  : B+ Line.
- $\square$  : adjustment for repair.
- Voltages are dc with respect to ground under no-signal (detuned) conditions.  
no mark : FM  
( ) : AM  
\* : Impossible to measure
- Voltages are taken with a VOM (Input impedance 10 M $\Omega$ ). Voltage variations may be noted due to normal production tolerances.
- Signal path.  
 $\rightarrow$  : FM  
 $\blacktriangleright$  : AM

## SECTION 6 EXPLODED VIEWS

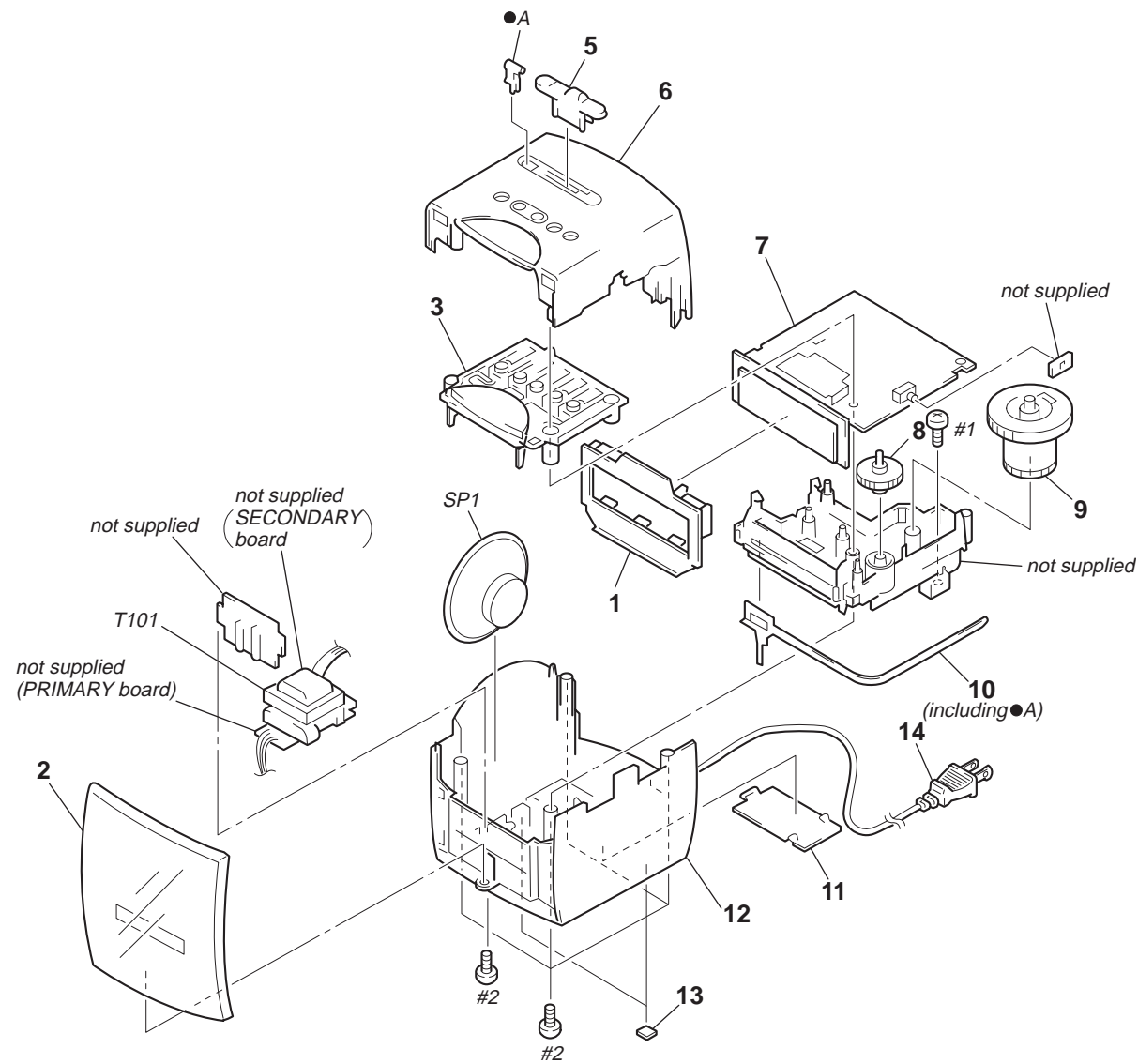
### NOTE:

- XX and -X mean standardized parts, so they may have some difference from the original one.
- 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.
- Accessories and packing materials are given in the last of the electrical parts list.

