

SPP-98/99

SERVICE MANUAL

Singapore Model



Handset

Base unit

Photo: SPP-98

SPECIFICATIONS

General

Operating channel
10 channels

Dial signal
Tone, 10 PPS (pulse) selectable

Supplied accessories
AC power adaptor (AC-T47) (1)
Telephone line cord (1)
Rechargeable battery pack (BP-T16) (1) (SPP-98)
Rechargeable battery pack (BP-T16) (2) (SPP-99)
Wall bracket/stand (1)
Screws (2)

Handset

Power source
Rechargeable battery pack BP-T16

Battery life
Standby : Approx. 8 days
Talk : Approx. 6 hours

Battery charging time
Approx. 12 hours

Dimensions
Approx. 54 × 195 × 49 mm (w/h/d),
antenna excluded
(approx. 2 1/4 × 7 3/4 × 1 15/16 inches)
Antenna: Approx. 285 mm
(approx. 11 1/4 inches)

Mass
Approx. 240 g (approx. 8 oz), battery
included

Base unit

Power source
DC 9V from AC power adaptor
Rechargeable battery pack BP-T16
(SPP-99 only)

Battery charging time
Approx. 20 hours (SPP-99 only)

Dimensions
Approx. 120 × 64 × 223 mm (w/h/d),
antenna excluded
(approx. 4 3/4 × 2 5/8 × 8 7/8 inches)
Antenna: Approx. 680 mm
(approx. 26 7/8 inches)

Mass
Approx. 350 g (approx. 12 oz), wall
bracket and battery excluded

Design and specifications are subject to change without
notice.

CORDLESS TELEPHONE

SONY®



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7. ELECTRICAL PARTS LIST

Notes on Chip Component Replacement

- Never reuse a disconnected chip component.
- Notice that the minus side of a tantalum capacitor may be damaged by heat.

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK $\triangle$ OR DOTTED LINE WITH MARK $\triangle$ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

SECTION 1 GENERAL

This section is extracted
from instruction manual.

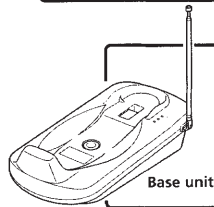
Getting Started

Read this first

Before you use your phone, you must first set it up. Here's a quick way to set up your phone: Steps 1, 2 and 3.

Step 1 (page 5)

First, unpack the phone and the supplied accessories.



Base unit

Step 2 (pages 6 to 9)

Next, you need to do three (SPP-874/98) or four (SPP-884/99) things to set up the base unit, including finding the best location for the base unit.



Handset

Step 3 (pages 10 to 11)

Then, insert the battery pack into the handset and charge it for more than 12 hours.

That's it!

About the digital security code

This cordless telephone uses a digital security code to provide protection against unintentional access to your base unit.

This security code blocks other cordless handsets to make calls through your base unit. A random security code will be assigned automatically between your base unit and handset when you charge the battery pack for the first time.

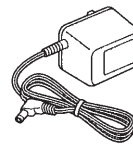
If you want to reset the digital security code manually, see page 22.

4th Getting Started

Step 1

Checking the package contents

Make sure you have received the following items in the package. If anything is missing, contact your local Sony dealer.

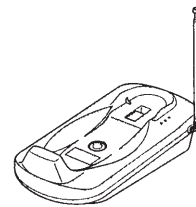


AC power adaptor

AC-T124 (for SPP-884/874 use on 220-240V AC)

AC-T56 (for SPP-884/874 use on 120V AC)

AC-T47 (for SPP-99/98)



Base unit



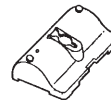
Handset



Telephone line cord



Rechargeable battery pack (BP-T16)
(1) for SPP-874/98
(2) for SPP-884/99



Wall bracket/stand for base unit



Screws (2)

Getting Started 5th

Step 2

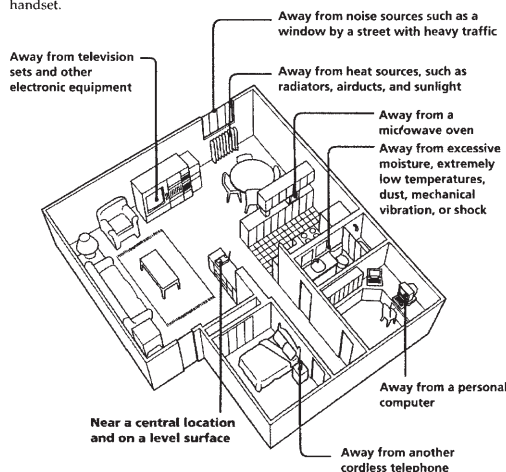
Setting up the base unit

Do the following steps:

- Choose the best location
- Insert the battery pack (SPP-884/99 only)
- Connect the base unit
- Choose the dialing mode

Choose the best location

Where you place the base unit affects the reception quality of the handset.



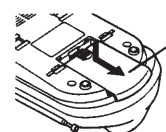
CAUTION: The cordless telephone operates at a frequency that may cause interference to nearby TVs and VCRs; the base unit should not be placed near or on the top of a TV or VCR; and, if interference is experienced, moving the cordless telephone farther away from the TV or VCR will often reduce or eliminate the interference.

6th Getting Started

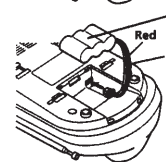
Insert the battery pack

—SPP-884/99 only

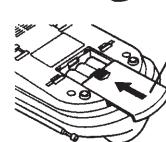
The supplied battery packs are common to the base unit and handset. Insert one of the supplied battery packs into the base unit to enable telephone usage in case of power failure.



1 Slide open the battery compartment lid of the base unit.



2 Connect the battery connector with correct polarity (black and red cords).



3 Insert the battery pack, and then close the lid. Charge the battery pack for more than 20 hours so that the battery is fully charged.

CAUTION: Make sure that the telephone line cord is disconnected before opening the battery compartment lid.

On power failure

Even during a power failure, you can make or receive calls, or use the phone's functions normally.

During a power failure:

- The POWER lamp on the base unit flashes.
- The phone can be used for about 2 hours continuously.
- The battery duration is about 4.5 hours when the phone is in standby mode.
- The battery pack in the handset cannot be charged with the base unit.

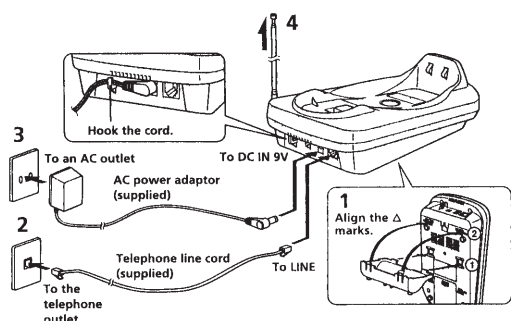
continued

Getting Started 7th

Step 2: Setting up the base unit (continued)

Connect the base unit

If you want to hang the base unit on the wall, see page 24.



- 1 Attach the wall bracket to the bottom of the base unit as illustrated to use it as a stand.
- 2 Connect the telephone line cord to the LINE jack and to a telephone outlet.
- 3 Connect the AC power adaptor to the DC IN 9V jack and to an AC outlet.
The POWER lamp lights up.
- 4 Fully extend the antenna. Make sure it points towards the ceiling.

Notes

- Use only the supplied AC power adaptor. Do not use any other AC power adaptor.
- Connect the AC power adaptor to a continuous power supply.
- Place the base unit close to the AC outlet so that you can unplug the AC power adaptor easily.

Polarity of the plug



Tips

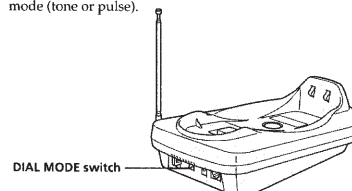
- If your telephone outlet is not modular, contact your telephone service company for assistance.
- To remove the wall bracket, press in the upper tab.

Modular



Choose the dialing mode

For the telephone to work properly, select an appropriate dialing mode (tone or pulse).



Depending on your dialing system, set the DIAL MODE switch as follows:

If your dialing system is	Set the switch to
Tone	T
Pulse	P

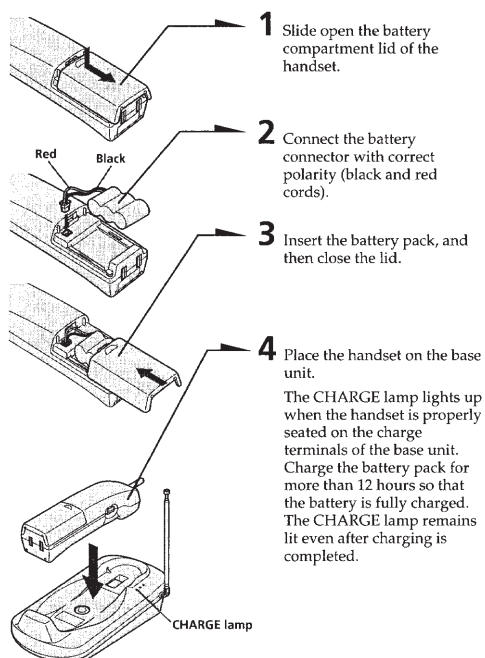
If you are not sure of your dialing system

Make a trial call with the DIAL MODE switch set to T. If the call connects, leave the switch as is; otherwise, set to P.

Step 3

Preparing the battery pack

Charge the battery pack for more than 12 hours before you start using your phone.



Battery duration

A fully charged battery pack lasts for about:

- 6 hours when you use the handset continuously.
- 8 days when the handset is in standby mode.

Notes

- The battery pack will gradually discharge over a long period of time, even when not in use.
- To obtain the best handset performance, place the handset on the base unit for charging after several calls.
- When the indicator and "BATTERY LOW" appear on the display, place the handset on the base unit for charging.
- If you leave the battery pack in the handset without charging it, the battery pack will be completely discharged and the digital security code will be erased. In this case, place the handset on the base unit for charging. A new digital security code will be assigned automatically. It may require several times of charging to recover to its full capacity.

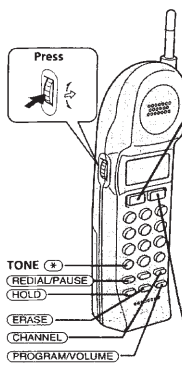
When to purchase a new battery pack

If the battery lasts only a few minutes even after 12 hours of charging, the usable life of the battery has expired and needs replacement. Contact your local Sony authorized dealer or service center, and ask for a Sony BP-T16 rechargeable battery pack.

Note

Battery life may vary depending on usage condition and ambient temperature.

Making calls

- 
- 1 Pick up the handset from the base unit.
 - 2 Press **(TALK)** and wait until "TALK" appears on the display. The dialing keys light up (SPP-884/99 only). You will then hear a dial tone.
The LINE lamp on the base unit lights up.
The display shows the operation duration in hours, minutes and seconds.
If you hear five short error beeps and "OUT OF RANGE" appears on the display, move closer to the base unit.
 - 3 Dial the phone number.
During a conversation, you can adjust the handset volume.
Follow the procedure described in the following table.
 - 4 When you are done talking, press **(OFF)** or replace the handset on the base unit.
The display and the LINE lamp on the base unit go off.

Additional tasks

To	Do this
Adjust the handset volume	During phone conversations, press (PROGRAM/VOLUME) . Each press of (PROGRAM/VOLUME) switches the handset volume level between HIGH and NORM (normal). The display shows the selected level.
Put a call on hold	Press (HOLD) . "HOLD" appears on the display. Press (HOLD) again to resume the conversation.
Switch to tone dialing temporarily	Press TONE after you are connected. The line will remain in tone dialing until disconnected.

Making calls (continued)

To check the phone number before redialing

While the handset is not in use, press **(REDIAL/PAUSE)**.

The last number dialed is displayed for 20 seconds.

To dial the number, press **(TALK)** while the number is displayed.

Note

The number will not be displayed and you will hear five short error beeps if the last number dialed exceeds 32 digits or if it is erased.

To erase the last phone number dialed

While the handset is not in use, press **(REDIAL/PAUSE)**, and then **(ERASE)**. "YES" flashes on the display. Press **(ERASE)** again or push Jog Dial to erase the last phone number dialed.

When the number is erased from the memory, you hear a long confirmation beep.

Notes

- If you hear beeps during the conversation, move closer to the base unit; otherwise, the call will be disconnected after 15 seconds. Note that, however, you may not hear beeps if it is noisy on the handset.
- During a power failure, press **(OFF)** to disconnect the call (SPP-884/99 only).

If interference occurs on the handset

When you press **(TALK)**, the handset automatically searches for the channel with the best reception. However, if you notice interference during a conversation, move closer to the base unit.

If interference persists, press **(CHANNEL)** to switch to another channel to improve the sound quality of your telephone conversation.

Note

If you hear five short beeps and "OUT OF RANGE" appears on the display when you press **(CHANNEL)**, move closer to the base unit.

If the battery becomes weak during a call

The handset will beep every three seconds, and "BATTERY LOW" appear on the display. Finish your call and charge the battery pack.

If this occurs, you cannot use the handset without charging it for more than one minute.

For optimum performance, charge the battery for a full 12 hours.

Redialing

- 1 Press **(TALK)** and wait until "TALK" appears on the display.
The LINE lamp on the base unit lights up.

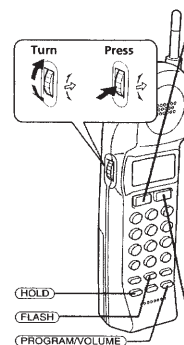
- 2 Press **(REDIAL/PAUSE)** to redial the last number dialed.

Note

If the number exceeds 32 digits or if it is erased, five short error beeps will alert you that the number cannot be redialed.

continued

Receiving calls

- 
- 1 When you hear the phone ring:
 - Press **(TALK)** (or any key except **(OFF)**).
 - or
 - Pick up the handset from the base unit when the handset is placed on the base unit.

"TALK" appears on the display. The LINE lamp lights up on the base unit. The display shows the operation duration in hours, minutes and seconds.

During a conversation, you can adjust the handset volume. Follow the procedure described in the following table.
 - 2 When you are done talking, press **(OFF)** or replace the handset on the base unit.
The display and the LINE lamp on the base unit go off.

Additional tasks

To	Do this
Adjust the handset volume	During phone conversations, press (PROGRAM/VOLUME) . Each press of (PROGRAM/VOLUME) switches the handset volume level between HIGH and NORM (normal). The display shows the selected level.
Put a call on hold	Press (HOLD) . "HOLD" appears on the display. Press (HOLD) again to resume the conversation.
Adjust the ringer volume	Press (PROGRAM/VOLUME) , and move the cursor to "HIGH", "LOW" or "OFF" by turning Jog Dial, and then press Jog Dial. You will hear a long confirmation beep. When "OFF" is selected, "RINGER OFF" appears on the display.
Switch to another call ("call waiting" service)	Press (FLASH) . Press (FLASH) again to return to the first caller.

* You need to subscribe to this service from your telephone company.

Note for SPP-884/99

During a power failure, press **(TALK)** or any key except **(OFF)** to connect the call. To disconnect the call, press **(OFF)**.

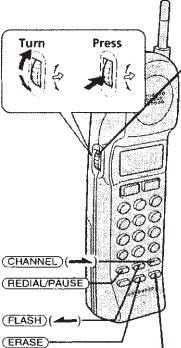
Tip

To inform you of an incoming call, the display shows "##RINGING##" according to the ring signal even when you set RINGER VOLUME to "RINGER OFF".

Phone Directory

You can dial a number by scrolling through the Phone Directory, in which up to 100 phone numbers can be stored.

Storing phone numbers and names



Example: to store "SONY" "123-4567".

- Press Jog Dial.
"ENTER NAME" appears.
- Enter the name using Jog Dial. You can enter up to 16 characters.
Turn Jog Dial until the desired character appears and press Jog Dial.
Enter successive characters in the same way.
The following characters can be entered.
ABC...XYZ ↔ 1-0 ↔ .-/'
To enter a "space", press (CHANNEL) (↔). The cursor moves to the right.
- Press (PROGRAM/VOLUME).
"ENTER NUMBER" appears.

SONY 1234567

- Enter the phone number by pressing the dialing keys.
You can enter up to 16 digits, including a tone and a pause, each of which is counted as one digit.



- Press (PROGRAM/VOLUME) or Jog Dial.
You will hear a long confirmation beep, and the name and the number are stored. The display goes off.

Notes

- If you intend to save a 101st phone number, you will hear five short error beeps and "MEMORY FULL" will be displayed. You cannot store the phone number. To store another phone number, erase one of the stored phone numbers (see page 19).
- Do not allow more than 20 seconds to elapse between each step of the procedure.

Tips

- You can press Jog Dial instead of (CHANNEL) (↔) for entering a "space" in step 2.
- If you have entered a wrong character in step 2, press (FLASH) (←) or (CHANNEL) (↔) to move the cursor to the character to be changed. Then enter the correct character. To erase a character, press (ERASE) instead of entering it. To change the number, see page 18.

To store a number to be dialed via Private Branch Exchange (PBX)

Before entering a phone number in step 4, do as follows:

- Enter the outside line access digit (e.g., 9).
- Press (REDIAL/PAUSE).

continued

Phone Directory (continued)

Changing a stored name and/or phone number

- Display the name and phone number you want to change by turning Jog Dial.
The names appear in alphabetical order.
- Press Jog Dial.
- Turn Jog Dial up to make "PGM" flash and press Jog Dial.
The cursor flashes at the first character of the name.
If you do not change the name, follow the procedure from step 6.
- Press (CHANNEL) (↔) or (FLASH) (←) until the character to be changed flashes.
- Turn Jog Dial until the desired character appears and press Jog Dial. The following characters can be entered.
ABC...XYZ ↔ 1-0 ↔ .-/'
To erase the character which is flashing, press (ERASE).
- Press (PROGRAM/VOLUME).
The cursor flashes at the right side of the last digit of the phone number.
If you do not change the number, go to step 8.

SONY 1234567

SONY 1234567 PGM ERASE

SONY 1234567

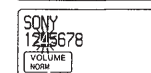
SONY 1234567

- You can add numbers following the last digit, or erase a number which is flashing. To move the cursor to the left, press (FLASH) (←), and to the right, press (CHANNEL) (↔).

Example: to change "1234567" to "1245678".

Enter "8" using the dialing keys. "8" is entered as the last digit.

Press (FLASH) (←) six times until "3" is flashing and press (ERASE). "3" is erased.



- Press (PROGRAM/VOLUME) or Jog Dial.

You will hear a long confirmation beep and the name and/or the number is changed.

Tip

When you change all of the digits of the phone number in step 7, move the cursor to the first digit by pressing (FLASH) (←) successively, and then enter the new phone number.

Erasing a memory location

- Display the name and phone number you want to erase by turning Jog Dial.
The names appear in alphabetical order.
- Press Jog Dial.
- Turn Jog Dial up to make "ERASE" flash and press Jog Dial.
- Turn Jog Dial up to make "YES" flash, then press Jog Dial.
You hear a long confirmation beep and the memory location is erased.

SONY 1234567

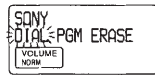
SONY 1234567 PGM ERASE

SONY ERASE YES

continued

Making calls from the Phone Directory

- 1 Display the name and phone number you want to call by turning Jog Dial.
The names appear in alphabetical order.

- 2 Press Jog Dial.

- 3 Press Jog Dial again.
The phone number will be dialed.

Note
If there is no name and/or phone number stored in Phone Directory, "NO DATA" will appear in step 1.

Tip
You may press **TALK** to make a call instead of doing steps 2 and 3.

About the search order

The names appear in the following order when you turn Jog Dial up or down.

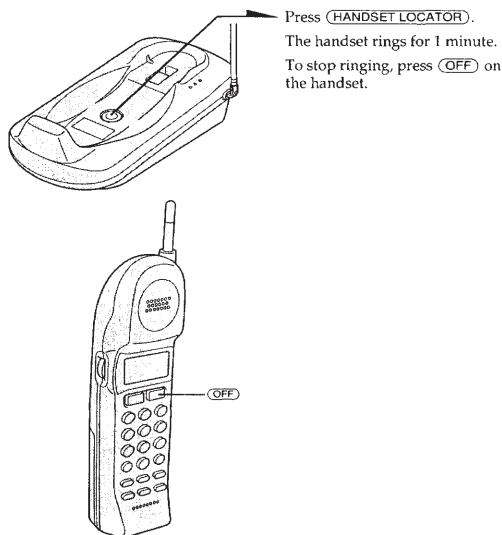
- Alphabetical order: ABC...XYZ ↔ 1 - 0 ↔ . - /

The names are sorted with only the first character. When some names have the same first character, these names appear in order in which they are stored in Phone Directory.

