

CPX-946/953 software Specification (Caller ID / Caller ID ITAD model)

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Revision History

At 2nd release

Change the indication of “ADJOIN” to “LOCAL”. (P12, 13, 14, 16, 19)

At 3rd release

Update the underline part after Vancouver meeting.

Add stutter tone detection method, etc.

At 4th release

Add section 3.2.4.2 to determine when answering machine is answered.

At 5th release

Add call waiting sound in section 5 and solve the picture problem in section 9.

And fix the order of the character on # key.

0. Description of the difference between Sony's SPP-SS960 and CPX-946

0-1) Volume control of H/S

Implement 3-position slide switch for H/S volume control.

0-2) No one-touch dialing

0-3,4) Redial/Pause & Channel key

Separate the redial and pause function because of the elimination of Channel key.
Assign PAUSE key instead of CHANNEL key.

0-5) Ringer Setting

Suggested new method for ringer setting.
See section 2.1.4 in detail.

0-6) Back lighting

SPP-SS960 has no back lighting for LCD and numeric keys but CPX-946 need this function.

0-7) Changing the number of digits of caller ID data

SPP-SS960 can't change the number of digits but this function must be implemented as a new function. As for the spec, refer section 2.7.

0-8) Memory match ringing

SPP-SS960 has already this function but it may be new for you because SPP-ID910 doesn't have. As for the spec, refer section 7.1.

0-9) Talk time indication

This is new function because SPP-SS960 has no talk time indication.
As for the spec, refer section 3.1.

0-10) **Additional area code (Sub area)**

We would like to implement the possibility that user can set the additional area code corresponding to the recent situation for the division of area code.
As for the spec, refer section 2.1.3 and addendum sheet.

0-11) Viewing of Caller ID list

Need a little bit of modification from SPP-SS960.
The changing point is,
"If user turns around the jog dial in idle mode, indicate Caller ID list."
As for the spec, refer section 2.5 and addendum sheet.

0-12) "EDIT" indication

When modifying the directory data, change the LCD indication from "PGM" to "EDIT". (See section 2.6.3.2 in detail.)

0-13) Visual Message Waiting Indicator (CPX-946 only)

Implement visual message waiting indicator.

See section 7.2 in detail.

0-14) ITAD function (CPX-953 only)

Basically the ITAD function will be same with SPP-A945 except the implementation of slow playback function.

0-15) Reprogramming the security code

As a service matter, implement the way to reprogram the security code.

When EEPROM is replaced at our service center, this function will be useful to resume the link between handset and base.

1 List of switches and LED's (CPX-946)

1.1 BASE

1.1.1 Front keys

- HANDSET LOCATOR ; To page the H/S.

1.1.2 Side switch

- DIAL MODE ; For Tone/Pulse setting

1.1.3 LED's

- SPARE BATTERY ; Red
- CHARGE ; Red
- LINE ; Green
- NEW CALL ; Flash in red while new caller ID data has (500msec on/off)
- MESSAGE ; Flash in red for VMWI (500msec on/off)

1.2 HAND

1.2.1 Front keys

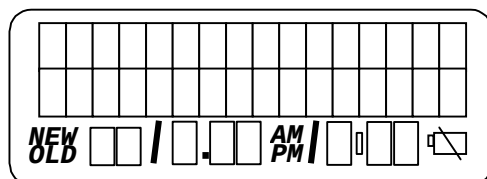
- TALK
- OFF
- FLASH
- 0 9 */TONE #
- PGM
- PAUSE
- REDIAL

1.2.2 Side switches

- JOG DIAL
- VOL SWITCH ; 3 position

1.2.3 Indication

- LCD ; CALLER ID/DIAL MONITOR indication (16 digits of 2 low and characters)



2 Off line operation

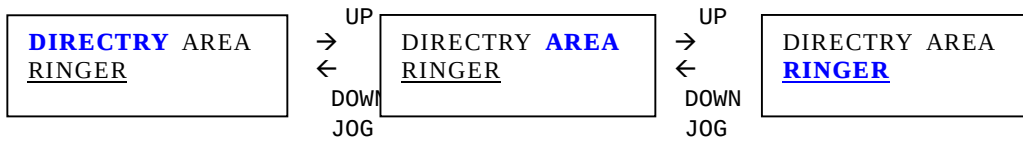
2.1 Programming

Common sense of programming will be described below.

