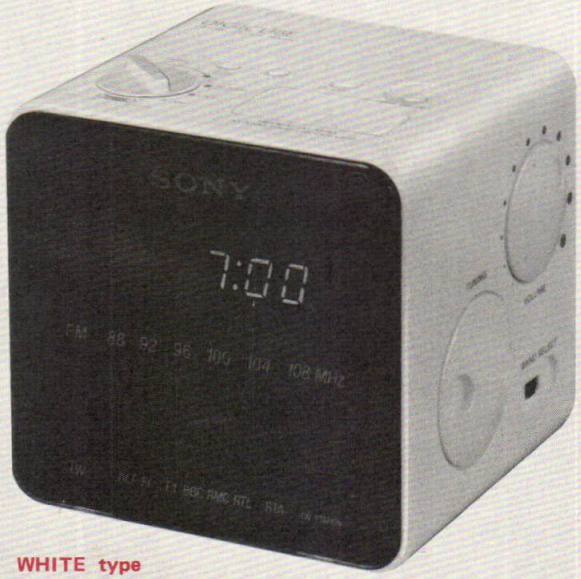
ICF-C10L

AEP Model



WHITE type

FM / LW DIGITAL CLOCK RADIO

SPECIFICATIONS

Frequency range: FM 87.5–108 MHz
LW 150–255 kHz (2,000–1,176 m)

Antennas: FM: Wire antenna
LW: Built-in ferrite bar antenna

Speaker: Approx. 6.6 cm ($2^1/_2$ inches) dia.

Power output: 400 mW
(at 10% harmonic distortion)

Power requirements: 220 V ac, 50 Hz
For the power backup function: 9 V dc, one battery, IEC designation 6F22

Power consumption: 5 W ac (2.5 W ac when only the clock is in operation)

Dimensions: Approx. 121 x 118 x 116 mm (w/h/d)
($4^7/_8$ x $4^3/_4$ x $4^5/_8$ inches)
incl. projecting parts and controls

Weight: Approx. 910 g (2 lb)

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY SHADING AND MARK ⚠ ON THE SCHEMATIC DIAGRAMS, EXPLODED VIEWS 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.

MICROFILM

SONY®
SERVICE MANUAL

Handling Precautions for MOS ICs

Generally, the insulation resistance of the oxide layer in MOS IC structures is very high, and the oxide layer is very thin. Because of this, it is possible that the static voltages usually present on clothes and the human body will be enough to generate a potential difference across the insulator, high enough to cause a breakdown of the insulating layer.

The following precautions should be taken while handling these ICs.

(Particular care should be taken under conditions of low humidity.)

Precautions in Replacing MOS ICs

1. Store new ICs by inserting them into a urethane-polyester cushion (which is somewhat conductive), or wrapping it in aluminum foil, so that all the pins are at the same potential.
   (The ICs should be stored in that manner until mounted on the circuit board.)

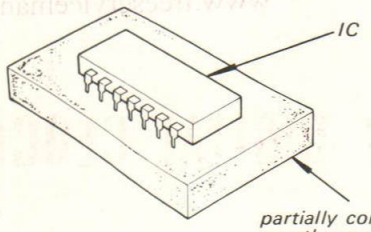


Fig. A

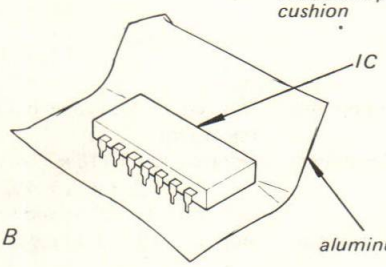


Fig. B

2. Check the soldering iron for possible power-line leakage current. Make sure that there is no leakage path by connecting an ohmmeter to the tip of the soldering iron and the plug as shown in Fig. C. If there is a leakage path, use some other soldering iron.

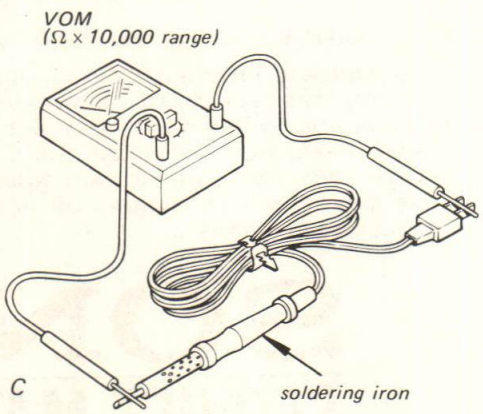


Fig. C

3. Equalize any potential difference between the clothes, the tools in use, the work bench, the set being worked on, and the packaged IC by touching them all in succession with the hands or a conductive wire or tool.

4. The following are effective methods for handling ICs that remove the potential difference across the oxide layer.
   - Use a paper clip modified by soldering in a wire braid insert.

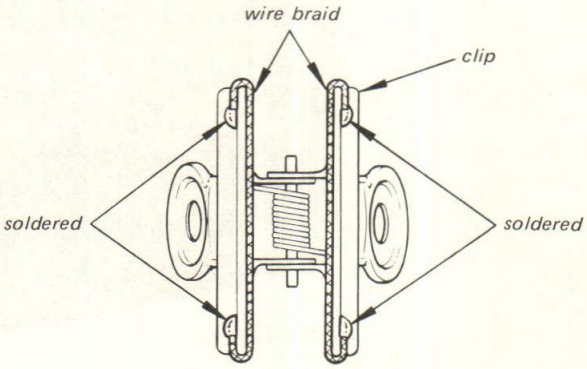


Fig. D

Make sure that there is no solder on the inside.

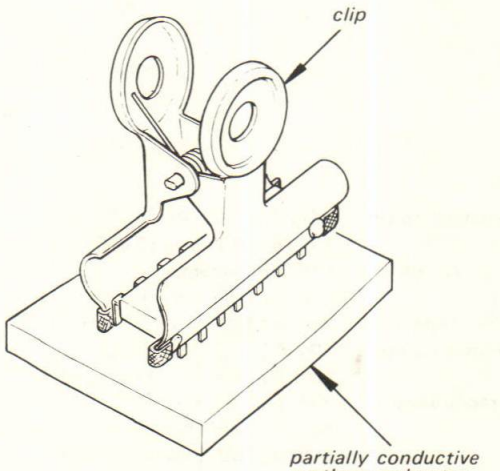
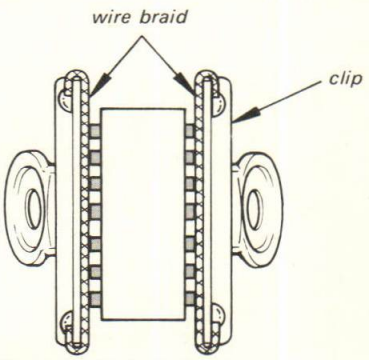


Fig. E



Make sure that all the pins are in contact with the wire braid (all the pins will then be at the same potential.).

Fig. F

- Take a short length of fine bare wire and wind it around the IC so that it shorts all the pins of the IC, while it is still in the urethane-polyester cushion or aluminum foil. This ensures that all the pins are at the same potential.

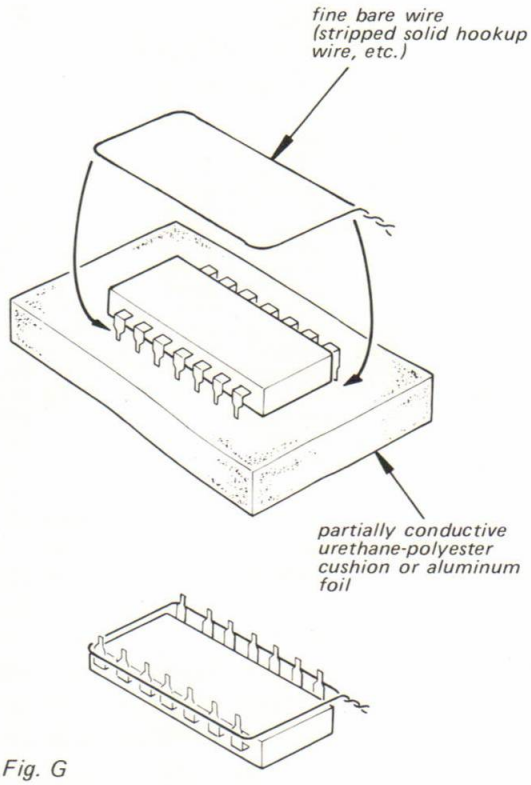


Fig. G

- When it is necessary to handle the IC with the fingers, do not touch any pin, and hold the IC at the ends of its plastic-package case as shown in Fig. H.

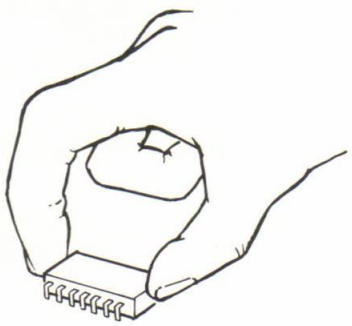


Fig. H

5. Method of Mounting

Insert the IC while holding it with the modified clip, and solder all the pins with the clip still shorting the pins. (Similarly, solder all the pins while the bare shorting wire is still wound around them.). Remove the clip or the bare shorting wire only after all the pins have been soldered.

Precaution while Checking C-MOS ICs

The C-MOS ICs (Complementary MOS) are MOS ICs that have their output sections made up of N-channel and P-channel push-pull stages to increase their speed of operation. If the output terminal of these ICs comes into contact with B+ or B– voltage, then the FET which is ON at that time will either become shorted or open.

This is valid for all the output sections that are connected together by the interconnections. Even the circuits that are physically separated (and not on the same board) can be destroyed simultaneously.

