Service Manual Telephone Equipment

Caller ID Compatible

2.4GHz Digital Cordless Answering System

Silver Version

(for Asia, Middle Near East and Other area)

KX-TG2257BXS





(Base Unit)

SPECIFICATIONS

	Base Unit	Handset
Power Supply: Receiving Frequency: Receiving Method: Transmitting Frequency: Oscillation Method: Tolerance of OSC Frequency: Modulation Method: ID Code: Dialing Mode: Redial:	AC Adaptor (PQLV1BXZ) 39 channels within 2411.77625~2479.87350 MHz Double super heterodyne 39 channels within 2411.77625~2479.87350 MHz PLL synthesizer 8.192 MHz TDD-FSK 28-bit Tone (DTMF)/Pulse 1 (Up to 32 digits)	Rechargeable Ni-Cd battery 39 channels within 2411.77625~2479.87350 MHz Double super heterodyne 39 channels within 2411.77625~2479.87350 MHz PLL synthesizer 8.192 MHz TDD-FSK 28-bit Tone (DTMF)/Pulse 5 (Up to 32 digits)
Speed Dialer: Power Consumption: Dimension (H × W × D): Weight	10 (Up to 22 digits) Approx. 84 mm × 180 mm × 215 mm (3 ⁵ / ₁₆ " × 7 ³ / ₃₂ " × 8 ¹⁵ / ₃₂ ") 470 g (1.03 lbs.)	50 (Up to 22 digits) 11 days at Standby, 5 hours at Talk Approx. 245 mm × 55 mm × 45 mm (9 ³¹ / ₃₂ " × 2 ⁵ / ₃₂ " × 1 ²⁵ / ₃₂ ") 230g (0.51 lbs.) with battery

Design and specifications are subject to change without notice.

IMPORTANT INFORMATION ABOUT LEAD FREE, (PbF), SOLDERING

If lead free solder was used in the manufacture of this product the printed circuit boards will be marked PbF. Standard leaded, (Pb), solder can be used as usual on boards without the PbF mark.

When this mark does appear please read and follow the special instructions described in this manual on the use of PbF and how it might be permissible to use Pb solder during service and repair work.



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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 note the serial number, write down all 11 digits. The serial number may be found on the bottom of the unit.

FOR SERVICE TECHNICIANS

ICs and LSIs are vulnerable to static electricity.

When repairing, the following precautions will help prevent recurring malfunctions.

- 1. Cover plastic parts boxes with aluminum foil.
- 2. Ground the soldering irons.
- 3. Use a conductive mat on worktable.
- 4. Do not grasp IC or LSI pins with bare fingers.

CAUTION

Danger of explosion if battery is incorrectly replaced.

Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's Instructions.

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1

ABOUT LEAD FREE SOLDER (PbF: Pb free)

Note:

In the information below, Pb, the symbol for lead in the periodic table of elements, will refer to standard solder or solder that contains lead.

We will use PbF when discussing the lead free solder used in our manufacturing process which is made from Tin, (Tn), Silver, (Ag), and Copper, (Cu).

This model, and others like it, manufactured using lead free solder will have PbF stamped on the PCB. For service and repair work we suggest using the same type of solder although, with some precautions, standard Pb solder can also be used.

Caution

- PbF solder has a melting point that is 50° ~ 70° F, (30° ~ 40°C) higher than Pb solder. Please use a soldering iron with temperature control and adjust it to 700° ± 20° F, (370° ± 10°C). In case of using high temperature soldering iron, please be careful not to heat too long.
- PbF solder will tend to splash if it is heated much higher than its melting point, approximately 1100°F, (600°C).
- If you must use Pb solder on a PCB manufactured using PbF solder, remove as much of the original PbF solder as possible and be sure that any remaining is melted prior to applying the Pb solder.
- When applying PbF solder to double layered boards, please check the component side for excess which may flow onto the opposite side (See figure, below).



1.1. Suggested PbF Solder

There are several types of PbF solder available commercially. While this product is manufactured using Tin, Silver, and Copper, (Tn+Ag+Cu), you can also use Tin and Copper, (Tn+Cu), or Tin, Zinc, and Bismuth, (Tn+Zn+Bi). Please check the manufac turer's specific instructions for the melting points of their products and any precautions for using their product with other materials.

The following lead free (PbF) solder wire sizes are recommended for service of this product: 0.3mm, 0.6mm and 1.0mm.



1.2. How to recognize that Pb Free solder is used (at KX-TG2257BXS)

1.2.1. Base Unit PCB

PBF is stamped on the upper of DC jack to show that Pb free solder is used.(See the figure below.)



(Component View)

1.2.2. Handset PCB

PBF is stamped between battery terminals to show that Pb free solder is used.(See the figure below.)



(Component View)

2 STANDARD BATTERY LIFE

2.1. Battery Charge

Place the handset on the base unit and charge for about 15 hours before initial use.

• The IN USE/CHARGE indicator lights and a beep sounds.



IN USE/CHARGE Indicator

2.2. Battery Strength

You can check the battery strength on the handset display.

Display prompt	Battery strength
{===]	Fully charged
{]	Medium
{ ■]	Low
ັ້,[∎] (flashing)	Needs to be recharged.

The battery strength is as shown in the chart below.

2.3. Recharge

Recharge the battery when:

- "Recharge" is displayed on the handset,
- -"[I' flashes on the display, or
- the handset beeps intermittently while it is in use.

Recharge	
	11

 If you DO NOT recharge the handset battery for more than 15 minutes, the display will continually indicate "Recharge" and/or "(1)" will flash when the handset is lifted off the base unit.

Note for service:

The battery strength may not be indicated correctly if the battery is disconnected and connected again, even after it is fully charged. In that case, by recharging the battery as mentioned above, you will get a correct indication of the battery strength.

2.4. Battery information

After your Panasonic battery is fully charged:

Operation	Operating time
While in use (TALK)	Up to 5 hours
While not in use (Standby)	Up to 11 days

- The battery operating time may be shortened depending on usage conditions, such as viewing the Caller ID Caller List or directory 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.

3 BATTERY REPLACEMENT

If "Recharge" is displayed and/or " [■]" flashes after a few telephone calls even if the battery was fully charged, replace the battery with a new Panasonic N4HKGMA00002 (P-P511) battery.



3 Close the cover. Make sure you charge the new battery for about 15 hours in order to display the battery strength prompt correctly.

4 LOCATION OF CONTROLS

4.1. Base unit





How to use the Navigator key

This key has four active areas that are indicated by arrows.



Pressing the up or down arrow allows you to enter the Caller List and scroll through the function menu, the Caller List and the directory list. It is also used to adjust the handset ringer and receiver/speaker volumes.
Pressing the right or left arrow allows you to enter the directory list and move the cursor when entering items. The right arrow is used to select or confirm your menu choices and to edit a phone number of the Caller List. The left arrow is used to select a clearer channel.

Throughout this Service Manual, the navigator key is indicated by the arrows \bigtriangledown , \blacktriangle , \checkmark , \checkmark or \triangleright .

5 DISPLAYS

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

5.1. Handset display

Recharge _[∎]″	The battery needs to be charged. Place the handset on the base unit to charge the battery.
Received calls { III]	The display shows that you have received new calls. To check the new calls, lift the handset and press 文 or 🛦.
Received calls ¥	The display shows that you have received new calls. To check the new calls, press ♥ or ▲.
Handset off the base unit)	
12 new calls ▲ ▶=Directory	 This 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 ▶ (Directory key).
°Ringer off ({∎∎∎]	When the handset ringer volume is set to OFF, "Ringer off" will flash for about 45 seconds after completing operations such as talk, viewing the Caller List or programming.
10002223333	When a call is received, the display shows the caller's number after the first ring.
Talk 01-06-35 {]	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.

No link to base Place on cradle and try again.	The handset has lost communication with the base unit. Place the handset on the base unit and try again.
12223334444 11:20A JAN10 x3	This is a name from the Caller List. The display shows: —the caller's phone number, —the time and date of the last call (ex. Jan. 10, 11:20 AM), and —the number of times called (ex. 3 times).
Ann 1234567890	This is a name from the directory. The stored name and phone number are displayed.
Please lift up and try again.	 ▼, ▲, ◀ or ▶ was pressed while the handset was on the base unit. Lift the handset and press the button again.
Not available	While the base unit was in use, ♥ or ▲ was pressed to search the Caller List/directory list, ▶ was pressed to select an option or HOLD/INTERCOM was pressed.
Directory full	When trying to store an item or Caller List information in the directory, the directory memory is full.
Save error	While programming procedure, the handset has lost communication with the base unit. Move closer to the base unit and try again.
Remote operation {	The handset is operating the answering system remotely.

5.2. Base unit display



E

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



The unit is in the answering system programming mode.

The clock needs adjusting.



The speaker volume level is set to "5". You can select:

- -9 levels (0-8) are available while using the answering system.



12 messages have been recorded.



Memory is full. Erase some, or all, of the messages.



The ringer volume is set to OFF.



The recording time is set to "Greeting only". (The display is blank.)

6 CONNECTIONS



Note:

- USE ONLY WITH Panasonic AC ADAPTOR PQLV1BXZ.
- 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 services, you cannot access those services.
- When more than one unit is used, the units may interfere with each other.

To prevent or reduce interference, please leave ample space between the base units.

6.1. Adding Another Phone

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



7 OPERATION

7.1. Making Calls

7.1.1. Handset



• If the handset has lost communication with the base unit, 3 beeps sound and "No link to base Place on cradle and try again." is displayed.

To have a hands-free phone conversation (Using Digital Duplex Speakerphone)

	Press 🚓).	SP-phone
	Diel e shene sumher	
	Dial à phone number.	SP-phone
	 The dialed number is displayed. 	1110000
	 After a few seconds, the display will show the 	
	length of the call and the battery strength.	SP-phone
	When the other party answers, talk into the	00-00-00 [
r	microphone.	
	To hang up, press OFE or place the	
	handset on the base unit	Off
	1101000000000000000000000000000000000	

- If the handset has lost communication with the base unit, 3 beeps sound and "No
 - link to base Place on cradle and try again." is displayed.

Hands-free Digital Duplex 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 🔽 to decrease the speaker volume.
- If the other party's voice from the speaker cuts in/out during a conversation, press ▼ to decrease the speaker volume.
- While talking using , you can switch to the hands-free phone conversation by pressing . To switch back to the receiver, press .

If noise interferes with the conversation

Press <a>Ito select a clearer channel in the talk, speakerphone, intercom or remote operation mode, or move closer to the base unit.

To redial the last number dialed on the handset

Press or 🗬 and press [REDIAL/PAUSE].

To dial after confirming the entered number

- Dial a phone number.
- If you misdial, press **CLEAR**. One digit is erased. Dial the correct phone number.
- Press 💽 . 2

OR

To have a hands-free phone conversation, press , and when the other party answers, talk into the microphone.

• After a few seconds, the display will show the length of the call and the battery strength.

3334444

Ex. 充 was pressed.
Talk
3334444
Talk
00-00-00 [

To hang up, press **OFF** or place the 3

handset on the base unit.

