ORDER NO. OSA0701C108

Service Manual

FM-LW-MW-SW
ALL BAND RECEIVER

Radio

RF-B60L

(Black)

This is the Service Manual for the following areas.

- [Z] ...For all European areas except United Kingdom & F.R. Germany.
- [E] ...For United Kingdom.
- [X] ...For Asia, Latin America, Middle East and Africa areas.
- [L] ...For Australia.

■ SPECIFICATIONS

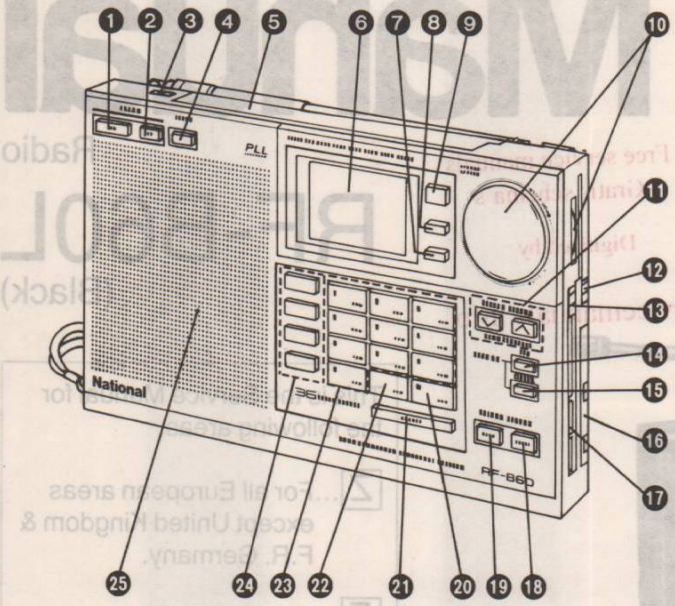
Frequency Range:	FM; 87.5~108 MHz LW; 155~519 kHz MW; 522~1611 kHz (at 9 kHz step) 520~1610 kHz (at 10 kHz step) SW; 1.615~29.999 MHz
Intermediate Frequency:	FM; 10.7 MHz AM (MW, LW, SW); 450 kHz
Sensitivity:	FM; 4 µV/50 mW output (−3 dB, Limit Sens) LW; 1000 µV/m/50 mW output (at 281 kHz, S/N 20 dB) MW; 32 µV/m/50 mW output SW; 10 µV/50 mW (at 6 MHz, S/N 20 dB)
Power Source:	Battery; 6 V (four UM-3, "AA" size batteries for radio) 3 V (two UM-3, "AA" size batteries for memory back-up) AC; [Z]...220 V, 50 Hz with optional AC adaptor RD-9496S [E]...240 V, 50 Hz with optional AC adaptor RD-9496E [X]...110~127/220~240 V, 50/60 Hz with optional AC adaptor RD-9496 [L]...240 V, 50 Hz with optional AC adaptor RD-9496A
Power Output:	550 mW (RMS Max.)
Speaker:	8 cm PM dynamic Speaker, 8Ω
Jacks:	Earphone; 8Ω ∅3.5 mm EXT. ANT. (LW/MW/SW); ∅3.5 mm DC IN; 6 V
Dimensions:	205 (W)×119 (H)×36 (D) mm
Weight:	650 g without batteries

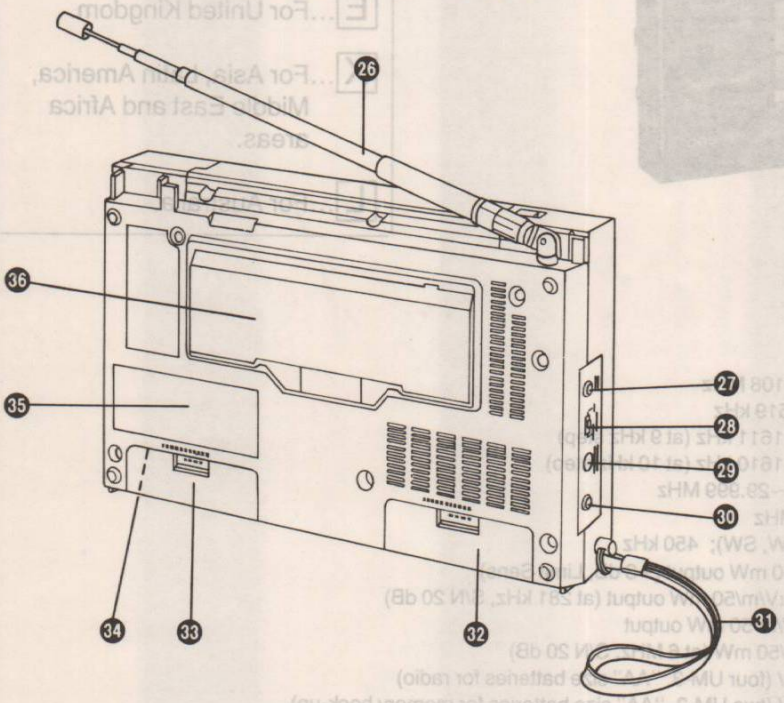
Design and specifications are subject to change without notice.

National / Panasonic

Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan

LOCATION OF CONTROLS AND COMPONENTS





❶ Power On Key (ON)
Press the key to turn the radio on.

❷ Power Off Key (OFF)
Press the key to turn the radio off.

❸ Station Reminder Open Switch
Use the switch to open the Station Reminder cover.

❹ Sleep Key (SLEEP)
Press the key to turn the radio off automatically in 60 minutes.

❺ Station Reminder (STATION REMINDER)
Attach the included Memory Channel Sheets to the Station Reminder. It is useful for Memory Tuning.

❻ LCD Multi-Information Display

❼ Time Set Key (TIME SET)
Press the key when setting a clock time.

❽ Dual Time Set Key (DUAL TIME)
This unit enables the dual clock time besides the normal clock time to be set. Press the key when setting the dual clock time, or selecting the display of the normal or dual clock time.

❾ Display Select Key (CLOCK/FREQ)
Press the key to select the frequency display or the clock display.

❿ Rotary Tuning Control (ROTARY TUNING)

⓫ Up and Down Keys (∨ • ∧)
Press the Up Key (∧) or Down Key (∨) to make the frequency change up or down during Manual Tuning and Auto Scan Tuning. Or press to stop Auto Scan Tuning.

⓬ Tone Selector (TONE)

⓭ Rotary Tuning Step Selector
For Rotary Tuning, set the selector to "FAST" or "SLOW" to make the frequency change at your desired tuning steps. In "LOCK" position, Rotary Tuning cannot operate. So, the frequency being received will be locked, and cannot be drifted accidentally.

⓮ Standby Time Set Key (SET)
Press the key to set the time you want to turn the radio on automatically.

⓯ Standby Time Cancel Key (CANCEL)
Press the key to cancel the standby time.

⓰ Volume Control (VOLUME)

⓱ Hold Switch
Usually set the switch to the opposite direction of the arrow.
When it is set to the direction of the arrow, the operation of all the keys and the Rotary Tuning Control will be locked.
It is effective during both the radio-on and off.

⓲ Meter Band Direct Access Key (METER)
Press the key before calling the lowest frequency of the SW meter band including your desired station.

⓳ Frequency Direct Access Key (FREQ)
When you know the frequency of your desired station, press the key before entering the frequency number.

⓴ Memory/Meter Band Key
Use the key first when you preset the desired stations into each of the memory channels. This key also functions as the Meter Band Key, which can call the lowest frequency of a SW meter band.

㉑ Enter Key (ENTER)
After entering the frequency number of your desired station or the number of a clock time, press the key to begin receiving the broadcast of the station or to complete the time setting.

㉒ Decimal Point/Meter Band Key
For Frequency Direct Access Tuning, use the key to enter the decimal point of the frequency.
This key also functions as the Meter Band Key.

㉙ **Number/Memory Channel/Meter Band Keys**
Press the keys in the following ways.
- In Frequency Direct Access Tuning, to enter the frequency number of your desired stations.
- In Memory Tuning, to preset and call the stations.
- In Meter Band Direct Access Tuning, to call the lowest frequency of a SW meter band.

㉘ **Band Select Keys**

㉗ **Speaker (8 cm, 8Ω)**

㉖ **Telescopic Antenna**

㉗ **External Antenna Jack (EXT ANT) ∅3.5 mm**

㉘ **Sensitivity Selector (SENS)**
Normally set to "DX". When the reception is impaired or interfered by powerful station, set to "LOCAL".
The selector cannot operate for FM reception.

㉙ **DC Input Jack (DC IN 6 V ⊖◑⊕)**

㉚ **Earphone Jack (🎧) 8Ω, ∅3.5 mm**
Connect the included earphone to the jack.
- Adjust the volume to lower level so as not to injure your ear.

㉛ **Carrying Strap**

㉜ **Radio Battery Compartment**

㉝ **Memory Back-up Battery Compartment**

㉞ **MW Frequency Step Selector (In the Memory Back-up Battery Compartment)**
Before use, check that the selector is set to the frequency step corresponding to your area.
If not so, set the selector to the correct position.

㉟ **World Time Table**

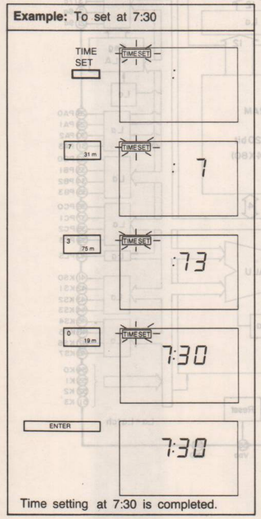
㊱ **Stand/Short Wave Frequency Allocation**

CLOCK OPERATION

This unit can set the dual clock time besides the normal clock time. The dual clock time is useful, when you listen to the broadcast in a foreign country, to set the standard time adapted in that country. It can be found out by refering to the World Time Table on the back of the unit.
- The clock time is displayed in 24-hour display.
- When the memory back-up batteries are installed, "0:00" will begin flashing. To set the normal or dual clock time, follow the procedure described below.
- If you are listening to the radio (the frequency is being displayed), press the Display Select Key or the Power Off Key to change to the clock display. (When the Display Select Key is pressed, you can continue to listen.) After that, begin the time setting.

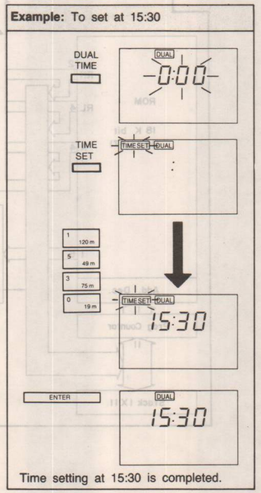
■ To set the normal clock time

1. Press the Time Set Key.
   - The indicator (TIMESET) will begin flashing.
2. Press the Number Keys to enter the number of the clock time.
3. Press the Enter Key.



■ To set the dual clock time

1. Press the Dual Time Set Key. •The indicator (DUAL) will be displayed and the clock time display (0:00) will begin flashing. (If you set the dual time before, it will be displayed.)
2. Press the Time Set Key.
   - The Indicator (TIMESET) will begin flashing.
3. Press the Number Keys to enter the number of the dual clock time.
4. Press the Enter Key.



- **To return the display of the normal clock time**
  Press the Dual Time Set Key.

- **To make sure the dual clock time when the normal clock time is being displayed**
  Press the Dual Time Set Key.

