ORDER NO. KM40008667C1
F11

Service Manual

Telephone Equipment

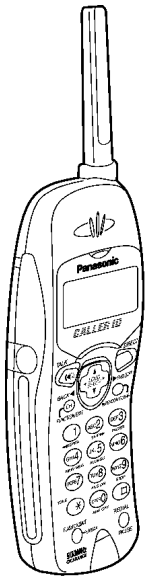
Caller ID Compatible

KX-TC1868B
KX-TC1871B
KX-TC1872B

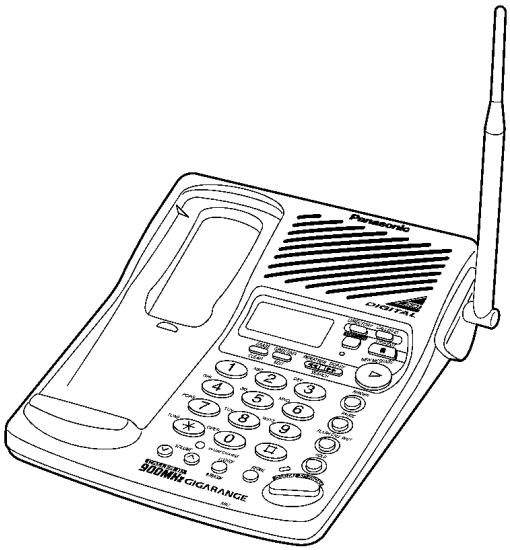
900MHz Cordless Answering System

Black Version

(for U.S.A.)



(Handset)



(Base Unit)

SPECIFICATIONS

	Base Unit	Handset
Power Source:	AC Adaptor (PQLV1Z)	Rechargeable Ni-Cd battery
Receiving Frequency:	24 channels within 906.00~923.25 MHz	24 channels within 906.00~923.25 MHz
Receiving Method:	Double super heterodyne	Double super heterodyne
Transmitting Frequency:	24 channels within 906.00~923.25 MHz	24 channels within 906.00~923.25 MHz
Oscillation Method:	PLL synthesizer	PLL synthesizer
Tolerance of OSC Frequency:	24 MHz ± 72 Hz	24 MHz ± 72 Hz
Modulation Method:	NA (FSK/SS)	NA (FSK/SS)
Spread spectrum Method:	Direct sequence	Direct sequence
Chip rate	15 chip	15 chip
ID Code:	22-bit	22-bit
Dial Mode:	Tone (DTMF)/Pulse	Tone (DTMF)/Pulse
Redial:	Up to 32digits	Up to 32 digits
Speed Dialer:		Up to 48 digits
Power Consumption:		7 days at Standby, 4 hours at Talk
Dimension (H × W × D):	2 29/32" × 6 7/32" × 8 7/32" (74 × 175 × 209mm)	8 31/32" × 2 1/4" × 1 13/32" (228 × 57 × 36 mm)
Weight	1.01 lbs. (460 g)	0.46 lbs. (210g) with battery

Design and specifications are subject to change without notice.

Panasonic

⚠ WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public.
It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product.
Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

When you mention the serial number, write down all 11 digits. The serial number may be found on the label affixed to the bottom of the unit.

FOR SERVICE TECHNICIANS

ICs and LSIs are vulnerable to static electricity.
When replacing, the following precautions will help prevent recurring malfunctions.
1. Cover the plastic parts boxes with aluminum foil.
2. Ground the soldering irons.
3. Use a conductive mat on the work table.
4. Do not grasp IC or LSI pins with bare fingers.

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1 STANDARD BATTERY LIFE

After your Panasonic battery is fully charged;

While in use (TALK)	near the base unit*	Up to about 6 hours
	away from the base unit	Up to about 4 hours
While not in use (Stand-By)		Up to about 14 days

* Within about 10 feet (3 m)

- Battery life may be shortened depending on usage conditions, such as viewing the Caller ID Caller List, and ambient temperature.
- **Clean the handset and the base unit charge contacts with a soft, dry cloth. Clean if the unit is subject to grease, dust or high humidity.** Otherwise the battery may not charge properly.
- If the battery is fully charged, you do not have to place the handset on the base unit until "Recharge battery" is displayed and/or "[▮]" flashes. This will maximize the battery life.
- The battery cannot be overcharged.

Standby mode

Handset (While off the base unit)

The handset goes into the standby mode after you finish using the handset (marking/answering a call, viewing the Caller List or directory list etc.). The display is blank, but the handset can receive calls. The battery life is conserved in this mode.

Base Unit

The base unit goes into the standby mode after you finish using the base unit (marking/answering a call, using the intercom, using the answering system etc.). Programming and storing phone numbers are possible **only when** the base unit is in the standby mode.

Battery strength

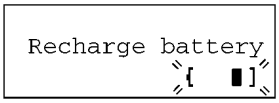
You can check the battery strength on the display while the handset is on the base unit, while it is in use (making/answering a call etc.), or after viewing the Caller List, or directory items, programming, etc.
The battery strength will remain for 5 seconds after using the handset, then the display will return to the stand-by mode.

The battery strength is as shown in the chart below.

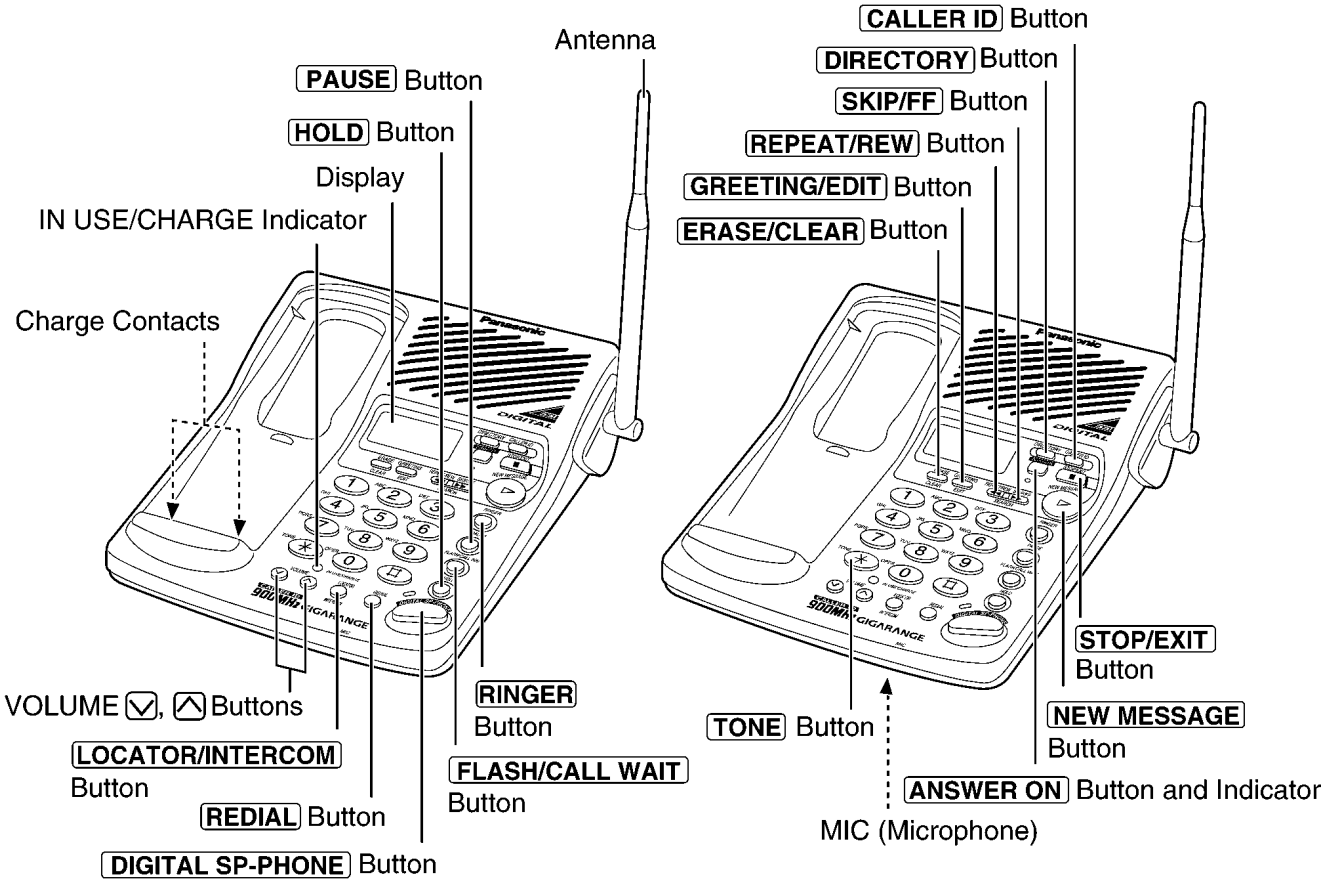
Display prompt	Battery strength
[▮▮▮]	Fully charged
[▮▮]	Medium
[▮]	Low
[▮] (flashing)	Needs to be recharged.

Recharge

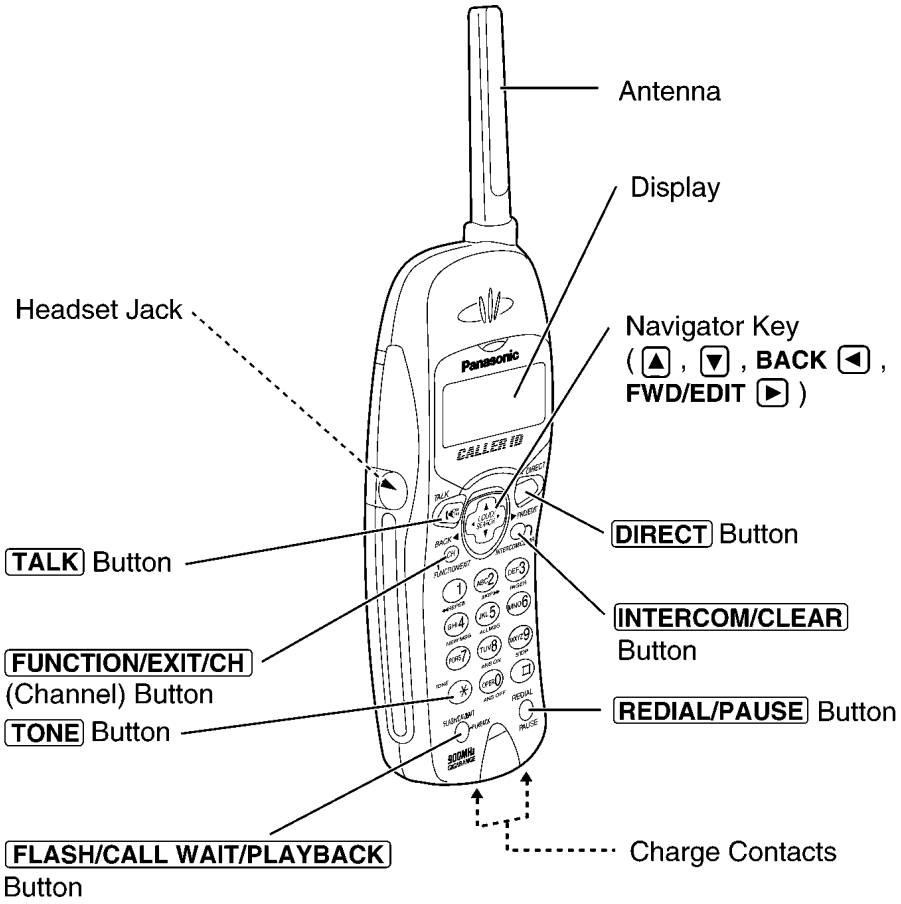
Recharge the battery when:
– "Recharge battery" is displayed on the handset,
– "[▮]" flashes on the handset display, or
– The handset beeps intermittently while it is in use.



2 LOCATION OF CONTROLS



(Base unit)

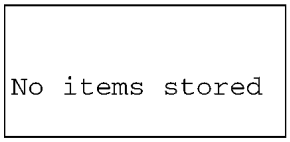


(Handset)

3 DISPLAYS

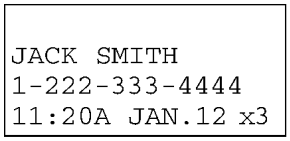
Both the handset and the base unit show you instructions and information on the displays. These display prompts are shown below.

3.1. Common prompts for the handset and the base unit

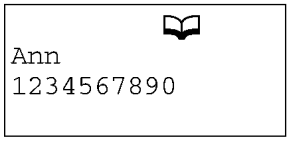


The Caller List is empty or there are no stored items in the directory.

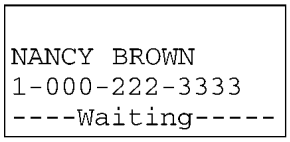
When a call is received, the display shows the caller's name and number after the first ring.



This is a name from the Caller List.
The display shows:
—the caller's name,
—the caller's number,
—the time and date of the last call (ex. Jan. 12, 11:20 AM), and
—the number of times called (ex. 3 times).

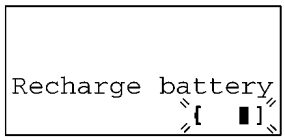


This is a name from the directory. The stored name and phone number are displayed.

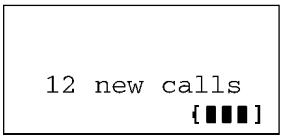


A second call is received during a conversation.

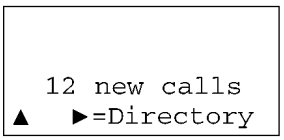
3.2. Handset only



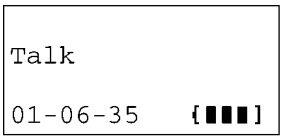
The battery needs to be charged. Place the handset on the base unit to charge the battery.



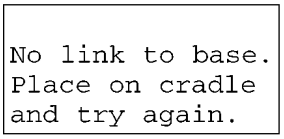
The display shows the number of new calls and the battery strength while the handset is on the base unit.



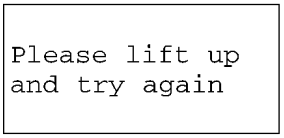
The display shows the number of new calls when ▼ or ▲ is pressed while the handset is off the base unit.
To search from the most recent call, press ▼.
To search from the oldest call, press ▲.
To go to the directory list, press **FWD/EDIT** ► (`Directory` key).



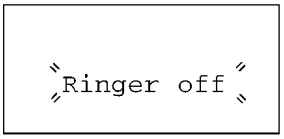
During a conversation, the display shows the length of the call (ex. 1 hour, 6 minutes and 35 seconds). The battery strength is also displayed.



The handset has lost communication with the base unit. Place the handset on the base unit and try again.



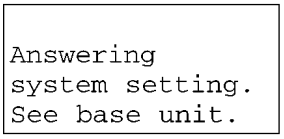
▼, ▲, **BACK** ◄ or **FWD/EDIT** ► was pressed while the handset was on the base unit. Lift the handset and press the button again.



When the ringer volume is set to OFF, "`Ringer off`" will flash for about 45 seconds before the unit returns to the standby mode.

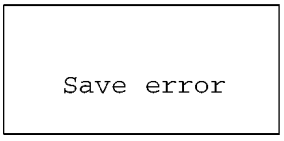
When trying to store an item or Caller List information in the directory, the directory memory is full.

▼, ▲, **BACK** ◄ or **FWD/EDIT** ► was pressed while the base unit was not in the standby mode.



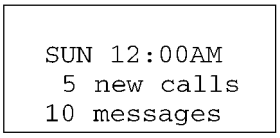
The unit is in answering system programming mode.

The handset is operating the answering system remotely.

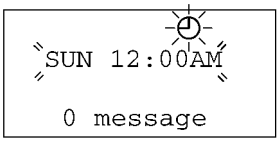


During a programming procedure, the handset has lost communication with the base unit. Move closer to the base unit.

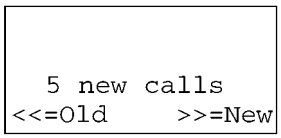
3.3. Base unit only



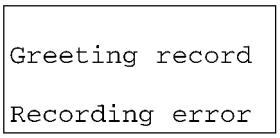
In the standby mode, the display shows the current day and time, the number of new calls and recorded messages. (Ex. 5 new calls have been received and 10 messages have been recorded.)



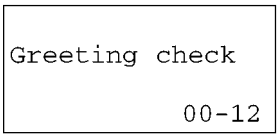
When the clock needs adjusting, the day and time flash.



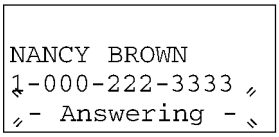
This display will be shown when **CALLER ID** is pressed. To search from the most recent call, press **SKIP/FF** (New key). To search from the oldest call, press **REPEAT/REW** (Old key).



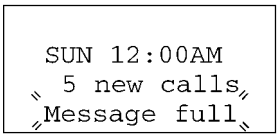
Your greeting message was not recorded correctly. Record it again.



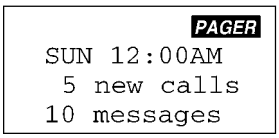
A greeting message is being played. The display shows the elapsed time.



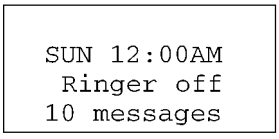
The answering system is recording a message. ("- Answering -" flashes.)



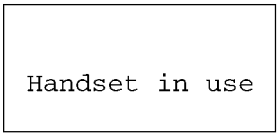
Message memory is full. ("Message full" flashes.) Erase some or all of the messages.



The pager call mode is set to ON.

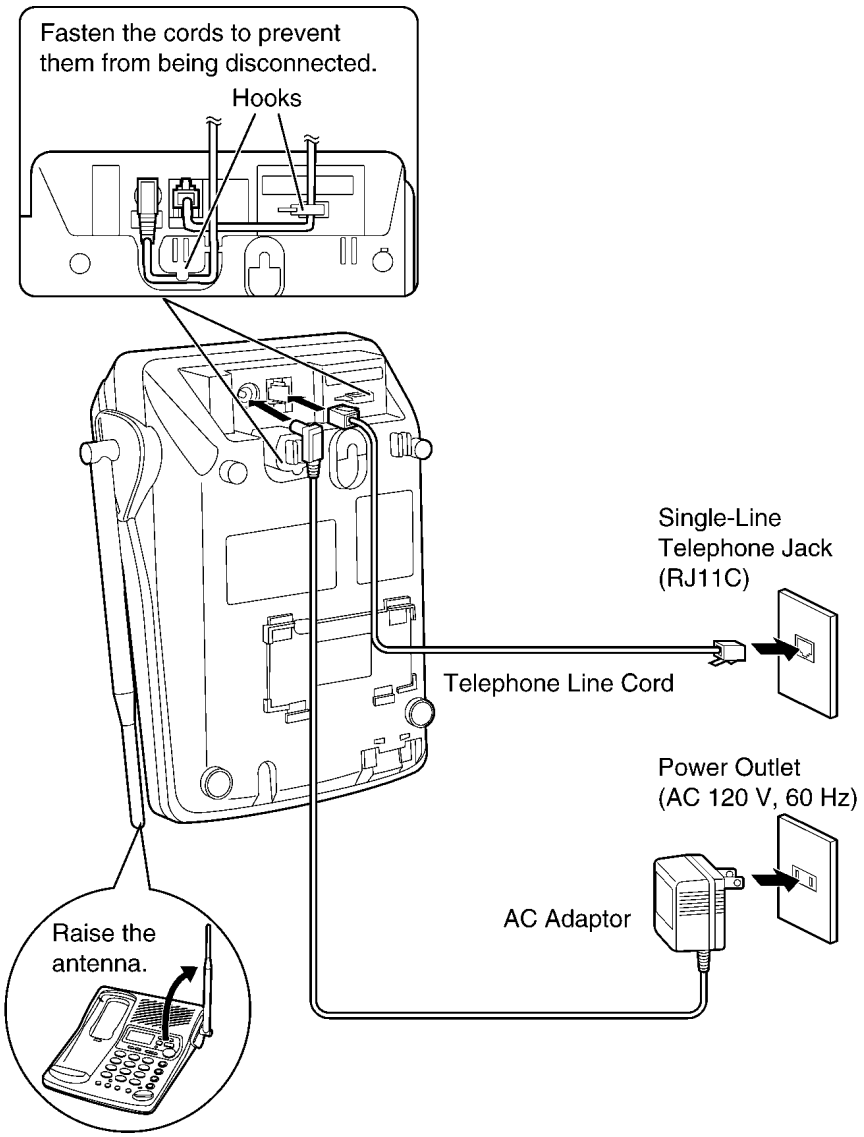


The ringer volume is set to OFF.



This display will be shown when the handset is used (making/answering a call, viewing the Caller List or directory list, etc.).

4 CONNECTION

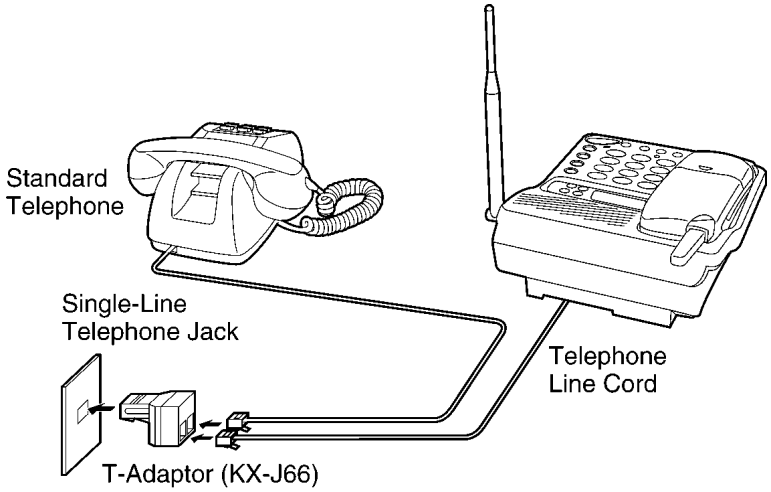


Note:

- USE ONLY WITH Panasonic AC ADAPTOR PQLV1Z.
- The AC adaptor must remain connected at all times. (It is normal for the adaptor to feel warm during use.)
- If your unit is connected to a PBX which does not support Caller ID and voice mail services, you cannot access those services.

4.1. Adding Another Phone

This unit will not function during a power failure. To connect a standard telephone on the same line, use the Panasonic T-adaptor KX-J66.

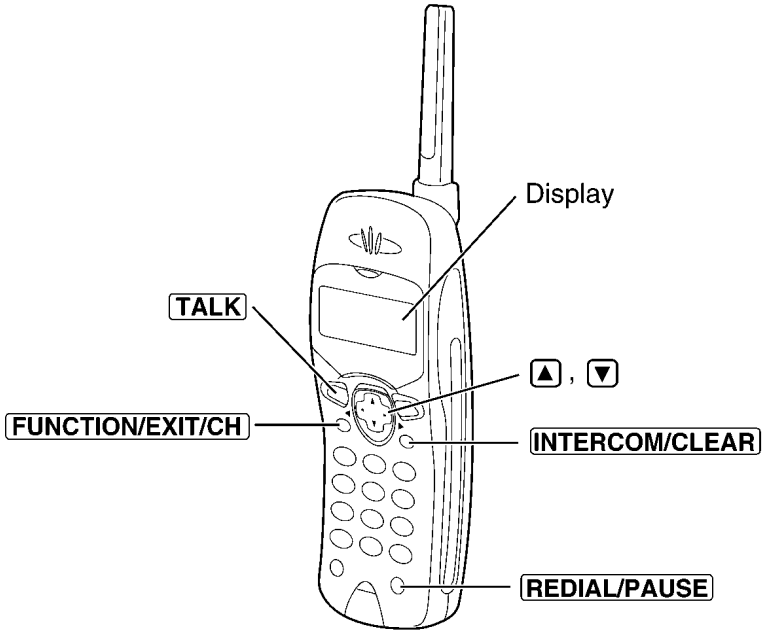


5 OPERATION

5.1. Making Calls

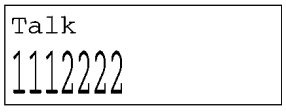
5.1.1. With the Handset

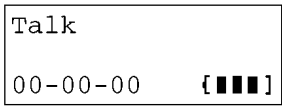
To have a hand-free conversation, connect the headset to the handset.



1 Press TALK .

2 Dial a phone number.
- The dialed number is displayed.
- After a few seconds, the display will show the length of the call and the battery strength.





3 To hang up, press TALK or place the handset on the base unit.

If noise interferes with the conversation

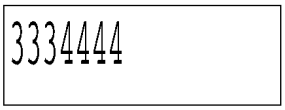
Press FUNCTION/EXIT/CH to select a clearer channel or move closer to the base unit.

To redial the last number dialed on the handset

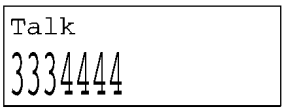
Press TALK ➡ REDIAL/PAUSE .

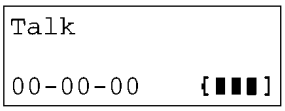
To dial after confirming the entered number

1 Dial a phone number.
- If you misdial, press **INTERCOM/CLEAR**. All digits are erased. Dial the correct phone number.



2 Press **TALK**.
- After a few seconds, the display will show the length of the call and the battery strength.





3 To hang up, press **TALK** or place the handset on the base unit.

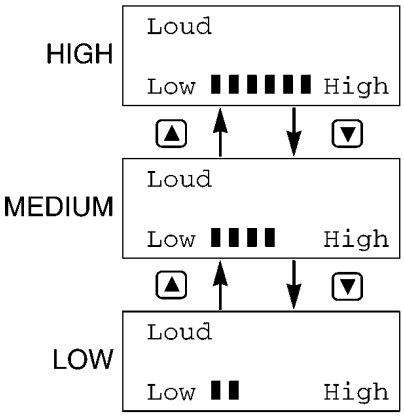
To redial after confirming the last number dialed

Press **REDIAL/PAUSE** ➡ **TALK**.

To select the receiver volume

Press ▲ or ▼ while talking.
- Each time you press ▲ or ▼, the volume level will change.
- The display will return to the length of the call.
- Your phone comes from the factory set to MEDIUM.

- When you replace the battery, the selected receiver volume setting will return to the factory set (MEDIUM). Reprogram if necessary.



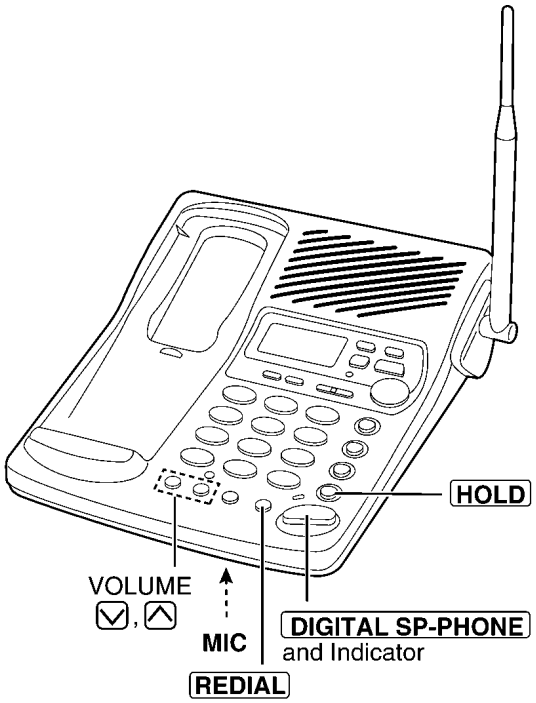
Backlit LCD display

The lighted handset display will stay on for about 10 seconds after pressing a handset button or lifting the handset off the base unit.

Lighted handset keypad

The handset dialing buttons will light when you press a button or lift the handset off the base unit, and flash when a call is received. The lights will go out about 10 seconds after pressing a button, lifting the handset or answering a call.

5.1.2. With the Base Unit



1 Press **DIGITAL SP-PHONE**.
- The DIGITAL SP-PHONE indicator lights.

Talk

2 Dial a telephone number.

Talk
1112222

3 When the other party answers, talk into the **MIC** (microphone).

Talk
00-00-00

4 To hang up, press **DIGITAL SP-PHONE**.
- The indicator light goes out.

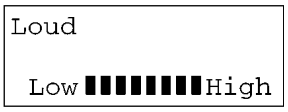
- To switch to the handset while using the speakerphone:
  —If the handset is off the base unit, press **TALK**.
  —If on the base unit, just lift up.
- During a call using the handset, the call can be switched to the speakerphone by pressing **DIGITAL SP-PHONE** on the base unit.

Hands-free Digital Speakerphone

For best performance, please note the following:
- Talk alternately with the caller in a quiet room.
- If the other party has difficulty hearing you, press **VOLUME** ▽ to decrease the speaker volume.
- If the other party's voice from the speaker cuts in/out during a conversation, press **VOLUME** ▽ to decrease the speaker volume.

To adjust the speaker volume (8 levels) while talking

To increase, press **VOLUME** △.
To decrease, press **VOLUME** ▽.



To redial the last number dialed on the base unit

Press **DIGITAL SP-PHONE** ➡ **REDIAL** .

To put a call on hold

Press **HOLD**.

- The DIGITAL SP-PHONE indicator flashes.

To release the hold

From the base unit, press **DIGITAL SP-PHONE**.
From the handset, press **TALK** or lift the handset off the base unit.

- If another phone is connected on the same line, you can also release the hold by lifting its handset.

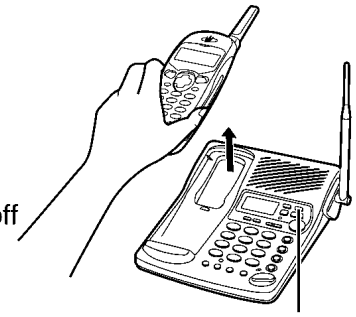
5.2. Answering Calls

When a call is received, the unit rings and the CALLER ID button on the base unit flashes quickly. If you subscribe to a Caller ID service, the calling party information will be displayed after the first ring. In order to view the Caller ID information, please wait until the second ring to answer a call.

5.2.1. With the Handset

Lift the handset off the base unit and press **TALK**.

You can also answer a call by pressing any dialing button **0** to **9**, **✱** or **#** (—**Any Key Talk**).



Auto Talk

If you set the Auto Talk feature to ON, you can answer a call by lifting the handset off the base unit without pressing **TALK**.

CALLER ID button

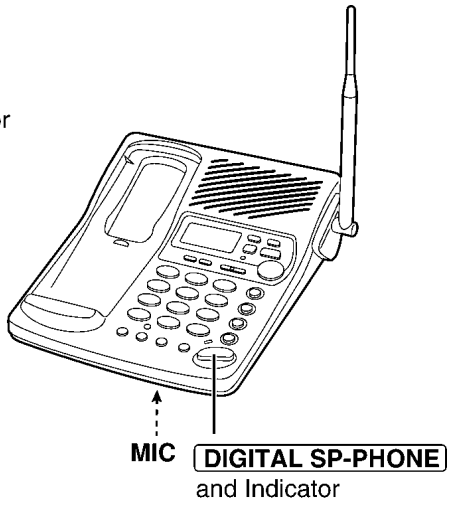
When the headset is connected, make sure to use the headset to talk with the caller. If you want to have a normal cordless phone conversation, disconnect the headset.

5.2.2. With the Base Unit

1 Press **DIGITAL SP-PHONE**.
- The DIGITAL SP-PHONE indicator lights.

2 Talk into the **MIC**.

3 To hang up, press **DIGITAL SP-PHONE**.
- The indicator light goes out.



5.3. Automatic Answering Operation

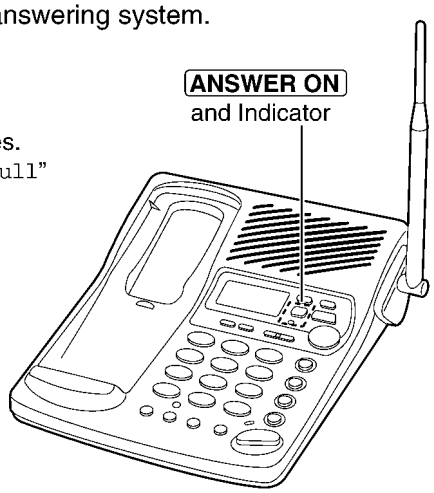
When the unit answers a call, a greeting message is played and the caller's message is recorded. While recording, "- Answering -" will be displayed.

- The total recording time (including greeting message) is **about 15 minutes**. If messages are recorded in noisy rooms, the time may be shortened by up to 3 minutes.
- A maximum of 64 messages (including greeting message) can be recorded.

5.3.1. Setting the Unit to Answer Calls

Press **ANSWER ON** to turn on the answering system.

- The indicator lights and "Answer set" is heard.
- The unit will announce the remaining recording time if it is less than 5 minutes.
- If you hear "Memory full", "Message full" is displayed on the base unit and the ANSWER ON indicator flashes rapidly, erase some, or all, of the messages.



- If you do not want the unit to answer calls, press **ANSWER ON** again to turn off the answering system. The indicator light goes out and "Answer off" is heard.
- You can also turn on the answering system remotely using any other phone.

Monitoring incoming calls

While a call is being recorded, you can monitor it through the speaker. To answer the call with the speakerphone, press **DIGITAL SP-PHONE**. For the handset, lift the handset off the base unit and press **TALK**. The unit stops recording.

5.4. Listening to Messages

You can see the total number of recorded messages on the base unit display. If the ANSWER ON indicator flashes, new messages have been recorded.

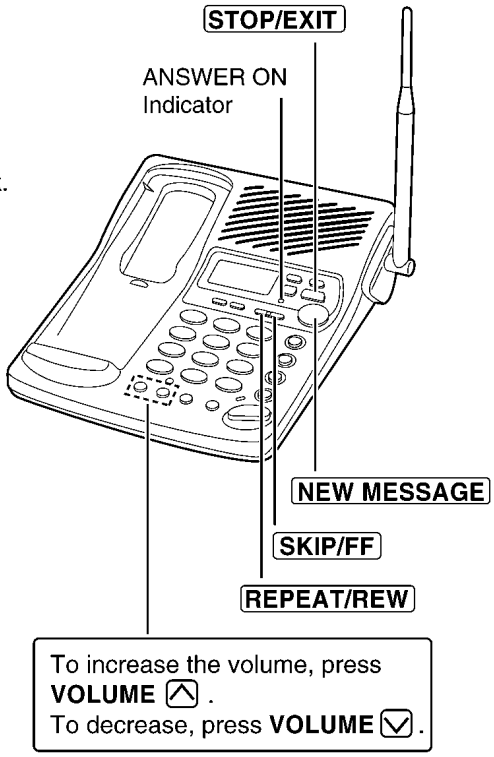
Listening to only new messages

Press **NEW MESSAGE** briefly.

- The unit announces the number of new messages and plays them back.

Listening to all recorded messages

Press and hold **NEW MESSAGE** until playback starts.



- During playback, the display shows which message is being played. (Ex. While the first message is being played back, "Message 1" is displayed.)
- At the end of the last message, "End of final message" is heard. The unit will announce the remaining recording time if it is less than 5 minutes.

5.4.1. During playback

To **repeat/ rewind** message	**To repeat from the beginning of the message** Press [REPEAT/REW] briefly. • If you press within 5 seconds of playback, the previous message will be played. **To rewind part of the message** Press and hold [REPEAT/REW] until you reach the desired place. • At the beginning of the message, 3 beeps will sound.
To **skip/cue** message	**To skip to the next message** Press [SKIP/FF] briefly. **To cue to part of the message** Press and hold [SKIP/FF] until you reach the desired place. • The message will be heard at twice the normal speed. • At the end of the message, 3 beeps will sound.
To **stop** operation	Press [STOP/EXIT] . • To resume playback, press [NEW MESSAGE]. • If you do not press any button for 60 seconds or if you press [STOP/EXIT] again, the unit will return to the standby mode.