To redial using the redial list (Memory Redial)

The last 5 phone numbers dialed with the handset are stored in the redial list.

- 1. Press [REDIAL/PAUSE]
 - •The last number dialed is displayed.
- Scroll to the desired number by pressing or 🔺
 - You can also scroll through the list by pressing [REDIAL/PAUSE]
 - To exit the list, press OFF .
- 3. Press 🔊 or 🞼.
- To erase an item, repeat steps 1 and 2, and press [CLEAR]
- If "No items stored" is displayed, the list is empty.

To put a call on hold

Press HOLD/INTERCOM

- "Hold" is displayed.
- If you put a call on hold for more than 6 minutes. an alarm tone will sound. The call will be disconnected after a total of 10 minutes.

To release the hold

From the handset, lift the handset, or press () or (. From the base unit, press SP-PHONE.

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

333-4444 ▼▲Redial list

Hold 00-00-08 {

To adjust the receiver volume (HIGH, MEDIUM or LOW) or speaker volume (6 levels) while talking

To increase, press \blacktriangle . To decrease, press \bigtriangledown .

•The display will return to the length of the call.

While using 🕤

• Each time you press ♥ or ▲, the volume level will change among 3 levels (HIGH, MEDIUM or LOW). Your phone comes from the factory set to level MEDIUM.

	Loud			
HIGH	Low			Hiah
		ſ		
	Lou	ıd		
MEDIUM				
	Low			High
			¥	
	Lou	ıd		
LOW				
	Low			Hiah

While using 🛒

- Each time you press ▼ or ▲, the volume level will change among 6 levels. Your phone comes from the factory set to level 3.
- Ex. Speaker volume: level 6 Loud

Low **I**III High

• When you replace the battery, the selected receiver/speaker volume setting will return to the factory set. Reprogram if necessary.

Lighted handset keypad

The handset dialing buttons will light when you press a button or lift the handset off the base unit. They flash when a call is received with the handset off the base unit.

The lights will go out a few seconds after pressing a button, lifting the handset, answering a call, hanging up a call, leaving the programming mode or ending the intercom.

Backlit LCD display

The lighted handset display will stay on for a few seconds after pressing a handset button, lifting the handset off the base unit, hanging up a call, leaving the programming mode or ending the intercom.

7.1.2. Base Unit (Digital Duplex Speakerphone)



- 1 Press **SP-PHONE**.
 - The SP-PHONE indicator lights.
- 2 Dial a telephone number.
- 3 When the other party answers, talk into the $\ensuremath{\text{MIC}}$ (microphone).
- 4 To hang up, press **SP-PHONE**. • The indicator light goes out.
- To switch to the handset while using the base unit speakerphone:
 If the handset is off the base unit, press or c.
 If on the base unit, just lift up.
- During a call using the handset, the call can be switched to the base unit by pressing [SP-PHONE] on the base unit.

Hands-free Digital Duplex 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** v to decrease the speaker volume.

To adjust the speaker volume (8 levels) while talking

To increase, press VOLUME \bigcirc . To decrease, press VOLUME \bigcirc .

To redial the last number dialed on the base unit

Press SP-PHONE and press REDIAL/PAUSE.

To put a call on hold

Press (HOLD/LOCATOR/INTERCOM).

- The SP-PHONE indicator flashes.
- If you put a call on hold for more than 6 minutes, an alarm tone will sound. The call will be disconnected after a total of 10 minutes.

To release the hold

From the base unit, press **SP-PHONE**. From the handset, press **S** or **G**, 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.

7.2. **Answering Calls**

When a call is received, the unit rings and "Incoming call" is displayed and the IN USE/CHARGE indicator on the base unit flashes. 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.

7.2.1. Handset

Press **S**.

• You can also answer a call by pressing any dialing button **(0)** to **(9)**, **(*)** or **(11)** (--Any Key Talk).

OR

Press , and when the other party answers, talk into the microphone.



• You can select the ringer volume while a call is being received. Press 🔽 or 🔺 while the handset is just ringing. To set to OFF, press and hold (.

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 🔨 or 🞼.



IN USE/CHARGE Indicator

7.2.2. **Base Unit**



- The SP-PHONE indicator lights.
- Talk into the MIC.
- 3 To hang up, press (SP-PHONE).
 - The indicator light goes out.



- You can select the ringer volume while a call is being received. Press **MUTE/RINGER** while the base unit is just ringing. To set to OFF, press and hold (MUTE/RINGER).
- When the handset and base unit ringer volumes are set to OFF, they will not ring.

7.3. Automatic Answering Operation

When the unit answers a call, a greeting message is played and the caller's message is recorded.

- 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.

(ANSWER ON)

and Indicator

7.3.1. Setting the Unit to Answer Calls

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

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



• 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 base unit speaker. To answer the call with the base unit speakerphone, press **SP-PHONE**. For the handset, press **S** or **S**. The unit stops recording.

7.4. Listening to Messages

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

To play back messages, press [MESSAGE PLAYBACK/SLOW TALK].

When you have new messages:

the unit announces the number of new messages and only new messages are played back.

When you have no new messages:

the unit announces "No new messages. All message playback" and plays back all messages.

When you have no messages:

the unit announces "No messages".

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.



7.4.1. Slow Talk Message Playback

For easier listening of recorded messages, you can slow down the playback speed by pressing [MESSAGE PLAYBACK/SLOW TALK] during playback. Each time you press the button, the playback speed will change to slow/normal.

Press [MESSAGE PLAYBACK/SLOW TALK] during playback.

- The playback speed will slow down by 30%.
- To return to the normal speed, press (MESSAGE PLAYBACK/SLOW TALK) again during playback.
- The playback speed will return to normal after playing back all messages.

During playback

To repeat message	 Press REPEAT. If you press within 5 seconds of playback, the previous message will be played.
To skip message	Press (SKIP).
To stop operation	 Press (STOP). To resume playback, press (MESSAGE PLAYBACK/SLOW TALK). If you do not press any button for 60 seconds or if you press (STOP) again, the playback mode will be canceled.

For Caller ID service users During playback, when the handset is on the base unit, the handset 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 or evidence within 10 seconds. —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.

7.4.3. From the Handset

If someone else is in the room and you want to listen to the recorded messages privately, you can use the handset.

1 Handset:

Press FLASH/CALL WAIT/PLAYBACK).

- The number of new messages is heard on the handset.
- "Remote operation" will be displayed.
- **)** Base unit:
 - To listen to messages: Press [MESSAGE PLAYBACK/SLOW TALK].

When you have new messages:

the unit announces the number of new messages and only new messages are played back.

When you have no new messages:

the unit announces "No new messages. All message playback" and plays back all messages.

When you have no messages:

the unit announces "No messages".

• The messages will be heard on the handset.

• MESSAGE PLAYBACK/SLOW TALK),

(REPEAT), (SKIP) and (STOP)

can also be used during playback.

3 When finished, press **FLASH/CALL WAIT/PLAYBACK**) or place the handset on the base unit.

•You can also listen to messages without using the base unit.

*When you press **STOP** during playback, operation is stopped.

To resume the playback, press **MESSAGE PLAYBACK/SLOW TALK** within 15 seconds, or the voice menu will start.

FLASH Button

Pressing **FLASH/CALL WAIT/PLAYBACK** or **FLASH/CALL WAIT** allows you to use special features of your host PBX such as transferring an extension call or accessing special telephone services (optional) such as call waiting.

• Pressing **FLASH/CALL WAIT/PLAYBACK**) or **FLASH/CALL WAIT** causes to

release following operations:

-temporary tone dialing,

-muting your conversation, or

-recording your conversation.

Selecting the flash time

The flash time depends on your telephone exchange or host PBX. You can select the following flash times: "700, 600, 400, 300, 250, 110, 100 or 90 ms (milliseconds)". Your phone comes from the factory set to "700 ms". **Make sure the unit is not being used and the handset is lifted off the base unit.**



• You can exit the programming mode any time by pressing OFF.

• If the unit is connected via a PBX, PBX functions (transferring a call etc.) might not work correctly. Consult your PBX supplier for the correct setting.

8 DISASSEMBLY INSTRUCTIONS



Fig. 3

Shown in Fig	To Remove	Remove
1	Lower Cabinet	Screws (2.6 × 12)(A) × 5
2	Main P.C. Board	Remove the P.C. Board
3	Antenna	Screw (3 × 10)(B) × 1
	Speaker	Screws (3 × 8)(C) × 3



Fig. 6

Shown in Fig	To Remove	Remove
4	Battery Cover	Remove the Battery Cover
5	Rear Cabinet	Screws (2.6 × 12)(D) × 2
6	Rear Cabinet	Remove the Rear Cabinet
7	Main P.C. Board	Screw (2.6 × 12)(E) × 1
		Screws (2.6 × 10)(F) × 2
		Remove the lead wires
		Remove the P.C. Board

9 ASSEMBLY INSTRUCTIONS

9.1. Assembly the LCD to P.C. Board (Handset)



10 TROUBLESHOOTING GUIDE

MAIN



Check Sp-phone Reception (P.34)

Check Battery Charge (P.35)

Check Link (P.35)

Check the RF Unit (P.36)

Check Handset Transmission (P.41)

Check Handset Reception (P.41)

Check Caller ID (P.41)

(*1) See How to change the Auto Disconnect activation

10.1. Check Power

BASE UNIT

Is the AC Adaptor inserted into 120V outlet?



Power Supply Circuit (P.54) **Reset Circuit** (P.55) Flash Memory is IC300. DSP is IC201.

10.2. Error Message Table

Display	Symptom	Remedy
E 1	The initialization was tried, but it could not be done.	1. Check the peripheral circuit of Flash Memory visually.
E 3 E 9	When the adjustment data was checked, an error was detected. (The adjustment data may not be written.)	 Confirm that the voltage is added to the power supply pin. If no voltage is detected, replace the Flash Memory because it might be defect.
E 7	The defect of synthesized voice was detected. (The synthesized voice may not be written.)	3. Solder the Flash Memory again.
E 2	The defect of Flash Memory was detected.	When Flash Memory has the fatal detect, replace Flash Memory. This error hardly occurs.
E 4	The defect of DSP was detected. (The chip in DSP may have a defect.)	 Confirm Pins of DSP or resoldering. Confirm the oscillation frequency of DSP. If no frequency is found, replace DSP because it might be defect.
E 5 E 6	The defect of DSP was detected.	Replace DSP.

Note:

Flash Memory is IC300. DSP is IC201.

10.3. Check Record

BASE UNIT

Not record Greeting Message



How to change the Auto Disconnect activation (time)

Some Telephone Company lines (fiber or cable) ON Hook and OFF Hook voltages are lower than conventional lines, which may cause a malfunction of Auto Disconnect detection. To solve this problem, try changing the Auto Disconnect activation (time) through the procedures below.

Auto Disconne	ct activation (time)	PROCEDURE	Status
Enable	2 sec [default]	"STOP"→"REPEAT"+"SP-PHONE"simultaneously	
	4 sec	"STOP"→"REPEAT"+"UP" simultaneously	Stand-by
Disable*		"STOP"→"REPEAT"+"DOWN" simultaneously	

*If the "Disable" is selected, even if the parallel-connected telephone is OFF HOOK, the line isn't disconnected.

