

# ICF-C420

## SERVICE MANUAL

*US Model*



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FM/AM DIGITAL CLOCK RADIO  
**SONY**<sup>®</sup>

## Specifications

Frequency range	FM: 87.5 – 108 MHz AM: 530 – 1610 kHz
Antennas	FM: AC power cord AM: Built-in ferrite bar antenna
Speaker	Approx. 6.6 cm (2 <sup>5</sup> / <sub>8</sub> inches) dia.
Power output	100 mW (at 10% harmonic distortion)
Power requirement	120 V AC, 60 Hz For the power back-up function: 9 V DC, one 6F22 battery
Battery life	Approx. 5 hours using Sony battery S-006P (U)
Dimensions	Approx. 224 × 58.8 × 151 mm (w/h/d) (8 <sup>7</sup> / <sub>8</sub> × 2 <sup>3</sup> / <sub>8</sub> × 6 inches) incl. projecting parts and controls
Weight	Approx. 630 g (1 lb 6 oz) not incl. battery

Design and specifications subject to change without notice.

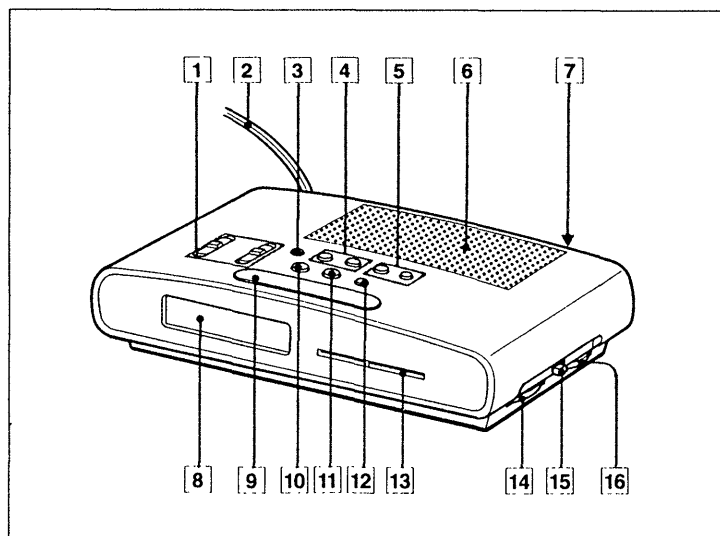
## Features

- Dual alarm digital clock radio.
- Choice of radio or buzzer awakening sound for both ALARM **[A]** and ALARM **[B]**.
- DREAM BAR SNOOZE: snooze alarm that can be operated with a feather-light touch.
- "FULL POWER BACK UP" — Power back-up function to keep the clock and the alarm (radio and buzzer) operating during a power interruption, using a 6F22 battery (not supplied).

## SECTION 1 GENERAL

### 1-1. LOCATION OF CONTROLS

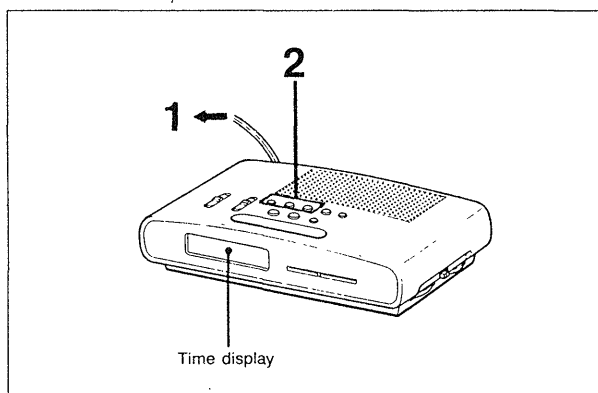
This section is extracted from instruction manual.



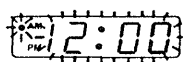
- 1 Alarm selectors (ALARM **[A]**, ALARM **[B]**: BUZZER/RADIO/OFF)
- 2 AC power cord (also works as an FM wire antenna)
- 3 CLOCK set button
- 4 TIME SET buttons (+/-)
- 5 ALARM set buttons (**[A]**/**[B]**)
- 6 Speaker
- 7 Power back-up battery compartment (bottom)
- 8 Time display
- 9 DREAM BAR SNOOZE
- 10 SLEEP button
- 11 RADIO ON button
- 12 ALARM RESET/RADIO OFF button
- 13 Dial scale
- 14 TUNING control
- 15 BAND selector (FM/AM)
- 16 VOL (volume) control

## How to Set the Clock

Example: To set to 8:15 AM

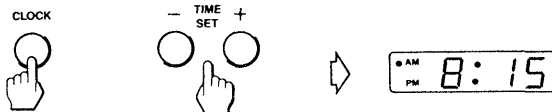


- 1 Connect the AC power cord to a wall outlet. Figures will appear on the time display and begin to blink.



Blinks.

- 2 Set the current time. While keeping CLOCK pressed, press the TIME SET + button (to go forward rapidly) and TIME SET - button (to go backward slowly). Release CLOCK exactly at 8:15 AM. The clock will begin to operate when CLOCK is released.



### To set the current time rapidly

Press the + button and advance to a time that is a few minutes ahead of the current time. Then press the - button to set the time correctly.