■ Notes for Time Setting

- The seconds will begin counting when the Enter Key is pressed.
- After pressing the Time Set Key, or between pressing one Number Key and the next, if more than about 10 seconds is allowed to elapse, the display of the clock time indicated last will be returned.
- When the impossible time (ex. 25:00) is entered, the error indication will appear. After a few seconds, a return is made to the previous display. Then press the Time Set Key again and enter the correct number.
- If you press the Time Set Key before pressing the Enter Key, the display of the clock time indicated last will be returned.
- The Time Set Key is designed not to be pressed easily, so as to prevent the clock time display from changing accidentally. If you cannot press the key with your finger, insert the tip of a ball-point pen into the depression of the key.

RADIO OPERATION

■ Reception Frequency Table

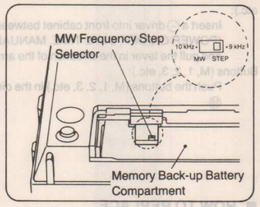
Band	Frequency Range
FM	87.5–108 MHz
LW	155–519 kHz
MW	522–1611 kHz (at 9 kHz step)
	520–1610 kHz (at 10 kHz step)
SW	1.615–29.999 MHz

SW Meter Band	Frequency Range
120 m	2.300–2.495 MHz
90 m	3.200–3.400 MHz
75 m	3.900–4.000 MHz
60 m	4.750–5.060 MHz
49 m	5.950–6.200 MHz
41 m	7.100–7.300 MHz
31 m	9.500–9.900 MHz
25 m	11.650–12.050 MHz
21 m	13.600–13.800 MHz
19 m	15.100–15.600 MHz
16 m	17.550–17.900 MHz
13 m	21.450–21.850 MHz
11 m	25.670–26.100 MHz

Note:
As there is no Meter Band Key corresponding to the 11 meter band (SW), use the Frequency Direct Access Tuning or the Rotary Tuning Control to tune to any station on that band.

■ To set the proper MW Frequency Step

The MW frequency step in theis unit is set corresponding to the area where you purchased this unit. If you use the unit in the area where the frequency step of the broadcasts is different, set the MW Frequency Step Selector inside the Memory Back-up Battery Compartment to the proper position.



1. Remove both all the memory back-up batteries and all the radio batteries.
2. Set the MW Frequency Step Selector to the proper position.
3. After about one minute, install the memory back-up batteries and the radio batteries and close the compartment covers.

Note:
When the memory back-up batteries and the radio batteries are removed, the memories of the radio stations and the clock times may be lost. Be sure to reset the memories and the clock times.

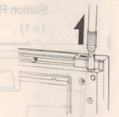
■ Antennas

FM: Pull out the Telescopic Antenna and adjust its length and angle for optimum reception.
LW/MW: The sensitive ferrite core antenna inside the set will provide excellent LW/MW reception in most areas. For optimum reception, turn the set in the direction which gives the best results since the ferrite core antenna is directional.
SW: Extend the Telescopic Antenna fully, keep it veritical.

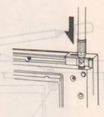
▼ Be sure to fold at the (▼) mark so that mark is on the outside.

Caution when adjusting the Telescopic Antenna

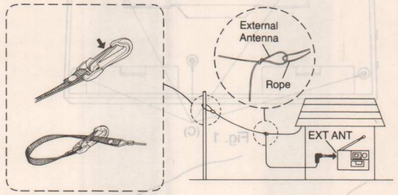
- If you wish to adjust the Telescopic Antenna, pull the base of the antenna until you hear a click, and then pull the remaining sections to extend it fully. If this unit is positioned horizontally or the stand is used, you will not be able to adjust the antenna unless the base has been pulled free of the set.



- When folding up the antenna, first push the base back into the set and then push the antenna elements back together starting with the thicker ones.



- **External Antenna**
  When the reception is poor in using with the Telescopic Antenna, or when you want to get more clear reception, connect the included External Antenna Cord to the External Antenna Jack. It doesn't work for FM reception.



■ Tuning Mode

This unit has the following tuning modes:

1 Rotary Tuning
Turning the Rotary Tuning Control makes the frequency change up or down. And setting the Rotray Tuning Step Selector to slow and turning the control enable you to get more precise tuning. The tuning mode is useful when you do not know the frequency of your desired station and when you want to tune precisely.

2 Frequency Direct Access Tuning
When you know the frequency number of your desired station, you can tune in the station directly by entering the frequency number.

3 Meter Band Direct Access Tuning
For SW reception, when you know the meter band including your desired station, you can call the lowest frequency of the meter band. To tune in your desired station more precisely, use the Rotary Tuning or Up and Down Tuning mode.

4 Up and Down Tuning (Manual Tuning/Auto Scan Tuning)
Pressing the Up Key (∧) or Down Key (∨) makes the frequency change up or down. Use the tuning when you do not know the frequency of your desired station. This mode includes Manual Tuning and Auto Scan Tuning.

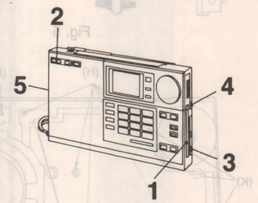
5 Memory Tuning
If the broadcast stations selected with the Rotary Tuning, Direct-Access Tuning or Up and Down Tuning mode has been entered into each of the memory channels (channels 1~9), you can recall those selected stations easily, merely by pressing the corresponding Memory Channel Key.

- Memory Tuning can be memorized the four bands (FM • LW • MW • SW) into each nine channel. So, in total, 36 stations memories are preset.

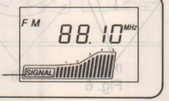
■ Before Operation

Be sure to check the following points before operating this unit.

1. The Hold Switch is set to the opposite direction of the arrow. If not, all the Operation Keys cannot operate.
2. The Power On Key is pressed.
3. The volume is adjusted by the Volume Control.
4. The tone is selected to "HIGH" or "LOW" by the Tone Selector.
5. The Sensitivity Selector is set to the proper position. Normally set to "DX". When the reception is impaired or interfered by powerfull station, set to "LOCAL". It doesn't work for FM reception.



- **Signal Indication**
  The bar displays indicate the receiving condition.



DISASSEMBLY INSTRUCTIONS

■ **Disassemble and assemble the unit with care since a flexible printed circuit board is used.**

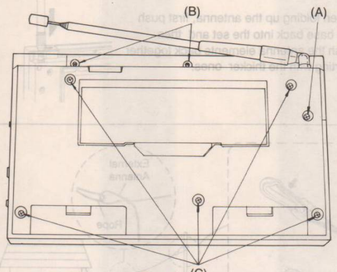


Fig. 1

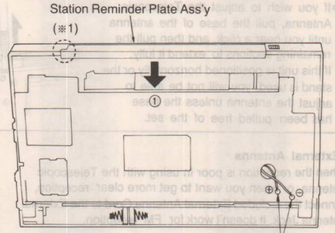


Fig. 2

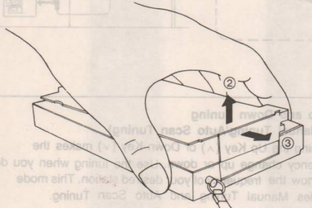
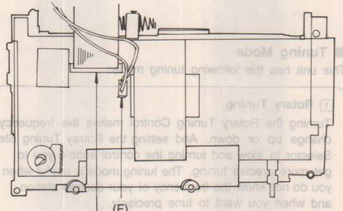


Fig. 3



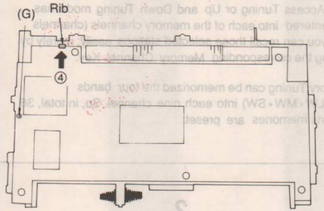


Fig. 5

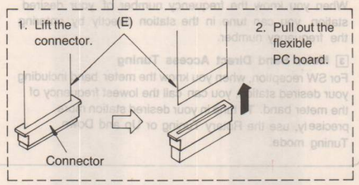


Fig. 4

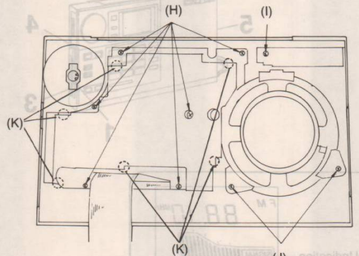


Fig. 6

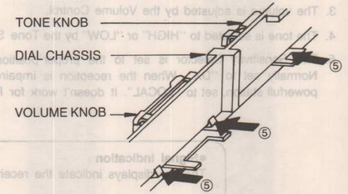


Fig. 7

Ref. No.	Show in Fig.—.	To remove—.	Remove—.
1	1	Telescopic Antenna	Screw (3×8) mm ..... (A)×1
2	1	Rear Cabinet	Screw (2.5×9) mm ..... (B)×2
			Screw (2.6×14) mm ..... (C)×5
3	2	Main Circuit Board	Open the station reminder plate ass'y and remove the station reminder plate ass'y in the direction of arrow ①. (※1)
	2		Remove the solder (D) from speaker terminal.
	3		Remove the main circuit board in the direction of arrow ②, ③.
	4		Flexible PC board (CP1) ..... (E)×1
			Socket (CP2) ..... (F)×1
4	5	Dial Chassis (※2)	Screw (2×5) mm ..... (G)×1
	5		Push the rib in the direction of the arrow ④ and remove the dial chassis.
5	6	LCD Circuit Board	Screw (2×5) mm ..... (H)×6
6	6	Switch Circuit Board	Screw (2×5) mm ..... (I)×1
7	6	Speaker	Screw (2.6×8) mm ..... (J)×2
8	6	Shield Plate (D)	Desolder the 6 points at (K).

(※1) Remove the station reminder plate ass'y as shown in Fig. 2. At this time, be careful not to loose the steel ball and the spring.
(※2) Remove the knobs (VOLUME, TONE) in the direction of arrow ⑤. (Fig. 7)

■ HOW TO REMOVE THE BUTTONS AND KNOBS

OPEN KNOB:
Push the open knob in the direction of the arrow ⑥.

VOLUME AND TONE KNOBS:
Pull the volume and tone knobs in the direction of the arrow ⑦, ⑧.

Buttons (POWER ON/OFF, DUAL TIME, MANUAL TUNING, FM, etc.):
Insert a ⊖ driver into front cabinet between the buttons (POWER ON/OFF, DUAL TIME, MANUAL TUNING, FM, etc.) and pull the lever in the direction of the arrow ⑨.

Buttons (M, 1, 2, 3, etc.):
Push the buttons (M, 1, 2, 3, etc.) in the direction of the arrow ⑩.