Example:

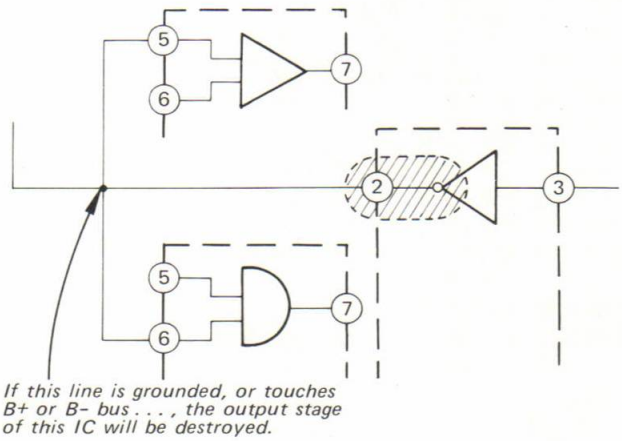


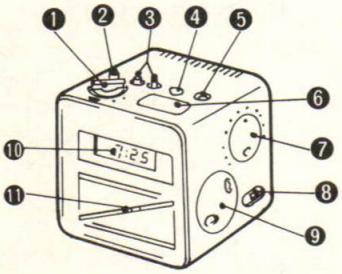
Fig. I

SECTION 1
OUTLINE

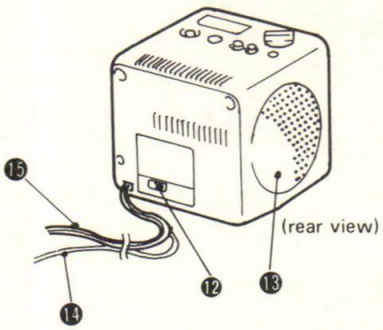
1-1. FEATURES

- High quality radio combined with an electronic digital alarm clock and sleep timer.
- Easy-to-read blue fluorescent display of time.
- Functions of each section are grouped on an appropriate panel.
- Choice of awakening to radio or buzzer.
- 24-hour alarm preset system automatically turns alarm on at same time easy day.
- Snooze bar, feather light to operate, and having three functions; repeat alarm, sleep timer off, and instant alarm time readout.
- Power backup function to keep the clock operating during a power failure, using an optional 9 V battery.

1-2. LOCATION AND FUNCTION OF CONTROLS



(front view)



(rear view)

❶ Function selector
Select a position as required.
TIME SET: for setting the current time.
ALARM SET: for setting the alarm time.
OFF: for turning off the radio manually or automatically.
ON: for turning on the radio manually.
RADIO: for radio alarm.
BUZZER: for buzzer alarm, or for radio and buzzer alarm.

❷ PUSH button: This button must be depressed in order to put the function selector in the TIME SET position. To set the time, hold this button down while turning the function selector to TIME SET.

❸ Time set buttons [H] (hour) [M] (minute): Each time the H or M button is pressed, the hour or minute digit advances by one. While the H or M button is kept pressed, the clock stops operating.

❹ SLEEP timer button: Press the button to set the sleep timer.

❺ ALARM RESET button: Press to turn off the alarm sound manually.

❻ Snooze bar: Lightly press for an instant readout of the alarm time, for operating the repeat alarm function, or for turning off the radio before the preset time of the sleep timer.

❼ VOLUME control: Turn clockwise for more volume.

❽ BAND selector: Choose the desired band: FM or LW.

❾ TUNING knob: Turn to select the frequency of the desired station.

❿ Time display: When the function selector is set to ALARM SET, or when the Snooze bar is pressed, the display on the indicator shows alarm time with an "Alarm" marking. When the SLEEP button is pressed, the display shown is the length of time the radio will keep playing (up to 60 minutes). In other cases, the display is current time.

⓫ Dial scale and dial pointer

⓬ Time display brightness switch [BRIGHT]: Set this switch to H to brighten the figures on the display and to L to dim.

⓭ Speaker

⓮ FM wire antenna: Used for FM reception.

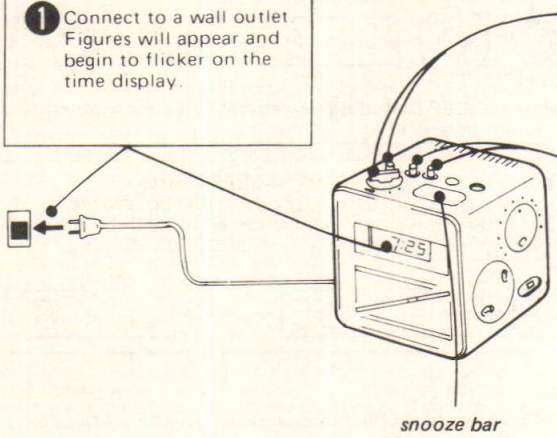
⓯ AC power cord

1-3. HANDLING DESCRIPTION

HOW TO SET THE CLOCK

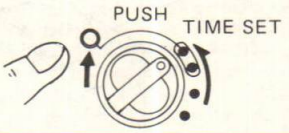
The numbers in the illustration refer to the sequence of operation.

❶ Connect to a wall outlet. Figures will appear and begin to flicker on the time display.

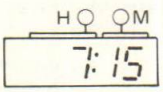


snooze bar

❷ While pressing in the PUSH button, set the function selector to TIME SET. Figures stop flickering.



❸ Adjust the clock to the current time by pressing the H (hour) and M (minute) buttons. Each time the H or M button is pressed, the hour or minute digit advances by one. If the M button is pressed when the minute digits are "59", the minute indication returns to "00", but the hour digits do not advance. The hour and minutes can thus be adjusted independently.



Note: Make sure not to press the snooze bar while adjusting the time indication. Otherwise the time display will show the alarm time with an "Alarm" marking.

- After setting the time, be sure to set the function selector to BUZZER, RADIO ON or OFF. If the selector is set to TIME SET or ALARM SET, accidental pushing of the time set buttons will change the current or alarm time display.

WARNING

When the power backup battery is not inserted.

If the ac power supply is interrupted, even though the interruption might have been very short, the time display will blink (when the function selector is set to a position other than ALARM SET). This shows the time and alarm setting are completely cancelled. In this case, be sure to reset the time and the alarm setting.

Zero second adjustment

If you want to adjust the time exactly to the second with a radio or telephone time signal, proceed as in the following example.

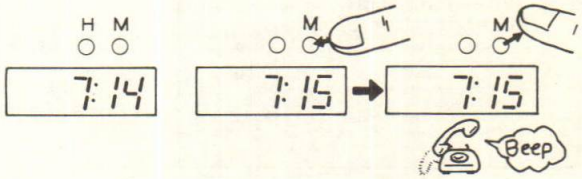
Example: Several minutes in anticipation of a 7:15 p.m. time signal:

❶ Adjust the time indication to PM 7:14 as described before. Leave the function selector set to TIME SET during the steps ❷ and ❸.

❷ press the M button once and keep it pressed. The time display changes to PM 7:15, and the clock remains at 7 o'clock 15 minutes and 00 seconds while the button is kept pressed.

❸ Release the M button simultaneously with the radio or telephone time signal.

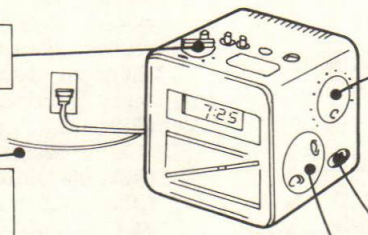
When you release the M button, the clock will then begin to operate, showing the precise time of day.



RADIO OPERATION

The numbers in the illustration refer to the sequence of operation.

❶ Set to ON.



❷ Turn a little clockwise to get sound.

❻ Adjust the volume to your preference.

❸ Choose the desired band, FM or LW.

❹ Turn to tune in the desired station.

❺ Adjust the antenna as required.

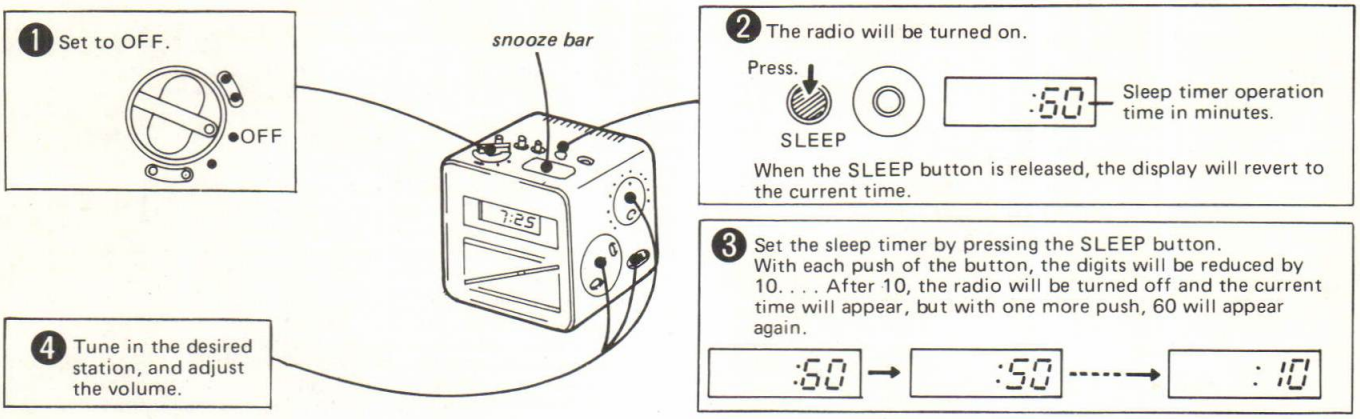
FM: Extend the FM wire antenna and vary its direction and position for best reception. If possible, secure the antenna in this position with some suitable fastening.

LW: The built-in ferrite bar antenna is used when the BAND switch is set to LW. Since the antenna is directional, turn the set until you get optimum reception.

- To turn off the radio, set the function selector to OFF.

HOW TO USE THE SLEEP TIMER

The numbers in the illustration refer to the sequence of operation.