- Store all of the memories in the EEPROM.
- Input duration of each valid key will be 20seconds and send error beep when time out.
- Programming is possible only from the idle mode.
(DIRECTORY will be possible to program from CALLER ID mode.)
- When programming error is occurred, send error beep and go back to the idle mode.
- During sending error beep, only [OFF] and [ON CRADLE] will be available and go back to the idle mode after stopping the error beep on the way.
- Back lighting duration should be 10 seconds and the timer should be updated by valid key input or [JOG] operation.
- When ring or paging has come during programming, this unit will ring but still keep the operation.
(Caller ID indication concomitant with ring will postpone until end of the programming.)
- When [TALK] key was pressed during programming, stop the programming and go to the TALK mode.
And if caller ID data has been received at this moment, indicate the caller ID data for 20 seconds.
- [JOG PUSH] will be treated as a key pressing and the unit sends key beep.
- [JOG UP] means up or right. [JOG DOWN] means down or left.

2.1.1 Programming of DIRECTORY (HAND)

- Indicate "DIRECTORY AREA RINGER" by pressing [PGM].
Initial position of the cursor is "DIRECTORY".
- The cursor moves by [JOG UP] and [JOG DOWN].
- Key input except [JOG PUSH], [JOG UP], [JOG DOWN], [#], [*] and [TALK] will be treated as error and the unit goes back to the idle mode with sending error beep.
- Cancel the programming and go back to the idle mode without sending error beeps when [OFF] key is pressed or handset is put back on the cradle.



2.1.1.1 Programming of DIRECTORY

- The maximum number of the DIRECTORY is 50.

[PGM] → [JOG PUSH] → [DIAL 2] → [DIAL 3] → [DIAL 4]

“**DIRECTRY** AREA” “ENTER NAME” “A” “AD” “ADG”

“RINGER”

[JOG PUSH] → [DIAL 5] → [DIAL 6] → [DIAL 7] → [JOG PUSH]

[PGM] [PGM]

Confirmation beep

“ADG” “ADG” “ADG” “ADG”

“ENTER NUMBER” “5” “56” “567”

Start of the programming

- By pressing [JOG] when cursor is on the "DIRECTORY", "ENTER NAME" will be indicated and unit leads the input of name.
- In case of memory full, indicate "MEMORY FULL" and go back to the idle mode with error beep.

Entering the name

- Key input except [DIAL], [JOG PUSH], [JOG UP], [JOG DOWN], and [TALK] will be regarded as error and the unit goes back to the idle mode with sending error beep.
- Cancel the programming and go back to the idle mode without sending error beeps when [OFF] key is pressed or handset is put back on the cradle.
- Indicate "ENTER NAME" again for [JOG PUSH] before entering any [DIAL].
- No function for [JOG UP] before entering any [DIAL].
- Indicate the following character by Pressing [DIAL].

DIAL 1 = **1**

DIAL 2 = **A → B → C → 2 → A**

DIAL 3 = **D → E → F → 3 → D**

DIAL 4 = **G → H → I → 4 → G**

DIAL 5 = **J → K → L → 5 → J**

DIAL 6 = **M → N → O → 6 → M**

DIAL 7 = **P → Q → R → S → 7 → P**

DIAL 8 = **T → U → V → 8 → T**

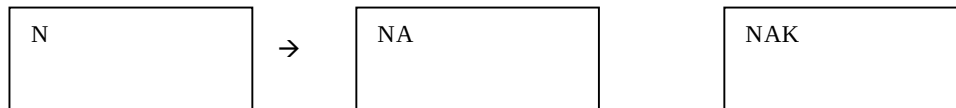
DIAL 9 = **W → X → Y → Z → 9 → W**

DIAL 0 = **0**

DIAL * = *****

DIAL # = **& → ' → , → - → . → # → &** (Fixed at Oct. 23rd.)