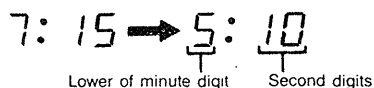
### Zero second adjustment

Example: To set to 7:15 AM

- 1 Adjust the time to 7:16 AM as previously described.
- 2 While keeping CLOCK pressed, press TIME SET - button simultaneously with the radio or telephone time signal, and then release them.

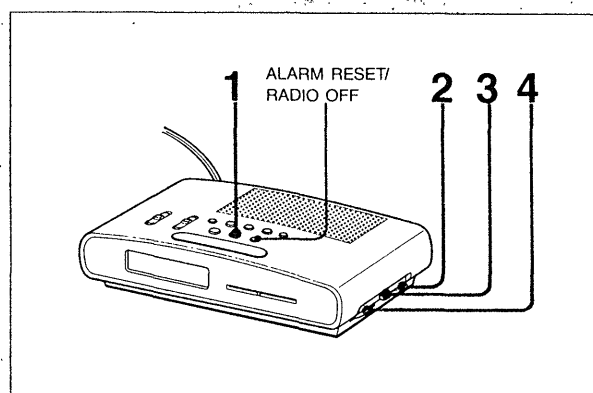
To display minute and second, press DREAM BAR SNOOZE.

Example: When the current time is 7:15:10, the display will become:



The display returns to the current hour and minute when it is released.

## Radio Operation



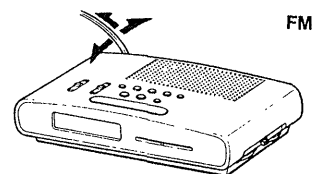
- 1 Press RADIO ON to turn on the radio.
- 2 Adjust the volume.
- 3 Select the desired band.
- 4 Tune in the desired station.

### To turn off the radio

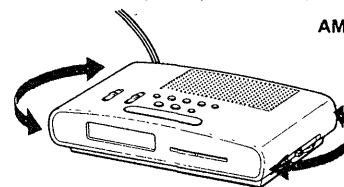
Press ALARM RESET/RADIO OFF.

### For improved reception

**FM:** Extend the AC power cord fully to increase the FM sensitivity.



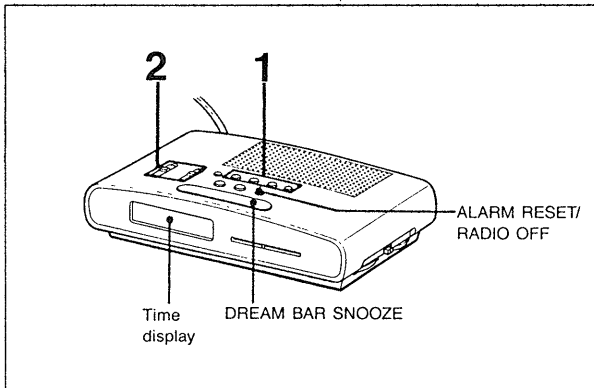
**AM:** Since the reception is affected by the direction of the radio, rotate the unit horizontally for optimum reception.



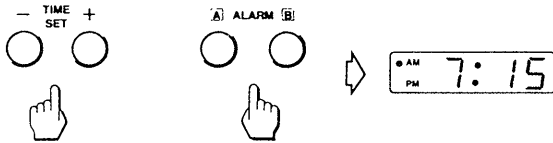
## How to Set the Alarm (RADIO or BUZZER)

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

**Example: To set the alarm time to 7:15 AM.**



- 1 Set the alarm time on the clock.**  
While keeping the desired ALARM set button (A or B) pressed, press the TIME SET + button (to go forward rapidly) and the TIME SET - button (to go backward slowly). Release the ALARM set button exactly at 7:15 AM.



- 2 Set the appropriate alarm selector (ALARM A or ALARM B) to the desired sound (RADIO or BUZZER).**

The radio or buzzer will automatically sound at the preset time, and automatically turn itself off after 59 minutes, unless it is turned off manually.

### To turn off the alarm manually

Press the ALARM RESET/RADIO OFF button. The alarm will sound at the regular preset time on the following day.

### Snooze alarm function

To shut off the alarm sound, press ALARM RESET/RADIO OFF, or press DREAM BAR SNOOZE when you want to doze a few more minutes. When you press DREAM BAR SNOOZE, the alarm sound becomes silent, but will automatically come on again after about seven minutes. You can repeat this function as many times as you like. If you do not press ALARM RESET/RADIO OFF, the unit shuts off automatically after 59 minutes whether or not you press DREAM BAR SNOOZE.

### To completely cancel the alarm

Set the desired alarm selector to OFF.

### The volume of the alarm sound

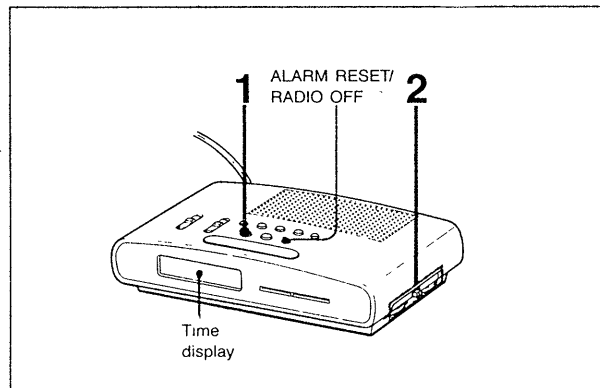
The radio volume can be adjusted.  
The buzzer volume is fixed.

### To check the preset time

Press the desired ALARM set button.

