

Service Manual

FM-LW-MW-SW
ALL BAND RECEIVER



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Radio
RF-B60L
(Black)

This is the Service Manual for the following areas.

- ☒ ...For all European areas except United Kingdom & F.R. Germany.
- ☒ ...For United Kingdom.
- ☒ ...For Asia, Latin America, Middle East and Africa areas.
- ☒ ...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)

Intermediate Frequency:

SW; 1.615~29.999 MHz
FM; 10.7 MHz
AM (MW, LW, SW); 450 kHz

Sensitivity:

FM; 4 μ V/50 mW output (-3 dB, Limit Sens)
LW; 1000 μ V/m/50 mW output (at 281 kHz, S/N 20 dB)
MW; 32 μ V/m/50 mW output
SW; 10 μ V/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; ☒ ...220 V, 50 Hz with optional AC adaptor RD-9496S
☒ ...240 V, 50 Hz with optional AC adaptor RD-9496E
☒ ...110~127/220~240 V, 50/60 Hz with optional AC adaptor RD-9496
☒ ...240 V, 50 Hz with optional AC adaptor RD-9496A

Power Output:

550 mW (RMS Max.)
8 cm PM dynamic Speaker, 8 Ω
Earphone; 8 Ω $\varnothing$ 3.5 mm
EXT. ANT. (LW/MW/SW); $\varnothing$ 3.5 mm

Speaker:

DC IN; 6 V
205 (W) $\times$ 119 (H) $\times$ 36 (D) mm
650 g without batteries

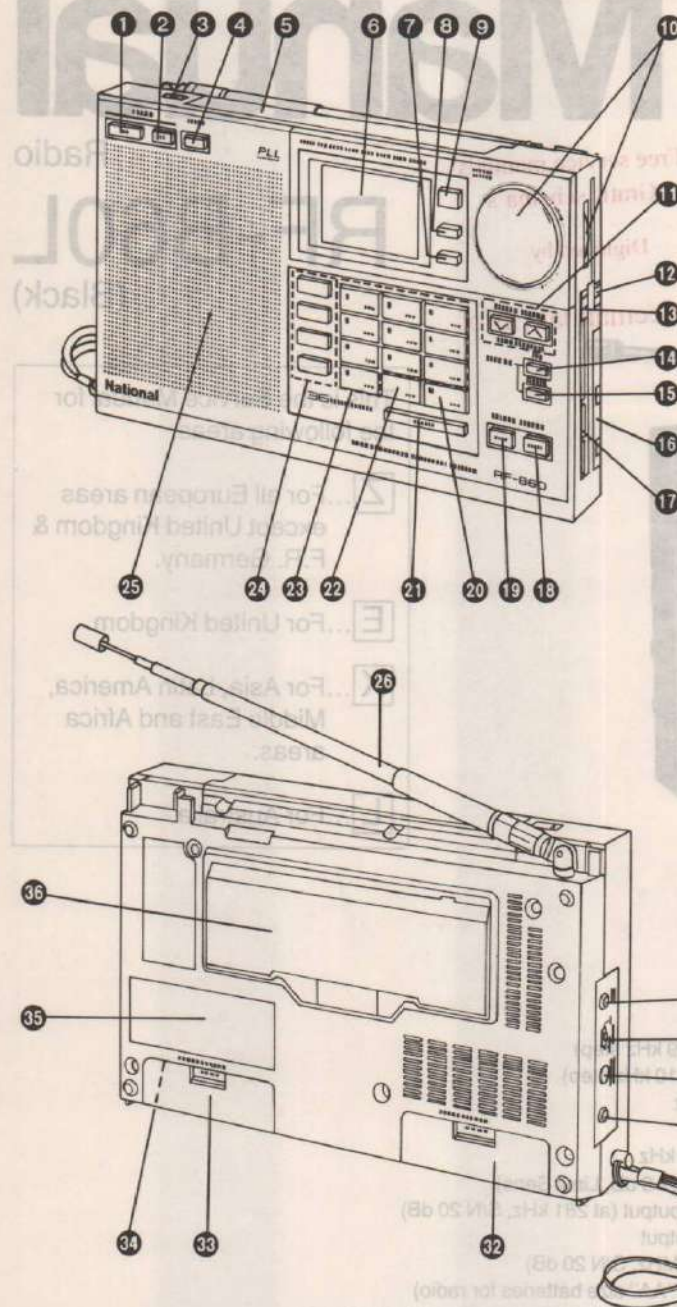
Jacks:

Dimensions:

Weight:

Design and specifications are subject to change without notice.

LOCATION OF CONTROLS AND COMPONENTS



- 1 Power On Key (ON)**
Press the key to turn the radio on.
- 2 Power Off Key (OFF)**
Press the key to turn the radio off.
- 3 Station Reminder Open Switch**
Use the switch to open the Station Reminder cover.
- 4 Sleep Key (SLEEP)**
Press the key to turn the radio off automatically in 60 minutes.
- 5 Station Reminder (STATION REMINDER)**
Attach the included Memory Channel Sheets to the Station Reminder. It is useful for Memory Tuning.
- 6 LCD Multi-Information Display**
- 7 Time Set Key (TIME SET)**
Press the key when setting a clock time.
- 8 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.
- 9 Display Select Key (CLOCK/FREQ)**
Press the key to select the frequency display or the clock display.
- 10 Rotary Tuning Control (ROTARY TUNING)**
- 11 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.
- 12 Tone Selector (TONE)**
- 13 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.
- 14 Standby Time Set Key (SET)**
Press the key to set the time you want to turn the radio on automatically.
- 15 Standby Time Cancel Key (CANCEL)**
Press the key to cancel the standby time.
- 16 Volume Control (VOLUME)**
- 17 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.
- 18 Meter Band Direct Access Key (METER)**
Press the key before calling the lowest frequency of the SW meter band including your desired station.
- 19 Frequency Direct Access Key (FREQ)**
When you know the frequency of your desired station, press the key before entering the frequency number.
- 20 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.

23 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.

24 Band Select Keys

25 Speaker (8 cm, 8Ω)

26 Telescopic Antenna

27 External Antenna Jack (EXT ANT) Ø3.5 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 $\oplus$ $\ominus$)

30 Earphone Jack (C) 8Ω, Ø3.5 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 referring to the World Time Table on the back of the unit.

• The clock time is displayed in 24-hour display.

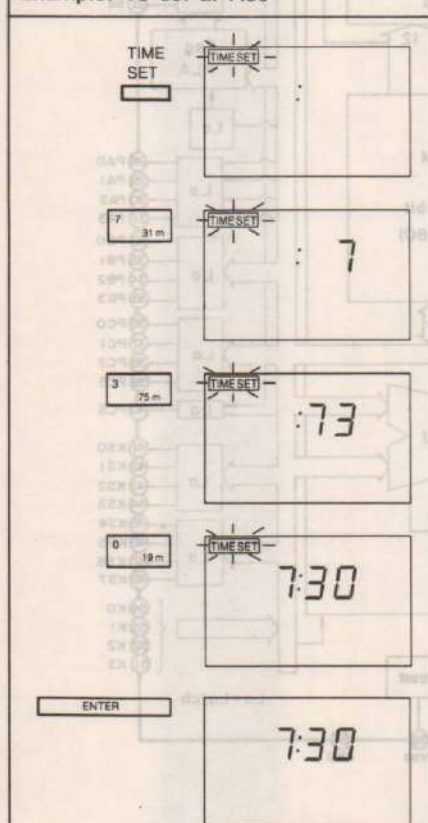
• When the memory back-up batteries are installed, "000" will begin flashing. To set the normal or dual clock time, follow the procedure described below.

• 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.

Example: To set at 7:30

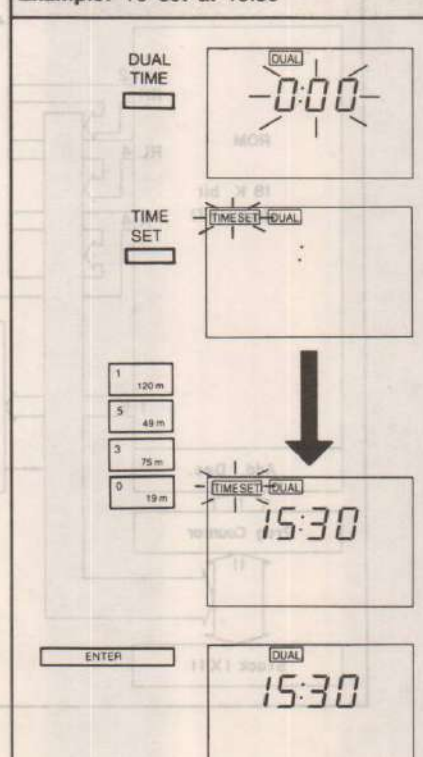


Time setting at 7:30 is completed.