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

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



Ref. No.	Part No.	Description	Remarks	Ref. No.	Part No.	Description	Remarks
1	3-040-753-01	HOLDER (LED)		11	3-369-135-21	LID, BATTERY CASE	
2	3-040-750-01	PANEL, FRONT		12	3-938-058-41	CABINET (LOWER)	
3	3-012-759-21	BUTTON (FUNC.)		13	3-368-852-01	FOOT	
5	3-938-064-21	KNOB(FUNCTION)		$\Delta$ 14	1-783-817-11	CORD, POWER	
6	3-938-059-41	CABINET (UPPER)		SP1	1-504-748-21	SPEAKER (6.6CM)	
* 7	A-3663-419-A	RADIO BOARD, COMPLETE		$\Delta$ T101	1-435-201-11	TRANSFORMER, POWER	
8	3-919-268-01	KNOB(VOL)		#1	7-685-647-79	SCREW +P 3X10 TYPE2 NON-SLIT	
9	3-930-828-01	KNOB(TUNING)		#2	7-685-154-19	SCREW +P 3X35 TYPE2 NON-SLIT	
10	3-040-752-01	POINTER					

## RADIO

### 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.
- Items marked "\*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

- CAPACITORS:**  
uF:  $\mu$ F
- RESISTORS**  
All resistors are in ohms.  
METAL: metal-film resistor  
METAL OXIDE: Metal Oxide-film resistor  
F: nonflammable
- COILS**  
uH:  $\mu$ H