## How to Set the Sleep Timer

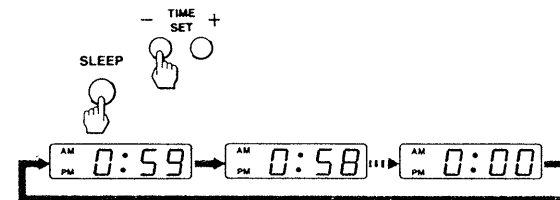
By using the sleep timer, you can fall asleep while listening to the radio. You can set the sleep time so that the radio turns off up to 59 minutes later.



- 1 Press SLEEP.**  
The radio turns on, and will turn off after 59 minutes.

**If you want to set the desired time duration**  
While keeping SLEEP pressed, press the TIME SET - button.

You can set the time duration within the range from 59 minutes to 1 minute.



- 2 Tune in the desired station and adjust the volume.**

### To turn off the radio before the preset time

Press ALARM RESET/RADIO OFF.

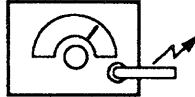
### To check the remaining minutes

Press SLEEP lightly.

## SECTION 2 ELECTRICAL ADJUSTMENTS

### AM section

AM RF Signal Generator

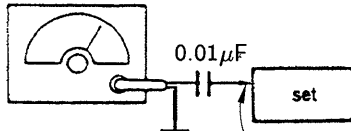


Put the lead-wire antenna close to the set.

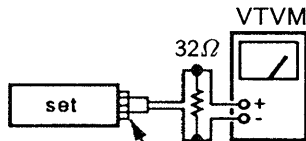
400Hz 30%  
AM modulation  
Output level : as low as possible

### FM section

FM RF Signal Generator



$\pm 22.5\text{kHz}$  frequency deviation by 400Hz signal  
antenna input terminal (See the illustration.)



Speaker terminal

- 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

AM FREQUENCY COVERAGE ADJUSTMENT	
Adjust for a maximum reading on VTVM	
L6	520kHz
CT4	1650kHz

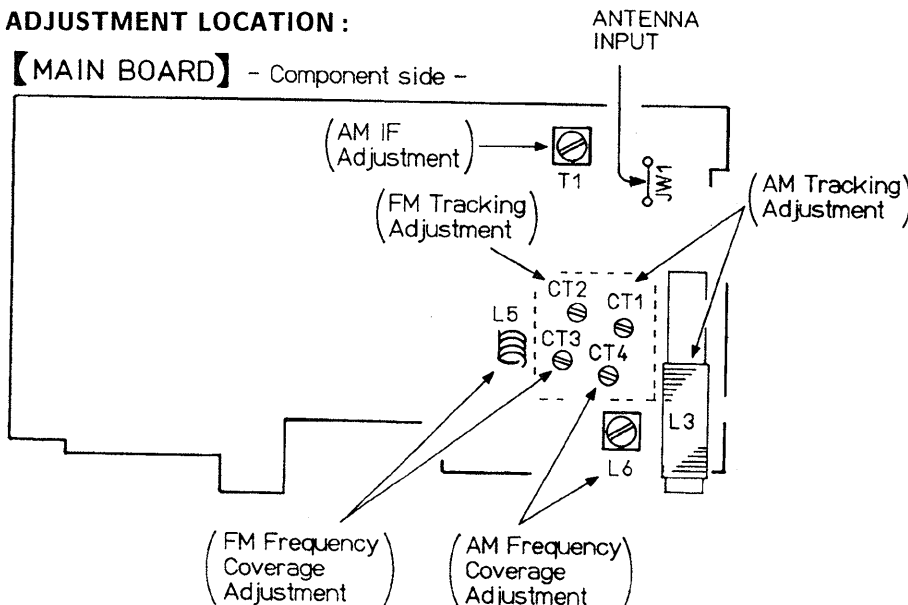
AM TRAKING ADJUSTMENT	
adjust for maximum reading on VTVM	
L3	600kHz
CT1	1400kHz

FM FREQUENCY COVERAGE ADJUSTMENT	
adjust for a maximum reading on VTVM	
L5	86.5MHz
CT3	109.5MHz

FM TRAKING ADJUSTMENT	
Adjust for a maximum reading on VTVM	
CT2	109.5MHz

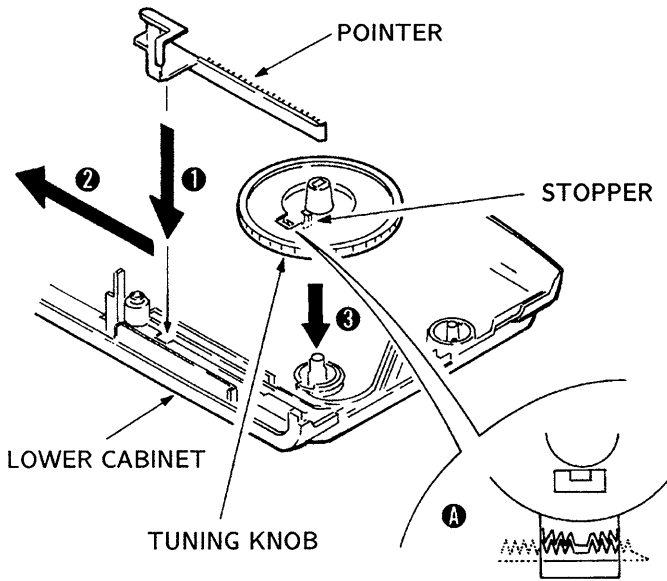
### ADJUSTMENT LOCATION :