Paging

You can page the handset from the base unit.
Note that you cannot page if the handset is in use.

To page



Note
Even if the ringer volume is set to "OFF" or "LOW", the handset rings at a high level when paging.

Additional Information

Resetting the digital security code

You normally do not need to reset the digital security code. It is assigned to your base unit and handset automatically when you charge the battery pack for the first time (see page 10). However, in the very unlikely event that you suspect that another cordless phone uses the same security code, you can change the code manually.

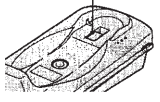
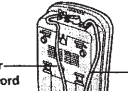
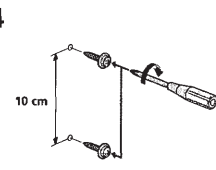
- 1 Press **PROGRAM/VOLUME**.
TALK flashes and "RINGER VOLUME" appears on the display.
The dialing keys light up (SPP-884/99 only).
- 2 Press **#**.
You hear a confirmation beep and "ENTER SECURITY" appears on the display.
- 3 Enter four-digit number (0001 to 9999) using the dialing keys.

- 4 Press **PROGRAM/VOLUME** or push Jog Dial.
You hear a long confirmation beep and the security code goes off.
- 5 Immediately replace the handset on the base unit.
You will hear a long confirmation beep and the phone stores the new code.

Note
If the battery pack in the handset is completely discharged, or is removed from the handset, the digital security code will be erased. In this case, charge the battery pack. A new digital security code will be assigned automatically.

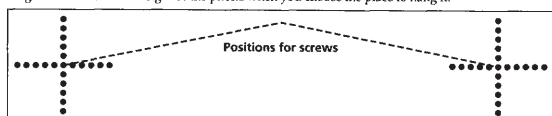
- Tips**
- This procedure changes the security code in both the base unit and the handset.
 - You can change the security code as often as desired.

Mounting the base unit on a wall

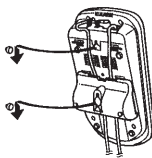
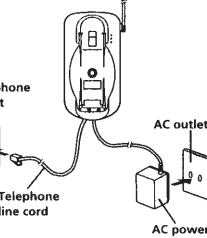
- 1  Raise the hang-up tab.
- 2  Plug the telephone line cord to the LINE jack and the AC power adaptor to the DC IN 9V jack, and hook the cords.
- 3  Attach the wall bracket to the center of the base unit. Align the Δ marks of the wall bracket with those of the base unit.
- 4  Attach the supplied screws to the wall.

Template for mounting the phone on the wall

To determine the positions for the screws, cut out the template below and use it as a guide. Consider the weight of the phone when you choose the place to hang it.



24^{en} Additional Information

- 5  Hook the base unit to the screws.
- 6  Plug the telephone line cord to the telephone outlet.
- 7  Plug the AC power adaptor to an AC outlet. Then fully extend the antenna so that it points towards the ceiling.

Tip
To remove the wall bracket, press the lower tabs.

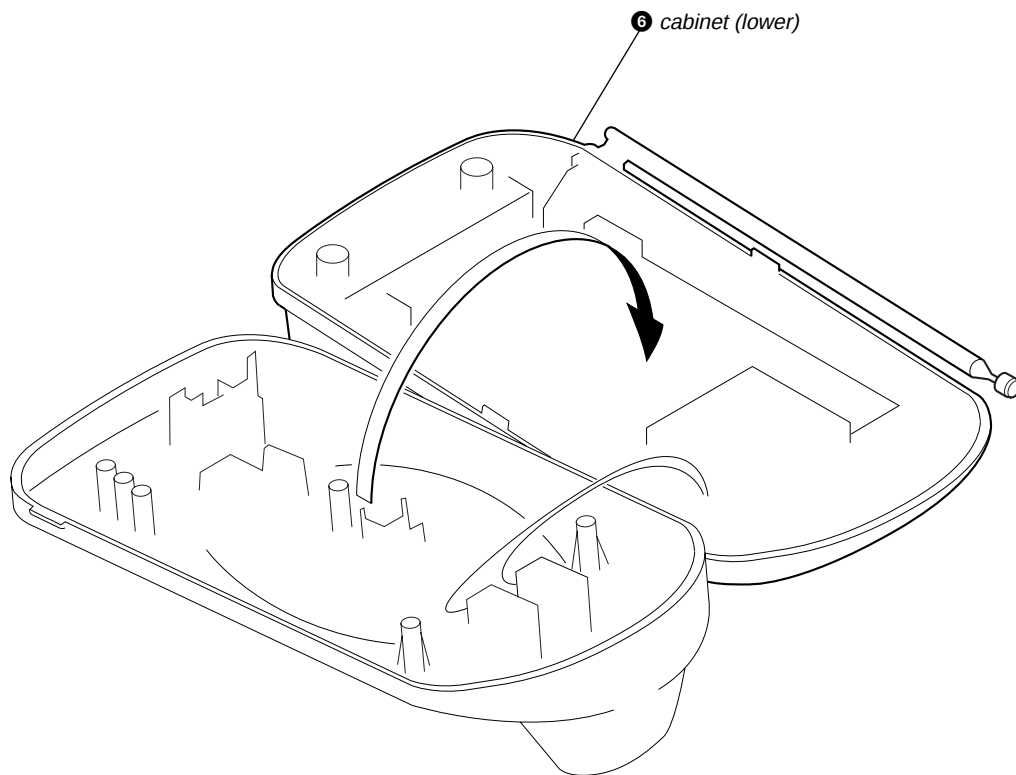
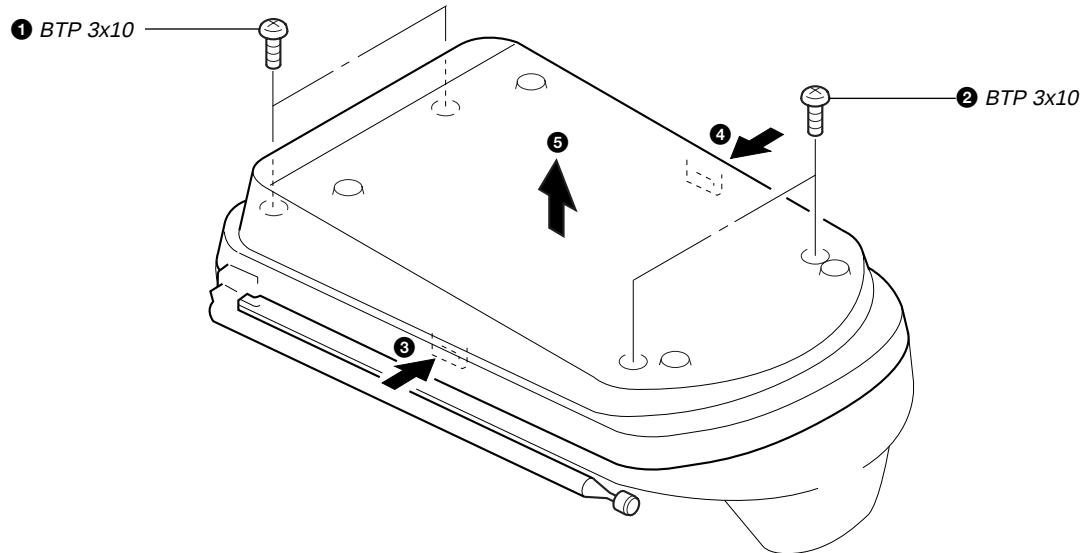
Additional Information

Additional Information | 25^{en}

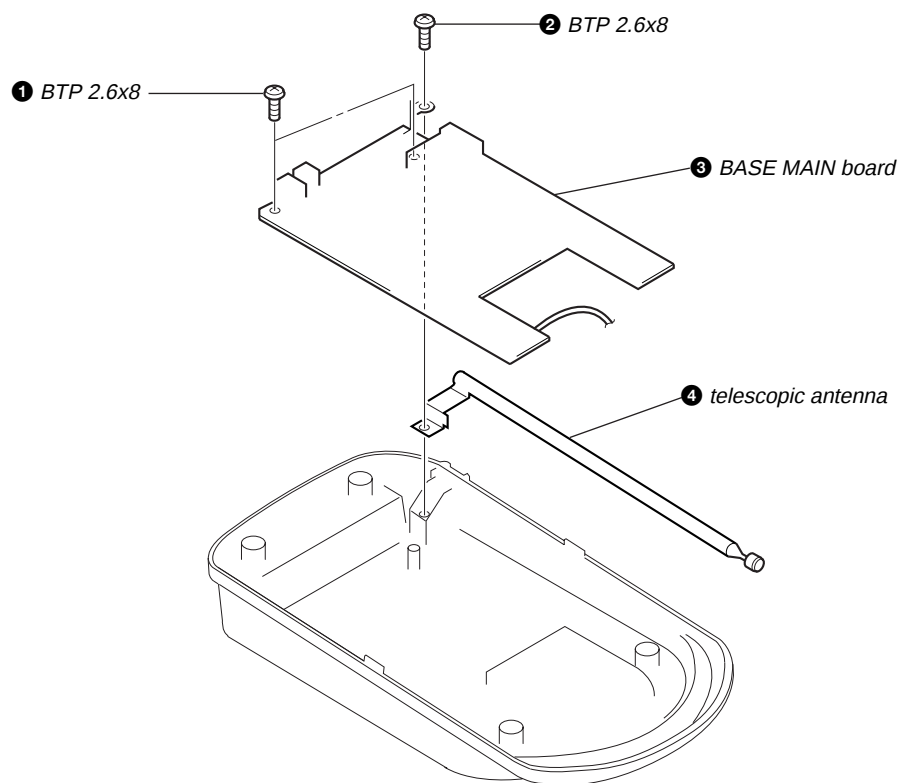
SECTION 2 DISASSEMBLY

Note : Follow the disassembly procedure in the numerical order given.

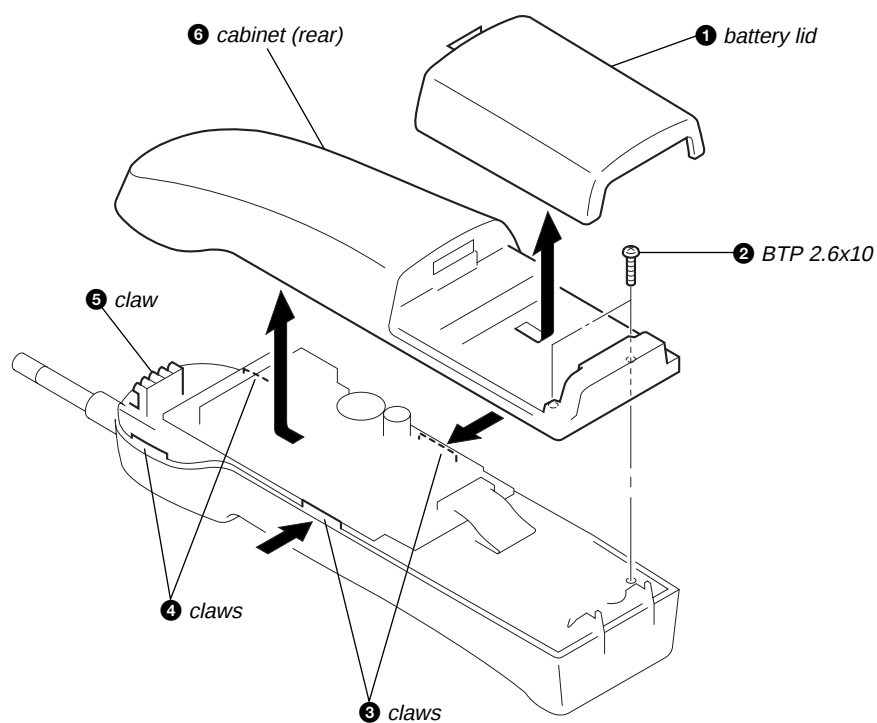
2-1. CABINET (LOWER)



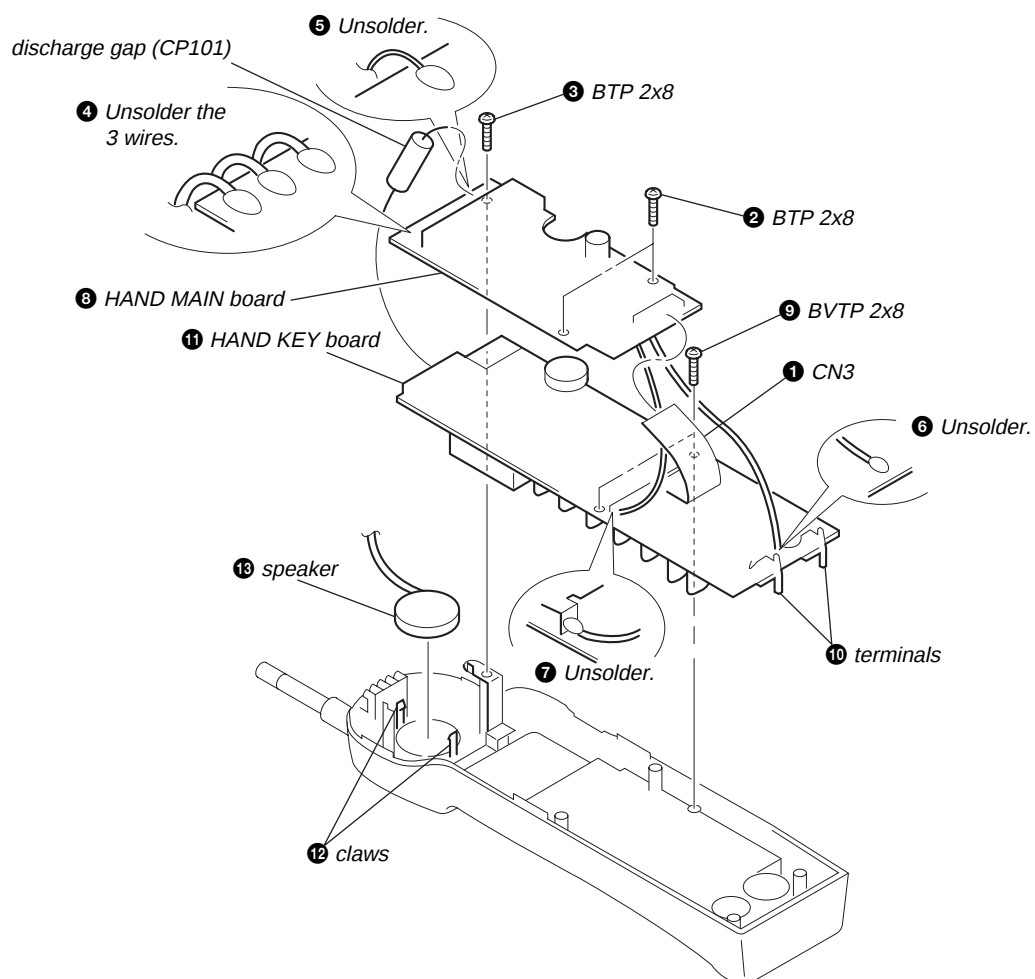
2-2. BASE MAIN BOARD



2-3. CABINET (REAR)



2-4. HAND MAIN BOARD



SECTION 3 TEST MODE

BASE UNIT SECTION

MANUAL TEST MODE

Set the Test Mode:

1. Set the **DIAL MODE** switch to “P” (pulse).
2. While pressing the **HANDSET LOCATOR** key, insert the AC adaptor (Reset start).
3. With the **HANDSET LOCATOR** key still held down, switch the **DIAL MODE** switch “T” (tone) → “P” (pulse).
4. When the **HANDSET LOCATOR** key is released, test mode starts.
5. The LEDs **POWER**, **LINE** and **CHARGE** light on one after another with a 0.5 sec interval in this order. When all of them are on, they will light off in 1 sec.
Firstly, “0” will be dialled out at 10 pps. Then “1”, “4”, “8” and “#” will be sent out by DTMF.
6. Set to TX ON. Goes to external line state in 1 CH. (LINE LED light on)

Release the Test Mode:

1. Pull out the AC adaptor or turn off the power.

MACHINE TEST MODE

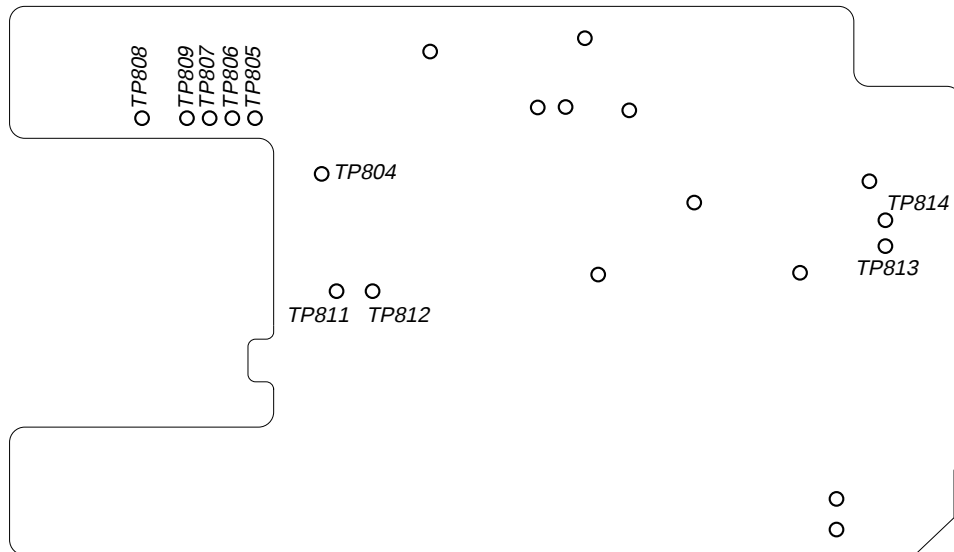
Set the Test Mode:

1. With the TEST I/O (TP808) terminal in “L” (low) input state, cause Reset of Power ON. Equipment enters machine test mode.
2. With the timing of marking the TEST I/O terminal “H” (high) 100 ms after the power is turned on, use the TEST CLK and COL1-4 information to set up.
3. ON/OFF of TX is according to the input logic of the DIAL MODE terminal.

Release the Test Mode:

1. Pull out the AC adaptor or turn off the power.
2. Remove the short plug and turn on the power again.

– base main board (conductor side) –



Channel Setting:

During startup in machine test mode, make the following channel settings by loading the terminal input data.

Pin No. Channel	30 TEST CLK/ POWER LED (TP809)	26 COL4 (TP807)	25 COL3 (TP806)	24 COL2 (TP805)	23 COL1 (TP804)	TX frequency (MHz)	RX frequency (MHz)
CH1	L	L	L	L	H	43.720	48.760
CH2	L	L	L	H	L	43.740	48.840
CH3	L	L	L	H	H	43.820	48.860
CH4	L	L	H	L	L	43.840	48.920
CH5	L	L	H	L	H	43.920	49.020
CH6	L	L	H	H	L	43.960	49.080
CH7	L	L	H	H	H	44.120	49.100
CH8	L	H	L	L	L	44.160	49.160
CH9	L	H	L	L	H	44.180	49.200
CH10	L	H	L	H	L	44.200	49.240
CH11	L	H	L	H	H	44.320	49.280
CH12	L	H	H	L	L	44.360	49.360
CH13	L	H	H	L	H	44.400	49.400
CH14	L	H	H	H	L	44.460	49.460
CH15	L	H	H	H	H	44.480	49.500
CH16 (CH1)	H	L	L	L	L	46.610	49.670
CH17 (CH2)	H	L	L	L	H	46.630	49.845
CH18 (CH3)	H	L	L	H	L	46.670	49.860
CH19 (CH4)	H	L	L	H	H	46.710	49.770
CH20 (CH5)	H	L	H	L	L	46.730	49.875
CH21 (CH6)	H	L	H	L	H	46.770	49.830
CH22 (CH7)	H	L	H	H	L	46.830	49.890
CH23 (CH8)	H	L	H	H	H	46.870	49.930
CH24 (CH9)	H	H	L	L	L	46.930	49.990
CH25 (CH10)	H	H	L	L	H	46.970	49.970
TEST1	H	H	L	H	L	43.780	48.800
TEST2	H	H	L	H	H	43.890	48.970
TEST3	H	H	H	L	L	46.800	49.910
TEST4	H	H	H	L	H	46.900	49.950

(): Singapore Model

Machine Test Mode Input / Output:

1. Input (Input ports for other than main tasks)

Pin Name	Pin No.	Function	Logic
TEST CLK/ POWER LED (TP809)	30	Setting the CH (channel)	Refer to channel setting
COL4 (TP807)	26		
COL3 (TP806)	25		
COL2 (TP805)	24		
COL1 (TP804)	23		
DIAL MODE (TP813, 814)	28	Setting the TX ON/OFF	TONE : short, PULSE : open
HANDSET LOCATOR (TP811, 812)	28	Manual : Channel increment	Incrementing of channels in order from 1 to 25.
		Machine : Dial data “5” is output to DTMF/DP exchange	The HANDSET LOCATOR switch is toggled between ON and OFF each time a short is made between TP811 and TP812. The first time there is output of “5” with DTMF.