For Caller ID service users

• During playback, the base unit display will show the name and/or number of the caller whose message is being played.

To call back the displayed number:

During playback, lift the handset and press [TALK] within 10 seconds, or press [DIGITAL SP-PHONE] .

—The unit stops playback and automatically dials the displayed phone number.

• After listening to new incoming messages, "✓" will be added to the call entries in the Caller ID Caller List.

6 DISASSEMBLY INSTRUCTIONS

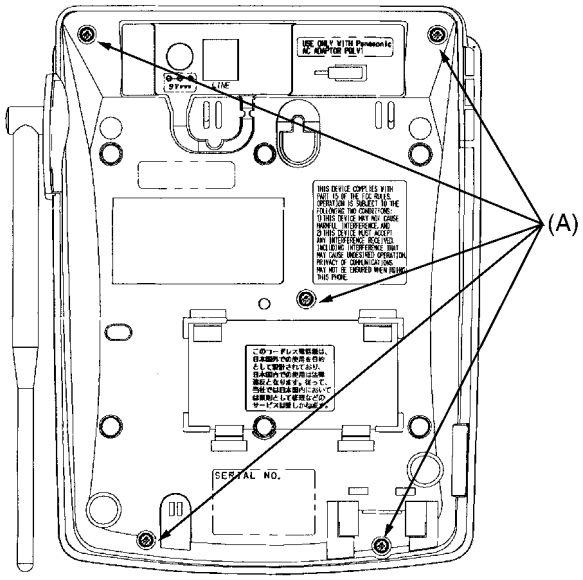


Fig. 1

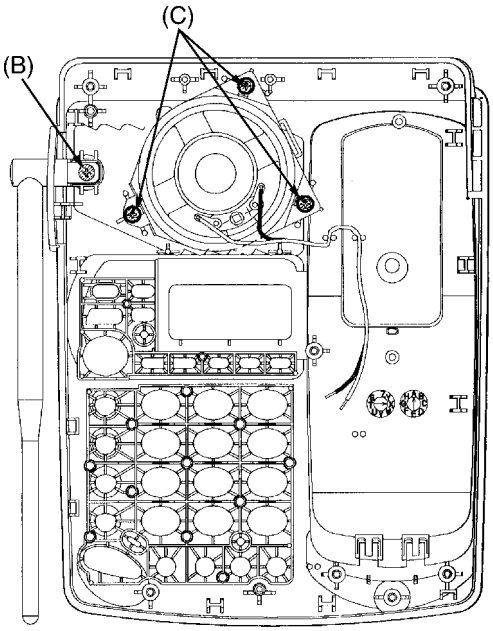


Fig. 3

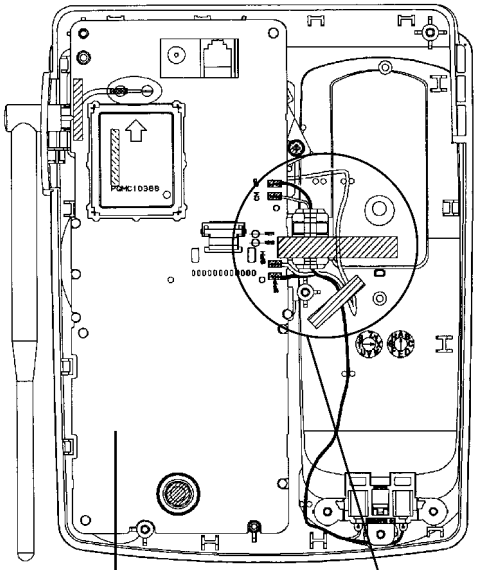
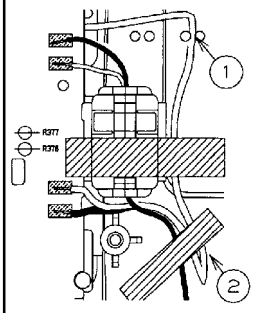


Fig. 2

Remove the
P. C. Board



SP LEAD THROUGH RIGHT SIDE RIB. DON'T DRESS UPSIDE.

DRESS SP LEAD DOWNSIDE OF FELIGHT CORE, AND FIX BY TAPE.

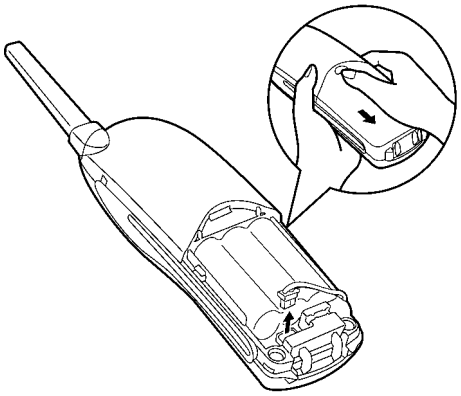


Fig. 4

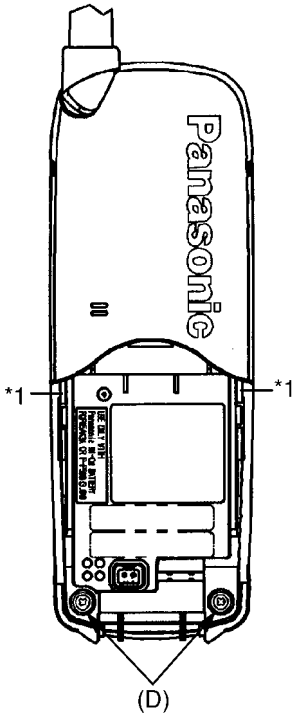


Fig. 5

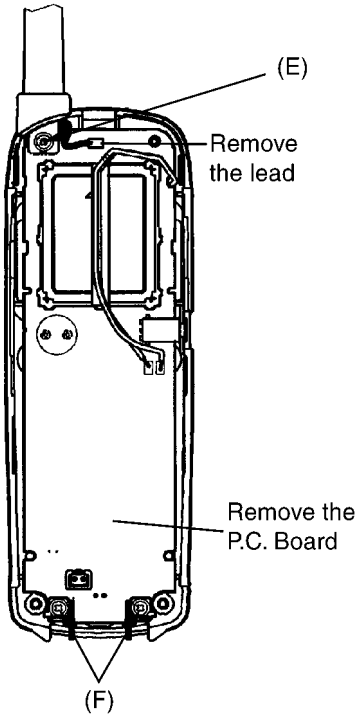


Fig. 6

Shown in Fig.-	To Remove	Remove
1	Lower Cabinet	Screws (2.6 X 12).....(A) X 5
2	Main P.C. Board	Remove the P.C. Board
3	Lower Cabinet	Screw (3 X 12).....(B) X 1
		Screws (3 X 8).....(C) X 3
4	Battery Cover	Remove the Battery Cover
5	Rear Cabinet	Screws (2.6 X 12).....(D) X 2
6	Main P.C. Board	Screw (2.6 X 12).....(E) X 1
		Screws (2.6 X 8).....(F) X 2
		Remove the lead
		Remove the P.C. Board

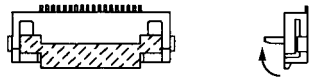
Note

*1 — After removing 2 screws (D), insert a (-) driver into *1 and pull it outside of the cabinet.

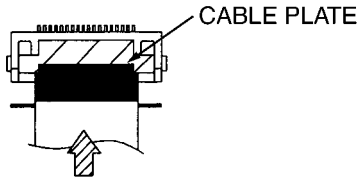
7 ASSEMBLY INSTRUCTIONS

7.1. Asseembly the LCD to P.C. Board (Base Unit)

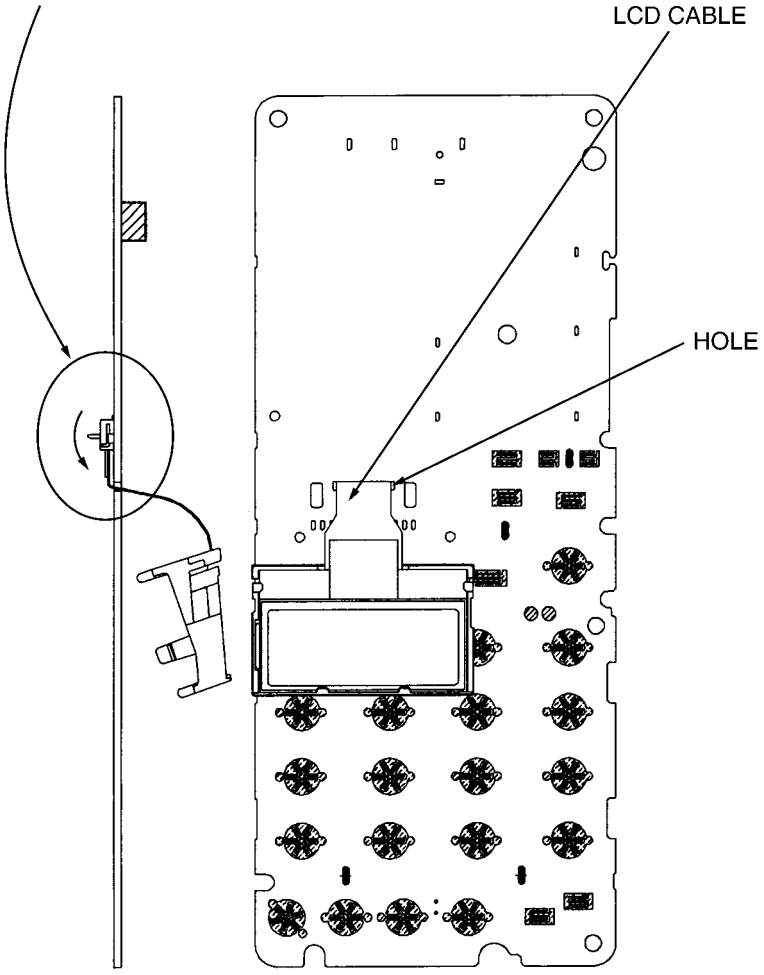
1. Open the lid of the connector to this side.



2. Insert the LCD cable through the hole of P.C. Board and hook the top of LCD cable back of P.C. Board. (See Fig. 7.)



3. Close the lid of connector.



4. Hangs on the substrate with right and left catch.

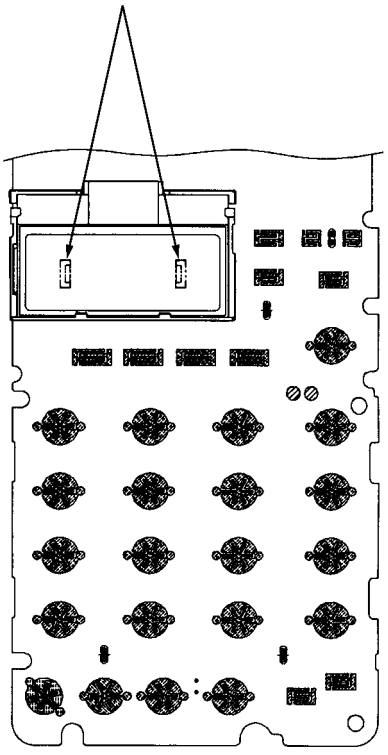
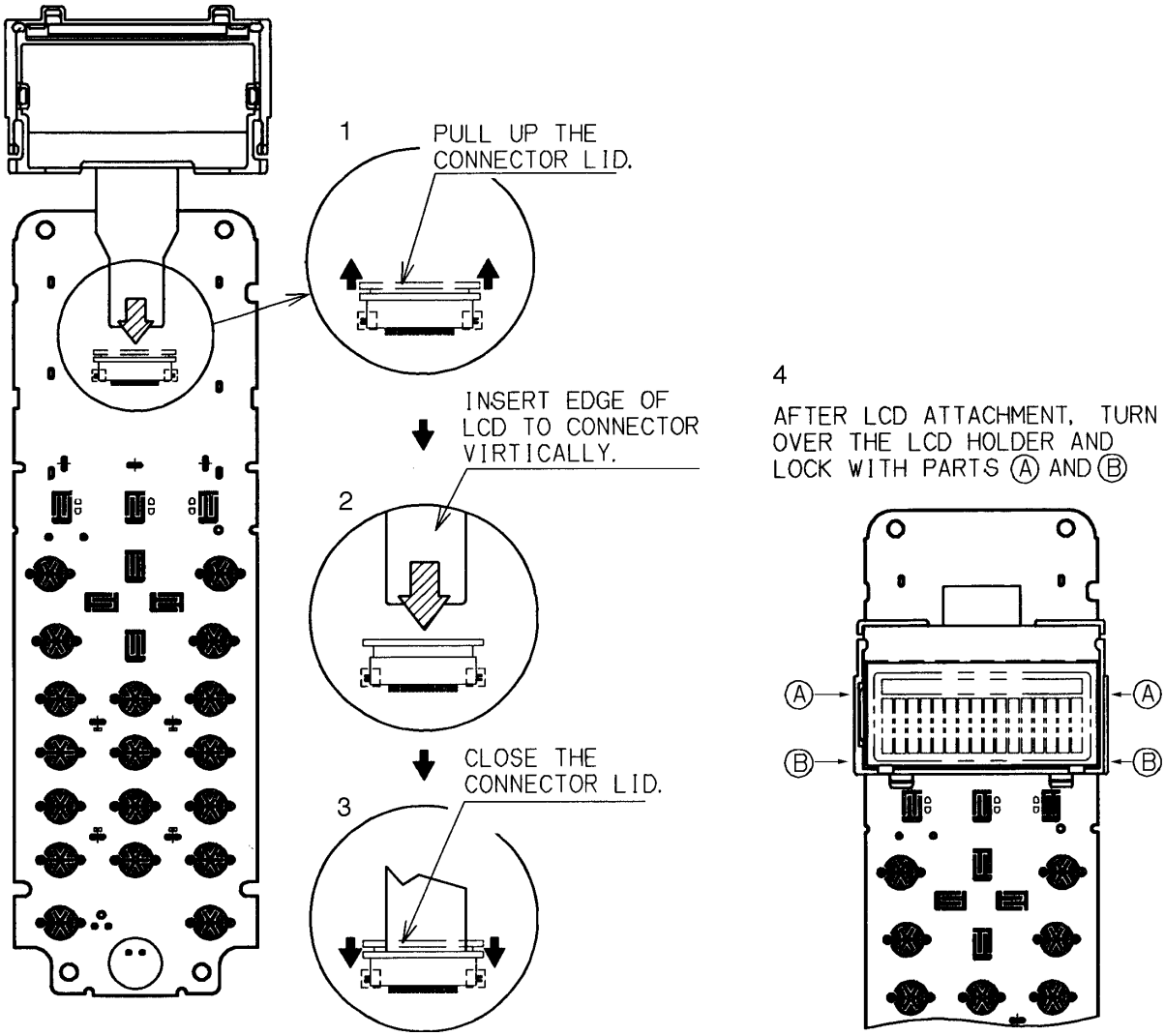


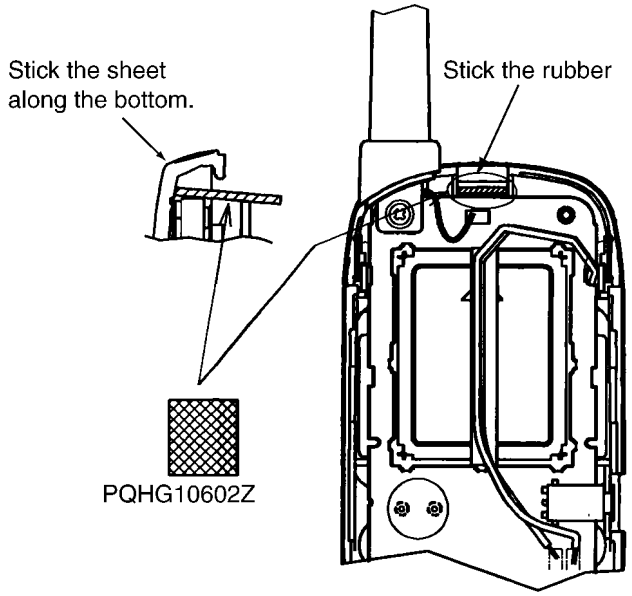
Fig. 7

7.2. Asseembly the LCD to P.C. Board (Handset)



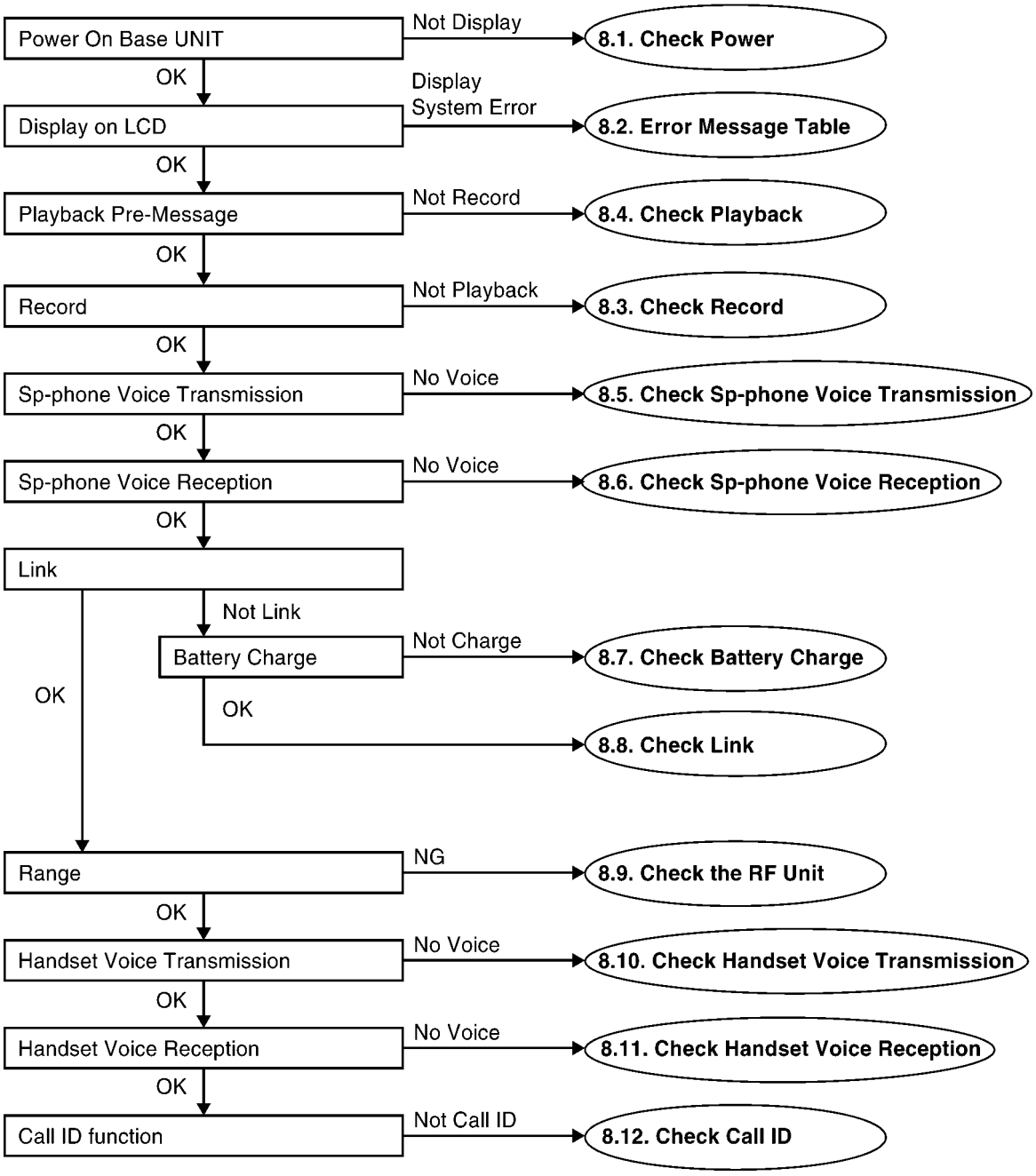
7.3. Adjustment to prevent the cabinet from opening at dropping

Stick the rubber on the front cabinet as shown in the figure to prevent the cabinet from opening at dropping.



8 TROUBLESHOOTING GUIDE

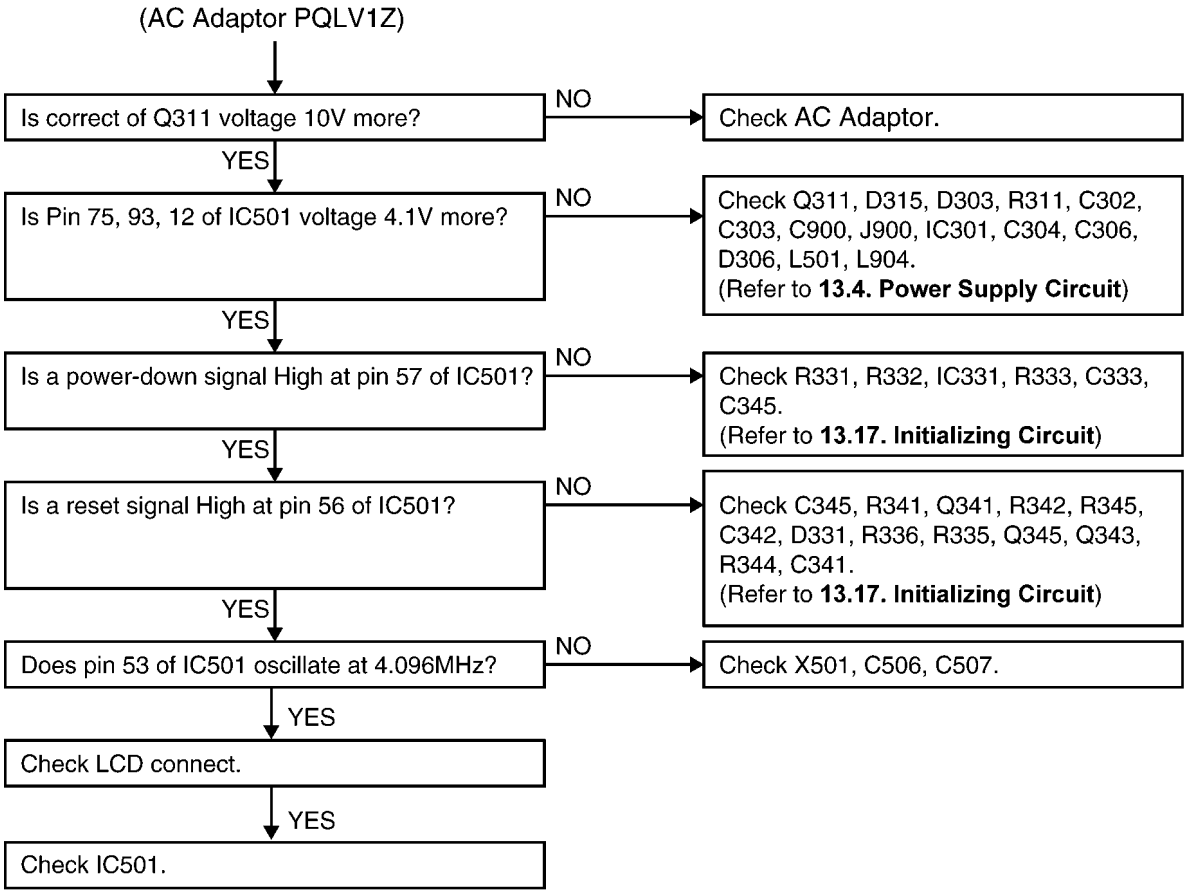
MAIN



8.1. Check Power

BASE UNIT

Is the AC Adaptor inserted into 120V outlet?



8.2. Error Message Table

Display	Symptom	Remedy
System error 1	The initialization was tried, but it could not be done.	1. Confirm Flash Memory is equipped. 2. Confirm the connection of Flash Memory. 3. Confirm the power supply of Flash Memory. When no error is found in above-mentioned items, Flash Memory has a defect. Replace Flash Memory.
System error 2	The defect of Flash Memory was detected.	When Flash Memory has the fatal detect, replace Flash Memory. This error hardly occurs.
System error 3 System error 9	When the adjustment data was checked, an error was detected. (The adjustment data may not be written.)	1. Confirm Flash Memory is equipped. 2. Confirm the connection of Flash Memory. 3. Confirm the power supply of Flash Memory. When no error is found in above-mentioned items, Flash Memory has a defect. Replace Flash Memory.
System error 4	The defect of DSP was detected. (The chip in DSP may have a defect.)	1. Confirm the connection of DSP. 2. Confirm the oscillation frequency of DSP. When no error is found in above-mentioned items, DSP has a defect. Replace DSP.
System error 5 System error 6	The defect of DSP was detected.	When DSP has the fatal defect, replace DSP. This error hardly occurs.
System error 7	The defect of synthesized voice was detected. (The synthesized voice may not be written.)	1. Confirm Flash Memory is equipped. 2. Confirm the connection of Flash Memory. 3. Confirm the power supply of Flash Memory. When no error is found in above-mentioned items, Flash Memory has a defect. Replace Flash Memory.

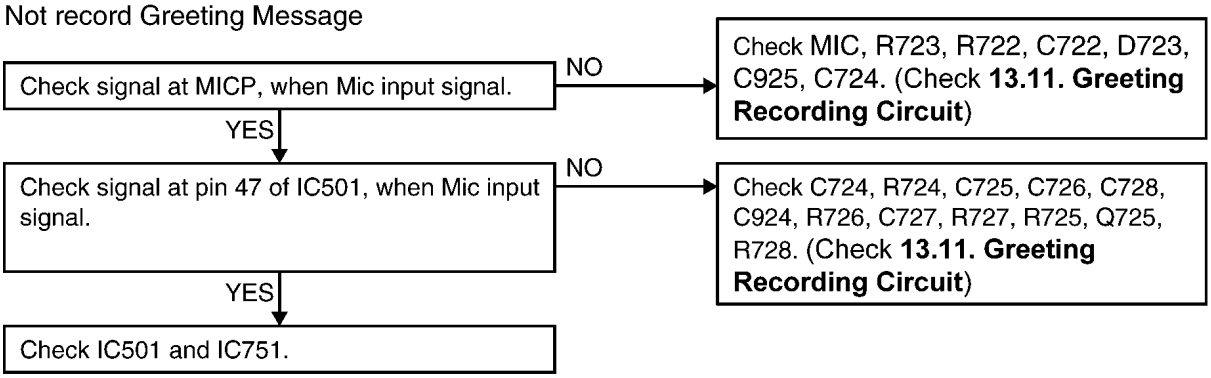
NOTE:

Flash memory is IC751. DSP is IC501

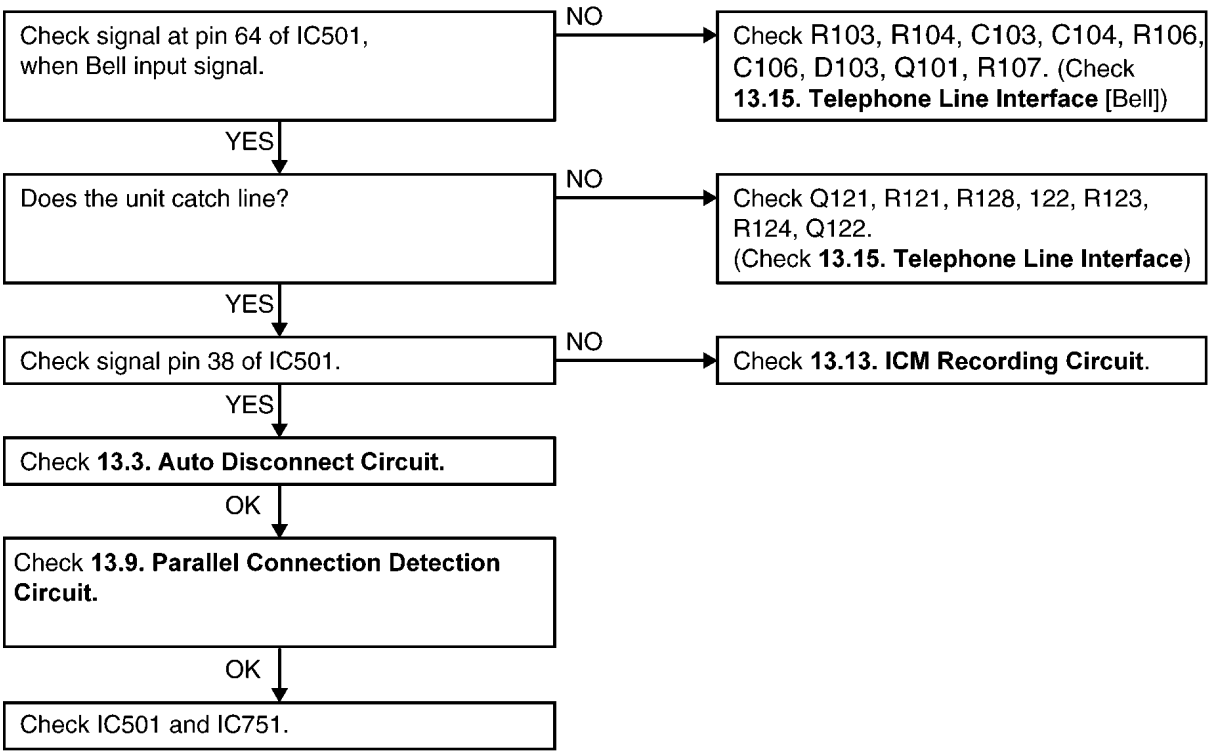
8.3. Check Record

BASE UNIT

Not record Greeting Message

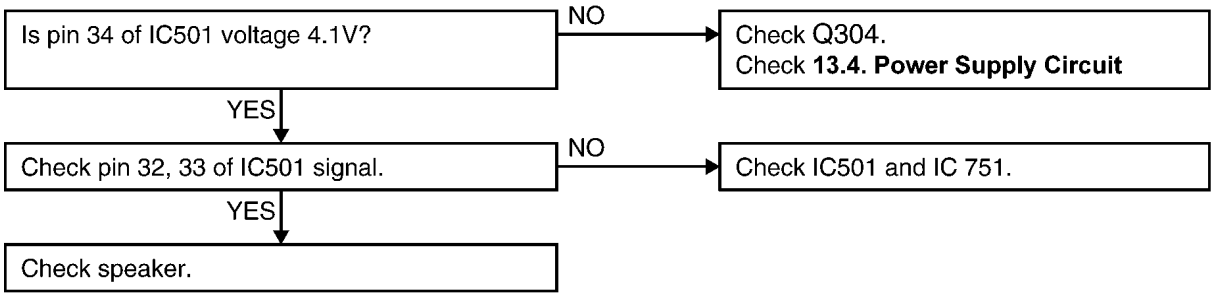


Not record Incoming Message



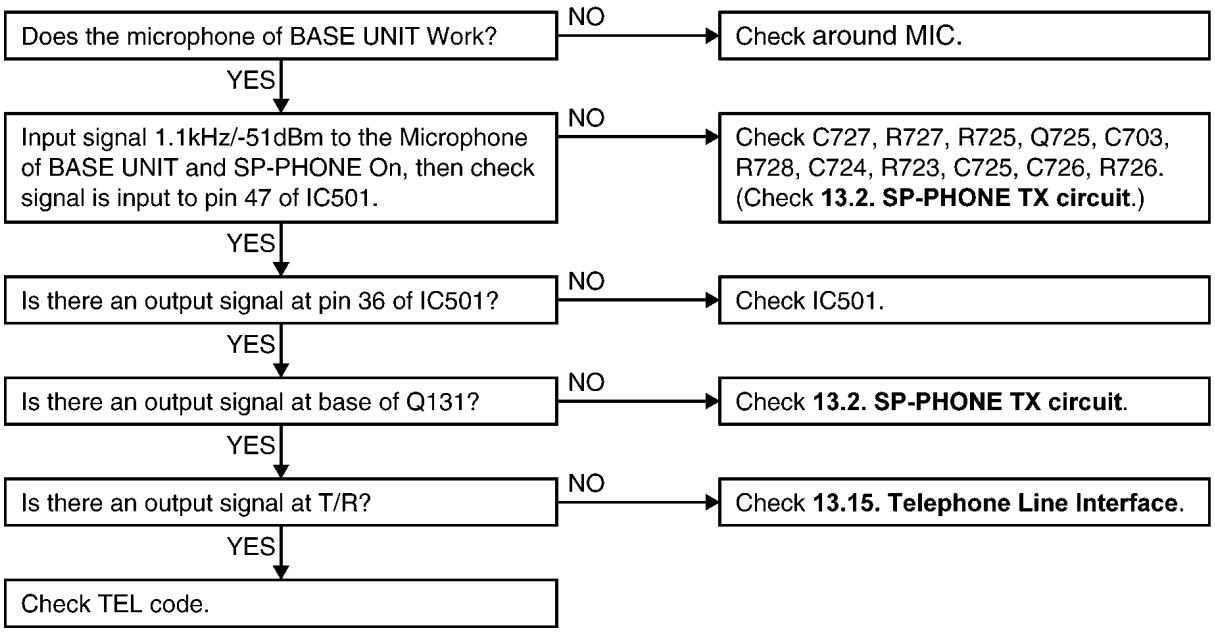
8.4. Check Playback

BASE UNIT



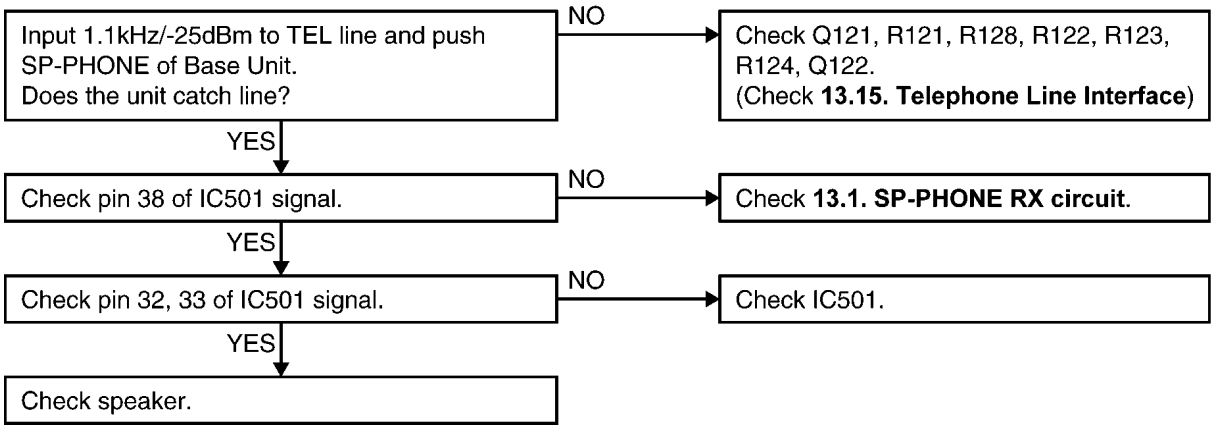
8.5. Check Sp-phone Voice Transmission

BASE UNIT



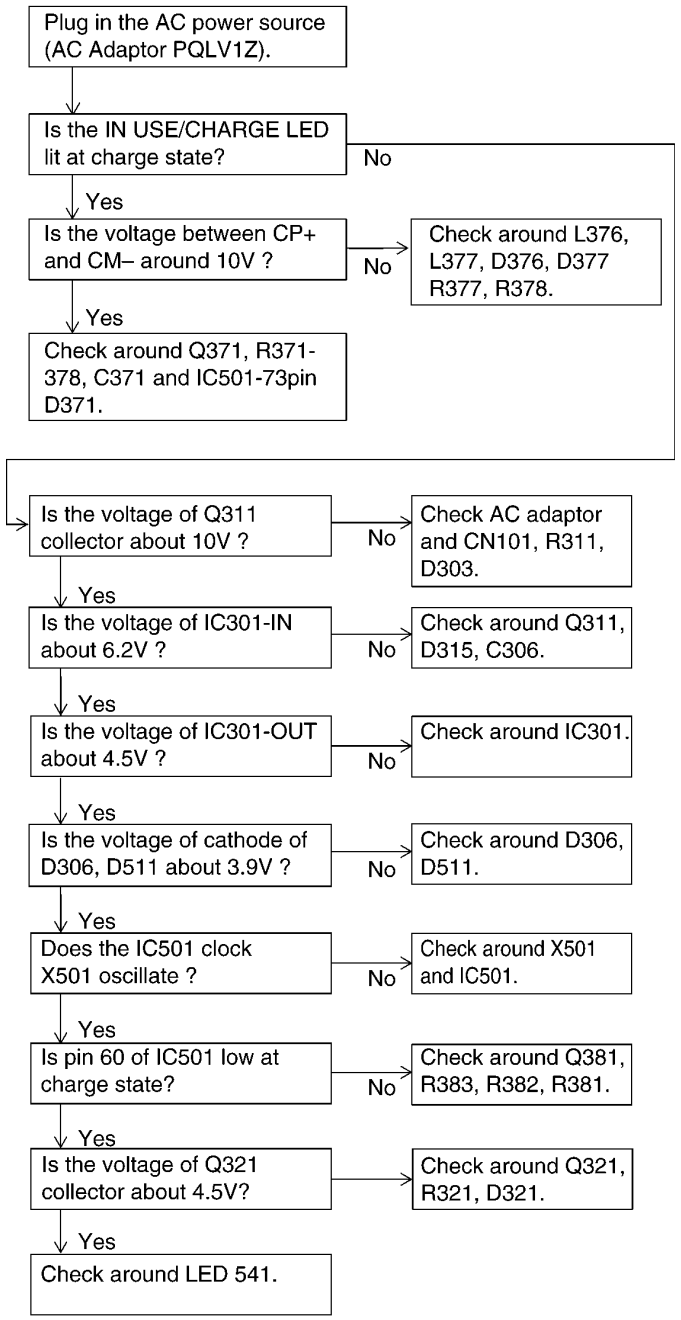
8.6. Check Sp-phone Voice Reception

BASE UNIT

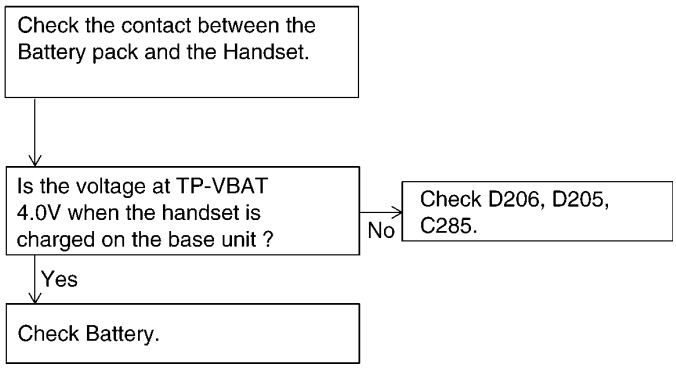


8.7. Check Battery Charge

BASE UNIT

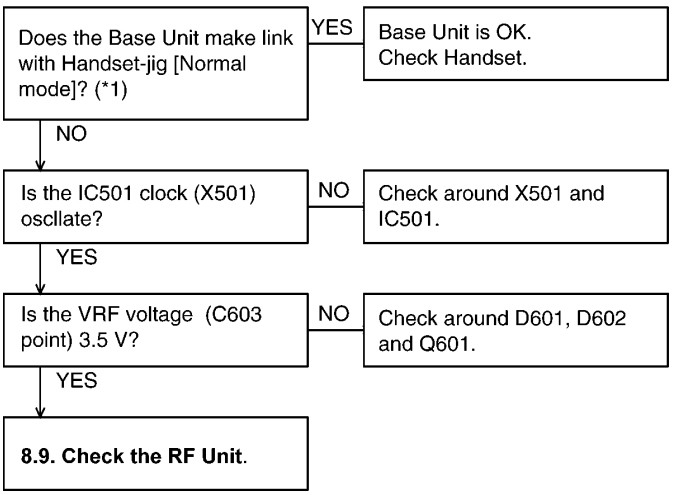


HANDSET

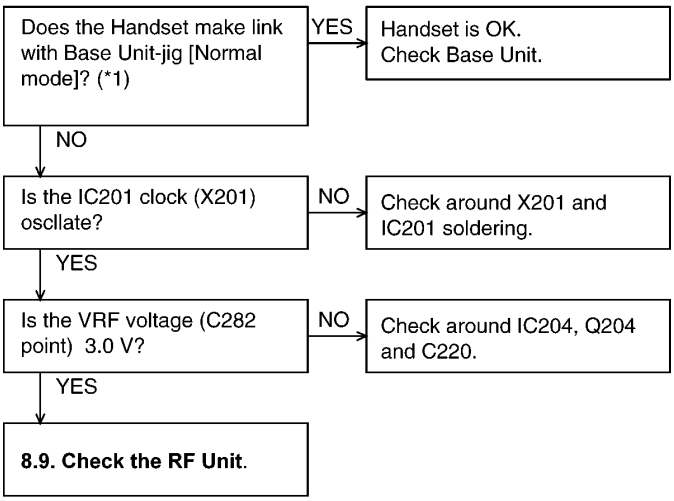


8.8. Check Link

BASE UNIT



HANDSET



(*1) Refer to "**8.9.1. Finding out the Defective Unit**."