【MAIN BOARD】 - Component side -



## SECTION 3 DIAL POINTER SETTING

### 3-1. DIAL POINTER SETTING



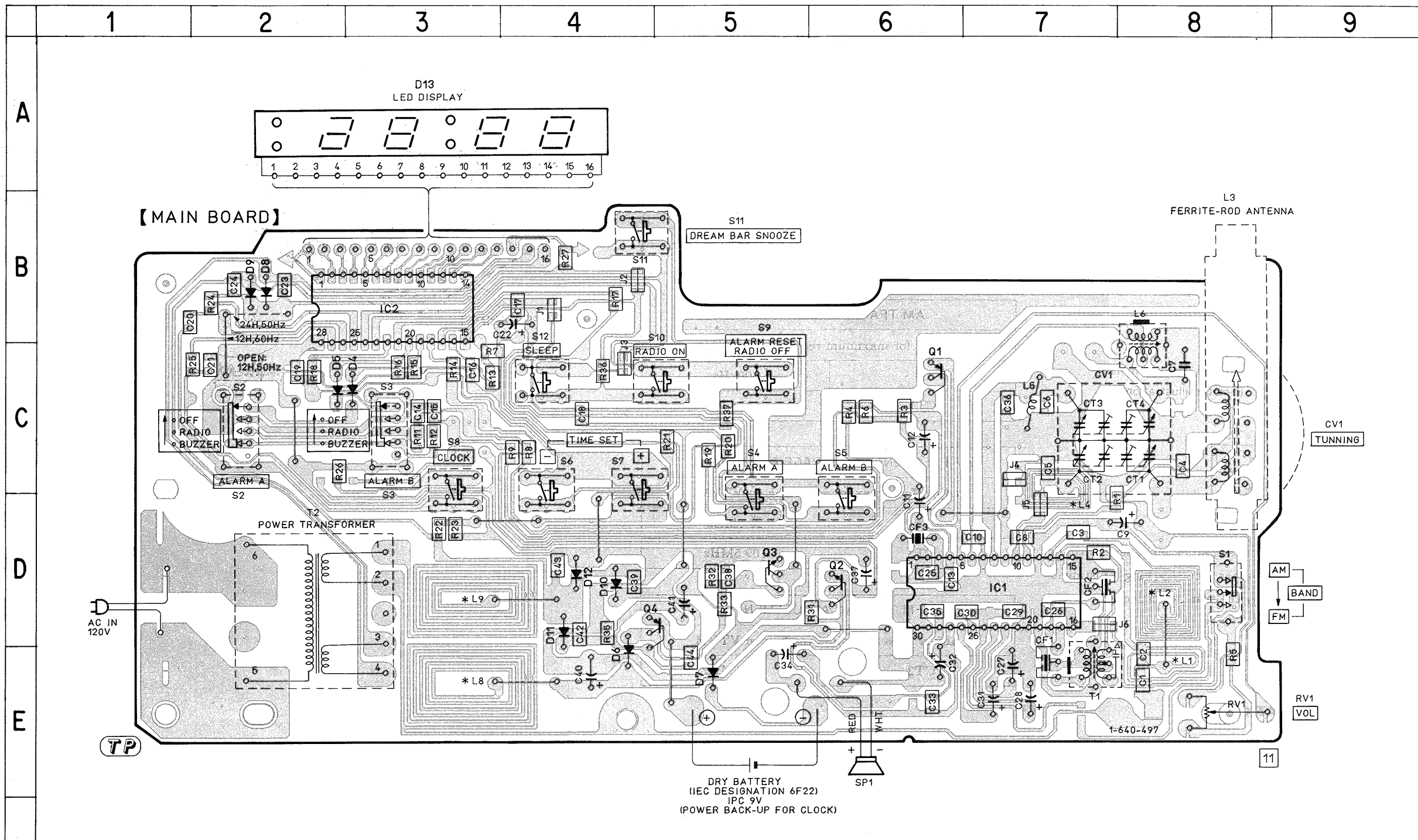
- ① Fit the gear part of pointer to cabinet groove and hook installing claw while taking pointer out of cabinet.
- ② Move pointer in the direction of arrow fully.
- ③ Install the gear part of stopper and the gear part of pointer as show in the drawing **A**.  
Make sure to fit the stopper to the cabinet hole.

# SECTION 4 DIAGRAMS

## • SEMICONDUCTOR LOCATION

Ref. No.	Location
D4	C-3
D5	C-2
D6	E-4
D7	E-5
D8	B-2
D9	B-2
D10	D-4
D11	D-4
D12	D-4
D13	A-3
IC1	D-7
IC2	B-3
Q1	C-6
Q2	D-6
Q3	D-5
Q4	D-4

## 4-1. PRINTED WIRING BOARD



Note :

- ○ : parts extracted from the component side.
- [ ] : indicates side identified with part number.
- [ ] : Pattern on the side which is seen.
- Never reuse a disconnected chip component.
- Notice that the minus side of a tantalum capacitor may be damaged by heat.
- ※ : printed pattern functions as a kind of coil.