Cross Reference:

Telephone Line Interface (P.56) Auto Disconnect Circuit (P.57) Parallel Connection Detect Circuit (P.57) Signal Route (P.58)

Note:

Flash Memory is IC300. DSP is IC201.

10.4. Check Playback

BASE UNIT



DSP is IC201.

10.5. Check Sp-phone Transmission

BASE UNIT



10.7. Check Battery Charge

10.8. Check Link



10.9. Check the RF Unit

10.9.1. Defective Unit Check

The defective unit should be checked using the HS of Regular unit (working) and BS of Regular unit (working). Both* of Regular unit (working) are required as the defect may be either in the handset or the base of the defective unit. For a defective BASE UNIT, place HS of Regular unit (working) on the cradle of the unit and check to see that the handset links with the base. To confirm that they do link, lift handset off the cradle and press TALK button. A beep is heard and in use/charge LED's of the base unit should turn on. For a defective HANDSET UNIT, place HS on the cradle of the BS of Regular unit (working) and check to see that the HS links with the base. Again, press TALK button. A beep is heard and in use/charge LED's of the BS of Regular unit (working) should turn on.



See RF Check Flowchart (P.38).

See Check Table for RF Block (P.39).

Note:

*KX-TG2257 with marks HS JIG/BS JIG can be used only for troubleshooting. However, regular production set also can be used as a JIG.

10.9.2. Converting a Regular Production Unit to a JIG

Both base unit and handset unit have two modes: TEST POWER LOW mode and NORMAL POWER mode even a Regular production unit.

Each unit can be used as a JIG by changing the original NORMAL POWER mode to TEST POWER LOW mode.

• NORMAL POWER mode.

In this mode both base unit and handset unit can be used as a regular set.

• TEST POWER LOW mode, when production unit has been changed into a jig and will be used to check RF link.

In this mode it is for checking if the sensitivity of RF block for both base unit and handset unit are good or not. Procedure as follows to enter this mode.

(1) Press "FLASH" and "IS" of the handset simultaneously, and keep it (10CH is taken for example).

(2) Place the handset unit on the cradle of the base unit. (A long beep sounds, and the display is not changed.)

As shown in below a) HANDSET, b) BASE UNIT

a) HANDSET




A short beep followed by a long beep is heard. This indicates the unit is in TEST POWER LOW mode. Once in TEST POWER LOW mode, to return the unit to the original NORMAL POWER mode, press 2, 5, 8, 0 simultaneously while the handset unit is in stand-by (not in use, not charging). A long beep is heard. Then disconnect the battery from the handset. Reconnect the battery and place the handset on the cradle to exchange security codes. A single beep is heard.

Note:

You can check the other channels as follows, if need.

Fixation CH	Figure 1				
СН	POWER	making key			
1CH	"LOW"	"FLASH" + "1"			
2CH	"LOW"	"FLASH" + "2"			
3CH	"LOW"	"FLASH" + "3"			
4CH	"LOW"	"FLASH" + "4"			
5CH	"LOW"	"FLASH" + "5"			
6CH	"LOW"	"FLASH" + "6"			
7CH	"LOW"	"FLASH" + "7"			
8CH	"LOW"	"FLASH" + "8"			
9CH	"LOW"	"FLASH" + "9"			
10CH	"LOW"	"FLASH" + " 🛞 " ← the above case			
11CH	"LOW"	"FLASH" + "0"			
12CH	"LOW"	"FLASH" + "#"			
13CH	"LOW"	"REDIAL" + "1"			
14CH	"LOW"	"REDIAL" + "2"			
15CH	"LOW"	"REDIAL" + "3"			
16CH	"LOW"	"REDIAL" + "4"			
17CH	"LOW"	"REDIAL" + "5"			
18CH	"LOW"	"REDIAL" + "6"			
19CH	"LOW"	"REDIAL" + "7"			
20CH	"LOW"	"REDIAL" + "8"			
21CH	"LOW"	"REDIAL" + "9"			
22CH	"LOW"	"REDIAL" + "🛞"			
23CH	"LOW"	"REDIAL" + "0"			
24CH	"LOW"	"REDIAL" + "#"			
25CH	"LOW"	"OFF" + "🛞"			
26CH	"LOW"	"OFF" + "#"			
1CH	"NORMAL"	"OFF" + "1"			
4CH	"NORMAL"	"OFF" + "2"			
7CH	"NORMAL"	"OFF" + "3"			
10CH	"NORMAL"	"OFF" + "4"			
13CH	"NORMAL"	"OFF" + "5"			
14CH	"NORMAL"	"OFF" + "6"			
17CH	"NORMAL"	"OFF" + "7"			
20CH	"NORMAL"	"OFF" + "8"			
23CH	"NORMAL"	"OFF" + "9"			
26CH	"NORMAL"	"OFF" + "0"			

KX-TG2257BXS 10.9.3. RF Check Flowchart



(ia) ~ (4) : Details of confirmation items are following in "Check Table for RF Block (P.39)".

Note:

DSP is IC201. (for Base Unit)

DSP is IC201. (for Handset)

Both of RF Blocks for Handset and Base Unit are same.

10.9.4. Check Table for RF Block

No	ltem		BS (Base unit) (*1)	HS (Handset) (*1)		
1a.	Link confirmation Procedure		1. Put "HS (working)" on BS.	1. Put HS on "BS (working)".		
	[NORMAL POWER]		2. Set MODE to [NORMAL POWER] of "HS (working)".	2. Set MODE to [NORMAL POWER] of "BS (working)".		
			 Press [TALK] key of "HS (working)" to establish link. 	3. Press [TALK] key of "HS" to establish link.		
1b.	Link confirmation [TEST POWER]	Procedure 1. Change MODE to [TEST POWER] of "HS (working)".		 Change MODE to [TEST POWER] of "BS (working)". 		
	tor confirmation the sensitivity of		2. Press [TALK] key of "HS (working)" to	2. Press [TALK] key of "HS" to establish link.		
	RF Block		3. Confirm the suspicious BS links to HS (working) with approximately the same distance from BS (working).	3. Confirm the suspicious HS links to BS (working) with approximately the same distance from HS (working).		
2	IC101 working confirmation	Procedure	1. Set Test-mode Just entering to test mode.(*3)	1. Set Test-mode Just entering to test mode.(*3)		
			2. Confirm oscillate signal of RF UNIT (8.192 MHz at OSC). (*5)	2. Confirm oscillate signal of RF UNIT (8.192 MHz at OSC). (*6)		
		Check point	1. Check Xtal oscillator at Q260 - C of the base unit.	1. Check Xtal oscillator at Q204 - C of the handset.		
			2. Check DSP interface(IC101←→DSP/BS) (*4).	2. Check DSP interface(IC101 $\leftarrow \rightarrow$ DSP/HS) (*4).		
3	TX Power confirmation	Procedure	1. Put RF wire to ANT and ANT_GND (See Base Unit Reference Drawing).	1. Put RF wire to ANT and ANT_GND (See Handset Reference Drawing).		
			Connect this wire to the Spectrum Analyzer.	Connect this wire to the Spectrum Analyzer.		
			2. Set Test-mode. (*7)	2. Set Test-mode. (*8)		
			3. Confirm TX power level within +11±5dBm (*2)	3. Confirm TX power level within +11±5dBm (*2)		
		Check point	1. Check L101 ~ L108, L113, C110, C111, C138, D103, D104, R109, C121, C122, C124, C125, FL101 soldering.	1. Check L101 ~ L108, L113, C110, C111, C138, D103, D104, R109, C121, C122, C124, C125, FL101 soldering.		
			2. Check Antenna in BS.	2. Check Antenna in HS.		
4	Receiver	Procedure	1. Put "HS (working)" on BS.	1. Put HS on "BS (working)".		
	confirmation		 Set MODE to [NORMAL POWER] of "HS (working)". 	 Set MODE to [NORMAL POWER] of "BS (working)". 		
			3. Press [TALK] key of "HS (working)" to	3. Press [TALK] key of "HS" to establish link.		
			4. Change MODE to [TEST POWER] of "HS	 Change MODE to [TEST POWER] of "BS (working)". 		
			(working)".	5. Press [TALK] key of "HS" to establish link.		
			5. Press [TALK] key of "HS (working)" to establish link. Confirm the suspicious BS links to HS (working) with approximately the same distance from BS (working).	Confirm the suspicious HS links to BS (working) with approximately the same distance from HS (working).		
		Check point	1. Check C115, C114, L111, C118 soldering.	1. Check C115, C114, L111, C118 soldering.		
			2. Check Antenna in BS.	2. Check Antenna in HS.		

(1*) BS : Base unit which is checked.

HS : Handset unit which is checked.

BS (working) : Base unit which is working.

HS (working) : Handset unit which is working.

(*2)<Spectrum analyzer setting>

SPAN: 10MHz

VBW, RBW: 1MHz

SWEEP: 1sec.

(*3)See TEST MODE (P.42).

(*4)See RF-DSP interface signal wave form (P.40).

See CIRCUIT BOARD (Base Unit) (P.87).

See CIRCUIT BOARD (Handset) (P.89).

(*5)See Base Unit Reference Drawing (P.46).

(*6) see Handset Reference Drawing (P.47)

(*7) see Test mode flow chart for Base Unit (P.42)

(*8) see Test mode flow chart for Handset (P.44)

Note:

DSP is IC201. (for Base Unit) DSP is IC201. (for Handset)

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10.9.5. RF-DSP interface signal wave form







10.10. Check Handset Transmission

Check MIC of HANDSET.

Check HANDSET Tx in 15.9. Signal Route.

Cross Reference:

Signal Route (P.58).

10.11. Check Handset Reception

Check Speaker of HANDSET.

Check HANDSET Rx in 15.9. Signal Route.

Cross Reference:

Signal Route (P.58).

Note:

When checking the RF UNIT, Refer to **Check the RF Unit** (P.36)

10.12. Check Caller ID

BASE UNIT



Cross Reference:

Telephone Line Interface (P.56).

Calling Line Identification (Caller ID)/Call Waiting Caller ID (P.59).

Note:

- Make sure the format of the Caller ID or Call Waiting Caller ID service of the Telephone company that the customer subscribed to.
- Also we recommend to confirm that the customer is really a subscriber of the service.

11 TEST MODE

11.1. Test mode flow chart for Base Unit



(*1) It shows whether the telephone line is connected or not.-ON: OFF HOOK.-OFF: ON HOOK

11.2. TAM Test mode flow chart



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11.3. Test mode flow chart for Handset



- (*1) See Handset Reference Drawing (P.47).---Should return to OPEN after entering the Test mode.
- (*2) See Adjustment Battery Low Detector Voltage (P.45).

11.4. X201 Check

The confirmation is made under the "TX Power Check" mode of TEST MODE.

```
Equipment: Frequency counter
TP for measurement: TP_ANT
Measure range: 2472.64550 MHz ± 5 kHz (1ch) at Test Standby mode in TEST MODE (P.42).
```

11.5. Adjustment Battery Low Detector Voltage

After replacing handset's DSP (IC201), Re-writing Battery Low voltage to EEPROM is required.