8.9. Check the RF Unit

8.9.1. Finding out the Defective Unit

Prepare HS JIG (Handset-jig) and BS JIG (Base Unit-jig). Place the HS JIG on the cradle of the base unit for checking, then confirm that they are linked. Place the handset for checking on the cradle of the BS JIG, then confirm that they are linked. How to confirm the link is as follows; press the TALK button and confirm that the LEDs of the base unit is turned ON.

8.9.2. Check Items

8.9.2.1. Handset-jig (HS JIG) for Base Unit

The handset unit jig also uses two modes: TEST SUPER LOW mode and NORMAL POWER mode. These modes alternate when the handset CLEAR button is pressed:

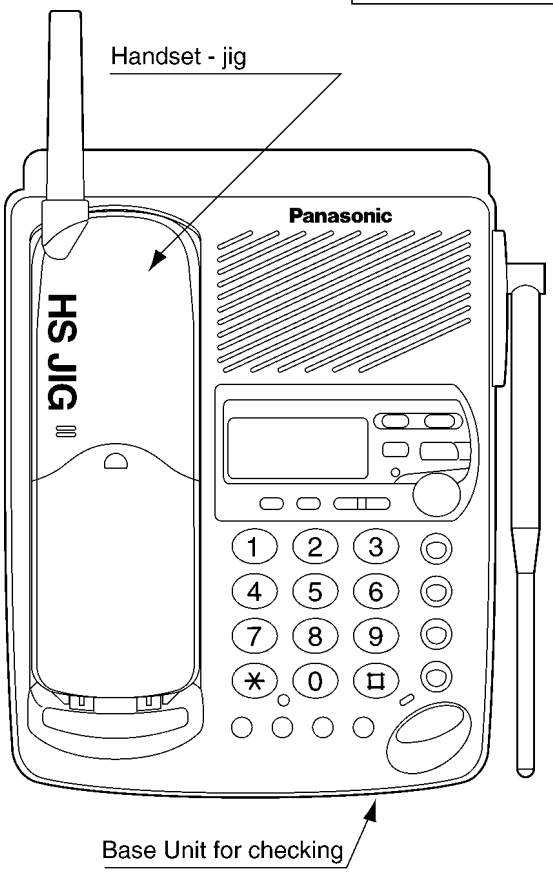
(1) NORMAL POWER mode (Stand-By). In this mode the LCD will remain blank.

(2) TEST SUPER LOW mode. When the CLEAR button is pressed, the LCD will show TEST SUPER LOW. This test simulates the handset is at very large distance from the base unit and the TX signal from handset to base is very small.

Procedure: First place handset jig on base under test to charge (exchange security code); press CLEAR and then TALK to operate. The LCD will show TALK and TEST. This means that the base unit sensitivity is OK.

* In TALK mode, LCD display change to “TALK TEST” or “TALK” on [TEST POWER] mode or [NORMAL POWER] mode.

* HS JIG becomes [NORMAL POWER] mode immediately after the power supply turning on.



NOTES:

1) If when setting the handset to TEST SUPER LOW mode, if handset beeps 3 times and the LCD shows "No link to base. Place on cradle and try again", press 2, 5, 8, 0 simultaneously and then disconnect battery. Re-install battery, place unit on cradle to get security codes and tries again.

2) Only KX-TC1851B with marks HS JIG can be used for troubleshooting. Regular KX-TC1851B production samples does not have the software needed for troubleshooting.

3) You can differentiate the jig from a regular unit because the jig has silver bottom cabinet (base) and back cabinet (handset).

8.9.2.2. Base Unit - jig (BS JIG) for Handset

The base unit jig uses two modes: NORMAL POWER mode and TEST POWER mode. These modes alternate when the base unit LOCATOR button is pressed:

(1) NORMAL POWER mode, TEST SUPER LOW (red) is OFF. This test simulates the handset is at normal/close distance. The base unit is in NORMAL POWER mode right after the AC adapter has been inserted.

(2) TEST SUPER LOW (POWER) mode, TEST SUPER LOW LED (red) is ON. This test simulates the handset is at very large distance from the base unit and the TX signal from base to handset is very small.

Procedure: First, place handset under test to charge (exchange security code), then remove handset from base after you hear a beep; press LOCATOR on base unit (red LED lights). Press TALK button on handset and if it links with the base, then this handset sensitivity is OK.

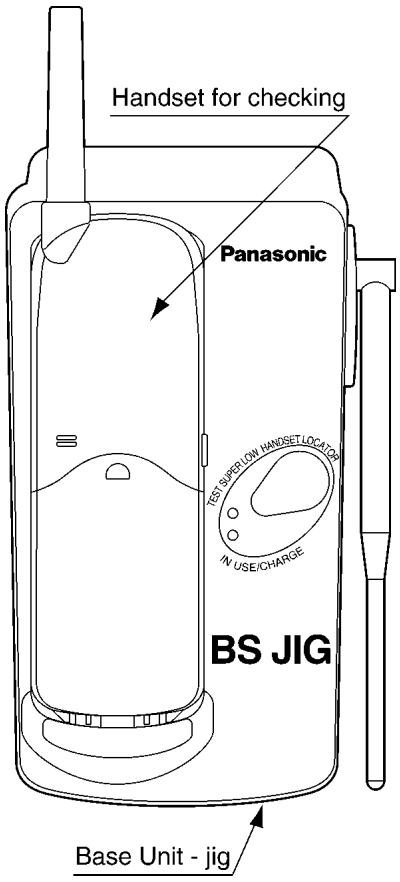
* BS JIG becomes [NORMAL POWER] mode immediately after the power supply turning on.

NOTES:

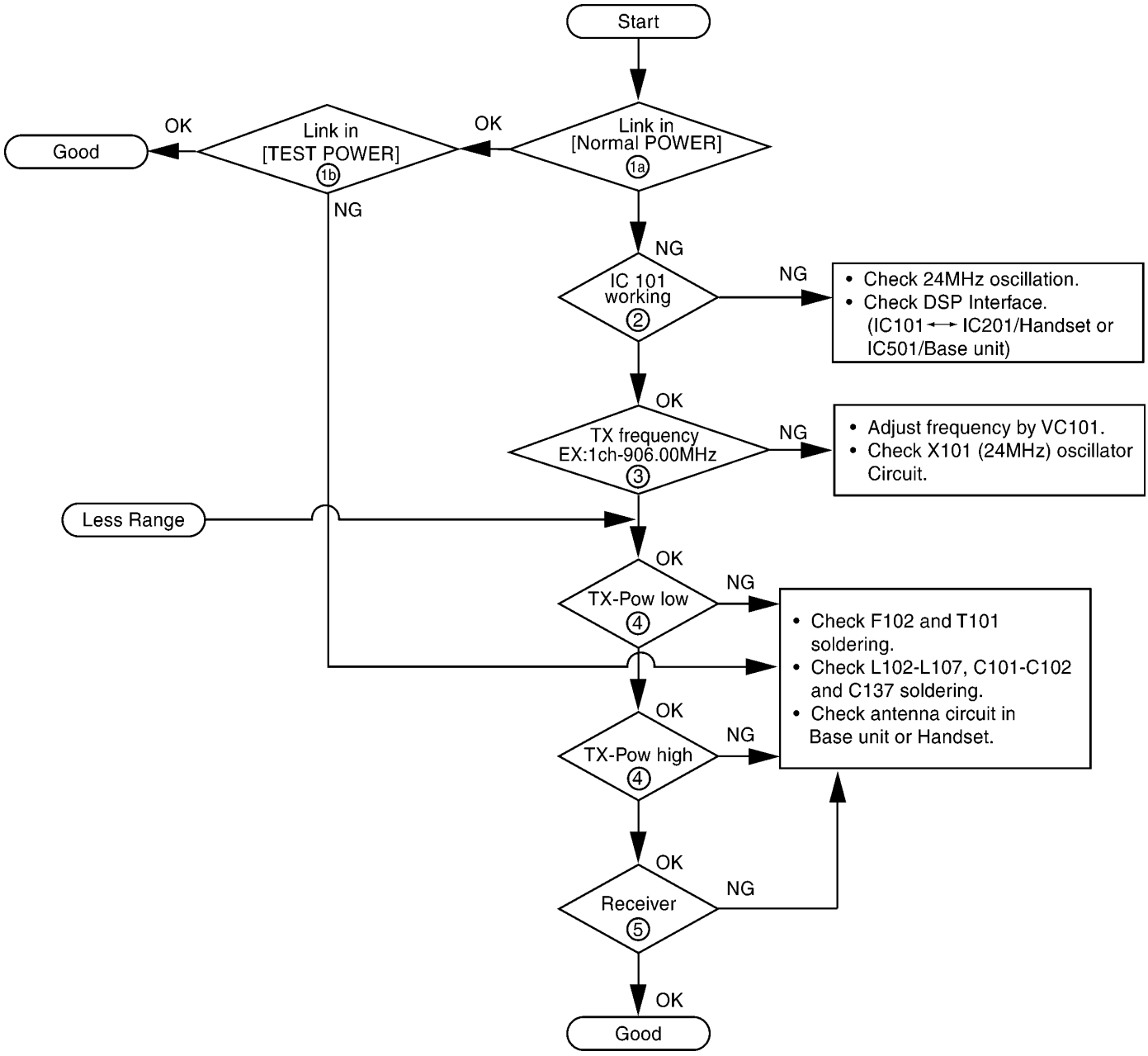
1) If when setting the base to TEST SUPER LOW mode, if handset beeps 3 times and the LCD shows "No link to base. Place on cradle and try again", press 2, 5, 8, 0 simultaneously and then disconnect battery. Re-install battery, place unit on cradle to get security codes and tries again.

2) Only KX-TC1851B with marks BS JIG can be used for troubleshooting. Regular KX-TC1851B production samples does not have the software needed for troubleshooting.

3) You can differentiate the jig from a regular unit because the jig has silver bottom cabinet (base) and back cabinet (handset).



8.9.3. RF Check Flowchart



(*) Details of confirmation items are following in "**8.9.4. Check Table for RF Block**".

8.9.4. Check Table for RF Block

No	Item		BS(Base uinit) (*1)	HS(Handset) (*1)
1a.	Link confirmation [NORMAL POWER]	Procedure	1. Put “HS JIG” on BS. 2. Set MODE to [NORMAL POWER] position of “HS JIG“. 3. Press [TALK] key of “HS JIG” to establish link .	1. Put HS on “BS JIG”. 2. Set MODE to [NORMAL POWER] position of “BS JIG“. 3. Press [TALK] key of “HS” to establish link.
1b.	Link confirmation [TEST POWER]	Procedure	1. Change MODE to [TEST POWER] position of “HS JIG”. 2. Press [TALK] key of “HS JIG” to establish link about 30cm away from “BS”.	1. Change MODE to [TEST POWER] position of “BS JIG”. 2. Press [TALK] key of “HS“ to establish link about 30cm away from “BS JIG”.
2	IC101 working confirmation	Procedure	1. Set Test-mode [Continuos Send Low Power].(*3) 2. Confirm X101 oscillate(24MHz). (*4)	1. Set Test-mode [Continuos Send Low Power].(*3) 2. Confirm X101 oscillate(24MHz) (*4).
		Check point	1. Check X101 oscillator. 2. Check DSP interface(IC101←→IC501/BS) (*5).	1. Check X101 oscillator. 2. Check DSP interface(IC101←→IC201/HS) (*5).
3	TX frequency Adjustment	Procedure	1. Set Test-model [Continuos Send Low Power].(*3) 2. Confirm TX-carrier frequency (1CH = 906MHz).	1. Set Test-mode [Continuos Send Low Power].(*3) 2. Confirm TX-carrier frequency (1CH = 906MHz).
		Check point	1. Adjust frequency by VC101.(*3) 2. Check X101 oscillator Circuit.	1. Adjust frequency by VC101.(*3) 2. Check X101 oscillator Circuit.
4	TX Power confirmation	Procedure	1. Put RF wire to ANT and ANT_GND(See **9.4. Base Unit Reference Drawing**). Connect this wire Marconi or Spectrum Analyzer. 2. Set Test-mode [Continuos Send Low Power].(*3) 3. Confirm TX power level within -3-±5dBm (*2) (0.158~1.58mW) 4. Set Test-mode [Continuos Send High Power].(*3) 5. Confirm TX power level within +17±4dBm (20~126mW)	1. Put RF wire to ANT and ANT_GND(See **9.5. Handset Reference Drawing**). 2. Set Test-mode [Continuos Send Low Power].(*3) 3. Confirm TX power level within -4±5dBm (*2) (0.126~1.26mW) 4. Set Test-mode [Continuos Send High Power].(*3) 5. Confirm TX power level within +16±4dBm (16~100mW)
		Check point	1. Check F102 and T101 soldering. 2. Check L102~107, C101~102 and C137 soldering. 3. Check Antenna in BS.	1. Check F102 and T101 soldering. 2. Check L102~107, C101~102 and C137 soldering. 3. Check Antenna in HS.
5	Receiver confirmation	Procedure	1. Put “HS JIG” on BS. 2. Set MODE to [NORMAL POWER] position of “HS JIG”. 3. Press [TALK] key of “HS JIG“ to establish link . 4. Change MODE to [TEST POWER] position of “HS JIG“. 5. Press [TALK] key of “HS JIG” to establish link about 30cm away from “BS”.	1. Put HS on “BS JIG”. 2. Set MODE to [NORMAL POWER] position of “BS JIG”. 3. Press [TALK] key of “HS” to establish link. 4. Change MODE to [TEST POWER] position of “BS JIG”. 5. Press [TALK] key of “HS” to establish link about 30cm away from “BS JIG“.
		Check point	1. Check F102 and T101 soldering. 2. Check L102~107, C101~102 and C137 soldering. 3. Check Antenna in BS.	1. Check F102 and T101 soldering. 2. Check L102~107, C101~102 and C137 soldering. 3. Check Antenna in HS.

(*1)BS;Base unit, HS;Handset unit, HS JIG;Handset-jig, BS JIG;Base unit-jig

(*2)Marconi setting

TX Freq.; 906.00MHz mode; WB

Spectrum analyzer setting

Freq. 906.00MHz Span 10MHz

RBW 1MHz or above VBW same as RBW

(*3)See “**9 TEST MODE AND ADJUSTMENT**”

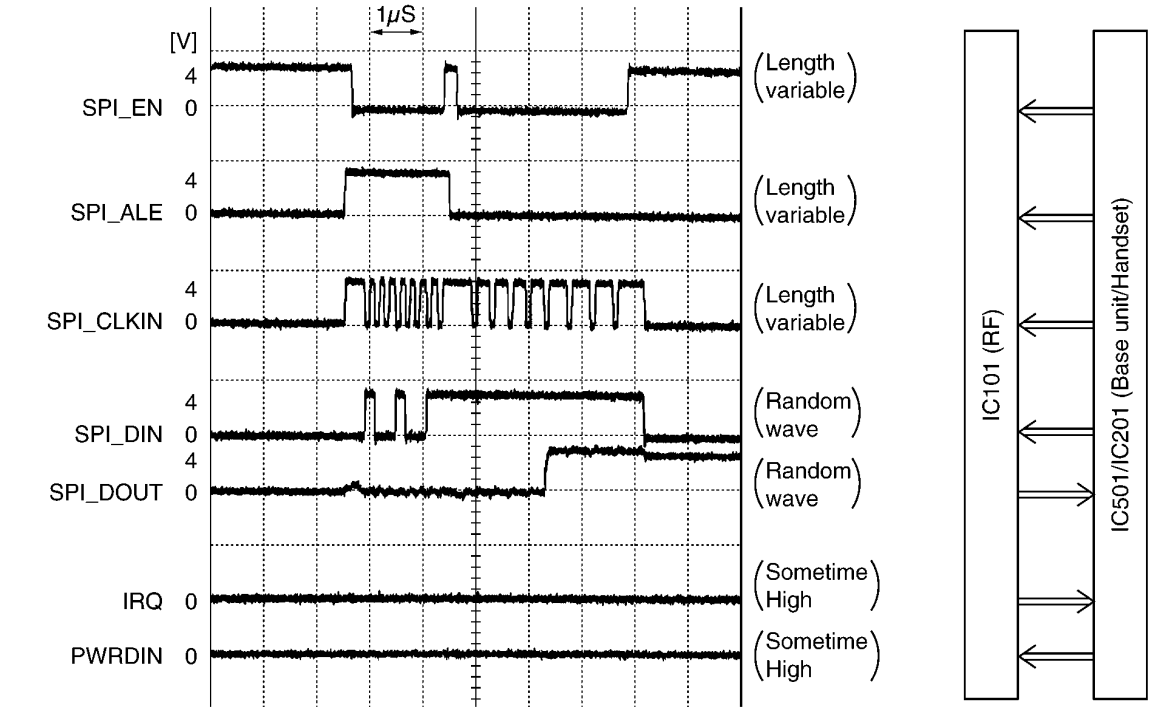
(*4)Do not adjust X101 when probe is directly attached to X101. Test probe should be attached to antenna, then adjust.

(*5)See 7.5.5. RF-DSP interface signal wave form.

8.9.5. RF-DSP interface signal wave form

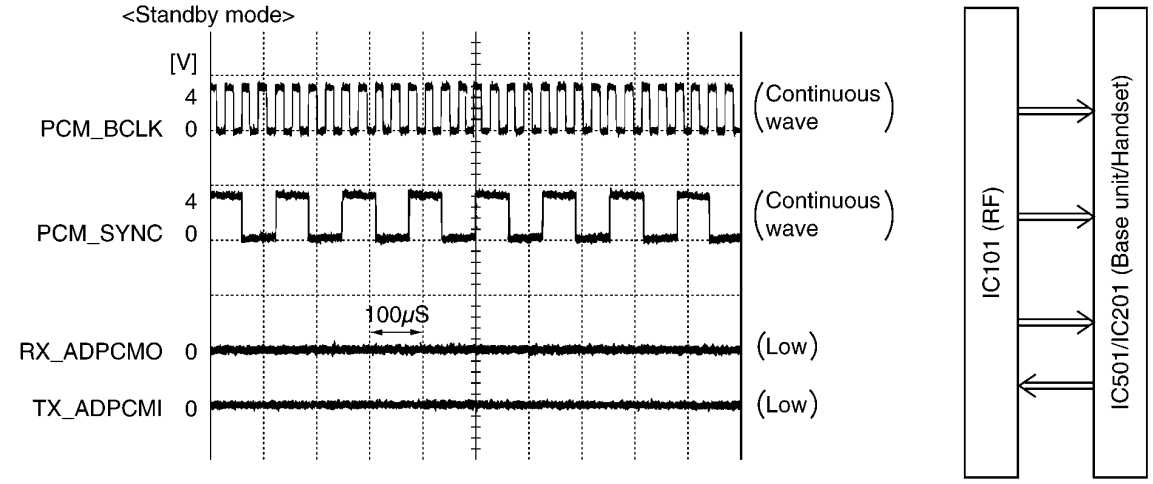
(1) Serial control line

<Standby mode>

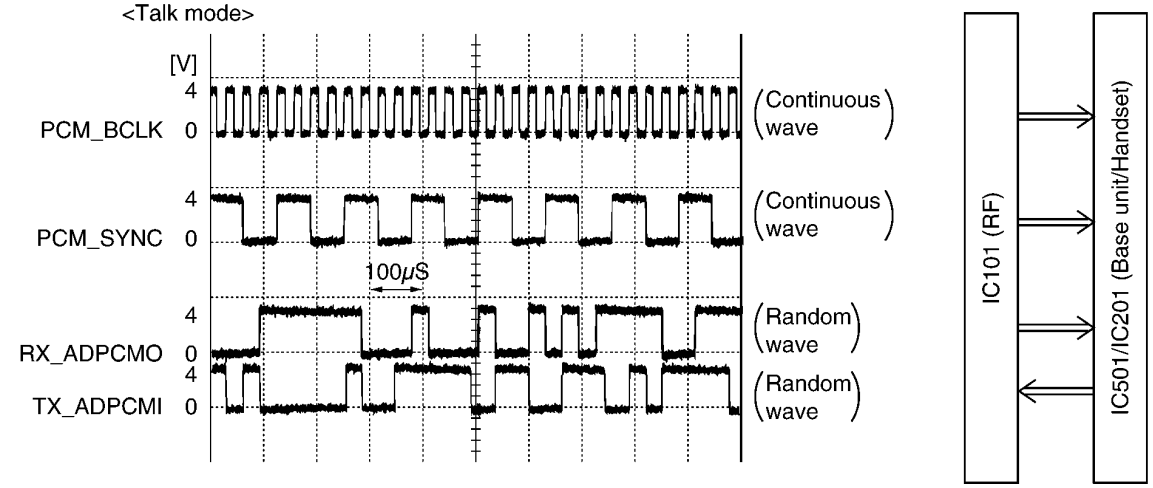


(2) ADPCM (Digital sound) line

<Standby mode>

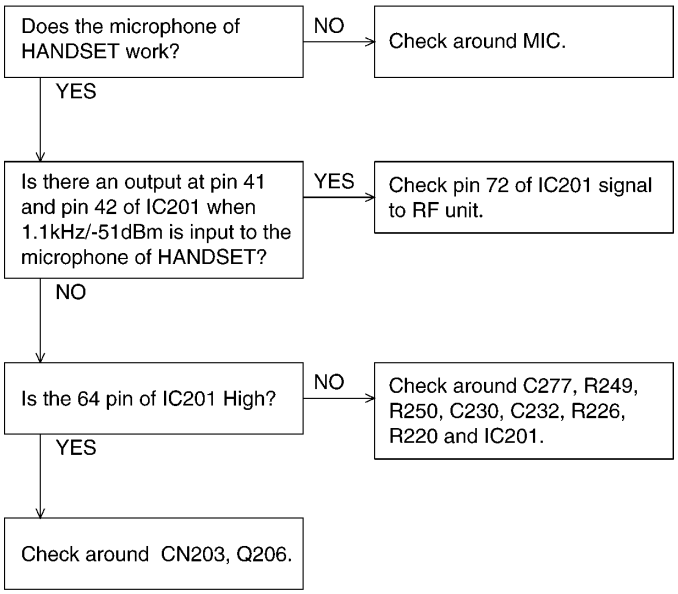


<Talk mode>

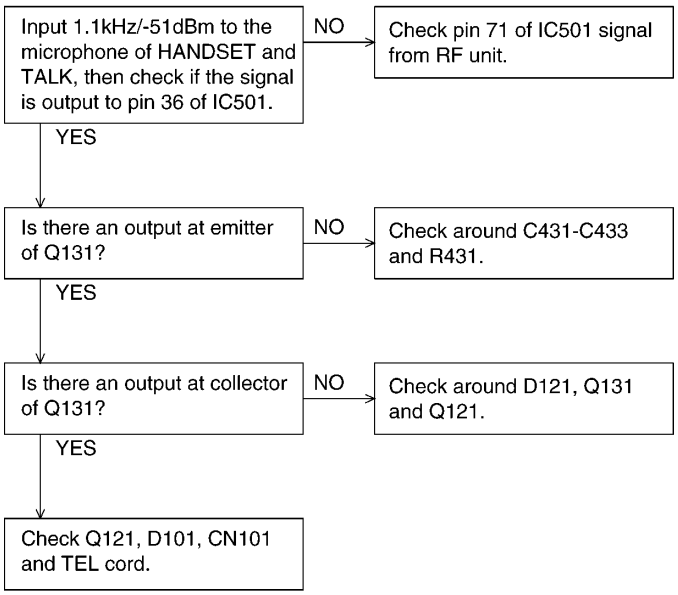


8.10. Check Handset Voice Transmission

HANDSET



BASE UNIT

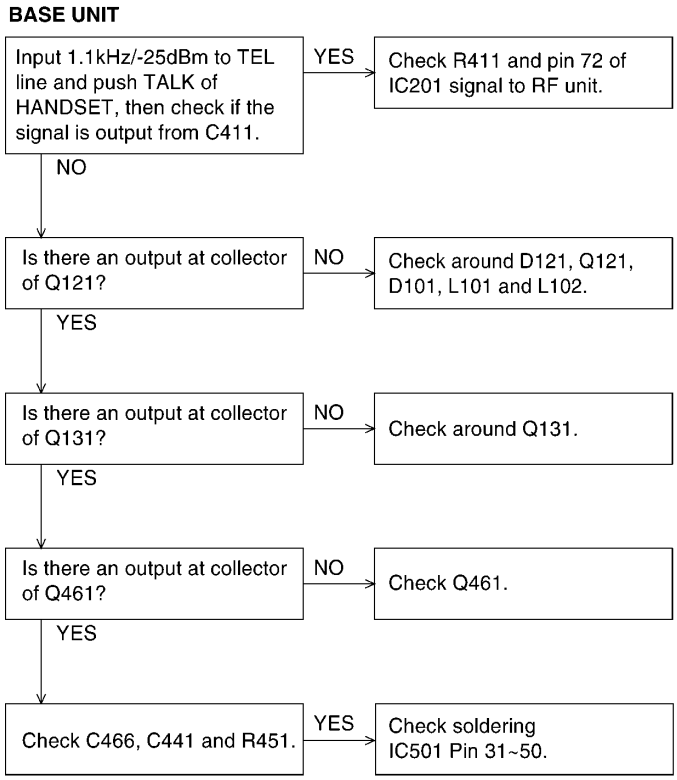


Note:

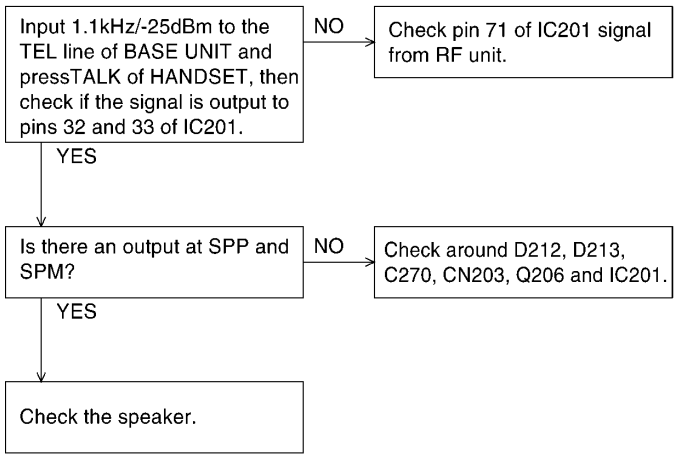
If you change MIC.
Put some bond or hot melt at hole of MIC behind after changing MIC.