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

Ref. No.	Part No.	Description	Remarks	Ref. No.	Part No.	Description	Remarks
*	A-3663-419-A	RADIO BOARD, COMPLETE *****				< TRIMMER >	
	1-535-804-11	SNAP, BATTERY		CT1-4	1-141-522-11	CAP, VAR	
	3-922-610-01	HOLDER (ANTENNA)				< VARIABLE CAPACITOR >	
		< CAPACITOR >		CV1	1-141-522-11	CAP, VAR (TUNING)	
C1	1-163-088-00	CERAMIC CHIP	5PF			< DIODE >	
C2	1-163-233-11	CERAMIC CHIP	18PF	5%	50V		
C3	1-163-102-00	CERAMIC CHIP	24PF	5%	50V		
C4	1-163-251-11	CERAMIC CHIP	100PF	5%	50V		
C5	1-163-031-11	CERAMIC CHIP	0.01uF		50V		
C6	1-126-964-11	ELECT	10uF	20%	50V		
C7	1-163-031-11	CERAMIC CHIP	0.01uF		50V		
C8	1-126-963-11	ELECT	4.7uF	20%	50V		
C9	1-126-963-11	ELECT	4.7uF	20%	50V		
C10	1-126-964-11	ELECT	10uF	20%	50V		
C11	1-163-033-91	CERAMIC CHIP	0.022uF		50V		
C12	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V		
C13	1-128-551-11	ELECT	22uF	20%	25V		
C14	1-163-038-91	CERAMIC CHIP	0.1uF		25V		
C15	1-126-924-11	ELECT	330uF	20%	10V		
C16	1-164-505-11	CERAMIC CHIP	2.2uF		16V		
C18	1-126-924-11	ELECT	330uF	20%	10V		
C19	1-163-031-11	CERAMIC CHIP	0.01uF		50V		
C20	1-163-220-11	CERAMIC CHIP	3PF	0.25PF	50V		
C30	1-162-282-31	CERAMIC	100PF	10%	50V		
C31	1-162-600-11	CERAMIC	0.0047uF	20%	16V		
C101	1-163-019-00	CERAMIC CHIP	0.0068uF	10%	50V		
C102	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V		
C103	1-163-031-11	CERAMIC CHIP	0.01uF		50V		
C104	1-163-038-91	CERAMIC CHIP	0.1uF		25V		
C107	1-126-963-11	ELECT	4.7uF	20%	50V		
C201	1-163-031-11	CERAMIC CHIP	0.01uF		50V		
C202	1-163-031-11	CERAMIC CHIP	0.01uF		50V		
C203	1-126-934-11	ELECT	220uF	20%	16V		
C204	1-163-031-11	CERAMIC CHIP	0.01uF		50V		
C205	1-163-031-11	CERAMIC CHIP	0.01uF		50V		
C206	1-126-925-11	ELECT	470uF	20%	10V		
C207	1-104-665-11	ELECT	100uF	20%	10V		
		< FILTER >					
CF1	1-577-324-11	FILTER, CERAMIC					
CF2	1-577-072-11	FILTER, CERAMIC					
CF3	1-577-324-11	FILTER, CERAMIC					
		< CONNECTOR >					
* CN701	1-568-272-11	SOCKET, CONNECTOR 6P					
						< JUMPER >	
				JC1	1-216-295-91	SHORT	0
						< COIL >	
				L1	1-754-099-11	ANTENNA, FERRITE-ROD (MW)	
				L2	1-406-028-00	COIL, OSC (MW)	
				L4	1-428-229-11	COIL, AIR-CORE	
						< LED >	
				LED101	8-749-016-86	LED SL-3998-78T	
						< TRANSISTOR >	
				Q1	8-729-119-76	TRANSISTOR	2SA1175-HFE
				Q201	8-729-011-92	TRANSISTOR	2SC2001TP-K1K2
				Q202	8-729-119-76	TRANSISTOR	2SA1175-HFE
						< RESISTOR >	
				R2	1-216-017-91	RES-CHIP	47 5% 1/10W
				R4	1-216-057-00	METAL CHIP	2.2K 5% 1/10W
				R5	1-216-057-00	METAL CHIP	2.2K 5% 1/10W
				R101	1-216-105-91	RES-CHIP	220K 5% 1/10W
				R102	1-216-097-91	RES-CHIP	100K 5% 1/10W
				R103	1-216-097-91	RES-CHIP	100K 5% 1/10W
				R104	1-216-089-91	RES-CHIP	47K 5% 1/10W
				R105	1-216-081-00	METAL CHIP	22K 5% 1/10W
				R204	1-216-009-91	RES-CHIP	22 5% 1/10W
				R205	1-216-041-00	METAL CHIP	470 5% 1/10W



<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>	<u>Remarks</u>
		< VARIABLE RESISTOR >	
RV1	1-228-790-00	RES, VAR, CARBON 50K (VOLUME)	
		< SWITCH >	
S1	1-692-181-21	SWITCH, SLIDE (FM/AM)	
S2	1-762-232-11	SWITCH, SLIDE (OFF/RADIO ON/RADIO/BUZZER)	
S3	1-554-303-21	SWITCH, TACTILE (TIME SET M)	
S4	1-554-303-21	SWITCH, TACTILE (TIME SET H)	
S5	1-554-303-21	SWITCH, TACTILE (ALARM)	
S6	1-554-303-21	SWITCH, TACTILE (CLOCK)	
S7	1-554-303-21	SWITCH, TACTILE (SLEEP)	
S8	1-554-303-21	SWITCH, TACTILE (SNOOZE/SLEEP OFF)	
		< TRANSFORMER >	
T1	1-404-790-11	TRANSFORMER, IF	
		< FLAT CABLE >	
* W701	1-776-983-11	CORD, CONNECTION	
* W702	1-769-137-11	CORD, CONNECTION (16 CORE)	
*****			
MISCELLANEOUS			
*****			
△ 14	1-783-817-11	CORD, POWER	
SP1	1-504-748-21	SPEAKER (6.6CM)	
△ T101	1-435-201-11	TRANSFORMER, POWER	
*****			
ACCESSORIES & PACKING MATERIALS			
*****			
	3-867-923-11	MANUAL, INSTRUCTION (ENGLISH/FRENCH)(CND)	
	3-867-923-21	MANUAL, INSTRUCTION (ENGLISH)(US)	

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.
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