## • SEMICONDUCTOR LEAD LAYOUTS

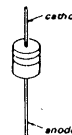
2SA933S-QR  
2SC2001



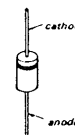
2SC2785-HFE



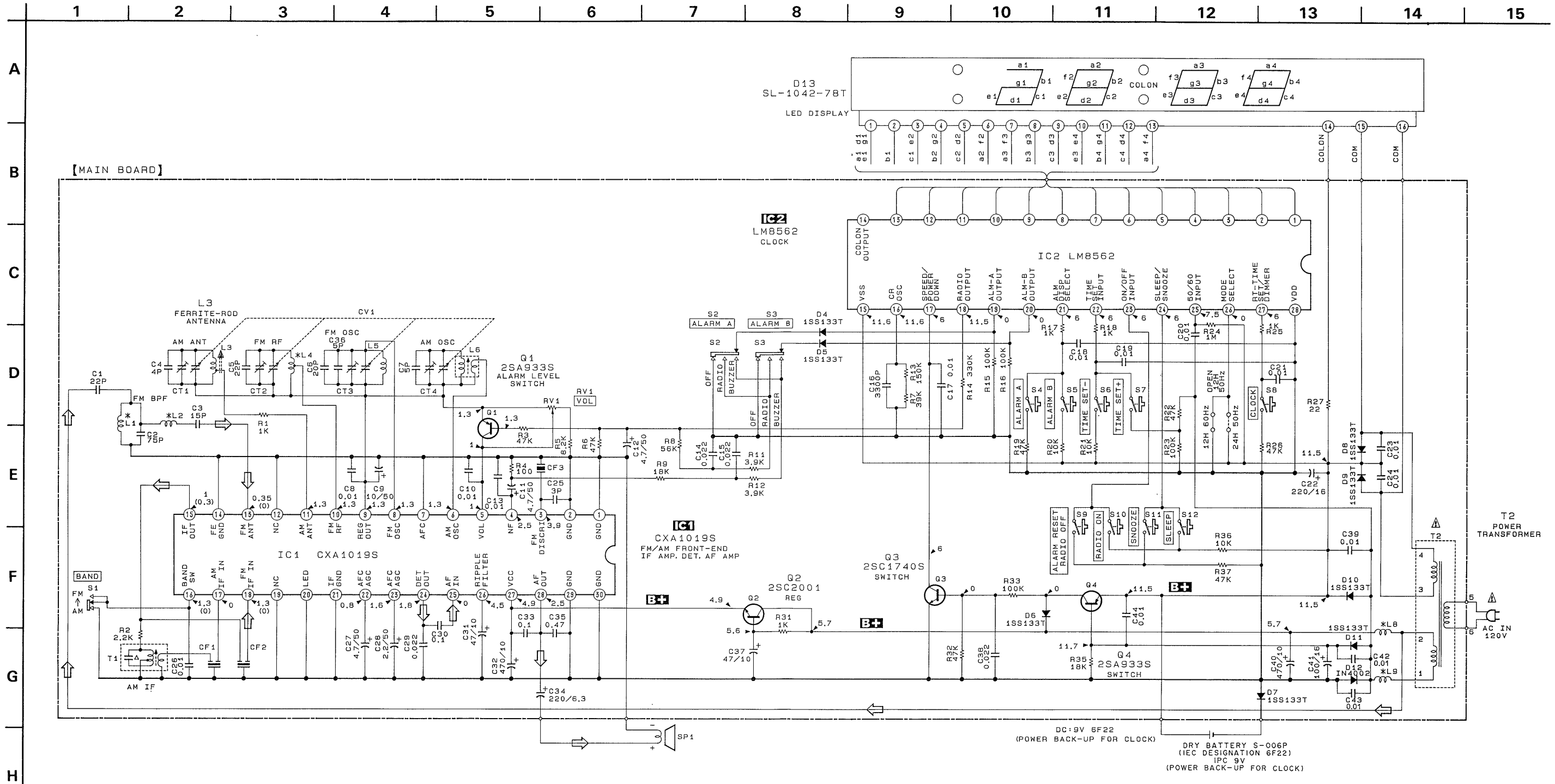
1SS119



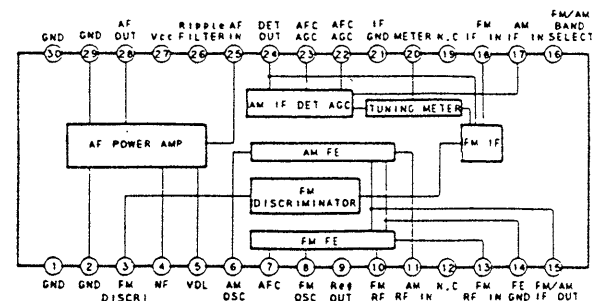
10E2



4-2. SCHEMATIC DIAGRAM



• IC BLOCK DIAGRAM  
IC2 CXA1019S



Note:

- All capacitors are in  $\mu F$  unless otherwise noted.  $pF$ :  $\mu\mu F$
- 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in  $\Omega$  and  $\frac{1}{4}W$  or less unless otherwise specified.
- $\Delta$ : internal component.
- B+**: B+ Line
- Voltage and waveforms are dc with respect to ground under no-signal (detuned) conditions.
- no mark: FM
- ( ): AM
- Voltages are taken with a VOM (Input impedance  $10M\Omega$ ). Voltage variations may be noted due to normal production tolerances.
- Signal path.
- $\Rightarrow$ : FM
- $\ast$ : printed pattern functions as a kind of coil.