8.11. Check Handset Voice Reception

BASE UNIT



HANDSET

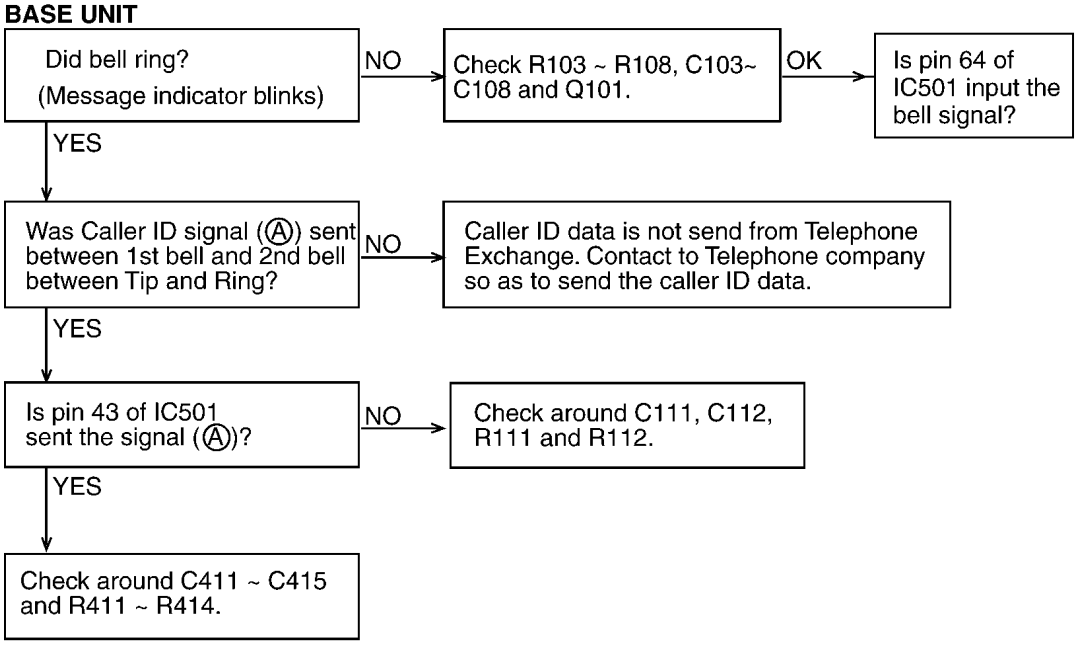


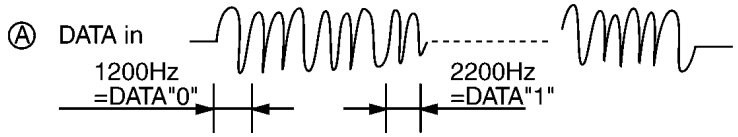
NOTE:

When checking the RF UNIT, Refet to **8.9. Check the RF Unit**

8.12. Check Call ID

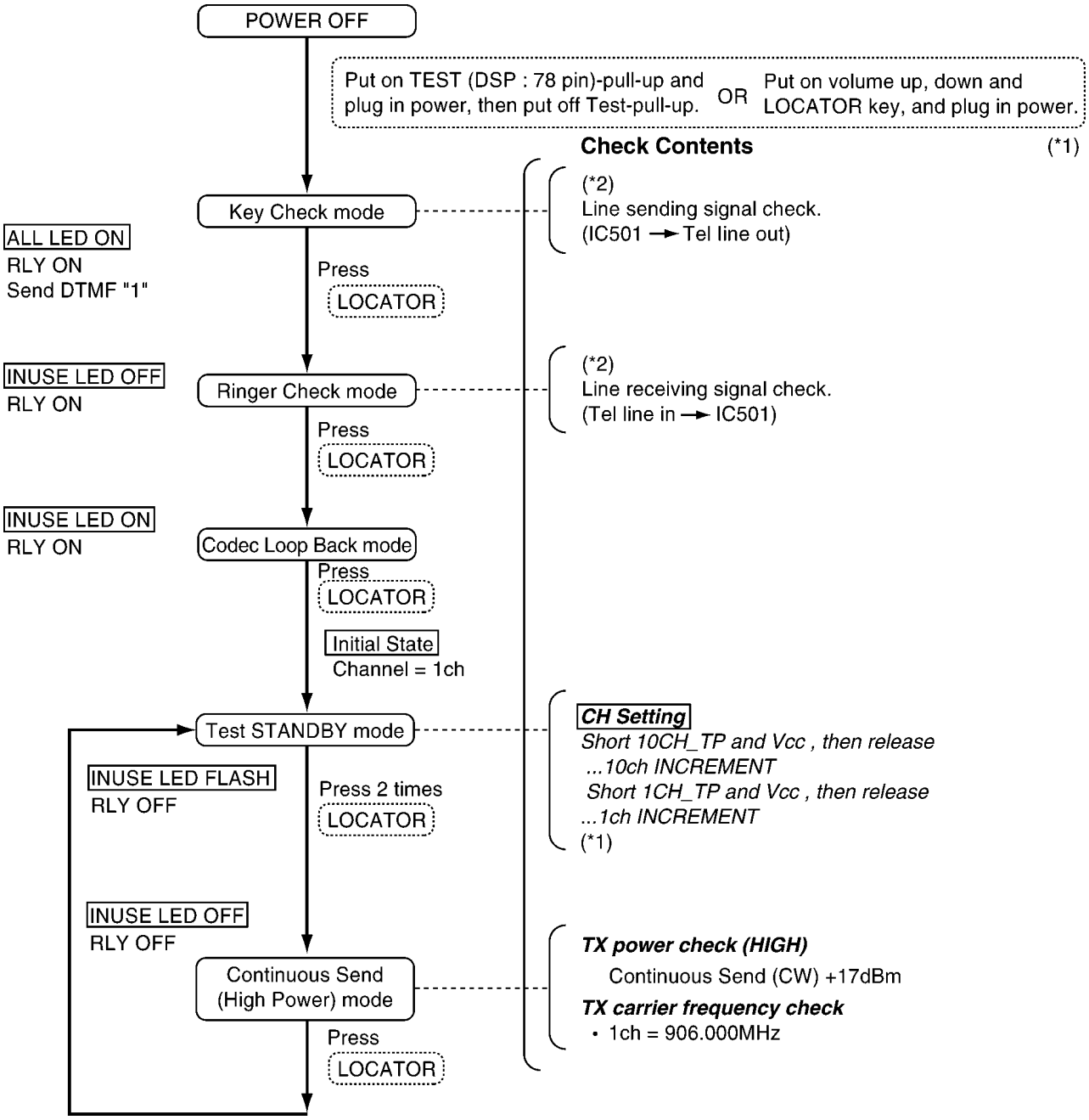
BASE UNIT





9 TEST MODE AND ADJUSTMENT

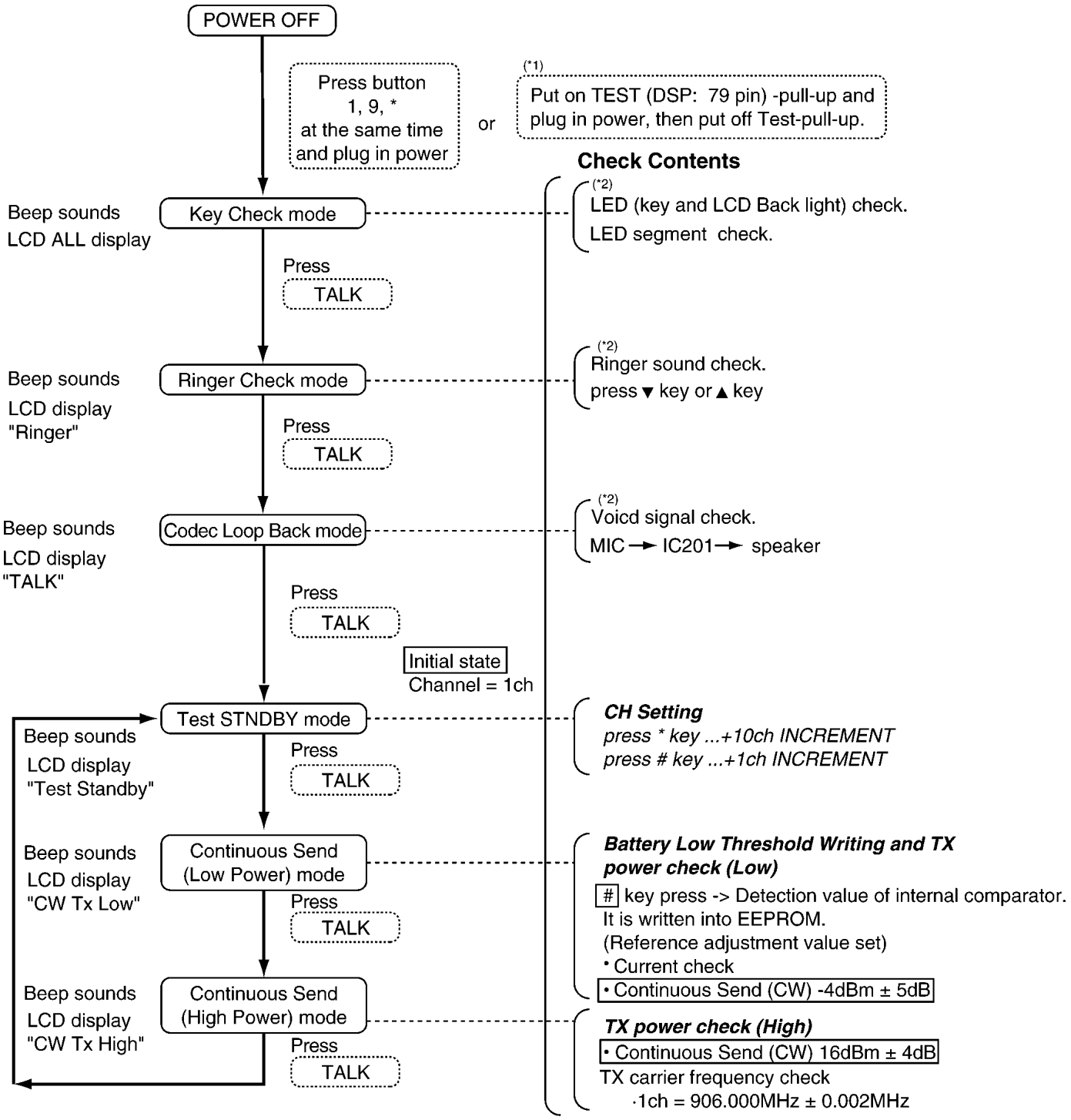
9.1. Test mode flow chart for Base Unit



(*1) See **9.4. Base Unit Reference Drawing**

(*2) Special check method for Base Unit individually.

9.2. Test mode flow chart for Handset



(*1) See **9.5. Handset Reference Drawing**

(*2) Special check method for Handset individually.

9.3. Adjustment X101

IN case of SS system, Carrier signal frequency directly by Frequency counter, can not be measured because sending signal is spread by PN code.

So, the confirmation and adjustment is made under the Continuous Send mode of TEST MODE.

Adjust the TX carrier(CW) frequency on the RF unit.

Equipment: Frequency counter

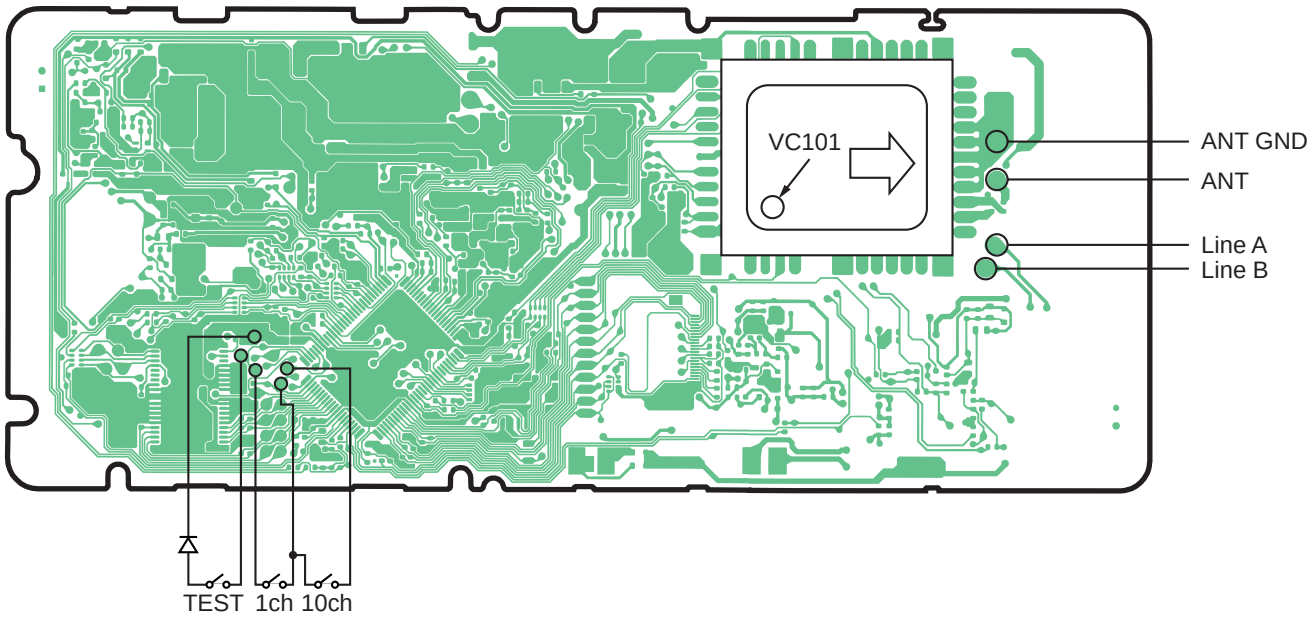
TP for adjustment: TP_ANT

Adjustment point: VC101 (RF unit)

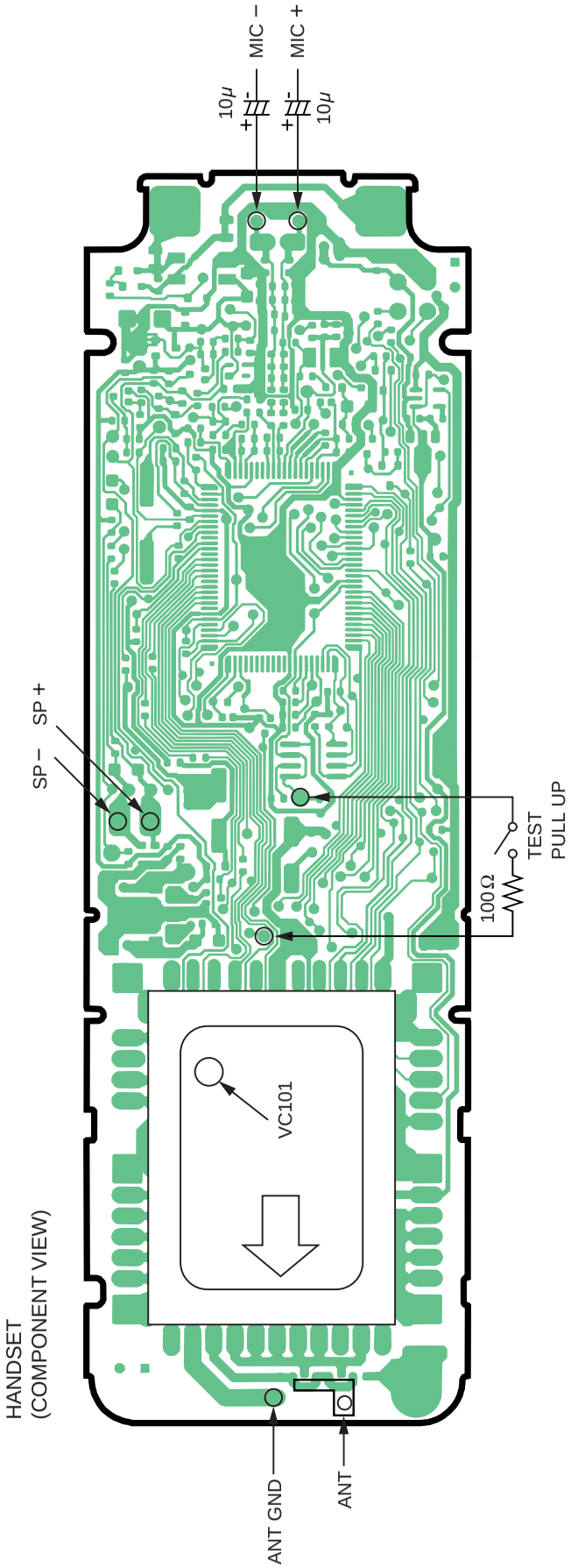
Adjustment range: 906.000 ± 0.002 MHz (1ch)

9.4. Base Unit Reference Drawing

(COMPONENT VIEW)



9.5. Handset Reference Drawing



9.6. FREQUENCY TABLE

(TDD: time division duplex)

Channel	TX/RX Frequency (MHz)	Channel	TX/RX Frequency (MHz)
1	906.000	13	915.000
2	906.750	14	915.750
3	907.500	15	916.500
4	908.250	16	917.250
5	909.000	17	918.000
6	909.750	18	918.750
7	910.500	19	919.500
8	911.250	20	920.250
9	912.000	21	921.000
10	912.750	22	921.750
11	913.500	23	922.500
12	914.250	24	923.250

10 DESCRIPTION

10.1. Frequency

The frequency range of 906.00 MHz ~ 923.25 MHz is used. Transmitting and receiving channel between base unit and handset is same frequency. Refer to the Frequency Table.

10.2. Time Division Duplex (TDD) operation

Transmission/reception between the base unit and handset is performed by time-sharing as shown in Fig. 7. 1 slot time of transmission and reception is 1mS.Same frequency is used in transmitting and receiving. The figure shows an example; the frequency of 3ch is used in transmitting between the base unit and handset.

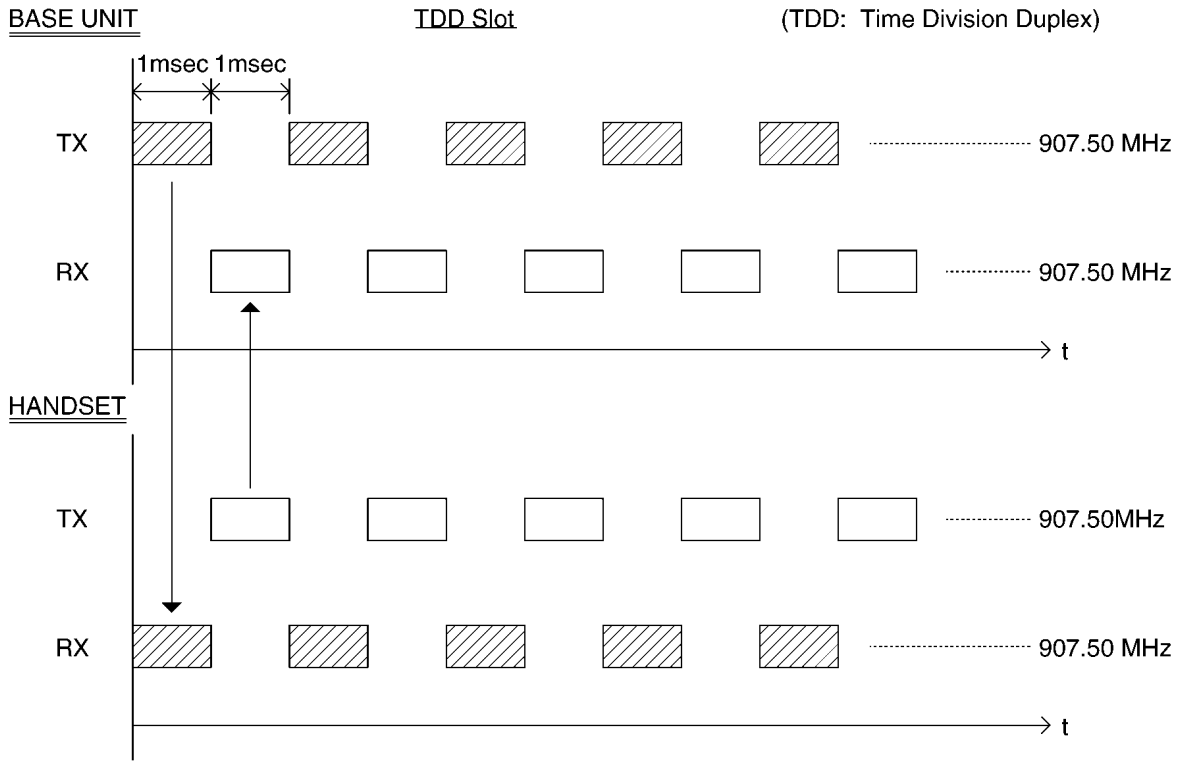


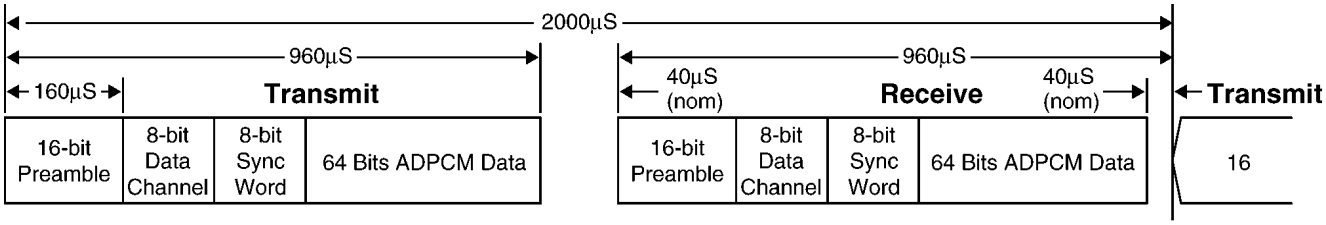
Fig. 7

10.2.1. TDD Frame Format

The TDD frame is 2mS in length, and is composed of two symmetrical 960 µS TX and RX subframes. Each subframe contains 96 bits of 10µS duration, with 40µS guard times between both TX and RX subframes.

Each subframe consists of the following four fields:

- A 16-bit Preamble field
- An 8-bit Data Channel field
- An 8-bit Sync Word
- A 64-bit ADPCM Payload



10.3. Spread Spectrum

Transmission and reception are operated using the spread spectrum method.

DSS (Digital Spread Spectrum)

Mixing the original signal with the pseudo random noise code (PN code) works the spread spectrum. In this system PN code is 15 chip. Although the band width is spread fifteen times, the power level per cannel becomes lower.

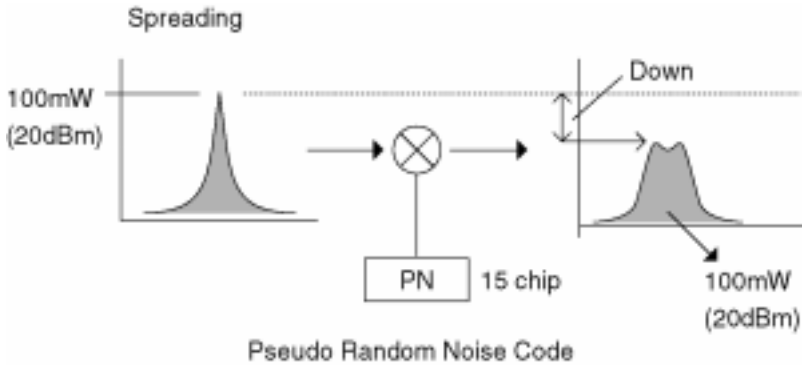


Fig. 8

10.4. Signal Flowchart in the Whole System

Reception

CN101 of the base unit is connected to the TEL line, and the signal is input through the bridge diode D101. While talking the relay (Q121) is turned ON and amplified at the amplifiers Q461, then led to DSP (IC501). DSP generates ADPCM signal. The ADPCM signal is input to RFIC (IC101) of RF UNIT, and is mixed with pseudo random noise code (PN code) to spread the spectrum. RFIC outputs FSK modulated RF signal. The RF signal is passed through the balun (T101) and filter (F102) to be transmitted from the antenna. As for the handset, RF signal from the antenna is input to RFIC passing through filter (F102) and the balun (T101) to perform the de-spread, then input to DSP (IC201). DSP performs ADPCM decoding to convert the signal into the voice signal, then it is output to the speaker.

Transmission

The voice signal input from the microphone is led to DSP (IC201). The DSP generates ADPCM signal. As well as the reception, it is converted into the RF signal by RFIC (IC101). Passing through the balun (T101) and filter (F102), it is transmitted from the antenna. As for the base unit, RF signal from the antenna is input to RFIC (IC101) passing through filter (F102) and the balum (T101) to perform the de-spread, then input to DSP (IC201). DSP performs ADPCM decoding to convert the signal into the voice signal. The voice signal is amplified at the TX amplifier (Q131), then output to the TEL line (CN101) through the relay (Q121) and bridge (D101).

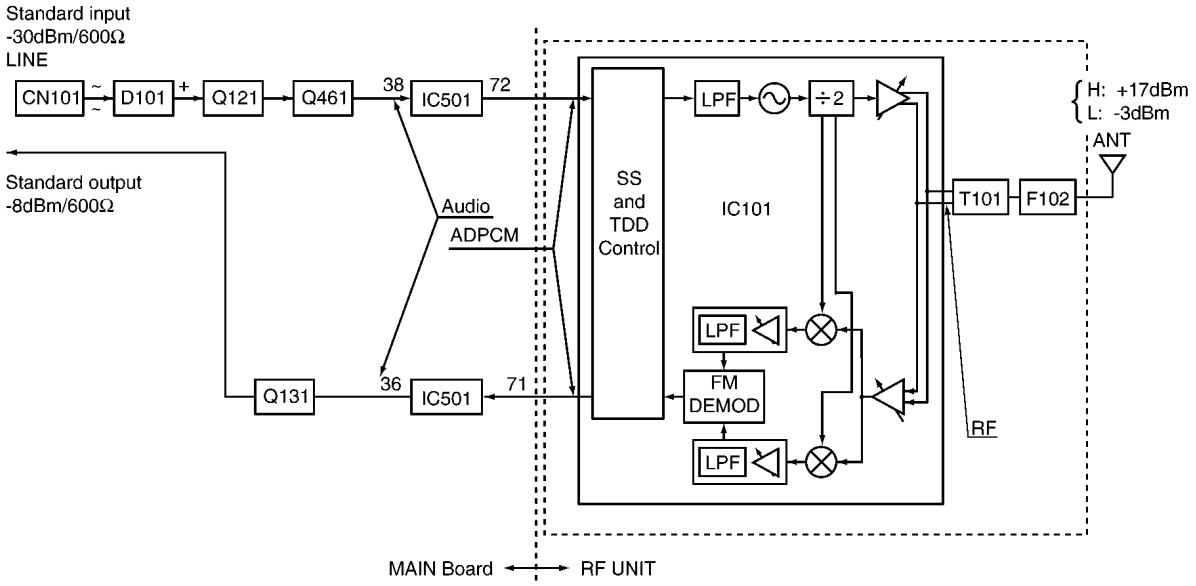


Fig. 9-1 BASE UNIT

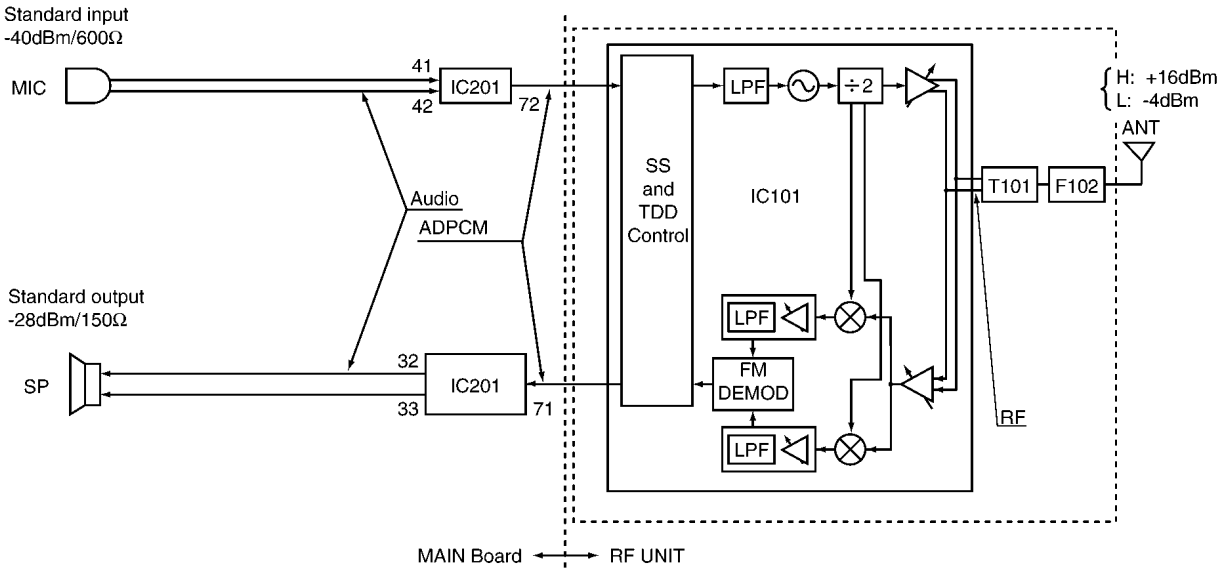
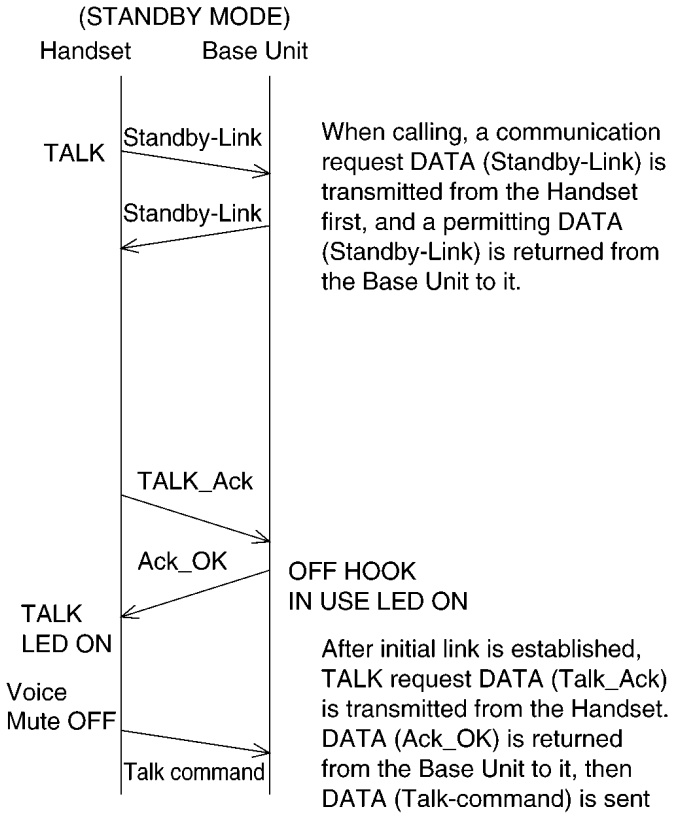


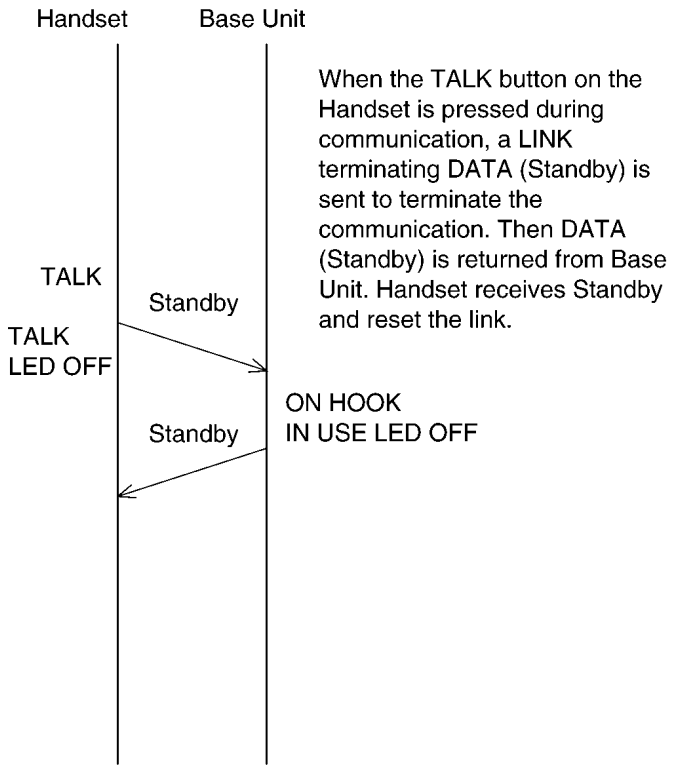
Fig. 9-2 HANDSET

10.5. EXPLANATION OF BBIC DATA COMMUNICATION

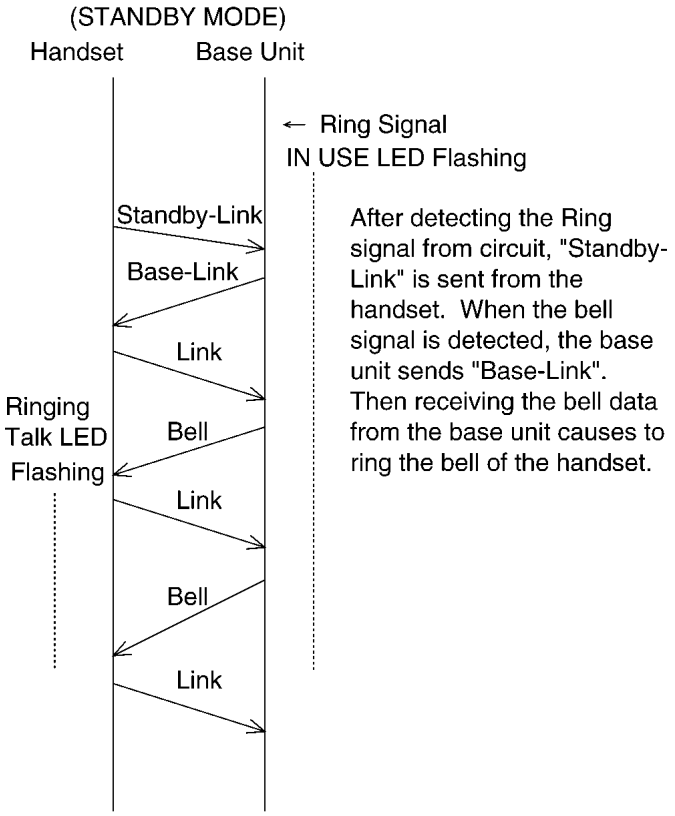
10.5.1. Calling



10.5.2. To Terminate Communication

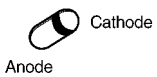
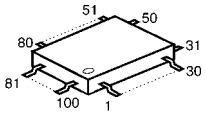
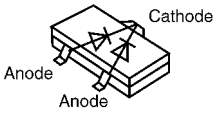
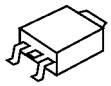
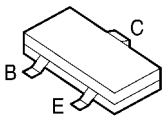
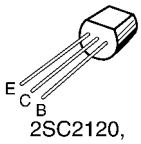
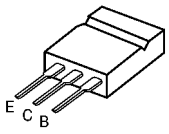
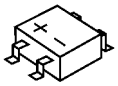
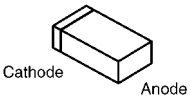
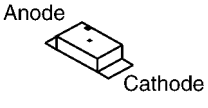
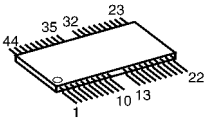
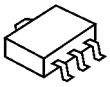
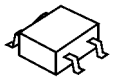
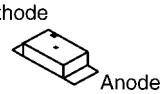


10.5.3. Ringing

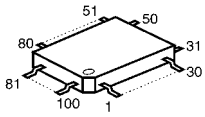
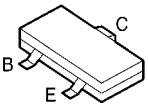
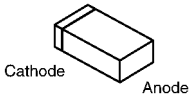
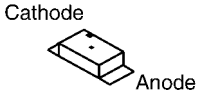
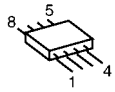
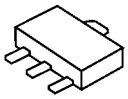
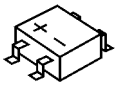
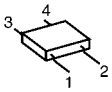


11 TERMINAL GUIDE OF IC´S, TRANSISTORS AND DIODES

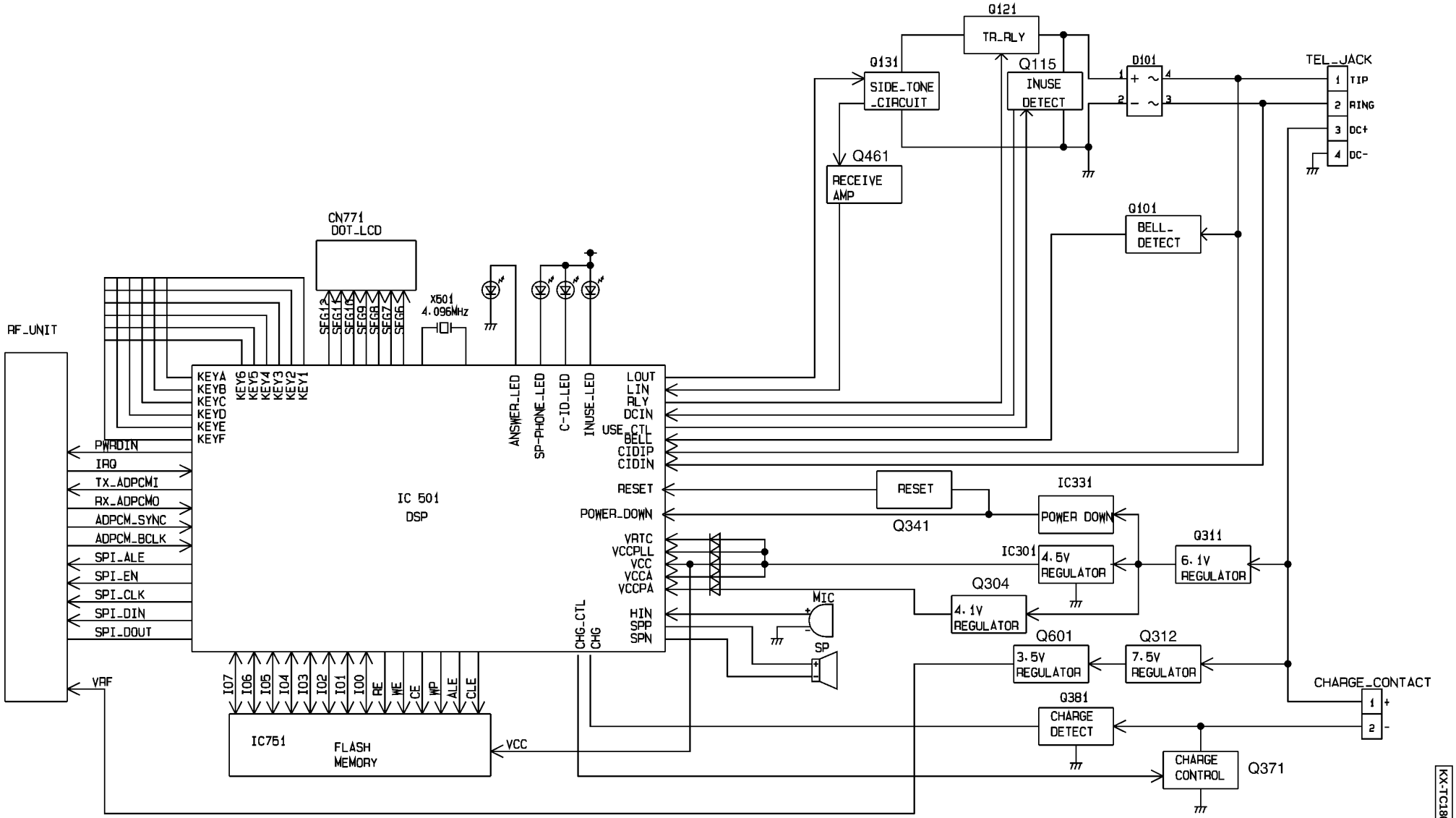
11.1. Base Unit

 PQVDRLZ2R0 PQVDRLZ8R2 PQVDRLZ20A	 PQVI16569ABA	 MA153	 2SD1758Q	 UN5213 2SD1819A, 2SD601A
 2SC2120, PQVT2N6517CA, 2SA1625	 2SD2136	 PQVDS1ZB60F1	 PQVTDTC123JU PQVDHRU0302A MA8047, MA8033, MA111, MA8051, MA8036H	
 PQVDBR1111C	 PQWITC1871BH	 PQVIXCF4502P	 PQVIPS3432UT	 PQVDSML310MT