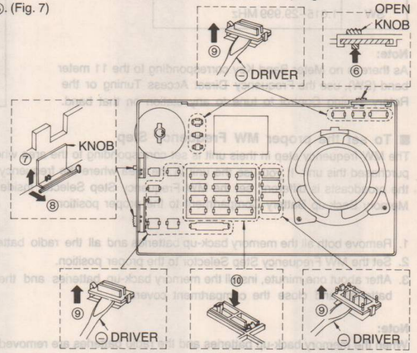
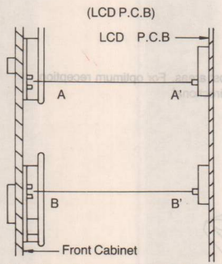
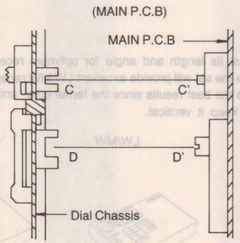


Fig. 8

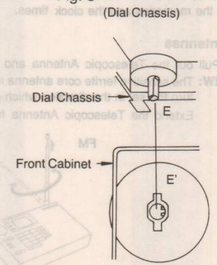
■ HOW TO REPLACE



During installation, simultaneously fit in A and A', B and B'.
Fig. 9



During installation, simultaneously fit in C and C', D and D'.
Fig. 10



During installation, simultaneously fit in E and E'.
Fig. 11

IC TERMINAL FUNCTION

1) Terminal view
μPD1706G524 (IC201)

Fig. 1

2) Block diagram
μPD1706G524 (IC201)

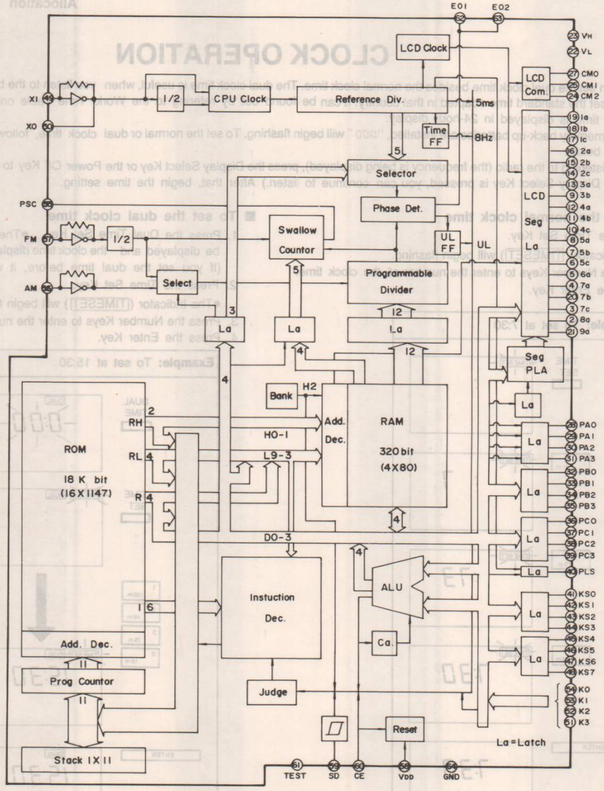
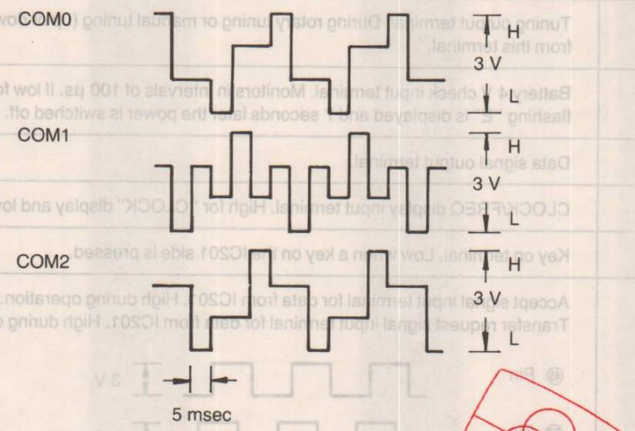
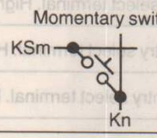
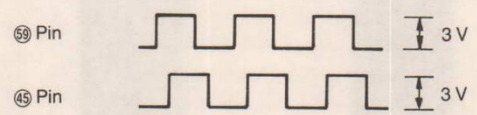


Fig. 2

3) Explanation of each terminal μPD1706G524 (IC201)

Pin. No.	Symbol	Description
2~21	1a~9a, 1b~5b, 7b 1c, 2c, 4c, 5c, 7c	Output terminals for LCD segment signals. (⅓ duty and ⅓ bias LCD drive.) Refer to Fig. 3 for output waveforms.
22 23	V_L V_H	Intermediate voltage output terminals for LCD. In this model, a 0.1 μF capacitor is connected to stabilize the intermediate voltage.
24 25 27	COM2 COM1 COM0	Terminals for LCD common signal output. 
26, 58	V_{DD}	A voltage of 3 V±10% supply to this terminal during device.
28~31	PA0~PA3	Data signal output terminal.
32 33 34 35	PB0 PB1 PB2 PB3	Band select output terminals. Outputs a low signal during LW, MW and SW. Outputs a low signal during LW and MW. Outputs a low signal during LW, MW and SW. Outputs a low signal during FM.
36 37 38	PC0 PC1 PC2	Level meter comparator output terminals.
39	PC3	Muting output terminal. The noise generated from the speaker when the power is turned on and off is muted.
40	PLS	Key on terminal. Outputs a low when a key on the IC201 side is pressed.
41~44	KS0~KS3	Key return signal source output terminals for momentary switch on the key matrix. 
45 59	KS4 SD	Accept signal output terminal for data to IC202. High during operation. Transfer request signal output terminal or data to IC202. High during operation. 

Pin. No.	Symbol	Description
46	KS5	Status control output terminal for IC202. High during time setting.
47	KS6	Automatic control output terminal for IC202. High when power is on and during times setting.
48	KS7	Radio power on/off output terminal. High when radio is on.
49 50	X1 X0	Terminals used for connecting a quartz oscillator. Connects a 150 kHz quartz oscillator.
51	K3	Level meter comparator input terminal.
52	K2	Hold signal input terminal.
53 54	K1 K0	Terminals for key matrix key return signal input.
55	PSC	Select signal output terminal for prescaler divider ratio. This terminal generates pulses at the leading edge of the signal applied to the FM terminal (pin 57) and continues to do so until the contents of the internal swallow counter are 0. At this time, the divider ratio of the prescaler is 1/17. When the contents of the swallow counter become 0, this terminal goes low and the divider ratio of the prescaler becomes 1/16.
57	FM	Input terminal for the FM local oscillator (VCO) output divided by 1/16 or 1/17 by the prescaler.
60	CE	Device select signal input terminal. Set the terminal high to select a device and low to deselect a device.
61	TEST	Terminal to test the device. Normally connected to "GND".
62	E02	PLL error output terminal. The output signal is output to the LPF (Q201–Q206). If the divided oscillation frequency is higher than the standard frequency, a high signal is output. If lower, a low signal is output. If the same, the terminal floats.
64	GND	Ground terminal.

4) Output signal waveforms of LCD segment
These output signal waveforms are produced when the frequency is SW 15,000 MHz, waveforms of the segments vary with frequency.

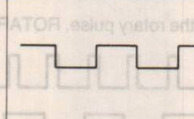
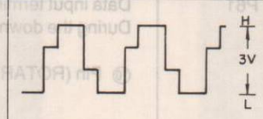
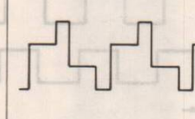
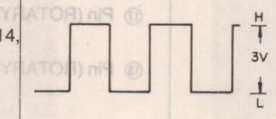
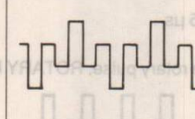
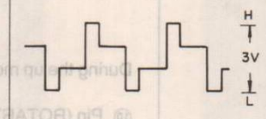
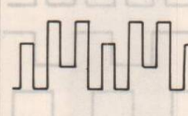
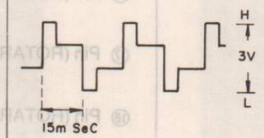
Pin No.	Output signal waveforms	Pin No.	Output signal waveforms
2, 9, 18		6, 13	
3, 27		8, 10, 12, 14, 16, 19, 20	
4, 25		17, 21	
5, 7, 11, 15		24	

Fig. 3

5) Terminal view
µPD7508G732 (IC202)

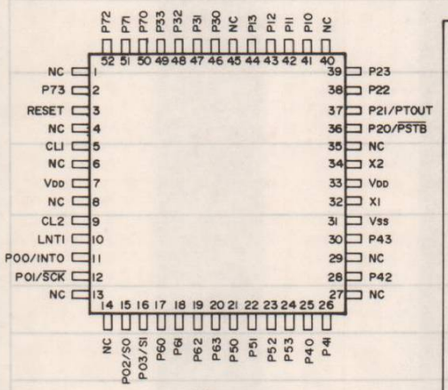


Fig. 4

6) Block diagram µPD7508G732 (IC202)

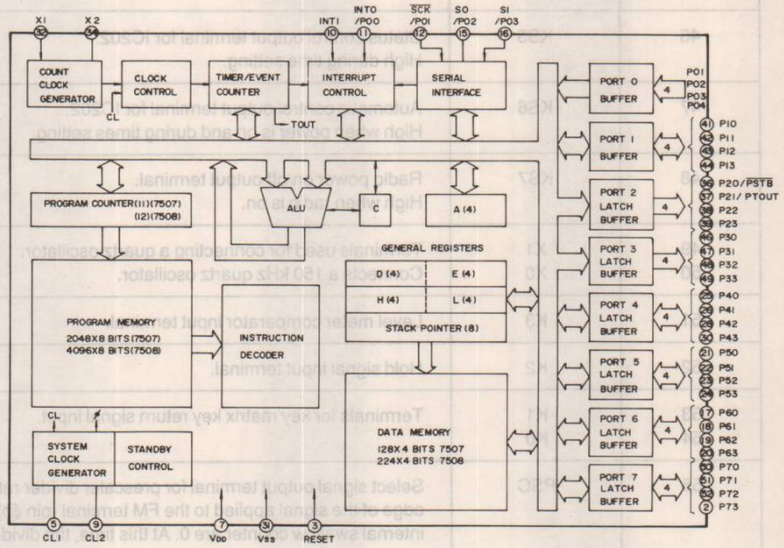
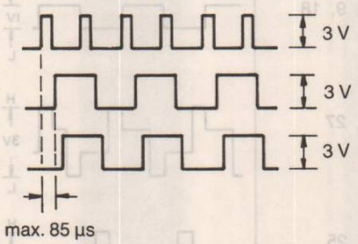
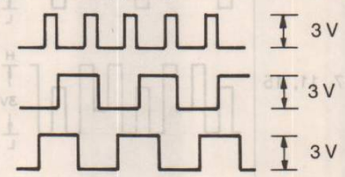
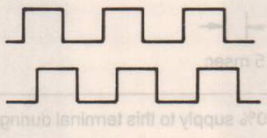
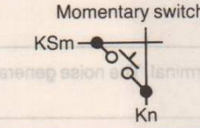


Fig. 5

7) Explanation of each terminal µPD7508G732 (IC202)

Pin No.	Symbol	Description
2	P73	FM receiving frequency select terminal. Low=87.5–108.0 MHz (for main unit) High=76.0–108.0 MHz
3	REST	Reset signal input terminal.
5	CLI	Clock signal input terminal.
7, 33	V_{DD}	A voltage of 3 V±10% supply to this terminal during device.
9	CL2	Clock signal output terminal.
10 17 18	INT1 P60 P61	Trigger pulse input terminal for rotary tuning. Data input terminal for rotary tuning. Data input terminal for rotary tuning. During the down mode (leading edge of the rotary pulse, ROTARY INPUT A=ROTARY INPUT B): ⑩ Pin (ROTARY PULSE) ⑰ Pin (ROTARY IN. A) ⑱ Pin (ROTARY IN. B)  During the up mode (leading edge of the rotary pulse, ROTARY INPUT A=ROTARY INPUT B): ⑩ Pin (ROTARY PULSE) ⑰ Pin (ROTARY IN. A) ⑱ Pin (ROTARY IN. B) 

Pin No.	Symbol	Description
11	PO0/INTO	Start signal input terminal.
12	PO1/$\overline{SCK}$	Hold input terminal. A high signal sets the key lock mode.
15	PO2/S0	Rotary tuning speed select input terminal. High for slow and low for lock.
16	PO3/S1	Rotary tuning speed select input terminal. High for fast and low for lock.
19	P62	Tuning output terminal. During rotary tuning or manual tuning (up or down), a high signal is output from this terminal.
20	P63	Battery 4 V check input terminal. Monitors in intervals of 100 µs. If low for 3 consecutive times, a flashing "E" is displayed and 7 seconds later the power is switched off.
21~24	P50~P53	Data signal output terminal.
25	P40	CLOCK/FREQ display input terminal. High for "CLOCK" display and low for "FREQ" display.
26	P41	Key on terminal. Low when a key on the IC201 side is pressed.
28 49	P42 P33	Accept signal input terminal for data from IC201. High during operation. Transfer request signal input terminal for data from IC201. High during operation. ⑭ Pin ㊾ Pin 
30	P43	ATS (Auto scan stop) input terminal. If a low signal is input during auto scan for 118 msec or longer, the scan stops.
31	GND	Ground terminal.
32	X1	Ground terminal.
36~39 46 47	$\overline{PSTB}$/P20~P23 P30 P31	Key return signal source output terminals for the momentary switches in the key matrix. Momentary switch 
41~44	P10~P13	Terminals for key matrix key return signal input.
50	P70	MW 9/10 kHz select terminal. High for 9 kHz and low for 10 kHz.
51	P71	Air band country select terminal. High for Japan and low for other countries.
52	P72	SW band country select terminal. High for Germany and low for other countries.