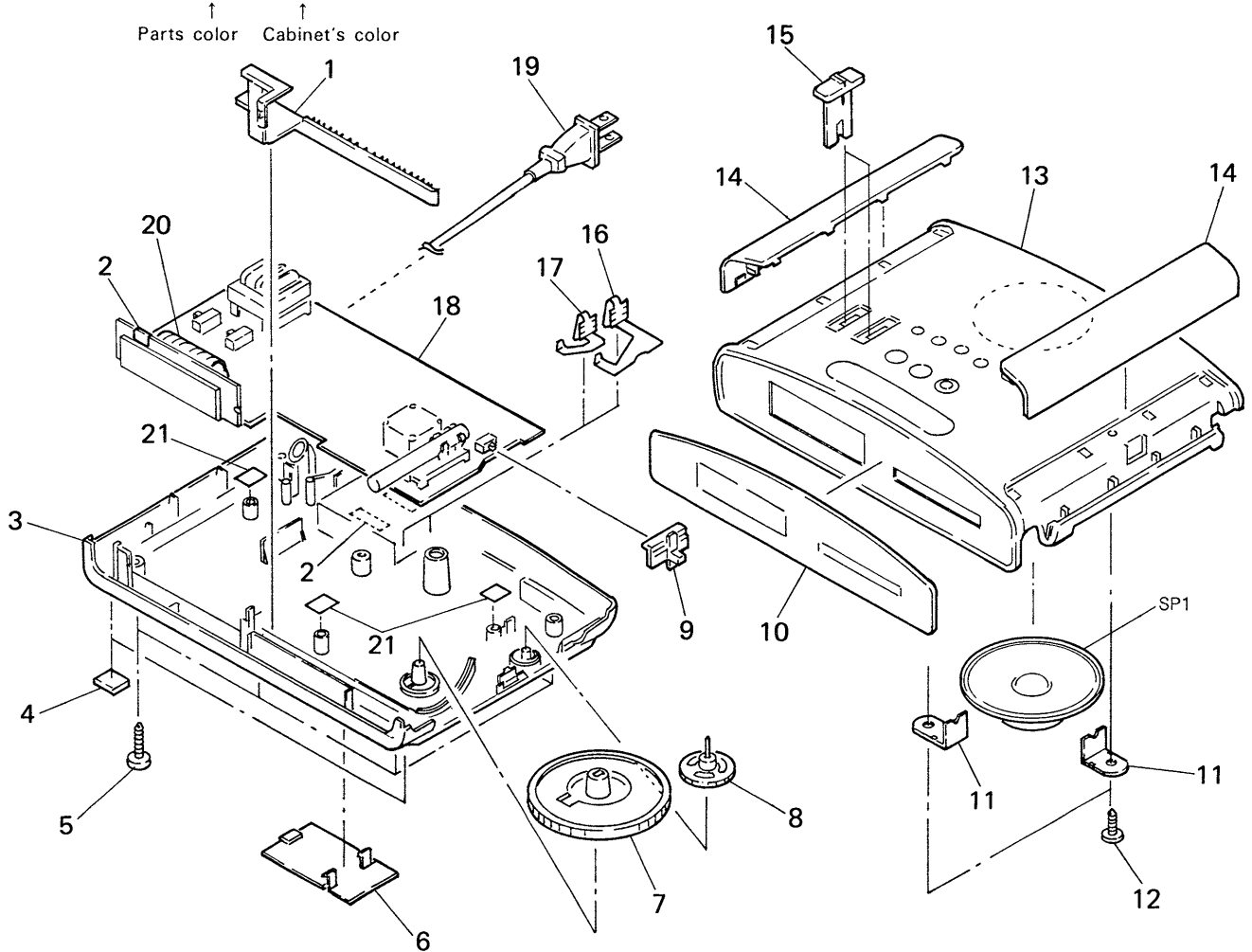
# SECTION 5 EXPLODED VIEW

**NOTE:**

- -XX, -X mean standardized parts, so they may have some differences from the original one.
- The construction parts of an assembled part are indicated with a collation number in the remark column.
- Color indication of Appearance Parts  
Example:  
KNOB, BALANCE (WHITE)...(RED)

- 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.

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



Ref. No.	Part No.	Description	Remark
1	3-369-675-01	POINTER (WHITE) (BROWN)	
1	3-369-675-11	POINTER (RED) (WHITE)	
2	3-831-441-XX	SEAL, MICROPHONE	
3	3-369-681-01	CABINET (LOWER) (BROWN)	
3	3-369-681-11	CABINET (LOWER) (WHITE)	
4	3-368-852-01	FOOT	
5	7-685-649-79	SCREW +P 3X14 TYPE2 NON-SLIT	
6	3-369-135-01	LID, BATTERY CASE	
7	3-369-138-01	KNOB (T)	
8	3-369-134-01	KNOB (V)	
9	3-369-670-01	KNOB (BAND)	
10	3-369-673-01	PLATE, INDICATION	
11	3-903-217-01	CLAW, SPEAKER	
12	7-685-647-79	SCREW +BTP 3X10 TYPE2 N-S	