11.2. Handset

 PQVI16107ACA	 PQVTDTC143E, UN521,PQVDTA143TU, 2SD1819A, PQVTD123T146,		 MA2ZD1400 MA8150,MA111	 PQVDSML310MT
 PQWITC1871BR PQWITC1872BR	 PQVIC62FP33M	 2SA1797Q	 PQVDS1ZB60F1	 PQVIC61CN32N
 PQVIXCP3002M				

12 BLOCK DIAGRAM (Base Unit)



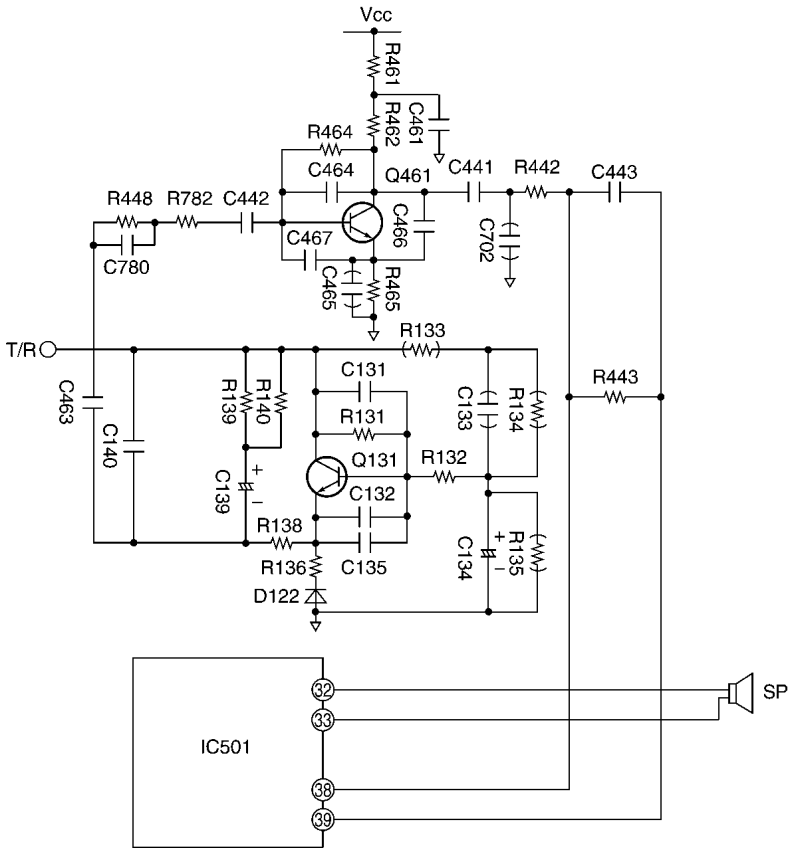
13 NEW CIRCUIT OPERATION (Base Unit)

13.1. SP-PHONE RX Circuit

Circuit Operation:

Telephone Line (T/R) → Q131 → C463 → R448 → C442 → R464 → C441 → pin 38 of IC501 → pins 32 and 33 of IC501 → Speaker

Circuit Diagram

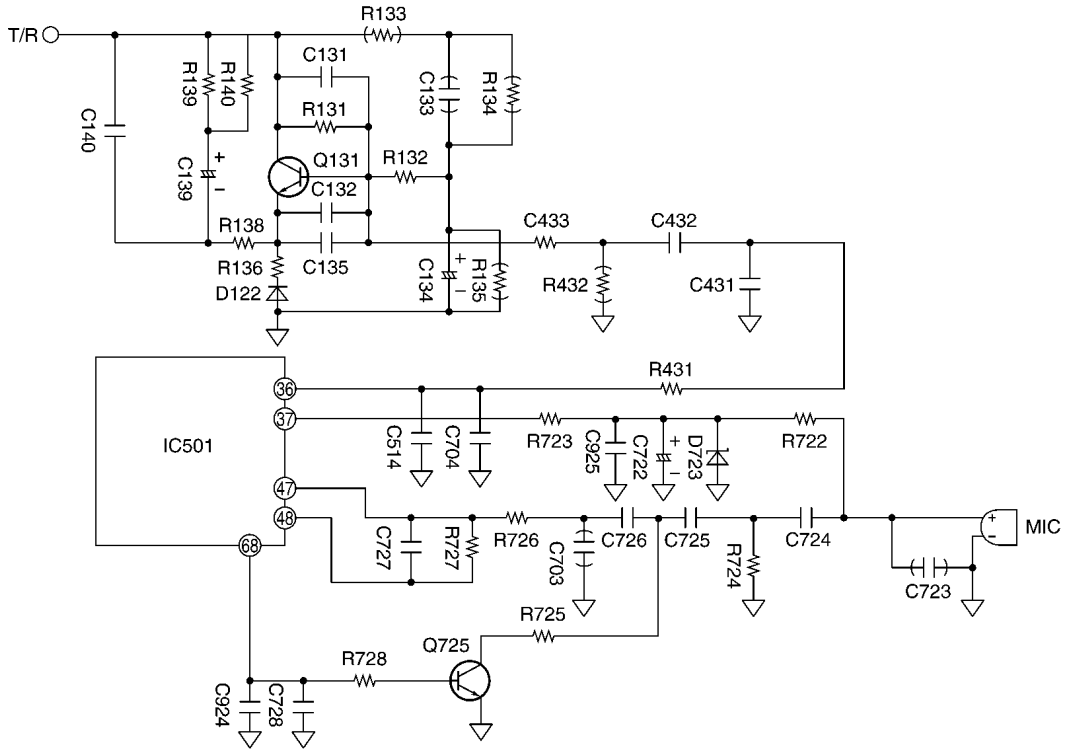


13.2. SP-PHONE TX Circuit

Circuit Operation:

MIC → C724 → C725 → C726 → R726 → pin 47 of IC501 → pin 36 of IC501 → R431 → C432 → C433 → Telephone Line

Circuit Diagram



13.3. Auto Disconnect Circuit

Function:

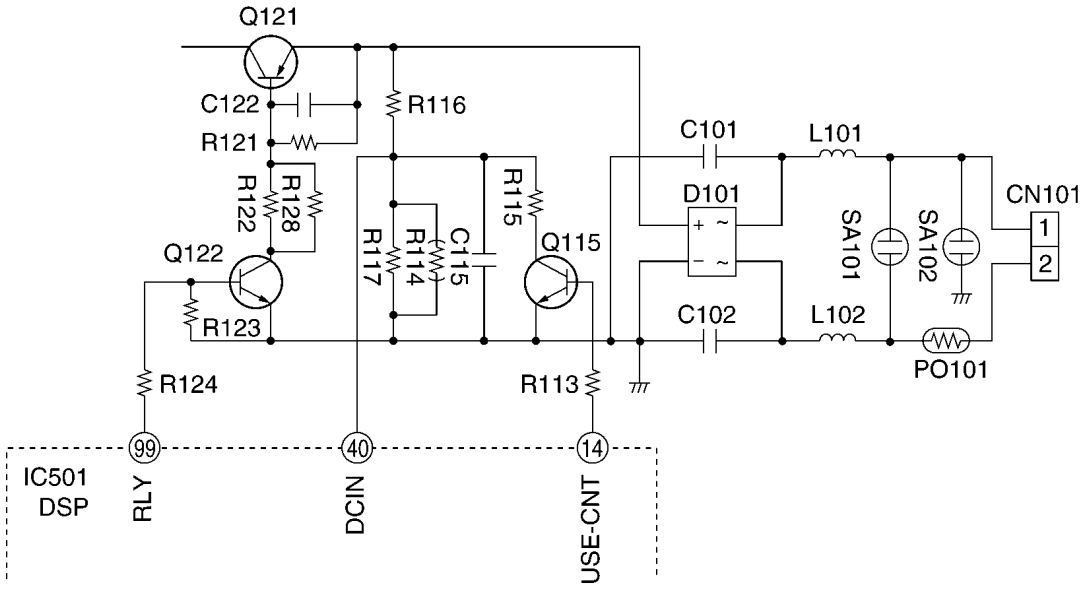
This circuit is used to detect the fact that another telephone connected to the same line is OFF-HOOK while the unit is in a receiving status or OGM transmitting status.

Circuit Operation:

The voltage pin 40 of IC501 is monitored. If a parallel-connected telephone is put into an OFF HOOK status, the presence/absence of a parallel connection is determined when the voltage changes by 0.2V or more.

When the set detects tha parallel-connected telephone is OFF HOOK status, the line is disconnected.

Circuit Diagram



13.4. Power Supply Circuit

Function:

Power from the AC adaptor passes through a regulating block consisting of IC301.

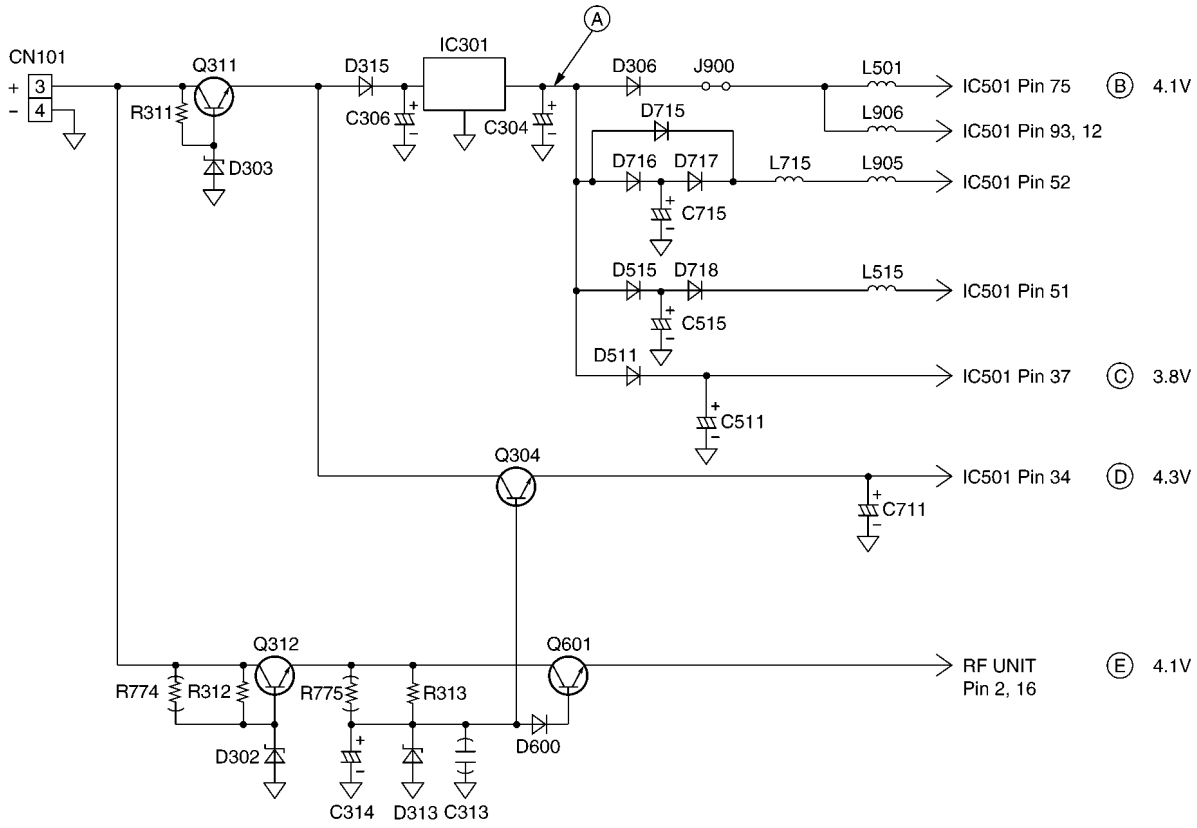
Circuit Operation:

IC401 is a regulated power supply. The voltage at point A is regulated to 4.5 V by IC301.
The voltage at point B is dropped by D306 and D307 to 4.1 V.
The voltage at point C is dropped by D511 to 3.8 V.

The voltage at point D is dropped by Q304 to 4.3V

The voltage at point E is dropped by Q312, Q601 to 4.1V

Circuit Diagram



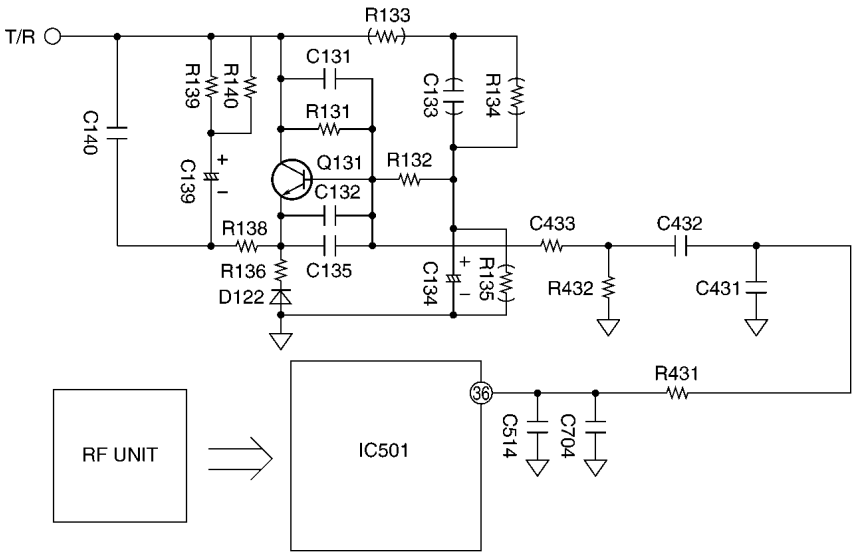
13.5. DTMF Signal

When the DTMF data from the Handset is received, the DTMF signal is output from pin 36 of IC501 and sent to the line through Q131.

13.6. Line Sending Signal

The modulation signal input from the RF unit is demodulated by IC501.
The audio signal output from IC501-36 and is input to telephone line.

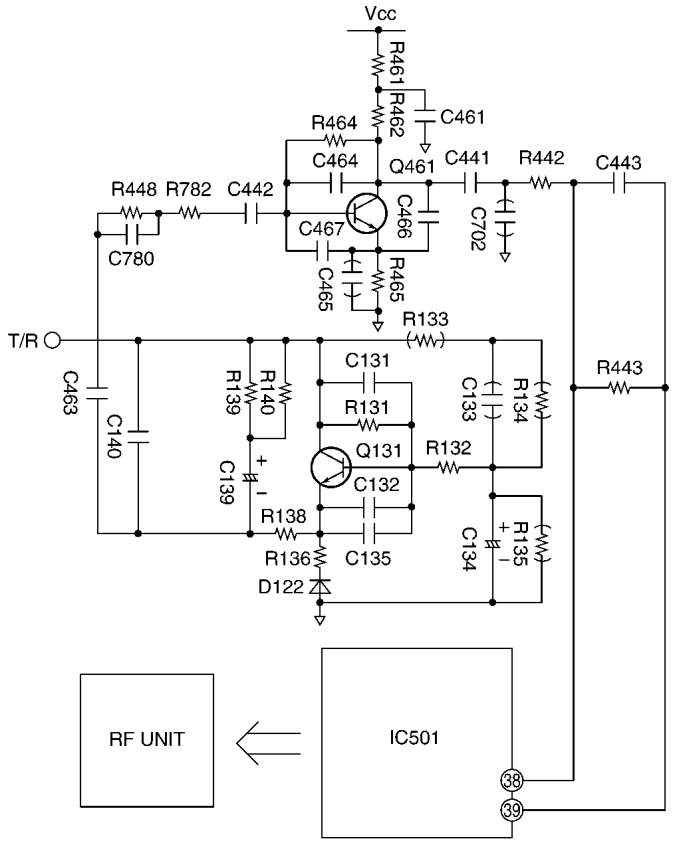
Circuit Diagram



13.7. Line Receiving Signal

The audio signal from line passes through Q106 and IC702, and the signal is input to pin 96 of IC502(BBIC).
IC502 modulates the input audio signal to output to the RF unit.

Circuit Diagram



13.8. Calling Line Identification Circuit (Caller ID)

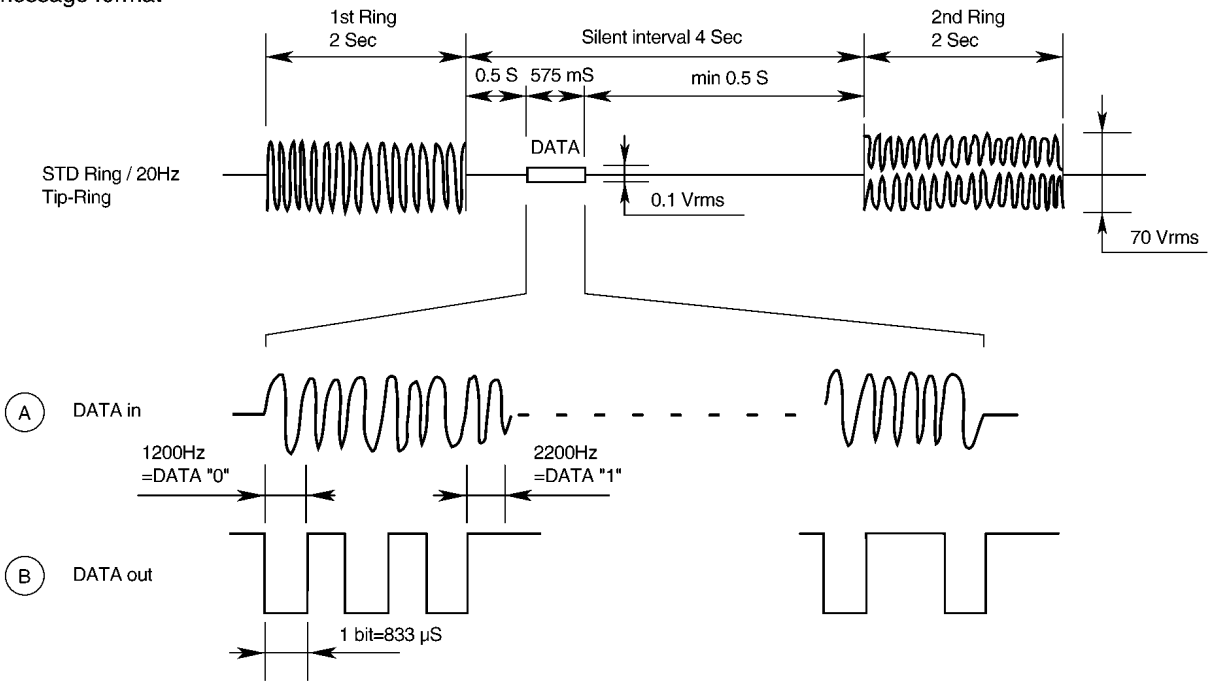
Function:

The caller ID is a chargeable ID which the user of a telephone circuit obtains by entering a contract with the telephone company to utilize a caller ID service. For this reason, the operation of this circuit assumes that a caller ID service contract has been entered for the circuit being used.

The data for the caller ID from the telephone exchange is sent during the interval between the first and second rings of the bell signal. The data from the telephone exchange is a modem signal which is modulated in an FSK (Frequency Shift Keying) format. Data "0" is a 1200 Hz sine wave, and data 1 a 2200 Hz sine wave.

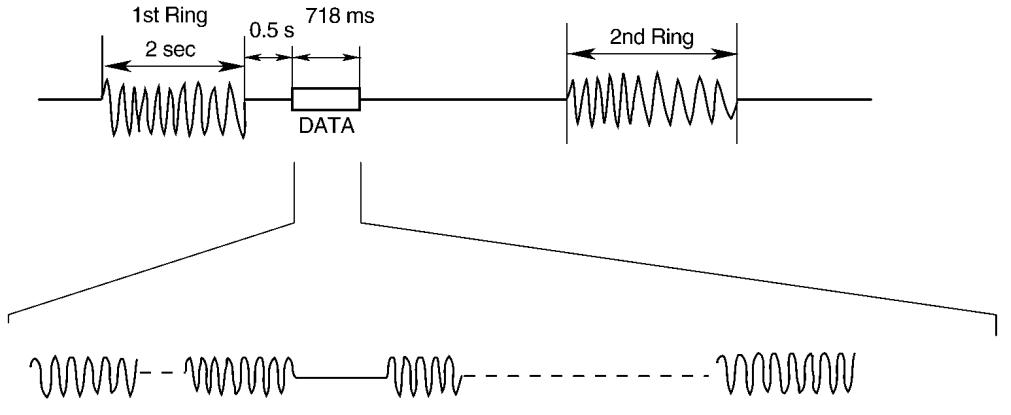
There are two type of the message format which can be received: i.e. the single message format and plural message format. The plural message format allows to transmit the name and data code information in addition to the time and telephone number data.

- Single message format



month		day		hour		minute		number
04	–	15	–	16	–	35	–	2013487000

- Plural message format



DATA CODE	NAME
201	John Smith

month		day		hour		minute		number
04	–	16	–	16	–	35	–	2013487000

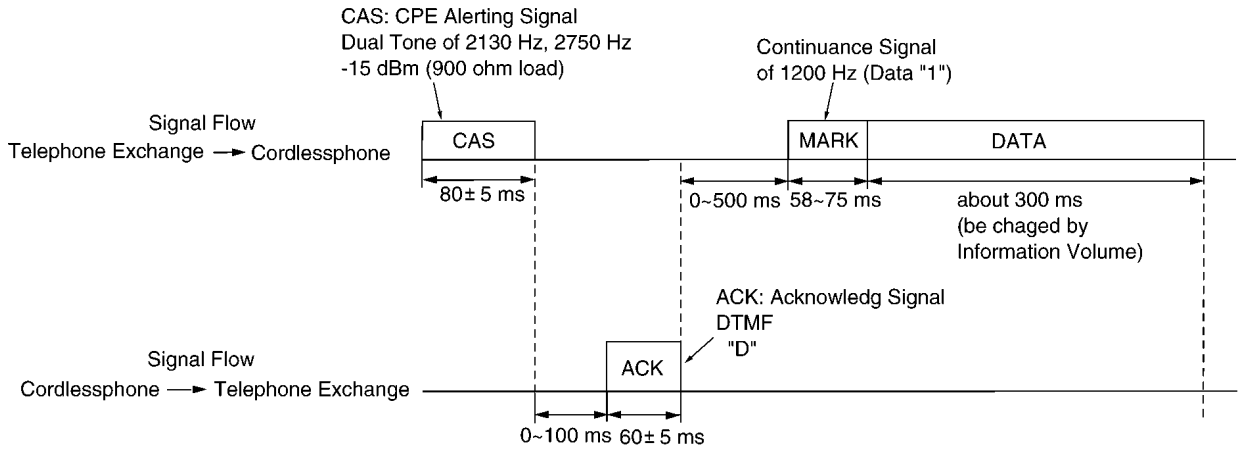
lCall Waiting

Calling Identity Delivery on Call Waiting (CIDCW) is a CLASS service that allows a customer, while off-hook on an existing call, to receive information about a calling party on a waited call. The transmission of the calling information takes place almost immediately after the customer is alerted to the new call so he/she can use this information to decide whether to take the new call.

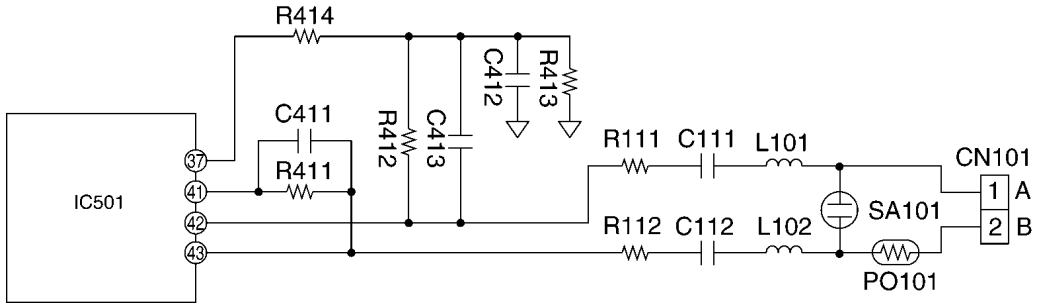
Function:

The CAS signal flows from T/R → R111, R112 collector → C111, C112 → IC501 pins 41~43 and the ACK (DTMF signal) is returned to the telephone exchange. The telephone exchange that received the ACK can send the data in the same manner as the caller ID. If the unit deems that a telephone connected in parallel is in use, ACK is not returned even if CAS is received, and the information for the second and subsequent callers is not displayed on the portable handset display.

Call Waiting Format



Circuit Diagram



13.9. Parallel Connection Detection Circuit

Function:

In order to disable call waiting and stutter tone functions when using telephones connected in parallel, it is necessary to have a circuit that judges whether a telephone connected in parallel is in use or not. This circuit determines whether the telephone connected in parallel is on hook or off hook by detecting changes in the T/R voltage.

Circuit Operation:

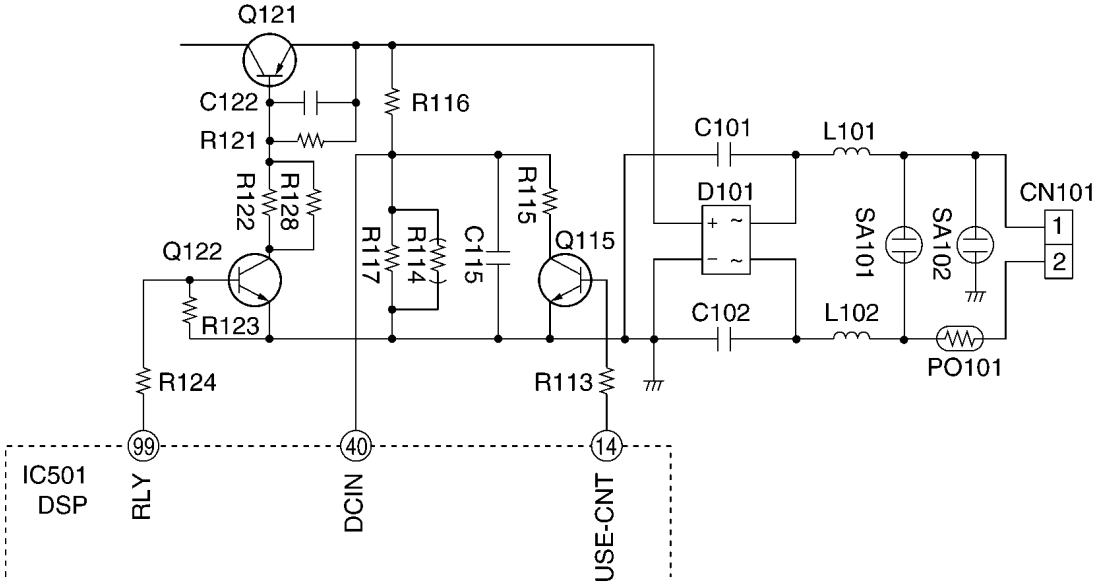
Parallel connection detection when on hook:

When on hook Q115 is ON, the voltage is monitored pin 40 of IC501. There is no parallel connection if the voltage is 1.65 V or higher, while a parallel connection is deemed to exist if the voltage is lower.

Parallel connection detection when off hook:

When off hook Q115 is OFF, the voltage is monitored pin 40 of IC501; the presence/absence of a parallel connection is determined when the voltage changes by 0.2 V or more.

Circuit Diagram



13.10. DSP (Digital Speech/Signal Processing) Circuit

General Description:

(IC501, IC751) is a digital speakerphone/speech/signal processing system that implements all the functions of speech compression, record and playback, and memory management required in a digital telephone answering machine.

The DSP system is fully controlled by a host processor IC501. The host processor provides activation and control of all that functions, such as speech Recording, Playback, Tone detecting and Line monitoring.

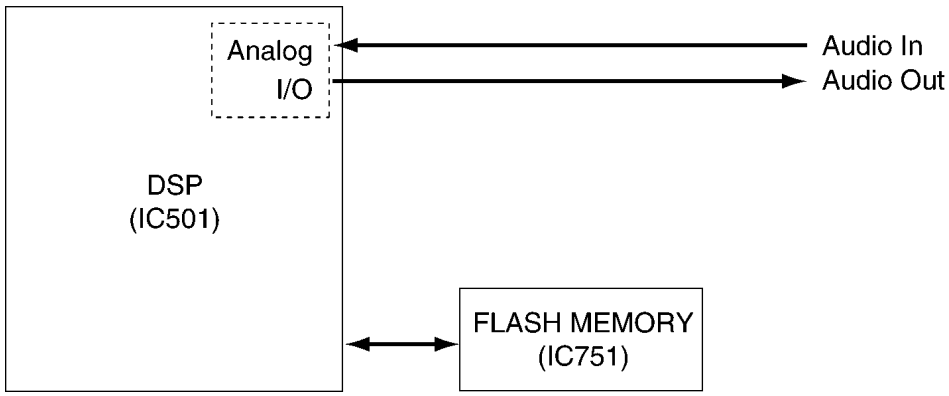
The DSP system comprises of following.

— a Host Processor.

— a Digital Signal Processor which includes the firmware implemented functions.

— a FLASH MEMORY (IC751), which is used for stored voice messages and synthesized voice.

Circuit Diagram



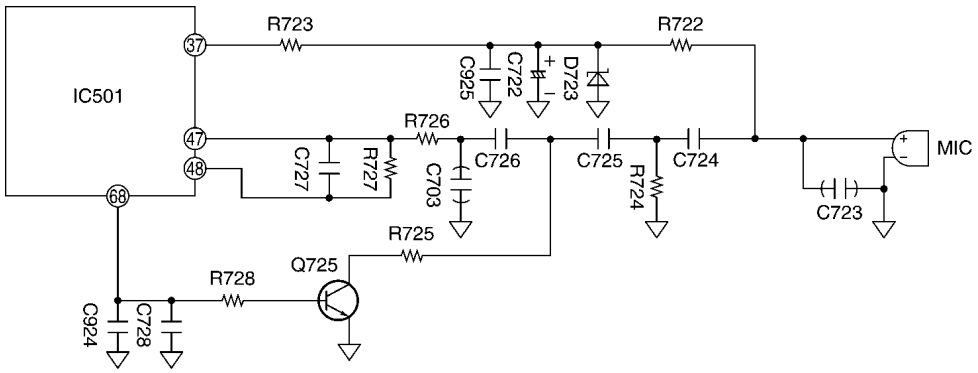
- **Voice Message Recording**
  The DSP system use a proprietary speech compression technique to record and store voice message in FLASH MEMORY (IC751).
  An error correction algorithm is used to enable playback of these messages from the FLASH MEMORY (IC751).
- **DTMF Detection**
  The DTMF detection is implemented by the DSP system in software. The DTMF detection is performed during Record, Playback, and Line Monitoring modes of operation.
- **Synthesized Voice**
  The DSP implements synthesized Voice, utilizing the built in speech detector and an FLASH MEMORY (IC751), which stored the vocabulary.
- **Caller ID and Call Waiting CID demodulation**
  The DSP implements monitor and demodulate the FSK signals that provide CID information from the Central Office.

13.11. Greeting Recording Circuit

Circuit Operation:

MIC → C724 → C725 → C726 → R726 → pin 47 of IC501.

Circuit Diagram

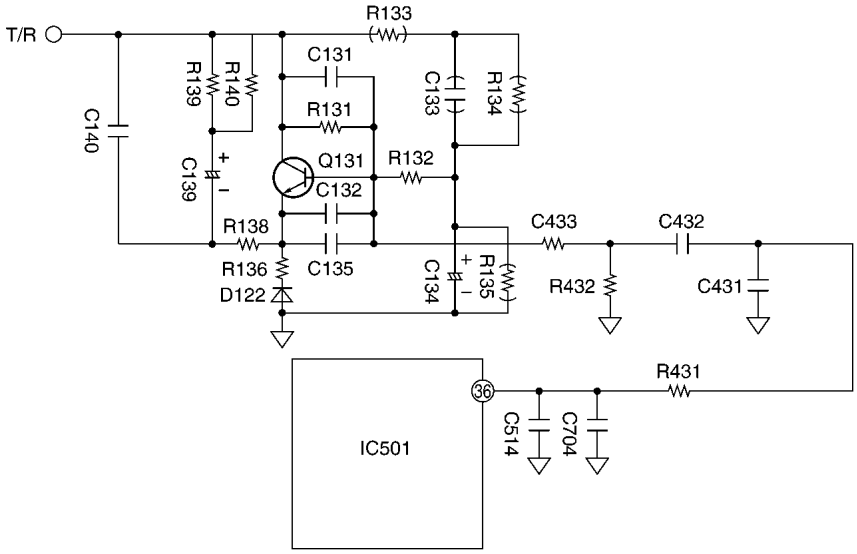


13.12. Greeting Play Back Circuit

Circuit Operation:

pin36 of IC501 → R431 → C432 → C433 → Telephone Line.

Circuit Diagram

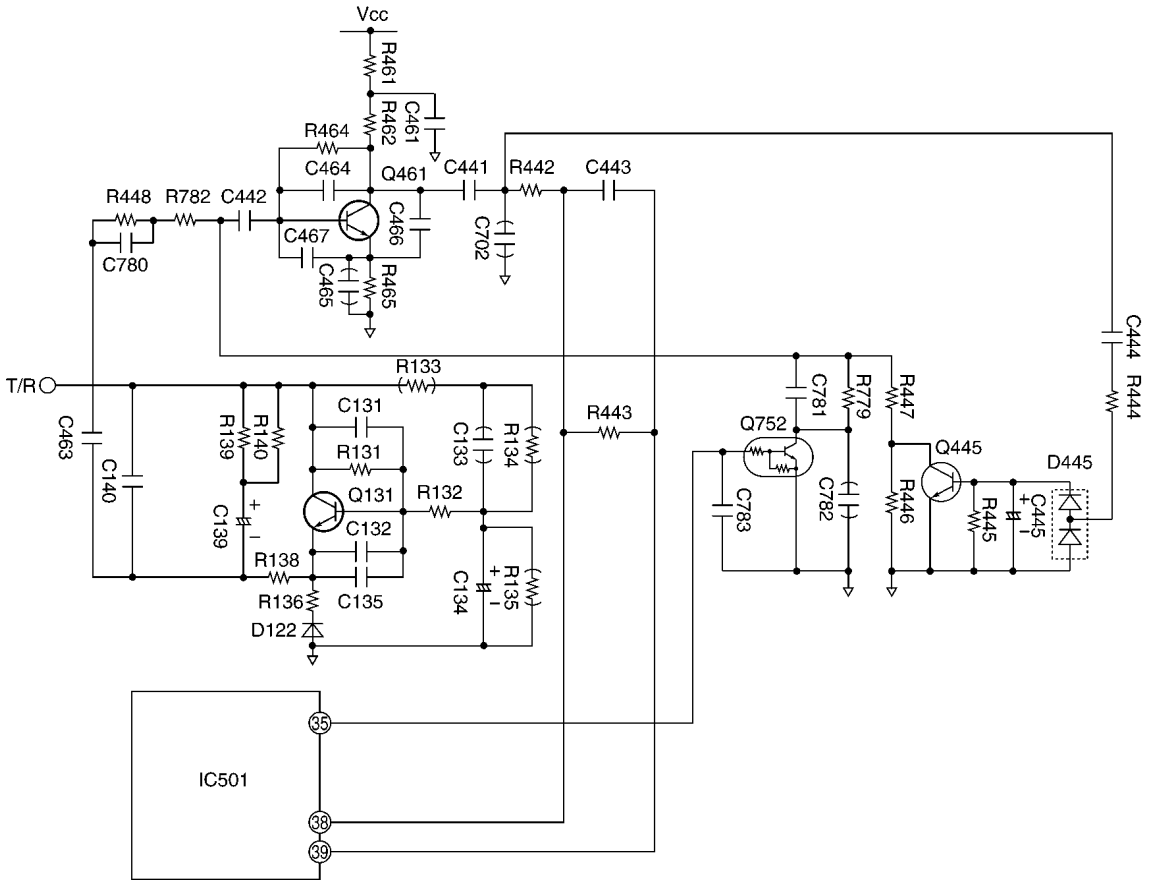


13.13. ICM Recording Circuit

Circuit Operation:

Telephone Line → Q131 → C463 → R448 → C442 → R464 → C441 → pin 32 and 33 of IC501.