LIQUID CRYSTAL DISPLAY (LCD)

1) The LCD and IC201 are connected in the following way:

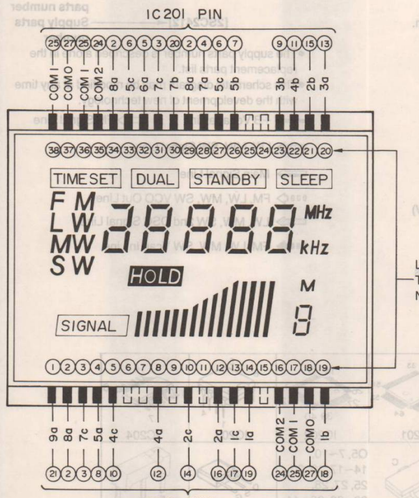


Fig. 1

2) The common and segment terminals of the LCD are connected in the following way:

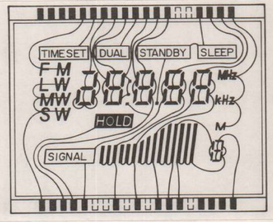


Fig. 2 (Segment)

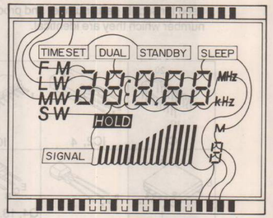


Fig. 3 (Common)

Numbering System of Capacitor

Example:

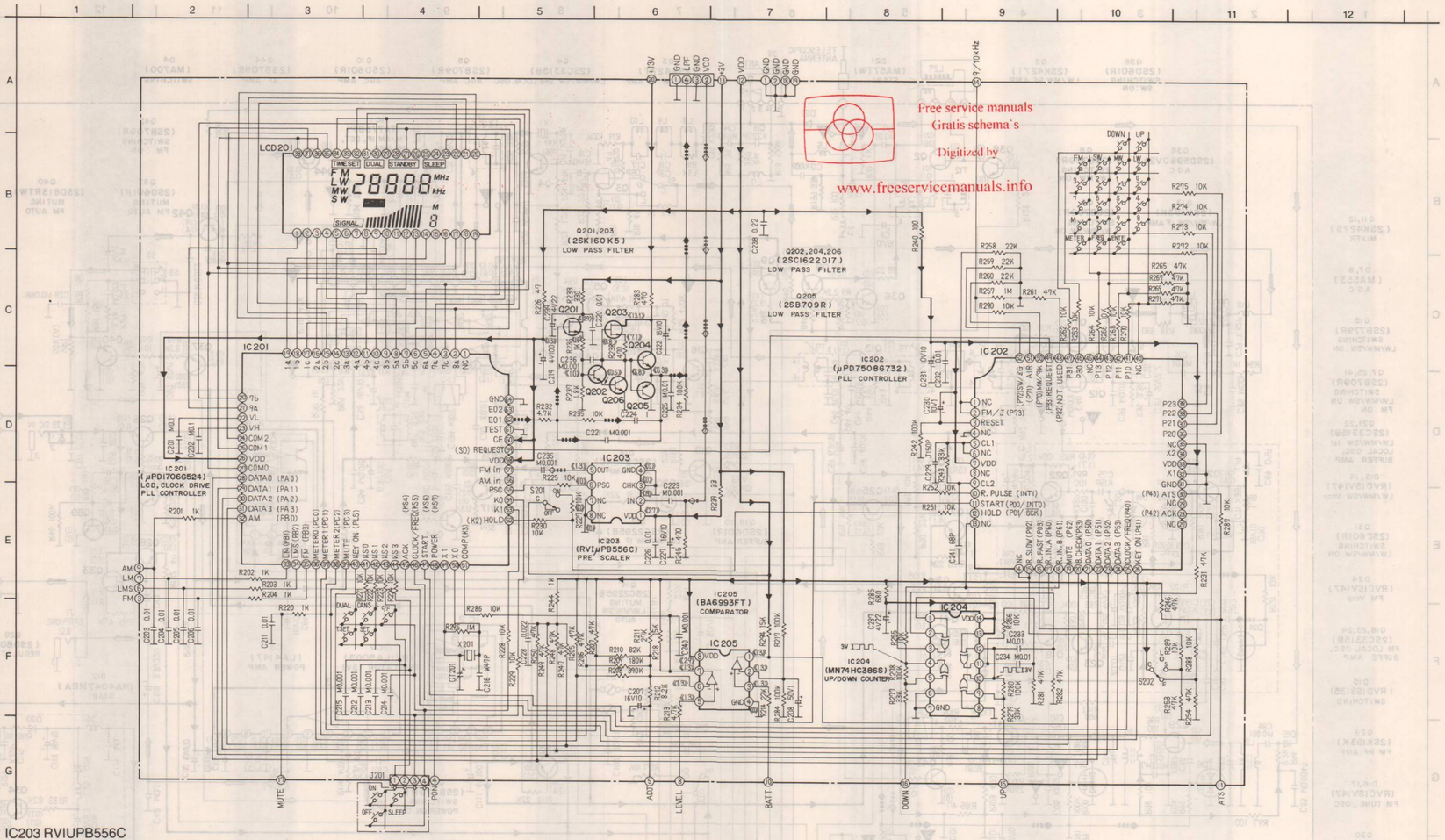
ECKD	1H	102	Z	F
Type	Voltage	Value (1000 pF)	Tolerance	Peculiarity

ECEA	50	M	R47
Type	Voltage	Peculiarity	Value (0.47 µF)

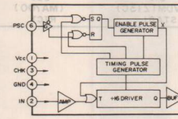
Capacitor Type		Voltage	Tolerance
ECCD:	Ceramic Capacitor (Chitacon)	(ECCD, ECKD Type) 1H : 500V DC 2H : 500V DC	K : ±10% M : ±20%
ECKD:	Ceramic Capacitor (Chitabari)	(ECFD Type) C : 12V DC D : 25V DC	Z : +80% −20%
ECFD:	Semiconductor Ceramic Capacitor	E : 50V DC (ECQ Type)	J : ±5% G : ±2%
ECE□:	Electrolytic Capacitor	05 : 50WV DC 1 : 100WV DC	F : ±1%
ECS□:	Tantalum Fixed Electrolytic Capacitor	(ECE, ECS Type) 0G : 4V 0J : 6.3V 1A : 10V 1C : 16V 1E : 25V 1V : 35V 1H : 50V 1J : 63V 2A : 100V	C : ±0.25pF D : ±0.5pF F : ±1pF
ECQ□:	Polystyrene Film Capacitor		
ECQS:	Polystyrene Film Capacitor		
ECQS:	Polypropylene Film Capacitor		
ECQV:	T.F Capacitor		
ECU□: RCU□:	Chip Capacitor		
ECBT:	Cylindrical Ceramic Capacitor		

Ref. No.	Part. No.	Ref. No.	Part. No.
CAPACITORS		C74,80,81	RCUX1H010CC
C7,25,35,36,39,		C75	RCUX1H150JC
47,60,98,99,107,		C76,128	RCUX1H150KC
112,114	RCUX1E103MD	C79,125	ECEA0GK470
		C86,88,131	RCUX1H680JC
C8,18,53,64,70,		C90,132	RCUX1H050DC
94	ECEA1CK100	C96	ECSF1VE474
C10	RCUX1E104ZF	C102	RCUX1H222MD
C11,31	RCUX1H680KC	C103,106	ECEA0JU470
C12	ECCV1H101K	C108	ECEA0JU221
C13,15,126	RCUX1H221K	C109	ECEA1AU101
C14	RCUX1H681KB	C110	ECEA1AU471
C16	RCUX1H030CC	C111	ECEA0GK101
C17,30	RCUX1H050DC	C113	ECEA1CKS100
C19	RCUX1H270KC	C116	ECEA1HKS3R3
C20,32,42,78,87,		C118	RCUX1H270KC
123	RCUX1H472MD	C119	RCUX1H220KC
C21,23	ECEA0JK220	C121	ECEA1AKS220
C22,50,52,58,61,		C122	RCUX1E333MD
62,93,129	RCUX1H103ZF	C127	RCUX1H390KC
C24,72,85	RCUX1H472MD	C130	RCUX1H330KC
C26	RCUX1E223MD	C133	RCUX1H100KC
C27,40,41,44,83,		C134	RCUX1H820KC
89,84	RCUX1H102MD	C135	RCUX1H681KB
C28	ECUV1E683MD	C201,202	ECUV1E104MD
C29	RCUX1H820KC	C203,204,205,	
C33,81	RCUX1H020CC	206,211,220,226,	
C34,57,82	ECEA1HK010	232	RCUV1H103ZF
C37	ECEA1HK2R2		
C38,69	RCUX1H070DC	C208	ECEA1HKS010
C43	RCUX1E223MD	C212,213,214,	
C45,49,65,66,67,		215,221,223,235,	
68,77,92,97,100,		236,240	RCUV1H102MD
115	RCUX1H103ZF		
		C216	RCUX1H470KC
C46	ECEA1HKR33	C224	ECQV1H105JZ
C48,124	ECUX1E104MD	C225,233,234	RCUV1E103MD
C51	RCUX1H330KC	C228	RCUV1E223ZF
C54,104	RCUX1E153MD	C229	RCUV1H151JC
C55	ECEA0JK101	C230	ECSE1AY105R
C56	ECEA1EK4R7	C231	ECSE1AT106R
C59	ECEA0JK330	C237,239	ECEA0GKK220
C71	RCUX1H390KC	C238	ECUV1E224ZF
C73	ECSE1VY104	C241	RCUV1H680KC

SCHEMATIC DIAGRAM (for LCD Circuit Section and Switch Circuit Section)



IC203 RVIUPB556C



Notes:

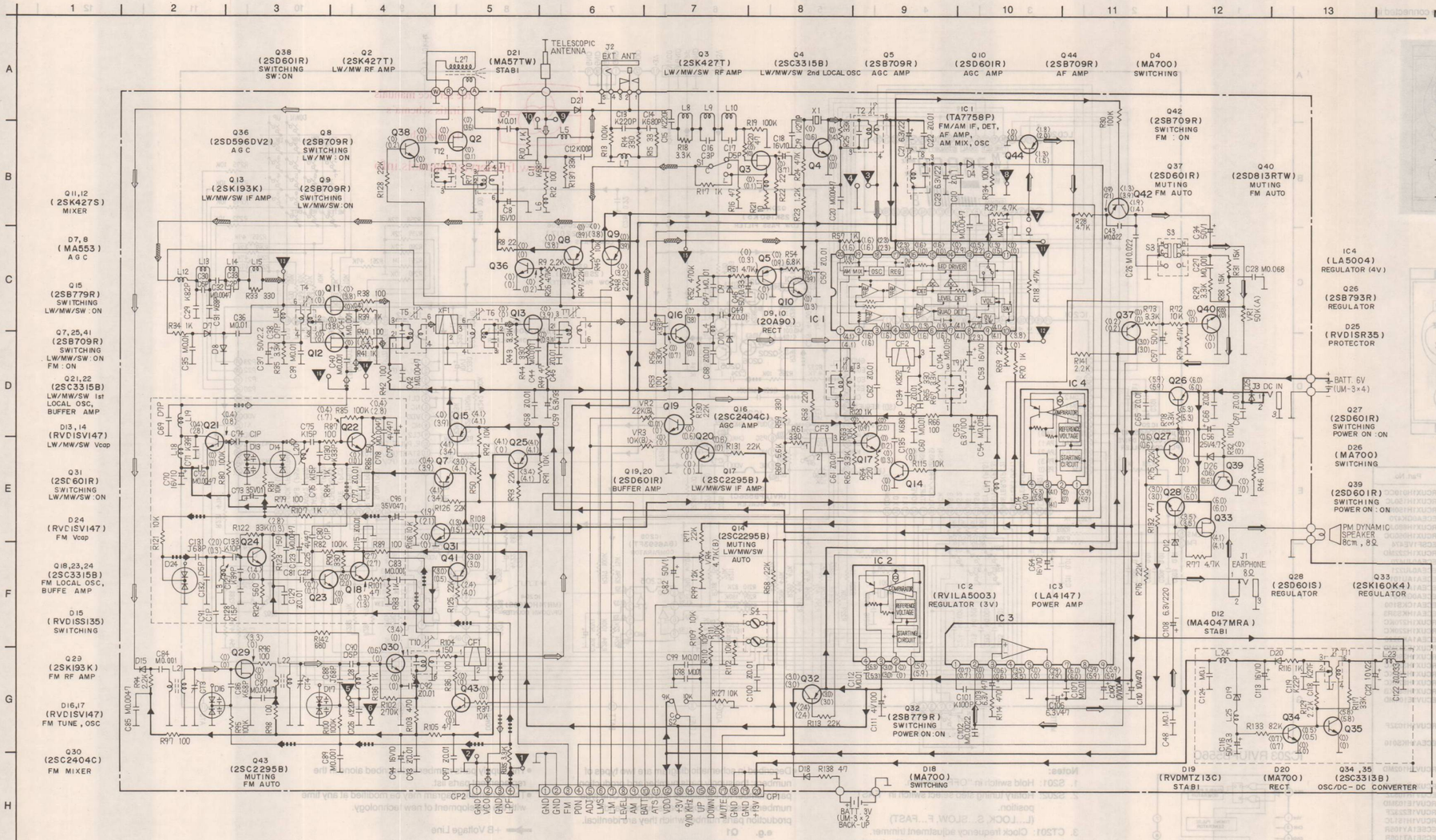
1. S201: Hold switch in "OFF" position.
2. S202: Rotary tuning step select switch in "FAST" position. (L...LOCK, S...SLOW, F...FAST)
3. CT201: Clock frequency adjustment trimmer.
4. DC voltage measurement are taken with electronics voltmeter from negative terminal of battery.
   << >>...SW position

- Described in schematic diagram are two types of numbers; the supply parts number and production parts number for transistors and diodes. One type number is used for supply parts number and production parts number which they are identical.
  e.g. Q1
  2SC2412NRTB, LNSTB ← Production parts number
  [2SC2412] ← Supply parts number

- The supply parts number is described alone in the replacement parts list.
- This schematic diagram may be modified at any time with the development of new technology.

→ +B Voltage Line
▯▯▯▷ FM, LW, MW, SW VCO In Line
▯▯▯▶ FM, LW, MW, SW Vcap Out Line

SCHEMATIC DIAGRAM (for Main Circuit Section)



Note:

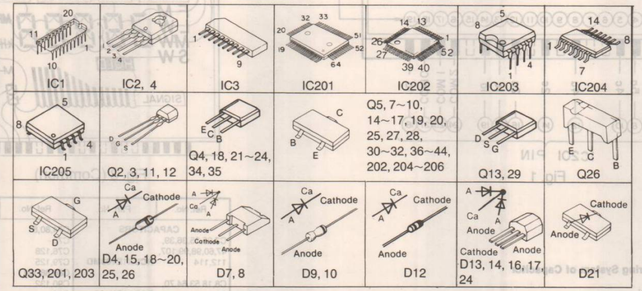
1. S1: Sensitivity select switch in "DX" position. (L...LOCAL, D...DX)
2. S2: MW frequency step select switch in "9 kHz" position.
3. S3: Tone select switch in "HIGH" position. (H...HIGH, L...LOW)
4. S4: Rotary tuning switch.
5. VR1: Volume control VR.
6. VR2: Signal meter (MW) adjustment VR.
7. VR3: Signal meter (FM) adjustment VR.
8. VR4: Battery error adjustment VR.
9. The mark (▼) shows test point e.g. ▼=test point 1.
10. DC voltage measurement are taken with electronics voltmeter from negative terminal of battery. < >...FM position, ( )...MW position
11. Battery current No signal . . . . 52 mA (FM), 62 mA (MW) Maximum output . . . . 171 mA (FM), 132 m A (MW)

- Described in schematic diagram are two types of numbers; the supply parts number and production parts number for transistors and diodes. One type number is used for supply parts number and production parts number which they are identical.

e.g. Q1 2SC2412NRTB, LNSTB ← Production parts number
[2SC2412] ← Supply parts number

- The supply parts number is described alone in the replacement parts list.
- This schematic diagram may be modified at any time with the development of new technology.

+B Voltage Line ⇒ FM Signal Line
LW, MW, SW Signal Line
Main Signal Line
FM, LW, MW, SW VCO Out Line
LW, MW, SW 2nd OSC Signal Line
FM, LW, MW, SW Vcap In Line

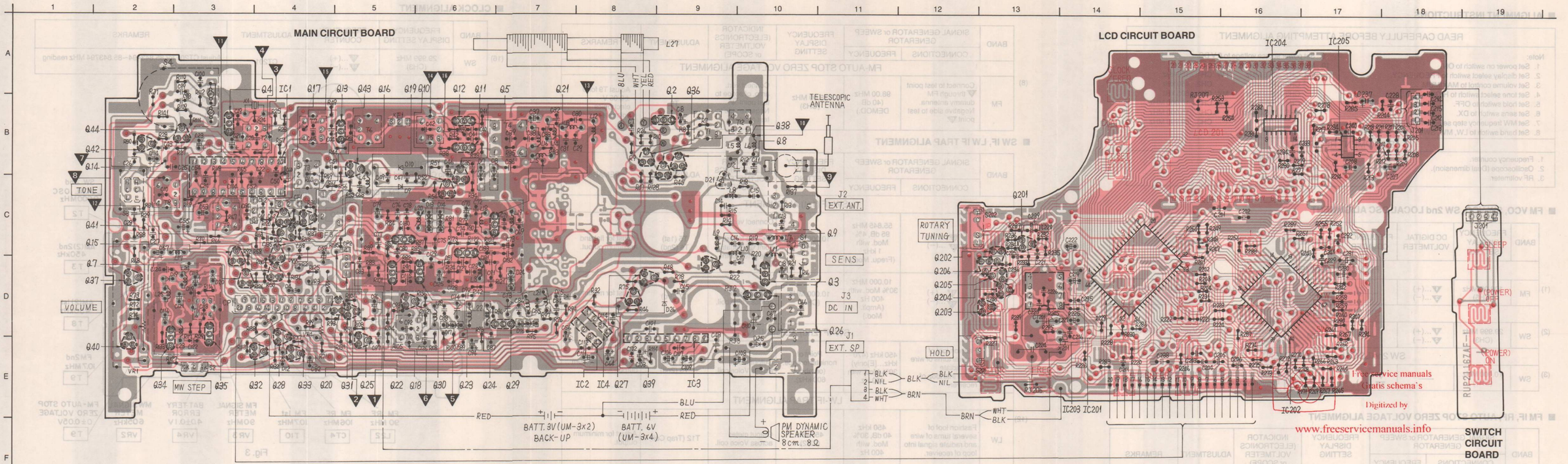


ELECTRICAL PARTS LIST

REPLACEMENT PARTS LIST

Ref. No.	Part. No.	Part Name & Description
		INTEGRATED CIRCUITS
IC1	TA7758P	IC (FM/AM IF, DET, AF AMP, AM MIX, OSC)
IC2	RVILA5003	IC (REGULATOR)
IC3	LA4147	IC (POWER AMP)
IC4	LA5004	IC (REGULATOR)
IC201	UPD1706G524	IC (LCD, CLOCK DRIVE, PLL CONTROLLER)
IC202	UPD7508G732	IC (PLL CONTROLLER)
IC203	RV1UPB556C	IC (PRE SCALER)
IC204	MN74HC386S	IC (UP/DOWN COUNTER)
IC205	BA6993FT	IC (COMPARATOR)
		TRANSISTORS
Q2,3	2SK427T	Transistor (AM RF AMP)
Q4,18,21,22,23,24	2SC3315B	Transistor (AM 2nd OSC, BUFFER AMP, FM/AM 1st LOCAL OSC)
Q5,7,8,9,25,41,42,44	2SB709R	Transistor (AGC, SWITCHING, AF AMP)
Q10,19,20,27,31,37,38,39	2SD601R	Transistor (AGC, BUFFER AMP SWITCHING)
Q11,12	2SK427S	Transistor (MIXER)
Q13,29	2SK193K	Transistor (AM IF AMP, FM RF AMP)
Q14	2SC2295B	Transistor (MUTING)
Q15,32	2SB779R	Transistor (SWITCHING)
Q16,30	2SC2404C	Transistor (AGC AMP, FM RF AMP)
Q17,43	2SC2295B	Transistor (IF AMP, MUTING)
Q26	2SB793R	Transistor (REGULATOR)
Q28	2SD601S	Transistor (REGULATOR)
Q33	2SK160K4	Transistor (REGULATOR)
Q34,35	2SC3313B	Transistor (CONVERTER)
Q36	2SD596DV2	Transistor (AGC)
Q40	2SD813RTW	Transistor (SWITCHING)
Q201,203	2SK160K5	Transistor (LOW PASS FILTER)
Q202,204,206	2SC1622AD17	Transistor (LOW PASS FILTER)
Q205	2SB709R	Transistor (LOW PASS FILTER)
		DIODES & RECTIFIERS
D4,18,20,26	MA700	Diode (RECT, SWITCHING)
D7,8	MA553	Diode (AGC)
D9,10	20A90	Diode (AGC)
D12	MA4047MRA	Diode (REGULATOR)
D13,14,16,17,24	RVD1SV147	Diode (AM Vcap, FM Vcap)
D15	RVD1SS135	Diode (SWITCHING)
D19	RVDMTZ13C	Diode (RECT)
D21	MA57TW	Diode (SWITCHING)
D25	RVD1SR35	Diode (PROTECTOR)
		COILS
L3	RL04N219-0	Coil, FM VCO
L4	RLQZPR39ML-Y	Coil, Choke
L5	RLQZN680K-D	Coil, Choke
L6	RLQZP181K-Y	Coil, Choke