<How to re-write>

- 1. Set 3.9V for DC power supply.
- 2. Enter the test mode (Refer to Test mode flow chart for Handset (P.44))
- 3. Follow to "Batt Low Check" mode (CW Tx High is displayed on LCD)
- 4. Set 3.5V for DC power supply.

Note: Check voltage at battery connector, because some voltage drop is happened, using long or thin cable.

- 5. Press "#" key to write voltage value in EEPROM.
- 6. Turn power off. Then this value is available.

11.6. Base Unit Reference Drawing

When connecting the Simulator and Equipments for checking, please refer to below.



AF OSC (1): SP_PHONE Receiving AF OSC (2): MIC Signal Input. <Intercom, SP-phone>

11.7. Handset Reference Drawing

When connecting the Simulator and Equipments for checking, please refer to below.



Note: (*2) is refered to No.2 of Check Table for RF Block (P.39)

KX-TG2257BXS 11.8. Frequency Table

Channel	TX/RX Frequency (MHz)	Channel	TX/RX Frequency (MHz)
1	2472.70400	21	2415.36100
2	2473.21425	22	2415.87125
3	2474.75150	23	2417.40850
4	2475.26175	24	2417.91875
5	2475.77525	25	2418.43225
6	2476.28550	26	2418.94250
7	2476.80225	27	2429.18325
8	2477.31250	28	2429.69675
9	2477.82600	29	2430.20700
10	2478.33625	30	2430.72050
11	2478.84975	31	2431.23075
12	2479.36000	32	2431.74425
13	2479.87350	33	2432.25450
14	2411.77625	34	2433.79175
15	2412.28975	35	2434.30200
16	2412.80000	36	2434.81550
17	2413.31350	37	2435.32575
18	2413.82375	38	2435.83925
19	2414.33725	39	2436.34950
20	2414.84750		

12 DESCRIPTION

12.1. Frequency

The frequency range of 2411.77625 MHz ~ 2479.87350 MHz is used. Transmitting and receiving channel between base unit and handset is same frequency. Refer to the Frequency Table.

12.2. 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.



12.2.1. TDD Frame Format

The TDD frame is 2mS in length. Each subframe contains 128 bits of 7.8µS duration.

Each subframe consists of the following four fields:

- A 1-bit Preamble field
- An 8-bit Data Channel field
- An 16-bit Sync Word
- A 72-bit ADPCM Payload (Parity 8-bit)

4 2000μS − 2000μ								10	00μS			
Transmit					Receive							
21-bit Gap	1-bit Preamble	8-bit Data Ch	72 bit ADPCM	16-bit Sync	10-bit Gap		21-bit Gap	1-bit Preamble	8-bit Data Ch	72 bit ADPCM	16-bit Sync	10-bit Gap

12.3. Signal Flowchart in the Whole System

Reception

CN1 of the base unit is connected to the TEL line, and the signal is input through the bridge diode D4. While talking the relay (Q4) is turned ON and amplified at the amplifiers Q50, then led to DSP (IC201). DSP generates ADPCM signal. The ADPCM signal is input to RFIC (IC101) of RF UNIT. RFIC outputs FSK modulated RF signal. The RF signal is passed through filter (FL101) to be transmitted from the antenna. As for the handset, RF signal from the antenna is input to RFIC passing through filter (FL101) 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 filter (FL101), it is transmitted from the antenna. As for the base unit, RF signal from the antenna is input to RFIC (IC101) passing through filter (FL101) 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 (Q1), then output to the TEL line (CN1) through the relay (Q4) and bridge (D4).

Standard Input



13 EXPLANATION OF BBIC (Base Band IC) DATA COMMUNICATION

13.1. Calling 13.3. Ringing (STANDBY MODE) (STANDBY MODE) Base Unit Handset Base Unit Handset Ring Signal When calling, a communication .ink_Req TALK request DATA (Link Reg) is IN USE LED Flashing transmitted from the Handset Link_Grant first, and a permitting DATA When the bell signal is (Link_Grant) is returned from detected, the base unit ID_OK the Base Unit to it. sends "ID OK". Then receiving the bell data from the base unit causes to ring ID OK the bell of the handset. Ringing Bell Talk LED Flashing TALK_Ack ID_OK Ack_OK OFF HOOK Bell IN USE LED ON TALK LED ON After initial link is established, TALK request DATA (Talk_Ack) ID OK Voice is transmitted from the Handset. Mute OFF DATA (Ack OK) is returned from the Base Unit to it, then Talk command DATA (Talk-command) is sent

13.4. Ports for Transmitting and Receiving of Data

Handset: (IC201) Transmitting Pin 57 (TXO), Pin 64 (TXEN) Receiving Pin 66 (RXI), Pin 63 (RXEN)

Base Unit: (IC201) Transmitting Pin 57 (TXO), Pin 64 (TXEN) Receiving Pin 66 (RXI), Pin 63 (RXEN)



14 BLOCK DIAGRAM (Base Unit)



KX-TG2257BXS BLOCK DIAGRAM (BASE UNIT)

15 CIRCUIT OPERATION (Base Unit)

General Description:

(DSP, Flash Memory) 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 DSP. The host processor provides activation and control of all that functions as follows.

15.1. DSP (Digital Speech/Signal Processing: IC201)

Voice Message Recording/Play back

The DSP system use a proprietary speech compression technique to record and store voice message in FLASH MEMORY.

An error correction algorithm is used to enable playback of these messages from the FLASH MEMORY.

DTMF Detection/Generator

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.

When the DTMF data from the Handset is received, the DTMF signal is output.

• Synthesized Voice (Pre-recorded message)

The DSP implements synthesized Voice, utilizing the built in speech detector and an FLASH MEMORY, 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.

• Analog Switching

The voice signal from telephone line is transmitted to the speaker or the voice signal from speakerphone microphone is transmitted to the Telephone line, etc. They are determined by the signal path route operation of voice signal.

• Block Interface Circuit

RF unit, LED, Key scan, Speaker, Microphone, Telephone line, LCD

15.2. Flash Memory (IC300)

Following information data is stored.

• Voice signal

ex: Pre-recorded Greeting message, Incoming message

- Telephone number, etc.
- ex: Telephone Directory number, Caller ID data, ID code

Settings

ex: message numbers, caller ID numbers, pulse tone dial

15.3. Power Supply Circuit

Function:

The power supply voltage from AC adaptor is converted to the desired voltage of each block.

Circuit Operation:

This unit supplies the voltage to each block as shown below.



15.3.1. Charge Circuit

The voltage from the AC is supplied to the main charge circuits. Normal charge (90 mA) of maximum 20-hours is started soon after the Handset is placed on the base unit. Then it changes to trickle charge (20 mA on the average) to prevent from overcharging. Normal charge : Q150 is ON

Trickle charge : Q150 is OFF



15.4. Reset 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 IC100, D101 and power is supplied to the DSP. The set can operate beyond point (a) in the circuit voltage diagram.

Circuit Diagram



15.5. Locator/Intercom Mode

- 1. When the base unit LOCATOR/INTERCOM button is pressed, a call monitor signal (intercom sound) is output from DSP (SPP, SPN). Thus a monitor tone is heard from the speaker.
- 2. At the same time, flashing of the IN USE/CHARGE (LED201) is obtained from DSP (INUSE-LED). This status is called "Intercom stand-by".
- 3. The receiving signal flows:

 $\mathsf{RF} \to \mathsf{DSP} \text{ (SPP, SPN)} \to \mathsf{SP}$

4. The transmission signal flows:

MIC \rightarrow C235, C236 \rightarrow R213, R214 \rightarrow DSP (MIN, MIP) \rightarrow RF

15.6. Telephone Line Interface

Telephone Line Interface Circuit:

Function

- Bell signal detection
- ON/OFF hook and pulse dial circuit
- Side tone circuit
- Auto-disconnect circuit/Parallel connection detection circuit

Bell signal detection and OFF HOOK circuit:

In the idle mode, Q4 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, R \rightarrow L1, L2 \rightarrow R30, R31 \rightarrow C16, C17 \rightarrow Q6 \rightarrow DSP (BELL) [BELL]

When the CPU (DSP) detects a ring signal, Q4 turns on, thus providing an off-hook condition (active DC current flow through the circuit) and the following signal flow is for the DC line current.

$$\mathsf{T} \rightarrow \mathsf{D4} \rightarrow \mathsf{Q4} \rightarrow \mathsf{Q1} \rightarrow \mathsf{R5} \rightarrow \mathsf{D1} \rightarrow \mathsf{D4} \rightarrow \mathsf{L2} \rightarrow \mathsf{POS1} \rightarrow \mathsf{R} \text{ [OFF HOOK]}$$

ON HOOK Circuit:

Q4 is open, Q4 is connected as to cut the DC loop current and to cut the voice signal. The unit is consequently in an on-hook condition.

Pulse Dial Circuit:

DSP (RYL) turns Q4 ON/OFF to make the pulse dialing.

Side Tone Circuit:

Basically this circuit prevents the TX signal from feeding back to RX signal.

As for this unit, TX signal feed back from Q1 is canceled by the echo canceller of DSP.

Note: DSP is IC201.

See CPU DATA (Base Unit) (P.65)

15.7. 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 DSP (DCIN) 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 the parallel-connected telephone is OFF HOOK status, the line is disconnected.

Note: DSP is IC201. See CPU DATA (Base Unit) (P.65)



You can enable or disable the Auto Disconnect function.

See Check Record (P.32).

15.8. Parallel Connection Detect 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.

It is like an "Auto Disconnect Circuit".

Circuit Operation:

Parallel connection detection when on hook:

When on hook Q7 is ON, the voltage is monitored DSP (DCIN). There is no parallel connection if the voltage is 2.50 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 Q7 is OFF, the voltage is monitored DSP (DCIN); the presence/absence of a parallel connection is determined when the voltage changes by 0.2 V or more.

15.9. Signal Route

Each signal route is as follows.

SIGNAL ROUTE	signal ROUTE DUT
SP-PHONE Tx	 MIC - C235, R213, C236, R214 - IC201 (46 - 47, 34) - R223, C244, R222 - Q1 TEL LINE
SP-PHONE Rx	TEL LINE (T/R) - C1 - C61 - R57 - R55 - C58 - Q50 - R227 - C250 - IC201 (36, 29 -31) - Speaker
HANDSET Tx	HANDSET MIC C232 - R231 IC201 (46 - 47, 57) - RF unit (15) C230 - R229 RF unit (4) - IC201 (66, 34) - R223 - C244 - R222 - Q1 - Q4 - D4 - TEL LINE
HANDSET Rx	TEL LINE - L1 - D4 - Q4 - C3 - C61 - R57 - R55 - C58 - Q50 - R227 - C250 - IC201 (36, 57) - RF unit (15) RF unit (4) - IC201 (66, 33 - 44) R302 HANDSET C257 - Headset - C301 - R303 - L209
GREETING PLAY TO TEL LINE	—— IC201 (34) - R223 - C244 - R222 - Q1 - TEL LINE
ICM PLAY TO SPEAKER	—— IC201 (29 - 31) - Speaker
	—— TEL LINE - C3 - C61 - R57 - C58 - Q50 - R227 - C250 - IC201 (36)
GREETING RECORDING	— MIC - C235, C236 - R213, R214 - IC201 (46 - 47)
DTMF DETECTION	
DTMF SIGNAL TO TEL- LINE	IC201 (34) - R223 - C244 - R222 - Q1 - Q4 - D4 - L1 - TEL LINE

15.10. Calling Line Identification (Caller ID)/Call Waiting Caller ID

Function:

Caller ID

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 "1" is a 1200 Hz sine wave, and data "0" 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.