■ To set the dual clock time

1. Press the Dual Time Set Key.
• The indicator (DUAL) will be displayed and the clock time display (000) 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.

Example: To set at 15:30



Time setting at 15:30 is completed.

• 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 this 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:

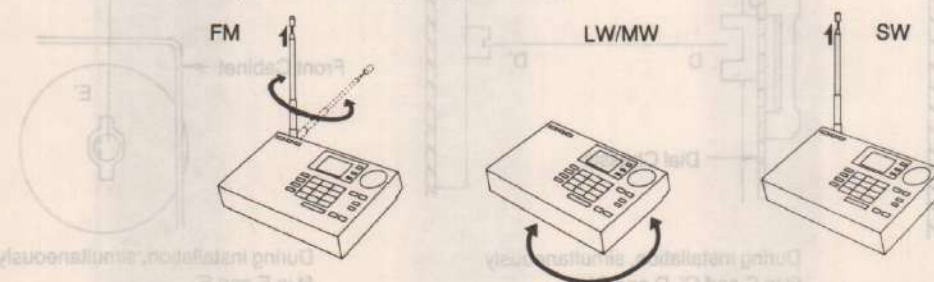
When the memory back-up batteries and the radio batteries are removed, the memories of the radio stations and the clock times may be lost. Be sure to reset the memories and the clock times.

■ 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.

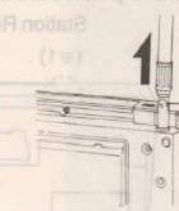
SW: Extend the Telescopic Antenna fully, keep it vertical.



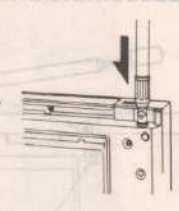
Be sure to fold at the (▼) mark so that mark is on the outside.

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.

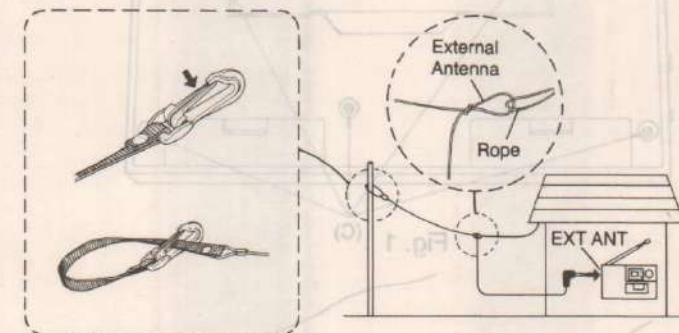


- When folding up the antenna, first push the base back into the set and then push the antenna elements back together starting with the thicker ones.



• 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 Rotary 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 powerful station, set to "LOCAL". It doesn't work for FM reception.

• Signal Indication

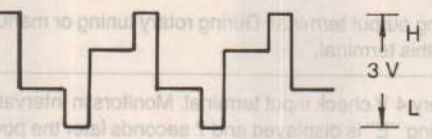
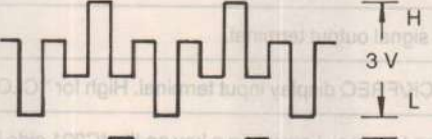
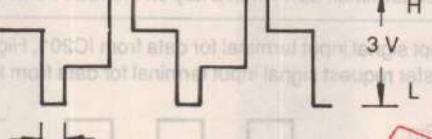
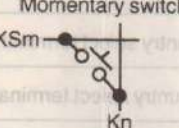
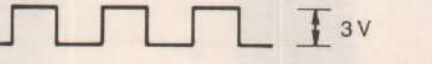
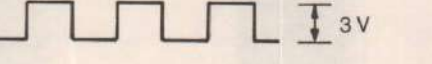
The bar displays indicate the receiving condition.



Signal Indication



3) Explanation of each terminal μ PD1706G524 (IC201)

Pin. No.	Symbol	Description
2~21	1a~9a, 1b~5b, 7b 1c, 2c, 4c, 5c, 7c	Output terminals for LCD segment signals. ($\frac{1}{2}$ duty and $\frac{1}{2}$ 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 μ F capacitor is connected to stabilize the intermediate voltage.
24 25 27	COM2 COM1 COM0	Terminals for LCD common signal output. COM0  COM1  COM2  5 msec
26, 58	V _{DD}	A voltage of 3 V $\pm$ 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. Momentary switch 
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.   5 msec

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 $\frac{1}{17}$. When the contents of the swallow counter become 0, this terminal goes low and the divider ratio of the prescaler becomes $\frac{1}{16}$.
57	FM	Input terminal for the FM local oscillator (VCO) output divided by $\frac{1}{16}$ or $\frac{1}{17}$ 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.

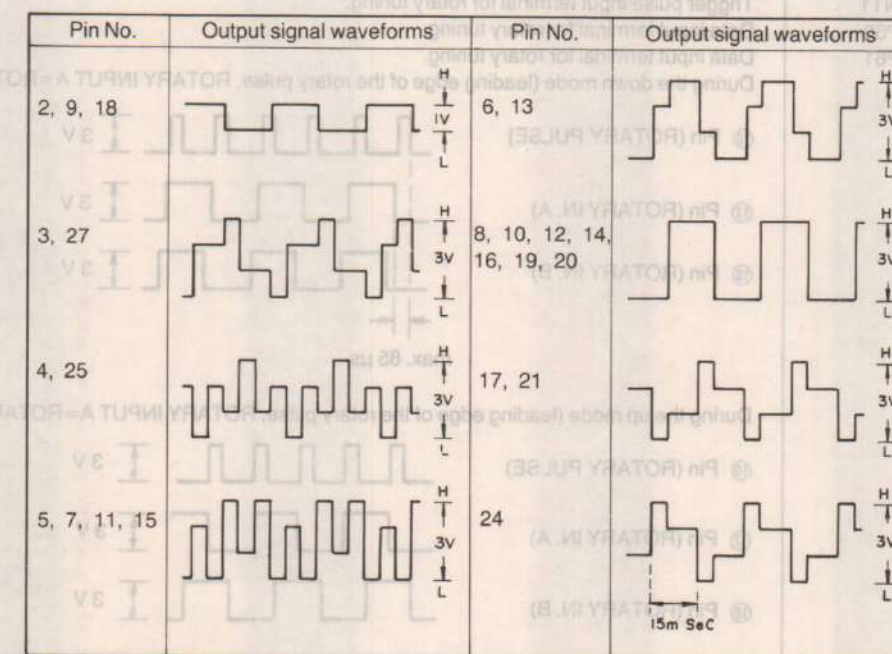


Fig. 3

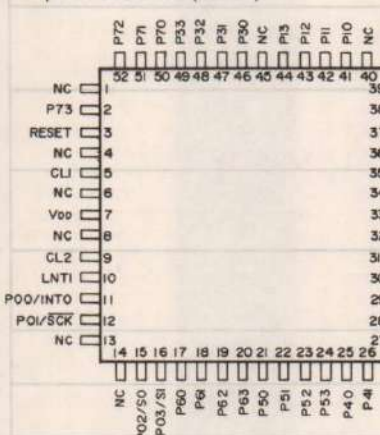
5) Terminal view
μPD7508G732 (IC202)

Fig. 4

6) Block diagram μPD7508G732 (IC202)

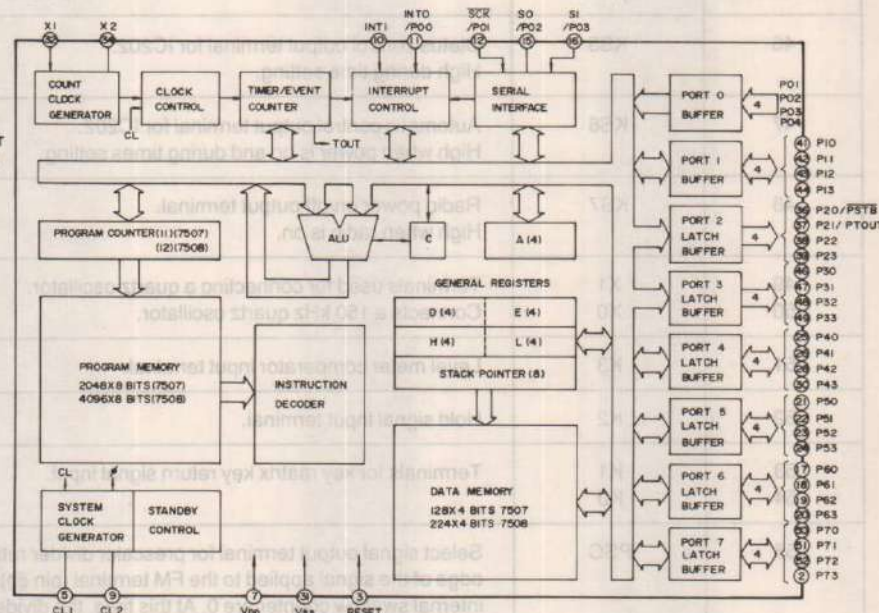


Fig. 5

7) Explanation of each terminal μPD7508G732 (IC202)