CIRCUIT BOARD AND WIRING CONNECTION DIAGRAM



REPLACEMENT PARTS LIST

Ref. No.	Part. No.	Part Name & Description
L7	RLQZN220K-D	Coil, Choke
L8	ELJFA6R8KT-D	Coil, Choke
L9	ELJFA1R0K	Coil, Choke
L10	ELJFAR47KT-D	Coil, Choke
L11,24	RLQZN221K-D	Coil, Choke
L12	RLQZPR47ML-Y	Coil, Choke
L13,16,28	RLQZP1R0M	Coil, Choke
L14	RLQZP1R5M	Coil, Choke
L15,19	RLQZPR22M	Coil, Choke
L17	RLQZN470K-D	Coil, Choke
L18	RLQZPR56ML-Y	Coil, Choke
L20	RL04N207-0	Coil, SW VCO
L21	RL04N216-0	Coil, FM RF
L22	RL04N208-0	Coil, FM RF
L23	RLQZP221K-Y	Coil, Choke
L25	RLQZN101K	Coil, Choke
L27	RLF6D19-0	Antenna Coil, AM
TRANSFORMERS		
T1	RLA6C1-T	IFT, LW, MW
T2	RL03A12-T	SW 2nd Local OSC
T3	RLI2A35-T	AM 2nd
T4	RLA3Z11-0	Mixing
T5,6	RLI3A1-T	IFT, AM
T7	RLI3A3-T	IFT, AM
T8	RLI2A34-T	AM 1st
T9	RLI4A33-T	IFT, FM
T10	RLI4A8	IFT, FM
T11	RL09A11-T	OSC, DC-DC CONVERTER
T12	RLI2A27	IFT, LW
TRIMMER CONDENSER		
CT3,4	RCVCTZ3110	Trimmer Capacitor
CT201	ECRLA020E12	Trimmer Capacitor
VARIABLE RESISTORS		
VR1	EWAMFOX05A54	Volume Control VR (50 kΩ/A)
VR2	QVNB3A00B223	MW Signal Meter Adjustment VR (22 kΩ/B)
VR3	QVNB3A00B103	FM Signal Meter Adjustment VR (10 kΩ/B)
VR4	QVNB3A00B472	Battery Error Adjustment VR (4.7 kΩ/B)
RESONATORS		
X1	RVCA55395NZW	Crystal
X201	RVCQ150NZF	Crystal
CERAMIC FILTERS		
CF1,2	RVFSFE107MAR	Ceramic Filter
CF3	RVFSFR450I1	Ceramic Filter
XF1	RVX55M845B	Ceramic Filter
FLUORESCENT LEVEL METER		
LCD201	HLC9340	Display
SWITCHES		
S1	RSS2B43Y	Slide Switch, Sensitivity
S2	QSS1228	Slide Switch, MW Step
S3	RSS2B60ZA-M	Slide Switch, Tone
S4	EVQWWHF1025B	Rotary Switch, Tuning
S201	RSS2B40ZA-Q	Slide Switch, Hold
S202	RSS3B32Z	Slide Switch, Lock/Slow/Fast
JACKS		
J1	QJA0199	Jack, EXT, SP
J2	RJJD5M2ZA-H	Jack, EXT ANT
J3	RJJ1B1Z	Jack, DC IN

Numbering System of Resistor

Example:

ERD	25	F	J	101
Type	Wattage	Shape	Tolerance	Value (100Ω)

ERJ	6G	C	J	2R2
Type	Wattage	Shape	Tolerance	Value (2.2Ω)

Resistor Type		Wattage	Tolerance
ERD:	Carbon Resistor	10 : 1/8W	F : ±1%
ERC:	Solid Resistor	25 : 1/4W	G : ±2%
ERF:	Incombustible Box-Shaped Wire-Wound Resistor	50 : 1/2W	J : ±5%
		18 : 1/3W	K : ±10%
		14 : 1/4W	H : ±20%
		12 : 1/3W	
ERG:	Metal Oxide-Film Resistor	1 : 1W	
		2 : 2W	
ERM:	Wire-Wound Resistor	3 : 3W	
		S1 : 1/2W	
ERO:	Superstable Metal Film Resistor	S2 : 1/4W	
		6G : 1/16W	
		8G : 1/8W	
ERX:	Metal-Film Resistor		
RRJ: ERJ:	Chip Resistor		

※ Capacity are in microtarads (μF) unless specified otherwise, P=Pico-farads.
※ Resistance are in ohms (Ω), unless specified otherwise, 1K=1,000Ω, 1M=1,000KΩ

Ref. No.	Part. No.
RESISTORS	
R7	RRJ6GCJ100
R8,22	ERJ6GCJ220
R9,94,129	ERJ6GCJ222
R10,17,34,39,41, 70,83,84,107,116	ERJ6GCJ102
R12,38,40,42,53, 79,87,89,97,98	ERJ6GCJ101
R13,19,30,32,46, 82,85,100	ERJ6GCJ104
R14,33,44,59,61, 90	ERJ6GCJ331
R15	ERJ6GCJ330
R16,20,49,101, 105,132,138	ERJ6GCJ470
R18,25,29,43,73, 78,135	ERJ6GCJ332
R21	ERJ6GCJ100
R23	ERJ6GCJ122
R24,118	RRJ6GCJ473
R26,27,28,51	ERJ6GCJ472
R31,88	ERJ6GCJ122
R35,62,67	RRJ6GCJ332
R36,66,96	RRJ6GCJ101
R37,63,81,92, 115,127	RRJ6GCJ103
R45,72,91,106, 108,109,110,111, 112,121	ERJ6GCJ103
R47,48,68,71,75, 76,93,113,125, 128,131	ERJ6GCJ223
R50,69,126,130	RRJ6GCJ223
R52	ERJ6GCJ474
R54	ERJ6GCJ682
R56	ERJ6GCJ334
R58,64	ERJ6GCJ221
R60	ERJ6GCJ562
R65	RRJ6GCJ331
R74	ERJ6GCJ473
R77	ERJ6GCJ472
R80,95,134	RRJ6GCJ104
R86,104,123	ERJ6GCJ151
R99	RRJ6GCJ123
R102	ERJ6GCJ274
R103,114	ERJ6GCJ471
R117,122,137	RRJ6GCJ333
R124	ERJ6GCJ561
R133	ERJ6GCJ823
R141	RRJ6GCJ222
R142	RRJ6GCJ681
R201,202,203, 204,220,236,244	ERJ6GCJ102
R205,206,207, 231,246,247,248, 249,250,253,254, 261,265,267,269, 271,281,282	RRJ6GCJ473
R208	RRJ6GCJ394
R209	RRJ6GCJ184
R213,232	RRJ6GCJ472
R214,258,259, 260	RRJ6GCJ223
R217,234,242, 278,280,284	RRJ6GCJ104
R218,294	RRJ6GJC153
R226	RRJ6GCJ470
R233	RRJ6GCJ331
R237	RRJ6GCJ182
R238,245,283	RRJ6GCJ471
R239	RRJ6GCJ330
R243,277,279	RRJ6GCJ333
R257,295	RRJ6GCJ105
R285	RRJ6GCJ681
CHIP JUMPERS	
RJ1,4	ERJ6GCJ000
RJ2,3	RRD18XK000
RJ207,208,209	RRJ6GCJ000

This printed circuit board is shown from the back side of chip parts.

Notes:

1. The circuit shown in ( ) on the conductor indicates printed circuit on the back side of the printed circuit board.
2. The circuit shown in ( ) on the conductor indicates printed circuit on the front side of the printed circuit board.
3. The symbols ( ) shown in the circuit board indicate connection points between conductors on the front side and back side of the circuit board.
4. : Chip Jamper.
5. : Chip Resistor.

•This circuit board diagram may be modified at any time with the development of new technology.

RF-B60L

MEASUREMENTS AND ADJUSTMENTS

■ ALIGNMENT INSTRUCTIONS

READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Note:
1. Set power on switch to ON.
2. Set display select switch to FREQUENCY.
3. Set volume control to MAXIMUM.
4. Set tone select switch to HIGH.
5. Set hold switch to OFF.
6. Set sens switch to DX.
7. Set MW frequency step select switch to 9 kHz.
8. Set band switch to LW, MW, SW or FM.
9. Set power source voltage to 6 V DC.
10. Memorize the following frequency.
FM CH1…87.5 MHz, CH2…90.0 MHz, CH3…98.0 MHz, CH4…106.0 MHz, CH5…108.0 MHz
LW CH1…155 kHz, CH2…450 kHz
MW CH1…605 kHz
SW CH1…10.000 MHz, CH2…15.000 MHz, CH3…29.999 MHz

EQUIPMENT REQUIRED

1. Frequency counter.
2. Oscilloscope (Dual dimension).
3. RF voltmeter.
4. DC digital voltmeter.
5. Ampere meter.
6. Signal generator.

■ FM VCO, SW VCO, SW 2nd LOCAL OSC ALIGNMENT

	BAND	FREQUENCY DISPLAY SETTING	DC DIGITAL VOLTMETER	FREQUENCY COUNTER	ADJUSTMENT	REMARKS
			FM VCO ALIGNMENT			
(1)	FM	108.00 MHz (CH5)	▽…(+) ▽…(−)	—	L3	Adjust L3 for 8.0 ±0.1 V reading on DC digital voltmeter.
			SW VCO ALIGNMENT			
(2)	SW	29.999 MHz (CH3)	▽…(+) ▽…(−)	—	L20	Adjust L20 for 10.0 ±0.1 V reading on DC digital voltmeter.
			SW 2nd LOCAL OSC ALIGNMENT			
(3)	SW	10.000 MHz (CH1)	—	▽…(+) ▽…(−)	T2	Adjust T2 for 55, 395 MHz ±50 Hz reading on frequency counter.

■ FM IF, RF, AUTO STOP ZERO VOLTAGE ALIGNMENT

	BAND	SIGNAL GENERATOR or SWEEP GENERATOR CONNECTIONS	SIGNAL GENERATOR or SWEEP GENERATOR FREQUENCY	FREQUENCY DISPLAY SETTING	INDICATOR (ELECTRONICS VOLTMETER or SCOPE)	ADJUSTMENT	REMARKS
				FM-IF ALIGNMENT			
(4)	FM	Connect to test point ▽ through 0.001µF. Negative side to test point ▽.	10.7 MHz (400 Hz SWP.)	Point of non-interference. (on/about 90 MHz)	Connect vert. amp. of scope to test point ▽. Negative side to test point ▽.	T10 (FM 1st IFT)	Adjust of maximum amplitude. (Refer to fig. 1.)
(5)	FM	〃	〃	〃	〃	T9 (FM 2nd IFT)	Adjust for maximum amplitude. (Refer to fig. 2.)
				FM-RF ALIGNMENT			
(6)	FM	Connect to test point ▽ through FM dummy antenna. Negative side to test point ▽.	90.00 MHz	90.00 MHz (CH2)	Connect vert. amp. of scope to test point ▽. Negative side to test point ▽.	L21 (FM RF Coil) L22 (FM RF Coil)	Adjust for maximum output.
(7)	FM	〃	106.00 MHz	106.00 MHz (CH4)	〃	CT3(FM RF Trimmer) CT4(FM RF Trimmer)	Adjust for maximum output. Repeat steps (6), (7).