29 Pin TEST I/O (TP808)	Operation with CHARGE LED TX OFF	Operation with CHARGE LED TX ON
L (1st)	If RSSI (H) is detected : Light ON	If RSSI (H) is detected : Light ON
L (2nd)	If RSSI (L) is detected : Light ON	If RSSI (L) is detected : Light ON
L (3rd)	If TX LOCK is detected : Light OFF	If TX LOCK is detected : Light OFF
L (4th)	If RX LOCK is detected : Light OFF	If RX LOCK is detected : Light OFF
L (5th)		BEEP output
L (6th)		ID CODE output
L (7th)	If RING is detected : Light ON	If RING is detected : Light ON
L (8th)	If HANDSET LOCATOR key is input : Light ON	If HANDSET LOCATOR key is input : Light ON
L (9th)	If DATA signal is detected : Light ON	If HANDSET LOCATOR key is input : Light ON

HANDSET SECTION

MANUAL TEST MODE

Set the Test Mode:

1. Enter the test mode by pressing **[*]** key while pressing **[1]** and **[TALK]** keys when in idle condition.
(Key operation **[*]** → **[1]** → **[TALK]**)
2. The RINGER will ring for 1 sec when the test mode is started.
3. Measurement mode of consumption current. (ch=01 state)
4. Use key input to carry out the various settings.
5. Use port inputs to set output from LED terminals.

Release the Test Mode:

1. Press the **[OFF]** key.
2. Turn off the power. (Remove the battery and replace them.)

MACHINE TEST MODE

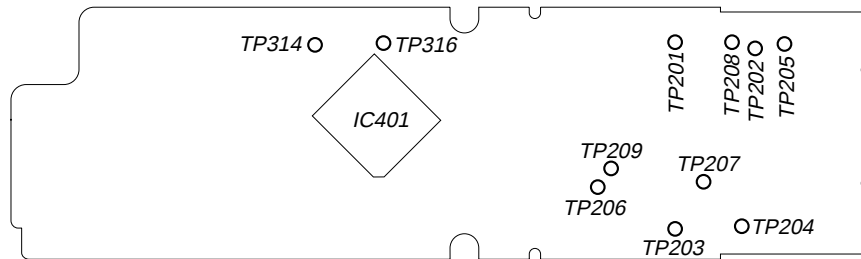
Set the Test Mode:

1. When power on reset is applied while a “L” (low) is input the TEST I/O (TP316) terminal (IC401 ③⑥ pin), the RING (Level H, 1 sec) sounds.
2. Checking the CH No. displayed on the LCD, up or down the JOG dial and select the No. It can be set by pushing the JOG dial. (“?” appears at the suffix No. is determined.)
3. Set the TX setting to TX OFF.
4. The channel is set by voice not by data.
5. Use port inputs to set output from LED terminals.

Release the Test Mode:

1. Press the **[OFF]** key.
2. Remove the short plug and turn on the power.

– hand key board (side B) –



Key Processing (Setting the Manual Test Mode) :

KEY	TEST POINT		FUNCTION	TX	RX RF	RX AF	LCD	MIC	KEY Light LCD Light	MUTE HICUT	VOL	DATA OUT-PUT	RSSI SENS
INITIAL TEST MODE			RX	×	○	○	○	×	○	–	NORM	×	HI
TALK	TP204	TP209	TX & RX	○	○	○	○	○	○	–	–	×	–
OFF	TP201	TP209	TEST MODE OFF	×	×	×	×	×	×	–	–	×	–
1	TP201	TP208	RX	×	○	○	○	×	○	–	–	×	–
2	TP201	TP207	TX & RX OFF	×	×	×	○	×	○	–	–	×	–
3	TP201	TP206	EEPROM CHECK	–	–	–	○	–	○	–	–	×	–
4	TP201	TP205	KEY CHECK	–	–	–	○	–	○	–	–	×	–
5	TP202	TP207	RSSI LOW SET	–	–	–	○	–	○	–	–	×	LOW
6	TP202	TP205	DATA TX	○/×	–	–	○	–	○	–	–	○/×	–
7	TP202	TP208	LIGHT OFF/ON	–	–	–	○	–	○/×	–	–	×	–
8	TP202	TP209	DATA RX	×	○	×	×	×	×	–	–	×	HI
9	TP202		TP206	–	–	–	–	–	–	–	–	–	–
*	TP203		TP205	–	–	–	–	–	–	–	–	–	–
0	TP203	TP209	FORCED HOLD IN	×	×	×	×	×	×	–	–	×	–
#	TP203		TP206	–	–	–	–	–	–	–	–	–	–
REDIAL/ PAUSE	TP204		TP208	–	–	–	–	–	–	–	–	–	–
FLASH	TP204		TP207	–	–	–	–	–	–	–	–	–	–
CHANNEL	TP204		TP206	–	–	–	–	–	–	–	–	–	–
HOLD	TP203	TP208	HI-CUT ON/OFF	–	–	–	○	–	○	○	–	–	–
ERASE	TP203		TP207	–	–	–	–	–	–	–	–	–	–
PROGRAM/ VOLUME	TP204	TP205	VOL HI/LO	–	–	–	○	–	○	–	HI/LOW	–	–

○ : ON, × : OFF

- When receiving data, the set is put in the same state as the intermittent reception state during normal wait.
- The channel is counted up each time the CH key is pressed. When the channel reaches 29 ch, then it returns to 1 ch.
- The JOG key may be used to change the channel.
- To clear all of the EEPROM, simultaneously press **ERASE** and **TALK** keys.
- “Channel Setting”, “SIGOUT Control” and “Power Control” can be separately set.

Channel Setting:

During startup in machine test mode, make the following channel settings by loading the terminal input data.

Pin No. Channel	45 PC0-I/O (TP205)	52 PD3-I (TP204)	51 PD2-I (TP203)	50 PD1-I (TP202)	49 PD0-I (TP201)	TX frequency (MHz)	RX frequency (MHz)
CH1	L	L	L	L	H	48.760	43.720
CH2	L	L	L	H	L	48.840	43.740
CH3	L	L	L	H	H	48.860	43.820
CH4	L	L	H	L	L	48.920	43.840
CH5	L	L	H	L	H	49.020	43.920
CH6	L	L	H	H	L	49.080	43.960
CH7	L	L	H	H	H	49.100	44.120
CH8	L	H	L	L	L	49.160	44.160
CH9	L	H	L	L	H	49.200	44.180
CH10	L	H	L	H	L	49.240	44.200
CH11	L	H	L	H	H	49.280	44.320
CH12	L	H	H	L	L	49.360	44.360
CH13	L	H	H	L	H	49.400	44.400
CH14	L	H	H	H	L	49.460	44.460
CH15	L	H	H	H	H	49.500	44.480
CH16 (CH1)	H	L	L	L	L	49.670	46.610
CH17 (CH2)	H	L	L	L	H	49.845	46.630
CH18 (CH3)	H	L	L	H	L	49.860	46.670
CH19 (CH4)	H	L	L	H	H	49.770	46.710
CH20 (CH5)	H	L	H	L	L	49.875	46.730
CH21 (CH6)	H	L	H	L	H	49.830	46.770
CH22 (CH7)	H	L	H	H	L	49.890	46.830
CH23 (CH8)	H	L	H	H	H	49.930	46.870
CH24 (CH9)	H	H	L	L	L	49.990	46.930
CH25 (CH10)	H	H	L	L	H	49.970	46.970
TEST1	H	H	L	H	L	48.800	43.780
TEST2	H	H	L	H	H	48.970	43.890
TEST3	H	H	H	L	L	49.910	46.800
TEST4	H	H	H	L	H	49.950	46.900

(): Singapore Model

Machine Test Mode Input / Output:

1. Input (Input ports for other than main tasks)

Pin Name	Pin No.	Function	Logic
PD0-I/O (TP205)	45	Setting the CH (channel)	Refer to channel setting
PD3-I (TP204)	52		
PD2-I (TP203)	51		
PD1-I (TP202)	50		
PD0-I (TP201)	49		
TEST I/O (TP316)	36	Startup of the test mode.	H : Start, L : No start

2. Output (Output ports for other than main tasks)

Pin Name	Pin No.	Function	H Logic	L Logic
TALK LED (TP314)	40	Various input/output monitor output (default : RSSI (H) detection).	No detection	Detection
LCD/KEY LED (D302 to 308)	39	During test mode : All light lit However, does not include measurment of consumption current.	No light	Light

SECTION 4 ELECTRICAL ADJUSTMENTS

BASE UNIT SECTION

Note:

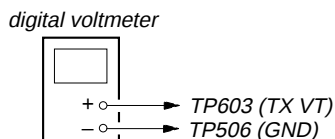
- Apply 9V dc from regulated DC power supply.
- Perform the adjustment at T3CH (28CH : 49.910 MHz) as a rule.
- Set to base unit manual test mode. (Refer to page 12.)
- Switch position :
S802 (DIAL MODE) : P (pulse)

TX SECTION ADJUSTMENT

- The electrolytic capacitor (10 μ F/10 V) connected TP505 (DET OUT) to TP506 (GND). (Only TX section adjustment)

TX VT Adjustment

Setting :

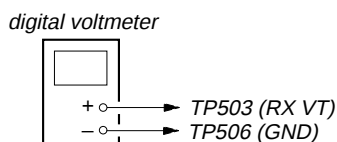


Procedure :

1. The digital voltmeter connected TP603 (TX VT) to TP506 (GND).
2. Adjust the L602 for 1.0 ± 0.1 V reading on the digital voltmeter.

RX VT Adjustment

Setting :



Procedure :

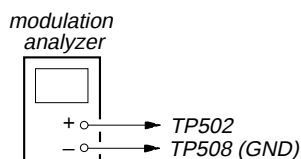
1. The digital voltmeter connected TP503 (RX VT) to TP506 (GND).
2. Adjust the L503 for 4.0 ± 0.1 V reading on the digital voltmeter.

Power Level Adjustment

Note:

- Connect a resistor of 50 Ω between TP502 and TP508 on Base main board before adjustment. (See page 18.)
After adjustment, remove the resistor.

Setting:



Procedure:

1. The modulation analyzer connected TP502 to TP508 (GND).
2. Adjust the RV601 for 52 ± 10 μ W reading on the modulation analyzer.

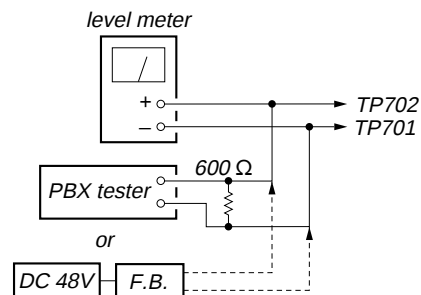
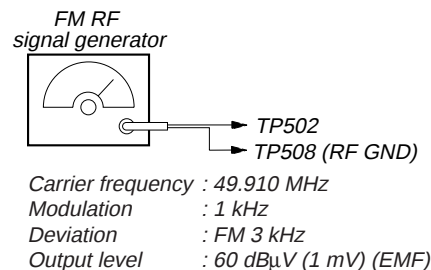
RX SECTION ADJUSTMENT

RX DISCRI Adjustment

Note:

- Perform the adjustment at T3CH (28CH : 49.910 MHz) as a rule.

Setting :



Procedure :

1. Adjust the FL501 for the maximum reading on the level meter.
Also check that the output level is the specified values.

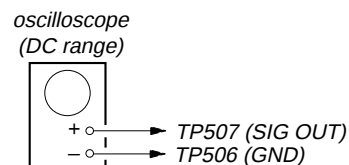
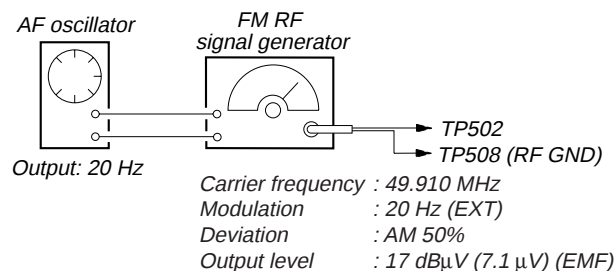
Specified Value : -2.6 to -10.6 dBV

RSSI Hi Adjustment

Note:

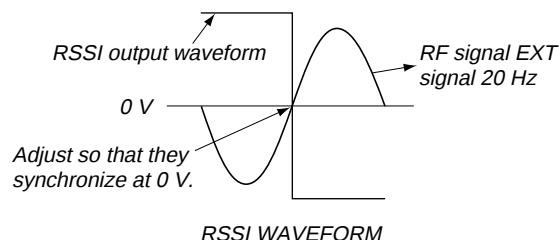
- Perform the adjustment at T3CH (28CH : 49.910 MHz) as a rule.

Setting :



Procedure :

1. Use the oscilloscope to confirm the FM RF signal generator input (AF) signal waveform and RSSI signal, and use the RV501 so that they are synchronized (duty is synchronized).

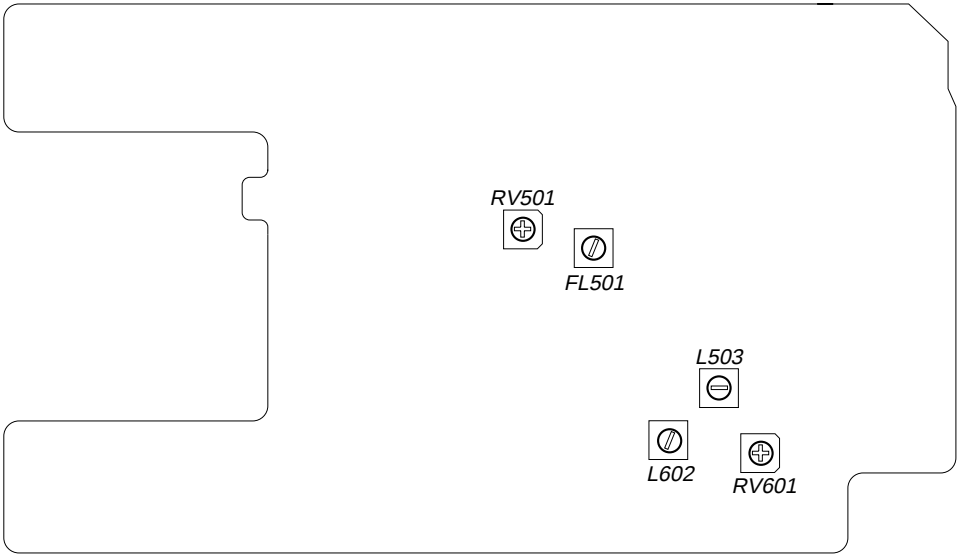


RSSI WAVEFORM

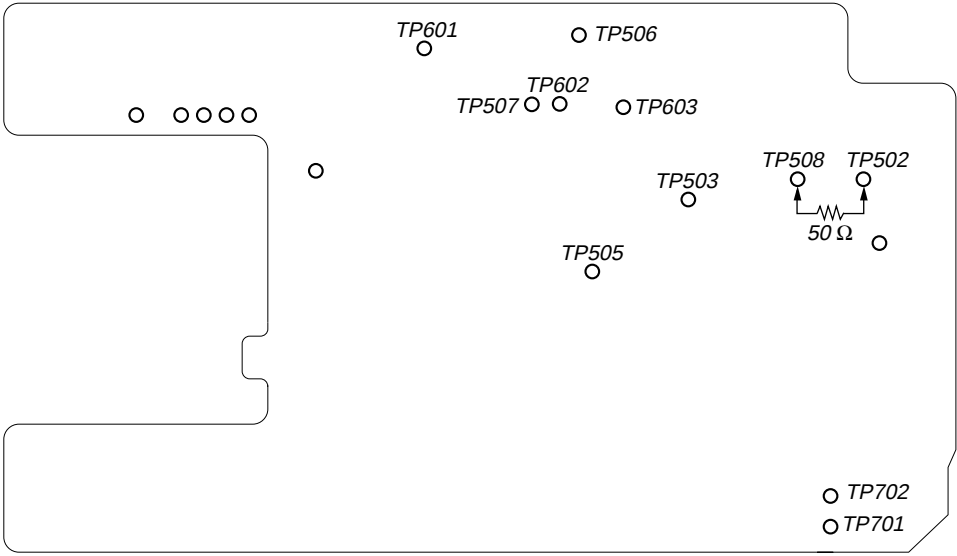
Adjustment Location : base main board (See page 18.)

Adjustment Location :

– base main board (component side) –



– base main board (conductor side) –



HANDSET SECTION

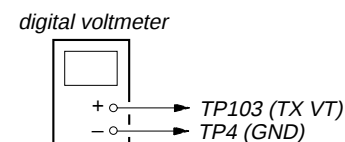
Note:

- Apply 3.6 V dc from regulated DC power supply.
- Perform the adjustment at T1CH (26CH : 43.780 MHz) as a rule.
- Set to handset manual test mode. (Refer to page 14.)

TX SECTION ADJUSTMENT

TX VT Adjustment

Setting :

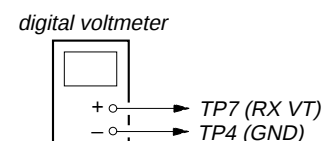


Procedure :

1. The digital voltmeter connected TP103 (TX VT) to TP4 (GND).
2. Adjust the L101 for $1.0 \pm 0.1V$ reading on the digital voltmeter.

RX VT Adjustment

Setting :



Procedure :

1. The digital voltmeter connected TP7 (RX VT) to TP4 (GND).
2. Adjust the L3 for $3.2 \pm 0.1 V$ reading on the digital voltmeter.

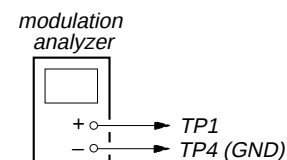
RX SECTION ADJUSTMENT

Power Level Adjustment

Note:

- Connect a resistor of 50Ω between TP1 and TP4 on Hand main board before adjustment.
- After adjustment, remove the resistor.

Setting:



Procedure:

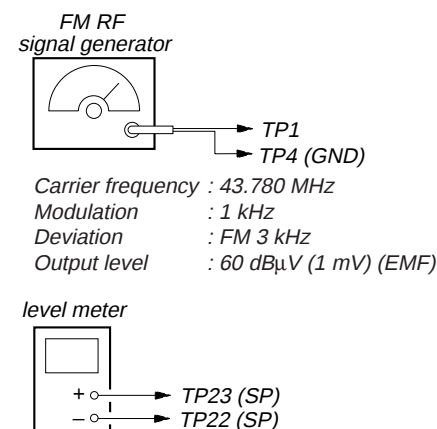
1. The modulation analyzer connected TP1 to TP4 (GND).
2. Adjust the RV101 for $0.75 \pm 0.05 \text{ mW}$ reading on the modulation analyzer.

RX DISCRI Adjustment

Note:

- Perform the adjustment at T1CH (26CH : 43.780 MHz) as a rule.