- (EX) The indication will be like follows after pressing [DIAL 6] twice, [DIAL 2], then [DIAL 5] twice.



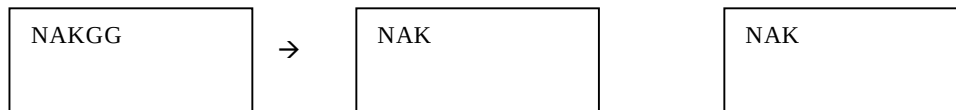
- To enter the same character which assigned on the same button, the cursor must be shift one position by [JOG UP]. The cursor should be blink.

--- The indication will be like follows after pressing [DIAL 4], [JOG UP], then [DIAL 4].



- By [JOG DOWN] operation, shift the cursor to the left and erase the character on the previous position of the cursor.

---After [JOG DOWN] twice, the indication will be like follows.



Entering the telephone number

By [JOG PUSH] after entering the name, the unit will be number programming mode and the indication will be like follows. Erase "ENTER NUMBER" if any dial key is pressed and indicate cursor.



- Key input except [DIAL], [REDIAL/PAUSE], [JOG PUSH], [JOG DOWN], [TALK], and [PGM] will be regarded as error and the unit goes back to the idle mode with sending error beep.
- Cancel the programming and go back to the idle mode without sending error beeps when [OFF] key is pressed or handset is put back on the cradle.
- By [JOG DOWN] operation, shift the cursor to the left and erase the character on the previous position of the cursor.
- Indicate the following character by Pressing [DIAL].

DIAL 1 = **1**
 DIAL 2 = **2**
 DIAL 3 = **3**
 DIAL 4 = **4**
 DIAL 5 = **5**
 DIAL 6 = **6**
 DIAL 7 = **7**
 DIAL 8 = **8**
 DIAL 9 = **9**
 DIAL 0 = **0**
 DIAL * = *****
 DIAL # = **#**
 PAUSE = **P**
 FLASH = **F**

- Shift the indication to the right every time the [DIAL] key is pressed.

NAKAJIMA 123456789

- Valid digit is 32 in maximum.
*, #, PAUSE and FLASH is also counted as a digit.
- When the digit is over the limitation, send error beep.
(Still keep the programming mode and the cursor will stay at the last digit without any changes of indication.)
- The redial data can be programmed at the first press of [REDIAL] in the number programming mode.
- If redial has no data, send the error beep.
(Still keep the programming mode.)
- When 17th digit is entered, the indication will be like follows.

1234567890123456 7

End of the programming

- When pressing [PGM] or [JOG PUSH], the data will be stored in the memory and go back to the idle mode with confirmation beep.
- Indicate “ENTER NUMBER” again for [JOG PUSH] before entering any [DIAL].
- No function for [JOG UP] before entering any [DIAL].
- When [PGM] button is pressed before entering the number, send error beep and go back to the idle mode without storing any data.

(Remarks)

The user would be able to enter a maximum of 50 entries with all 16-digit numbers or a maximum of 25 entries with all 32-digit numbers or any combination in between. With every addition of an entry with 32-digit number the total number of directory entries would be decreased by 1.

2.1.2 Programming of home area code

When no area code is stored, "NO AREA CODE" will be indicated for 20seconds after 1st power on. If status changed, clear the indication.