	BAND	SIGNAL GENERATOR or SWEEP GENERATOR CONNECTIONS	SIGNAL GENERATOR or SWEEP GENERATOR FREQUENCY	FREQUENCY DISPLAY SETTING	INDICATOR (ELECTRONICS VOLTMETER or SCOPE)	ADJUSTMENT	REMARKS
				FM-AUTO STOP ZERO VOLTAGE ALIGNMENT			
(8)	FM	Connect to test point ▽ through FM dummy antenna. Negative side to test point ▽.	98.00 MHz (40 dB DEMOD.)	98.00 MHz (CH3)	Connect vert. amp. of scope to test point ▽. Negative side to test point ▽.	T9	Adjust T9 for 0 ±0.05 V electronics voltmeter reading.

■ SW IF, LW IF TRAP ALIGNMENT

	BAND	SIGNAL GENERATOR or SWEEP GENERATOR CONNECTIONS	SIGNAL GENERATOR or SWEEP GENERATOR FREQUENCY	FREQUENCY DISPLAY SETTING	INDICATOR (ELECTRONICS VOLTMETER or SCOPE)	ADJUSTMENT	REMARKS
				SW-IF (1st) ALIGNMENT			
(9)	SW	▽…(+) ▽…(−)	55.845 MHz 95 dB, 4% Mod. with 1 kHz (Frequ. Mod.)	10.000 MHz (CH1)	Connect vert. amp. of scope to test point ▽. Negative side to test point ▽.	T5 (1st) T6 (2nd)	Adjust for flat and maximum output.
(10)	SW	▽…(+) ▽…(−)	10.000 MHz 30% Mod. with 400 Hz (Ampli. Mod.)	10.000 MHz (CH1)	Output meter across Voice coil.	T7 (3rd)	Adjust for maximum output.
				SW-IF (2nd) ALIGNMENT			
(11)	SW	Fashion loof of several turns of wire and radiate signal into loop of receiver.	450 kHz (470 kHz…[E]only) 30% Mod. with 400 Hz.	Point of noninterference. (on/about 600 kHz).	Output meter across Voice coil.	T8 (1st) T3 (2nd)	Adjust for maximum output.
				LW-IF TRAP ALIGNMENT			
(12)	LW	Fashion loof of several turns of wire and radiate signal into loop of receiver.	450 kHz 40 dB, 30% Mod. with 400 Hz	450 kHz (CH2)	Output meter across Voice coil.	T12 (Trap Coil)	Adjust for minimum output.

■ SIGNAL METER ALIGNMENT

(※1): When adjusting the signal meter, connect a resistance (330 k and 820 k resisters connected in parallel) to terminals 8 and 12 of CP1.

	BAND	FREQUENCY DISPLAY SETTING	ADJUSTMENT	REMARKS
(13)	FM	90.00 MHz (※1)	VR3	1. A zero signal is used for the input signal. 2. Adjust VR3 so that the first LCD (point A) disappears. (Refer to fig. 5.)
(14)	MW	605 kHz (※1)	VR2	1. A zero signal is used for the input signal. 2. Adjust VR2 so that the first LCD (point A) disappears. (Refer to fig. 5.)

■ BATTERY ERROR ALIGNMENT

	POWER SOURCE	ADJUSTMENT	REMARKS
(15)	4.0 ±0.1 V (POWER…ON)	VR4	Adjust VR4 so that "E" is shown on the LCD. (Refer to fig. 5.)

■ CLOCK ALIGNMENT

	BAND	FREQUENCY DISPLAY SETTING	FREQUENCY COUNTER	ADJUSTMENT	REMARKS
(16)	SW	29.999 MHz (CH3)	▽…(+) ▽…(−)	CT201	Adjust CT201 for 85,843494~85.843794 MHz reading on frequency counter.

Fig. 1

Fig. 2

■ ALIGNMENT POINT

●Please refer to Circuit Board and Wiring Connection Diagram which is located test point.

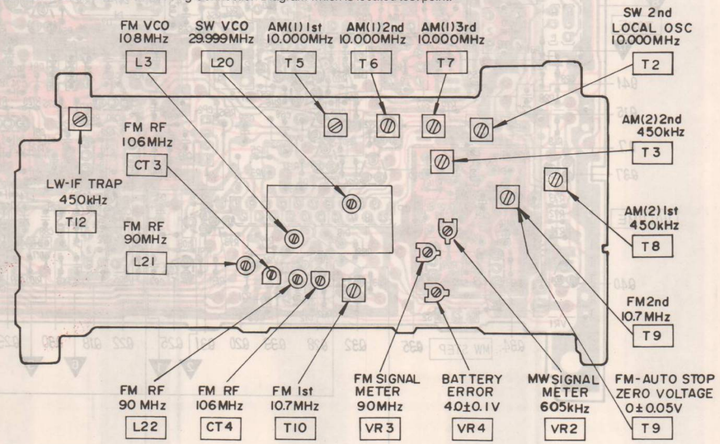


Fig. 3

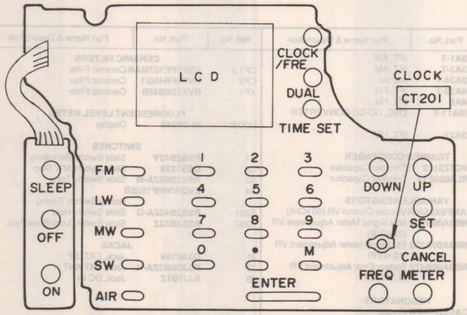


Fig. 4

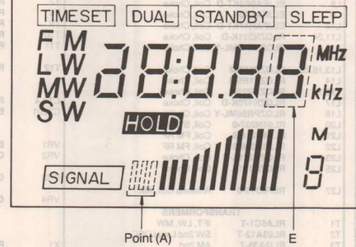
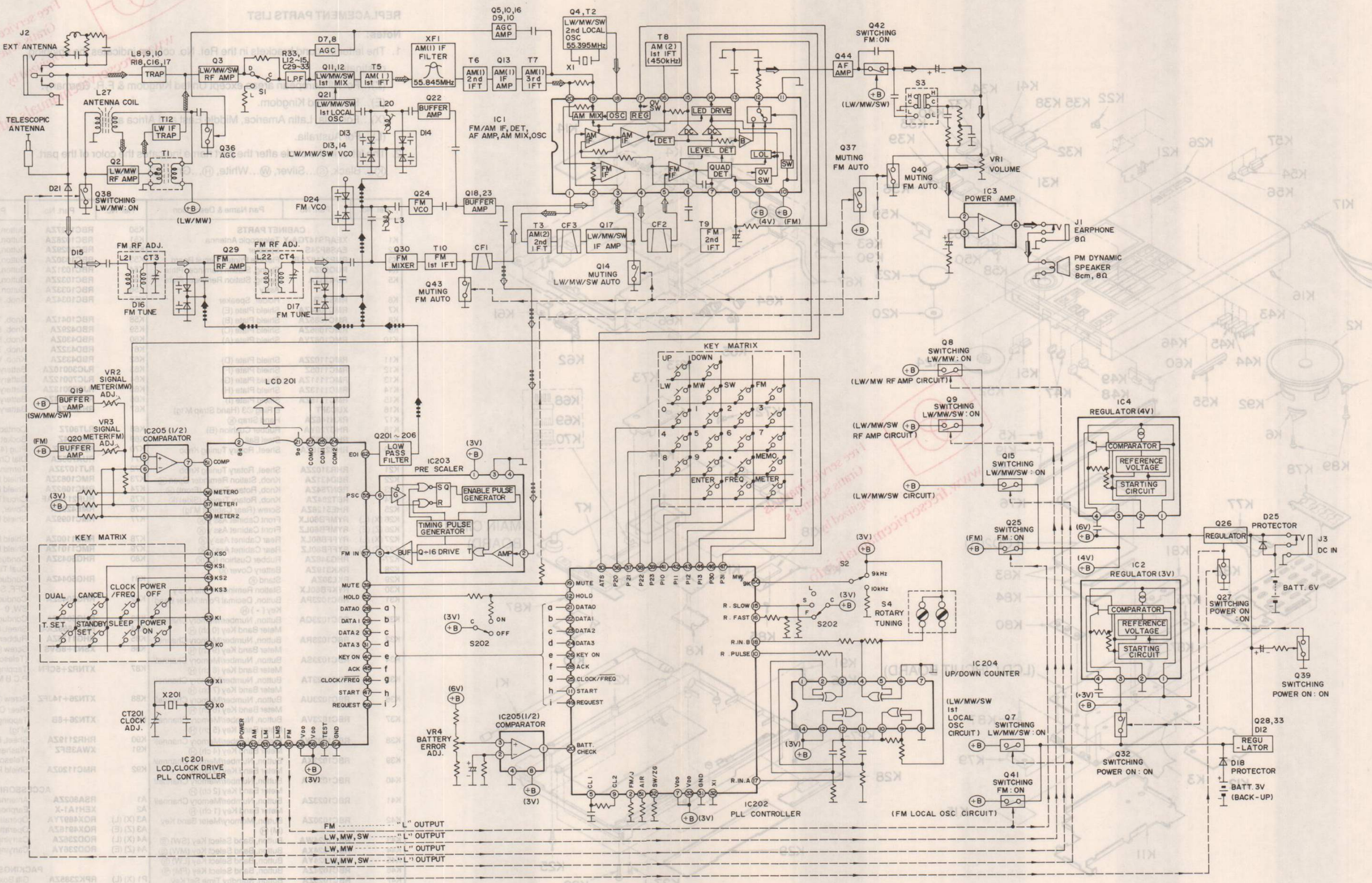