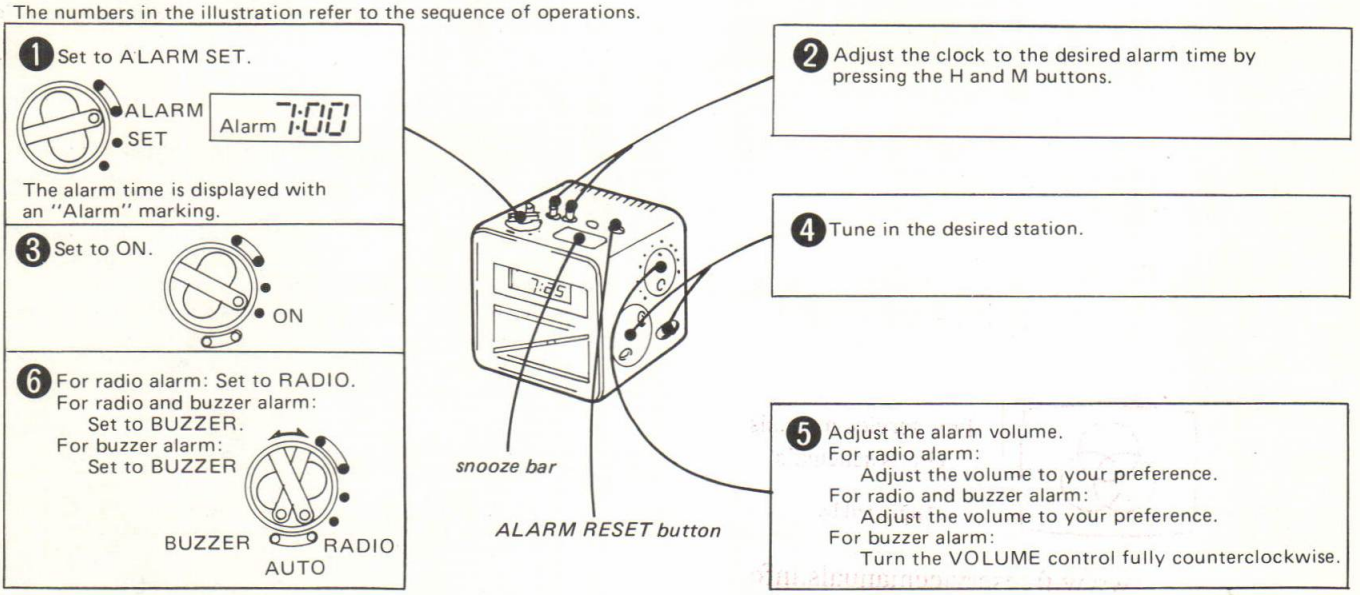
The radio will be turned off automatically after the preset time has elapsed.

To turn off the radio before the preset time, press the snooze bar lightly (this cancels the "sleep" function).

Note: Make sure not to set the function selector to ALARM SET during sleep timer operation. Otherwise the sleep timer will be cancelled.

HOW TO SET THE ALARM (RADIO OR BUZZER)

The numbers in the illustration refer to the sequence of operations.



The radio and/or buzzer sound will come on automatically at the preset time, and will shut itself off automatically after about 64 minutes, unless it is shut off manually.

To turn off the alarm sound manually, press the ALARM RESET button. At the same time of the next day, the alarm sound will come on again.

REPEAT ALARM FUNCTION

If you awake to the radio and/or buzzer in the morning but want to doze for a few more minutes, just lightly press the snooze bar. The radio and/or buzzer will be silenced, but will automatically come on again after about eight minutes. If you want to doze more, press the bar again. You can repeat this snooze function as many times as you like.

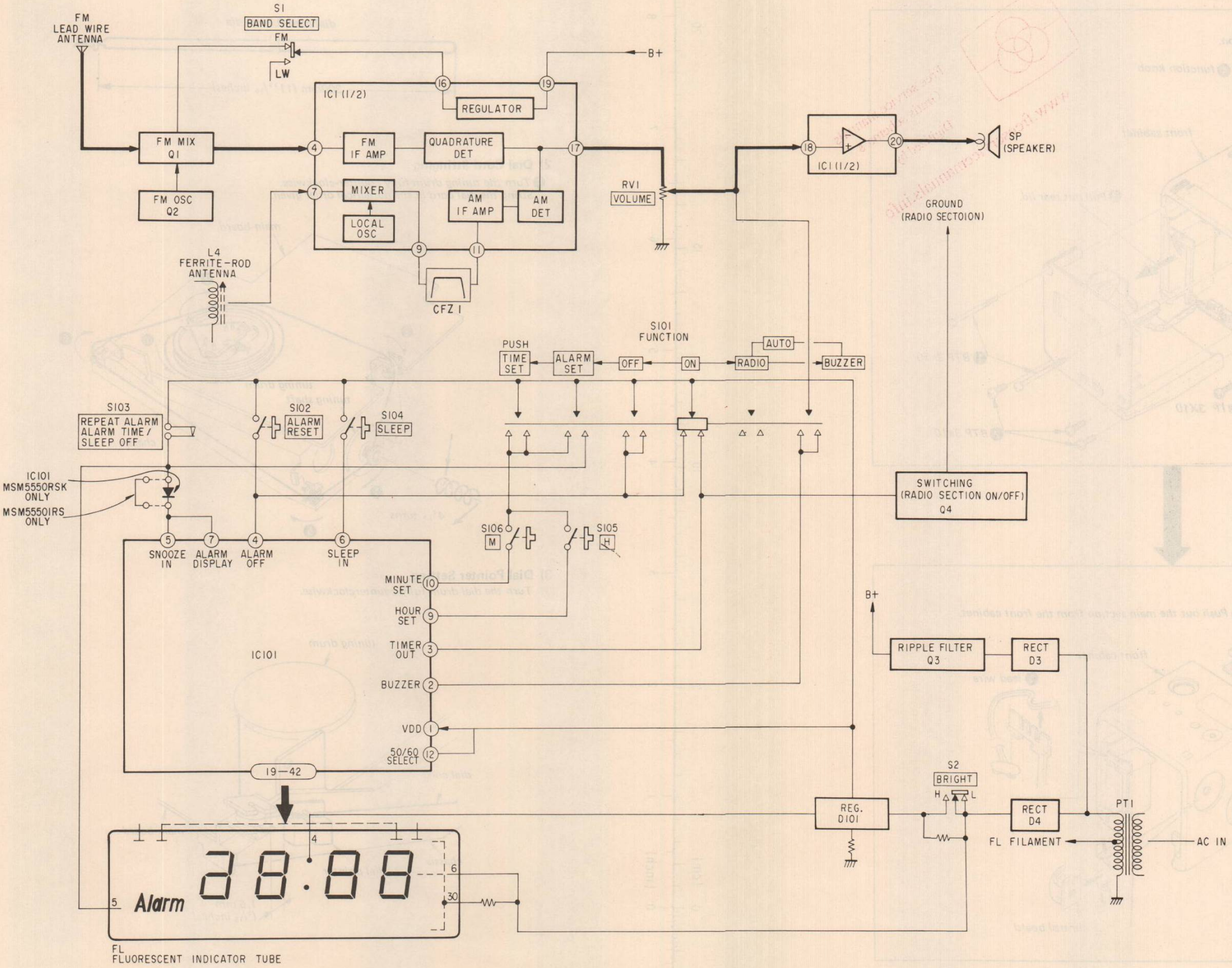
USE OF SLEEP TIMER AFTER SETTING ALARM

With your Sony DIGICUBE, you can fall asleep to music, knowing the radio will turn itself off at the preset time and you will be awakened by the alarm sound at your preset alarm time. For details of each operation and notes, refer to the specified sections described before.

1. Set the function selector to ALARM SET, and adjust the time display to your wake-up time with the H and M buttons.
2. Set the function selector to BUZZER or RADIO, as required.
3. Set the sleep timer by pressing the SLEEP button.
4. Tune in the desired station and adjust the volume.

Note: If you press the snooze bar in order to check the alarm time while using the sleep timer, the "sleep" function will be cancelled. It will then be necessary to reset the sleep timer by pressing the SLEEP button.

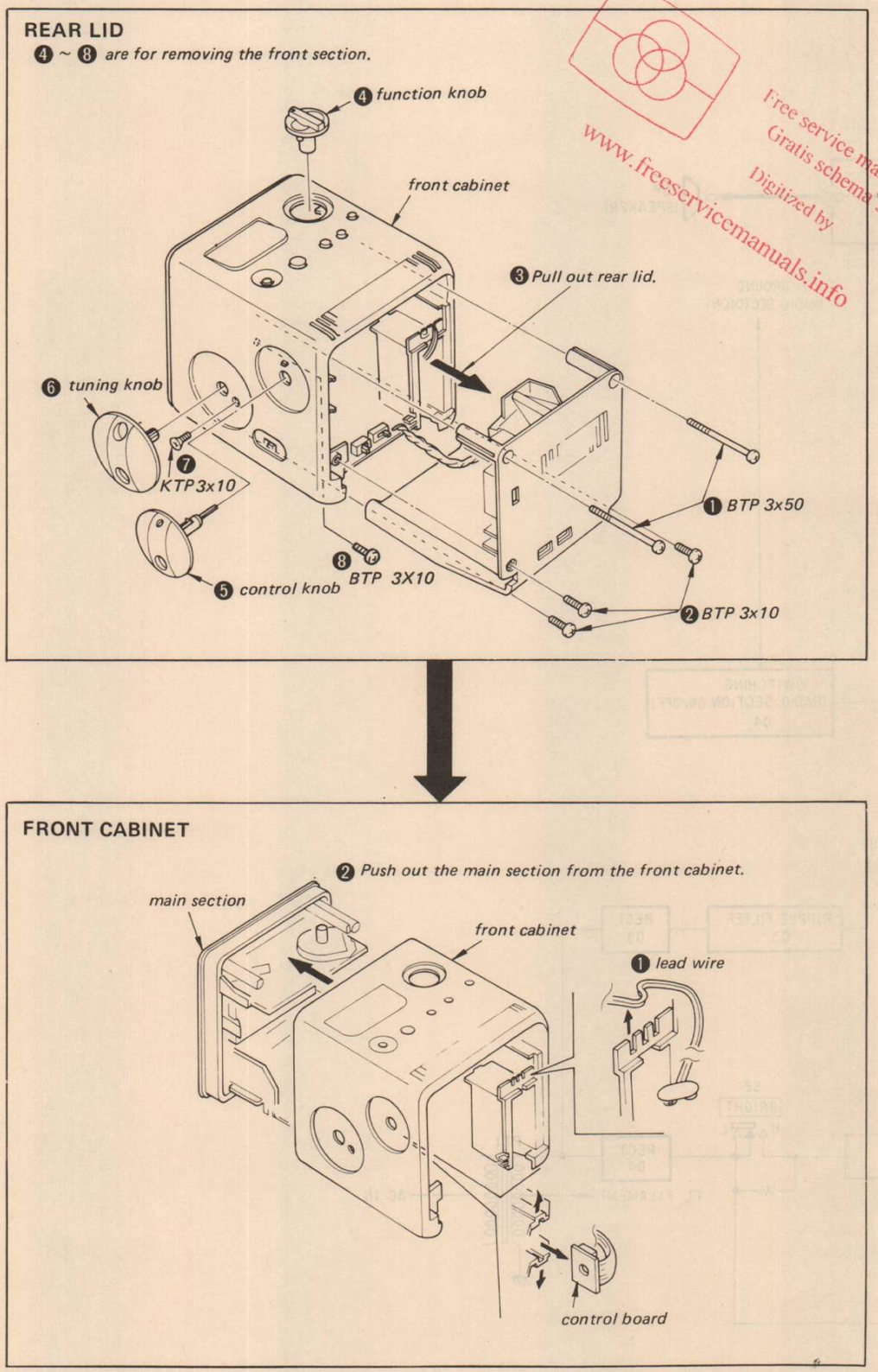
1-4. BLOCK DIAGRAM



SECTION 2
DISASSEMBLY

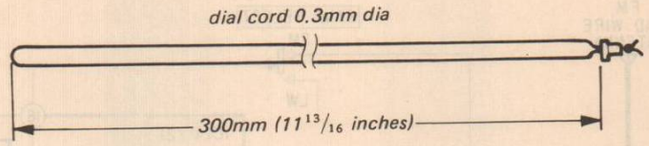
2-1. REMOVAL

- Follow the disassembly procedure in the numerical order given.