[PGM] → [JOG UP] → [JOG PUSH] → [JOG PUSH]

“**DIRECTORY** AREA” “**DIRECTORY AREA**” “**HOME** LOCAL” “ENTER AREA CODE”

“RINGER”

“RINGER”

“ “

[DIAL 2] → [DIAL 1] → [DIAL 2] → [JOG PUSH]
[PGM]

Confirmation beep

“ENTER AREA CODE” “ENTER AREA CODE” “ENTER AREA CODE”

“2”

“21”

“212”

Start of the programming

- By [JOG PUSH] when cursor is on the "AREA", the unit will be programming mode of area code and indicates "HOME LOCAL" to choose which area code should be programmed.
- By [JOG PUSH] when cursor is on the "HOME", the unit will be programming mode of home area code and indicates "ENTER AREA CODE".

No programmed

Has been programmed

ENTER AREA CODE

ENTER AREA CODE
212

- Key input except [DIAL], [JOG PUSH], [JOG DOWN], [TALK], and [PGM] will be error and the unit goes back to the idle mode with sending error beep.
- Cancel the programming and go back to the idle mode without sending error beeps when [OFF] key is pressed or handset is put back on the cradle.
- No function for [JOG UP] and [DIAL *, #].
- Only 3 digit will be valid.
- By [JOG DOWN] operation, shift the cursor to the left and erase the character on the previous position of the cursor.

→ Following indication will be after operating [JOG DOWN] twice.



End of programming

- When pressing [PGM] or [JOG PUSH], the data will be stored in the memory and go back to the idle mode with confirmation beep.
- When [PGM] button is pressed before entering 3rd digit, send error beep and go back to the idle mode without storing any data.
- No function for [JOG PUSH] before entering 3rd digit.
- The stored area code will be common on both base and H/S and it will be used for caller-ID indication.

(Comment)

"NO AREA CODE" indication will be adopted only for the home area code.

2.1.3 Programming of additional area code

Can set 5 additional area code to correspond with recent situation for the division of area code.

[PGM] → [JOG UP] → [JOG PUSH] → [JOG UP]

“**DIRECTORY** AREA” “DIRECTORY **AREA**” “**HOME** LOCAL” “HOME **LOCAL**”
“RINGER” “RINGER”

[JOG PUSH] → [JOG UP] → [JOG UP] → [JOG PUSH]

“**#1** #2 #3 #4 #5” “#1 **#2** #3 #4 #5” “#1 #2 **#3** #4 #5” “ENTER AREA CODE”
“201” “432” “ “

[DIAL 7] → [DIAL 1] → [DIAL 5] → [JOG PUSH]
[PGM]

Confirmation beep

“ENTER AREA CODE” “ENTER AREA CODE” “ENTER AREA CODE”
“7” “71” “715”

Start of the programming

- By [JOG PUSH] when cursor is on the "AREA", the unit will be programming mode of area code and indicates "HOME LOCAL" to choose which area code should be programmed.
- By [JOG PUSH] when cursor is on the "LOCAL", the unit will be programming mode of additional area code and indicates "#1 #2 #3 #4 #5".
- User can set 5 additional area code in maximum.

No programmed

Has been programmed

ENTER AREA CODE

ENTER AREA CODE
212

- Key input except [DIAL], [JOG PUSH], [JOG DOWN], [TALK], and [PGM] will be error and the unit goes back to the idle mode with sending error beep.
- Cancel the programming and go back to the idle mode without sending error beeps when [OFF] key is pressed or handset is put back on the cradle.
- No function for [JOG UP] and [DIAL *, #].
- Only 3 digit will be valid.
- By [JOG DOWN] operation, shift the cursor to the left and erase the character on the previous position of the cursor.

→ Following indication will be after operating [JOG DOWN] twice.



End of programming

- When pressing [PGM] or [JOG PUSH], the data will be stored in the memory and go back to the idle mode with confirmation beep.
- When [PGM] button is pressed before entering 3rd digit, send error beep and go back to the idle mode without storing any data.
But when [PGM] button is pressed after erasing all of the character on the previous position of the cursor by [JOG DOWN] operation, the previous data will be erased. (The additional area code should be erasable.)
- No function for [JOG PUSH] before entering 3rd digit.
- The stored area code will be common on both base and H/S and it will be used for caller-ID indication.