*: Also the telephone exchange service provides other formats.

• Single message format



• Plural message format



Call Waiting Caller ID

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 telephone exchange transmits or receives CAS and ACK signals through each voice RX/TX route. Then FSK data and MARK data pass the following route.

Telephone Line \rightarrow CN1(A, B) \rightarrow C11, C12 \rightarrow R14, R15 \rightarrow DSP (39~40).

. 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

16 BLOCK DIAGRAM (Handset)



KX-TG2257BXS BLOCK DIAGRAM (HANDSET)

17 CIRCUIT OPERATION (Handset)

17.1. Construction

The circuit mainly consists of DSP and RF unit as shown in the block diagram.

17.1.1. DSP:IC201

Function

- Battery Low, Power down detect circuit
- Ringer Generation
- Interface circuit

RF unit, speaker, mic, LED, Key scan, LCD, Headset

17.1.2. RF unit

Mainly voice signal is modulated to RF, or it goes the other way.

17.1.3. EEPROM: IC202

All setting data is stored.

ex: ID code, user setting (Flash Time, Tone/Pulse)

17.2. Power Supply Circuit

Voltage is supplied separately to each block.

Circuit Diagram (Handset Power)



17.3. Charge Circuit

Ni-Cd battery is connected to (BATT+, BATT-). 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.

17.4. Ringer and Handset SP-Phone

DSP (29-31) \rightarrow SP/RINGER



17.5. Sending Signal

The voice signal from the microphone input to DSP (46-47). CN203 is the headphone jack. When the headphone is connected, the Q206 detect it. The input from the microphone of the handset (MIN, MIP) is cut and the microphone signal from the headphone is input to DSP (36). Also the power for the microphone is supplied from Q211, and the power is turned OFF on standby.



Note: DSP is IC201. See CPU DATA (Handset) (P.66).

Circuit Diagram

17.6. Reception Signal

The voice signal from the base unit is output to DSP (33) (HSSOUT). This signal is led to the headset jack (CN203) and DSP (44) (HSMIP). The signal input to DSP (44) is inverted and output to DSP (34) (LOUTO). The signal through the headset jack is inverted, then output from DSP (34) to drive the speaker. When the headset is inserted to the jack, the voice signal is cut at the jack, so the sound does not come out from the speaker, but from the headset only.



Circuit Diagram

18 CPU DATA (Base Unit)

18.1. IC201

Pin	Description	I/O	High	High_Z	Low		Pin	Description	I/O	High	High_Z	Low
1	LINE_SZ	D.O	On		Off		51	XOUT	A.O			
2	RLY	D.O	On		Off		52	XIN	A.I			
3	CHAGEG_CTL	D.O		Charge	Non Charge		53	GND	GND			GND
4	SEG3	D.O			Normal		54	RSTN	D.I	Normal		Reset
5	SEG4	D.O			Normal		55	PDN	D.I	Power On		Power Down
6	SEG5	D.O			Normal		56	CE	D.O	Not		Active
7	SEG6	D.O			Normal		57	TXOUT	D.O	High		Low
8	SEG7	D.O			Normal		58	RXGAIN	D.I	HIGH_GAIN		LOW_GAIN
9	SEG8	D.O			Normal		59	ALE	D.O	High		Low
10	SEG9	D.O			Normal		60	CLE	D.O	High		Low
11	SEG10	D.O			Normal		61	NC	D.O			Normal
12	SEG11	D.O			Normal		62	RSTH	D.O	Normal		Wakeup
13	SEG12	D.O			Normal		63	RXEN	D.O	Enable		Disable
14	vcc	VCC	Vcc				64	TXEN	D.O	Enable		Disable
15	GND	GND			GND		65	SHCTRL	D.O	High		Low
16	COM2	D.O			Normal		66	RXI	D.I	High		Low
17	COM1	D.O			Normal		67	UART_RX	D.I	High		Low
18	STB5	D.O	Active	Not			68	UART_TX	D.O	High		Low
19	STB4	D.O	Active	Not			69	INUSE_LED	D.O		Off	On
20	STB3	D.O	Active	Not			70	SP_LED	D.O		Off	On
21	STB2	D.O	Active	Not			71	Tr_Ctrl	D.O	STOP		Normal
22	STB1	D.O	Active	Not			72	GND	GND			GND
23	SIOD0	D.O					73	VCC	VCC	VCC		
24	SIOALE	D.O				-	74	CHARGE_DET	D.I	Off Charge		On Charge
25	SIOCLK	D.O					75	TCK	D.O			
26	RESET	D.O			Normal		76	TMS	D.O			
27	BELL	D.I	Off		On		77	TDI	D.I			
28	GND	GND			GND		78	TDO	D.O			
29	I SPP	A.O					79	MSG_LED	D.O		Off	On
30	GNDPA	GND			GND		80	ANSWER_LED	D.O		Ott	On
31	SPN	A.O					81	WP	D.O	Not		Active
32		VCC	VCC				82	KIN6	D.I	Key In		Non
33	HSSPOUT	A.O					83	KIN5	D.I	Key In		Non
34		A.O					84	KIN4	D.I	Key In		Non
35	DCINO	A.I					85	KIN3	D.I	Key In		Non
36	LINO	A.I					86	KIN2	D.I	Key In		Non
37	LGSO	A.I					87	KIN1	D.I	Key In		Non
38		A.I					88	107	D.O	High		Low
39		A.I					89	106	D.O	High		Low
40							90	105	D.O	High		Low
41		VCC	VCC				91	104	D.O	High		Low
42		A.I					92	103	D.O	High		Low
43	GNDA	GND			GND		93	102	D.O	High		
44		A.I					94		D.O	High		LOW
45		A.U					95			High		
40		A.I					96					GND
47							9/			VUU	 NI-+	 A ative
48							98		D.U			Active
49					GND		199		0.0	Linh Dours	ΙΝΟΣ	
50	VUUPLL	VUU]		FOIRE	D.O	Hign Power		Low Power

KX-TG2257BXS

19 CPU DATA (Handset)

19.1. IC201

Pin	Description	I/O	High	High_Z	Low	Pin	Description	I/O	High	High_Z	Low
1	NC	D.O			Normal	51	XOUT	A.O			
2	NC	D.O			Normal	52	XIN	A.I			
3	UART_RX	D.I	High		Low	53	GND	GND			GND
4	UART_TX	D.O	High		Low	54	RSTN	D.I	Normal		Reset
5	LCD POWER_SW	D.O	Off		On	55	PDN	D.I	Power On		Power Down
6	KEY STROBE_F	D.O		Not	Active	56	MIC_POWSW	D.O	Bias Off		Bias On
7	KEY STROBE_E	D.O		Not	Active	57	TX0	D.O	High		Low
8	KEY STROBE_D	D.O		Not	Active	58	RXGAIN	D.I	HIGH_GAIN		LOW_GAIN
9	KEY STROBE_C	D.O		Not	Active	59	EEPROM_DO	D.I	High		Low
10	KEY STROBE_B	D.O		Not	Active	60	EEPROM_DI	D.O	High		Low
11	KEY STROBE_A	D.O		Not	Active	61	NC	D.O			Normal
12	NC	D.O			Normal	62	RSTH	D.O	Normal		Wakeup
13	HEADSET_DET	D.I	Headset In		Non	63	RXEN	D.O	High		Low
14	VCC	VCC	Vcc			64	TXEN	D.O	High		Low
15	GND	GND			GND	65	SHCTRL	D.O	High		Low
16	DOT_DB4	D.O	High		Low	66	RXI	D.I	High		Low
17	DOT_DB5	D.O	High		Low	67	EEPROM_CS	D.O	Active		Not
18	DOT_DB6	D.O	High		Low	68	NC	D.O			Normal
19	DOT_DB7	D.O	High		Low	69	LITED LED	D.O	On		Off
20	DOT_E/RD	D.O	Active		Not	70	TALK LED	D.0	Off		On
21	DOT_RW/WR	D.O	Read		Write	71	RADIOEN	D.0	On		Off
22	DOT_RS	D.O	Data		Instruction	72	GND	GND			GND
23	SIODO_RF	D.O	High		Low	73	VCC	VCC	VCC		
24	SIOLE_RF	D.O	Latch		Latch	74	CHAGE DET	D.I	Off Charge		On Charge
25	SIOCLK_RF	D.O	High		Low	75	тск	D.O	_		_
26	NC	D.O			Normal	76	TMS	D.O			
27	DOT_RESET	D.O	Not		Reset	77	TDI	D.I			
28	GND	GND			GND	78	TDO	D.O			
29	SPOUTP	A.O				79	RECHAGE LED	D.O	Off		On
30	GNDPA	GND			GND	80	INTLED	D.O	Off		On
31	SPOUTN	A.O				81	NC	D.O	Normal		
32	VCCPA	VCC	VCC			82	KEYIN_5	D.I	Non		Key In
33	HSSPOUT	A.O				83	KEYIN_4	D.I	Non		Key In
34	LOUT0	A.O				84	KEYIN_3	D.I	Non		Key In
35	DCIN0	A.I				85	KEYIN_2	D.I	Non		Key In
36	LIN0	A.I				86	KEYIN_1	D.I	Non		Key In
37	LGS0	A.I				87	NC	D.O	Normal		
38	CIDO0	A.I				88	LCD_BL	D.O	On		Off
39	CIDIN0	A.I				89	NC	D.O			Normal
40	CIDIP0	A.I				90	NC	D.O			Normal
41	VCCA	VCC	VCC			91	NC	D.Ö			Normal
42	DCIN1	A.I				92	NC	D.O			Normal
43	GNDA	GND			GND	93	NC	D.O			Normal
44	HSMIP	A.I				94	NC	D.O			Normal
45	VRFF	A.O				95	NC	D.O			Normal
46	MIN	A.I				96	GND	GND			GND
47	MIP	A.I				97	VCC	VCC	VCC		
48	RSSI	A.I				98	NC	D.O	Normal		
49	GNDPLL	GND			GND	99	EPP_CLK	D.O	High		Low
50	VCCPLL	VCC	vcc			100	POWCTRL	D.O			Normal

20 EXPLANATION OF RF UNIT TERMINALS

20.1. IC101



Pin	Description	I/O	Pi
1	ТХ	O&VCC	17
2	GND_RF	GND	18
3	RX		19
4	VCC_RF	VCC	20
5	VCC_BIAS	VCC	21
6	REXT		22
7	TESTP	0	23
8	TESTN	0	24
9	VCC_IF	VCC	25
10	XOUT	XI/XO	26
11	XIN	XI/XO	27
12	VREG	0	28
13	VDD		29
14	RSSI	0	30
15	RSTN		31
16	RXDATA	0	32
			PK

Pin	Description	I/O
17	SHCTRL	
18	VCC_DIG	VCC
19	VCC_PLL1B	VCC
20	VCC_PLL1A	VCC
21	TXEN	I
22	RXEN	I
23	VCC_PLL2B	VCC
24	VCC_PLL2A	VCC
25	RXGAIN	0
26	BCLK	0
27	TXMOD	I
28	SYN_CLK	I
29	SYN_EN	I
30	SYN_DATA	I
31	VDD_PA	I
32	VCC_PA	VCC
PKG	PADDLE_GND	GND

21 HOW TO REPLACE A FLAT PACKAGE IC

21.1. Preparation

- PbF (: Pb free) Solder
- Soldering Iron

Tip Temperature of 662°F ± 50°F (350°C ± 10°C)

Note: We recommend a 30 to 40 Watt soldering iron. An expert may be able to use a 60 to 80 Watt iron where someone with less experience could overheat and damage the PCB foil.