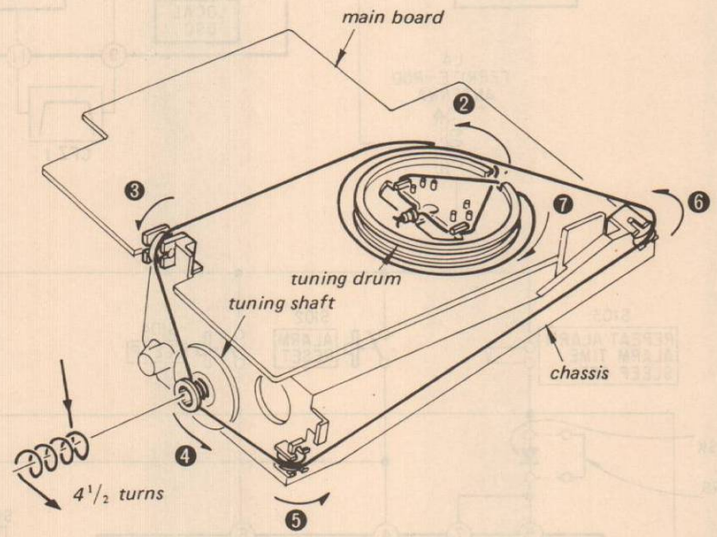
2-2. DIAL CORD STRINGING

1) Dial Cord Preparation



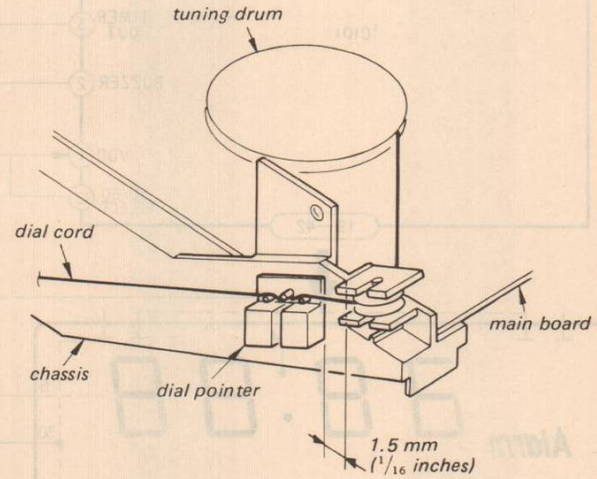
2) Dial Cord Stringing

❶ *Turn the tuning drum fully counter-clockwise.*
String the dial cord in the numerical order given.



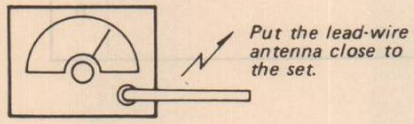
3) Dial Pointer Setting

Turn the dial drum fully counterclockwise.

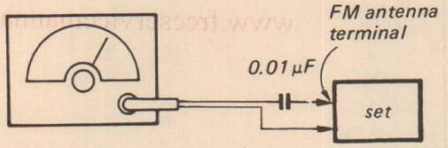


SECTION 3
ELECTRICAL ADJUSTMENTS

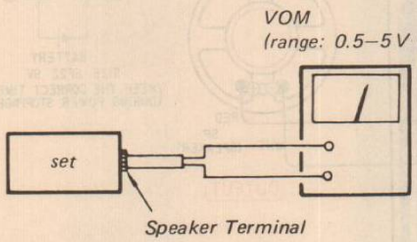
LW



FM



Carrier frequency: 98 MHz
Modulation: 1 kHz, 75 kHz deviation (100 %)

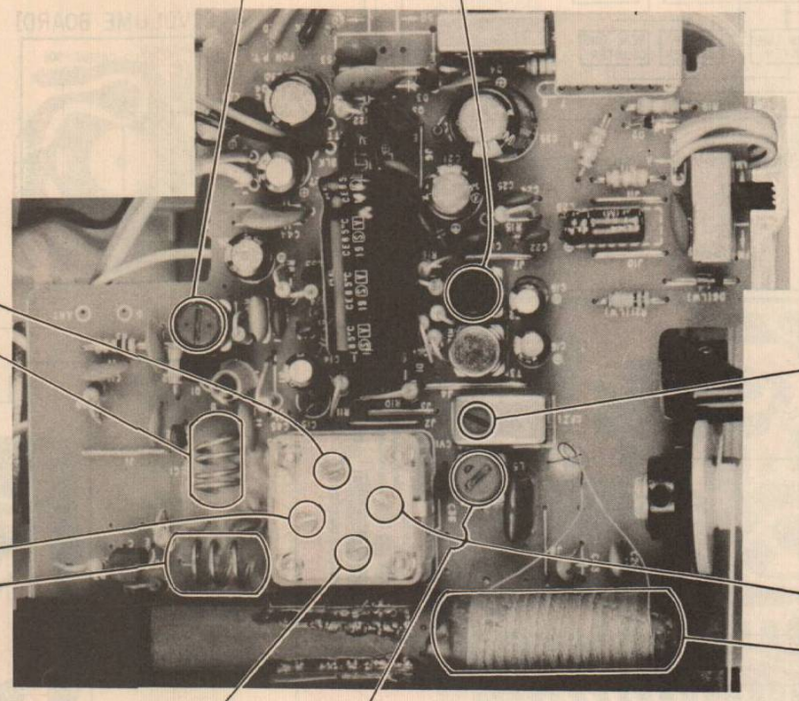


- Repeat the procedures in each adjustment several times, and the frequency coverage and tracking adjustments should be finally done by the trimmer capacitors.

FM IF ALIGNEMNT (10.7 MHz with modulation)	
Adjust for a maximum reading on VOM.	
T1	T2

FM TRACKING ADJUSTMENT	
Adjust for a maximum reading on VOM.	
108.5 MHz	CT1
87.1 MHz	L1

FM FREQUENCY COVERAGE ADJUSTMENT	
Adjust for a maximum reading on VOM.	
108.5 MHz	CT2
87.1 MHz	L3



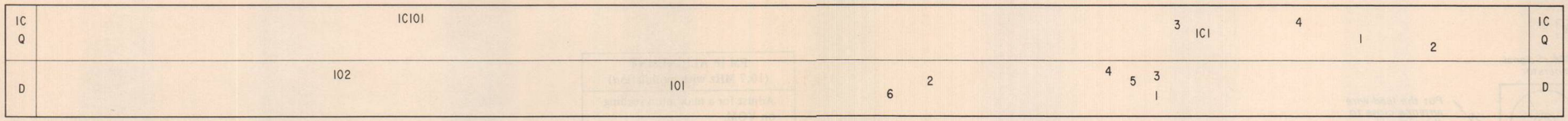
LW IF ALIGNMENT	
Adjust for a maximum reading on VOM 1 .	
CFZ 1	450 kHz

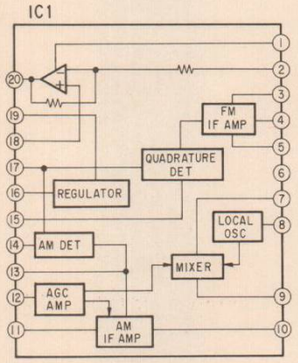
LW TRACKING ADJUSTMENT	
Adjust for a maximum reading on VOM.	
CT3	250 kHz
L4	160 kHz

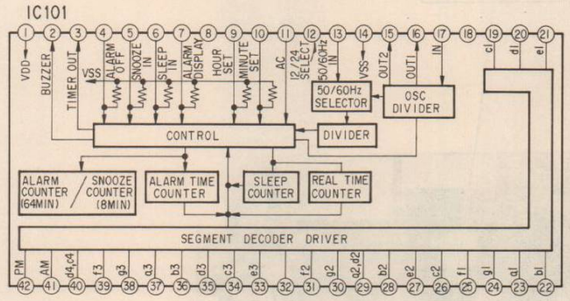
CT4	L5
265 kHz	145 kHz
Adjust for a maximum reading on VOM.	
LW FREQUENCY COVERAGE ADJUSTMENT	

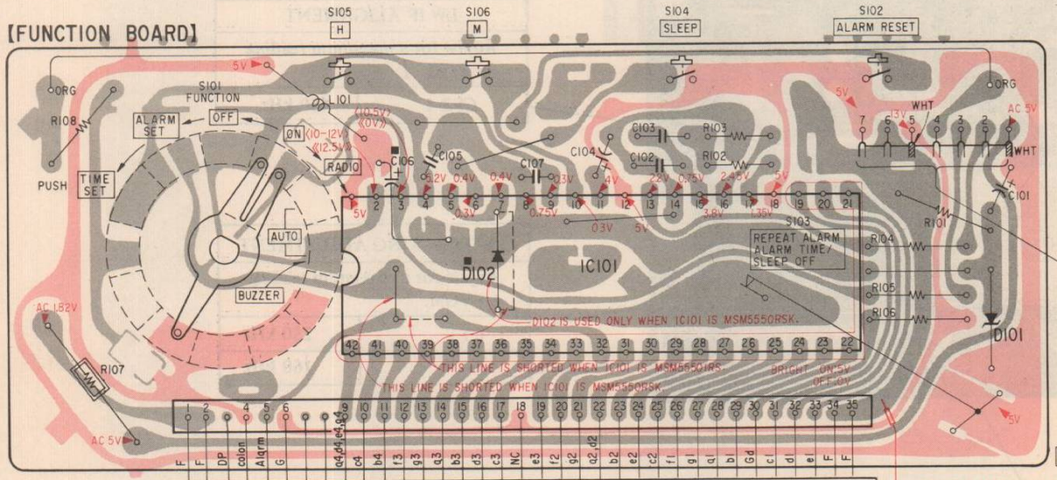
4-1. MOUNTING DIAGRAM
– Conductor Side –