2.1.4 Changing the ringer type

Can select a ringer type from four types.

[PGM]	→	[JOG UP]	→	[JOG UP]	→	[JOG PUSH]

" DIRECTORY AREA"	"DIRECTORY AREA "	"DIRECTORY AREA"	"RINGER X"			

" <u>RINGER</u> "	" <u>RINGER</u> "	" <u>RINGER</u> "	"SELECTED"			

[DIAL 1] → [DIAL 2] → [DIAL 3] → [DIAL 4] → [DIAL 0] → [OFF]						
						20sec time out

Generate corresponding ringer tone for pressing [DIAL 1] to [DIAL 4].						

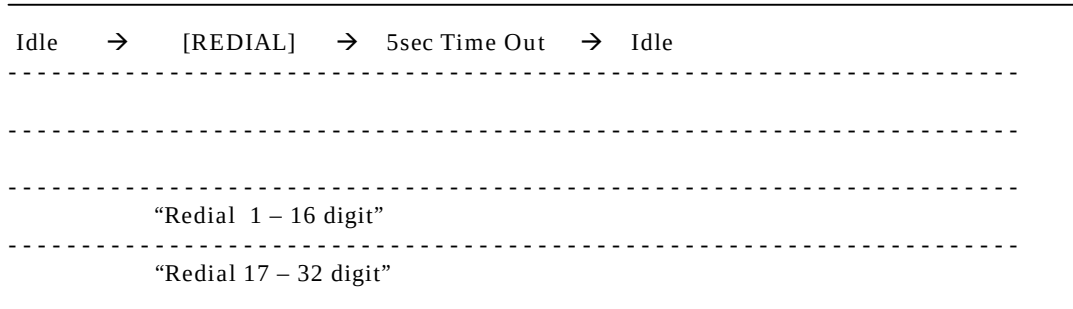
"RINGER 1"	"RINGER 2"	"RINGER 3"	"RINGER 4"	"RINGER OFF"		

"SELECTED"	"SELECTED"	"SELECTED"	"SELECTED"	"SELECTED"		

- By [JOG PUSH] when cursor is on the "RINGER", the unit indicates the present status of the ringer type.
- By pressing a number button, [1] to [4], generate corresponding ringer sound and set the ringer type.
 - When [0] is pressed, set ringer off. In this case only key beep is generated.
 - Key input except [TALK], [PGM] and [OFF] will be ignored.
- By pressing [PGM], [OFF] or 20 second has passed after the last input or handset is put back on the cradle, the unit goes back to the idle mode.