• Flux

Recommended Flux: Specific Gravity \rightarrow 0.82.

Type \rightarrow RMA (lower residue, non-cleaning type)

Note: See ABOUT LEAD FREE SOLDER (PbF: Pb free) (P.4).

21.2. Procedure

1. Tack the flat pack IC to the PCB by temporarily soldering two diagonally opposite pins in the correct positions on the PCB.



• - - - - - - Temporary soldering point.

Be certain each pin is located over the correct pad on the PCB.

2. Apply flux to all of the pins on the IC.



3. Being careful to not unsolder the tack points, slide the soldering iron along the tips of the pins while feeding enough solder to the tip so that it flows under the pins as they are heated.



21.3. Removing Solder from Between Pins

- 1. Add a small amount of solder to the bridged pins.
- 2. With a hot iron, use a sweeping motion along the flat part of the pin to draw the solder from between the adjacent pads.



22 CABINET AND ELECTRICAL PARTS (Base Unit)



23 CABINET AND ELECTRICAL PARTS (Handset)



24 ACCESSORIES AND PACKING MATERIALS



25 TERMINAL GUIDE OF THE ICs, TRANSISTORS AND DIODES

25.1. Base Unit



25.2. Handset

51 50 31 30 30 30	B	Š	Cathode Anode	Cathode Anode
C2HBBG000063	C0EBF0000157, 2SI UN5117, PQVTDTC14	D1819A, 2SC3930C, 43E, PQVTDTA143TU	MA111 MA8100M MA2ZD1400	PQVDSML310MT
8 15 1 1 1	5 4 HZ 3	A B B B B B B B B B B B B B B B B B B B	A A A A A A A A A A A A A A A A A A A	
PQWIG2257BXR	PQVIMM1385EN	C0CBABD00011	PQVDMD5S	
26 REPLACEMENT PARTS LIST

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 depends on the type of assembly and the laws governing parts and product retention.

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

2. Important safety notice

Components identified by the \triangle mark indicates special characteristics important for safety. When replacing any of these components, only use specified manufacture's parts.

- 3. The S mark means the part is one of some identical parts. For that reason, it may be different from the installed part.
- 4. ISO code (Example: ABS-94HB) of the remarks column shows quality of the material and a flame resisting grade about plastics.
- 5. RESISTORS & CAPACITORS
 - Unless otherwise specified;

All resistors are in ohms (\Omega) K=1000 \Omega, M=1000 k\Omega

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

*Type & Wattage of Resistor

Type

21							
ERC:Solid EF ERD:Carbon EF PQRD:Carbon EF		ERX:Metal Film ERG:Metal Oxide ER0:Metal Film		PQ4R:Carbon ERS:Fusible Resistor ERF:Cement Resistor		esistor esistor	
Wattege							
10,16:1/8W	14,25:1	/4W	12:1/2	W	1:1W	2:2W	3:3W
*Type & Voltage of Capacitor Type							
ECFD:Semi-Conductor ECQS:Styrol PQCUV:Chip ECQMS:Mica		ECCE ECQE ECEA ECQF	ECCD,ECKD,ECBT,PQCBC:Ceramic ECQE,ECQV,ECQG:Polyester ECEA,ECSZ:Electlytic ECQP:Polypropylene			C	
Voltage							
ECQ Type	ECQG ECQV Typ	ECS2	Z Туре		Othe	ſS	
1H:50V 2A:100V 2E:250V 2H:500V	05:50V 1:100V 2:200V	0F:3.1 1A:10 1V:35 0J:6.3	15V V V SV	0J 1A 1C 1E,25	:6.3V :10V :16V :25V	1V :: 50,1H: 1J : 2A :	35V 50V 63V 100V

26.1. Base Unit

26.1.1. CABINET AND ELECTRICAL PARTS

Ref. No.	Part No.	Part Name & Description	Remarks
1	PQAS57P03Y	SPEAKER	
2	PQBC10355Z1	BUTTON, NEW MESSAGE	AS-HB
3	PQBC10357Z1	BUTTON, STOP	ABS-HB
4	PQGG10138Z1	GRILLE	PS-HB

Ref.	Part No.	Part Name & Description	Remarks
NO.			
5	PQGP10206Z1	PANEL, LCD	AS-HB
6	L5DCBCB00009	LIQUID CRYSTAL DISPLAY	
7	PQHR10911Z	SPACER, LCD HOLDER	PS-HB
8	PQHR10914Z	SPACER, LED GUIDE	ABS-HB
9	PQHS10327Z	COVER, LCD TAPE	
10	PQHS10526Z	TAPE, PANEL	
11	PQHS10527Z	TAPE, PANEL	
12	PQHX11129Z	COVER, PANEL SHEET	
13	PQKE10131Z7	HANGER, HOOK LEVER	PC+ABS- HB
14	PQKE10134Z1	HANGER, HOOK KNOB	POM-HB
15	PQKM10547X1	CABINET BODY	PS-HB
16	PQQT22298Y	LABEL, TAM	
17	PQSA10098X	ANTENNA	
18	PQSX10204Z	KEYBOARD SWITCH, DIAL	
19	PQSX10205Z	KEYBOARD SWITCH, TAM	
20	PQUS10285Z	TORSION SPRING, HOOK	
21	PQWE10022Z	BATTERY TERMINAL	
22	PQYF10539X1	CABINET COVER	PS-HB
23	PQGT15355Z	NAME PLATE	

26.1.2. MAIN P.C. BOARD PARTS

Ref.	Part No.	Part Name & Description	Remarks
PCB1	POWPG2257BYH	MATN P C BOAPD ASS Y (PTL)	
PCB1-1	POL P102547	DE INTT	
rebi-i	101102342		
TC100	COCBABD00013		
TC101	COCBABD00017	TC	
TC201	C2HBBG000056	TC	
TC300	POWIG2257BXH		
TC331	POVTPS3432UT	TC	s
TC332	C0EBE0000142	TC	-
		(TRANSISTORS)	
01	25C2120	TRANSISTOR (ST)	s
2- 03	POVT2N6517CA	TRANSISTOR (SI)	s
2 0 04	2SA1625	TRANSISTOR (SI)	s
05	UN5213	TRANSISTOR (SI)	s
2 0 06	2SD1819A	TRANSISTOR (SI)	-
07	2SD1819A	TRANSISTOR (SI)	
£. 050	2SD1819A	TRANSISTOR (SI)	
0102	2SD1819A	TRANSISTOR (SI)	
0104	2SD17580	TRANSISTOR (SI)	s
0105	2SD2136	TRANSISTOR (SI)	-
0108	2SD2136	TRANSISTOR (SI)	
0150	2SD1994A	TRANSISTOR (SI)	
0151	2SD1819A	TRANSISTOR (SI)	
0260	25C3930C	TRANSISTOR (SI)	
~ ~		(DIODES)	
D1	PQVDRLZ2R0	DIODE(SI)	s
D2	PQVDBZ284C20	DIODE(SI)	s
D3	MA111	DIODE(SI)	
D4	PQVDMD5S	DIODE(SI)	
D5	PQVDSS24	DIODE(SI)	
D101	PQVDHRU0302A	DIODE(SI)	s
D102	PQVDHRU0302A	DIODE(SI)	s
D103	MA8039	DIODE(SI)	
D105	PQVDHRU0302A	DIODE(SI)	s
D106	PQVDHRU0302A	DIODE(SI)	S
D107	MA8082	DIODE(SI)	
D110	MA8082	DIODE(SI)	
D152	MA8220	DIODE(SI)	
D153	MA8220	DIODE(SI)	
D202	MA111	DIODE(SI)	
D203	MA111	DIODE(SI)	
LED201	PQVDSML210MT	LED	
LED202	PQVDSML210L	LED	S
LED203	PQVDSML210L	LED	S
LED204	PQVDEL1921SR	LED	
		(COILS)	
L1	PQLQXF330K	COIL	S
L2	PQLQXF330K	COIL	S

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Ref.	Part No.	Part Name & Description	Remarks
NO.	POLOXE3P3K	COTI	
150	PQLQAFSRSK	COLL	S
1150	PQLQZKSKSK		
1200	PQLQZMIOOK		
6200	PQLQR2KA213		
011	DO T T 2 H 0 0 2 7	(CONNECTORS)	
	PQ002H003Z		
7401	2072101507	(CHARGE TERMINALS)	
G401	PQJT101522	CHARGE TERMINAL	
G402	PQJT10152Z	CHARGE TERMINAL	
G405	PQJT10152Z	CHARGE TERMINAL	
3406	PQJT10152Z	CHARGE TERMINAL	
		(COMPONENT COMBINATIONS)	
RA200	EXRV8V104JV	RESISTOR ARRAY	S
RA201	EXRV8V472JV	RESISTOR ARRAY	S
		(VARISTORS)	
SA1	PQVDDSS301L	VARISTOR (SURGE ABSORBER)	S
SA2	PQVDDSS301L	VARISTOR (SURGE ABSORBER)	S
		(RESISTORS)	
R1	ERJ3GEYJ122	1.2k	
R2	ERJ3GEYJ681	680	1
R3	ERJ3GEYJ470	47	1
R5	ERDS1TJ330	33	s
 R7	ERJ3GEVJ393	39k	+
R8	ERITIGEVOROO	0	+
	EP.T3CEV.T100	12	+
D12	EDITO CEVITATO	471	+
NI J		2001-	
x14	ERJ3GEYJ394	2001-	+
K15	ERJ3GEYJ394	390k	
R17	ERJ3GEYJ473	4/K	
R18	ERJ3GEYJ103	10k	_
R19	ERJ3GEYJ563	56k	
R20	ERD25TJ104	100k	S
R21	ERJ3GEYJ103	10k	
R23	D0AF106JA010	10M	
R24	ERJ3GEYJ275	2.7M	
R25	ERJ3GEYJ155	1.5M	
R26	ERJ3GEYJ472	4.7k	
R29	ERJ3GEYJ472	4.7k	
R30	ERJ3GEYJ104	100k	
R31	ERJ3GEYJ104	100k	
R50	ERJ3GEYJ102	lk	
 R51	ERJ3GEV.1470	47	
852	ERI3CEV.T204	3901	
NJ4	ERUJGEIUJ94	11	
K))	ERUSGEYJ102		-
K5/	ERJ3GEY0R00		
K/U	ERJ3GEYJ392	3.9K	
к91	PQ4R10XJ102		S
R100	PQ4R10XJ102	lk	S
R102	ERJ3GEYJ224	220k	
R104	ERJ3GEYJ473	47k	
R105	ERJ3GEYJ103	10k	
R107	PQ4R10XJ471	470	s
R108	PQ4R10XJ102	lk	S
R109	ERJ3GEYJ683	68k	
R112	ERJ3GEYJ273	27k	
R114	PQ4R10XJ102	lk	S
R116	ERJ3GEY0R00	0	
R117	ERJ3GEY0R00	0	1
R118	ERJ3GEV.T102	lk	+
R150	ERJ3GEV.T104	100k	+
2151	FP.T3CEV.TEC1	560	+
0150	ED TO CET TO 21	330	+
152	ERUSGEIUSSI	27	
K153	ERJ3GEYJ270	21	
R154	ERJ3GEYJ270	27	
R155	ERJ3GEYJ270	27	_
R156	ERJ3GEYJ330	33	_
R157	ERDS1TJ221	220	S
R159	ERJ3GEYJ103	10k	
R160	ERJ3GEYJ563	56k	
R161	ERJ3GEYJ563	56k	
R200	ERJ3GEYJ101	100	
R201	ERJ3GEYJ101	100	
R203	ERJ3GEYJ473	47k	+