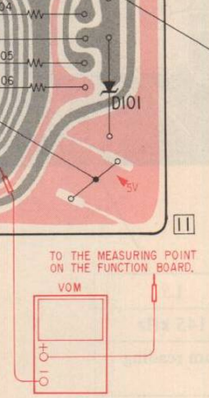
SECTION 4
DIAGRAMS

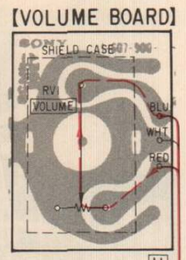


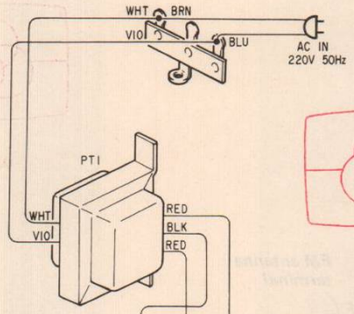


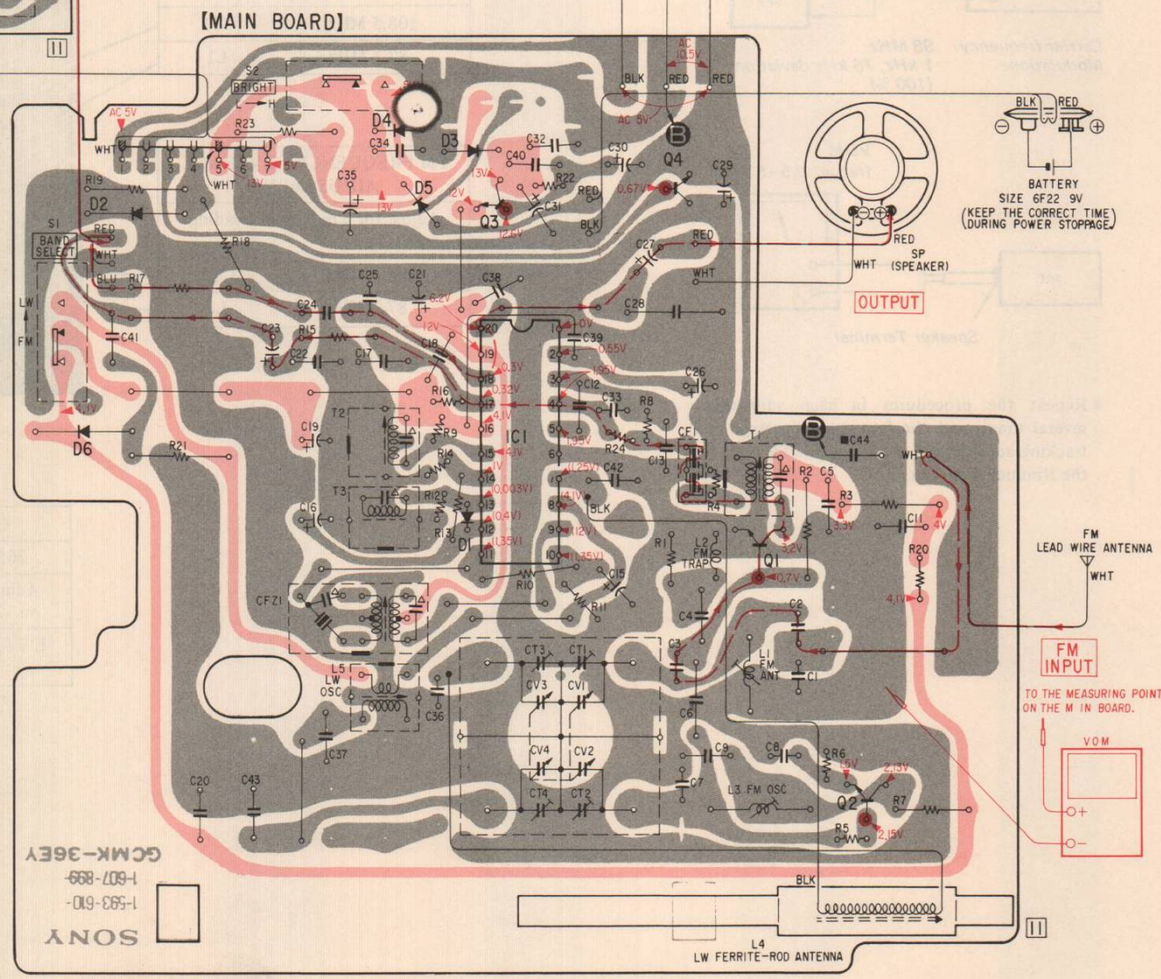






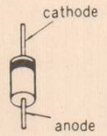




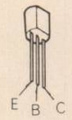


• SEMICONDUCTOR LEAD LAYOUTS

1S1555
RD5.1E-B
10E2

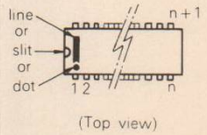


2SC1674
2SC1675
2SC2001



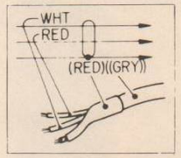
2SC710-13

LM1868N
MSM5550RSK
MSM5550IRS



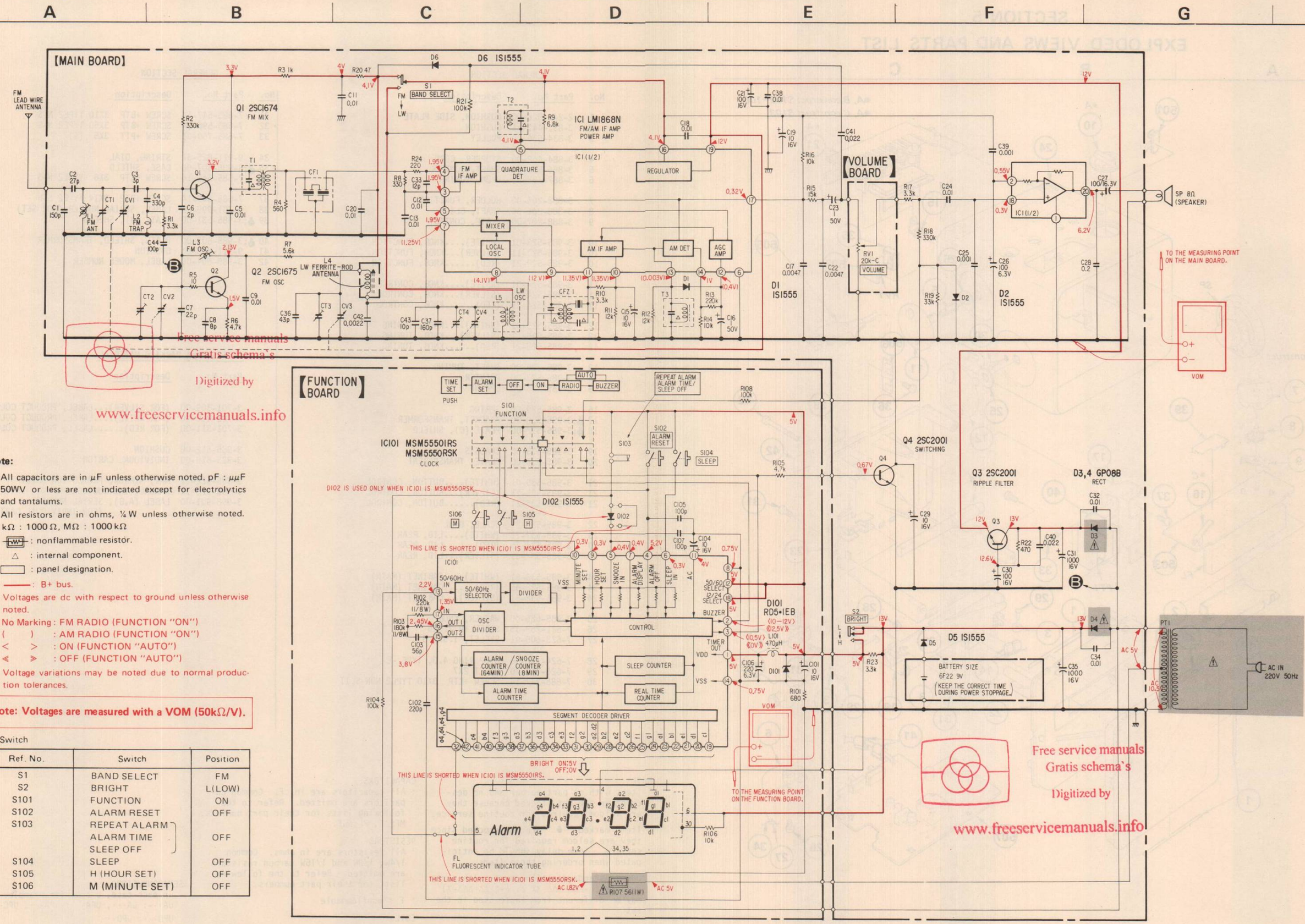
Note:

- Color code of sleeving over the end of the jacket.



- —: parts extracted from the component side.
- •—: parts extracted from the conductor side.
- ■ : part mounted on the conductor side.
- [ ]— : indicates side identified with part number.
- ▲ : nonflammable resistor.
- : B + pattern
- : signal path

4-2. SCHEMATIC DIAGRAM



Note:

- All capacitors are in μF unless otherwise noted. pF : μμF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in ohms, ¼W unless otherwise noted. kΩ : 1000Ω, MΩ : 1000kΩ
- FW : nonflammable resistor.
- △ : internal component.
- ▭ : panel designation.
- ——— : B+ bus.
- Voltages are dc with respect to ground unless otherwise noted.
- No Marking : FM RADIO (FUNCTION "ON")
  ( ) : AM RADIO (FUNCTION "ON")
  < > : ON (FUNCTION "AUTO")
  ≪ ≫ : OFF (FUNCTION "AUTO")
- Voltage variations may be noted due to normal production tolerances.