Setting :



Procedure :

1. Adjust the L4 for the maximum reading on the level meter.
- Also check that the output level is the specified values.

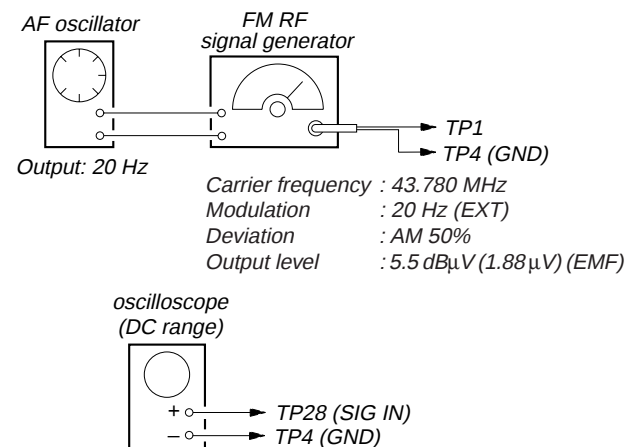
Specified Value : -8.6 to -16.6 dBV

RSSI Hi Adjustment

Note:

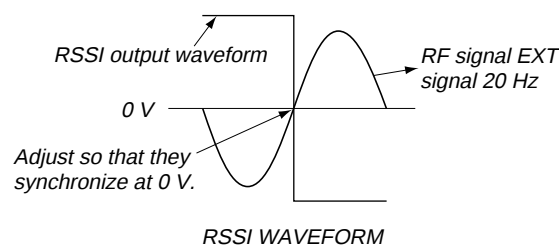
- Perform the adjustment at T1CH (26CH : 43.780 MHz) as a rule.

Setting :



Procedure :

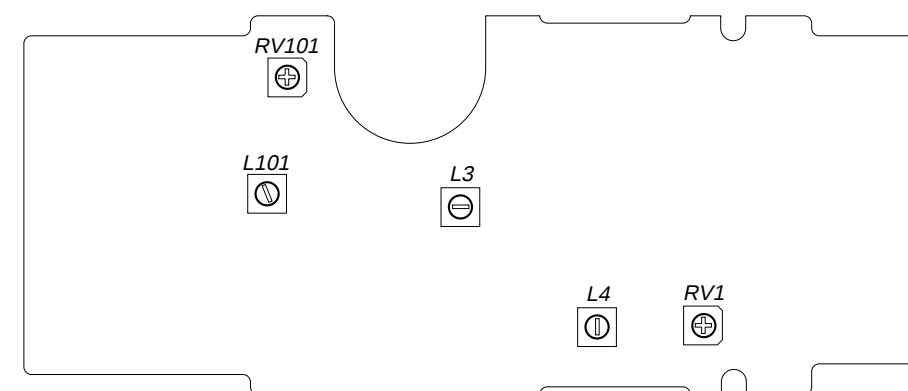
1. Use the oscilloscope to confirm the FM RF signal generator input (AF) signal waveform and RSSI signal, and use the RV1 so that they are synchronized (duty is synchronized).



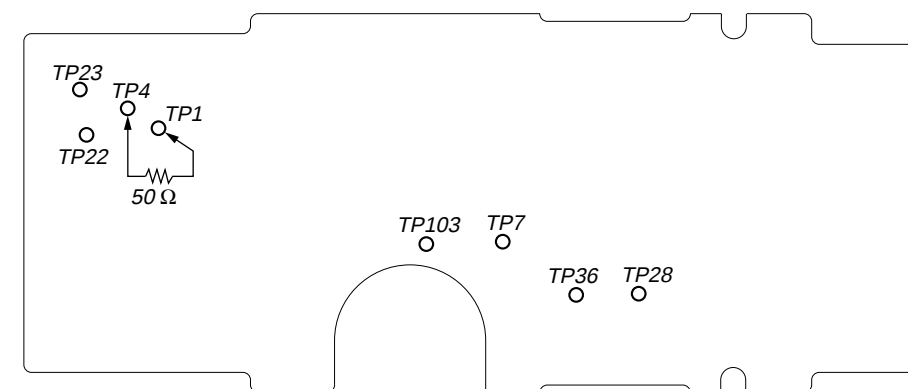
Adjustment Location : hand main board (See page 20).

Adjustment Location :

– hand main board (side A) –

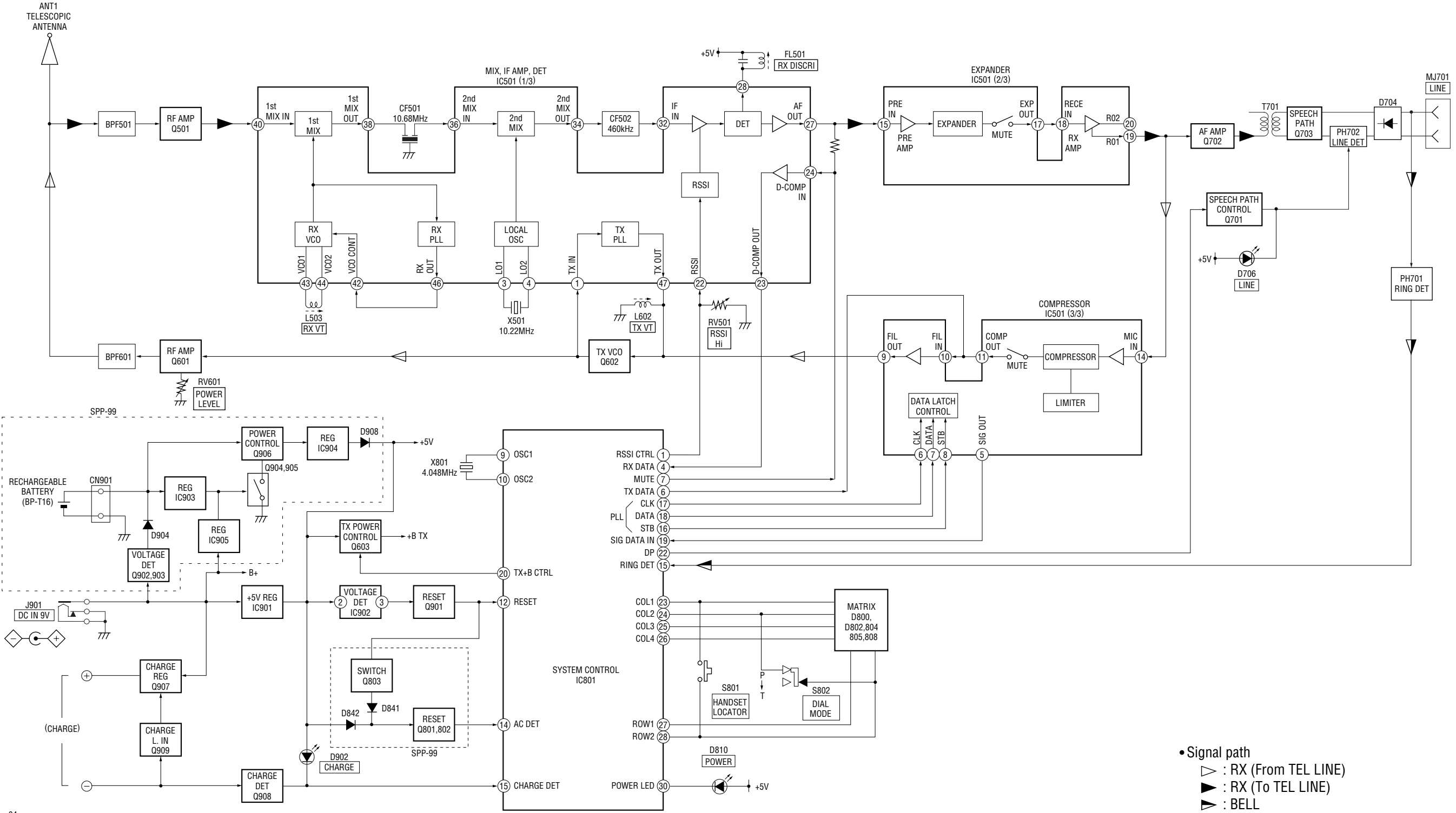


– hand main board (side B) –

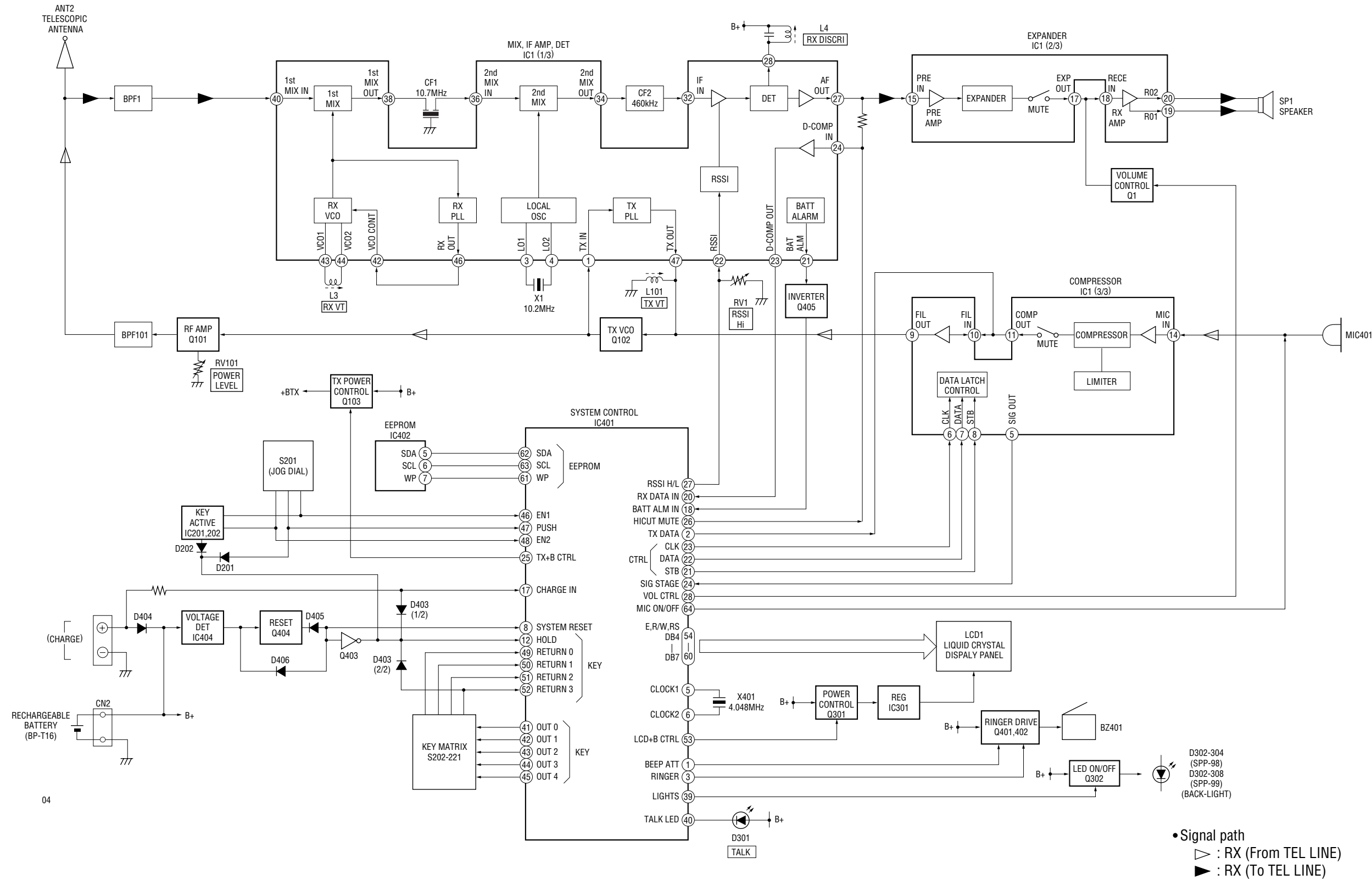


SECTION 5
DIAGRAMS

5-1. BLOCK DIAGRAM — BASE SECTION —



5-2. BLOCK DIAGRAM — HANDSET SECTION —

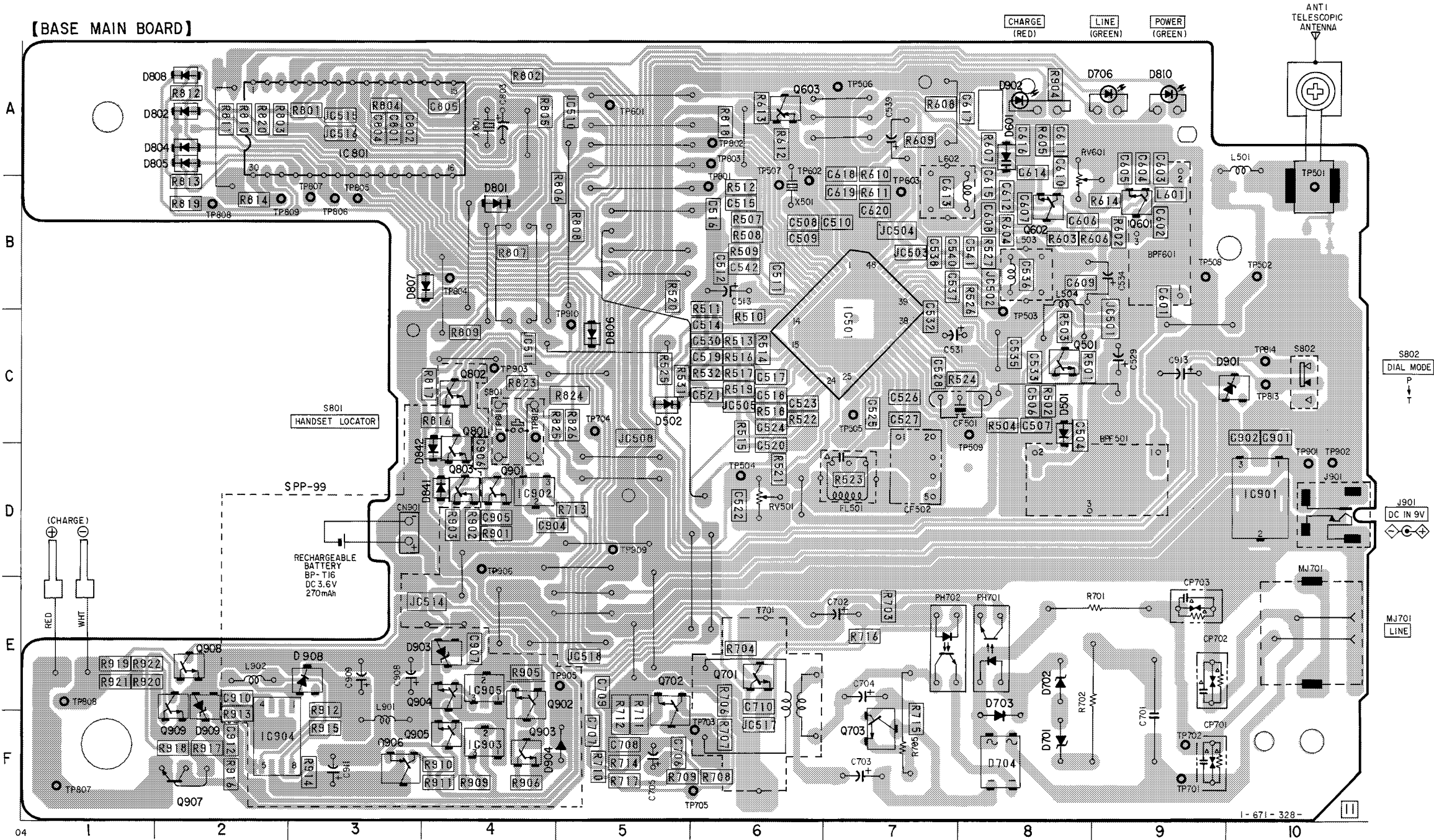


04

5-3. PRINTED WIRING BOARD — BASE SECTION —

• Semiconductor Location

Ref. No.	Location
D501	C-8
D502	C-5
D601	A-8
D701	F-8
D702	E-8
D703	F-8
D704	F-8
D706	A-9
D801	B-4
D802	A-2
D804	A-2
D805	A-2
D806	C-5
D807	B-4
D808	A-2
D810	A-9
(D841)	D-4
(D842)	D-4
D901	C-10
D902	A-8
(D903)	E-4
(D904)	F-5
(D908)	E-3
D909	F-2
IC501	C-7
IC801	A-3
IC901	D-10
IC902	D-4
(IC903)	F-4
(IC904)	F-2
(IC905)	E-4
PH701	E-8
PH702	E-7
Q501	C-8
Q601	B-9
Q602	B-8
Q603	A-6
Q701	E-6
Q702	E-5
Q703	F-7
(Q801)	D-4
(Q802)	C-4
(Q803)	D-4
Q901	D-4
(Q902)	E-4
(Q903)	F-4
(Q904)	E-4
(Q905)	F-4
(Q906)	F-3
Q907	F-2
Q908	E-2
Q909	F-2

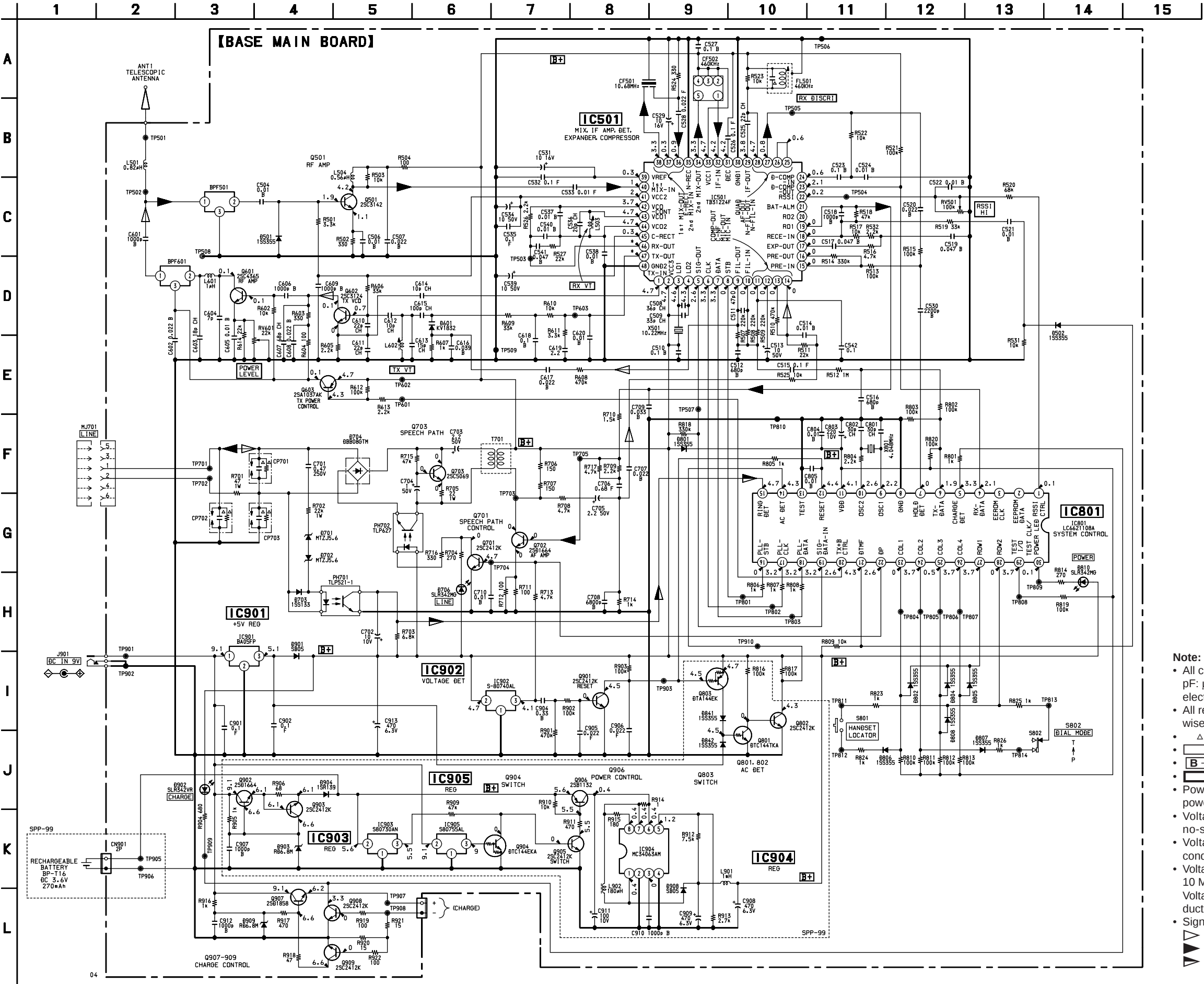


() : SPP-99 only

Note:

- : parts extracted from the component side.
- Δ : internal component.
- : Pattern from the side which enables seeing.