Circuit Diagram

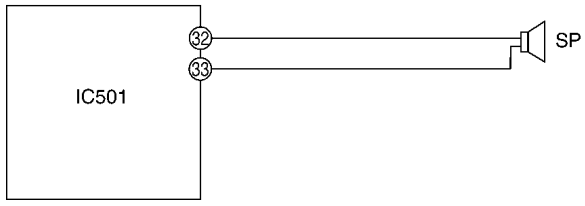


13.14. ICM Play Circuit

Circuit Operation:

pins 32 and 33 of IC501 → Speaker.

Circuit Diagram



13.15. Telephone Line Interface

Circuit Operation:

l **ANSWER**

In the idle mode, Q121 is open to cut the DC loop current and decrease the ring load. When ring voltage appears at the Tip (T) and Ring (R) leads (When the telephone rings), the AC ring voltage is transferred as follows:

T → L101 → R103 → C103 → Q101 → IC501 pin 64.

When the CPU (DSP) detects a ring signal, Q121 turns on, thus providing an off-hook condition (active DC current flow through the circuit) and the following signal flow is for the voice signal.

T → D101 → Q121 → Q131 → R138 → C140 → D101 → L102 → PO101 → R

l **ON HOOK**

Q121 is open, Q121 is connected as to cut the DC loop current and to cut the voice signal. The unit is consequently in an on-hook condition.

l **SPECIFICATIONS**

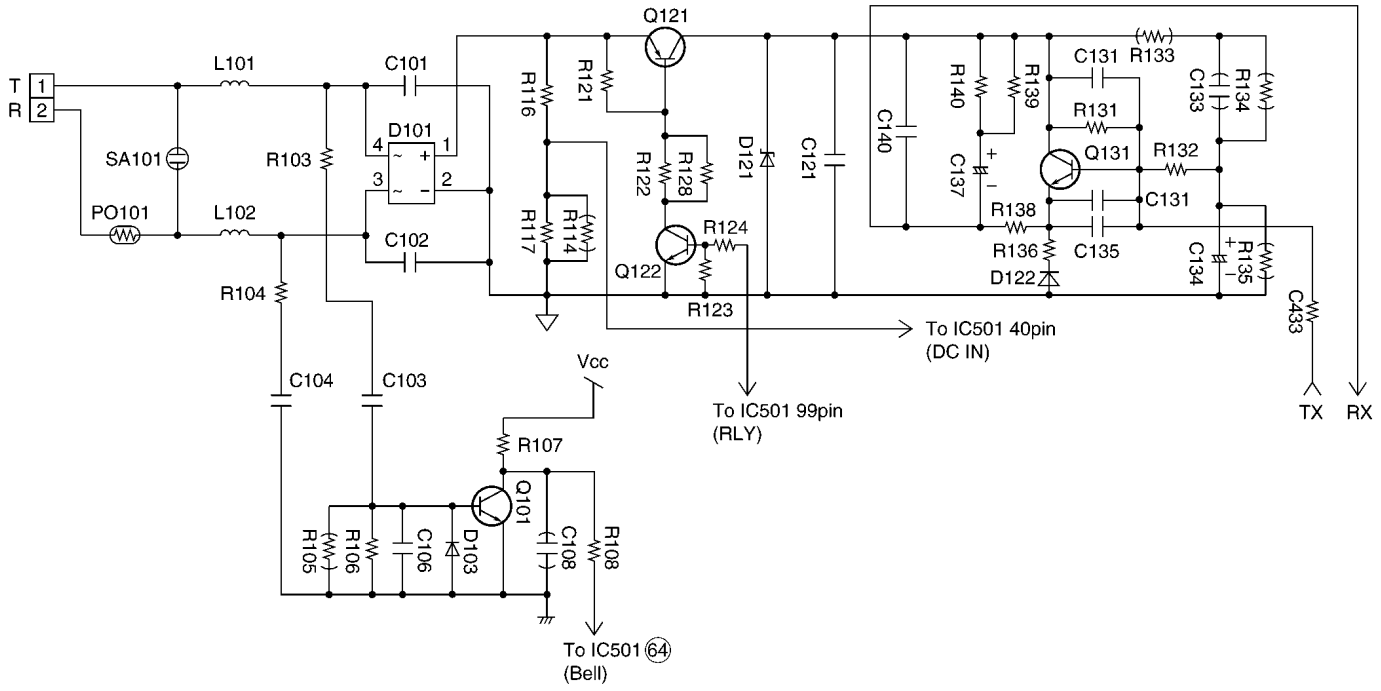
In the on-hook state (idle), the current flows between the telephone line and the unit is as follows:

T → L101 → R103 → C103 → R106 → C104 → R104 → L102 → PO101 → R.

The DC component is blocked by C103, C104: thereby providing an on-hook condition.

The AC interface impedance is over 47 kΩ; thus, satisfying the telephone company requirements.

Circuit Diagram



13.16. Intercom Mode

1. When the base unit LOCATOR/INTERCOM button is pressed, a call monitor signal (intercom sound) is output from pins 32 and 33 of IC501. Thus a monitor tone is heard from the speaker.
2. At the same time, flashing of the IN USE/CHARGE (LED541) is obtained from pin 65 of IC501. This status is called "Intercom stand-by".
3. The receiving signal flows:
   RF → pin 32 and 33 of IC501 → SP
4. The transmission signal flows:
   MIC → C724 → C725 → C726 → R726 → pin 47 of IC501 → RF

13.17. Initializing Circuit

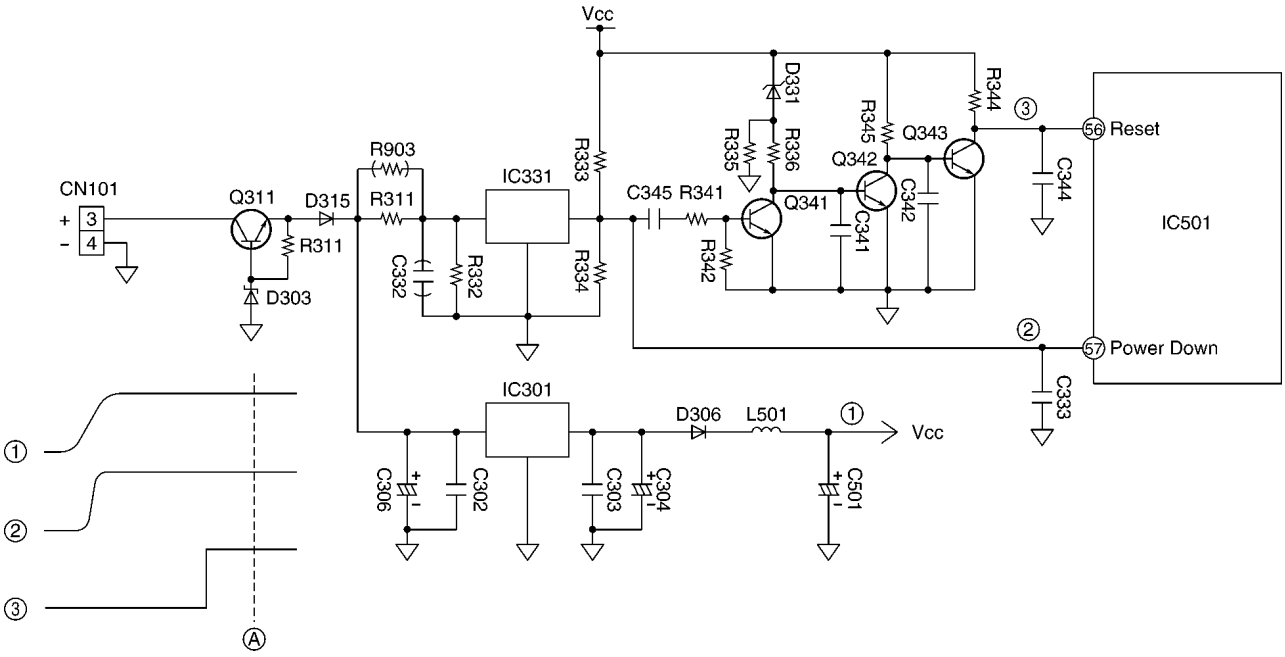
Function:

This circuit is used for to initialize the microcomputer when it incorporates an AC adaptor.

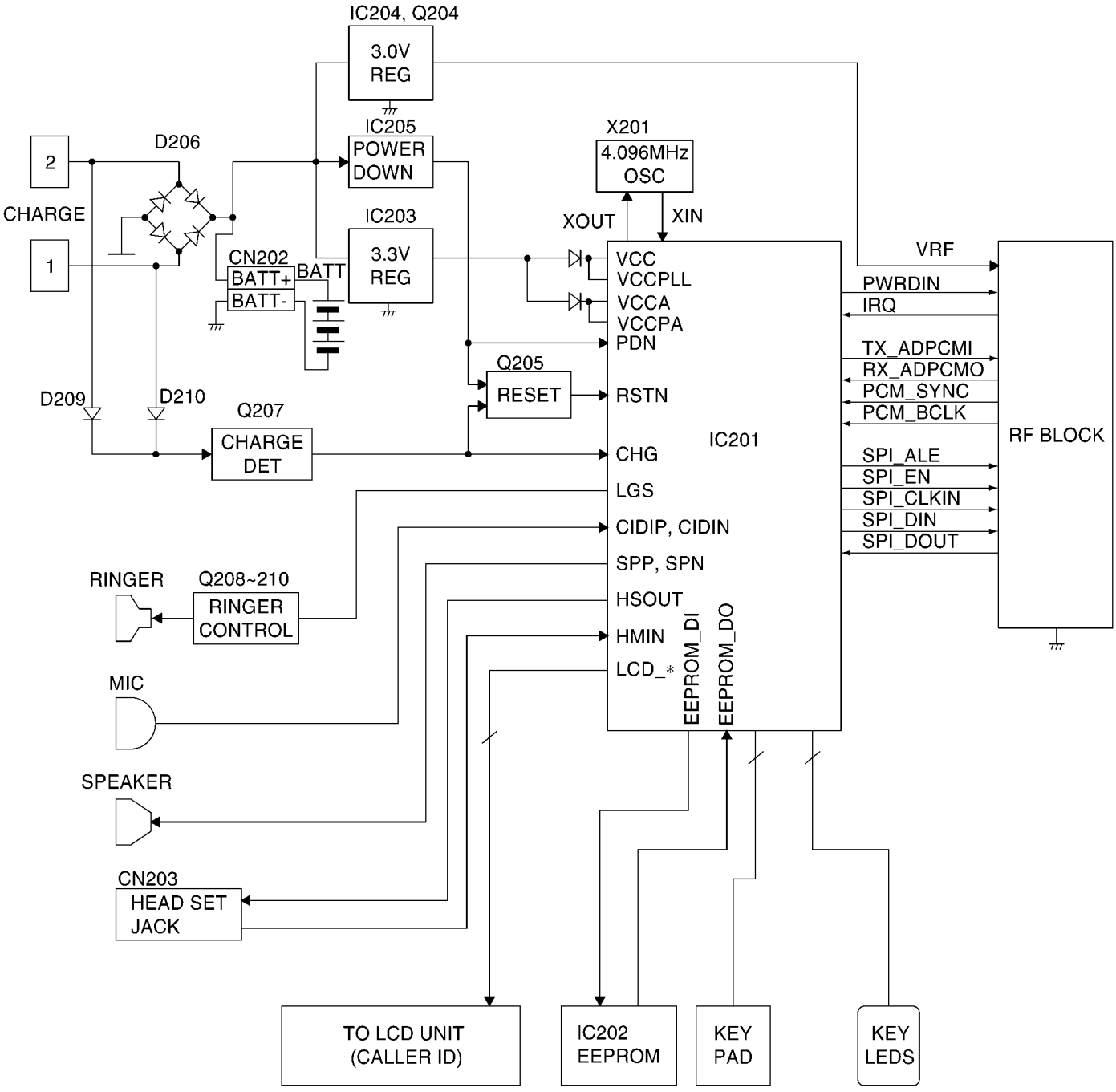
Circuit Operation:

When the AC Adaptor is inserted into the unit, then the voltage is shifted by IC301, D306 and power is supplied to the DSP. The set can operate beyond point A in the circuit voltage diagram.

Circuit Diagram



14 BLOCK DIAGRAM (Handset)

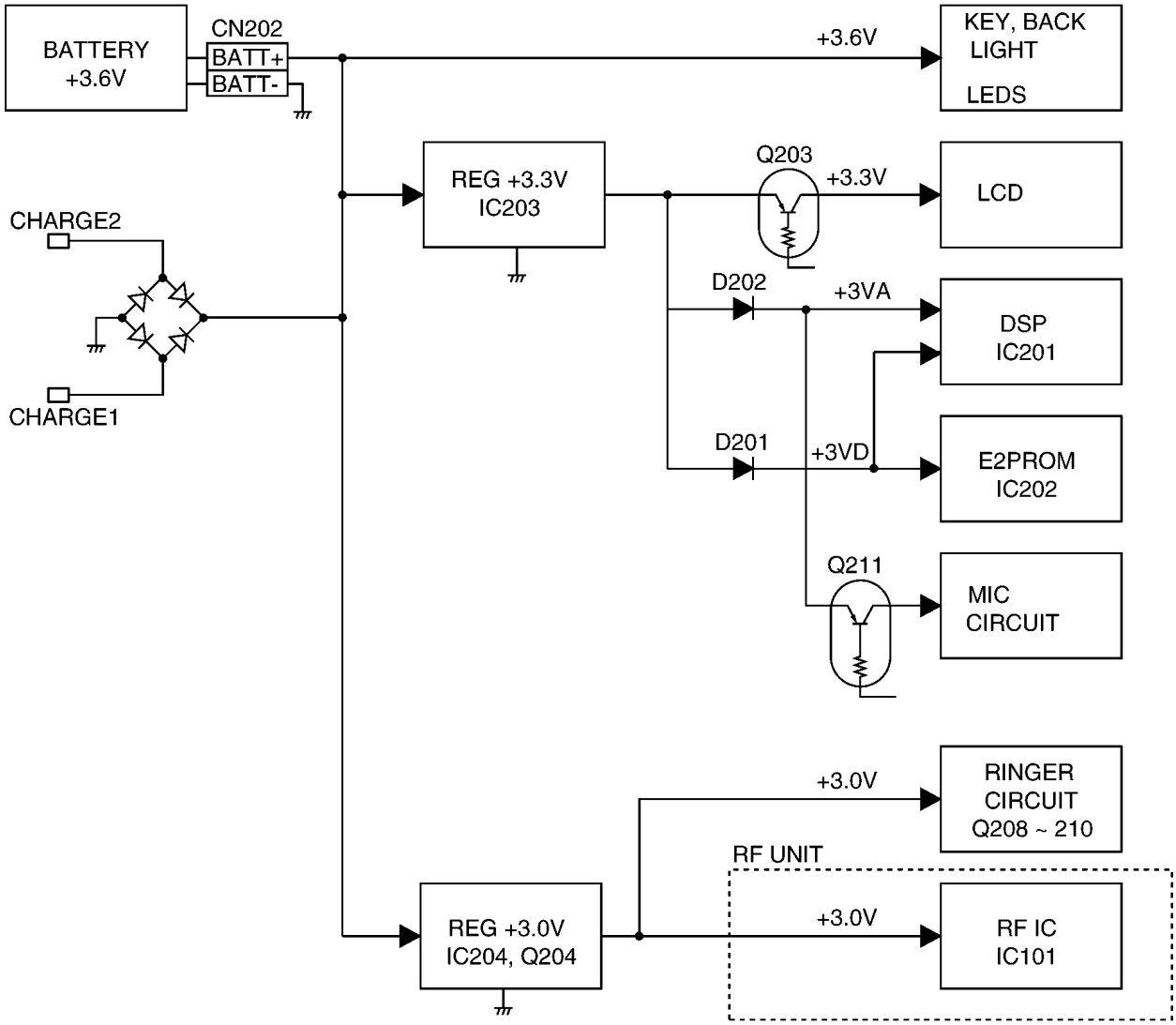


15 NEW CIRCUIT OPERATION (Handset)

15.1. Power Supply Circuit

Voltage is supplied separately to each block.

Block Diagram (Handset Power)



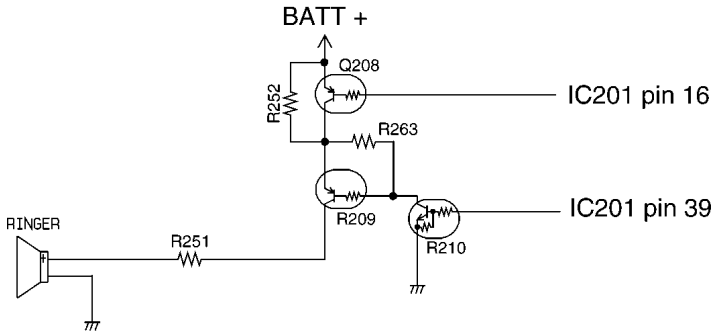
15.2. Charge Circuit

Ni-Cd battery is connected to CN202. When the handset is put on the cradle of the base unit, the power is supplied from CHARGE1 and CHARGE2 terminals to charge the battery. Q207 detects the voltage of CHARGE1 and CHARGE2 terminals, then the handset makes ID code setting (*) with the base unit.

15.3. Ringer Circuit

If the ringer volume is set to low and an alarm tone is output from 39 pin, IC201 DSP and input to Q209. Then Q208 is turned off. If the ringer volume is set to high, Q208 turns on and results in a louder beep tone.

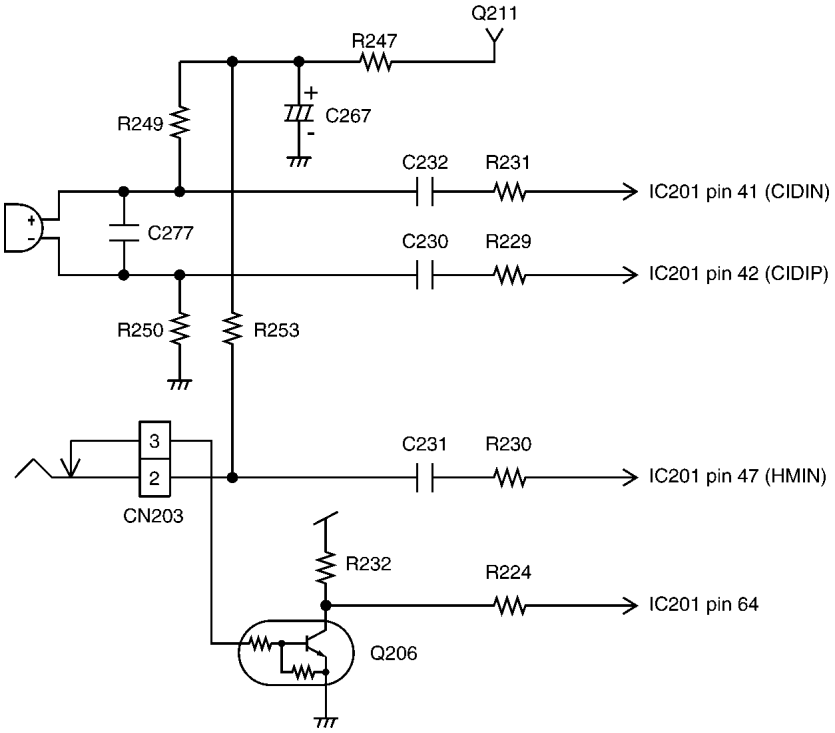
Circuit Diagram



15.4. Sending Signal

The voice signal from the microphone input to pin 42 (CIDIP) and pin 41(CIDIN) of IC201 (DSP). CN203 is the headphone jack. When the headphone is connected, the Q206 detect it. The input from the microphone of the handset (CIDIN, CIDIP) is cut and the microphone signal from the headphone is input to pin 47 of IC201 (HMIN). Also the power for the microphone is supplied from Q211, and the power is turned OFF on standby.

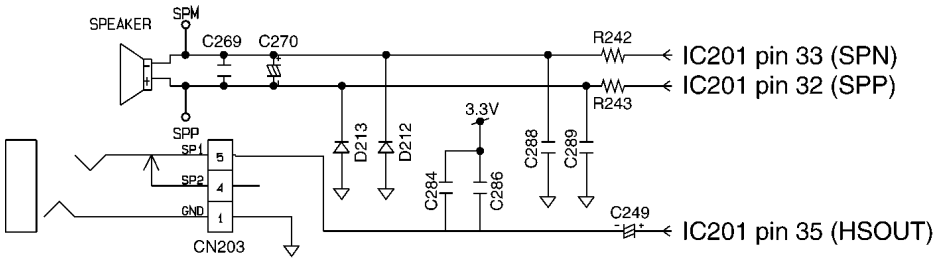
Circuit Diagram



15.5. Reception Signal Circuit

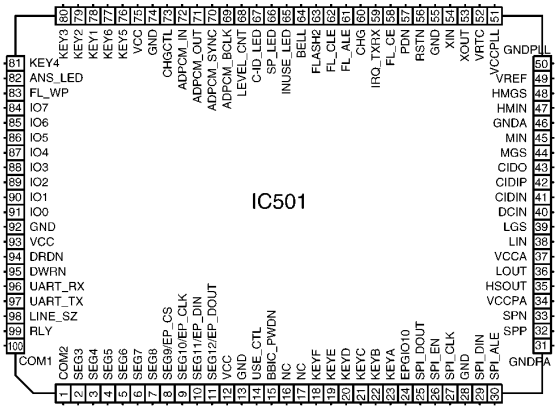
The received signal from the base unit is output from pins 33 (SPN) and 32 (SPP) of IC201 (DSP) as the voice signal. SPN is the inverse output of SPP, and the speaker is driven by SPN and SPP. CN203 is the headphone jack. When the headphone is connected to this jack, the output to the speaker of the handset (SPN,SPP) is cut and the voice signal is output to the headphone (HSOUT) only.

Circuit Diagram



16 CPU DATA (Base Unit)

16.1. IC501

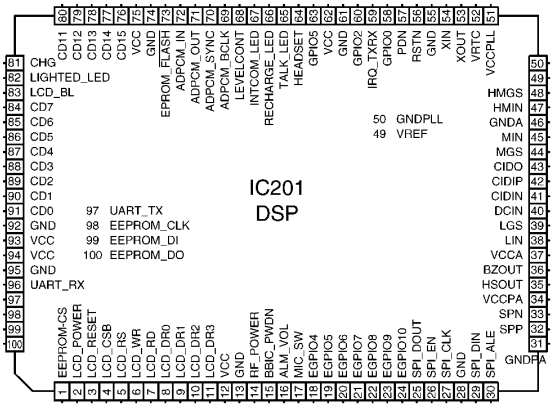


Pin	Description	I/O	High	High_Z	Low
1	COM2	D.O	-	-	-
2	SEG3	D.O	-	-	-
3	SEG4	D.O	Normal	-	Reset
4	SEG5	D.O	-	-	Active
5	SEG6	D.O	Data	-	Instruction
6	SEG7	D.O	Read	-	Write
7	SEG8	D.O	Active	-	Normal
8	SEG9/EP_CS	D.O	High	-	Low
9	SEG10/EP_CLK	D.O	High	-	Low
10	SEG11/EP_DIN	D.O	High	-	Low
11	SEG12/EP_DOUT	D.O	High	-	Low
12	VCC	VCC	Vcc	-	-
13	GND	GND	-	-	GND
14	USE_CTL	D.O	RLY Off	-	RLY On
15	BBIC_PWDN	D.O	-	-	Active
16	NC	D.O	-	-	-
17	NC	D.O	-	-	-
18	KEYF	D.O	Strobe On	Strobe Off	-
19	KEYE	D.O	Strobe On	Strobe Off	-
20	KEYD	D.O	Strobe On	Strobe Off	-
21	KEYC	D.O	Strobe On	Strobe Off	-
22	KEYB	D.O	Strobe On	Strobe Off	-
23	KEYA	D.O	Strobe On	Strobe Off	-
24	EPGIO10	D.O		-	Normal
25	SPI_DOUT	D.O	High	-	Low
26	SPI_EN	D.O	Normal	-	Active
27	SPI_CLK	D.O	High	-	Low
28	GND	GND	-	-	GND
29	SPI_DIN	D.I	High	-	Low
30	SPI_ALE	D.O	Address	-	Data
31	GNDPA	GND	-	-	GND
32	SPP	A.O	-	-	-
33	SPN	A.O	-	-	-
34	VCCPA	VCC	VCC	-	-
35	HSOUT	A.O	-	-	-
36	LOUT	A.O	-	-	-
37	VCCA	VCC	VCC	-	-
38	LIN	A.I	-	-	-
39	LGS	A.O	-	-	-
40	DCIN	A.I	-	-	-
41	CIDIN	A.I	-	-	-
42	CIDIP	A.I	-	-	-
43	CIDO	A.O	-	-	-
44	MGS	A.O	-	-	-
45	MIN	A.I	-	-	-
46	GNDA	GND	-	-	GND
47	HMIN	A.I	-	-	-
48	HMGS	A.O	-	-	-
49	VREF	A.O	-	-	-
50	GNDPLL	GND	-	-	GND

Pin	Description	I/O	High	High_Z	Low
51	VCCPLL	VCC	VCC	-	-
52	VRTC	VCC	VCC	-	-
53	XOUT	A.O	-	-	-
54	XIN	A.I	-	-	-
55	GND	GND	-	-	GND
56	RSTN	D.I	Normal	-	Reset
57	PDN	D.I	Power On	-	Power Down
58	FL_CE	D.O	-	-	Select
59	IRQ_TXRX	D.I	Normal	-	Interrupt
60	CHG	D.O	Charge Off	-	Charge On
61	FL_ALE	D.O	-	-	Normal
62	FL_CLE	D.O	-	-	Normal
63	FLASH2	D.O	-	-	Normal
64	BELL	D.I	-	-	-
65	INUSE_LED	D.O	Off	-	On
66	SP_LED	D.O	Off	-	On
67	C-ID_LED	D.O	Off	-	On
68	LEVEL_CNT	D.O	Normal	-	MicRec
69	ADPCM_BCLK	D.I	High	-	Low
70	ADPCM_SYNC	D.I	High	-	Low
71	ADPCM_OUT	D.I	High	-	Low
72	ADPCM _IN	D.O	High	-	Low
73	CHGCTL	D.O	-	On	Off
74	GND	GND	-	-	GND
75	VCC	VCC	VCC	-	-
76	KEY5	D.I	On	-	Off
77	KEY6	D.I	On	-	Off
78	KEY1	D.I	On	-	Off
79	KEY2	D.I	On	-	Off
80	KEY3	D.I	On	-	Off
81	KEY4	D.I	On	-	Off
82	ANS_LED	D.O	On	-	Off
83	FL_WP	D.O	On	-	Off
84	IO7	D.O	-	-	Normal
85	IO6	D.O	-	-	Normal
86	IO5	D.O	-	-	Normal
87	IO4	D.O	-	-	Normal
88	IO3	D.O	-	-	Normal
89	IO2	D.O	-	-	Normal
90	IO1	D.O	-	-	Normal
91	IO0	D.O	-	-	Normal
92	GND	GND	-	-	GND
93	VCC	VCC	VCC	-	-
94	DRDN	DRDN	-	-	-
95	DWRN	DWRN	-	-	-
96	UART_RX	D.O	High	-	Low
97	UART_TX	D.I	High	-	Low
98	LINE_SZ	D.O	On	-	Off
99	RLY	D.I	On	-	Off
100	COM1	D.O	High	-	Low

17 CPU DATA (Handset)

17.1. IC201

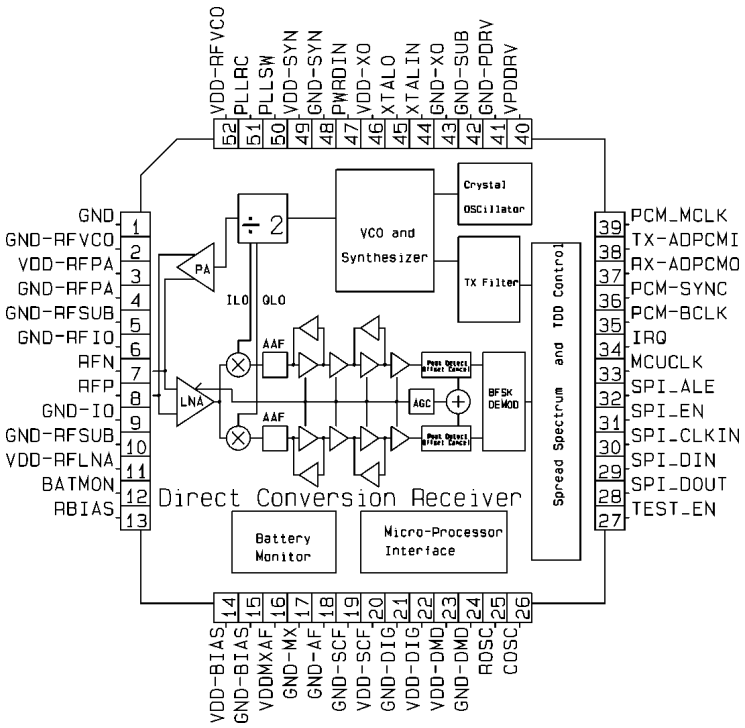


Pin	Description	I/O	High	High_Z	Low
1	EEPROM-CS	D.O	Active	-	Normal
2	LCD_PW_CTL	D.O	Off	-	On
3	LCD_RESET	D.O	Normal	-	Reset
4	LCD_CSB	D.O	-	-	Active
5	LCD_RS	D.O	Data	-	Instruction
6	LCD_WR	D.O	Read	-	Write
7	LCD_RD	D.O	Active	-	Normal
8	LCD_DA0	D.O	High	-	Low
9	LCD_DA1	D.O	High	-	Low
10	LCD_DA2	D.O	High	-	Low
11	LCD_DA3	D.O	High	-	Low
12	VCC	VCC	Vcc	-	-
13	GND	GND	-	-	GND
14	RF_PW_CTL	D.O	Off	-	On
15	BBIC_PDN	D.O	-	-	Active
16	ALM_VOL	D.O	Low	-	High
17	MIC_BIAS	D.O	Off	-	On
18	KEY_STB0	D.O	Strobe On	Strobe Off	-
19	KEY_STB1	D.O	Strobe On	Strobe Off	-
20	KEY_STB2	D.O	Strobe On	Strobe Off	-
21	KEY_STB3	D.O	Strobe On	Strobe Off	-
22	KEY_STB4	D.O	Strobe On	Strobe Off	-
23	KEY_STB5	D.O	Strobe On	Strobe Off	-
24	NC	D.O	-	-	Normal
25	SPI_OUT	D.O	High	-	Low
26	SPI_EN	D.O	Normal	-	Active
27	SPI_CLK	D.O	High	-	Low
28	GND	-	-	-	GND
29	SPI_DIN	D.I	High	-	Low
30	SPI_ALE	D.O	Address	-	Data
31	GNDPA	GND	-	-	GND
32	SPOUTP	A.O	-	-	-
33	SPOUTN	A.O	-	-	-
34	VCCPA	VCC	VCC	-	-
35	HSOUT	A.O	-	-	-
36	LOUT	A.O	-	-	-
37	VCCA	VCC	VCC	-	-
38	LIN	A.I	-	-	-
39	LGS	A.O	-	-	-
40	DCIN	A.I	-	-	-
41	CIDIN	A.I	-	-	-
42	CIDIP	A.I	-	-	-
43	CIDO	A.O	-	-	-
44	HMGS	A.O	-	-	-
45	HMIN	A.I	-	-	-
46	GNDA	GND	-	-	GND
47	MIN	A.I	-	-	-
48	MGS	A.O	-	-	-
49	VREF	A.O	-	-	-
50	GNDPLL	GND	-	-	GND

Pin	Description	I/O	High	High_Z	Low
51	VCCPLL	VCC	VCC	-	-
52	VRTC	VCC	VCC	-	-
53	XOUT	A.O	-	-	-
54	XIN	A.I	-	-	-
55	GND	GND	-	-	GND
56	RESET	D.I	Normal	-	Reset
57	PDN	D.I	Power On	-	Power Down
58	NC	D.O	-	-	Normal
59	IRQ_INT	D.I	Normal	-	Interrupt
60	NC	D.O	-	-	Normal
61	NC	D.O	-	-	Normal
62	NC	D.O	-	-	Normal
63	NC	D.O	-	-	Normal
64	HEAD_DET	D.I	Off	-	Headset
65	NC	D.O	Normal	-	-
66	NC	D.O	Normal	-	-
67	NC	D.O	Normal	-	-
68	NC	D.O	Normal	-	-
69	BCLK	D.I	High	-	Low
70	FSYNC	D.I	High	-	Low
71	ADPCM OUT	D.I	High	-	Low
72	ADPCM IN	D.O	High	-	Low
73	NC	D.O	-	-	Low
74	GND	GND	-	-	GND
75	VCC	VCC	VCC	-	-
76	KEY_SCAN0	D.I	On	-	Off
77	KEY_SCAN1	D.I	On	-	Off
78	KEY_SCAN2	D.I	On	-	Off
79	KEY_SCAN3	D.I	On	-	Off
80	KEY_SCAN4	D.I	On	-	Off
81	CHG_DET	D.I	Off Chrg	-	On Chrg
82	LIGH_LED	D.O	On	-	Off
83	LCD_BL	D.O	On	-	Off
84	NC	D.O	-	-	Normal
85	NC	D.O	-	-	Normal
86	NC	D.O	-	-	Normal
87	NC	D.O	-	-	Normal
88	NC	D.O	-	-	Normal
89	NC	D.O	-	-	Normal
90	NC	D.O	-	-	Normal
91	NC	D.O	-	-	Normal
92	GND	GND	-	-	GND
93	VCC	VCC	VCC	-	-
94	DRDN	VCC	VCC	-	-
95	DWRN	GND	-	-	GND
96	UART_TX	D.O	High	-	Low
97	UART_RX	D.I	High	-	Low
98	EEP_CLK	D.O	High	-	Low
99	EEP_DI	D.I	High	-	Low
100	EEP_DOUT	D.O	High	-	Low

18 EXPLANATION OF IC TERMINALS (RF Unit)

18.1. IC101



Pin	Description	I/O
1	GND	NA
2	GND-RFVCO	NA
3	VDD-RFPA	NA
4	GND-RFPA	NA
5	GND-RFSUB	NA
6	GND-RFIO	NA
7	RFN	I/O
8	RFP	I/O
9	GND-RFIO	NA
10	GND-RFSUB	NA
11	VDD-RFLNA	NA
12	BATMON	I
13	RBIAS	NA
14	VDD-BIAS	NA
15	GND-BIAS	NA
16	VDD-MXAF	NA
17	GND-MX	NA
18	GND-AF	NA
19	GND-SCF	NA
20	VDD-SCF	NA
21	GND-DIG	NA
22	VDD-DIG	NA
23	VDD-DMD	NA
24	GND-DMD	NA
25	ROSC	NA
26	COSC	NA

Pin	Description	I/O
27	TEST_EN	I
28	SPI_DOUT	O
29	SPI_DIN	I
30	SPI_CLKIN	I
31	SPI_EN	I
32	SPI_ALE	I
33	MCUCLK	O
34	IRQ	O
35	PCM_BCLK	O
36	PCM_SYNC	O
37	RX_ADPCMO	O
38	TX_ADPCMI	I
39	PCM_MCLK	O
40	VPDDRV	NA
41	GND-PDRV	NA
42	GND-SUB	NA
43	GND-XO	NA
44	XTALIN	I
45	XTALO	O
46	VDD-XO	NA
47	PWRDIN	I
48	GND-SYN	NA
49	VDD-SYN	NA
50	PLLSW	NA
51	PLLRC	NA
52	VDD-RFVCO	NA

19 HOW TO REPLACE FLAT PACKAGE IC

19.1. Preparation

- SOLDER

  Sparkle Solder 115A-1, 115B-1 or Almit Solder KR-19, KR-19RMA

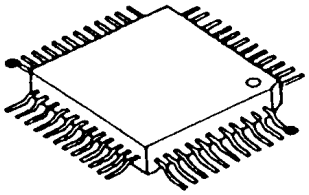
- Soldering iron

  Recommended power consumption will be between 30 W to 40 W.
  Temperature of Copper Rod 662 ± 50°F (350 ± 10°C)
  (An expert may handle between 60 W to 80 W iron, but beginner might damage foil by overheating.)