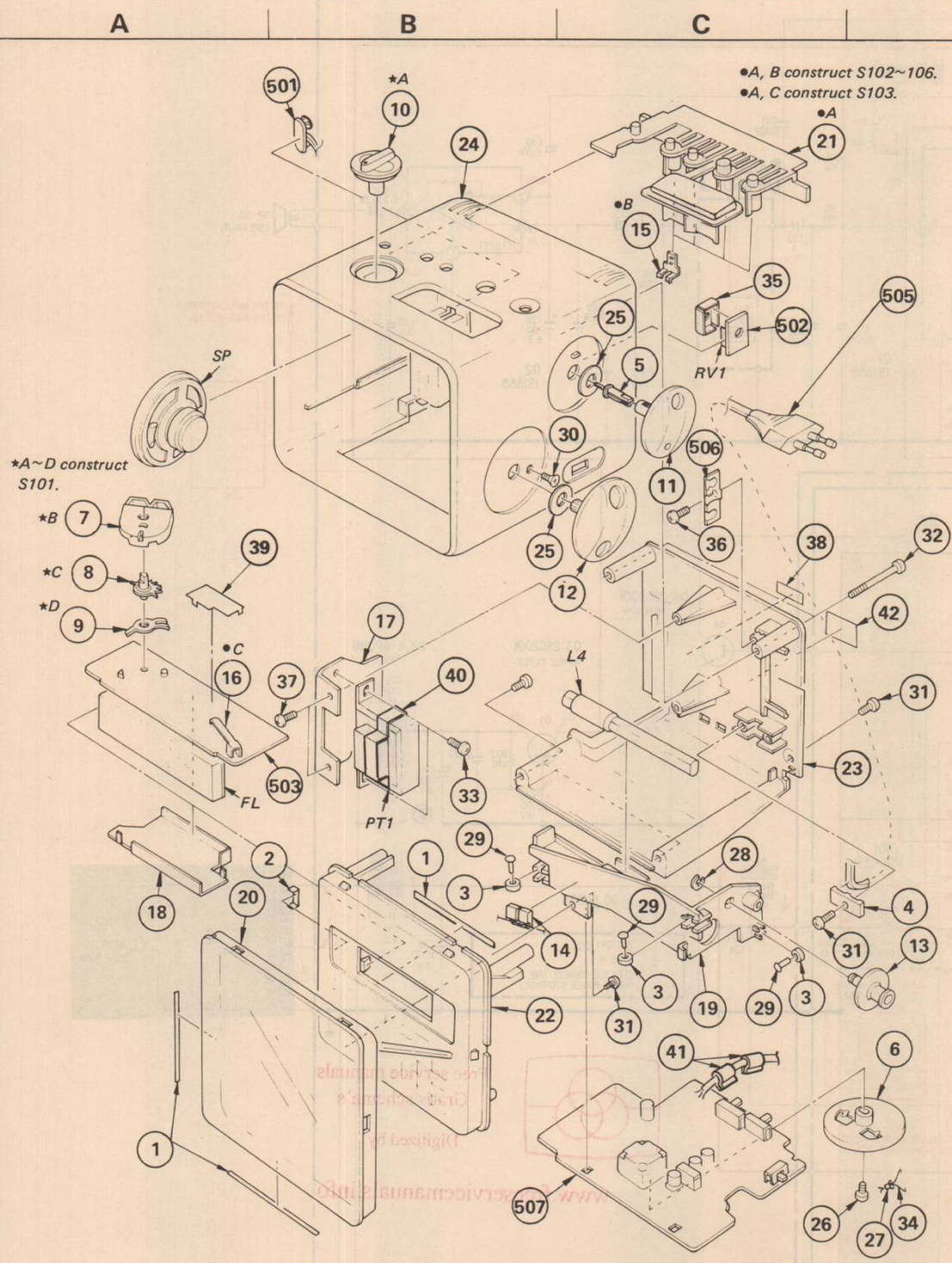
Note: Voltages are measured with a VOM (50kΩ/V).

- Switch

Ref. No.	Switch	Position
S1	BAND SELECT	FM
S2	BRIGHT	L(LOW)
S101	FUNCTION	ON
S102	ALARM RESET	OFF
S103	REPEAT ALARM / ALARM TIME / SLEEP OFF	OFF
S104	SLEEP	OFF
S105	H (HOUR SET)	OFF
S106	M (MINUTE SET)	OFF

Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

SECTION 5
EXPLODED VIEWS AND PARTS LIST



GENERAL SECTION

No.	Part No.	Description
1	2-242-926-00	CUSHION, SIDE PLATE
2	3-831-441-11	CUSHION
3	3-834-636-00	PULLEY
4	3-884-408-00	STOPPER, CORD
5	3-886-531-00	SHAFT, CONTROL
6	3-887-128-00	DRUM, TUNING
7	3-888-205-00	HOLDER, FUNCTION
8	3-888-206-00	SHAFT, CLICK
9	3-888-207-00	PLATE, CONTACT
10	3-985-523-01	(WHITE)....KNOB, FUNCTION
10	3-985-523-11	(SILVER)...KNOB, FUNCTION
10	3-985-523-21	(RED).....KNOB, FUNCTION
11	3-985-524-01	(WHITE)....KNOB, CONTROL
11	3-985-524-11	(SILVER)...KNOB, CONTROL
11	3-985-524-21	(RED).....KNOB, CONTROL
12	3-985-525-01	(WHITE)....KNOB, TUNING
12	3-985-525-11	(SILVER)...KNOB, TUNING
12	3-985-525-21	(RED).....KNOB, TUNING
13	3-985-526-00	SHAFT, TUNING
14	3-985-527-00	POINTER
15	3-985-528-00	SPRING
16	3-985-529-00	SPRING
17 ♦	3-985-530-00	BRACKET, TRANSFORMER
18 ♦	3-985-532-00	PLATE (C), SHIELD
19	3-985-533-00	CHASSIS
20	3-985-534-00	PLATE, TRANSPARENT
21	3-985-535-01	(WHITE)....BUTTON, CONTROL
21	3-985-535-11	(SILVER)...BUTTON, CONTROL
21	3-985-535-21	(RED).....BUTTON, CONTROL
22	3-985-536-21	SCALE, DIAL
23	3-985-537-71	(WHITE)....LID, REAR
23	3-985-537-75	(RED).....LID, REAR
23	3-985-537-81	(SILVER)...LID, REAR
24	3-985-538-51	(WHITE)....CABINET (MAIN)
24	3-985-538-55	(RED).....CABINET (MAIN)
24	3-985-538-61	(SILVER)...CABINET (MAIN)
25	3-985-625-00	WASHER, KNOB
26	7-621-259-35	SCREW +P 2.6X5
27	7-623-605-01	EYELET, 1.3X2.5
28	7-624-108-04	STOP RING 4.0, TYPE -E
29	7-625-712-80	RIVET 2X7
30	7-685-247-14	SCREW +KTP 3X10 TYPE2 NON-SLIT

GENERAL SECTION

No.	Part No.	Description
31	7-685-547-14	SCREW +BTP 3X10 TYPE2 N-S
32	7-685-596-14	SCREW +BTP 3X50 TYPE2 N-S
33	7-685-750-01	SCREW +PTT 3X5 (S)
34	9-911-825-32	STRING, DIAL
35 ♦	3-985-607-00	CASE, SHIELD
36	7-685-545-14	SCREW +BTP 3X6 TYPE2 N-S
37	7-685-549-14	SCREW +BTP 3X14 TYPE2 S-N
38	3-701-999-00	LABEL, SERIAL NUMBER (FOR SET)
39 ♦	3-985-531-00	PLATE (B), SHIELD
40 ♦	3-985-609-00	PLATE, SHIELD, TRANSFORMER
41	9-911-815-01	CUSHION
42	3-985-604-00	LABEL, MODEL NUMBER

ACCESSORY & PACKING MATERIAL

Part No.	Description
3-701-309-00	(FOR SILVER)...LABEL, PRODUCT COLOR
3-701-310-00	(FOR WHITE)....LABEL, PRODUCT COLOR
3-701-311-00	(FOR RED).....LABEL, PRODUCT COLOR
3-985-612-00	CUSHION
3-985-619-00	INDIVIDUAL CARTON
3-985-622-11	MAT, MIRROR, PROTECTION SHEET
3-995-928-11	MANUAL, INSTRUCTION
3-998-901-00	LABEL (A,B), SERIAL NUMBER (FOR INDIVIDUAL CARTON)

NOTE:
- Items with no part number and no description are not stocked because they are seldom required for routine service.
- 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 numbers (Δ-ΔΔΔ-ΔΔΔ-XX or Δ-ΔΔΔΔ-ΔΔΔ-X) may be different from those used in the set.

CAPACITORS:
- All capacitors are in μF. Common capacitors are omitted. Refer to the following lists for their part numbers. MF:μF, PF:μμF.

RESISTORS
- All resistors are in ohms. Common 1/4W, 1/8W and 1/16W carbon resistors are omitted. Refer to the following lists for their part numbers.
- F : nonflammable

COILS
- MMH : mH, UH : μH

SEMICONDUCTORS
In each case, U : μ, for example:
UA···: μA···, UPA···: μPA···, UPC···: μPC, UPD···: μPD···

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
501	1-535-502-XX	SNAP, BATTERY			
502	;1-607-900-00	PC BOARD, VOLUME			
503	;1-608-139-00	PC BOARD, FUNCTION			
504	.....				
505	⚠ 1-551-958-00	CORD, POWER			
506	⚠ 1-536-401-XX	C-TYPE 1L1 LUG TERMINAL STRIP			
507	;A-3660-385-A	MOUNTED PCB, MAIN			
C7	1-102-641-00	CERAMIC	22PF	5%	50V
C28	1-101-798-00	CERAMIC	0.2MF		12V
C37	1-103-706-00	POLYSTYRENE	160PF	5%	50V
CF1	1-527-795-71	FILTER, CERAMIC			
CFZ1	1-403-163-00	CERAMIC FILTER			
CT1-4	1-151-372-00	CAP, TUNING, POLYETHYLENE			
CV1-4	1-151-372-00	CAP, TUNING, POLYETHYLENE			
D1	8-719-815-55	DIODE 1S1555			
D2	8-719-815-55	DIODE 1S1555			
D3	⚠ 8-719-911-55	DIODE U05G			
D4	⚠ 8-719-911-55	DIODE U05G			
D5	8-719-815-55	DIODE 1S1555			
D6	8-719-815-55	DIODE 1S1555			
D101	8-719-151-07	DIODE RD5.1E-B			
D102	8-719-815-55	DIODE 1S1555			
FL	1-519-271-00	INDICATOR TUBE, FLUORESCENT			
IC1	1-806-474-11	IC LM1868N			
IC101	1-806-242-11	IC MSM55501RS (LSI)			
IC101	8-759-955-52	IC MSM5550RSK (LSI)			
L1	;1-420-856-00	COIL, FM RF			
L2	;1-409-293-00	COIL, AIR CORE			
L3	;1-425-795-00	COIL, HIGH FREQ TRANSFORMER(FM)			
L4	1-401-997-00	ANTENNA, FERRITE-ROD (LW)			
L5	1-406-028-00	COIL, OSC (MW)			
L101	1-408-096-00	MICRO INDUCTOR 470UH			
PT1	⚠ 1-446-486-00	TRANSFOMER, POWER			
Q1	8-729-167-42	TRANSISTOR 2SC1674			
Q2	8-729-671-13	TRANSISTOR 2SC710-13			
Q3	8-729-100-13	TRANSISTOR 2SC2001			
Q4	8-729-100-13	TRANSISTOR 2SC2001			