5-4. SCHEMATIC DIAGRAM — BASE SECTION — • Refer to page 37 for IC Block Diagrams.

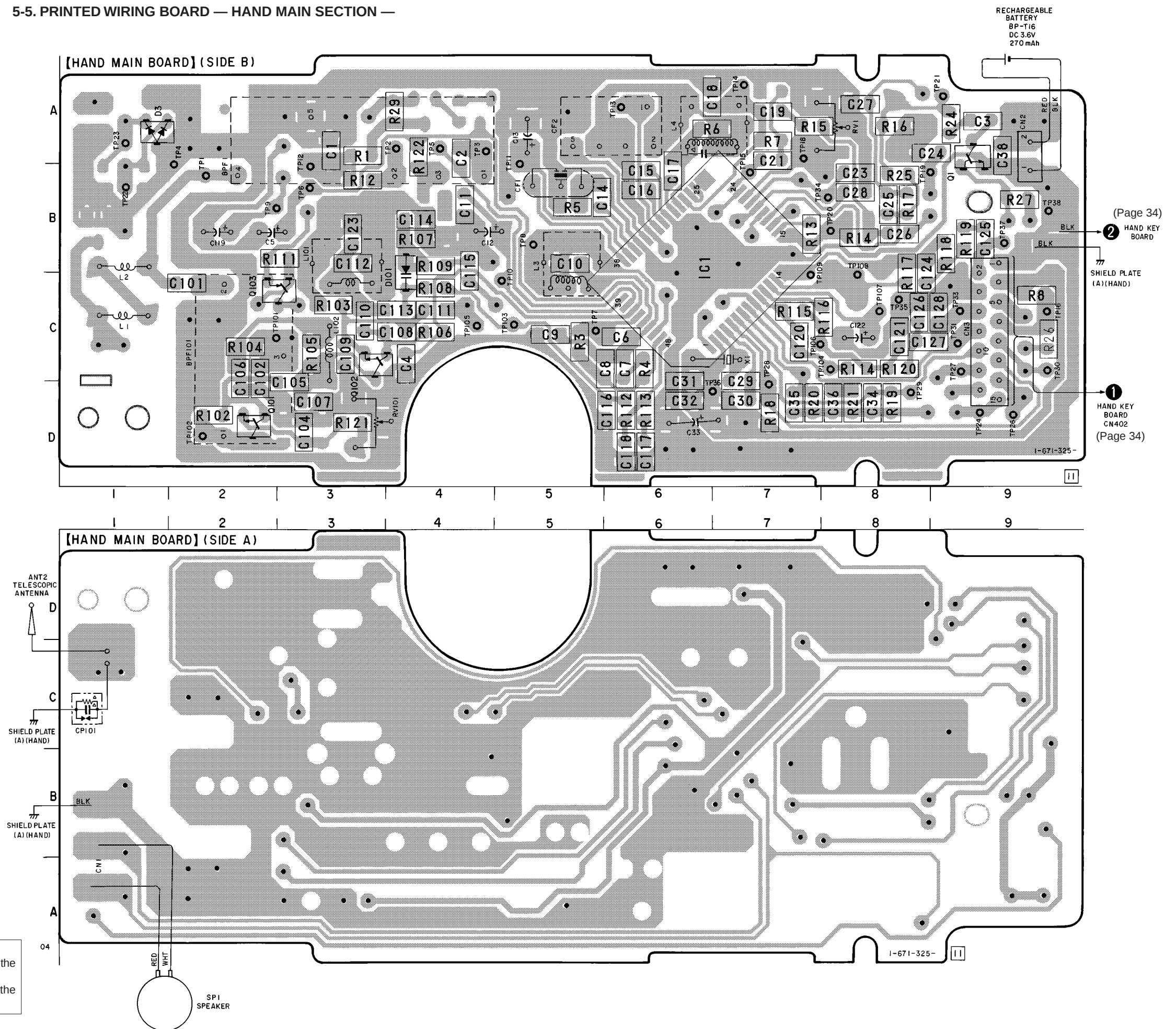


- Note:**
- All capacitors are in μF unless otherwise noted. pF : μF 50 WV or less are not indicated except for electrolytics and tantalums.
 - All resistors are in Ω and $\frac{1}{4}\text{W}$ or less unless otherwise specified.
 - Δ : internal component.
 - $\square$: panel designation.
 - B+ : B+ Line.
 - $\square$: adjustment for repair.
 - Power voltage is dc 9 V and fed with regulated dc power supply from external power voltage jack.
 - Voltage is dc with respect to ground under no-signal condition.
 - Voltage dc with respect to ground under no-signal conditions.
 - Voltages are taken with a VOM (Input impedance 10 M Ω).
 - Voltage variations may be noted due to normal production tolerances.
 - Signal path.
 - $\blacktriangle$: RX
 - $\blacktriangledown$: TX
 - $\blacktriangleright$: bell

5-5. PRINTED WIRING BOARD — HAND MAIN SECTION —

- **Semiconductor Location**

Ref. No.	Location
D3	A-1
D101	C-4
IC1	B-6
Q1	B-9
Q101	D-2
Q102	C-3
Q103	C-2

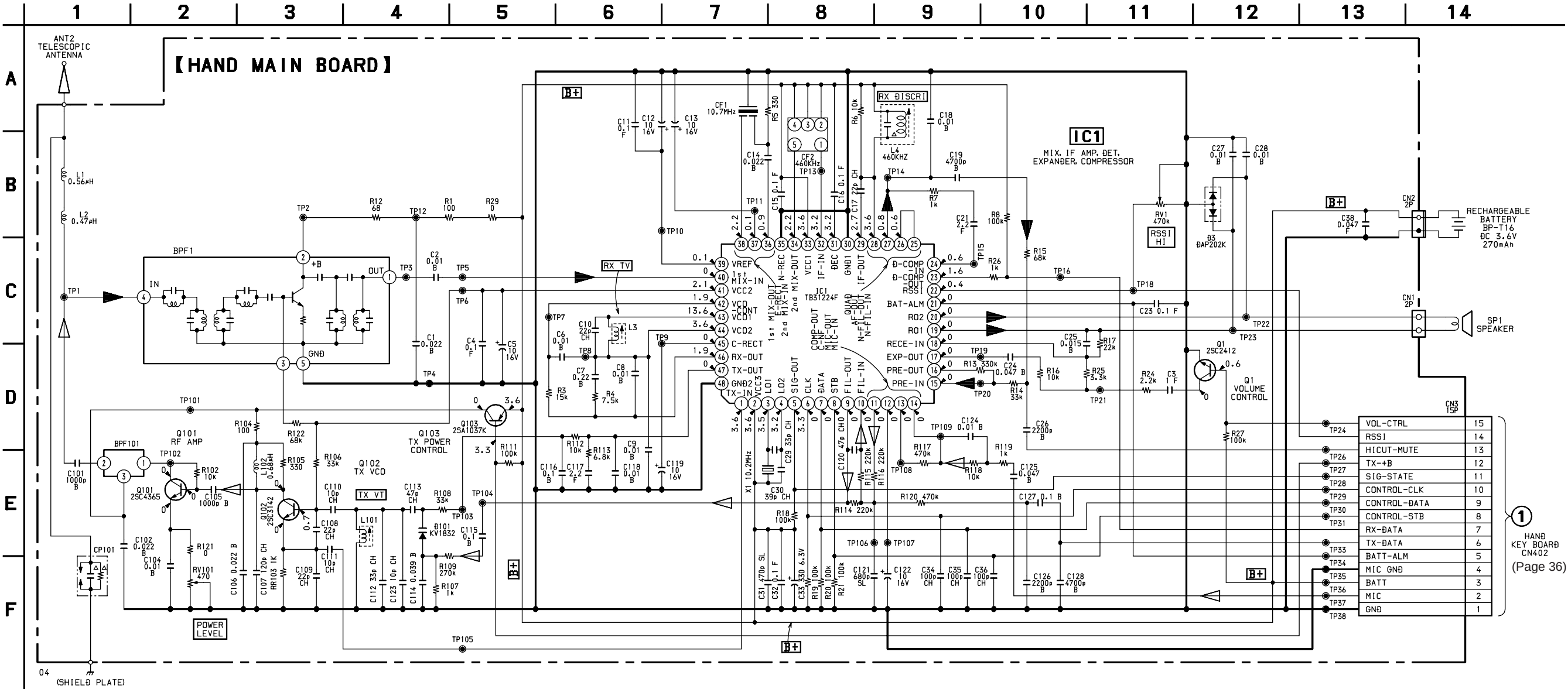


Note:

- : parts extracted from the component side.
- : parts extracted from the conductor side.
- : Through hole.
- ▨ : Pattern from the side which enables seeing.
(The other layer's patterns are not indicated.)

Caution: Pattern face side: Parts on the pattern face side seen from the (Side B) pattern face are indicated. Parts face side: Parts on the parts face side seen from the (Side A) parts face are indicated.
--

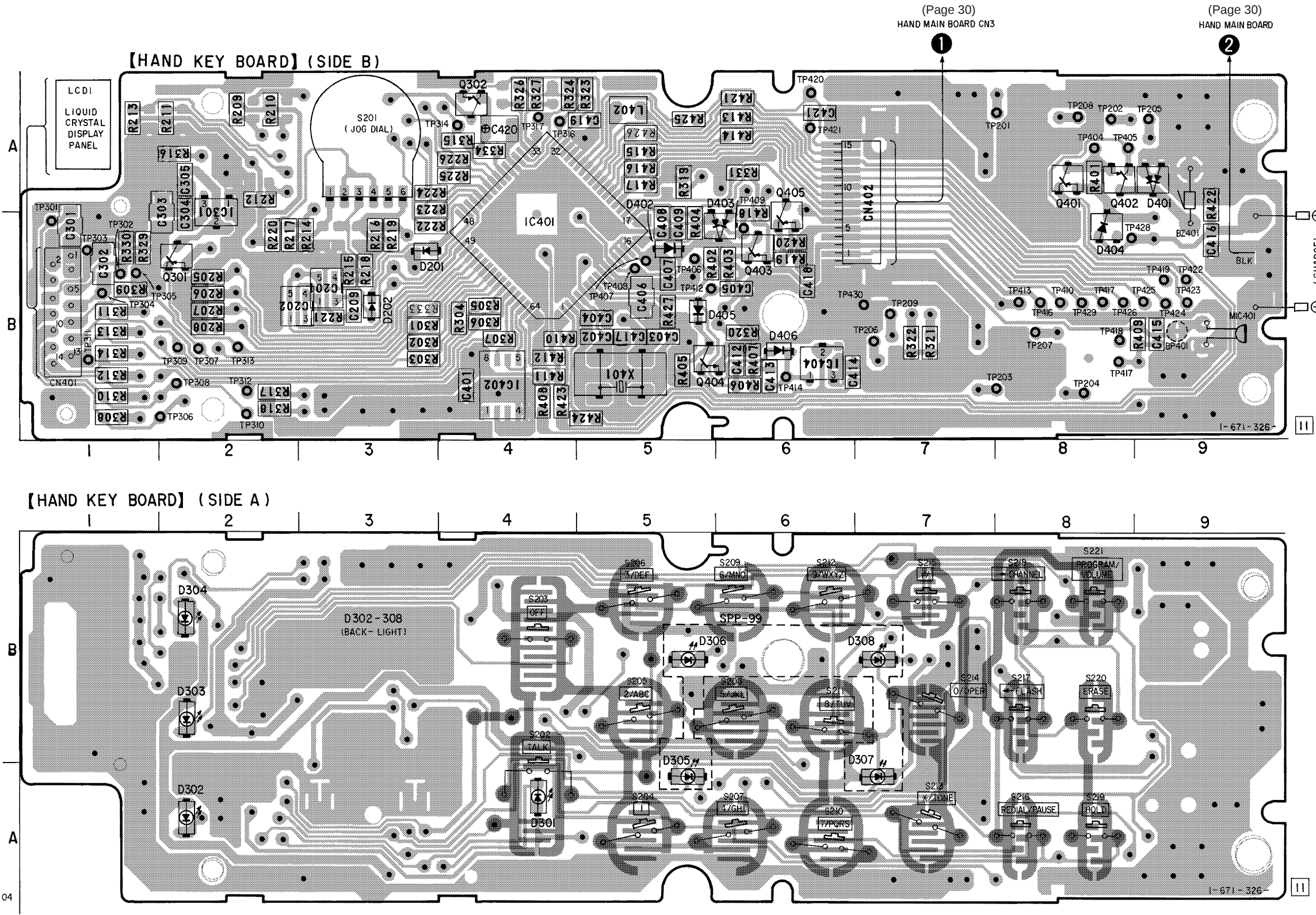
5-6. SCHEMATIC DIAGRAM — HAND MAIN SECTION — • Refer to page 37 for IC Block Diagrams.



Note:

- All capacitors are in μF unless otherwise noted. pF : μF 50 WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and $\frac{1}{4}\text{W}$ or less unless otherwise specified.
- Δ : internal component.
- **B+** : B+ Line.
- $\square$: adjustment for repair.
- Power voltage is dc 3.6 V and fed with regulated dc power supply from battery connector (CN2).
- Voltage is dc with respect to ground under no-signal condition.
- Voltages are taken with a VOM (Input impedance 10 M Ω). Voltage variations may be noted due to normal production tolerances.
- Signal path.
 - ∇ : RX
 - $\blacktriangleright$: TX

5-7. PRINTED WIRING BOARD — HAND KEY SECTION —



• Semiconductor Location

Ref. No.	Location
D201	B-3
D202	B-3
(D301)	A-4
(D302)	A-2
(D303)	B-2
(D304)	B-2
<D305>	A-5
<D306>	B-5
<D307>	A-7
<D308>	B-7
D401	A-9
D402	B-5
D403	B-6
D404	B-8
D405	B-5
D406	B-6
IC201	B-3
IC202	B-3
IC301	B-2
IC401	B-4
IC402	B-4
IC404	B-6
Q301	B-2
Q302	A-4
Q401	A-8
Q402	A-8
Q403	B-6
Q404	B-5
Q405	B-6

() : SIDE A
< > : SIDE A and SPP-99 only

Note:

- : parts extracted from the component side.
- : parts extracted from the conductor side.
- : Through hole.
- : Pattern from the side which enables seeing.
- : Carbon pattern

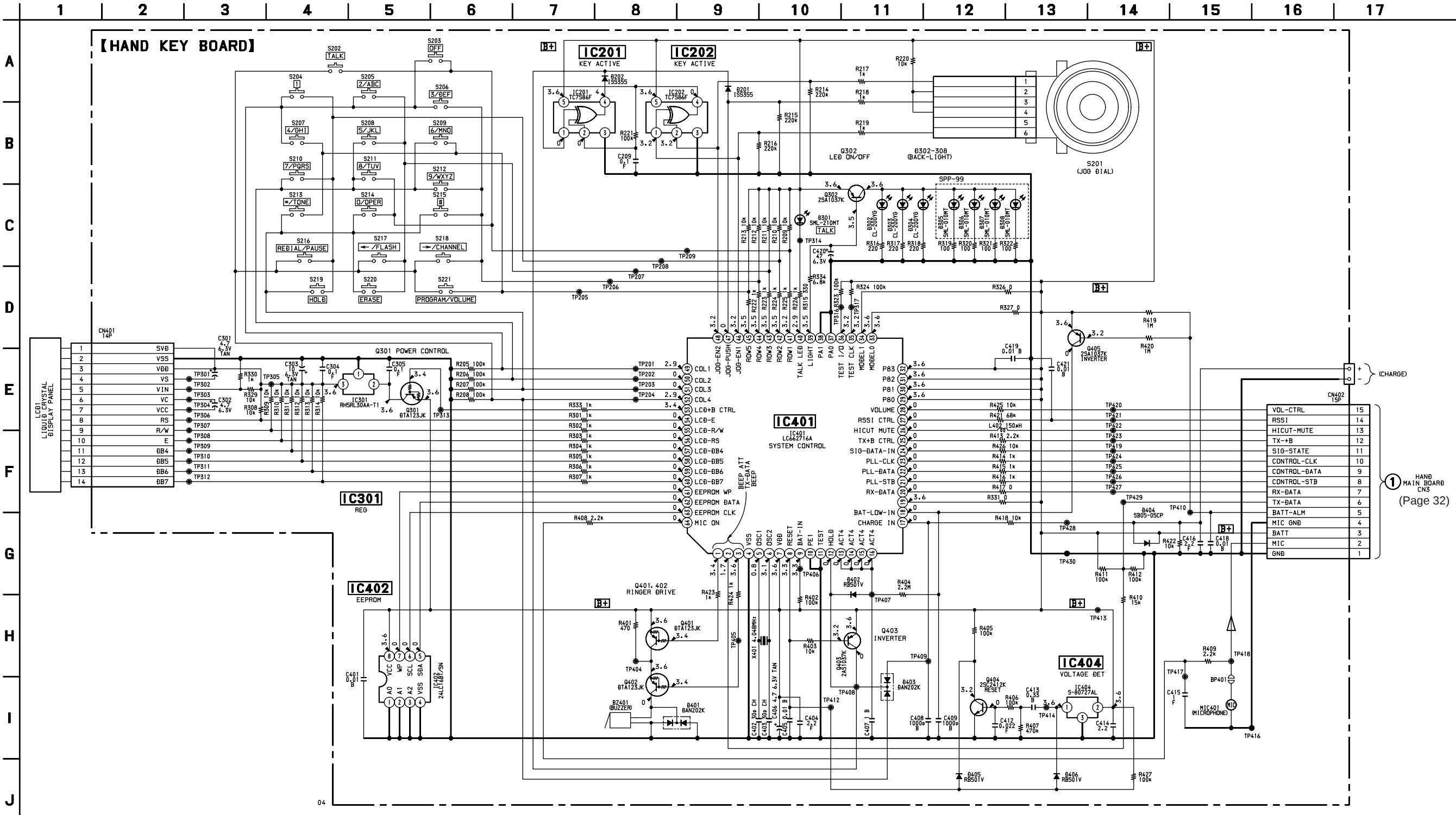
(The other layer's patterns are not indicated.)

Caution:

Pattern face side: Parts on the pattern face side seen from the pattern face are indicated.
(Side B)

Parts face side: Parts on the parts face side seen from the parts face are indicated.
(Side A)

5-8. SCHEMATIC DIAGRAM — HAND KEY SECTION — • Refer to page 37 for IC Block Diagrams.



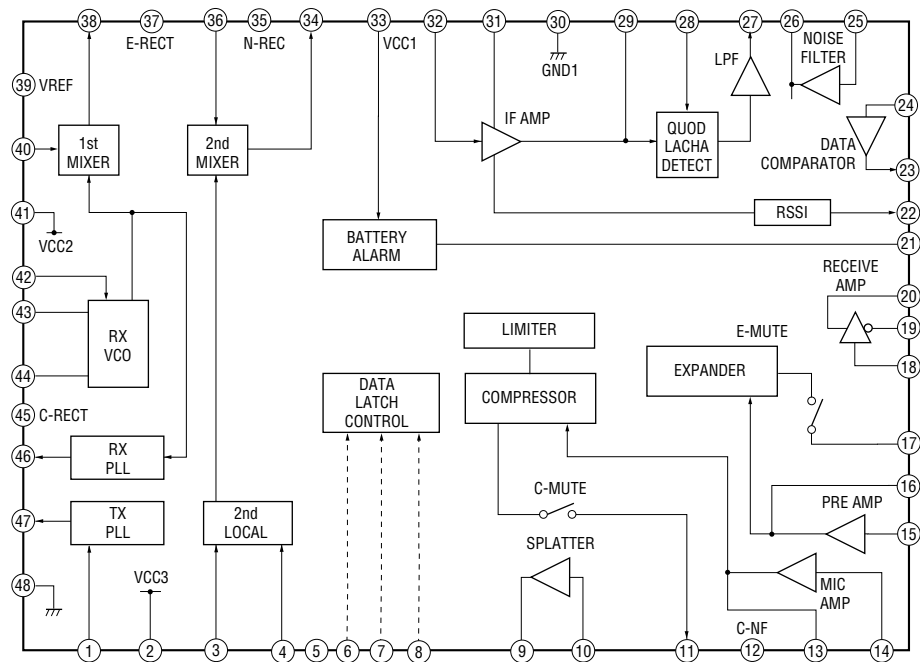
Note:

- All capacitors are in μF unless otherwise noted. pF : μF 50 WV or less are not indicated except for electrolytics and tantalums.
- : panel designation.
- **B+** : B+ Line.
- Power voltage is dc 3.6 V and fed with regulated dc power supply from battery connector (CN2).