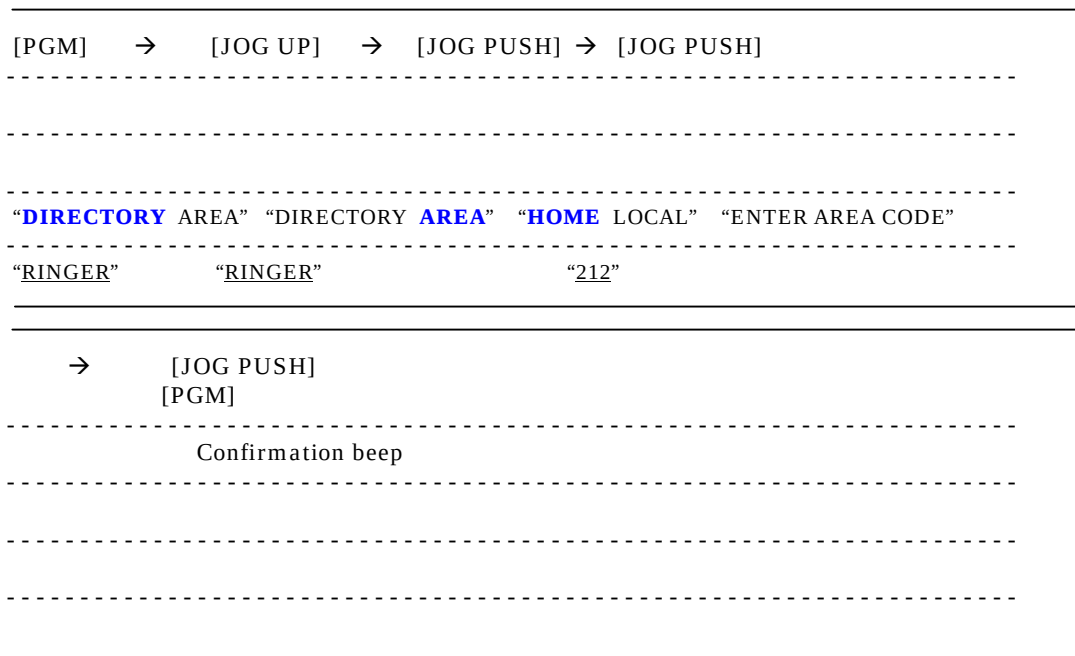
2.2 Confirmation

2.2.1 Redial confirmation



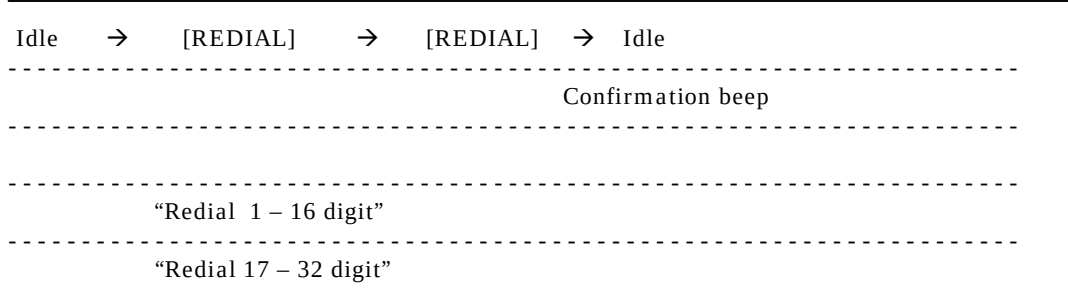
- Indicate the redial number when pressed [REDIAL] at the idle mode.
- It will be indicated for 5 seconds and the unit goes back to the idle mode after that.
- Input of the other key is also valid during the indication and switch to the corresponded status of pressed key.
- If it will be over 16 digits, use 2nd low for 17th to 32nd digit.
- Nothing is indicated when no redial stored.
- When ring has come during indication, switch to the ring tasks.

2.2.2 AREA CODE Confirmation HAND



- AREA CODE can be confirmed only when programming.

2.3 Erasing the redial



Operation

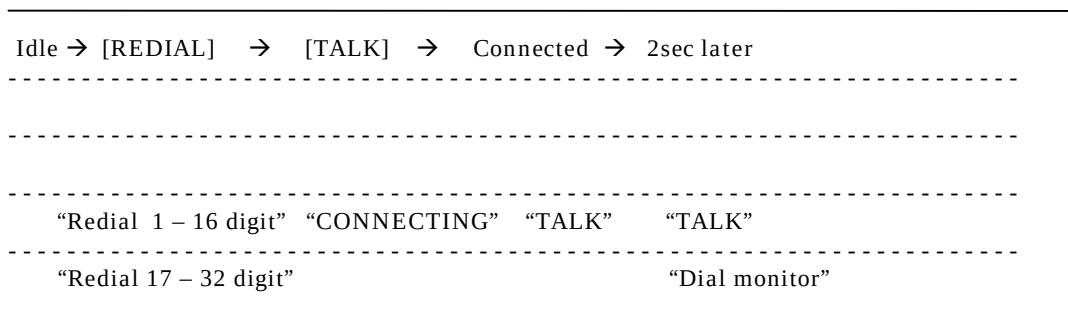
- Redial will be erased when redial key is pressed twice within 5 seconds.
- Erase the redial memory after second press of the key and go back to the idle mode with confirmation beep.
- When 5 seconds has passed before the second press, the unit goes back to the idle mode without any beep.
- Input of the other key is also valid during the indication and switch to the corresponded status of pressed key.
- This function is valid even no memory stored.