- Flux
  HI115 Specific gravity 0.863
  (Original flux will be replaced daily.)

19.2. Procedure

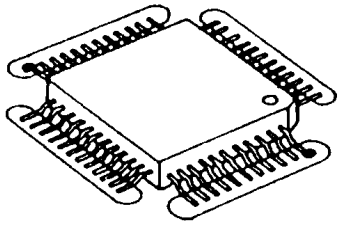
1. Temporary fix FLAT PACKAGE IC by soldering on two marked 2 pins.



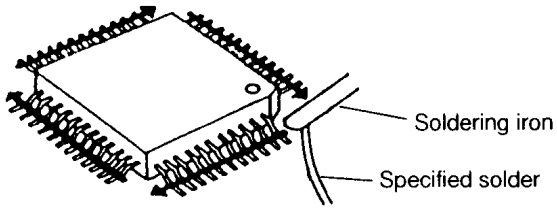
● - - - - - - Temporary soldering point.

*Most important matter is accurate setting of IC to the corresponding soldering foil.

2. Apply flux for all pins of FLAT PACKAGE IC.

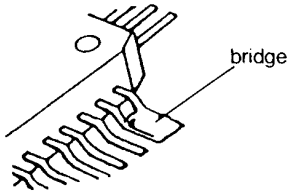


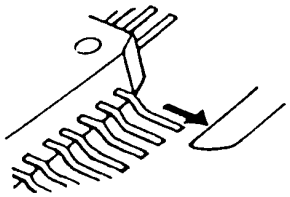
3. Solder employing specified solder to direction of arrow, as sliding the soldering iron.



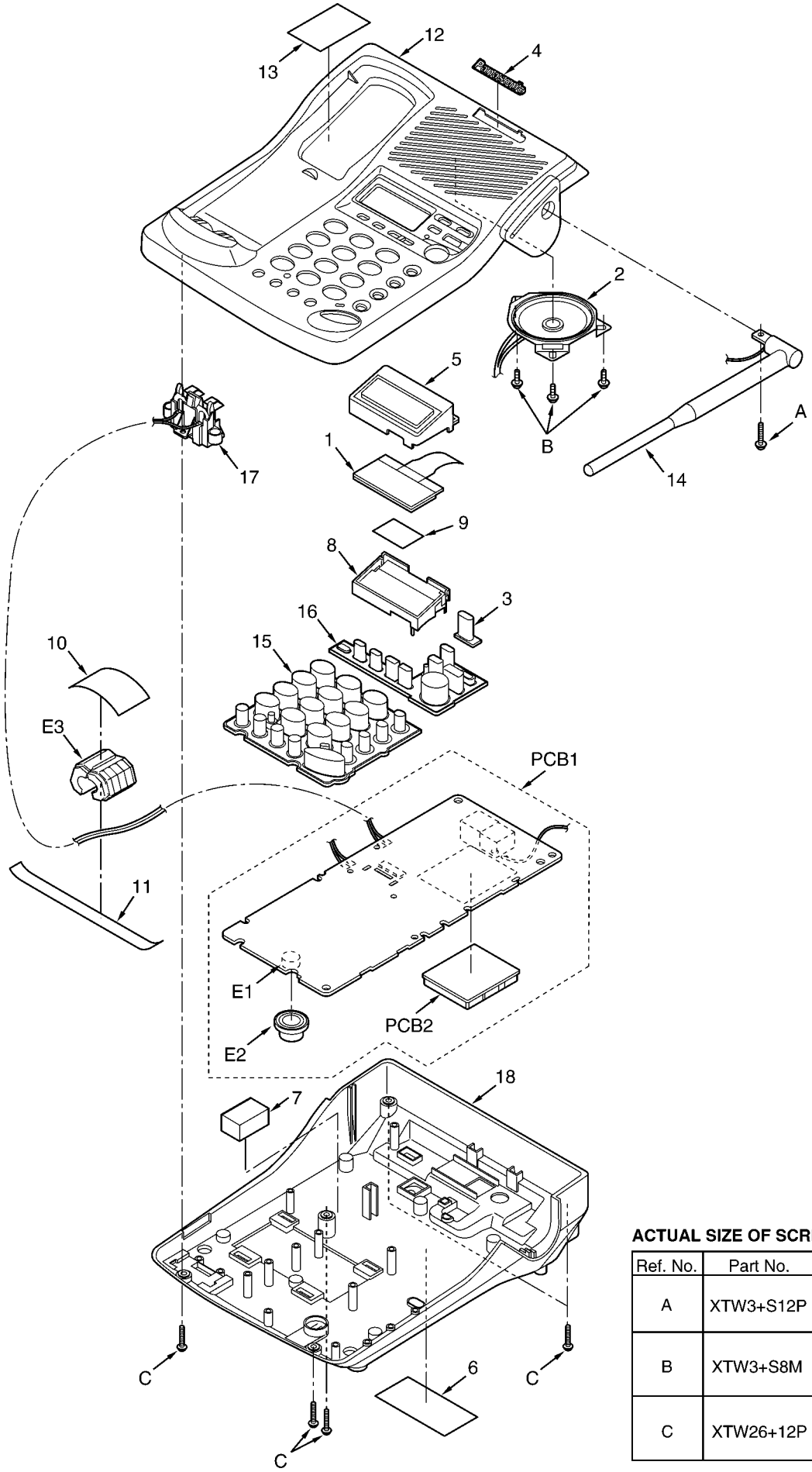
19.3. Modification Procedure of Bridge

1. Re-solder slightly on bridged portion.
2. Remove remained solder along pins employing soldering iron as shown in below figure.





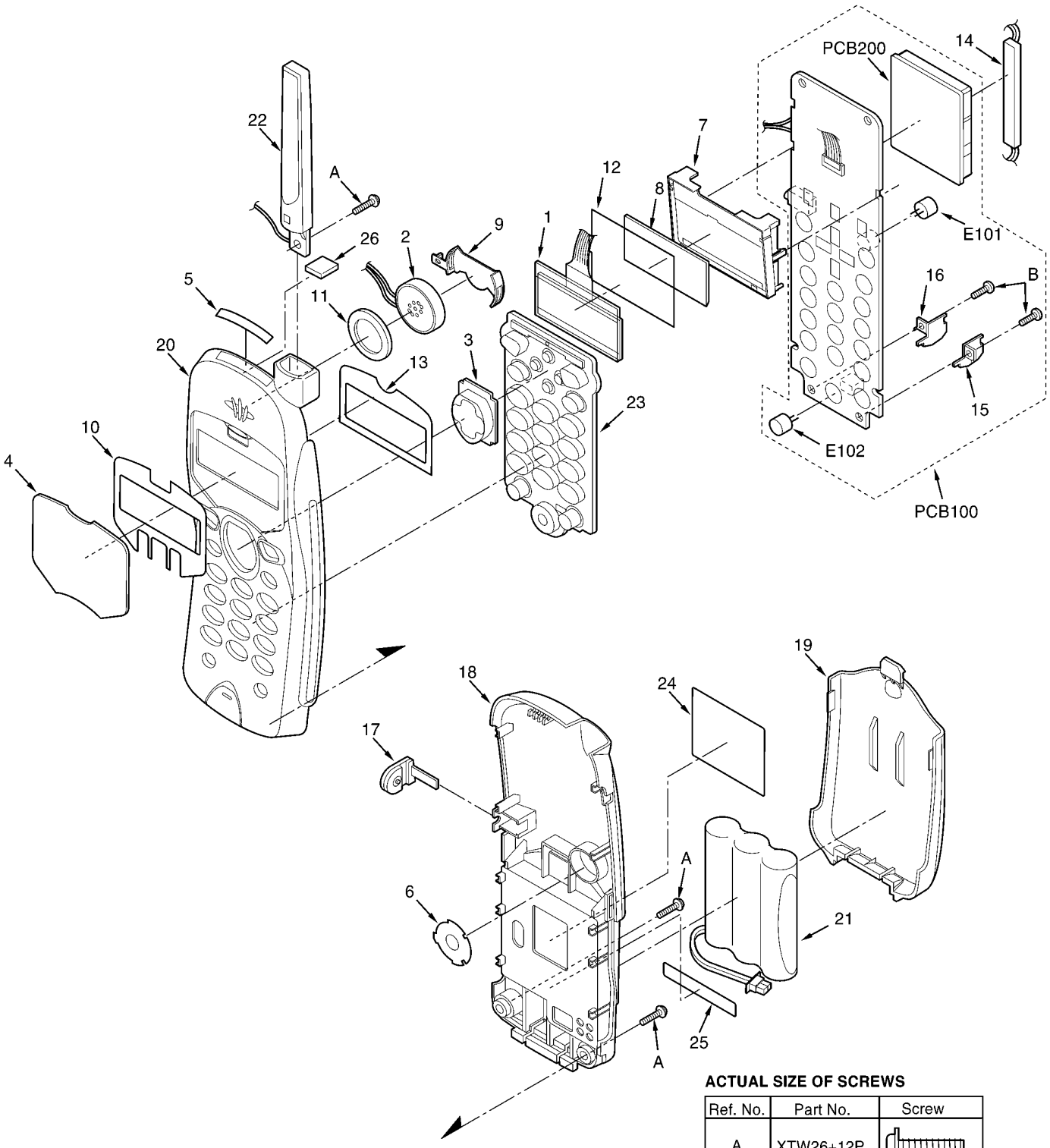
20 CABINET AND ELECTRICAL PARTS (Base Unit)



ACTUAL SIZE OF SCREWS

Ref. No.	Part No.	Screw
A	XTW3+S12P	
B	XTW3+S8M	
C	XTW26+12P	

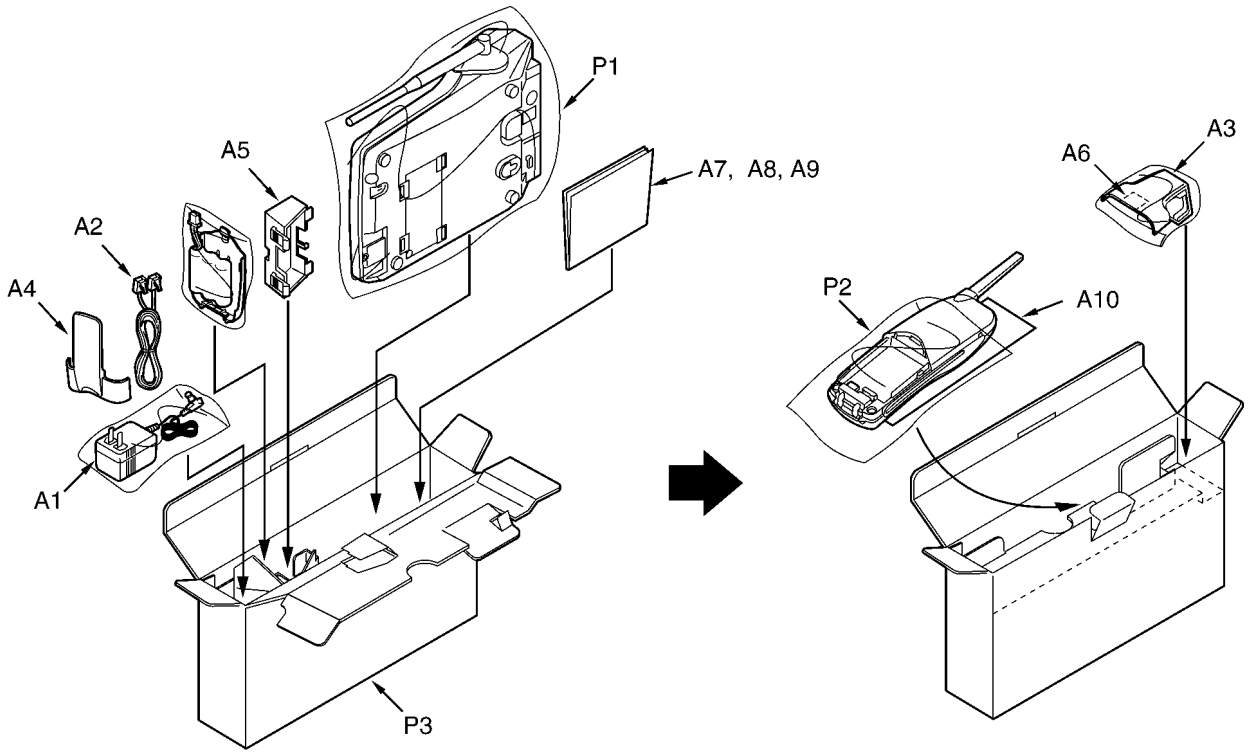
21 CABINET AND ELECTRICAL PARTS (Handset)



ACTUAL SIZE OF SCREWS

Ref. No.	Part No.	Screw
A	XTW26+12P	
B	XTB26+8J	

22 ACCESSORIES AND PACKING MATERIALS



23 REPLACEMENT PARTS LIST

This replacement parts list are U.S.A. version only.

Note:

1. RTL (Retention Time Limited)

   The marking (RTL) indicates that the Retention Time is limited for this item.

   After the discontinuation of this assembly in production, the item will continue to be available for a specific period of time. The retention period of availability is dependent on the type of assembly, and in accordance with the laws governing part and product retention.

   After the end of this period, the assembly will no longer be available.

2. Important safety notice

   Components identified by a ⚠ mark special characteristics important for safety. When replacing any of these components, use only manufacture´s specified parts.

3. The S mark indicates service standard parts and may differ from production parts.

4. RESISTORS & CAPACITORS

   Unless otherwise specified;

   All resistors are in ohms (Ω) K=1000Ω, M=1000kΩ

   All capacitors are in MICRO FARADS (µF) P=µµF

   *Type & Wattage of Resistor

Type

ERC:Solid ERD:Carbon PQRD:Carbon	ERX:Metal Film ERG:Metal Oxide ER0:Metal Film	PQ4R:Carbon ERS:Fusible Resistor ERF:Cement Resistor

Wattege

10,16:1/8W	14,25:1/4W	12:1/2W	1:1W	2:2W	3:3W

*Type & Voltage of Capacitor

Type

ECFD:Semi-Conductor ECQS:Styrol PQCUV:Chip ECQMS:Mica	ECCD,ECKD,ECBT,PQCBC:Ceramic ECQE,ECQV,ECQG:Polyester ECEA,ECSZ:Electlytic ECQP:Polypropylene

Voltage

ECQ Type	ECQG ECQV Type	ECSZ Type	Others	
1H:50V 2A:100V 2E:250V 2H:500V	05:50V 1:100V 2:200V	0F:3.15V 1A:10V 1V:35V 0J:6.3V	0J :6.3V 1A :10V 1C :16V 1E,25:25V	1V :35V 50,1H:50V 1J :63V 2A :100V

23.1. Base Unit

23.1.1. CABINET AND ELECTRICAL PARTS

Ref. No.	Part No.	Part Name & Description	Remarks
1	PQADGP0821GN	LIQUID CRYSTAL DISPLAY	
2	PQAS57P03Y	SPEAKER	
3	PQBC10305Z1	CALL ID BUTTON	S
4	PQGB7Y	BADGE	
5	PQGP10166Z1	LCD PANEL	S
6	PQGT14422Z	NAME PLATE (for KX-TC1868B)	
6	PQGT14423Z	NAME PLATE (for KX-TC1871B)	
6	PQGT14406Z	NAME PLATE (for KX-TC1872B)	
7	PQHG10606Z	CUSHION SPONGE	
8	PQHR10755Z	LCD HOLDER	
9	PQHS10446Z	DOUBLE SIDE TAPE	
10	PQHS10452Z	DOUBLE SIDE TAPE	
11	PQHS10453Z	TAPE	
12	PQKM10439X1	UPPER CABINET	S
13	PQQT22085Z	TAM LABEL	
14	PQSA10095Z	ANTENNA	
15	PQSX10136Z	RUBBER SWITCH, 21KEY	
16	PQSX10138Z	RUBBER SWITCH, TAM	
17	PQWE10022Z	CHARGE TERMINAL	
18	PQYF10171Z1	LOWER CABINET	S

23.1.2. MAIN P.C. BOARD PARTS

Ref. No.	Part No.	Part Name & Description	Remarks
PCB1	PQWPTC1871BH	MAIN P.C.BOARD ASS´Y (RTL)	
		(ICS)	
IC301	PQVIXCF4502P	IC	
IC331	PQVIPS3432UT	IC	
IC501	PQVI16569ABA	IC	
IC751	PQWITC1871BH	IC	
		(TRANSISTORS)	
Q101	2SD1819A	TRANSISTOR(SI)	
Q115	2SD1819A	TRANSISTOR(SI)	
Q121	2SA1625	TRANSISTOR(SI)	
Q122	PQVT2N6517CA	TRANSISTOR(SI)	
Q131	2SC2120	TRANSISTOR(SI)	
Q304	2SD1758Q	TRANSISTOR(SI)	
Q311	2SD2136	TRANSISTOR(SI)	
Q312	2SD2136	TRANSISTOR(SI)	
Q321	2SD1819A	TRANSISTOR(SI)	
Q341	2SD1819A	TRANSISTOR(SI)	
Q342	2SD1819A	TRANSISTOR(SI)	
Q343	2SD1819A	TRANSISTOR(SI)	
Q371	2SD2136	TRANSISTOR(SI)	
Q381	2SD1819A	TRANSISTOR(SI)	
Q445	2SD1819A	TRANSISTOR(SI)	
Q461	2SD1819A	TRANSISTOR(SI)	
Q601	2SD1758Q	TRANSISTOR(SI)	
Q725	2SD601A	TRANSISTOR(SI)	
Q751	UN5213	TRANSISTOR(SI)	S
Q752	PQVTDTC123JU	TRANSISTOR(SI)	
		(DIODES)	
D101	PQVDS1ZB60F1	DIODE(SI)	
D103	MA111	DIODE(SI)	

Ref. No.	Part No.	Part Name & Description	Remarks
D121	PQVDRLZ20A	DIODE(SI)	
D122	PQVDRLZ2R0	DIODE(SI)	
D302	PQVDRLZ8R2	DIODE(SI)	
D303	PQVDRLZ8R2	DIODE(SI)	
D306	PQVDHRU0302A	DIODE(SI)	
D313	MA8047	DIODE(SI)	
D315	PQVDHRU0302A	DIODE(SI)	
D321	MA8051	DIODE(SI)	
D331	MA8036H	DIODE(SI)	
D371	MA111	DIODE(SI)	
D376	PQVDRLZ20A	DIODE(SI)	
D377	PQVDRLZ20A	DIODE(SI)	
D445	MA153	DIODE(SI)	
D500	MA111	DIODE(SI)	
D501	MA111	DIODE(SI)	
D511	PQVDHRU0203A	DIODE(SI)	
D515	MA111	DIODE(SI)	
D600	MA111	DIODE(SI)	
D715	MA111	DIODE(SI)	
D716	MA111	DIODE(SI)	
D717	MA111	DIODE(SI)	
D718	MA111	DIODE(SI)	
D721	MA8051	DIODE(SI)	
D722	MA8051	DIODE(SI)	
D723	MA8033	DIODE(SI)	
		(LEDS)	
LED541	PQVDSML310MT	LED	
LED542	PQVDBR1111C	LED	
LED703	PQVDBR1111C	LED	
LED704	PQVDBR1111C	LED	
		(COILS)	
L101	PQLQXF330K	COIL	
L102	PQLQXF330K	COIL	
L376	PQLQZK3R3K	COIL	
L377	PQLQXF330K	COIL	
L501	PQLQR2KA213	COIL	
L515	PQLQR2K1A102	COIL	
L715	PQLQR2KA213	COIL	
L901	PQLQR2K1A102	COIL	
L902	PQLQR2K1A102	COIL	
L904	PQLQR2KA213	COIL	
L905	PQLQR2K1A102	COIL	
L906	PQLQR2K1A102	COIL	
C682	MQLRE33NJF2	COIL	
		(CONNECTORS)	
CN101	PQJJ2H003Z	JACK	
CN771	PQJS22B11Z	CONNECTOR	

Ref. No.	Part No.	Part Name & Description	Remarks
		(VARISTORS)	
SA101	PQVDDSS301L	VARISTOR	
SA102	PQVDDSS301L	VARISTOR	
		(RESISTOR ARRAYS)	
RA702	EXRV8V221JV	RESISTOR ARRAY	
RA761	EXRV8V221JV	RESISTOR ARRAY	
RA901	EXRV8V000	RESISTOR ARRAY	
RA902	EXRV8V000	RESISTOR ARRAY	
RA903	EXRV8V000	RESISTOR ARRAY	
		(OTHERS)	
E1	PQJM147Z	MICROPHONE	
E2	PQMG10023Z	CUSHION RUBBER, MIC	
E3	KRCBG130714	FELIGHT CORE	
G601	PQJT10152Z	CHARGE TERMINAL	
G602	PQJT10152Z	CHARGE TERMINAL	
G603	PQJT10152Z	CHARGE TERMINAL	
G604	PQJT10152Z	CHARGE TERMINAL	
G605	PQJT10152Z	CHARGE TERMINAL	
G606	PQJT10152Z	CHARGE TERMINAL	
P101	PQRPAR390N	THERMISTOR	S
X501	PQVCK4096N9Z	CRYSTAL OSCILLATOR	
		(RESISTORS)	
R103	ERJ3GEYJ104	100k	
R104	ERJ3GEYJ104	100k	
R106	ERJ3GEYJ472	4.7k	
R107	ERJ3GEYJ473	47k	
R108	ERJ3GEYJ102	1k	
R111	ERJ3GEYJ394	390k	
R112	ERJ3GEYJ394	390k	
R113	ERJ3GEYJ472	4.7k	
R115	ERJ3GEYJ125	1.2M	
R116	ERDS1VJ106	10M	
R117	ERJ3GEYJ335	3.3M	
R118	ERJ3GEYJ102	1k	
R121	ERD25TJ104	100k	
R122	ERJ3GEYJ103	10k	
R123	ERJ3GEYJ153	15k	
R124	ERJ3GEYJ473	47k	
R128	ERJ3GEYJ103	10k	
R131	ERJ3GEYJ393	39k	
R132	ERJ3GEYJ222	2.2k	
R136	ERDS1TJ330	33	S
R138	ERJ3GEYJ470	47	
R139	ERJ3GEYJ122	1.2k	
R140	ERJ3GEYJ152	1.5k	
R311	ERD25TJ221	220	S
R312	ERJ3GEYJ471	470	
R313	ERJ3GEYJ221	220	
R321	ERJ3GEYJ152	1.5k	
R331	ERJ3GEYJ273	27k	
R332	ERJ3GEYJ683	68k	
R333	ERJ3GEYJ103	10k	
R335	ERJ3GEYJ561	560	
R336	ERJ3GEYJ563	56k	
R341	ERJ3GEYJ473	47k	
R342	ERJ3GEYJ224	220k	

Ref. No.	Part No.	Part Name & Description	Remarks
R344	ERJ3GEYJ104	100k	
R345	ERJ3GEYJ224	220k	
R371	ERJ3GEYJ121	120	
R372	ERJ3GEYJ561	560	
R373	ERJ3GEYJ220	22	
R374	ERJ3GEYJ220	22	
R375	ERJ3GEYJ220	22	
R376	ERJ3GEYJ220	22	
R377	ERDS1TJ221	220	S
R378	ERDS1TJ221	220	S
R381	ERJ3GEYJ563	56k	
R382	ERJ3GEYJ563	56k	
R383	ERJ3GEYJ103	10k	
R384	ERJ3GEYJ104	100k	
R385	ERJ3GEYJ102	1k	
R411	ERJ3GEYJ394	390k	
R412	ERJ3GEYJ394	390k	
R413	ERJ3GEYJ103	10k	
R414	ERJ3GEYJ103	10k	
R415	ERJ3GEYJ473	47k	
R431	ERJ3GEYJ222	2.2k	
R442	ERJ3GEYJ682	6.8k	
R443	ERJ3GEYJ103	10k	
R444	ERJ3GEYJ332	3.3k	
R445	ERJ3GEYJ564	560k	
R446	ERJ3GEYJ105	1M	
R447	ERJ3GEYJ151	150	
R448	ERJ3GEYJ222	2.2k	
R461	ERJ3GEYJ150	15	
R462	ERJ3GEYJ392	3.9k	
R464	ERJ3GEYJ474	470k	
R465	ERJ3GEYJ390	39	
R541	ERJ3GEYJ391	390	
R542	ERJ3GEYJ391	390	
R703	ERJ3GEYJ391	390	
R704	ERJ3GEYJ391	390	
R705	ERJ3GEYJ101	100	
R706	ERJ3GEYJ101	100	
R707	ERJ3GEYJ472	4.7k	
R722	ERJ3GEYJ392	3.9k	
R723	ERJ3GEYJ102	1k	
R724	ERJ3GEYJ562	5.6k	
R725	ERJ3GEYJ152	1.5k	
R726	ERJ3GEYJ392	3.9k	
R727	ERJ3GEYJ274	270k	
R728	ERJ3GEYJ102	1k	
R751	ERJ3GEYJ104	100k	
R752	ERJ3GEYJ104	100k	
R753	ERJ3GEYJ821	820	
R754	ERJ3GEYJ821	820	
R755	ERJ3GEYJ821	820	
R757	ERJ3GEYJ221	220	
R761	ERJ3GEYJ221	220	
R762	ERJ3GEYJ821	820	
R763	ERJ3GEYJ221	220	
R764	ERJ3GEYJ821	820	
R765	ERJ3GEYJ221	220	
R766	ERJ3GEYJ821	820	
R771	ERJ3GEYF824	820k	
R772	ERJ3GEYF474	470k	
R777	ERJ3GEYJ104	100k	

Ref. No.	Part No.	Part Name & Description	Remarks
R779	ERJ3GEYJ103	10k	
R782	ERJ3GEYJ102	1k	
C433	ERJ3GEYJ822	8.2k	
J1	PQ4R18XJ000	0	S
J2	ERJ3GEY0R00	0	
J6	PQ4R18XJ000	0	S
J900	ERJ3GEY0R00	0	
J901	PQ4R18XJ000	0	S
J902	PQ4R10XJ000	0	S
J903	PQ4R10XJ000	0	S
J904	PQ4R18XJ000	0	S
J905	ERJ3GEY0R00	0	
J906	PQ4R18XJ000	0	S
J910	PQ4R10XJ000	0	S
J911	ERJ3GEY0R00	0	
JGND1	PQ4R18XJ000	0	S
L903	PQ4R10XJ000	0	S
		(CAPACITORS)	
C101	ECKD2H681KB	680P	S
C102	ECKD2H681KB	680P	S
C103	PQCUV1H154KR	0.15	
C104	PQCUV1H154KR	0.15	
C106	PQCUV1A684KB	0.68	
C111	ECUV1H681JCV	680P	S
C112	ECUV1H681JCV	680P	S
C115	ECUV1H103KBV	0.01	
C121	ECUV1H103KBV	0.01	S
C122	ECUV1H470JCV	47P	
C131	ECUV1H101JCV	100P	
C132	ECUV1H103KBV	0.01	
C134	ECEA1HKA010	1	
C135	ECUV1H470JCV	47P	
C139	ECEA1CKA100	10	
C140	ECUV1C473KBV	0.047	
C302	ECUV1C104ZFV	0.1	
C303	ECUV1C104ZFV	0.1	
C304	ECEV0JA220	22	
C306	ECA1AM102	0.001	
C314	ECEA1AU101	100	S
C333	ECUV1H103KBV	0.01	S
C341	ECUV1H102KBV	0.001	
C342	ECUV1H102KBV	0.001	
C344	ECUV1C104ZFV	0.1	
C345	ECUV1C104KBV	0.1	
C371	ECUV1C104ZFV	0.1	
C411	ECUV1H121JCV	120P	
C412	ECUV1A105ZFV	1	
C413	ECUV1H121JCV	120P	
C415	ECUV1A105ZFV	1	
C431	ECUV1H272KBV	0.0027	
C432	ECUV1C104KBV	0.1	
C441	ECUV1C473KBV	0.047	

Ref. No.	Part No.	Part Name & Description	Remarks
C442	ECUV1C104KBV	0.1	
C443	ECUV1H101JCV	100P	
C444	ECUV1C104KBV	0.1	
C445	ECST0JZ106R	10	
C461	ECUV1C104ZFV	0.1	
C463	ECUV1C104KBV	0.1	
C464	ECUV1H470JCV	47P	
C466	ECUV1H101JCV	100P	
C467	ECUV1H470JCV	47P	
C470	ECST0JZ106R	10	
C501	ECEA0JU102	1000	
C502	ECUV1C104ZFV	0.1	
C504	ECUV1H152KBV	0.0015	
C505	ECUV1H152KBV	0.0015	
C506	ECUV1H080CCV	8P	
C507	ECUV1H050CCV	5P	
C511	ECEV0JA101	100	
C512	ECUV1C104ZFV	0.1	
C514	ECUV1H100DCV	10P	
C515	ECEV0JA220	22	
C516	ECUV1C104ZFV	0.1	
C601	ECEV0JA101	100	
C603	ECUV1C104ZFV	0.1	
C681	ECUV1H030CCV	3P	
C684	ECUV1H471JCV	470P	S
C685	ECUV1H121JCV	120P	
C686	ECUV1H331JCV	330P	S
C701	ECUV1H101JCV	100P	
C704	ECUV1H100DCV	10P	
C706	ECUV1H331JCV	330P	S
C707	ECUV1H331JCV	330P	S
C711	ECEA0JU331	330	
C713	ECUV1H221JCV	220P	
C714	ECUV1H221JCV	220P	
C715	EECW5R5D473	0.047	S
C716	ECUV1H221JCV	220P	
C717	ECUV1H221JCV	220P	
C721	ECUV1H470JCV	47P	
C722	ECST0JY475	4.7	
C724	ECUV1A224KBV	0.22	
C725	PQCUV1H154KR	0.15	
C726	ECUV1A224KBV	0.22	
C727	ECUV1H331JCV	330P	S
C728	ECUV1H102KBV	0.001	
C729	ECUV1C104ZFV	0.1	
C731	ECUV1H331JCV	330P	S
C732	ECUV1H331JCV	330P	S
C733	ECUV1H331JCV	330P	S
C734	ECUV1H331JCV	330P	S
C735	ECUV1H331JCV	330P	S
C737	ECUV1H331JCV	330P	S
C738	ECUV1H331JCV	330P	S
C743	ECUV1H331JCV	330P	S
C761	ECUV1H470JCV	47P	
C771	ECUV1A474KBV	0.47	
C772	ECUV1C104ZFV	0.1	
C773	ECUV1C104ZFV	0.1	
C774	ECUV1C104ZFV	0.1	
C775	ECUV1C104ZFV	0.1	
C776	ECUV1C104ZFV	0.1	

Ref. No.	Part No.	Part Name & Description	Remarks
C777	ECUV1A474KBV	0.47	
C778	ECUV1A474KBV	0.47	
C779	ECUV1H471JCV	470P	S
C780	ECUV1C473KBV	0.047	
C781	ECUV1C473KBV	0.047	
C783	ECUV1H330JCV	33P	
C791	ECUV1H681JCV	680P	S
C792	ECUV1H681JCV	680P	S
C793	ECUV1H681JCV	680P	S
C794	ECUV1H681JCV	680P	S
C795	ECUV1H471JCV	470P	S
C796	ECUV1H471JCV	470P	S
C797	ECUV1H471JCV	470P	S
C798	ECUV1H471JCV	470P	S
C900	ECUV1H101JCV	100P	
C903	ECUV1H681JCV	680P	S
C904	ECUV1H103KBV	0.01	S
C905	ECUV1H103KBV	0.01	S
C906	ECUV1H103KBV	0.01	S
C907	ECUV1H103KBV	0.01	S
C909	ECUV1H820JCV	82P	
C910	ECUV1H681JCV	680P	S
C911	ECUV1H470JCV	47P	
C912	ECUV1H681JCV	680P	S
C913	ECUV1H681JCV	680P	S
C914	ECUV1H681JCV	680P	S
C915	ECUV1H101JCV	100P	
C916	ECUV1H103KBV	0.01	S
C917	ECUV1H221JCV	220P	
C918	ECUV1H103KBV	0.01	S
C919	ECUV1C104ZFV	0.1	
C920	ECUV1H040CCV	4P	
C921	ECUV1H040CCV	4P	
C922	ECUV1H121JCV	120P	
C923	ECUV1H471JCV	470P	S
C924	ECUV1H331JCV	330P	S
C925	ECUV1H470JCV	47P	
C926	ECUV1H331JCV	330P	S
C927	ECUV1H121JCV	120P	
CA705	ECJRVC1H331K	330P	
CB	ECUV1C104ZFV	0.1	
R551	ECUV1H471JCV	470P	S
R552	ECUV1H471JCV	470P	S
R553	ECUV1H471JCV	470P	S
R708	ECUV1H681JCV	680P	S
PCB2	PQLP10233Z	RF BLOCK ASS´Y	

23.2. Handset

23.2.1. CABINET AND ELECTRICAL PARTS

Ref. No.	Part No.	Part Name & Description	Remarks
1	PQADGP0831GN	LIQUID CRYSTAL DISPLAY	
2	PQAX2P06Z	SPEAKER	
3	PQBC10294Z1	BUTTON NAVIGATOR KEY	
4	PQGP10158Z1	LCD PANEL	S
5	PQGT14426Z	NAME PLATE (for KX-TC1868B)	
5	PQGT14427Z	NAME PLATE (for KX-TC1871B)	
5	PQGT14410Z	NAME PLATE (for KX-TC1872B)	

Ref. No.	Part No.	Part Name & Description	Remarks
6	PQHG10527Y	RUBBER SHEET	
7	PQHR10726Z	LCD HOLDER	
8	PQHR10727Z	LCD PLATE	
9	PQHR10739Z	SP HOLDER	
10	PQHS10410Y	DOUBLE SIDE TAPE	
11	PQHS10425Z	SP SPONGE	
12	PQHX10862Z	LCD COVER SHEET	
13	PQHX10955Z	LCD SHEET	
14	PQHX10959Z	CUSHION	
15	PQJT10158Z	CHARGE TERMINAL	
16	PQJT10159Z	CHARGE TERMINAL	
17	PQKE10099Z1	EARPHONE CAP	S
18	PQKF10312Z1	REAR CABINET	S
19	PQKK10099Z1	BATTERY COVER	S
20	PQKM10417V4	FRONT CABINET	S
21	PQP508SVC	BATTERY	S
22	PQSA10102X	ANTENNA	
23	PQSX10134Z	KEYBOARD SWITCH	
24	PQHX10934Z	SHEET	
25	PQQT22108Z	PRODUCTION LABEL	
26	PQHG10602Z	RUBBER	