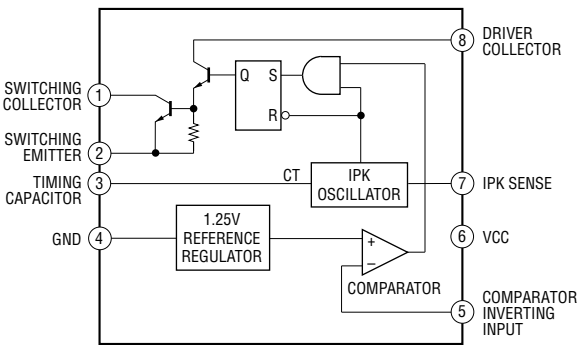
- Voltage is dc with respect to ground under no-signal condition.
- Voltages are taken with a VOM (Input impedance 10 M Ω). Voltage variations may be noted due to normal production tolerances.

• IC Block Diagrams

IC501 TB31224F (BASE MAIN BOARD)
IC1 TB31224F (HAND MAIN BOARD)



IC901 MC34063AM



5-9. IC PIN DESCRIPTIONS

• IC801 LC6621108A (SYSTEM CONTROL) (BASE UNIT)

Pin No.	Pin Name	I/O	Pin Description
1	RSSI CTRL	O	RSSI sens select output (L: Low sens)
2	EEPROM DATA	I/O	EEPROM data input/output (Not used in this set.)
3	EEROM CLK	O	EEPROM clock output (Not used in this set.)
4	RX-DATA	I	RF reception data input
5	CHARGE DET	I	Charge detection input
6	TX-DATA	O	Beep output at RF transmission data or outside the circle.
7	HOLD DET	I	Hold cancellation detection input
8	GND	—	Ground
9	OSC1	—	Crystal oscillation input (4.048MHz)
10	OSC2	—	Crystal oscillation output (4.048MHz)
11	VDD	—	Power supply pin
12	RESET	—	Reset input
13	TEST	—	Not used. (Fixed at L in this set.)
14	AC DET	I	AC adaptor without detection input
15	RING DET	I	Ring detection input
16	PLL-STB	O	PLL control standby output
17	PLL-CLK	O	PLL control clock output
18	PLL-DATA	O	PLL control data output
19	SIG-DATA-IN	I	RSSI/LOCK signal input (L:RSSI, H:LOCK)
20	TX+B CTRL	O	TX power control output
21	DTMF	O	DTMF output
22	DP	O	Pulse output
23	COL1	I	MODEL1/PAGE input
24	COL2	I	MODEL2/ T/P input
25	COL3	I	MODEL3/MAKE input
26	COL4	I	FLASH time/ D/P input
27	ROW1	O	Matrix 1 output
28	ROW2	O	Matrix 2 output
29	TEST I/O	I/O	At TEST start-up or ID writing, data input/output. (L: TEST start-up)
30	TEST CLK/POWER LED	I/O	At initial ID writing, clock input/output and flashing on power failure.

• IC401 LC662716A (SYSTEM CONTROL) (HANDSET)

Pin No.	Pin Name	I/O	Pin Description
1	BEEP ATT	O	Beep volume High/Low control output (L: High)
2	TX-DATA	O	RF transmission data output
3	BEEP	O	Beep output
4	VSS	—	Ground
5	OSC1	—	Crystal oscillation input (4.048MHz)
6	OSC2	—	Crystal oscillation output (4.048MHz)
7	VDD	—	Power supply pin
8	RESET	—	Reset input
9	BAT-IN	I	Battery detection input
10	PE1	—	Not used. (Fixed at L in this set.)
11	TEST	—	Not used. (Fixed at L in this set.)
12	HOLD	I	Input for intermittent. (CR external)
13 – 16	ACT4	O	Output for intermittent reception control. (L: at operation)
17	CHARGE DET	I	Charge detection input (H: in charge)
18	BAT-LOW-IN	I	Battery low-voltage detection input
19	—	—	Not used. (Fixed at H in this set.)
20	RX-DATA	I	RF reception data input
21	PLL-STB	O	PLL control standby output
22	PLL-DATA	O	PLL control data output
23	PLL-CLK	O	PLL control clock output
24	SIG-DATA-IN	I	RSSI/LOCK signal input (L: RSSI, H: LOCK)
25	TX+B CTRL	O	TX power control output
26	HICUT MUTE	O	High band noise mute output
27	RSSI CTRL	O	RSSI sens select output (L: Low sens)
28	VOLUME	O	VOLUME HIGH/NORM select output
29 – 32	P80 – 83	O	Not used. (Fixed at H in this set.)
33	MODE0	I	Destination model select input 0 (Fixed at H in this set.)
34	MODE1	I	Destination model select input 1 (Fixed at H in this set.)
35	TEST CLK	I/O	At initial ID writing, clock input/output.
36	TEST I/O	I/O	At TEST start-up or ID writing, data input/output. (L: TEST start-up)
37, 38	PA0, 1	—	Not used. (Fixed at L in this set.)
39	LIGHT	O	Key & LCD back light LED control output
40	TALK LED	O	TALK LED control output
41 – 45	ROW1 – 5	O	Key matrix output
46	JOG-EN1	I	JOG input
47	JOG-PUSH	I	JOG input
48	JOG-EN2	I	JOG input
49 – 52	COL1 – 4	I	Key matrix input
53	LCD+B CTRL	O	LCD power control output (L: at operation)
54	LCD-E	O	LCD-R/W trigger output
55	LCD-R/W	O	LCD-R/W control output
56	LCD-RS	O	LCD register select signal output
57 – 60	LCD-DB4 – 7	O	LCD-DATA output
61	EEPROM WP	O	EEPROM write protect output
62	EEPROM DATA	I/O	EEPROM data input/output
63	EEPROM CLK	O	EEPROM clock output
64	MIC ON	O	MIC ON/OFF control output (L: OFF)

SECTION 6 EXPLODED VIEWS

NOTE:

- The mechanical parts with no reference number in the exploded views are not supplied.
- Items marked “*” are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

- -XX and -X mean standardized parts, so they may have some difference from the original one.

- Color Indication of Appearance Parts

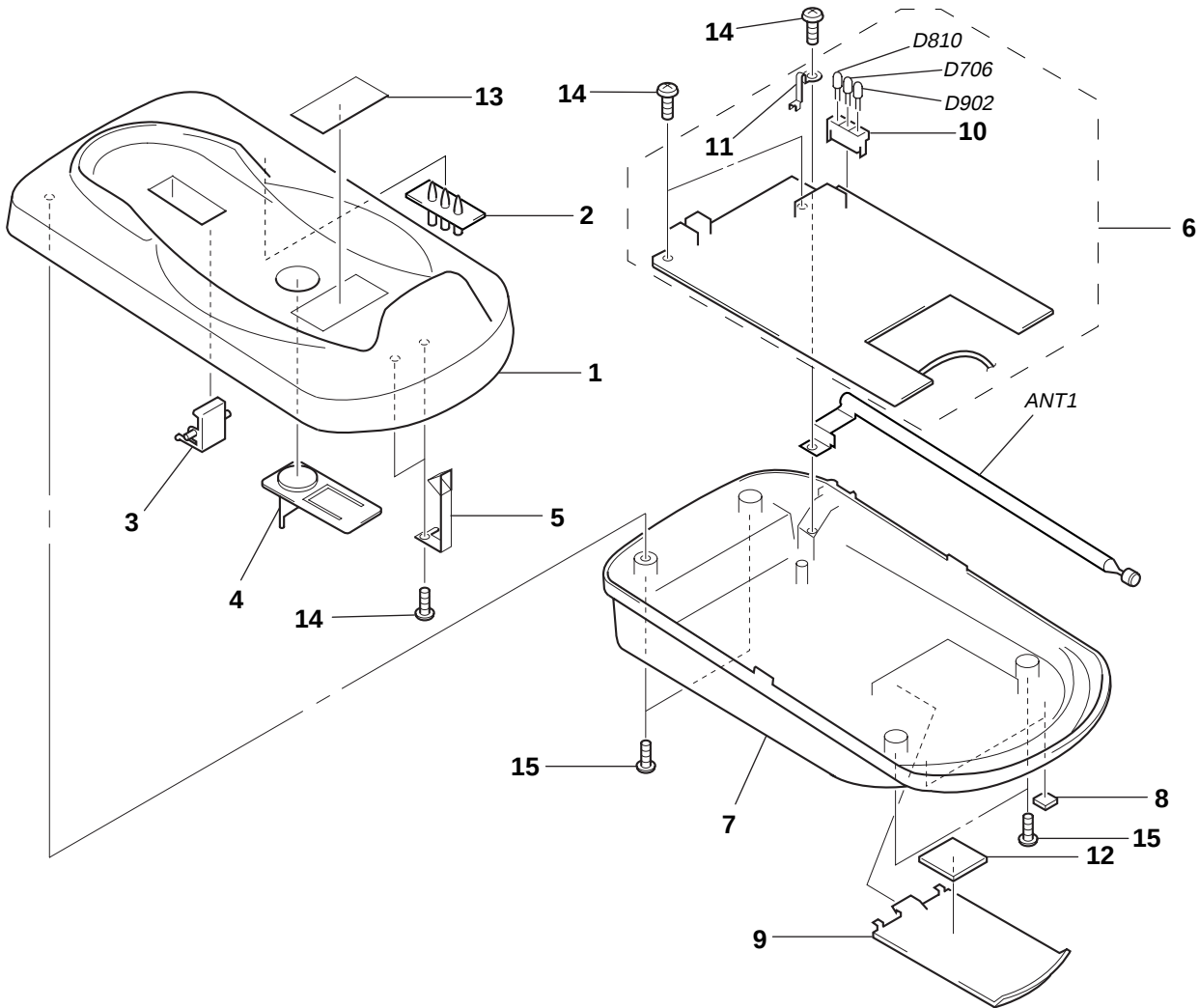
Example :

KNOB, BALANCE (WHITE) ... (RED)

↑ ↑
 Parts Color Cabinet's Color

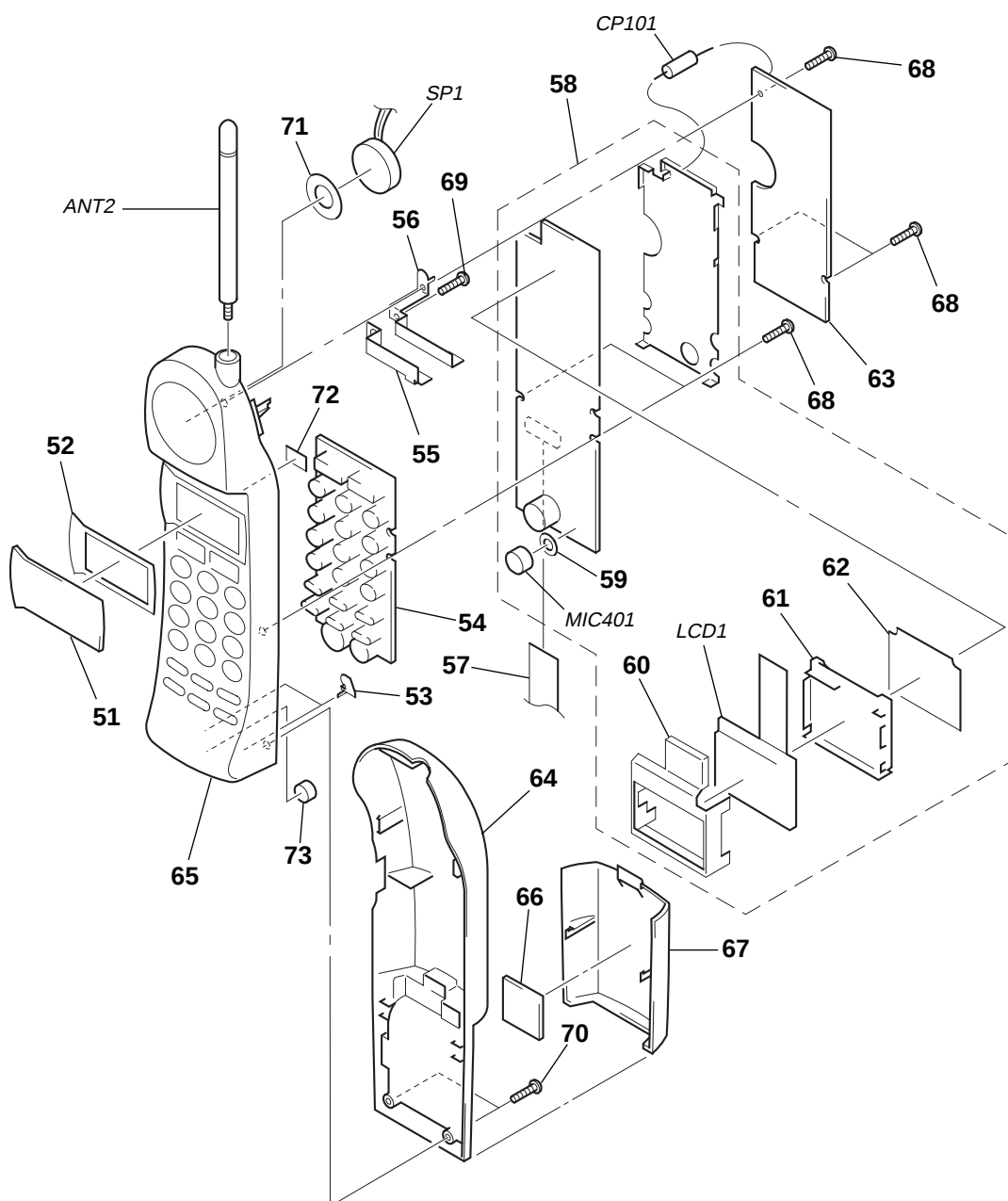
- Accessories and packing materials are given in the last of this parts list.

6-1. BASE UNIT SECTION



Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
1	3-025-391-11	CABINET (UPPER) (SPP-99)		9	3-025-393-01	LID (BASE), BATTERY CASE (SPP-99)	
1	3-025-391-41	CABINET (UPPER) (SPP-98)		10	3-025-409-01	HOLDER (LED)	
2	3-025-394-01	PLATE (LED), LIGHT GUIDE		11	3-025-404-01	TERMINAL (ANTENNA)	
3	3-025-395-01	HANGER (WALL HOOK)		12	3-027-564-01	CUSHION, BATTERY CASE (SPP-99)	
4	3-025-405-01	BUTTON (PAGE)		13	3-007-173-01	LABEL (TERMINAL CAUTION) (/S)	
5	3-025-403-01	TERMINAL (BASE), CHARGE		14	7-685-134-19	SCREW +BTP 2.6X8 TYPE2 N-S	
* 6	A-3672-591-A	BASE MAIN BOARD, COMPLETE (SPP-99)		15	7-685-547-14	SCREW +BTP 3X10 TYPE2 N-S	
* 6	A-3672-600-A	BASE MAIN BOARD, COMPLETE (SPP-98)		ANT1	1-501-982-11	ANTENNA, TELESCOPIC (BASE UNIT)	
7	3-025-392-01	CABINET (LOWER) (SPP-99)		D706	8-719-049-07	LED SLR-342MG3F (LINE)	
7	3-027-454-01	CABINET (LOWER) (SPP-98)		D810	8-719-049-07	LED SLR-342MG3F (POWER)	
8	3-936-696-31	FOOT, RUBBER		D902	8-719-048-90	LED SLR-342VR3F (CHARGE)	

6-2. HANDSET SECTION



Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
51	3-025-399-01	WINDOW (LCD)		64	3-025-397-01	CABINET (REAR)	
52	3-027-148-01	SHEET (WINDOW), ADHESIVE		65	3-025-396-01	CABINET (FRONT)	
53	3-025-401-01	TERMINAL (HAND), CHARGE		66	3-027-146-01	LID (H), CUSHION BATTERY CASE	
54	1-771-405-11	SWITCH, RUBBER KEY (SPP-99)		67	3-025-398-01	LID (HAND), BATTERY CASE	
54	1-771-405-31	SWITCH, RUBBER KEY (SPP-98)		68	3-371-765-21	SCREW (2X8), +BTP	
55	3-025-829-01	HOLDER, ANTENNA		69	7-685-134-19	SCREW +BTP 2.6X8 TYPE2 N-S	
56	3-025-525-01	TERMINAL (ANTENNA H)		70	7-685-535-14	SCREW +BTP 2.6X10 TYPE2 N-S	
57	1-790-013-11	WIRE (FLAT TYPE) (15 CORE)		71	3-027-147-01	SHEET (RECEIVER), ADHESIVE	
* 58	A-3622-243-A	HAND KEY BOARD, COMPLETE (SPP-99)		72	3-027-565-01	SHEET (LCD), ELECTROSTATIC	
* 58	A-3622-249-A	HAND KEY BOARD, COMPLETE (SPP-98)		73	3-031-843-01	SPONGE (MICROPHONE)	
59	3-030-405-01	SPACER (MICROPHONE)		ANT2	1-754-006-11	ANTENNA, TELESCOPIC (HANDSET)	
60	3-025-402-01	HOLDER (LCD)		CP101	1-519-504-11	GAP, DISCHARGE	
61	3-025-400-01	PLATE (LCD), LIGHT GUIDE		LCD1	1-803-146-11	DISPLAY PANEL, LIQUID CRYSTAL	
62	3-027-149-01	SHEET (LCD)		MIC401	1-542-349-11	MICROPHONE	
* 63	A-3672-595-A	HAND MAIN BOARD, COMPLETE		SP1	1-505-333-12	SPEAKER (2.1cm)	

BASE MAIN

SECTION 7 ELECTRICAL PARTS LIST

NOTE:

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX and -X mean standardized parts, so they may have some difference from the original one.
- RESISTORS
All resistors are in ohms.
METAL: Metal-film resistor.
METAL OXIDE: Metal oxide-film resistor.
F: nonflammable

- Items marked “*” are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- SEMICONDUCTORS
In each case, u : μ , for example:
uA.. : μ A.. uPA.. : μ PA..
uPB.. : μ PB.. uPC.. : μ PC.. uPD.. : μ PD..
- CAPACITORS
uF : μ F
- COILS
uH : μ H