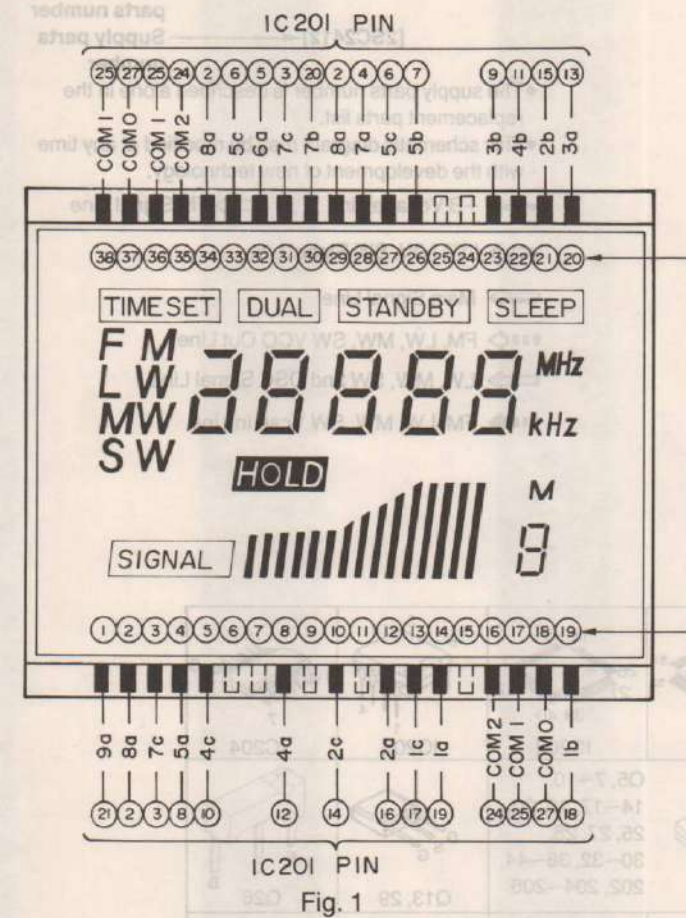
Pin No.	Symbol	Description
2	P73	FM receiving frequency select terminal. Low=87.5–108.0 MHz (for main unit) High=76.0–108.0 MHz
3	REST	Reset signal input terminal.
5	CLI	Clock signal input terminal.
7, 33	V _{DD}	A voltage of 3 V±10% supply to this terminal during device.
9	CL2	Clock signal output terminal.
10	INT1	Trigger pulse input terminal for rotary tuning.
17	P60	Data input terminal for rotary tuning.
18	P61	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)	3 V max. 85 μs
	⑰ Pin (ROTARY IN. A)	3 V
	⑱ Pin (ROTARY IN. B)	3 V
		During the up mode (leading edge of the rotary pulse, ROTARY INPUT A=ROTARY INPUT B):
	⑩ Pin (ROTARY PULSE)	3 V
	⑰ Pin (ROTARY IN. A)	3 V
	⑱ Pin (ROTARY IN. B)	3 V

Pin No.	Symbol	Description
11	PO0/INTO	Start signal input terminal.
12	PO1/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	P42	Accept signal input terminal for data from IC201. High during operation.
49	P33	Transfer request signal input terminal for data from IC201. High during operation.
		④⑨ Pin 3 V
		②⑧ Pin 3 V
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	PSTB/P20~P23	Key return signal source output terminals for the momentary switches in the key matrix.
46	P30	
47	P31	
		④⑨ Pin 3 V
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.

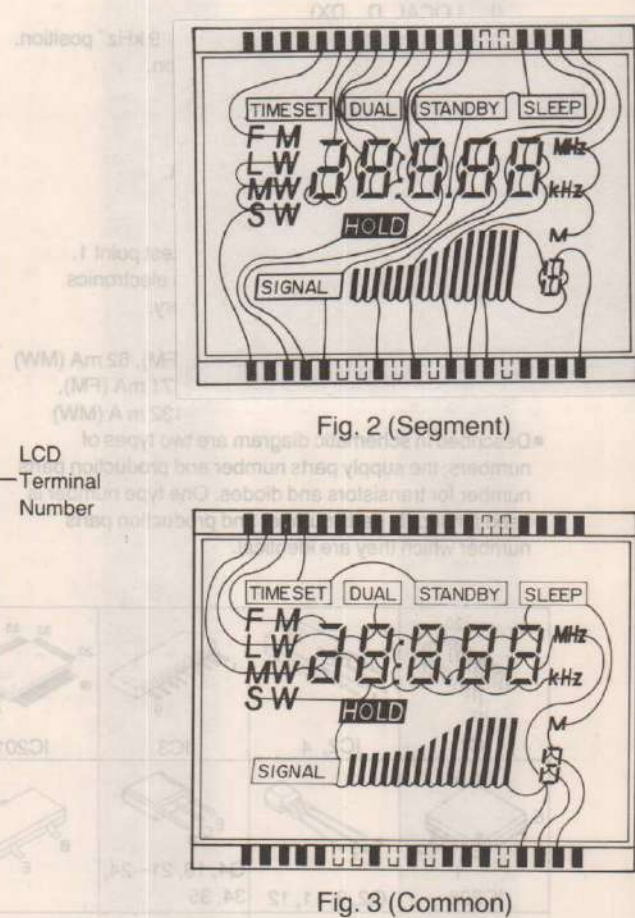
LIQUID CRYSTAL DISPLAY (LCD)

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

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



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



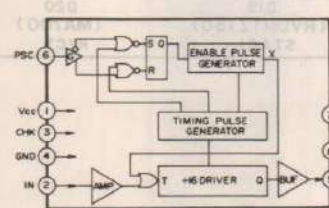
Numbering System of Capacitor

Example:	1H	102	Z	F
Type	Voltage	Value (1000pF)	Tolerance	Peculiarity
ECEA	50	M	R47	
Type	Voltage	Peculiarity	Value (0.47 μF)	

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

Ref. No.	Part No.	Ref. No.	Part No.
C7,25,35,36,39,47,60,98,99,107,112,114	RCUX1E103MD	C74,80,81	RCUX1H010CC
C8,18,53,64,70,94	ECEA1CK100	C75	RCUX1H150JC
C10	RCUX1E104ZF	C76,128	RCUX1H150KC
C11,31	RCUX1H680KC	C79,125	ECEA0GK470
C12	ECCV1H101K	C86,88,131	RCUX1H680JC
C13,15,126	RCUX1H221K	C90,132	RCUX1H050DC
C14	RCUX1H681KB	C96	ECSF1VE474
C16	RCUX1H030CC	C102	RCUX1H222MD
C17,30	RCUX1H050DC	C103,106	ECEA0JU470
C19	RCUX1H270KC	C108	ECEA0JU221
C20,32,42,78,87,123	RCUX1H472MD	C109	ECEA1AU101
C21,23	ECEA0JK220	C110	ECEA1AU471
C22,50,52,58,61	RCUX1H103ZF	C111	ECEA0GK101
C24,72,85	RCUX1H472MD	C113	ECEA1CKS100
C26	RCUX1E223MD	C116	ECEA1HKS3R3
C27,40,41,44,83,89,84	RCUX1H102MD	C118	RCUX1H270KC
C28	RCUX1E683MD	C119	RCUX1H220KC
C29	RCUX1H820KC	C121	ECEA1AKS220
C33,81	RCUX1H020CC	C122	RCUX1E330MD
C34,57,82	ECEA1HK010	C127	RCUX1H390KC
C37	ECEA1HK2R2	C130	RCUX1H330KC
C38,69	RCUX1H070DC	C133	RCUX1H100KC
C43	RCUX1E223MD	C134	RCUX1H820KC
C45,49,65,66,67,68,77,92,97,100,115	RCUX1H103ZF	C135	RCUX1H681KB
C46	ECEA1HKR33	C201,202	ECUV1E104MD
C48,124	RCUX1E104MD	C203,204,205,206,211,220,226,232	RCUX1H103ZF
C51	RCUX1H330KC	C208	ECEA1HKS010
C54,104	RCUX1E153MD	C212,213,214,215,221,223,235,236,240	RCUX1H102MD
C55	ECEA0JK101	C216	RCUX1H470KC
C59	ECEA1EK4R7	C224	RCUX1H105JC
C71	RCUX1H390KC	C228	RCUX1E103MD
C73	ECSE1VY104	C229	RCUX1E223ZF
		C230	RCUX1H151JC
		C231	ECSE1A1105R
		C232,239	ECEA0GK220
		C238	RCUX1E224ZF
		C241	RCUX1H680KC

IC203 RVIUPB556C



Notes:

- S201: Hold switch in "OFF" position.
 - S202: Rotary tuning select switch in "FAST" position. (L...LOCK, S...SLOW, F...FAST)
 - CT201: Clock frequency adjustment trimmer.
 - 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.