Fig. 5

BLOCK DIAGRAM

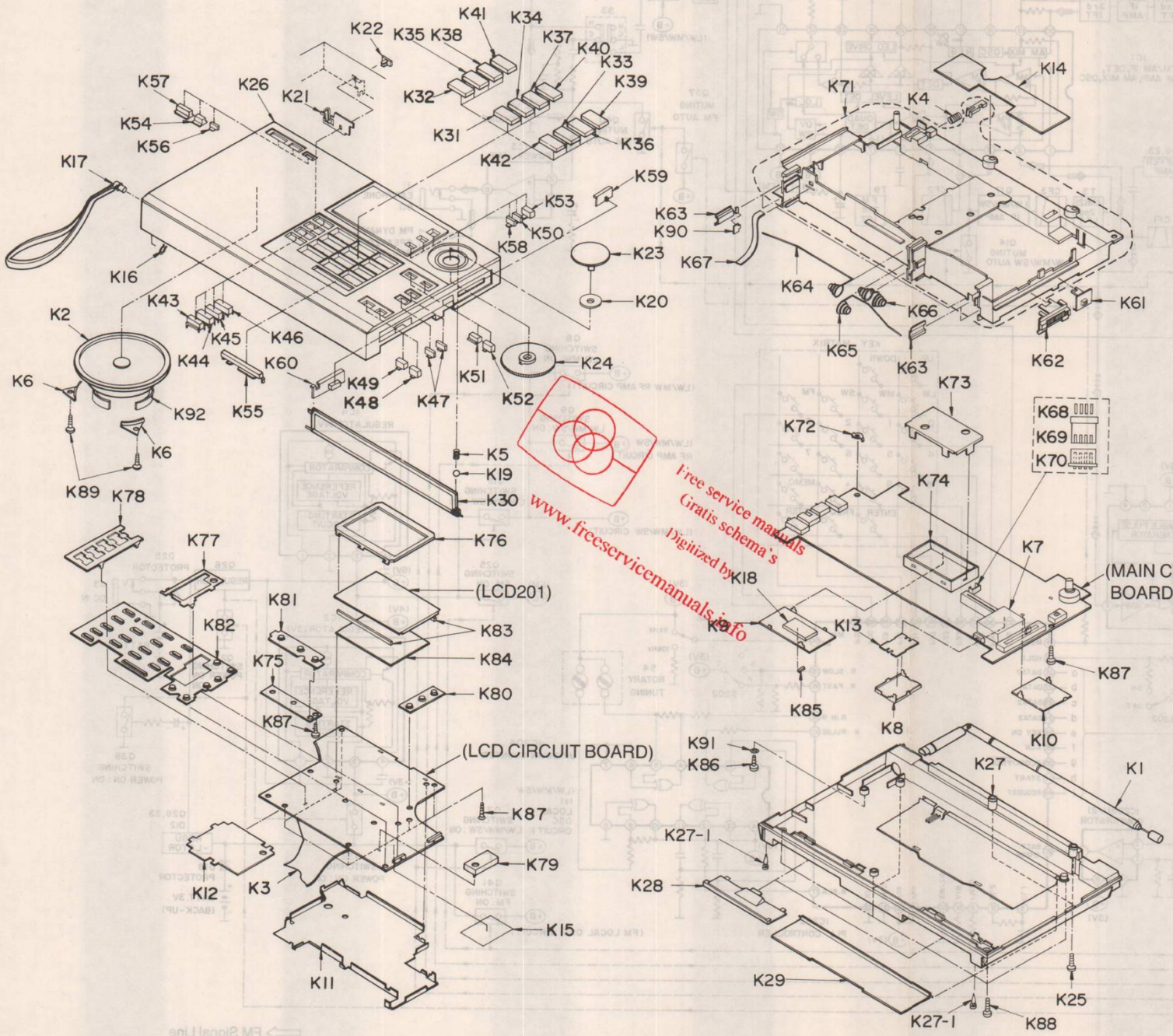


Notes:

1. S1: Sensitivity select switch in "DX" position. (L...LOCAL, D...DX)
2. S2: MW frequency step select switch in "9 kHz" position.
3. S3: Tone select switch in "HIGH" position. (H...HIGH, L...LOW)
4. S4: Rotary tuning switch.
5. S201: Hold switch in "OFF" position.
6. S202: Rotary tuning step select switch in "FAST" position. (L...LOCK, S...SLOW, F...FAST)
7. VR1: Volume control VR.
8. VR2: Signal meter (MW) adjustment VR.
9. VR3: Signal meter (FM) adjustment VR.
10. VR4: Battery error adjustment VR.
11. CT201: Clock frequency adjustment trimmer.

- FM Signal Line
- LW, MW, SW Signal Line
- Main Signal Line
- LW, MW, SW 2nd OSC Signal Line
- FM, LW, MW, SW, VCO Line
- FM, LW, MW, SW, Vcap Line

CABINET PARTS LOCATION



REPLACEMENT PARTS LIST

Notes:

1. The letter in round brackets in the Ref. No. column indicates the shipping destination.
   (Z)...For All European areas except United Kingdom & F.R. Germany.
   (E)...For United Kingdom.
   (X)...For Asia, Latin America, Middle East and Africa areas.
   (L)...For Australia.
2. The letter in the circle after the part name indicates the color of the part.
   Ⓚ... Black, Ⓢ...Silver, Ⓦ...White, Ⓗ...Gray, Ⓖ...Green

Ref. No.	Part. No.	Part Name & Description
		CABINET PARTS
K1	XEARS147GA-Y	Telescopic Antenna
K2	EAS8P24S	Speaker
K3	RUP2118ZAR	Flexible Printed Circuit Board
K4	RUQ52ZA	Spring, Station Reminder Plate
K5	RUQ53ZA	Spring, Station Reminder Plate Ass'y
K6	RMS12B	Holder, Speaker
K7	RMC1084ZA	Shield Plate (E)
K8	RMC1085ZA	Shield Plate (B)
K9	RMC1086ZA	Shield Plate (C)
K10	RMC1087YA	Shield Plate (A)
K11	RMC1102ZA	Shield Plate (D)
K12	RMC1105Z	Shield Plate (F)
K13	RMC1111ZA	Shield Plate (G)
K14	RMC1113ZA	Shield Plate (H)
K15	RMC1115ZA	Shield Plate (I)
K16	XUC3FT	E Ring ∅3 (Hand Strap M'tg)
K17	RKH146ZA	Hand Strap Ⓚ
K18	RHG720YA	Rubber Cushion (B)
K19	RHM156Z	Steel Ball
K20	RHR2110ZA	Sheet, Rotary Tuning Knob
K21	RHR3102ZA	Sheet, Rotary Tuning Knob
K22	RBD431ZA	Knob, Station Reminder Open Ⓚ
K23	RBN754ZA	Knob, Rotary Tuning (Front) Ⓗ
K24	RBT284ZA	Knob, Rotary Tuning (Side) Ⓚ
K25	RHE5128ZA	Screw (Rear Cabinet M'tg)
K26 (X) (L)	RYMFB60LX	Front Cabinet Ass'y Ⓚ
K26 (Z) (E)	RYMFB60LZ	Front Cabinet Ass'y Ⓚ
K27 (X) (L)	RYFFB60LX	Rear Cabinet Ass'y Ⓚ
K27 (Z) (E)	RYFFB60LZ	Rear Cabinet Ass'y Ⓚ
K27-1	RHG348ZA	Rubber Cushion (C) Ⓚ
K28	RKK319ZA	Battery Cover Ⓚ
K29	RKL30ZA	Stand Ⓚ
K30	RYKFB60LX	Station Reminder Plate Ass'y
K31	RBC1023PA	Button, Decimal Point/Meter Band Key (•) Ⓗ
K32	RBC1023QA	Button, Number/Memory Channel/ Meter Band Key (0 ch) Ⓗ
K33	RBC1023RA	Button, Number/Memory Channel/ Meter Band Key (9 ch) Ⓗ
K34	RBC1023SA	Button, Number/Memory Channel/ Meter Band Key (8 ch) Ⓗ
K35	RBC1023TA	Button, Number/Memory Channel/ Meter Band Key (7 ch) Ⓗ
K36	RBC1023UA	Button, Number/Memory Channel/ Meter Band Key (6 ch) Ⓗ
K37	RBC1023VA	Button, Number/Memory Channel/ Meter Band Key (5 ch) Ⓗ
K38	RBC1023WA	Button, Number/Memory Channel/ Meter Band Key (4 ch) Ⓗ
K39	RBC1023XA	Button, Number/Memory Channel/ Meter Band Key (3 ch) Ⓗ
K40	RBC1023YA	Button, Number/Memory Channel/ Meter Band Key (2 ch) Ⓗ
K41	RBC1023ZA	Button, Number/Memory Channel/ Meter Band Key (1 ch) Ⓗ
K42	RBC1030ZA	Button, Memory/Meter Band Key (M) Ⓗ
K43	RBC1024WA	Button, Band Select Key (SW) Ⓢ
K44	RBC1024XA	Button, Band Select Key (MW) Ⓢ
K45	RBC1024YA	Button, Band Select Key (LW) Ⓢ
K46	RBC1024ZA	Button, Band Select Key (FM) Ⓢ
K47	RBC1025ZA	Button, Standby Time Set Key, Standby Time Cancel Key Ⓚ
K48	RBC1026YA	Button, Meter Band Direct Access Key Ⓚ
K49	RBC1026ZA	Button, Frequency Direct Access Key Ⓚ
K50	RBC1027ZA	Button, Dial Time Set Key Ⓗ
K51	RBC1028ZA	Button, Down Key (∨) Ⓚ
K52	RBC1029ZA	Button, Up.Key (∧) Ⓚ
K53	RBC1030ZA	Button, Display Select Ⓗ
K54	RBC1031ZA	Button, Power OFF Key Ⓚ
K55	RBC1032ZA	Button, Enter Key Ⓖ
K56	RBC1033ZA	Button, Sleep Key Ⓚ
K57	RBC1034ZA	Knob, Power ON Key Ⓚ
K58	RBC1041ZA	Knob, Time Set Key Ⓗ
K59	RBD429ZA	Knob, Rotary Tuning Step Select Ⓚ
K60	RBD430ZA	Knob, Hold Ⓚ
K61	RBD432ZA	Knob, Tone Select Ⓚ
K62	RBD433ZA	Knob, Volume Ⓚ
K63	RJC30010ZA	Battery Terminal, +
K64	RJC70012ZA	Battery Terminal, – (Long)
K65	RJC70013ZA	Battery Terminal, – (Short)
K66	RJC70014ZA	Battery Terminal, –
K67	RHS32ZA	Battery Ribbon
K68	RJT807Z	Contact, Socket
K69	RJS4L4Z	Socket (4P/CS2)
K70	RJP4G10Z	Plug (4P/CP2)
K71	RUA735ZA	Dial Chassis Ⓚ
K72	RJT1073ZA	Terminal, Telescopic Antenna
K73	RMC1083ZA	Shield Plate, Over
K74	RMC1082ZA	Shield Plate, Under
K75	RUP2116ZAF	Circuit Board (POWER)
K76	RME429ZA	Cover, LCD
K77	RMC1099ZA	Shield Plate (J)
K78	RMC1100ZA	Shield Plate (K)
K79	RMC1101ZA	Shield Plate (L)
K80	RHG5043ZA	Conductive Rubber, Clock/FREQ, Dual Time, Time Set
K81	RHG5044ZA	Conductive Rubber, Power ON/ OFF, Sleep
K82	RHG5045ZA	Conductive Rubber, FM, LW MW, SW, 0~9 CH etc.
K83	RHG5047ZA	Conductive Rubber
K84	RGX1659ZA-0	Sheet, Insulator
K85	RHG1175ZA	Rubber Cushion (A)
K86	XSN3+8BVS	Screw ⊕3×8 (Telescopic Antenna M'tg)
K87	XTNR2+5CFN	Tapping Screw ⊕2×5 (MAIN/LCD P.C.B M'tg)
K88	XTN26+14JFZ	Screw ⊕2.6×14 (Rear Cabinet M'tg)
K89	XTN26+8B	Tapping Screw ⊕2.6×8 (Speaker M'tg)
K90	RHR2119ZA	Sheet, Battery
K91	XWA3BFZ	Washer ∅3 (Telescopic Antenna M'tg)
K92	RMC1120ZA	Shield Plate, Speaker
		ACCESSORIES
A1	RSA802ZA	Antenna Cord
A2	XEH1A1-X	Earphone
A3 (X) (L)	RQX4897YA	Operating Instructions
A3 (Z) (E)	RQX4916ZA	Operating Instructions
A4 (X) (L)	RQD236ZA	Carrying Case
A4 (Z) (E)	RQD236YA	Carrying Case
		PACKINGS
P1 (X) (L)	RPK2385ZA	Gift Box
P1 (Z) (E)	RPK2415ZA	Gift Box
P2	RPN5131ZA	Cushion
P3	RPH554ZA	Protection Cover (for UNIT)

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