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

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

Ref. No.	Part No.	Description	Remark				Ref. No.	Part No.	Description	Remark			
*	A-3672-591-A	BASE MAIN BOARD, COMPLETE (SPP-99)					C538	1-163-021-11	CERAMIC CHIP	0.01uF	10%	50V	
*	A-3672-600-A	BASE MAIN BOARD, COMPLETE (SPP-98)					C539	1-126-964-11	ELECT	10uF	20%	50V	
		*****					C540	1-163-021-11	CERAMIC CHIP	0.01uF	10%	50V	
	3-025-404-01	TERMINAL (ANTENNA)					C541	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V	
	3-025-409-01	HOLDER (LED)					C542	1-162-851-11	CERAMIC	0.1uF	10%	16V	
		< BAND PASS FILTER >					C601	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V	
BPF501	1-233-334-11	FILTER, BAND PASS					C602	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V	
BPF601	1-233-336-11	FILTER, BAND PASS					C603	1-163-233-11	CERAMIC CHIP	18PF	5%	50V	
		< CAPACITOR >					C604	1-163-224-11	CERAMIC CHIP	7PF	0.25PF	50V	
C504	1-163-021-11	CERAMIC CHIP	0.01uF	10%	50V		C605	1-163-021-11	CERAMIC CHIP	0.01uF	10%	50V	
C506	1-163-021-11	CERAMIC CHIP	0.01uF	10%	50V		C606	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V	
C507	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V		C607	1-163-113-00	CERAMIC CHIP	68PF	5%	50V	
C508	1-163-106-00	CERAMIC CHIP	36PF	5%	50V		C608	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V	
C509	1-163-239-11	CERAMIC CHIP	33PF	5%	50V		C609	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V	
C510	1-107-725-11	CERAMIC CHIP	0.1uF	10%	16V		C610	1-163-235-11	CERAMIC CHIP	22PF	5%	50V	
C511	1-163-243-11	CERAMIC CHIP	47PF	5%	50V		C611	1-163-235-11	CERAMIC CHIP	22PF	5%	50V	
C512	1-163-007-11	CERAMIC CHIP	680PF	10%	50V		C612	1-163-227-11	CERAMIC CHIP	10PF	0.5PF	50V	
C513	1-126-964-11	ELECT	10uF	20%	50V		C613	1-163-231-11	CERAMIC CHIP	15PF	5%	50V	
C514	1-163-021-11	CERAMIC CHIP	0.01uF	10%	50V		C614	1-163-227-11	CERAMIC CHIP	10PF	0.5PF	50V	
C515	1-163-038-00	CERAMIC CHIP	0.1uF		25V		C615	1-163-251-11	CERAMIC CHIP	100PF	5%	50V	
C516	1-163-007-11	CERAMIC CHIP	680PF	10%	50V		C616	1-162-587-11	CERAMIC CHIP	0.039uF	10%	25V	
C517	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V		C617	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V	
C518	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V		C618	1-107-725-11	CERAMIC CHIP	0.1uF	10%	16V	
C519	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V		C619	1-164-505-11	CERAMIC CHIP	2.2uF		16V	
C520	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V		C620	1-163-021-11	CERAMIC CHIP	0.01uF	10%	50V	
C521	1-163-021-11	CERAMIC CHIP	0.01uF	10%	50V		C701	1-136-193-11	FILM	0.47uF	10%	250V	
C522	1-163-021-11	CERAMIC CHIP	0.01uF	10%	50V		C702	1-126-964-11	ELECT	10uF	20%	50V	
C523	1-107-725-11	CERAMIC CHIP	0.1uF	10%	16V		C703	1-126-961-11	ELECT	2.2uF	20%	50V	
C524	1-163-021-11	CERAMIC CHIP	0.01uF	10%	50V		C704	1-126-960-11	ELECT	1uF	20%	50V	
C525	1-163-235-11	CERAMIC CHIP	22PF	5%	50V		C705	1-126-961-11	ELECT	2.2uF	20%	50V	
C526	1-163-038-00	CERAMIC CHIP	0.1uF		25V		C706	1-164-700-11	CERAMIC CHIP	0.68uF		16V	
C527	1-107-725-11	CERAMIC CHIP	0.1uF	10%	16V		C707	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V	
C528	1-163-033-11	CERAMIC CHIP	0.022uF		50V		C708	1-163-019-00	CERAMIC CHIP	0.0068uF	10%	50V	
C529	1-126-791-11	ELECT	10uF	20%	16V		C709	1-163-989-11	CERAMIC CHIP	0.033uF	10%	25V	
C530	1-164-161-11	CERAMIC CHIP	0.0022uF	10%	100V		C710	1-163-021-11	CERAMIC CHIP	0.01uF	10%	50V	
C531	1-126-791-11	ELECT	10uF	20%	16V		C801	1-163-104-00	CERAMIC CHIP	30PF	5%	50V	
C532	1-163-038-00	CERAMIC CHIP	0.1uF		25V		C802	1-163-104-00	CERAMIC CHIP	30PF	5%	50V	
C533	1-163-021-11	CERAMIC CHIP	0.01uF	10%	50V		C803	1-126-934-11	ELECT	220uF	20%	10V	
C534	1-126-964-11	ELECT	10uF	20%	50V		C804	1-163-021-11	CERAMIC CHIP	0.01uF	10%	50V	
C535	1-163-038-00	CERAMIC CHIP	0.1uF		25V		C805	1-163-021-11	CERAMIC CHIP	0.01uF	10%	50V	
C536	1-163-234-11	CERAMIC CHIP	20PF	5%	50V		C901	1-163-038-00	CERAMIC CHIP	0.1uF		25V	
C537	1-163-021-11	CERAMIC CHIP	0.01uF	10%	50V		C902	1-163-038-00	CERAMIC CHIP	0.1uF		25V	
							C904	1-110-501-11	CERAMIC CHIP	0.33uF	10%	16V	
							C905	1-163-033-11	CERAMIC CHIP	0.022uF		50V	
							C906	1-163-033-11	CERAMIC CHIP	0.022uF		50V	

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
C907	1-163-009-11	CERAMIC CHIP 0.001uF 10%	50V (SPP-99)			< IC >	
C908	1-126-935-11	ELECT 470uF 20%	6.3V (SPP-99)	IC501	8-759-462-29	IC TB31224F	
C909	1-126-935-11	ELECT 470uF 20%	6.3V (SPP-99)	IC801	8-759-565-54	IC LC6621108A-4K71	
C910	1-163-009-11	CERAMIC CHIP 0.001uF 10%	50V (SPP-99)	IC901	8-759-460-74	IC BA05FP-E2	
C911	1-104-665-11	ELECT 100uF 20%	10V (SPP-99)	IC902	8-759-273-93	IC S-80740AL-A4-T1	
				IC903	8-759-519-46	IC S-80730AN-DT-S (SPP-99)	
C912	1-163-009-11	CERAMIC CHIP 0.001uF 10%	50V	IC904	8-759-434-07	IC MC34063AMEL (SPP-99)	
C913	1-126-935-11	ELECT 470uF 20%	6.3V	IC905	8-759-346-83	IC S-80755AL-EK-T1 (SPP-99)	
		< FILTER >				< JACK >	
CF501	1-577-070-11	FILTER, CERAMIC		J901	1-778-380-11	JACK, DC (POLARITY UNIFIED TYPE)	(DC IN 9V)
CF502	1-760-418-11	FILTER, CERAMIC				< JUMPER RESISTOR >	
		< CONNECTOR >		JC501	1-216-296-00	SHORT 0	
GN901	1-766-180-11	PIN, CONNECTOR (PC BOARD) 2P (SPP-99)		JC502	1-216-296-00	SHORT 0	
		< SURGE ABSORBER >		JC503	1-216-295-00	SHORT 0	
CP701	1-803-011-11	ABSORBER, SURGE (TPA180A18)		JC504	1-216-296-00	SHORT 0	
CP702	1-803-011-11	ABSORBER, SURGE (TPA180A18)		JC505	1-216-295-00	SHORT 0	
CP703	1-803-011-11	ABSORBER, SURGE (TPA180A18)		JC508	1-216-296-00	SHORT 0	
		< DIODE >		JC510	1-216-295-00	SHORT 0	
D501	8-719-988-62	DIODE 1SS355		JC511	1-216-295-00	SHORT 0	
D502	8-719-988-62	DIODE 1SS355		JC514	1-216-296-00	SHORT 0	
D601	8-719-055-14	DIODE KV1832CTR3		JC515	1-216-295-00	SHORT 0	
D701	8-719-109-89	DIODE RD5.6ESB2		JC516	1-216-295-00	SHORT 0	
D702	8-719-109-89	DIODE RD5.6ESB2		JC517	1-216-295-00	SHORT 0	
				JC518	1-216-295-00	SHORT 0	
						< COIL >	
D703	8-719-991-33	DIODE 1SS133T-77		L501	1-414-141-11	INDUCTOR 0.82uH	
D704	8-719-046-69	DIODE DBB08G		L503	1-409-798-11	COIL, OSC	
D706	8-719-049-07	LED SLR-342MG3F (LINE)		L504	1-410-751-41	INDUCTOR 0.56uH	
D801	8-719-988-62	DIODE 1SS355		L601	1-410-993-42	INDUCTOR CHIP 1uH	
D802	8-719-988-62	DIODE 1SS355		L602	1-411-884-11	COIL, OSC	
				L901	1-412-549-11	INDUCTOR 1mH (SPP-99)	
D804	8-719-988-62	DIODE 1SS355		L902	1-412-540-11	INDUCTOR 180uH (SPP-99)	
D805	8-719-988-62	DIODE 1SS355				< MODULAR JACK >	
D806	8-719-988-62	DIODE 1SS355		MJ701	1-766-250-11	JACK, MODULAR (2C) 6P (LINE)	
D807	8-719-988-62	DIODE 1SS355				< PHOTO TRANSISTOR >	
D808	8-719-988-62	DIODE 1SS355					
D810	8-719-049-07	LED SLR-342MG3F (POWER)		PH701	8-719-802-04	PHOTO TRANSISTOR TLP521-1-GR	
D841	8-719-988-62	DIODE 1SS355 (SPP-99)		PH702	8-719-821-66	PHOTO COUPLER TLP627	
D842	8-719-988-62	DIODE 1SS355 (SPP-99)				< TRANSISTOR >	
D901	8-719-938-75	DIODE SB05-05CP		Q501	8-729-031-86	TRANSISTOR 2SC3142-J3J4-TB	
D902	8-719-048-90	LED SLR-342VR3F (CHARGE)		Q601	8-729-031-85	TRANSISTOR 2SC4365-34-TB	
				Q602	8-729-031-86	TRANSISTOR 2SC3142-J3J4-TB	
D903	8-719-157-36	DIODE RD6.8M-B (SPP-99)		Q603	8-729-216-22	TRANSISTOR 2SA1162-G	
D904	8-719-970-02	DIODE 1SR139-400 (SPP-99)		Q701	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
D908	8-719-938-75	DIODE SB05-05CP (SPP-99)					
D909	8-719-157-36	DIODE RD6.8M-B		Q702	8-729-106-68	TRANSISTOR 2SD1615A-GP	
		< COIL >					
FL501	1-409-671-11	COIL, IFT					

BASE MAIN

Ref. No.	Part No.	Description	Remark
Q703	8-729-032-66	TRANSISTOR 2SC5069-TD	
Q801	8-729-027-60	TRANSISTOR DTC144TKA-T146 (SPP-99)	
Q802	8-729-120-28	TRANSISTOR 2SC1623-L5L6 (SPP-99)	
Q803	8-729-901-06	TRANSISTOR DTA144EK (SPP-99)	
Q901	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q902	8-729-106-68	TRANSISTOR 2SD1615A-GP (SPP-99)	
Q903	8-729-120-28	TRANSISTOR 2SC1623-L5L6 (SPP-99)	
Q904	1-801-806-11	TRANSISTOR DTC144EKA-T146 (SPP-99)	
Q905	8-729-120-28	TRANSISTOR 2SC1623-L5L6 (SPP-99)	
Q906	8-729-106-60	TRANSISTOR 2SB1115A (SPP-99)	
Q907	8-729-931-14	TRANSISTOR 2SD1858-Q-TV2	
Q908	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q909	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
< RESISTOR >			
R501	1-216-061-00	METAL CHIP 3.3K 5% 1/10W	
R502	1-216-037-00	METAL CHIP 330 5% 1/10W	
R503	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R504	1-216-025-00	RES,CHIP 100 5% 1/10W	
R507	1-216-105-00	RES,CHIP 220K 5% 1/10W	
R508	1-216-105-00	RES,CHIP 220K 5% 1/10W	
R509	1-216-105-00	RES,CHIP 220K 5% 1/10W	
R510	1-216-113-00	METAL CHIP 470K 5% 1/10W	
R511	1-216-081-00	METAL CHIP 22K 5% 1/10W	
R512	1-216-121-00	RES,CHIP 1M 5% 1/10W	
R513	1-216-097-00	RES,CHIP 100K 5% 1/10W	
R514	1-216-109-00	METAL CHIP 330K 5% 1/10W	
R515	1-216-097-00	RES,CHIP 100K 5% 1/10W	
R516	1-216-065-00	RES,CHIP 4.7K 5% 1/10W	
R517	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R518	1-216-089-00	RES,CHIP 47K 5% 1/10W	
R519	1-216-085-00	METAL CHIP 33K 5% 1/10W	
R520	1-216-093-00	METAL CHIP 68K 5% 1/10W	
R521	1-216-097-00	RES,CHIP 100K 5% 1/10W	
R522	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R523	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R524	1-216-037-00	METAL CHIP 330 5% 1/10W	
R525	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R526	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R527	1-216-081-00	METAL CHIP 22K 5% 1/10W	
R531	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R532	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R602	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R603	1-216-037-00	METAL CHIP 330 5% 1/10W	
R604	1-216-025-00	RES,CHIP 100 5% 1/10W	
R605	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R606	1-216-085-00	METAL CHIP 33K 5% 1/10W	
R607	1-216-049-11	RES,CHIP 1K 5% 1/10W	
R608	1-216-113-00	METAL CHIP 470K 5% 1/10W	
R609	1-216-085-00	METAL CHIP 33K 5% 1/10W	
R610	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R611	1-216-061-00	METAL CHIP 3.3K 5% 1/10W	
R612	1-216-097-00	RES,CHIP 100K 5% 1/10W	

Ref. No.	Part No.	Description	Remark
R613	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R614	1-216-081-00	METAL CHIP 22K 5% 1/10W	
R701	1-215-861-00	METAL OXIDE 47 5% 1W F	
R702	1-215-877-11	METAL OXIDE 22K 5% 1W F	
R703	1-216-069-00	METAL CHIP 6.8K 5% 1/10W	
R704	1-216-035-00	METAL CHIP 270 5% 1/10W	
R705	1-215-859-00	METAL OXIDE 22 5% 1W F	
R706	1-216-029-00	METAL CHIP 150 5% 1/10W	
R707	1-216-029-00	METAL CHIP 150 5% 1/10W	
R708	1-216-065-00	RES,CHIP 4.7K 5% 1/10W	
R709	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R710	1-216-053-00	METAL CHIP 1.5K 5% 1/10W	
R711	1-216-174-00	RES,CHIP 100 5% 1/8W	
R712	1-216-174-00	RES,CHIP 100 5% 1/8W	
R713	1-216-065-00	RES,CHIP 4.7K 5% 1/10W	
R714	1-216-049-11	RES,CHIP 1K 5% 1/10W	
R715	1-216-089-00	RES,CHIP 47K 5% 1/10W	
R716	1-216-037-00	METAL CHIP 330 5% 1/10W	
R717	1-216-065-00	RES,CHIP 4.7K 5% 1/10W	
R801	1-216-049-11	RES,CHIP 1K 5% 1/10W	
R802	1-216-097-00	RES,CHIP 100K 5% 1/10W	
R803	1-216-097-00	RES,CHIP 100K 5% 1/10W	
R804	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R805	1-216-049-11	RES,CHIP 1K 5% 1/10W	
R806	1-216-049-11	RES,CHIP 1K 5% 1/10W	
R807	1-216-049-11	RES,CHIP 1K 5% 1/10W	
R808	1-216-049-11	RES,CHIP 1K 5% 1/10W	
R809	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R810	1-216-097-00	RES,CHIP 100K 5% 1/10W	
R811	1-216-097-00	RES,CHIP 100K 5% 1/10W	
R812	1-216-097-00	RES,CHIP 100K 5% 1/10W	
R813	1-216-097-00	RES,CHIP 100K 5% 1/10W	
R814	1-216-035-00	METAL CHIP 270 5% 1/10W	
R816	1-216-097-00	RES,CHIP 100K 5% 1/10W	
R817	1-216-097-00	RES,CHIP 100K 5% 1/10W	(SPP-99)
R818	1-216-109-00	METAL CHIP 330K 5% 1/10W	
R819	1-216-097-00	RES,CHIP 100K 5% 1/10W	
R820	1-216-097-00	RES,CHIP 100K 5% 1/10W	
R823	1-216-049-11	RES,CHIP 1K 5% 1/10W	
R824	1-216-198-00	RES,CHIP 1K 5% 1/8W	
R825	1-216-049-11	RES,CHIP 1K 5% 1/10W	
R826	1-216-049-11	RES,CHIP 1K 5% 1/10W	
R901	1-216-113-00	METAL CHIP 470K 5% 1/10W	
R902	1-216-097-00	RES,CHIP 100K 5% 1/10W	
R903	1-216-097-00	RES,CHIP 100K 5% 1/10W	
R904	1-216-045-00	METAL CHIP 680 5% 1/10W	
R905	1-216-049-11	RES,CHIP 1K 5% 1/10W	(SPP-99)
R906	1-216-021-00	METAL CHIP 68 5% 1/10W	(SPP-99)
R909	1-216-089-00	RES,CHIP 47K 5% 1/10W	(SPP-99)

BASE MAIN

HAND KEY

Ref. No.	Part No.	Description	Remark
R910	1-216-073-00	METAL CHIP 10K 5%	1/10W (SPP-99)
R911	1-216-041-00	METAL CHIP 470 5%	1/10W (SPP-99)
R912	1-216-070-00	METAL CHIP 7.5K 5%	1/10W (SPP-99)
R913	1-216-059-00	METAL CHIP 2.7K 5%	1/10W (SPP-99)
R914	1-217-671-11	METAL CHIP 1 5%	1/10W (SPP-99)
R915	1-216-031-00	METAL CHIP 180 5%	1/10W (SPP-99)
R916	1-216-049-11	RES,CHIP 1K 5%	1/10W
R917	1-216-041-00	METAL CHIP 470 5%	1/10W
R918	1-216-017-00	RES,CHIP 47 5%	1/10W
R919	1-216-025-00	RES,CHIP 100 5%	1/10W
R920	1-216-005-00	METAL CHIP 15 5%	1/10W
R921	1-216-005-00	METAL CHIP 15 5%	1/10W
R922	1-216-025-00	RES,CHIP 100 5%	1/10W
< VARIABLE RESISTOR >			
RV501	1-241-767-21	RES, ADJ, CARBON 100K	
RV601	1-241-765-11	RES, ADJ, CARBON 22K	
< SWITCH >			
S801	1-553-856-00	SWITCH, KEY BOARD (HANDSET LOCATOR)	
S802	1-692-991-11	SWITCH, SLIDE (DIAL MODE)	
< TRANSFORMER >			
T701	1-431-832-11	TRANSFORMER, LINE	
< VIBRATOR >			
X501	1-760-325-11	VIBRATOR, CRYSTAL (10.22MHz)	
X801	1-760-324-11	VIBRATOR, CRYSTAL (4.048MHz)	

*	A-3622-243-A	HAND KEY BOARD, COMPLETE (SPP-99)	
*	A-3622-249-A	HAND KEY BOARD, COMPLETE (SPP-98)	

	3-025-400-01	PLATE (LCD), LIGHT GUIDE	
	3-025-402-01	HOLDER (LCD)	
	3-027-149-01	SHEET (LCD)	
	3-030-405-01	SPACER (MICROPHONE)	
< BUZZER >			
BZ401	1-544-603-11	BUZZER	
< CAPACITOR >			
C209	1-163-038-00	CERAMIC CHIP 0.1uF	25V
C301	1-135-181-21	TANTALUM CHIP 4.7uF	20% 6.3V
C302	1-135-181-21	TANTALUM CHIP 4.7uF	20% 6.3V
C303	1-135-259-11	TANTAL. CHIP 10uF	20% 6.3V
C304	1-163-038-00	CERAMIC CHIP 0.1uF	25V