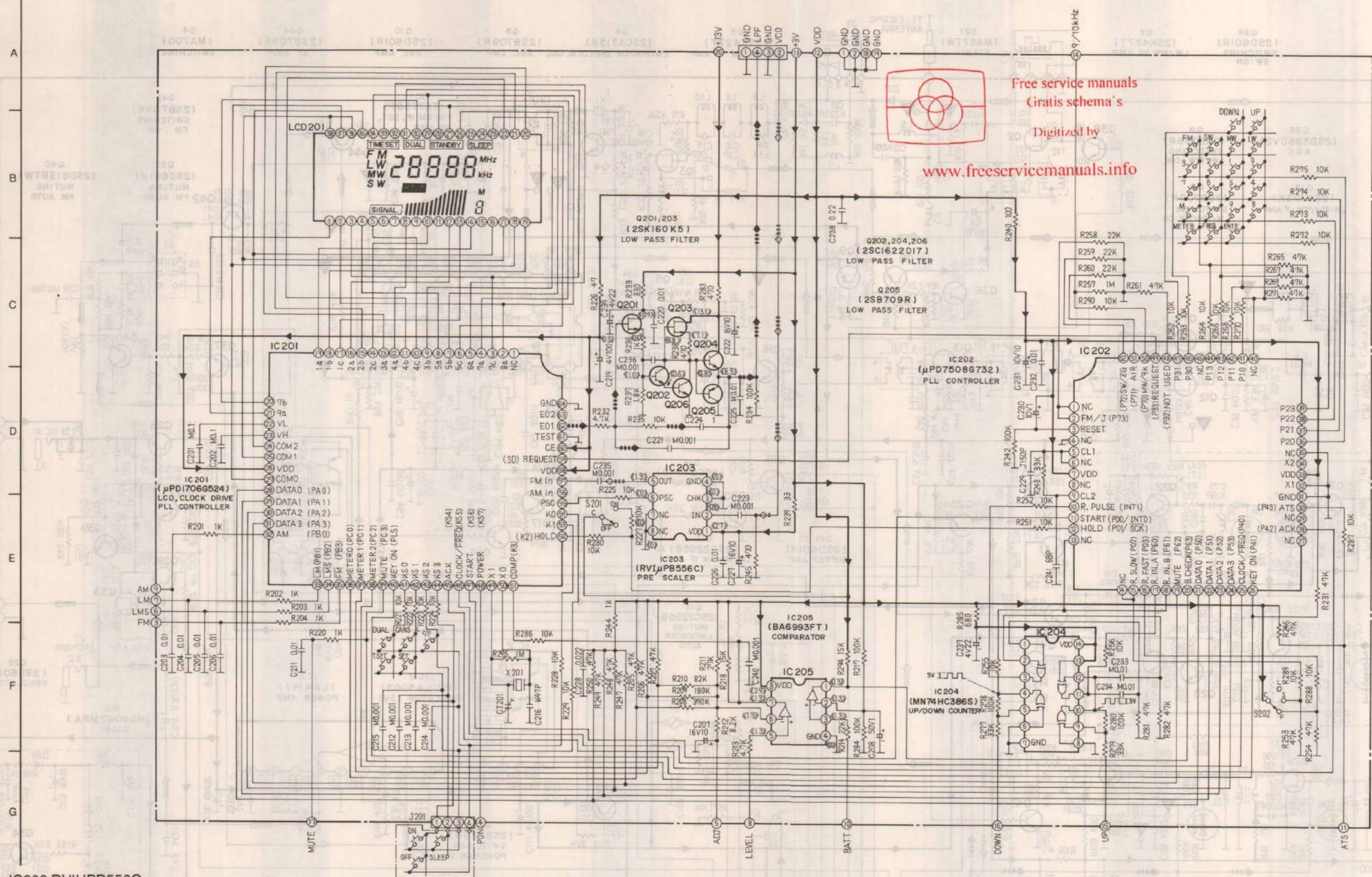
Q1
2SC2412NRTB,
LNSTB ← Production parts number
[2SC2412] ← Supply parts number

- 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



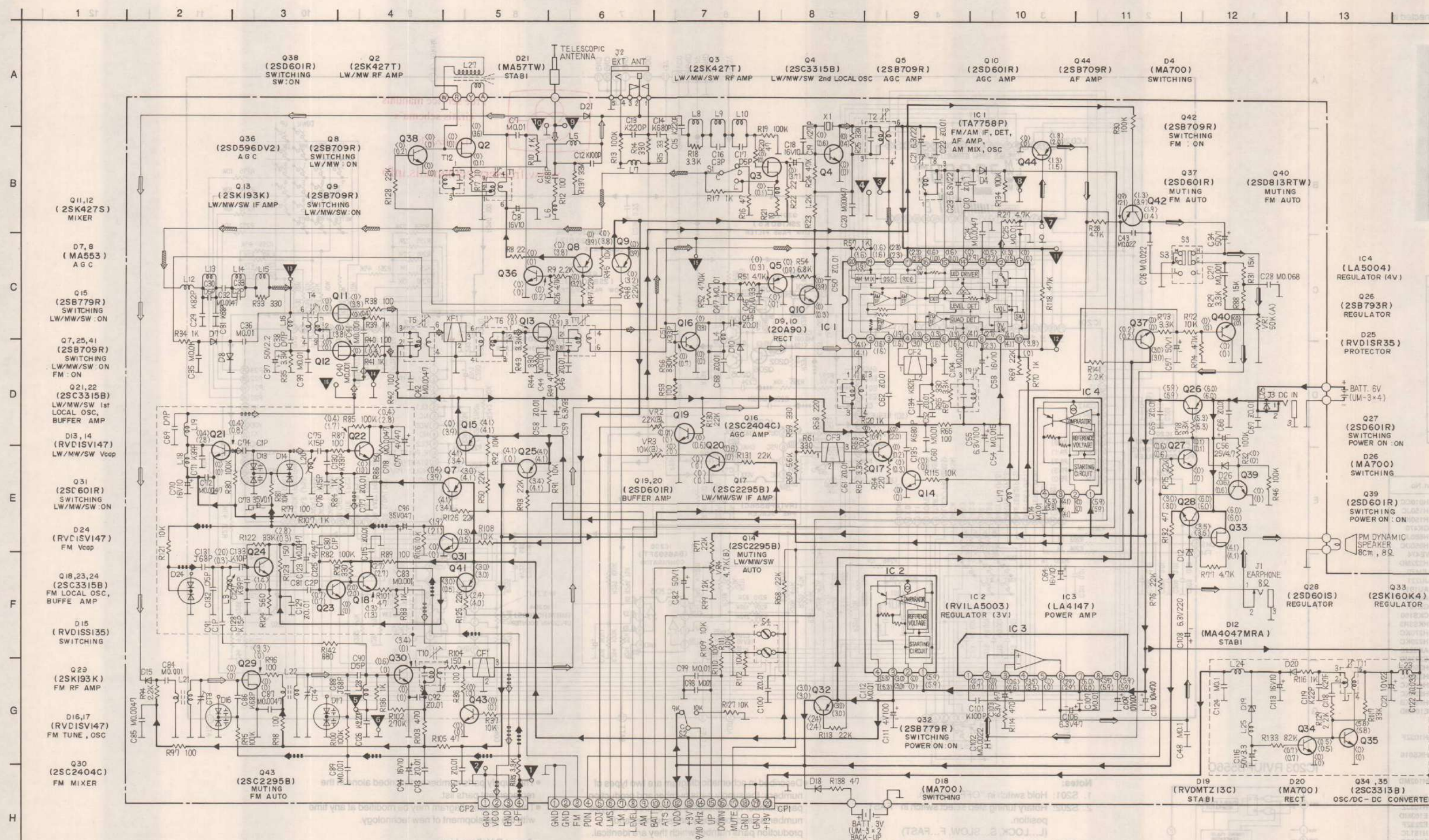
Free service manuals

Gratis schema's

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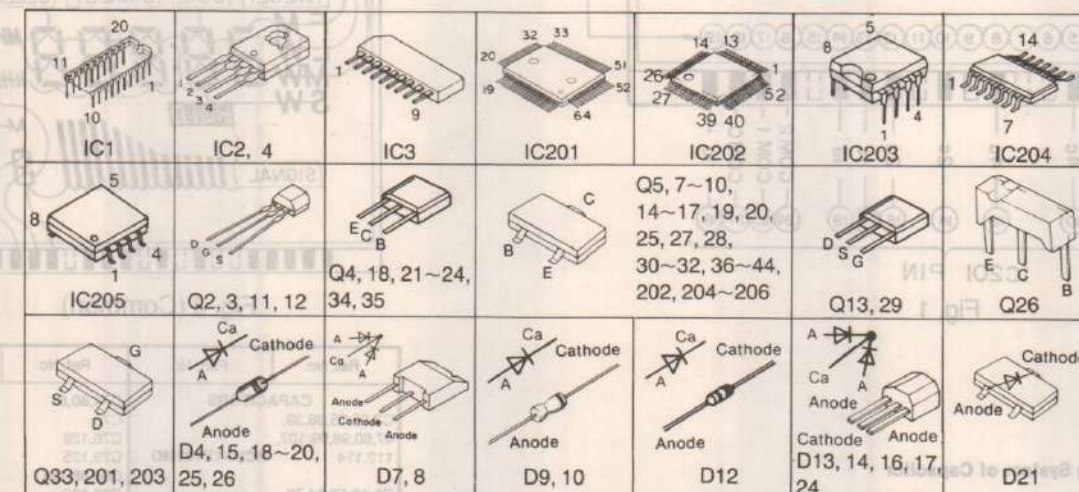
SCHEMATIC DIAGRAM (for Main Circuit Section)