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
R102	1-246-811-00	RES, CARBON	220K	1/8W	FH
R103	1-246-810-00	RES, CARBON	180K	1/8W	FH
R107	⚠ 1-213-128-00	METAL	56 5%	1W	F
RV1	1-226-824-00	RES, ADJ, CARBON 20K			
S1	1-552-370-00	SWITCH, SLIDE			
S2	1-552-370-00	SWITCH, SLIDE			
S101	CONSISTED OF 7,8,9,10 IN GENERAL SECTION				
S102					
|	CONSISTED OF 21,15,16(ONLY S103) IN GENERAL SECTION				
S106					
SP	1-503-082-00	SPEAKER			
T1	1-403-872-00	I.F.T			
T2	1-404-249-51	COIL, FM DETECTOR			
T3	1-404-408-00	COIL, DETECTOR IFT			

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- F : nonflammable

COILS
- MMH : mH, UH : μH

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

SEMICONDUCTORS
In each case, U : μ, for example:
UA···: μA···, UPA···: μPA···, UPC···: μPC, UPD···: μPD···

ELECTROLYTIC CAPACITORS

CAP. (μF)	RATING → : Use the high voltage rated one.					
	6.3 VOLT.	10 VOLT.	16 VOLT.	25 VOLT.	35 VOLT.	50 VOLT.
	PART No.	PART No.	PART No.	PART No.	PART No.	PART No.
0.47					→	1-121-726-00
1.0					→	1-121-391-00
2.2					→	1-121-450-00
3.3	→	→	→	1-121-392-00	→	1-121-393-00
4.7	→	→	→	1-121-395-00	→	1-121-396-00
10	→	→	1-121-651-00	1-121-398-00	→	1-121-738-00
22	→	→	1-121-479-00	1-121-480-00	1-121-662-00	1-121-152-00
33	→	→	1-121-403-00	1-121-404-00	1-121-652-00	1-121-405-00
47	→	1-121-352-00	1-121-409-00	1-121-410-00	1-121-653-00	1-121-411-00
100	→	1-121-414-00	1-121-415-00	1-121-416-00	1-121-357-00	1-121-417-00
220	1-121-419-00	1-121-420-00	1-121-421-00	1-121-422-00	1-121-261-00	1-121-423-00
330	1-121-751-00	1-121-805-00	1-121-521-00	1-121-654-00	1-121-655-00	1-121-656-00
470	1-121-424-00	1-121-425-00	1-121-426-00	1-121-733-00	1-121-361-00	1-121-810-00
1000	–	1-121-736-00	1-121-245-00	1-121-657-00	1-121-388-00	1-123-061-00
2200	1-121-658-00	1-121-659-00	1-121-660-00	1-123-067-00	1-121-984-00	–
3300	1-121-661-00	1-123-075-00	1-123-071-00	–	–	–

CAP. (μF)	100 VOLT.	160 VOLT.	250 VOLT.	350 VOLT.
	PART No.	PART No.	PART No.	PART No.
0.47	–	–	–	–
1.0	1-123-249-00	1-123-252-00	1-123-003-00	1-121-168-00
2.2	1-123-250-00	1-123-026-00	–	1-123-028-00
3.3	1-121-995-00	–	1-123-004-00	1-123-006-00
4.7	1-123-255-00	1-121-246-00	1-121-759-00	1-123-007-00
10	1-121-126-00	1-121-999-00	1-123-254-00	1-123-008-00
22	1-121-996-00	1-123-253-00	1-123-005-00	1-123-022-00
33	1-121-997-00	1-121-757-00	–	–
47	1-123-251-00	1-121-919-00	–	–
100	1-123-084-00	–	–	–

CERAMIC CAPACITORS

CAP. (pF)	RATING 50 VOLT. PART No.	CAP. (pF)	50 VOLT. PART No.	CAP. (pF)	50 VOLT. PART No.	CAP. (μF)	50 VOLT. PART No.
0.5	1-101-837-00	22	1-102-959-00	150	1-101-361-00	0.001	1-102-074-00
0.75	1-101-586-00	24	1-102-960-00	160	1-101-367-00	0.0012	1-102-118-00
1.0	1-102-934-00	27	1-102-961-00	180	1-102-976-00	0.0015	1-102-119-00
1.5	1-101-576-00	30	1-102-962-00	200	1-102-977-00	0.0018	1-102-120-00
2.0	1-102-935-00	33	1-102-963-00	220	1-102-978-00	0.0022	1-102-121-00
3	1-102-936-00	36	1-102-964-00	240	1-102-979-00	0.0027	1-102-122-00
4	1-102-937-00	39	1-102-965-00	270	1-102-980-00	0.0033	1-102-123-00
5	1-102-942-00	43	1-102-966-00	300	1-102-981-00	0.0039	1-102-124-00
6	1-102-943-00	47	1-101-880-00	330	1-102-820-00	0.0047	1-102-125-00
7	1-102-944-00	51	1-101-882-00	360	1-102-821-00	0.0056	1-102-126-00
8	1-102-945-00	56	1-101-884-00	390	1-102-822-00	0.0068	1-102-127-00
9	1-102-946-00	62	1-101-886-00	430	1-102-823-00	0.0082	1-102-128-00
10	1-102-947-00	68	1-101-888-00	470	1-102-824-00	0.01	1-102-129-00
11	1-102-948-00	75	1-101-890-00	510	1-101-059-00	0.022	1-101-005-00
12	1-102-949-00	82	1-102-971-00	560	1-102-115-00	0.047	1-101-006-00
13	1-102-950-00	91	1-102-972-00	680	1-102-116-00		
15	1-102-951-00	100	1-102-973-00	820	1-102-117-00		
16	1-102-952-00	110	1-102-815-00				
18	1-102-953-00	120	1-102-816-00				
20	1-102-958-00	130	1-101-081-00				

0.001μF = 1,000pF

CERAMIC (SEMICONDUCTOR) CAPACITORS

CAP. (μF)	RATING → : Use the high voltage rated one. 25 VOLT. PART No.	50 VOLT. PART No.	CAP. (μF)	25 VOLT. PART No.	50 VOLT. PART No.
0.001	→	1-161-039-00	0.018	1-161-016-00	1-161-054-00
0.0012	→	1-161-040-00	0.022	1-161-017-00	1-161-055-00
0.0015		1-161-041-00	0.027	1-161-018-00	1-161-056-00
0.0018		1-161-042-00	0.033	1-161-019-00	1-161-057-00
0.0022		1-161-043-00	0.039	1-161-010-00	1-161-058-00
0.0027	→	1-161-044-00	0.047	1-161-021-00	1-161-059-00
0.0033	→	1-161-045-00	0.056	→	1-161-060-00
0.0039	→	1-161-046-00	0.068	→	1-161-061-00
0.0047	→	1-161-047-00	0.082	1-161-024-00	1-161-062-00
0.0056	→	1-161-048-00	0.1	1-161-025-00	1-161-063-00
0.0068	→	1-161-049-00			
0.0082	1-161-012-00	1-161-050-00			
0.01	1-161-013-00	1-161-051-00			
0.012	→	1-161-052-00			
0.015	1-161-015-00	1-161-053-00			

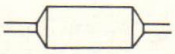
MYLAR CAPACITORS

CAP. (μF)	RATING 50 VOLT. PART No.	100 VOLT. PART No.	200 VOLT. PART No.	CAP. (μF)	50 VOLT. PART No.	100 VOLT. PART No.	200 VOLT. PART No.	CAP. (μF)	50 VOLT. PART No.	100 VOLT. PART No.	200 VOLT. PART No.
0.001	1-108-227-00	1-108-365-00	1-108-409-00	0.01	1-108-239-00	1-108-377-00	1-108-421-00	0.1	1-108-251-00	1-108-389-00	1-108-433-00
0.0012	1-108-351-00	1-108-366-00	1-108-410-00	0.012	1-108-357-00	1-108-378-00	1-108-422-00	0.12	1-108-363-00	1-108-390-00	1-108-434-00
0.0015	1-108-228-00	1-108-367-00	1-108-411-00	0.015	1-108-240-00	1-108-379-00	1-108-423-00	0.15	1-108-252-00	1-108-391-00	1-108-435-00
0.0018	1-108-352-00	1-108-368-00	1-108-412-00	0.018	1-108-358-00	1-108-380-00	1-108-424-00	0.18	1-108-364-00	1-108-392-00	1-108-436-00
0.0022	1-108-230-00	1-108-369-00	1-108-413-00	0.022	1-108-242-00	1-108-381-00	1-108-425-00	0.22	1-108-254-00	1-108-393-00	1-108-437-00
0.0027	1-108-353-00	1-108-370-00	1-108-414-00	0.027	1-108-359-00	1-108-382-00	1-108-426-00	0.27	1-108-854-00	–	–
0.0033	1-108-232-00	1-108-371-00	1-108-415-00	0.033	1-108-244-00	1-108-383-00	1-108-427-00	0.33	1-108-855-00	–	–
0.0039	1-108-354-00	1-108-372-00	1-108-416-00	0.039	1-108-360-00	1-108-384-00	1-108-428-00	0.39	1-108-856-00	–	–
0.0047	1-108-234-00	1-108-373-00	1-108-417-00	0.047	1-108-246-00	1-108-385-00	1-108-429-00	0.47	1-108-857-00	–	–
0.0056	1-108-355-00	1-108-374-00	1-108-418-00	0.056	1-108-361-00	1-108-386-00	1-108-430-00				
0.0068	1-108-237-00	1-108-375-00	1-108-419-00	0.068	1-108-249-00	1-108-387-00	1-108-431-00				
0.0082	1-108-356-00	1-108-376-00	1-108-420-00	0.082	1-108-362-00	1-108-388-00	1-108-432-00				