Ref. No.	Part No.	Description	Remark
C305	1-163-038-00	CERAMIC CHIP 0.1uF	25V
C401	1-163-021-11	CERAMIC CHIP 0.01uF	10% 50V
C402	1-163-104-00	CERAMIC CHIP 30PF	5% 50V
C403	1-163-104-00	CERAMIC CHIP 30PF	5% 50V
C404	1-164-505-11	CERAMIC CHIP 2.2uF	16V
C405	1-163-021-11	CERAMIC CHIP 0.01uF	10% 50V
C406	1-135-181-21	TANTALUM CHIP 4.7uF	20% 6.3V
C407	1-109-982-11	CERAMIC CHIP 1uF	10% 10V
C408	1-163-009-11	CERAMIC CHIP 0.001uF	10% 50V
C409	1-163-009-11	CERAMIC CHIP 0.001uF	10% 50V
C412	1-163-033-11	CERAMIC CHIP 0.022uF	50V
C413	1-110-501-11	CERAMIC CHIP 0.33uF	10% 16V
C414	1-164-505-11	CERAMIC CHIP 2.2uF	16V
C415	1-164-346-11	CERAMIC CHIP 1uF	16V
C416	1-164-505-11	CERAMIC CHIP 2.2uF	16V
C418	1-163-021-11	CERAMIC CHIP 0.01uF	10% 50V
C419	1-163-021-11	CERAMIC CHIP 0.01uF	10% 50V
C420	1-110-569-11	TANTAL. CHIP 47uF	20% 6.3V
C421	1-163-021-11	CERAMIC CHIP 0.01uF	10% 50V
< CONNECTOR >			
CN401	1-566-514-11	CONNECTOR, FPC (ZIF) 14P	
CN402	1-774-403-11	CONNECTOR, FPC 15P	
< DIODE >			
D201	8-719-988-62	DIODE 1SS355	
D202	8-719-988-62	DIODE 1SS355	
D301	8-719-060-99	LED SML-210MT (TALK)	
D302	8-719-066-82	LED CL-200YG-C-TU	
D303	8-719-066-82	LED CL-200YG-C-TU	
D304	8-719-066-82	LED CL-200YG-C-TU	
D305	8-719-059-94	LED SML-010MT-T86 (SPP-99)	
D306	8-719-059-94	LED SML-010MT-T86 (SPP-99)	
D307	8-719-059-94	LED SML-010MT-T86 (SPP-99)	
D308	8-719-059-94	LED SML-010MT-T86 (SPP-99)	
D401	8-719-914-43	DIODE DAN202K	
D402	8-719-058-24	DIODE RB501V-40TE-17	
D403	8-719-914-43	DIODE DAN202K	
D404	8-719-938-75	DIODE SB05-05CP	
D405	8-719-058-24	DIODE RB501V-40TE-17	
D406	8-719-058-24	DIODE RB501V-40TE-17	
< IC >			
IC201	8-759-195-02	IC TC7S86F-TE85L	
IC202	8-759-195-02	IC TC7S86F-TE85L	
IC301	8-759-448-39	IC RH5RL30AA-T1	
IC401	8-759-565-55	IC LC662716A-4K70	
IC402	8-759-454-79	IC 24LC16BT/SN	
IC404	8-759-082-66	IC S-80727AL-AQ-T1	
< COIL >			
L402	1-410-656-11	INDUCTOR CHIP 150uH	

HAND KEY

Ref. No.	Part No.	Description	Remark				Ref. No.	Part No.	Description	Remark			
LCD1	1-803-146-11	< LIQUID CRYSTAL DISPLAY >					R314	1-216-073-00	METAL CHIP	10K	5%	1/10W	
							R315	1-216-037-00	METAL CHIP	330	5%	1/10W	
		DISPLAY PANEL, LIQUID CRYSTAL					R316	1-216-033-00	METAL CHIP	220	5%	1/10W	
							R317	1-216-033-00	METAL CHIP	220	5%	1/10W	
		< MICROPHONE >					R318	1-216-033-00	METAL CHIP	220	5%	1/10W	
MIC401	1-542-349-11	MICROPHONE					R319	1-216-025-00	RES,CHIP	100	5%	1/10W	
							R320	1-216-025-00	RES,CHIP	100	5%	1/10W	
		< TRANSISTOR >					R321	1-216-025-00	RES,CHIP	100	5%	1/10W	
							R322	1-216-025-00	RES,CHIP	100	5%	1/10W	
							R323	1-216-097-00	RES,CHIP	100K	5%	1/10W	
Q301	8-729-923-62	TRANSISTOR	DTA123JK										
Q302	8-729-216-22	TRANSISTOR	2SA1162-G										
Q401	8-729-923-62	TRANSISTOR	DTA123JK				R324	1-216-097-00	RES,CHIP	100K	5%	1/10W	
Q402	8-729-923-62	TRANSISTOR	DTA123JK				R326	1-216-295-00	SHORT	0			
Q403	8-729-216-22	TRANSISTOR	2SA1162-G				R327	1-216-295-00	SHORT	0			
							R329	1-216-073-00	METAL CHIP	10K	5%	1/10W	
Q404	8-729-120-28	TRANSISTOR	2SC1623-L5L6				R330	1-216-049-11	RES,CHIP	1K	5%	1/10W	
Q405	8-729-216-22	TRANSISTOR	2SA1162-G										
		< RESISTOR >					R331	1-216-295-00	SHORT	0			
							R333	1-216-049-11	RES,CHIP	1K	5%	1/10W	
R205	1-216-097-00	RES,CHIP	100K	5%	1/10W		R334	1-216-069-00	METAL CHIP	6.8K	5%	1/10W	
R206	1-216-097-00	RES,CHIP	100K	5%	1/10W		R401	1-216-041-00	METAL CHIP	470	5%	1/10W	
R207	1-216-097-00	RES,CHIP	100K	5%	1/10W		R402	1-216-097-00	RES,CHIP	100K	5%	1/10W	
R208	1-216-097-00	RES,CHIP	100K	5%	1/10W								
R209	1-216-073-00	METAL CHIP	10K	5%	1/10W		R403	1-216-073-00	METAL CHIP	10K	5%	1/10W	
							R404	1-216-129-00	METAL CHIP	2.2M	5%	1/10W	
R210	1-216-073-00	METAL CHIP	10K	5%	1/10W		R405	1-216-097-00	RES,CHIP	100K	5%	1/10W	
R211	1-216-073-00	METAL CHIP	10K	5%	1/10W		R406	1-216-097-00	RES,CHIP	100K	5%	1/10W	
R212	1-216-073-00	METAL CHIP	10K	5%	1/10W		R407	1-216-113-00	METAL CHIP	470K	5%	1/10W	
R213	1-216-073-00	METAL CHIP	10K	5%	1/10W								
R214	1-216-105-00	RES,CHIP	220K	5%	1/10W		R408	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
							R409	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R215	1-216-105-00	RES,CHIP	220K	5%	1/10W		R410	1-216-077-00	METAL CHIP	15K	5%	1/10W	
R216	1-216-105-00	RES,CHIP	220K	5%	1/10W		R411	1-216-097-00	RES,CHIP	100K	5%	1/10W	
R217	1-216-049-11	RES,CHIP	1K	5%	1/10W		R412	1-216-097-00	RES,CHIP	100K	5%	1/10W	
R218	1-216-049-11	RES,CHIP	1K	5%	1/10W								
R219	1-216-049-11	RES,CHIP	1K	5%	1/10W		R413	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
							R414	1-216-049-11	RES,CHIP	1K	5%	1/10W	
R220	1-216-073-00	METAL CHIP	10K	5%	1/10W		R415	1-216-049-11	RES,CHIP	1K	5%	1/10W	
R221	1-216-097-00	RES,CHIP	100K	5%	1/10W		R416	1-216-049-11	RES,CHIP	1K	5%	1/10W	
R222	1-216-049-11	RES,CHIP	1K	5%	1/10W		R417	1-216-295-00	SHORT	0			
R223	1-216-049-11	RES,CHIP	1K	5%	1/10W								
R224	1-216-049-11	RES,CHIP	1K	5%	1/10W		R418	1-216-073-00	METAL CHIP	10K	5%	1/10W	
							R419	1-216-121-00	RES,CHIP	1M	5%	1/10W	
R225	1-216-049-11	RES,CHIP	1K	5%	1/10W		R420	1-216-121-00	RES,CHIP	1M	5%	1/10W	
R226	1-216-049-11	RES,CHIP	1K	5%	1/10W		R421	1-216-093-00	METAL CHIP	68K	5%	1/10W	
R301	1-216-049-11	RES,CHIP	1K	5%	1/10W		R422	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R302	1-216-049-11	RES,CHIP	1K	5%	1/10W								
R303	1-216-049-11	RES,CHIP	1K	5%	1/10W		R423	1-216-049-11	RES,CHIP	1K	5%	1/10W	
							R424	1-216-049-11	RES,CHIP	1K	5%	1/10W	
R304	1-216-049-11	RES,CHIP	1K	5%	1/10W		R425	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R305	1-216-049-11	RES,CHIP	1K	5%	1/10W		R426	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R306	1-216-049-11	RES,CHIP	1K	5%	1/10W		R427	1-216-097-00	RES,CHIP	100K	5%	1/10W	
R307	1-216-049-11	RES,CHIP	1K	5%	1/10W								
R308	1-216-073-00	METAL CHIP	10K	5%	1/10W				< ROTARY ENCODER >				
							S201	1-475-568-12	ENCODER, ROTARY				
R309	1-216-073-00	METAL CHIP	10K	5%	1/10W				< VIBRATOR >				
R310	1-216-073-00	METAL CHIP	10K	5%	1/10W								
R311	1-216-073-00	METAL CHIP	10K	5%	1/10W								
R312	1-216-073-00	METAL CHIP	10K	5%	1/10W								
R313	1-216-073-00	METAL CHIP	10K	5%	1/10W		X401	1-781-101-11	VIBRATOR, CRYSTAL (4.048MHz)				

Ref. No.	Part No.	Description	Remark			Ref. No.	Part No.	Description	Remark		
*	A-3672-595-A	HAND MAIN BOARD, COMPLETE *****				C112	1-163-239-11	CERAMIC CHIP 33PF	5%	50V	
		< BAND PASS FILTER >				C113	1-163-243-11	CERAMIC CHIP 47PF	5%	50V	
						C114	1-162-587-11	CERAMIC CHIP 0.039uF	10%	25V	
						C115	1-107-725-11	CERAMIC CHIP 0.1uF	10%	16V	
						C116	1-107-725-11	CERAMIC CHIP 0.1uF	10%	16V	
BPF1	1-234-163-21	FILTER, BAND PASS				C117	1-164-505-11	CERAMIC CHIP 2.2uF		16V	
BPF101	1-233-334-11	FILTER, BAND PASS				C118	1-163-021-11	CERAMIC CHIP 0.01uF	10%	50V	
		< CAPACITOR >				C119	1-126-791-11	ELECT 10uF	20%	16V	
C1	1-163-037-11	CERAMIC CHIP 0.022uF	10%	25V		C120	1-163-243-11	CERAMIC CHIP 47PF	5%	50V	
C2	1-163-021-11	CERAMIC CHIP 0.01uF	10%	50V		C121	1-163-137-00	CERAMIC CHIP 680PF	5%	50V	
C3	1-164-346-11	CERAMIC CHIP 1uF		16V		C122	1-126-791-11	ELECT 10uF	20%	16V	
C4	1-163-038-00	CERAMIC CHIP 0.1uF		25V		C123	1-163-227-11	CERAMIC CHIP 10PF	0.5PF	50V	
C5	1-126-791-11	ELECT 10uF	20%	16V		C124	1-163-021-11	CERAMIC CHIP 0.01uF	10%	50V	
C6	1-163-021-11	CERAMIC CHIP 0.01uF	10%	50V		C125	1-163-809-11	CERAMIC CHIP 0.047uF	10%	25V	
C7	1-164-489-11	CERAMIC CHIP 0.22uF	10%	16V		C126	1-164-161-11	CERAMIC CHIP 0.0022uF	10%	100V	
C8	1-163-021-11	CERAMIC CHIP 0.01uF	10%	50V		C127	1-107-725-11	CERAMIC CHIP 0.1uF	10%	16V	
C9	1-163-021-11	CERAMIC CHIP 0.01uF	10%	50V		C128	1-163-017-00	CERAMIC CHIP 0.0047uF	5%	50V	
C10	1-163-235-11	CERAMIC CHIP 22PF	5%	50V				< FILTER >			
C11	1-163-038-00	CERAMIC CHIP 0.1uF		25V		CF1	1-767-743-21	FILTER, CERAMIC			
C12	1-126-791-11	ELECT 10uF	20%	16V		CF2	1-760-418-11	FILTER, CERAMIC			
C13	1-126-791-11	ELECT 10uF	20%	16V				< CONNECTOR >			
C14	1-163-037-11	CERAMIC CHIP 0.022uF	10%	25V		CN2	1-766-180-11	PIN, CONNECTOR (PC BOARD) 2P			
C15	1-163-038-00	CERAMIC CHIP 0.1uF		25V		CN3	1-785-414-11	CONNECTOR, FFC/FPC 15P			
C16	1-163-038-00	CERAMIC CHIP 0.1uF		25V				< DIODE >			
C17	1-163-235-11	CERAMIC CHIP 22PF	5%	50V		D3	8-719-914-44	DIODE DAP202K			
C18	1-163-021-11	CERAMIC CHIP 0.01uF	10%	50V		D101	8-719-055-14	DIODE KV1832CTR3			
C19	1-163-017-00	CERAMIC CHIP 0.0047uF	5%	50V				< IC >			
C21	1-164-505-11	CERAMIC CHIP 2.2uF		16V		IC1	8-759-462-29	IC TB31224F			
C23	1-163-038-00	CERAMIC CHIP 0.1uF		25V				< COIL >			
C24	1-163-809-11	CERAMIC CHIP 0.047uF	10%	25V		L1	1-410-751-41	INDUCTOR 0.56uH			
C25	1-163-023-00	CERAMIC CHIP 0.015uF	5%	50V		L2	1-410-750-41	INDUCTOR 0.47uH			
C26	1-164-161-11	CERAMIC CHIP 0.0022uF	10%	100V		L3	1-409-670-11	COIL, OSC			
C27	1-163-021-11	CERAMIC CHIP 0.01uF	10%	50V		L4	1-409-671-11	COIL, IFT			
C28	1-163-021-11	CERAMIC CHIP 0.01uF	10%	50V		L101	1-411-883-11	COIL, OSC			
C29	1-163-239-11	CERAMIC CHIP 33PF	5%	50V		L102	1-414-140-11	INDUCTOR 0.68uH			
C30	1-163-241-11	CERAMIC CHIP 39PF	5%	50V				< TRANSISTOR >			
C31	1-163-133-00	CERAMIC CHIP 470PF	5%	50V		Q1	8-729-120-28	TRANSISTOR 2SC1623-L5L6			
C32	1-163-038-00	CERAMIC CHIP 0.1uF		25V		Q101	8-729-031-85	TRANSISTOR 2SC4365-34-TB			
C33	1-126-245-11	ELECT 330uF	20%	6.3V		Q102	8-729-031-86	TRANSISTOR 2SC3142-J3J4-TB			
C34	1-163-251-11	CERAMIC CHIP 100PF	5%	50V		Q103	8-729-216-22	TRANSISTOR 2SA1162-G			
C35	1-163-251-11	CERAMIC CHIP 100PF	5%	50V							
C36	1-163-251-11	CERAMIC CHIP 100PF	5%	50V							
C38	1-163-035-00	CERAMIC CHIP 0.047uF		50V							
C101	1-163-009-11	CERAMIC CHIP 0.001uF	10%	50V							
C102	1-163-037-11	CERAMIC CHIP 0.022uF	10%	25V							
C104	1-163-021-11	CERAMIC CHIP 0.01uF	10%	50V							
C105	1-163-009-11	CERAMIC CHIP 0.001uF	10%	50V							
C106	1-163-037-11	CERAMIC CHIP 0.022uF	10%	25V							
C107	1-163-253-11	CERAMIC CHIP 120PF	5%	50V							
C108	1-163-235-11	CERAMIC CHIP 22PF	5%	50V							
C109	1-163-235-11	CERAMIC CHIP 22PF	5%	50V							
C110	1-163-227-11	CERAMIC CHIP 10PF	0.5PF	50V							
C111	1-163-227-11	CERAMIC CHIP 10PF	0.5PF	50V							

HAND MAIN

Ref. No.	Part No.	Description	Remark		
< RESISTOR >					
R1	1-216-025-00	RES,CHIP	100	5%	1/10W
R3	1-216-077-00	METAL CHIP	15K	5%	1/10W
R4	1-216-070-00	METAL CHIP	7.5K	5%	1/10W
R5	1-216-037-00	METAL CHIP	330	5%	1/10W
R6	1-216-073-00	METAL CHIP	10K	5%	1/10W
R7	1-216-049-11	RES,CHIP	1K	5%	1/10W
R8	1-216-097-00	RES,CHIP	100K	5%	1/10W
R12	1-216-021-00	METAL CHIP	68	5%	1/10W
R13	1-216-109-00	METAL CHIP	330K	5%	1/10W
R14	1-216-085-00	METAL CHIP	33K	5%	1/10W
R15	1-216-093-00	METAL CHIP	68K	5%	1/10W
R16	1-216-073-00	METAL CHIP	10K	5%	1/10W
R17	1-216-081-00	METAL CHIP	22K	5%	1/10W
R18	1-216-097-00	RES,CHIP	100K	5%	1/10W
R19	1-216-097-00	RES,CHIP	100K	5%	1/10W
R20	1-216-097-00	RES,CHIP	100K	5%	1/10W
R21	1-216-097-00	RES,CHIP	100K	5%	1/10W
R24	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R25	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R26	1-216-049-11	RES,CHIP	1K	5%	1/10W
R27	1-216-097-00	RES,CHIP	100K	5%	1/10W
R29	1-216-295-00	SHORT	0		
R102	1-216-073-00	METAL CHIP	10K	5%	1/10W
R103	1-216-049-11	RES,CHIP	1K	5%	1/10W
R104	1-216-025-00	RES,CHIP	100	5%	1/10W
R105	1-216-037-00	METAL CHIP	330	5%	1/10W
R106	1-216-085-00	METAL CHIP	33K	5%	1/10W
R107	1-216-049-11	RES,CHIP	1K	5%	1/10W
R108	1-216-085-00	METAL CHIP	33K	5%	1/10W
R109	1-216-107-00	METAL CHIP	270K	5%	1/10W
R111	1-216-097-00	RES,CHIP	100K	5%	1/10W
R112	1-216-073-00	METAL CHIP	10K	5%	1/10W
R113	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R114	1-216-105-00	RES,CHIP	220K	5%	1/10W
R115	1-216-105-00	RES,CHIP	220K	5%	1/10W
R116	1-216-105-00	RES,CHIP	220K	5%	1/10W
R117	1-216-113-00	METAL CHIP	470K	5%	1/10W
R118	1-216-073-00	METAL CHIP	10K	5%	1/10W
R119	1-216-049-11	RES,CHIP	1K	5%	1/10W
R120	1-216-113-00	METAL CHIP	470K	5%	1/10W
R121	1-216-295-00	SHORT	0		
R122	1-216-093-00	METAL CHIP	68K	5%	1/10W
< VARIABLE RESISTOR >					
RV1	1-241-769-11	RES, ADJ, CARBON	470K		
RV101	1-241-760-11	RES, ADJ, CARBON	470		
< VIBRATOR >					
X1	1-760-326-11	VIBRATOR, CRYSTAL (10.2MHz)			

Ref. No.	Part No.	Description	Remark
MISCELLANEOUS			

54	1-771-405-11	SWITCH, RUBBER KEY (SPP-99)	
54	1-771-405-31	SWITCH, RUBBER KEY (SPP-98)	
57	1-790-013-11	WIRE (FLAT TYPE) (15 CORE)	
ANT1	1-501-982-11	ANTENNA, TELESCOPIC (BASE UNIT)	
ANT2	1-754-006-11	ANTENNA, TELESCOPIC (HANDSET)	
CP101	1-519-504-11	GAP, DISCHARGE	
SP1	1-505-333-12	SPEAKER (2.1cm)	

ACCESSORIES & PACKING MATERIALS			

△	1-467-498-21	ADAPTOR, AC (AC-T47)	
	1-528-710-12	BATTERY, NICKEL CADMIUM (BP-T16) (DC 3.6V/270mAh)	
	1-696-454-11	CORD (WITH MODULAR PLUG) (LINE)	
	3-027-539-01	CASE (WALL HOOK)	
	3-864-040-11	MANUAL, INSTRUCTION (ENGLISH,SPANISH, CHINESE)	
	3-906-289-01	SCREW, STEP TAPPING (A) (for WALL HOOK)	

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