Note:

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

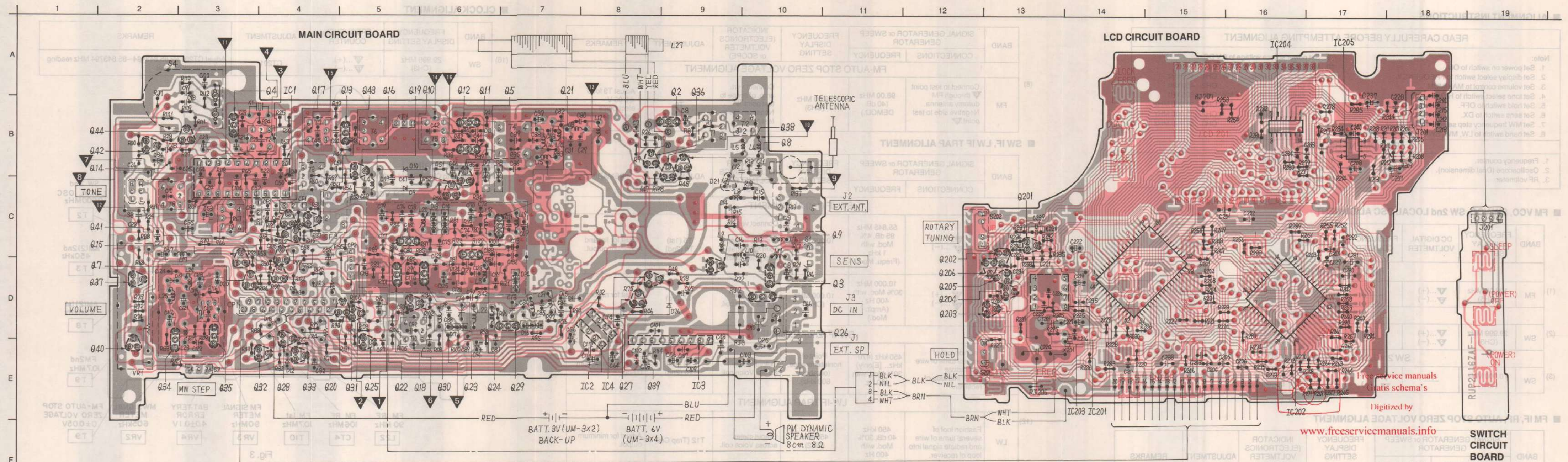


ELECTRICAL PARTS LIST

REPLACEMENT PARTS LIST

Ref. No.	Part No.	Part Name & Description	Ref. No.	Part No.	Part Name & Description
INTEGRATED CIRCUITS					
IC1	TA7758P	IC (FM/AM IF, DET, AF AMP, AM MIX, OSC)	Q17,43	2SC2295B	Transistor (IF AMP, MUTING)
IC2	RV1A5003	IC (REGULATOR)	Q26	2SB793R	Transistor (REGULATOR)
IC3	LA4147	IC (POWER AMP)	Q28	2SD601S	Transistor (REGULATOR)
IC4	LA5004	IC (REGULATOR)	Q33	2SK160K4	Transistor (REGULATOR)
IC201	UPD1706G524	IC (LCD, CLOCK DRIVE, PLL CONTROLLER)	Q34,35	2SC3313B	Transistor (CONVERTER)
IC202	UPD7508G732	IC (PLL CONTROLLER)	Q36	2SD596DV2	Transistor (AGC)
IC203	RV1UPB556C	IC (PRE SCALER)	Q40	2SD813RTW	Transistor (SWITCHING)
IC204	MN74HC388S	IC (UP/DOWN COUNTER)	Q201,203	2SK160K5	Transistor (LOW PASS FILTER)
IC205	BA6993FT	IC (COMPARATOR)	Q202,204,206	2SC1622AD17	Transistor (LOW PASS FILTER)
TRANSISTORS					
Q2,3	2SK427T	Transistor (AM RF AMP)	Q205	2SB709R	Transistor (LOW PASS FILTER)
Q4,18,21,22,23,24	2SC3315B	Transistor (AM 2nd OSC, BUFFER AMP, FM/AM 1st LOCAL OSC)	Q205	2SB709R	Transistor (LOW PASS FILTER)
Q5,7,8,9,25,41,42,44	2SB709R	Transistor (AGC, SWITCHING, AF AMP)	Q205	2SB709R	Transistor (LOW PASS FILTER)
Q10,19,20,27,31,37,38,39	2SD601R	Transistor (AGC, BUFFER AMP SWITCHING)	Q205	2SB709R	Transistor (LOW PASS FILTER)
Q11,12	2SK427S	Transistor (MIXER)	Q205	2SB709R	Transistor (LOW PASS FILTER)
Q13,29	2SK193K	Transistor (AM IF AMP, FM RF AMP)	Q205	2SB709R	Transistor (LOW PASS FILTER)
Q14	2SC2295B	Transistor (MUTING)	Q205	2SB709R	Transistor (LOW PASS FILTER)
Q15,32	2SB779R	Transistor (SWITCHING)	Q205	2SB709R	Transistor (LOW PASS FILTER)
Q16,30	2SC2404C	Transistor (AGC AMP, FM RF AMP)	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	RVD1SV135	Diode (SWITCHING)
D19	RVD1SV135	Diode (RECT)	D21	MA57TW	Diode (SWITCHING)
D21	MA57TW	Diode (SWITCHING)	D25	RVD1SR35	Diode (PROTECTOR)
COILS					
L3	RL04N219-0	Coil, FM VCO	L4	RLQ2PR39ML-Y	Coil, Choke
L4	RLQ2PR39ML-Y	Coil, Choke	L5	RLQ2N680K-D	Coil, Choke
L5	RLQ2N680K-D	Coil, Choke	L6	RLQ2P181K-Y	Coil, Choke

CIRCUIT BOARD AND WIRING CONNECTION DIAGRAM



REPLACEMENT PARTS LIST

Ref. No.	Part No.	Part Name & Description	Ref. No.	Part No.	Part Name & Description	Ref. No.	Part No.	Part Name & Description
L7	RLQZN220K-D	Coil, Choke	T5,6	RLI3A1-T	IFT, AM			CERAMIC FILTERS
L8	ELJFA689KT-D	Coil, Choke	T7	RLI3A3-T	IFT, AM	CF1,2	RVFSFE107MAR	Ceramic Filter
L9	ELJFA1R0K	Coil, Choke	T8	RLI2A34-T	AM 1st	CF3	RVFSFR450I1	Ceramic Filter
L10	ELJFAR447K-T-D	Coil, Choke	T9	RL4A33-T	IFT, FM	XF1	RVX55M845B	Ceramic Filter
L11,24	RLQZN221K-D	Coil, Choke	T10	RLI4A8	IFT, FM			
L12	RLQZPR47ML-Y	Coil, Choke	T11	RL09A11-T	OSC. DC-DC CONVERTER			
L13,16,28	RLQZP1R0M	Coil, Choke	T12	RLI2A27	IFT, LW	LCD201	HLC9340	FLUORESCENT LEVEL METER Display
L14	RLQZP1R5M	Coil, Choke						SWITCHES
L15,19	RLQZPR22M	Coil, Choke		TRIMMER CONDENSER		S1	RSS2B43Y	Slide Switch, Sensitivity
L17	RLQZN470K-D	Coil, Choke	CT3,4	RCVCT23110	Trimmer Capacitor	S2	QSS1228	Slide Switch, MW Step
L18	RLQZPR56ML-Y	Coil, Choke	CT201	ECRLA020E12	Trimmer Capacitor	S3	RSS2B60ZA-M	Slide Switch, Tone
L20	RL04N207-0	Coil, SW VCO				S4	EVQWWHF1025B	Rotary Switch, Tuning
L21	RL04N216-0	Coil, FM RF		VARIABLE RESISTORS		S201	RSS2B40ZA-O	Slide Switch, Hold
L22	RL04N208-0	Coil, FM RF	VR1	EWAMF0X05A54	Volume Control VR (50 kΩ/A)	S202	RSS3B3Z2	Slide Switch, Lock/Slow/Fast
L23	RLQZP221K-Y	Coil, Choke	VR2	QVNB3A00B223	MW Signal Meter Adjustment VR (22 kΩ/B)			
L25	RLQZN101K	Coil, Choke	VR3	QVNB3A00B103	FM Signal Meter Adjustment VR (10 kΩ/B)	J1	QJA0199	JACKS Jack, EXT, SP
L27	RLF6D19-0	Antenna Coil, AM	VR4	QVNB3A00B472	Battery Error Adjustment VR (4.7 kΩ/B)	J2	RJJD5M2ZA-H	Jack, EXT ANT
						J3	RJJ1B1Z	Jack, DC IN
		TRANSFORMERS			RESONATORS			
T1	RLA6C1-T	IFT, LW, MW						
T2	RL03A12-T	SW 2nd Local OSC						
T3	RLI2A35-T	AM 2nd	X1	RVCA55395NZW	Crystal			
T4	RLA3Z11-0	Mixing	X201	RVC0150NZF	Crystal			