23.2.2. MAIN P.C. BOARD PARTS

Ref. No.	Part No.	Part Name & Description	Remarks
PCB100	PQWPTC1871BR	MAIN P.C.BOARD ASS´Y (RTL)	
		(for KX-TC1868B) (for KX-TC1871B)	
PCB100	PQWPTC1872BR	MAIN P.C.BOARD ASS´Y (RTL)	
		(for KX-TC1872B)	
		(ICS)	
IC201	PQVI16107ACA	IC	
IC202	PQWITC1871BR	IC (for KX-TC1868B, KX-TC1871B)	
IC202	PQWITC1872BR	IC (for KX-TC1872B)	
IC203	PQVIC62FP33M	IC	
IC204	PQVIXCP3002M	IC	
IC205	PQVIC61CN32N	IC	
		(TRANSISTORS)	
Q201	PQVTDTC143E	TRANSISTOR(SI)	
Q202	PQVTDTC143E	TRANSISTOR(SI)	
Q203	PQVTDTA143TU	TRANSISTOR(SI)	
Q204	2SA1797Q	TRANSISTOR(SI)	
Q205	2SD1819A	TRANSISTOR(SI)	
Q206	PQVTDTC143E	TRANSISTOR(SI)	
Q207	2SD1819A	TRANSISTOR(SI)	
Q208	PQVTD123T146	TRANSISTOR(SI)	S
Q209	PQVTD123T146	TRANSISTOR(SI)	S
Q210	UN521	TRANSISTOR(SI)	
Q211	PQVTDTA143TU	TRANSISTOR(SI)	
		(DIODES)	
D201	MA2ZD1400	DIODE(SI)	
D202	MA2ZD1400	DIODE(SI)	
D203	MA111	DIODE(SI)	
D206	PQVDS1ZB60F1	DIODE(SI)	
D209	MA111	DIODE(SI)	
D210	MA111	DIODE(SI)	
D212	MA8150	DIODE(SI)	
D213	MA8150	DIODE(SI)	
		(LEDS)	
LED201	PQVDSML310MT	LED	

Ref. No.	Part No.	Part Name & Description	Remarks
LED202	PQVDSML310MT	LED	
LED203	PQVDSML310MT	LED	
LED204	PQVDSML310MT	LED	
LED205	PQVDSML310MT	LED	S
LED206	PQVDSML310MT	LED	S
LED207	PQVDSML310MT	LED	S
		(COILS)	
L201	MQLRE15NJF	COIL	
L203	PQLQR3FL121	COIL	
L204	PQLQR3FL121	COIL	
L205	PQLQR3FL121	COIL	
		(CONNECTORS)	
CN201	PQJS22B11Z	CONNECTOR	
CN202	PQJP2D13Z	CONNECTOR	
CN203	PQJJ1J007Z	JACK	
		(OTHERS)	
E101	PQEFBC12111B	BUZZER	S
E102	PQJM147Z	MICROPHONE	
G1	PQJT10152Z	CHARGE TERMINAL	
G2	PQJT10152Z	CHARGE TERMINAL	
G3	PQJT10152Z	CHARGE TERMINAL	
G4	PQJT10152Z	CHARGE TERMINAL	
G5	PQJT10152Z	CHARGE TERMINAL	
G6	PQJT10152Z	CHARGE TERMINAL	
X201	PQVCI4096N3Z	CRYSTAL OSCILLATOR	
		(RESISTORS)	
R201	ERJ3GEYJ331	330	
R202	ERJ3GEYJ331	330	
R203	ERJ3GEYJ331	330	
R204	ERJ3GEYJ331	330	
R205	ERJ3GEYJ101	100	
R206	ERJ3GEYJ101	100	
R207	ERJ3GEYJ101	100	
R209	ERJ3GEYJ104	100k	
R210	ERJ3GEYJ104	100k	
R211	ERJ3GEYJ104	100k	
R212	ERJ3GEYJ101	100	
R213	ERJ3GEYJ101	100	
R217	ERJ3GEYF434	430k	
R218	ERJ3GEYF824	820k	
R220	ERJ3GEYJ474	470k	
R221	ERJ3GEYJ103	10k	
R222	ERJ3GEYJ101	100	
R223	ERJ3GEY0R00	0	
R224	ERJ3GEYJ103	10k	
R225	ERJ3GEYJ472	4.2k	
R226	ERJ3GEYJ123	12k	
R227	ERJ3GEYJ473	47k	
R228	ERJ3GEYJ224	220k	
R229	ERJ3GEYJ102	1k	
R230	ERJ3GEYJ102	1k	
R231	ERJ3GEYJ102	1k	
R232	ERJ3GEYJ103	10k	
R233	ERJ3GEY0R00	0	
R234	ERJ3EKF2204	0	
R235	ERJ3EKF2204	0	
R236	ERJ3GEYJ102	1k	
R241	ERJ3GEY0R00	0	
R242	ERJ3GEYJ180	18	
R243	ERJ3GEYJ180	18	
R244	ERJ3GEYJ473	47k	

Ref. No.	Part No.	Part Name & Description	Remarks
R245	ERJ3GEYJ103	10k	
R246	ERJ3GEYJ153	15k	
R247	ERJ3GEYJ391	390	
R248	ERJ3GEYJ393	39k	
R249	ERJ3GEYJ222	2.2k	
R250	ERJ3GEYJ222	2.2k	
R251	ERJ3GEYJ120	12	
R252	ERJ3GEYJ221	220	
R253	ERJ3GEYJ222	2.2k	
R260	ERJ3GEYJ104	100k	
R263	ERJ3GEYJ104	100k	
R264	ERJ3GEYJ103	10k	
R265	ERJ3GEYJ103	10k	
C202	ERJ3GEY0R00	0	
C204	ERJ3GEYJ104	100k	
		(CAPACITORS)	
C203	ECUV1C104ZFV	0.1	
C205	ECUV1H101JCV	100P	
C206	ECUV1C104KBV	0.1	
C207	ECUV1C104KBV	0.1	
C208	ECUV1C104KBV	0.1	
C209	ECUV1C104KBV	0.1	
C210	ECUV1C104KBV	0.1	
C211	ECUV1A474KBV	0.47	
C212	ECUV1A474KBV	0.47	
C213	ECEV1AA221	220	
C214	ECUV1H103KBV	0.01	
C215	ECUV1A474KBV	0.47	
C217	ECUV1C104ZFV	0.1	
C218	ECUV1C104ZFV	0.1	
C219	ECUV1H470JCV	47P	
C220	ECEV0JA101	100	
C221	ECUV1C104ZFV	0.1	
C222	ECUV1C104ZFV	0.1	
C223	ECST0JY106	10	
C224	ECUV1C104ZFV	0.1	
C226	ECUV1C104ZFV	0.1	
C227	ECUV1H470JCV	47P	
C228	ECUV1C104ZFV	0.1	
C229	ECUV1C104ZFV	0.1	
C230	ECUV1C104KBV	0.1	
C231	ECUV1A224KBV	0.22	
C232	ECUV1C104KBV	0.1	
C233	ECUV1C104ZFV	0.1	
C234	ECUV1A224KBV	0.22	
C236	ECUV1H060DCV	6P	S
C237	ECUV1H060DCV	6P	S
C239	ECUV1H103KBV	0.01	
C249	ECST0GY226	22	
C255	ECUV1A224KBV	0.22	
C267	ECST0JX226	22	
C269	ECUV1H330JCV	33P	
C270	ECST0JY475	4.7	
C274	ECUV1C104ZFV	0.1	
C277	ECUV1C563KBV	0.056	
C279	ECUV1H010CCV	1P	
C280	ECUV1C104ZFV	0.1	
C284	ECUV1H330JCV	33P	
C286	ECUV1H330JCV	33P	
C287	ECUV1C104ZFV	0.1	
C288	ECUV1H330JCV	33P	
C289	ECUV1H330JCV	33P	
C290	ECUV1H102KBV	0.001	
C291	ECUV1H102KBV	0.001	
C292	ECUV1H330JCV	33P	
C294	ECUV1H103KBV	0.01	
PCB200	PQLP10233Z	RF BLOCK ASS´Y	

23.2.3. ACCESSORIES AND PACKING MATERIALS

Ref. No.	Part No.	Part Name & Description	Remarks
A1	PQLV1Z	AC ADAPTOR	⚠
A2	PQJA10075Z	TEL CORD	
A3	PQKE10097Z1	HADSET HOLDER	S
A4	PQKE10098Z1	BELT CLIP	S
A5	PQKL10035Z1	STAND	S
A6	PQHG10592Z	CUSHION RUBBER	
A7	PQQW12244Z	QUICK GUIDE (for English)	
A8	PQQW12245Z	QUICK GUIDE (for Spanish)	
A9	PQQX12722Z	INSTRUCTION BOOK	
A10	PQQW12298Z	LEAFLET HS	
P1	PQPH89Y	PROTECTION COVER	
		(for Base Unit)	
P2	XZB10X35A02	PROTECTION COVER	
		(for Handset)	
P3	PQPK13274Z	GIFT BOX (for KX-TC1868B)	
P3	PQPK13275Z	GIFT BOX (for KX-TC1871B)	
P3	PQPK13268Z	GIFT BOX (for KX-TC1872B)	

24 FOR SCHEMATIC DIAGRAM

24.1. Base Unit (28 SCHEMATIC DIAGRAM (Base Unit))

Notes:

1. DC voltage measurements are taken with voltmeter from the negative voltage line.

> Important Safety Notice:
> Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only the manufacturer's specified parts.

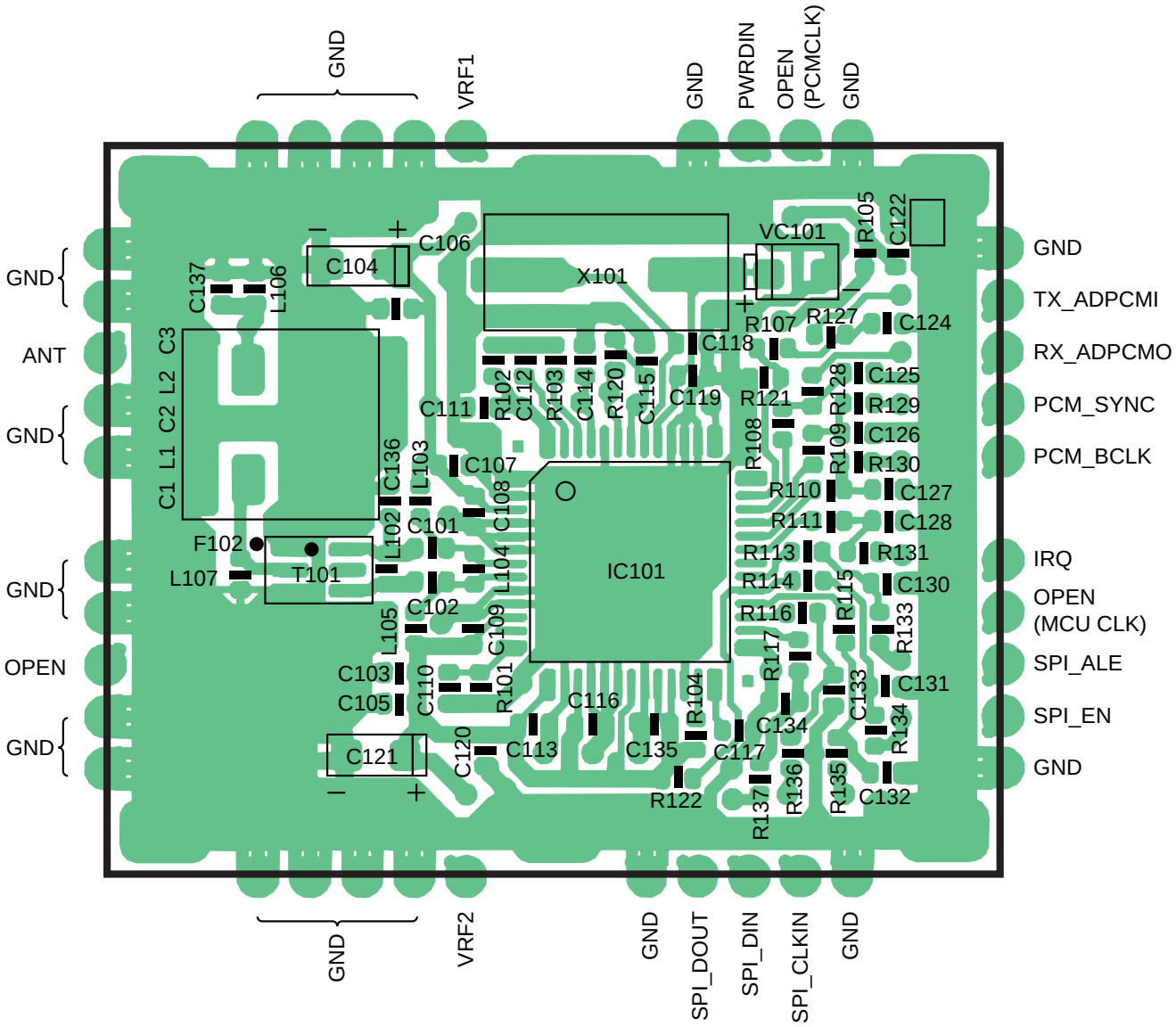
This schematic diagram may be modified at any time with the development of new technology.

24.2. Handset (30 SCHEMATIC DIAGRAM (Handset))

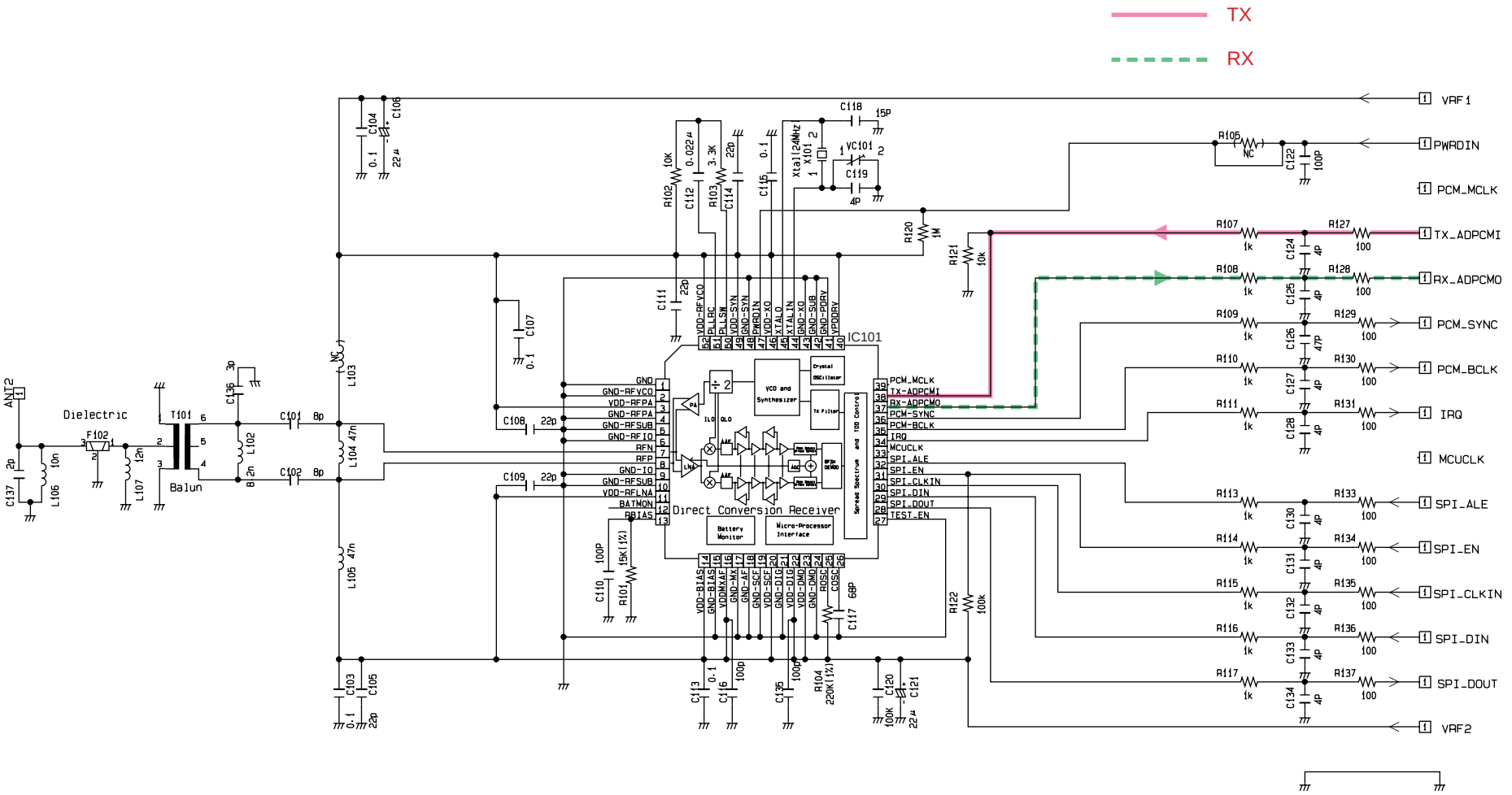
Notes:

1. DC voltage measurements are taken with an oscilloscope or a tester with a ground.
2. The schematic diagrams and circuit board may be modified at any time with the development of new technology.

25 CIRCUIT BOARD (RF Unit)



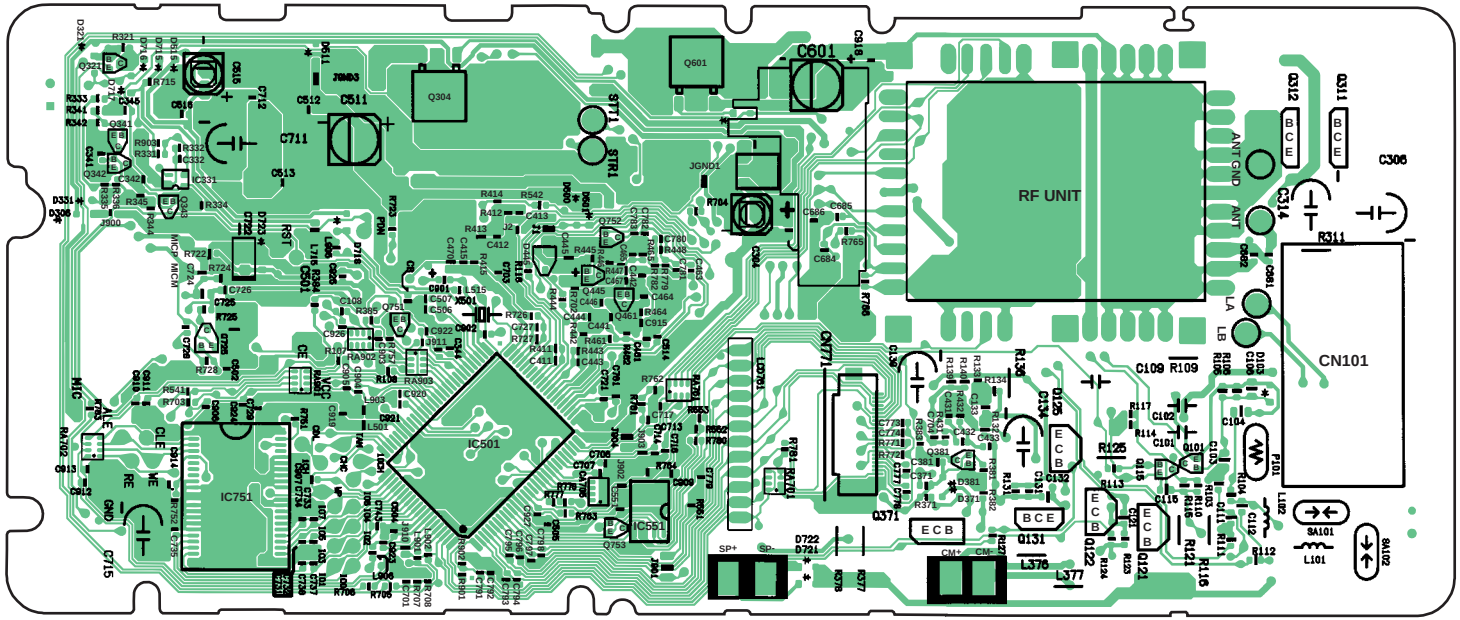
26 SCHEMATIC DIAGRAM (RF Unit)



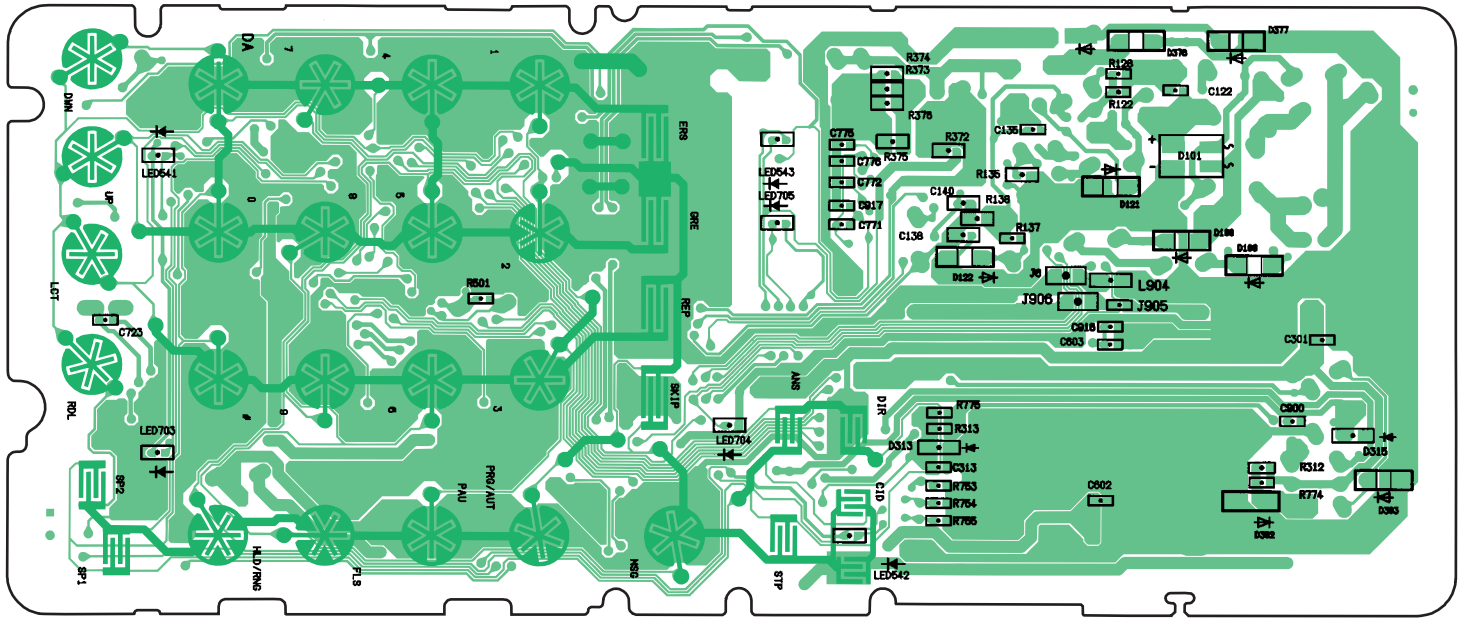
26.1. MEMO

27 CIRCUIT BOARD (Base Unit)

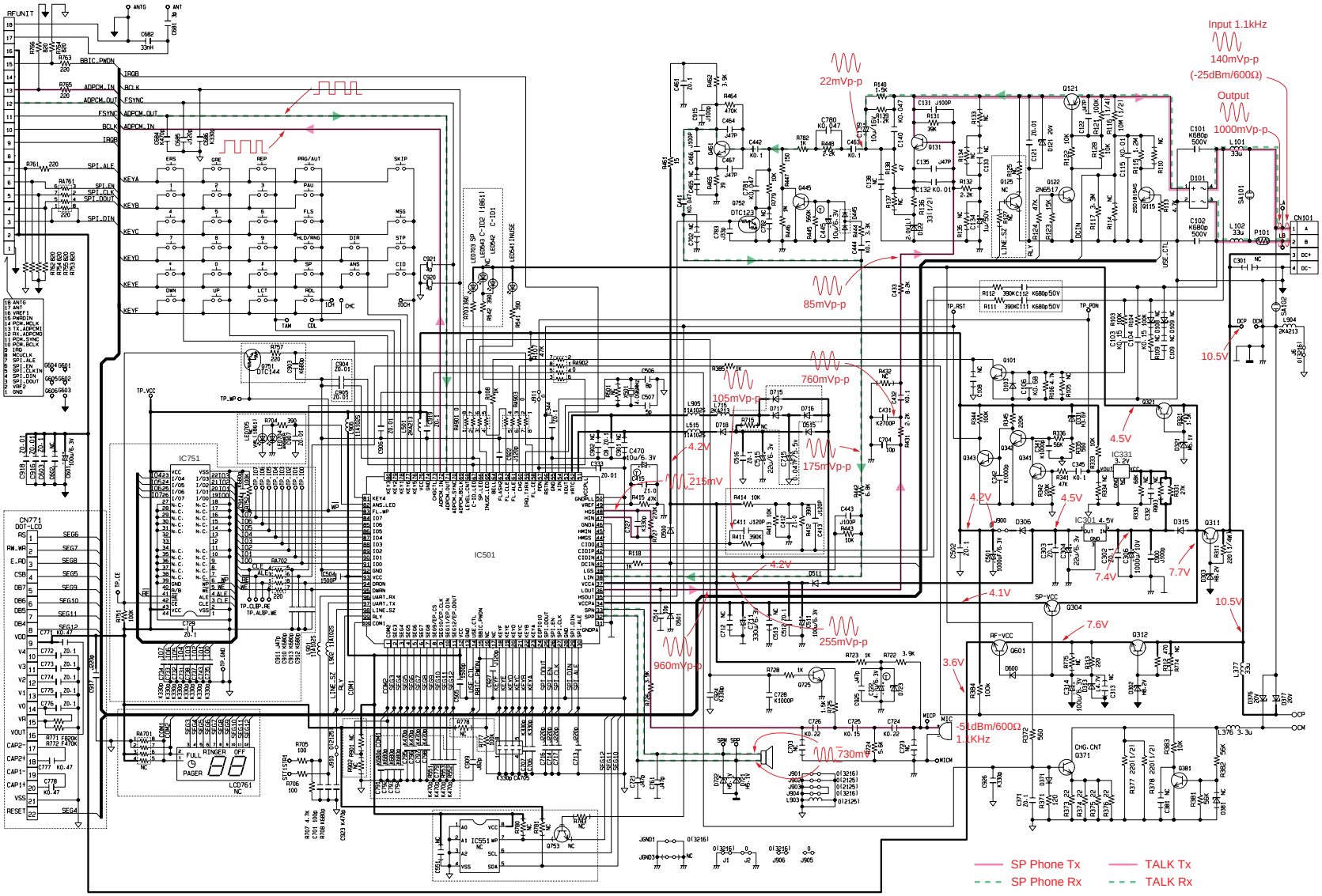
27.1. Component View



27.2. Flow Solder Side View

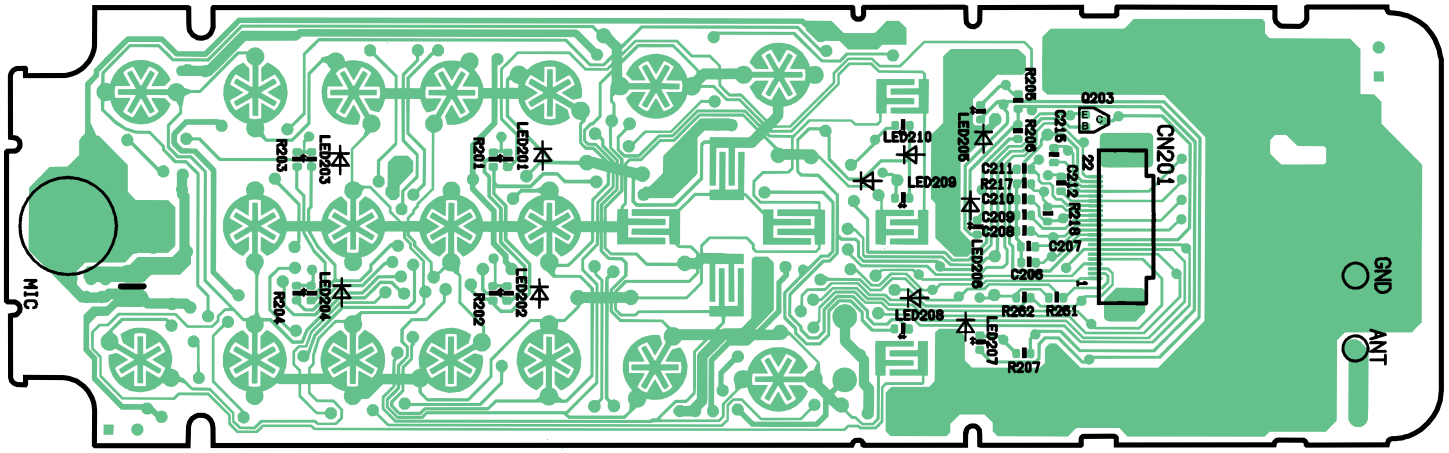


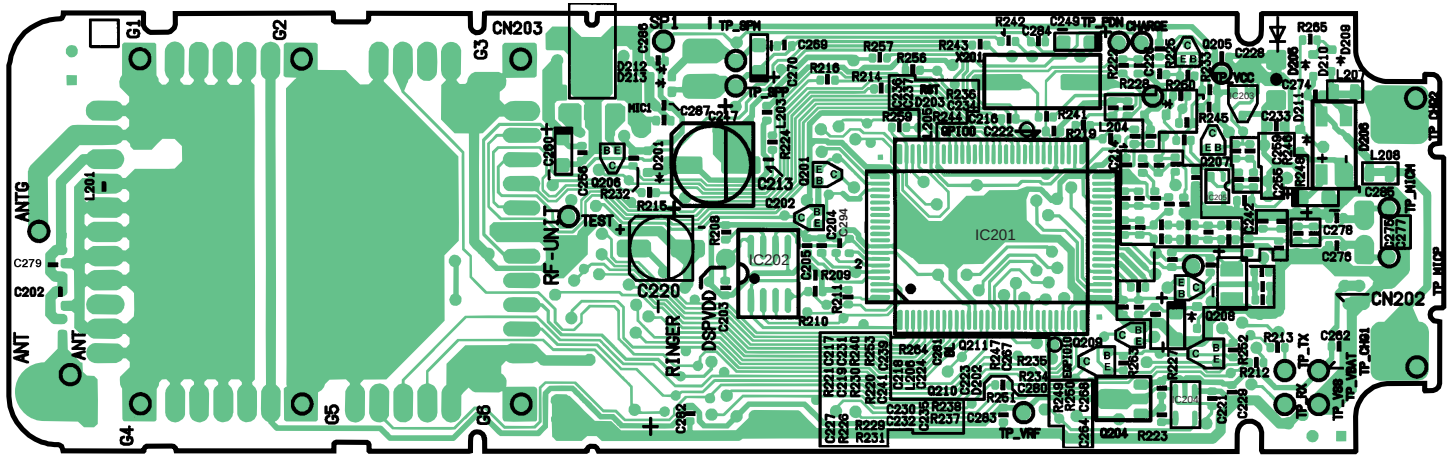
28 SCHEMATIC DIAGRAM (Base Unit)



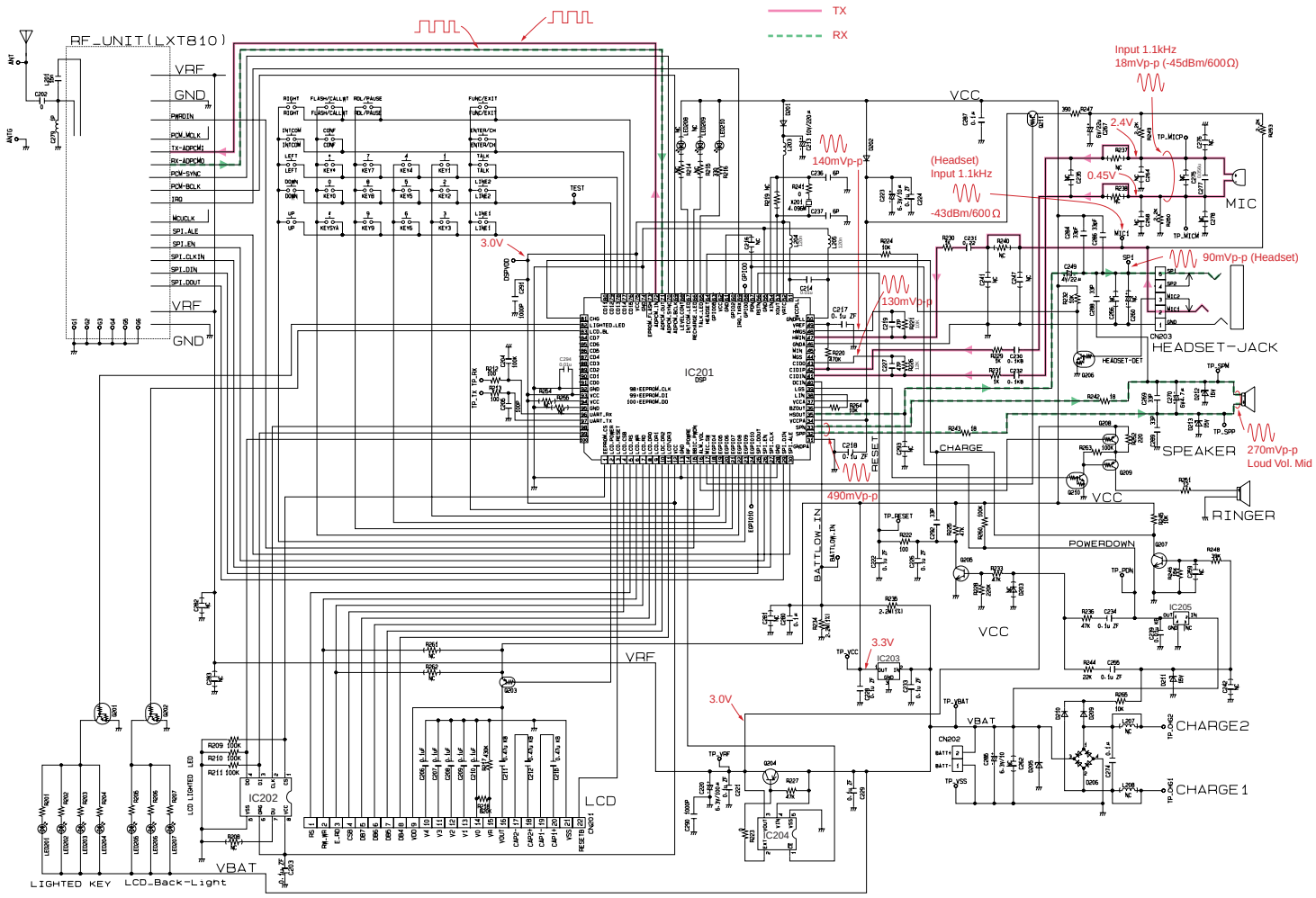
* "NC" is the part not used.

29 CIRCUIT BOARD (Handset)





30 SCHEMATIC DIAGRAM (Handset)



* "NC" is the part not used.

M (W)
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