Ref. No.	Part No.	Description	Remark
13	X-3363-578-1	CABINET (UPPER) (BROWN)	
13	X-3363-727-1	CABINET (UPPER) (WHITE)	
14	3-369-674-01	PLATE, ORNAMENTAL (WOOD) (BROWN)	
14	3-369-674-11	PLATE, ORNAMENTAL (STONE) (WHITE)	
15	3-369-676-01	KNOB (ALARM) (BROWN) (BROWN)	
15	3-369-676-11	KNOB (ALARM) (WHITE) (WHITE)	
16	3-369-678-01	SPRING (BATTERY -)	
17	3-369-677-01	SPRING (BATTERY +)	
18	* A-3661-365-A	MOUNTED PCB (CHIP), MAIN	
19	1-558-566-21	CORD, POWER	
20	1-575-159-82	CORD, CONNECTION	
21	3-831-441-11	CUSHION (B)	
SP1	1-503-082-00	SPEAKER	

# SECTION 6 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:  $\mu$ , for example:  
uA....:  $\mu$ A...., uPA....:  $\mu$ PA....  
uPB....:  $\mu$ PB...., uPC....:  $\mu$ PC....  
uPD....:  $\mu$ PD....
- CAPACITORS  
uF:  $\mu$ F
- COILS  
uH:  $\mu$ H

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

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

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
	A-3661-364-A	MOUNTED PCB (HAND), MAIN *****		C31	1-124-126-00	ELECT 47uF	20% 10V
	$\Delta$ 1-558-566-21	CORD, POWER		C32	1-124-472-11	ELECT 470uF	20% 10V
	1-575-159-82	CORD, CONNECTION		C33	1-164-004-11	CERAMIC CHIP 0.1uF	10% 25V
		< CAPACITOR >		C34	1-126-176-11	ELECT 220uF	20% 10V
C1	1-163-165-00	CERAMIC CHIP 22PF	5% 50V	C35	1-164-005-11	CERAMIC CHIP 0.47uF	25V
C2	1-163-114-00	CERAMIC CHIP 75PF	5% 50V	C36	1-163-222-91	CERAMIC CHIP 5PF	0.25PF 50V
C3	1-163-097-00	CERAMIC CHIP 15PF	5% 50V	C37	1-124-126-00	ELECT 47uF	20% 10V
C4	1-163-087-00	CERAMIC CHIP 4PF	50V	C38	1-163-033-00	CERAMIC CHIP 0.022uF	50V
C5	1-163-165-00	CERAMIC CHIP 22PF	5% 50V	C39	1-163-038-00	CERAMIC CHIP 0.1uF	25V
C6	1-164-280-91	CERAMIC CHIP 20PF	5% 50V	C40	1-124-472-11	ELECT 470uF	20% 10V
C7	1-102-942-00	CERAMIC 5.0PF	+0.5PF 50V	C41	1-126-101-11	ELECT 100uF	20% 16V
C8	1-163-059-00	CERAMIC CHIP 0.01uF	10% 50V	C42	1-163-059-00	CERAMIC CHIP 0.01uF	50V
C9	1-124-907-11	ELECT 10uF	20% 50V	C43	1-163-031-11	CERAMIC CHIP 0.01uF	50V
C10	1-163-031-91	CERAMIC CHIP 0.01uF	50V	C44	1-163-031-91	CERAMIC CHIP 0.01uF	50V
C11	1-124-927-11	ELECT 4.7uF	20% 100V			< FILTER >	
C12	1-124-927-11	ELECT 4.7uF	20% 100V	CF1	1-577-072-11	FILTER, CERAMIC	
C13	1-163-031-91	CERAMIC CHIP 0.01uF	50V	CF2	1-579-312-91	FILTER, CERAMIC	
C14	1-163-033-00	CERAMIC CHIP 0.022uF	50V	CF3	1-579-312-91	FILTER, CERAMIC	
C15	1-163-033-00	CERAMIC CHIP 0.022uF	50V			< VARIABLE CAPACITOR >	
C16	1-164-182-11	CERAMIC CHIP 0.0033uF	10% 50V	CV1	1-151-628-11	CAP, VARIABLE	
C17	1-163-031-91	CERAMIC CHIP 0.01uF	50V			< DIODE >	
C18	1-163-031-91	CERAMIC CHIP 0.01uF	50V	D4	8-719-911-19	DIODE 1SS119	
C19	1-163-031-91	CERAMIC CHIP 0.01uF	50V	D5	8-719-911-19	DIODE 1SS119	
C20	1-163-031-91	CERAMIC CHIP 0.01uF	50V	D6	8-719-911-19	DIODE 1SS119	
C21	1-163-031-91	CERAMIC CHIP 0.01uF	50V	D7	8-719-911-19	DIODE 1SS119	
C22	1-124-120-11	ELECT 220uF	20% 25V	D8	8-719-911-19	DIODE 1SS119	
C23	1-163-031-91	CERAMIC CHIP 0.01uF	50V	D9	8-719-911-19	DIODE 1SS119	
C24	1-163-031-91	CERAMIC CHIP 0.01uF	50V	D10	8-719-911-19	DIODE 1SS119	
C25	1-163-086-00	CERAMIC CHIP 3PF	50V	D11	8-719-911-19	DIODE 1SS119	
C26	1-163-031-91	CERAMIC CHIP 0.01uF	50V	D12	8-719-200-02	DIODE 10E2	
C27	1-124-927-11	ELECT 4.7uF	20% 100V	D13	1-808-342-11	DIODE SL1042-78T	
C28	1-124-925-11	ELECT 2.2uF	20% 100V				
C29	1-163-033-00	CERAMIC CHIP 0.022uF	50V				
C30	1-163-038-00	CERAMIC CHIP 0.1uF	25V				