TANTALUM CAPACITORS

CAP. (μF)	RATING 3.15 VOLT. PART No.	6.3 VOLT. PART No.	10 VOLT. PART No.	16 VOLT. PART No.	20 VOLT. PART No.	25 VOLT. PART No.	35 VOLT. PART No.
	→ : Use the high voltage rated one.						
0.01					→	→	1-131-396-00
0.015						→	1-131-397-00
0.022						→	1-131-398-00
0.033						→	1-131-399-00
0.047						→	1-131-400-00
0.068					→	→	1-131-401-00
0.1					→	→	1-131-402-00
0.15					→	→	1-131-403-00
0.22					→	→	1-131-404-00
0.33					→	1-131-409-00	1-131-405-00
0.47	–	–	–	–	1-131-412-00	→	1-131-406-00
0.68	–	–	–	1-131-415-00	→	1-131-410-00	1-131-407-00
1.0	–	–	1-131-418-00	–	1-131-413-00	→	1-131-408-00
1.5	–	1-131-421-00	–	1-131-416-00	→	1-131-411-00	1-131-348-00
2.2	1-131-424-00	–	1-131-419-00	–	1-131-414-00	1-131-355-00	1-131-349-00
3.3	–	1-131-422-00	–	1-131-417-00	1-131-362-00	1-131-356-00	1-131-350-00
4.7	1-131-425-00	–	1-131-420-00	1-131-369-00	1-131-363-00	1-131-357-00	1-131-351-00
6.8	–	1-131-423-00	1-131-376-00	1-131-370-00	1-131-364-00	1-131-358-00	1-131-352-00
10	1-131-426-00	1-131-383-00	1-131-377-00	1-131-371-00	1-131-365-00	1-131-359-00	1-131-353-00
15	1-131-390-00	1-131-384-00	1-131-378-00	1-131-372-00	1-131-366-00	1-131-360-00	–
22	1-131-391-00	1-131-385-00	1-131-379-00	1-131-373-00	1-131-367-00		
33	1-131-392-00	1-131-386-00	1-131-380-00	1-131-374-00			
47	1-131-393-00	1-131-387-00	1-131-381-00	–			
68	1-131-394-00	1-131-388-00	–	–			
100	1-131-395-00	–	–	–			

TANTALUM CAPACITORS



CAP. (μF)	RATING 3 VOLT. PART No.	6.3 VOLT. PART No.	10 VOLT. PART No.	16 VOLT. PART No.	20 VOLT. PART No.	35 VOLT. PART No.
0.033						1-131-273-00
0.047						1-131-274-00
0.068						1-131-275-00
0.1						1-131-276-00
0.15						1-131-277-00
0.22			–	–	1-131-262-00	1-131-278-00
0.33			–	–	1-131-263-00	1-131-279-00
0.47			1-131-169-00	–	1-131-264-00	1-131-280-00
0.68			–	1-131-258-00	1-131-265-00	1-131-281-00
1.0			1-131-254-00	–	1-131-266-00	1-131-282-00
1.5		1-131-250-00	–	–	1-131-267-00	1-131-283-00
2.2		–	–	1-131-259-00	1-131-268-00	1-131-284-00
3.3		–	1-131-255-00	–	1-131-269-00	–
4.7		1-131-251-00	1-131-171-00	–	1-131-270-00	–
6.8		–	–	1-131-260-00	1-131-271-00	–
10	–	–	1-131-256-00	–	1-131-272-00	–
15	–	1-131-252-00	–	1-131-261-00		
22	–	–	1-131-257-00	–		
33	1-131-176-00	1-131-253-00	1-131-173-00	–		
47	1-131-288-00	1-131-174-00	–	–		
100	1-131-177-00					

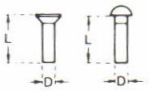
1/4 WATT CARBON RESISTORS

Ω	Part No.	Ω	Part No.	Ω	Part No.	Ω	Part No.	Ω	Part No.	Ω	Part No.	Ω	Part No.
1.0	1-246-401-00	10	1-246-425-00	100	1-246-449-00	1.0k	1-246-473-00	10k	1-246-497-00	100k	1-246-521-00	1.0M	1-246-545-00
1.1	1-246-402-00	11	1-246-426-00	110	1-246-450-00	1.1k	1-246-474-00	11k	1-246-498-00	110k	1-246-522-00	1.1M	1-210-814-00
1.2	1-246-403-00	12	1-246-427-00	120	1-246-451-00	1.2k	1-246-475-00	12k	1-246-499-00	120k	1-246-523-00	1.2M	1-210-815-00
1.3	1-246-404-00	13	1-246-428-00	130	1-246-452-00	1.3k	1-246-476-00	13k	1-246-500-00	130k	1-246-524-00	1.3M	1-210-816-00
1.5	1-246-405-00	15	1-246-429-00	150	1-246-453-00	1.5k	1-246-477-00	15k	1-246-501-00	150k	1-246-525-00	1.5M	1-210-817-00
1.6	1-246-406-00	16	1-246-430-00	160	1-246-454-00	1.6k	1-246-478-00	16k	1-246-502-00	160k	1-246-526-00	1.6M	1-210-818-00
1.8	1-246-407-00	18	1-246-431-00	180	1-246-455-00	1.8k	1-246-479-00	18k	1-246-503-00	180k	1-246-527-00	1.8M	1-210-819-00
2.0	1-246-408-00	20	1-246-432-00	200	1-246-456-00	2.0k	1-246-480-00	20k	1-246-504-00	200k	1-246-528-00	2.0M	1-210-820-00
2.2	1-246-409-00	22	1-246-433-00	220	1-246-457-00	2.2k	1-246-481-00	22k	1-246-505-00	220k	1-246-529-00	2.2M	1-210-821-00
2.4	1-246-410-00	24	1-246-434-00	240	1-246-458-00	2.4k	1-246-482-00	24k	1-246-506-00	240k	1-246-530-00	2.4M	1-244-754-00
2.7	1-246-411-00	27	1-246-435-00	270	1-246-459-00	2.7k	1-246-483-00	27k	1-246-507-00	270k	1-246-531-00	2.7M	1-244-755-00
3.0	1-246-412-00	30	1-246-436-00	300	1-246-460-00	3.0k	1-246-484-00	30k	1-246-508-00	300k	1-246-532-00	3.0M	1-244-756-00
3.3	1-246-413-00	33	1-246-437-00	330	1-246-461-00	3.3k	1-246-485-00	33k	1-246-509-00	330k	1-246-533-00	3.3M	1-244-757-00
3.6	1-246-414-00	36	1-246-438-00	360	1-246-462-00	3.6k	1-246-486-00	36k	1-246-510-00	360k	1-246-534-00	3.6M	1-244-758-00
3.9	1-246-415-00	39	1-246-439-00	390	1-246-463-00	3.9k	1-246-487-00	39k	1-246-511-00	390k	1-246-535-00	3.9M	1-244-759-00
4.3	1-246-416-00	43	1-246-440-00	430	1-246-464-00	4.3k	1-246-488-00	43k	1-246-512-00	430k	1-246-536-00	4.3M	1-244-760-00
4.7	1-246-417-00	47	1-246-441-00	470	1-246-465-00	4.7k	1-246-489-00	47k	1-246-513-00	470k	1-246-537-00	4.7M	1-244-761-00
5.1	1-246-418-00	51	1-246-442-00	510	1-246-466-00	5.1k	1-246-490-00	51k	1-246-514-00	510k	1-246-538-00	5.1M	1-244-762-00
5.6	1-246-419-00	56	1-246-443-00	560	1-246-467-00	5.6k	1-246-491-00	56k	1-246-515-00	560k	1-246-539-00		
6.2	1-246-420-00	62	1-246-444-00	620	1-246-468-00	6.2k	1-246-492-00	62k	1-246-516-00	620k	1-246-540-00		
6.8	1-246-421-00	68	1-246-445-00	680	1-246-469-00	6.8k	1-246-493-00	68k	1-246-517-00	680k	1-246-541-00		
7.5	1-246-422-00	75	1-246-446-00	750	1-246-470-00	7.5k	1-246-494-00	75k	1-246-518-00	750k	1-246-542-00		
8.2	1-246-423-00	82	1-246-447-00	820	1-246-471-00	8.2k	1-246-495-00	82k	1-246-519-00	820k	1-246-543-00		
9.1	1-246-424-00	91	1-246-448-00	910	1-246-472-00	9.1k	1-246-496-00	91k	1-246-520-00	910k	1-246-544-00		

HARDWARE NOMENCLATURE

Screw:

– P 3 x 10
- *L: Length in mm*
- *D: Diameter in mm*
- *Type of head*
- *Indicated slotted-head only. Unless otherwise indicated, it means cross-recessed head (Phillips type).*



Nut, Washer, Retaining ring:

N 3
- *Diameter of usable screw or shaft*
- *Reference designation*

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
PS PSP		pan-head screw with spring washer	binding-head (B) screw and spring washer for replacement
PSW PSPW		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-countersunk-head screw	
RK		oval-countersunk-head screw	
B		binding-head screw	
T		truss-head screw	binding-head (B) screw for replacement
F		flat-fillister-head screw	
RF		fillister-head screw	
BV		braizer-head screw	

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 (TA, B) screw for replacement
PTPWH		pan-head self-tapping screw with washer face	binding-head self tapping (TA, B) screw and flat washer for replacement
PTTWH		pan-head thread-rolling screw with washer face	binding-head (B) screw and flat washer for replacement
		SET SCREWS	
SC		set screw	
SC		hexagon-socket set screw	ex: SC 2.6 x 4, hexagon socket
		NUT	
N		nut	
		WASHERS	
W		flat washer	
SW		spring washer	
LW		internal-tooth lock washer	ex: LW3, internal
LW		external-tooth lock washer	ex: LW3, external
		RETAINING RINGS	
E		retaining ring	
G		grip-type retaining ring	

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