Numbering System of Resistor

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

ERJ	6G	C	J	2R2
Type	Wattage	Shape	Tolerance	Value

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

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

Ref. No.	Part No.
RESISTORS	
R7	RRJ6GCJ100
R8,22	ERJ6GCJ220
R9,94,129	ERJ6GCJ220
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

Ref. No.	Part. No.	Ref. No.	Part. No.
R47,48,68,71,75, 76,93,113,125, 128,131	ERJ6GCJ223	271,281,282	RRJ6GCJ473
R50,69,126,130	RRJ6GCJ223	R208	RRJ6GCJ394
R52	ERJ6GCJ474	R209	RRJ6GCJ184
R54	RRJ6GCJ682	R213,232	RRJ6GCJ472
R56	ERJ6GCJ334	R214,258,259, 260	RRJ6GCJ223
R58,64	ERJ6GCJ221	R217,234,242, 278,280,284	RRJ6GCJ104
R60	ERJ6GCJ562	R218,294	RRJ6GCJ153
R65	RRJ6GCJ331	R226	RRJ6GCJ470
R74	ERJ6GCJ473	R233	RRJ6GCJ331
R77	RRJ6GCJ472	R237	RRJ6GCJ182
R80,95,134	RRJ6GCJ104	R238,245,283	RRJ6GCJ471
R86,104,123	RRJ6GCJ151	R239	RRJ6GCJ330
R99	RRJ6GCJ123	R243,277,279	RRJ6GCJ333
R102	ERJ6GCJ274	R257,295	RRJ6GCJ105
R103,114	ERJ6GCJ471	R265	RRJ6GCJ681
R117,122,137	RRJ6GCJ333		
R123	ERJ6GCJ561		CHIP JUMPERS
R134	ERJ6GCJ823	RJ1,4	ERJ6GCJ000
R141	RRJ6GCJ222	RJ2,3	RRD18XK000
R142	RRJ6GCJ681	RJ207,208,209	RRJ6GCJ000
R201,202,203, 204,220,236,244	ERJ6GCJ102		
R205,206,207, 231,246,247,248, 249,250,253,254, 261,265,267,269			

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 Jumper.
5.  : Chip Resistor.

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

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 LW CH1...155 kHz CH2...90.0 MHz CH2...450 kHz CH3...98.0 MHz MW CH1...605 kHz CH4...106.0 MHz SW CH1...10.000 MHz CH5...108.0 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	FREQUENCY DISPLAY SETTING	INDICATOR (ELECTRONICS VOLTMETER or SCOPE)	ADJUSTMENT	REMARKS
CONNECTIONS	FREQUENCY				
FM-IF ALIGNMENT					
(4) FM	Connect to test point ▼ through FM dummy antenna. Negative side to test point ▼.	10.7 MHz (400 Hz SWP.)	Point of non-interference. (on/about 90 MHz)	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)	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).

MARGA NOITTEW CONNECTION DIAGRAM

BAND	SIGNAL GENERATOR or SWEEP GENERATOR	FREQUENCY DISPLAY SETTING	INDICATOR (ELECTRONICS VOLTMETER or SCOPE)	ADJUSTMENT	REMARKS
CONNECTIONS	FREQUENCY				
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)	T9	Adjust T9 for 0 ±0.05 V electronics voltmeter reading.

SW IF, LW IF TRAP ALIGNMENT

BAND	SIGNAL GENERATOR or SWEEP GENERATOR	FREQUENCY DISPLAY SETTING	INDICATOR (ELECTRONICS VOLTMETER or SCOPE)	ADJUSTMENT	REMARKS
CONNECTIONS	FREQUENCY				
SW-IF (1st) ALIGNMENT					
(9) SW	▼...(+) ▲...(-)	55.845 MHz 95 dB, 4% Mod. with 1 kHz (Frequ. Mod.)	10.000 MHz (CH1)	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)	T7 (3rd)	Adjust for maximum output.
SW-IF (2nd) ALIGNMENT					
(11) SW	Fashion loop 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).	T8 (1st) T3 (2nd)	Adjust for maximum output.
LW-IF TRAP ALIGNMENT					
(12) LW	Fashion loop of several turns of wire and radiate signal into loop of receiver.	450 kHz 40 dB, 30% Mod. with 400 Hz	450 kHz (CH2)	T12 (Trap Coil)	Adjust for minimum output.

SIGNAL METER ALIGNMENT

(※1): When adjusting the signal meter, connect a resistance (330 k and 820 k resistors 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.