Ref.	Part No.	Part Name & Description	Remarks
R204	EBJI3GEYJI271	270	
R205	ERJ3GEYJ391	390	
R206	ERJ3GEYJ821	820	
R207	ERJ3GEYJ181	180	
R212	ERJ3GEYJ102	lk	
R213	ERJ3GEYJ102	1k	
R214	ERJ3GEYJ102	1k	
R215	ERJ3GEYJ122	1.2k	
R216	ERJ3GEYJ122	1.2k	
R217	ERJ3GEYJ394	390k	
R210	ERUSGEIUIZS	10k	
R222	ERJ3GEYJ333	33k	
R223	ERJ3GEYJ222	2.2k	
R224	ERJ3GEYJ394	390k	
R227	ERJ3GEYJ222	2.2k	
R230	ERJ3GEY0R00	0	
R231	ERJ3GEY0R00	0	
R232	ERJ3GEY0R00	0	
R233	ERJ3GEY0R00	0	
R234	ERJ3GEY0R00	0	
R251	ERJ3GEYJ102	1k	
R252	ERJ3GEYJ102	170	
K20U ₽261	ERUSGEYJ4/1	470	
R262	ERI3GEV.T104	100k	
R263	ERJ3GEV.T101	100	
R264	ERJ3GEYJ182	1.8k	
R300	ERJ3GEYJ104	100k	
R301	ERJ3GEYJ103	10k	
R400	ERJ3GEYJ332	3.3k	
R430	ERJ3GEYJ121	120	
R431	ERJ3GEYJ121	120	
R432	ERJ3GEYJ121	120	
R433	ERJ3GEYJ102	1k	
R434	ERJ3GEYJ121	120	
R435	ERJ3GEYJ121	120	
R436	ERJ3GEYJ121	120	
R437	ERJ3GEYJ121	120	
R438	ERJ3GEYJ121	120	
R439	ERJ3GEYJ121	120	
R440 D000	ERUSGEIUIZI	100	
C61	ERUSGEIUIUI	0	
J201	ERJ3GEYJ472	4.7k	
J202	ERJ3GEY0R00	0	
L203	PQ4R10XJ000	0	s
L204	PQ4R10XJ000	0	s
		(CAPACITORS)	
C1	ECEA1CKA100	10	
C3	ECUV1C473KBV	0.047	
C4	ECUV1H101JCV	100p	
C6	ECUV1H103KBV	0.01	
C8	ECEA1HKA010		
C9	ECUV1H103KBV	0.01	S
C11	ECUV1H681JCV	680p	S
C12	ECUVIH681JCV	0.001	2 C
C14	ECUVIHIU2KBV	0.001	۵
C15	POCUV1A684KB	0.68	
C16	POCUV1H154KR	0.15	
C17	PQCUV1H154KR	0.15	
C18	ECKD2H681KB	680p	s
C19	ECKD2H681KB	680p	s
C55	ECUV1H102KBV	0.001	s
C58	ECUV1C104KBV	0.1	
C70	EEE0JA220SR	22	
C100	ECUV1C104ZFV	0.1	
C101	EEE0JA101SP	100	
C103	ECEA0JU102	1000	
C105	PQCUV1C334KB	0.33	
C106	ECUV1C104ZFV	0.1	
C107	EEE0JA220SR	22	

Ref. No.	Part No.	Part Name & Description	Remarks
C108	EEE0JA101SP	100	
C109	ECUV1H103KBV	0.01	S
C110	ECUV1C104ZFV	0.1	
C112	EEE1AA101SP	100	
C114	ECEA1CK101	100	S
C120	ECEA1EU101	100	S
C150	ECUV1C104ZFV	0.1	
C200	ECUV1C104ZFV	0.1	
C201	ECUV1H681JCV	680p	S
C207	ECUV1C104ZFV	0.1	
C213	ECUV1C104ZFV	0.1	
C214	ECUV1H101JCV	100p	
C215	ECUV1H101JCV	100p	
C216	ECUV1H101JCV	100p	
C217	ECUV1H101JCV	100p	
C218	ECUV1H101JCV	100p	
C219	ECUV1H101JCV	100p	
C220	ECUV1H101JCV	100p	
C222	ECUV1H101JCV	100p	
C223	ECUV1H101JCV	100p	
C227	ECUV1H050CCV	5p	
C228	ECUV1H050CCV	5p	
C230	EEE1CA100SR	10	
C231	ECUV1C104ZFV	0.1	
C232	ECUV1H101JCV	100p	
C233	ECUV1H101JCV	100p	
C234	ECUV1H103KBV	0.01	s
C235	ECUV1H103KBV	0.01	-
C236	FCIIV1H103KBV	0.01	
C230	EFF1CA100SP	10	
C237	FCIIVI H102KBV	0.01	c
C230	ECUVINIOSKOV	220	5
C239	ECEAUJUSSI	0 1	
C241 C241	ECUVICIO42FV	0.0027	
0242	ECUVIH2/2KBV	0.1	
C244	ECUVICI04KBV	0.1	-
C245	ECUVIHI21JCV	120p	
C250	ECUVIC473KBV	0.047	
C251	ECUV1C104ZFV	0.1	
C252	ECUV1C104ZFV	0.1	
C260	ECUV1C104ZFV	0.1	
C261	ECUV1H030CCV	3p	
C262	ECUV1C104KBV	0.1	
C263	ECUV1C104KBV	0.1	
C300	ECUV1H101JCV	100p	
C301	ECUV1H101JCV	100p	
C302	ECUV1H101JCV	100p	
C303	ECUV1H101JCV	100p	
C304	ECUV1H101JCV	100p	
C305	ECUV1H101JCV	100p	
C306	ECUV1H101JCV	100p	
C307	ECUV1H101JCV	100p	
C308	ECUV1C104ZFV	0.1	
C309	ECUV1C104ZFV	0.1	
C310	ECUV1H101JCV	100p	
C311	ECUV1H101JCV	100p	
C312	ECUV1H101JCV	100p	
C313	ECUV1H101JCV	100p	
C315	ECUV1H101JCV	100p	
C400	ECUV1H010CCV	1p	
C401	ECUV1H103KBV	0.01	s
C402	ECUV1C1047.FV	0.1	
C404	ECUV1H101.TCV	100p	
C405	ECIIVI H330 TOV	33n	
C405	FCIIVI H101 TOT	1005	+
0407	BOINT HI OL TOT	100-	
0407	ECOVIHIUIJCV	100-	
0408	ECOVIHIUIJCV	100-	
C409	ECUVIH101JCV	100 0 0 0 0 0	
C410	ECUVIH101JCV	100p	
C411	ECUV1H101JCV	100p	
C412	ECUV1H101JCV	100p	
C415	EEE0JA220SR	22	
C416	ECUV1H070CCV	7p	
C420	ECUV1H101JCV	100p	

			KX-TG2
Ref. No.	Part No.	Part Name & Description	Remarks
C421	ECUV1H101JCV	100p	
C422	ECUV1H101JCV	100p	
C430	ECUV1H471JCV	470p	
C450	ECEA0JKA101	100	
C453	ECUV1H030CCV	3p	
C723	ECUV1C823KBV	0.082	
		(OTHERS)	
E1	L0CBAB000044	MICROPHONE	
E2	PQMG10023Z	SPACER, MIC	
POS1	PQRPAR390N	THERMISTOR	S
X200	H0J819400004	CRYSTAL OSCILLATOR	

26.2. Handset

26.2.1. CABINET AND ELECTRICAL PARTS

Ref. No.	Part No.	Part Name & Description	Remarks
101	PQAS3P07Y	SPEAKER	
102	PQAX3P27Z	SPEAKER, RECEIVER	
103	PQBC10356Z1	BUTTON, NAVI	ABS-HB
104	PQBX10356Z1	BUTTON, ON / OFF	ABS-HB
105	PQGT15356Z	NAME PLATE	
106	PQHE10121Z	SPACER, BATTERY	
107	PQHG10589Y	SPACER, SP RUBBER SHEET	
108	PQHR10778Z	GUIDE, SPEAKER	ABS-HB
109	PQHR10855Z	GUIDE, SPEAKER	ABS-HB
110	PQHR10912Z	GUIDE, LCD	ABS-HB
111	PQHS10457Z	COVER, SPEAKER NET	
112	PQQT22481Z	LABEL, PRODUCTION	
113	PQHX11005Z	COVER, LCD SHEET	
114	PQJT10176Z	BATTERY TERMINAL (L)	
115	PQJT10177Z	BATTERY TERMINAL (R)	
116	PQKE10342Z1	COVER, EARPHONE CAP	
117	PQKF10558Z1	CABINET COVER	ABS-HB
118	PQKK10127Z1	LID, BATTERY	ABS-HB
119	N4HKGMA00002	BATTERY	
120	PQSA10125Z	ANTENNA	
121	PQSX10208W	KEYBOARD SWITCH, DIAL	
122	L5DCBDC00005	LIQUID CRYSTAL DISPLAY	
123	PQJC10050Z	BATTERY TERMINAL	
124	PQQT22488Z	LABEL, BATTERY	
125	PQKM10551R1	CABINET BODY	ABS-HB
126	PQHS10470Z	SPACER, LCD	
127	PQHS10535ZA	TAPE, GRILLE	
128	PQGG10139Z1	GRILL	ABS-HB
129	PQHS10528ZA	TAPE, PANEL	
130	PQGP10207X1	PANEL, LCD	AS-HB
131	PQHX11152Z	INSULATOR, PET SHEET	