**MAIN**

Ref. No.	Part No.	Description	Remark		
< IC >					
IC1	8-752-035-29	IC CXA1019S			
IC2	8-759-823-50	IC LM8562			
< JACK >					
J1	1-216-295-00	METAL CHIP	0	5%	1/10W
J2	1-216-296-00	METAL CHIP	0	5%	1/8W
J3	1-216-295-00	METAL CHIP	0	5%	1/10W
J4	1-216-295-00	METAL CHIP	0	5%	1/10W
J5	1-216-296-00	METAL CHIP	0	5%	1/8W
J6	1-216-296-00	METAL CHIP	0	5%	1/8W
< COIL >					
L3	1-402-464-11	ANTENNA, FERRITE-ROD (MW)			
L5	* 1-422-300-11	COIL, AIR-CORE			
L6	1-406-028-00	COIL, OSC (MW)			
< TRANSISTOR >					
Q1	8-729-920-68	TRANSISTOR 2SA933S-QR			
Q2	8-729-142-46	TRANSISTOR 2SC2001			
Q3	8-729-119-78	TRANSISTOR 2SC2785-HFE			
Q4	8-729-920-68	TRANSISTOR 2SA933S-QR			
< RESISTOR >					
R1	1-216-049-00	METAL CHIP	1K	5%	1/10W
R2	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R3	1-216-089-00	METAL CHIP	47K	5%	1/10W
R4	1-216-025-00	METAL CHIP	100	5%	1/10W
R5	1-216-071-00	METAL CHIP	8.2K	5%	1/10W
R6	1-216-089-00	METAL CHIP	47K	5%	1/10W
R7	1-216-748-11	METAL CHIP	39K	1%	1/10W
R8	1-216-091-00	METAL CHIP	56K	5%	1/10W
R9	1-216-079-00	METAL CHIP	18K	5%	1/10W
R11	1-216-063-00	METAL CHIP	3.9K	5%	1/10W
R12	1-216-063-00	METAL CHIP	3.9K	5%	1/10W
R13	1-216-101-00	METAL CHIP	150K	5%	1/10W
R14	1-216-258-00	METAL GLAZE	330K	5%	1/8W
R15	1-216-097-00	METAL CHIP	100K	5%	1/10W
R16	1-216-097-00	METAL CHIP	100K	5%	1/10W
R17	1-216-049-00	METAL CHIP	1K	5%	1/10W
R18	1-216-049-00	METAL CHIP	1K	5%	1/10W
R19	1-216-089-00	METAL CHIP	47K	5%	1/10W
R20	1-216-073-00	METAL CHIP	10K	5%	1/10W
R21	1-216-073-00	METAL CHIP	10K	5%	1/10W
R22	1-216-089-00	METAL CHIP	47K	5%	1/10W
R23	1-216-097-00	METAL CHIP	100K	5%	1/10W
R24	1-216-121-00	METAL CHIP	1M	5%	1/10W
R25	1-216-049-00	METAL CHIP	1K	5%	1/10W
R26	1-216-089-00	METAL CHIP	47K	5%	1/10W

Ref. No.	Part No.	Description	Remark		
R27	1-216-009-00	METAL CHIP	22	5%	1/10W
R31	1-216-049-00	METAL CHIP	1K	5%	1/10W
R32	1-216-089-00	METAL CHIP	47K	5%	1/10W
R33	1-216-097-00	METAL CHIP	100K	5%	1/10W
R35	1-216-079-00	METAL CHIP	18K	5%	1/10W
R36	1-216-073-00	METAL CHIP	10K	5%	1/10W
R37	1-216-238-00	METAL GLAZE	47K	5%	1/8W
< SWITCH >					
S1	1-571-478-11	SWITCH, SLIDE (BAND)			
S2	1-572-762-11	SWITCH, SLIDE (ALARM A)			
S3	1-572-762-11	SWITCH, SLIDE (ALARM B)			
S4	1-554-937-11	SWITCH, KEY BOARD (TIME SET ALARM A)			
S5	1-554-937-11	SWITCH, KEY BOARD (TIME SET ALARM B)			
S6	1-554-937-11	SWITCH, KEY BOARD (TIME SET -)			
S7	1-554-937-11	SWITCH, KEY BOARD (TIME SET +)			
S8	1-554-937-11	SWITCH, KEY BOARD (CLOCK)			
S9	1-554-937-11	SWITCH, KEY BOARD (ALARM RESET, RADIO OFF)			
S10	1-554-937-11	SWITCH, KEY BOARD (RADIO ON)			
S11	1-554-937-11	SWITCH, KEY BOARD (SNOOZE)			
S12	1-554-937-11	SWITCH, KEY BOARD (SLEEP)			
< TRANSFORMER >					
T1	1-404-790-11	TRANSFORMER, 1F (AM IF)			
T2	△ 1-449-801-21	TRANSFORMER, POWER			
< VARIABLE RESISTOR >					
VR1	1-228-790-00	RES, VAR, CARBON 50K (VOL)			
*****					
MISCELLANEOUS					
*****					
SP1	1-503-082-00	SPEAKER			
*****					
ACCESSORIES & PACKING MATERIALS					
*****					
* 3-371-162-01 INDIVIDUAL CARTON					
* 3-704-282-01 BAG (STANDARD), PROTECTION					
3-753-775-21 MANUAL, INSTRUCTION					

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