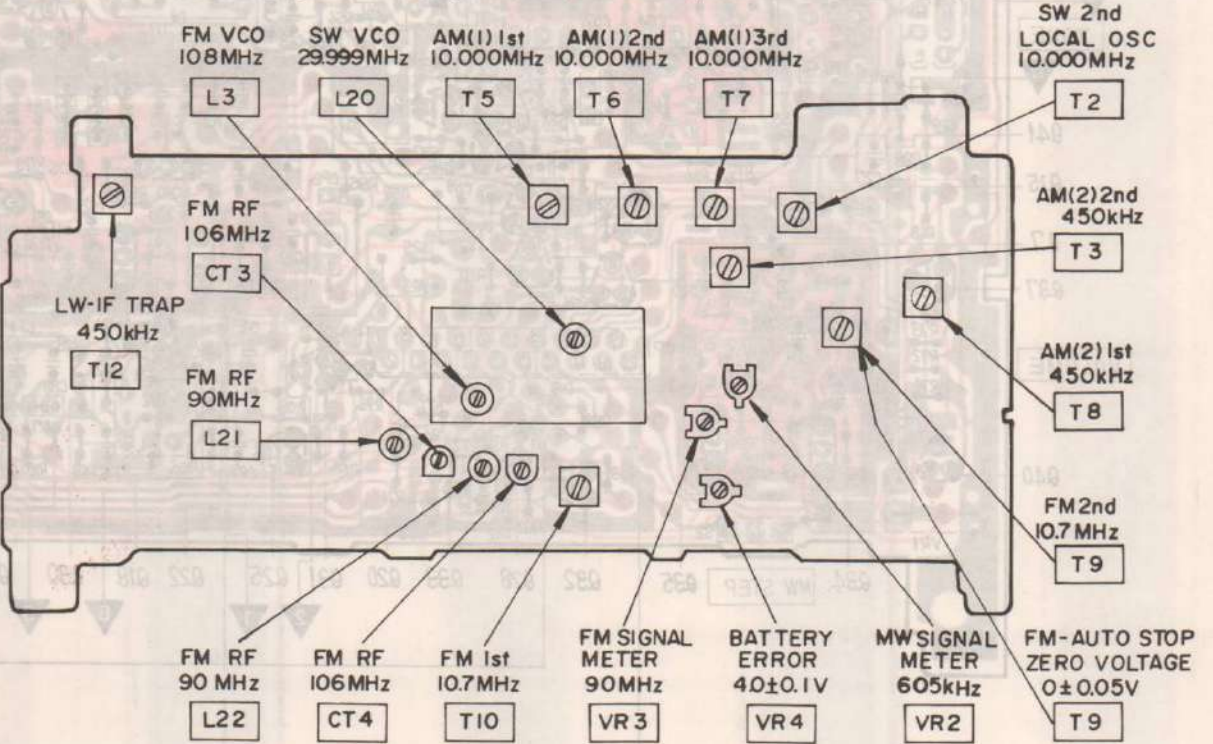


Fig. 3

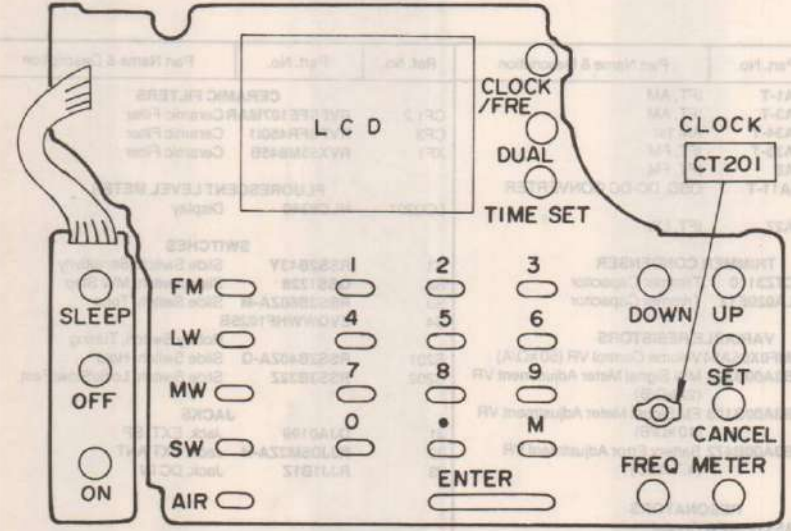


Fig. 4

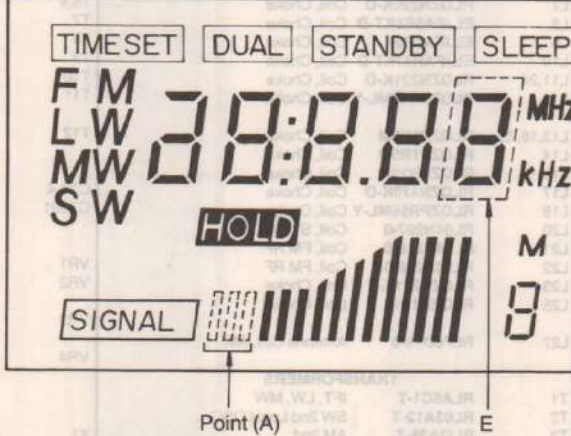
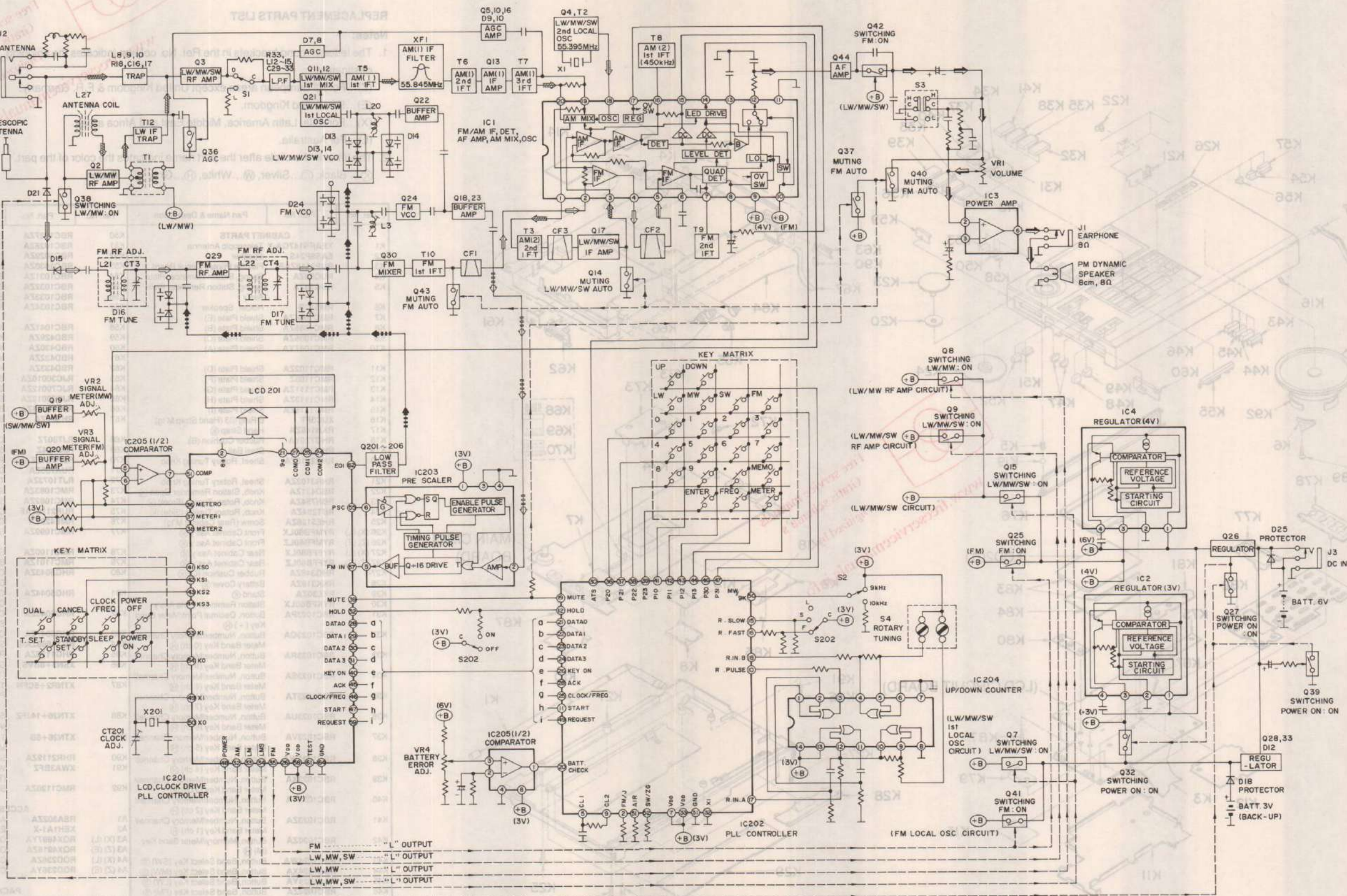


Fig. 5

BLOCK DIAGRAM



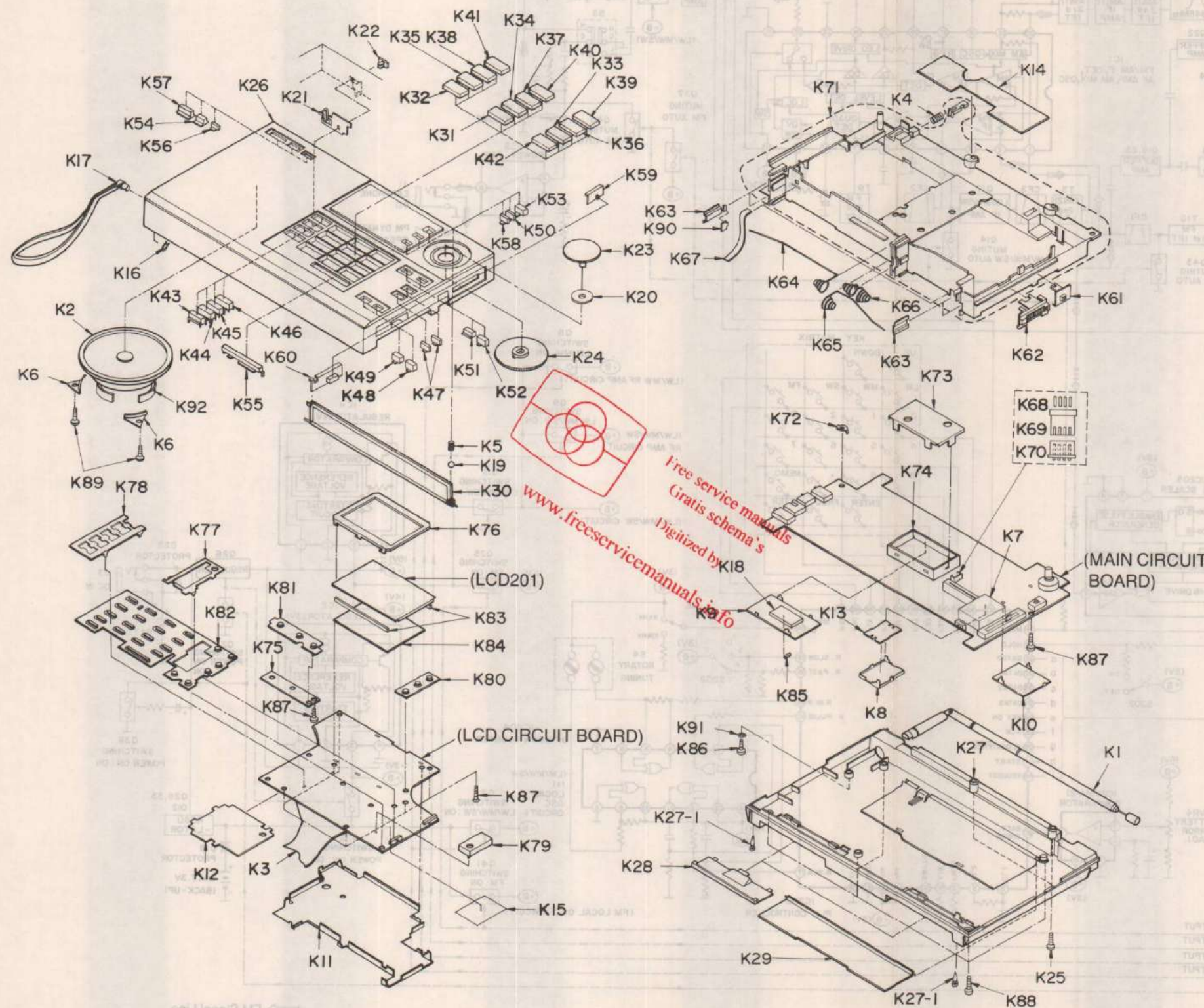
Notes:

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:

- 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.
- The letter in the circle after the part name indicates the color of the part.
(K)...Black, (S)...Silver, (W)...White, (H)...Gray, (G)...Green

Ref. No.	Part. No.	Part Name & Description	Ref. No.	Part. No.	Part Name & Description
CABINET PARTS					
K1	XEARS147GA-Y	Telescopic Antenna	K50	RBC1027ZA	Button, Dial Time Set Key (H)
K2	EAS8P24S	Speaker	K51	RBC1028ZA	Button, Down Key (v) (K)
K3	RUP2118ZAR	Flexible Printed Circuit Board	K52	RBC1029ZA	Button, Up Key (v) (K)
K4	RUQ52ZA	Spring, Station Reminder Plate	K53	RBC1030ZA	Button, Display Select (H)
K5	RUQ53ZA	Spring, Station Reminder Plate Ass'y	K54	RBC1031ZA	Button, Power OFF Key (K)
K6	RMS12B	Holder, Speaker	K55	RBC1032ZA	Button, Enter Key (K)
K7	RMC1084ZA	Shield Plate (E)	K56	RBC1033ZA	Button, Sleep Key (K)
K8	RMC1085ZA	Shield Plate (B)	K57	RBC1034ZA	Knob, Power ON Key (K)
K9	RMC1086ZA	Shield Plate (C)	K58	RBC1041ZA	Knob, Time Set Key (H)
K10	RMC1087YA	Shield Plate (A)	K59	RBD429ZA	Knob, Rotary Tuning Step Select (K)
K11	RMC1102ZA	Shield Plate (D)	K60	RBD430ZA	Knob, Hold (K)
K12	RMC1105Z	Shield Plate (F)	K61	RBD432ZA	Knob, Tone Select (K)
K13	RMC1111ZA	Shield Plate (G)	K62	RBD433ZA	Knob, Volume (K)
K14	RMC1113ZA	Shield Plate (H)	K63	RJC30010ZA	Battery Terminal, +
K15	RMC1115ZA	Shield Plate (I)	K64	RJC70012ZA	Battery Terminal, - (Long)
K16	XUC3FT	E Ring (3) (Hand Strap M'tg)	K65	RJC70013ZA	Battery Terminal, - (Short)
K17	RKH146ZA	Hand Strap (K)	K66	RJC70014ZA	Battery Terminal, -
K18	RHG720YA	Rubber Cushion (B)	K67	RHS32ZA	Battery Ribbon
K19	RHM156Z	Steel Ball	K68	RJT807Z	Contact, Socket
K20	RHR2110ZA	Sheet, Rotary Tuning Knob	K69	RJS4L4Z	Socket (4P/CS2)
K21	RHR3102ZA	Sheet, Rotary Tuning Knob	K70	RJP4G10Z	Plug (4P/CP2)
K22	RBD431ZA	Knob, Station Reminder Open (K)	K71	RUA735ZA	Dial Chassis (K)
K23	RBN754ZA	Knob, Rotary Tuning (Front) (H)	K72	RJT1073ZA	Terminal, Telescopic Antenna
K24	RBT284ZA	Knob, Rotary Tuning (Side) (K)	K73	RMC1083ZA	Shield Plate, Over
K25	RHE5128ZA	Screw (Rear Cabinet M'tg)	K74	RMC1082ZA	Shield Plate, Under
K26 (X) (L)	RYMFB60LX	Front Cabinet Ass'y (K)	K75	RUP2116ZAF	Circuit Board (POWER)
K26 (Z) (E)	RYMFB60LZ	Front Cabinet Ass'y (K)	K76	RME429ZA	Cover, LCD
K27 (X) (L)	RYFFB60LX	Rear Cabinet Ass'y (K)	K77	RMC1099ZA	Shield Plate (J)
K27 (Z) (E)	RYFFB60LZ	Rear Cabinet Ass'y (K)	K78	RMC1100ZA	Shield Plate (K)
K27-1	RHG348ZA	Rubber Cushion (C) (K)	K79	RMC1101ZA	Shield Plate (L)
K28	RKK319ZA	Battery Cover (K)	K80	RHG5043ZA	Conductive Rubber, Clock/FREQ, Dual Time, Time Set
K29	RKL30ZA	Stand (K)	K81	RHG5044ZA	Conductive Rubber, Power ON/OFF, Sleep
K30	RYKFB60LX	Station Reminder Plate Ass'y	K82	RHG5045ZA	Conductive Rubber, FM, LW MW, SW, 0-9 CH etc.
K31	RBC1023PA	Button, Decimal Point/Meter Band Key (.) (H)	K83	RHG5047ZA	Conductive Rubber
K32	RBC1023QA	Button, Number/Memory Channel/Meter Band Key (0 ch) (H)	K84	RGX1659ZA-0	Sheet, Insulator
K33	RBC1023RA	Button, Number/Memory Channel/Meter Band Key (9 ch) (H)	K85	RHG1175ZA	Rubber Cushion (A)
K34	RBC1023SA	Button, Number/Memory Channel/Meter Band Key (8 ch) (H)	K86	XSN3+8BVS	Screw (3x8) (Telescopic Antenna M'tg)
K35	RBC1023TA	Button, Number/Memory Channel/Meter Band Key (7 ch) (H)	K87	XTNR2+5CFN	Tapping Screw (2x5) (MAIN/LCD P.C.B M'tg)
K36	RBC1023UA	Button, Number/Memory Channel/Meter Band Key (6 ch) (H)	K88	XTN26+14JFZ	Screw (2.6x14) (Rear Cabinet M'tg)
K37	RBC1023VA	Button, Number/Memory Channel/Meter Band Key (5 ch) (H)	K89	XTN26+8B	Tapping Screw (2.6x8) (Speaker M'tg)
K38	RBC1023WA	Button, Number/Memory Channel/Meter Band Key (4 ch) (H)	K90	RHR2119ZA	Sheet, Battery
K39	RBC1023XA	Button, Number/Memory Channel/Meter Band Key (3 ch) (H)	K91	XWA3BFZ	Washer (3) (Telescopic Antenna M'tg)
K40	RBC1023YA	Button, Number/Memory Channel/Meter Band Key (2 ch) (H)	K92	RMC1120ZA	Shield Plate, Speaker
K41	RBC1023ZA	Button, Number/Memory Channel/Meter Band Key (1 ch) (H)	ACCESSORIES		
K42	RBC1030ZA	Button, Memory/Meter Band Key (M) (H)	A1	RSA802ZA	Antenna Cord
K43	RBC1024WA	Button, Band Select Key (SW) (S)	A2	XEH1A1-X	Earphone
K44	RBC1024XA	Button, Band Select Key (MW) (S)	A3 (X) (L)	RQX4897YA	Operating Instructions
K45	RBC1024YA	Button, Band Select Key (LW) (S)	A3 (Z) (E)	RQX4916ZA	Operating Instructions
K46	RBC1024ZA	Button, Band Select Key (FM) (S)	A4 (X) (L)	RQD236ZA	Carrying Case
K47	RBC1025ZA	Button, Standby Time Set Key, Standby Time Cancel Key (K)	A4 (Z) (E)	RQD236YA	Carrying Case
K48	RBC1026YA	Button, Meter Band Direct Access Key (K)	PACKINGS		
K49	RBC1026ZA	Button, Frequency Direct Access Key (K)	P1 (X) (L)	RPK2385ZA	Gift Box
			P1 (Z) (E)	RPK2415ZA	Gift Box
			P2	RPN5131ZA	Cushion
			P3	RPH554ZA	Protection Cover (for UNIT)