26.2.2. MAIN P.C. BOARD PARTS

Ref. No.	Part No.	Part Name & Description	Remarks
PCB100	PQWPG2257BXR	MAIN P.C.BOARD ASS'Y (RTL)	
PCB100- 1	PQLP10254Z	RF UNIT	
		(ICs)	
IC201	C2HBBG000063	IC	
IC202	PQWIG2257BXR	IC	
IC203	C0CBABD00011	IC	
IC204	PQVIMM1385EN	IC	S
IC205	C0EBF0000157	IC	
		(TRANSISTORS)	
Q201	PQVTDTC143E	TRANSISTOR (SI)	S
Q202	PQVTDTC143E	TRANSISTOR (SI)	S
Q203	UN5117	TRANSISTOR (SI)	
Q204	2SC3930C	TRANSISTOR (SI)	
Q205	2SD1819A	TRANSISTOR (SI)	
Q206	PQVTDTC143E	TRANSISTOR (SI)	S
Q207	2SD1819A	TRANSISTOR (SI)	

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Ref.	Part No.	Part Name & Description	Remarks
0211	POVTDTA143TU	TRANSISTOR (SI)	
x	x , 1	(DIODES)	
D201	MA2ZD1400	DIODE(SI)	
D203	MA111	DIODE(SI)	
D206	PQVDMD5S	DIODE(SI)	
D211	MA8100M	DIODE(SI)	
D214	MA111	DIODE(SI)	
D215	MA2ZD1400	DIODE(SI)	
D216	MA111	DIODE (SI)	
LED201	PQVDSML310MT	LED	S
LED202	PQVDSML310MT	LED	S
LED203	PQVDSML310MT	LED	S
LED204	PQVDSML310MT	LED	S
LED205	PQVDSML310MT	LED	S
LED206	PQVDSML310MT	LED	S
LED207	PQVDSML310MT	LED	S
		(COILS)	
L203	J0JCC0000186	COIL	
R242	PQLQR4RB601D	COIL	
R243	POLOR4RB601D	COIL	
		(CONNECTORS)	
CN201	PQJS22A12Z	CONNECTOR	s
CN203	POJJ1J0077	JACK	s
	- *********	(CHARGE TERMINALS)	-
BATT1	POTT101527	CHARGE TERMINAL	
BATT?	POJTT101527	CHARGE TERMINAL	
G1	POJTT101527	CHARGE TERMINAL	
G3	POJTT101527	CHARGE TERMINAL	
G4	PO.TT101527	CHARGE TERMINAL	
G4 C6	PQ01101522	CHARGE TERMINAL	-
90	FQ01101522	(DESTSTORS)	
D201	ED TO CEV TO OI	(RESISIONS)	+
R201	ERUSGEIUSSI	220	
R202	ERUSGEIUSSI	330	
R203	ERUSGEIUSSI	330	-
R204	ERJ3GEYJ331	330	
R205	ERJ3GEYJ271	270	_
R206	ERJ3GEYJ271	270	-
R207	ERJ3GEYJ271	270	-
R209	ERJ3GEYJ102	lk	_
R210	ERJ3GEYJ103	10k	_
R211	ERJ3GEYJ103	10k	
R212	ERJ3GEYJ101	100	
R213	ERJ3GEYJ101	100	
R217	ERJ3GEYF434	430k	S
R218	ERJ3GEYF824	820k	S
R222	ERJ3GEYJ101	100	
R223	ERJ3GEYJ101	100	
R224	ERJ3GEYJ103	10k	
R225	ERJ3GEYJ472	4.7k	
R228	ERJ3GEYJ224	220k	
R229	ERJ3GEYJ102	lk	
R230	ERJ3GEYJ102	1k	
R231	ERJ3GEYJ102	lk	
R232	ERJ3GEYJ103	10k	
R233	ERJ3GEY0R00	0	
R234	ERJ3GEYJ225	2.2M	
R235	ERJ3GEYJ225	2.2M	
R236	ERJ3GEYJ473	47k	
R244	ERJ3GEYJ473	47k	
R245	ERJ3GEYJ103	10k	
R246	ERJ3GEYJ153	15k	
R247	ERJ3GEYJ391	390	
R248	ERJ3GEVITA	39k	+
R249	ERJ3GEV.T122	1.2k	+ 1
R250	ER.T3CEV.T122	1.2k	+ - 1
D252	EROSGEIUIZZ	2.24	+
P260	ED.TSCEV.TIOS	104	+
R200	ERUSGEIULUS	102	
K405	ERUSGEYUIUS	1001-	
KZ/U	ERJ3GEYJ104	100K	
R276	ERJ3GEYJ471	4/0	
R277	ERJ3GEYJ471	470	
R278	ERJ3GEYJ104	100k	
R279	ERJ3GEYJ101	100	

Ref.	Part No.	Part Name & Description	Remarks
No.			
R280	ERJ3GEYJ182	1.8k	
R281	ERJ3GEYJ104	100k	
R302	ERJ3GEYJ180	18	
R303	ERJ3GEYJ180	18	
R306	ERJ3GEYJ104	100k	
R318	ERIT3GEVIT331	330	
D210	ED.130EV.1221	220	
R319	ERUSGEIUSSI	330	
R320	ER03GE10331	330	
R321	ERJ3GEYJ331	330	
R322	ERJ3GEYJ331	330	
R323	ERJ3GEYJ331	330	
R324	ERJ3GEYJ331	330	
C301	ERJ3GEY0R00	0	
L209	PQ4R10XJ000	0	S
		(CAPACITORS)	
C203	ECUV1C104ZEV	0.1	
0205	ECUV101011CV	1000	
C205	ECOVIAIOIDCV		
C206	ECUVICI04KBV	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	EEE0JA101SP	100	
C214	ECHV1C1047EV	0 1	
C21E	ECITV13474ZEV	0.47	
C215	ECUVIA4/4KBV	0.1	
C217	ECUV1C104ZFV	0.1	
C218	ECUV1C104ZFV	0.1	
C220	EEE0JA101SP	100	
C221	ECUV1C104ZFV	0.1	
C222	ECUV1C104ZFV	0.1	
C223	ECST0JY106	10	
C224	ECUV1C104ZEV	0.1	
C225	ECUVIA105ZEV	1	
0225	BCUVIAI052FV		
C220	ECOVICI042FV		
C227	ECUVICI042FV	0.1	
C228	ECUV1C104ZFV	0.1	
C229	ECUV1A105ZFV	1	
C230	ECUV1E333KBV	0.033	
C231	ECUV1A224KBV	0.22	
C232	ECUV1E333KBV	0.033	
C233	ECUV1A105ZFV	1	
C234	ECUV1A224KBV	0.22	
0236	ECUV1H050CCV	5.22 5	
0230	ECOVINOSOCCV	5p	
C237	ECUVIH050CCV	sp	
C239	ECUV1C104ZFV	0.1	
C242	ECUV1C104ZFV	0.1	ļ
C243	ECUV1H103KBV	0.01	
C244	ECUV1C104ZFV	0.1	
C255	ECUV1A224KBV	0.22	
C257	ECST0JY226	22	
C262	ECUV1A105ZFV	1	1
C267	ECST0.TX226	22	
C270	ECST0.TV475	4 7	
0270			
C2/4	ECUVICI04ZFV		
C277	ECUVIC823KBV	0.082	
C280	ECUV1C104ZFV	0.1	
C282	ECUV1C104ZFV	0.1	
C285	ECUV1C105ZF	1	
C291	ECUV1C104ZFV	0.1	
C294	ECUV1C104ZFV	0.1	
C296	ECUV1H102KBV	0.001	s
C297	ECUV1H471.TCV	470p	-
(200	ECIN/14101 707	100	
C298	ECOVIHIUIJCV	1000	
C299	ECUV1H101JCV	Tunb	
C303	ECST0JY106	10	
C304	ECUV1C104ZFV	0.1	
C305	ECUV1H030CCV	3p	
C306	ECUV1C104ZFV	0.1	
C307	ECUV1C104KBV	0.1	
C308	ECUV1H030CCV	30	
C309	FCIIV1C104VBV	0 1	
~~~~	TTCOATCTOAKDA	1	

Ref. No.	Part No.	Part Name & Description	Remarks
C315	ECUV1H030CCV	3p	
C316	ECUV1H221JCV	220p	
C317	ECUV1H010CCV	1p	
L201	ECUV1H010CCV	1p	
		(OTHERS)	
E101	L0CBAB000044	MICROPHONE	
RA201	EXRV8V104JV	RESISTOR ARRAY	S
X201	H0J819400004	CRYSTAL OSCILLATOR	

# 26.2.3. ACCESSORIES AND PACKING MATERIALS

Ref. No.	Part No.	Part Name & Description	Remarks
A1	PQJA10075Z	CORD, TELEPHONE	
A2	PQKE10341Z1	HANGER, BELT CLIP	PC+ABS- HB
A3	PQKL10035Z3	STAND, WALL MOUNT ADAPTOR	ABS-HB
A4	PQLV1BXZ	AC ADAPTOR	$\triangle$
A5	PQQW12672Z	QUICK GUIDE (for Arabic)	
A6	PQQX13394Z	INSTRUCTION BOOK	
P1	PQPP170Y	PROTECTION COVER (for Base Unit)	
P2	XZB10X35A02	PROTECTION COVER (for Handset)	
P3	PQPK13766Z	GIFT BOX	

# 27 FOR SCHEMATIC DIAGRAM

## 27.1. Base Unit (SCHEMATIC DIAGRAM (Base Unit))

#### Note:

- 1. DC voltage measurements are taken with voltmeter from the negative voltage line.
- 2. This schematic diagram may be modified at any time with the development of new technology.

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

## 27.2. Handset (SCHEMATIC DIAGRAM (Handset))

#### Note:

- 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.

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# 28 SCHEMATIC DIAGRAM (Base Unit)





KX-TG2257BXS SCHEMATIC DIAGRAM (Base Unit)

# 29 SCHEMATIC DIAGRAM (Handset)





KX-TG2257BXS SCHEMATIC DIAGRAM (Handset)

## **30 SCHEMATIC DIAGRAM (RF Unit)**

* When either Vpow or Vpow2 is in use, the other is out of use.



KX-TG2257BXS SCHEMATIC DIAGRAM (RF Unit)

# 31 CIRCUIT BOARD (RF Unit)



KX-TG2257BXS

KX-TG2257BXS

31.1. MEMO

## 32 CIRCUIT BOARD (Base Unit)

32.1. Component View





KX-TG2257BXS CIRCUIT BOARD (Flow Solder Side View (Base Unit))

## 33 CIRCUIT BOARD (Handset)

33.1. Component View



KX-TG2257BXS

KX-TG2257BXS CIRCUIT BOARD (Component View (Handset))



KX-TG2257BXS CIRCUIT BOARD (Flow Solder Side View (Handset))

H.M KXTG2257BXS