2.4 Dialing during confirmation

- Send the dial 2 second has passed after seizing the line.
- When no dial is indicated, only seize the line.

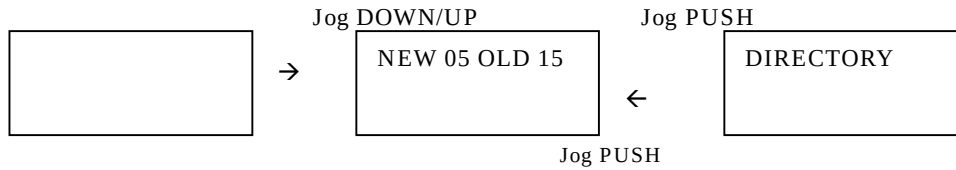
2.4.1 Redialing

HAND



2.5 CALLER ID MEMORY HAND

- By [JOG PUSH], switch between CALLER ID MEMORY and DIRECTORY.



2.5.1 Confirmation of CALLER ID MEMORY

- 20 memories for CALLER ID DATA.
- When ring has come during indication, stop the indication and go to the ringing status.
- Key input except [JOG PUSH], [JOG DOWN/UP], [TALK], and [PGM] will be ignored.
- Cancel the indication and go back to the idle mode with a key beep when [OFF] key is pressed or handset is put back on the cradle.

[JOG DOWN/UP] → [JOG DOWN] → [JOG DOWN] → [JOG DOWN] →

[NEW CALL] blinking

"NEW XX OLD XX"	"Name data 4"	"Name data 3"	"Name data 2"

"Dial data"	"Dial data"	"Dial data"	

[JOG DOWN] → [JOG DOWN] → [JOG UP] → [OFF]

20sec Time Out

(Key beep)

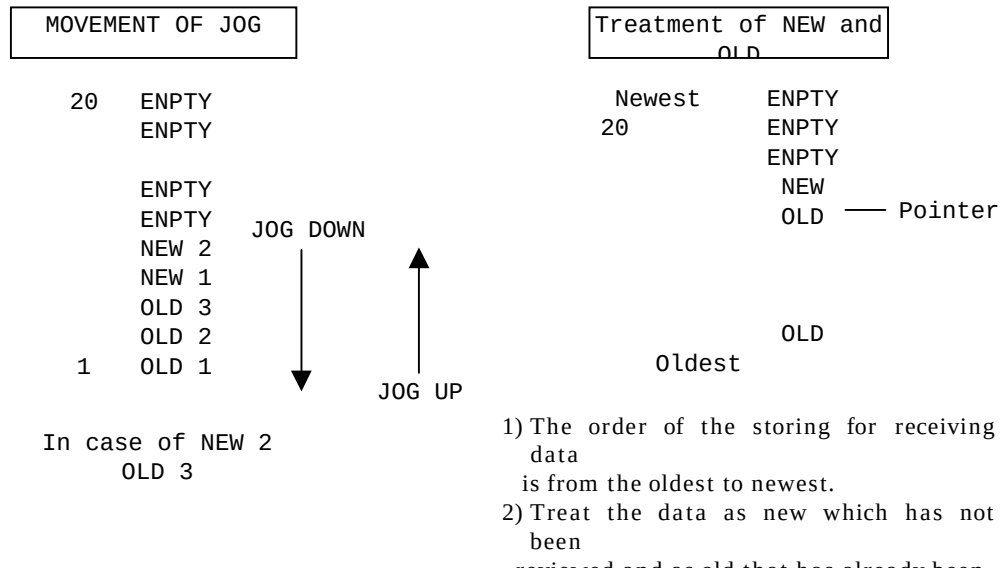
[NEW CALL] off

"Name data 1"	"END OF LIST"	"Name data 1"

"Dial data"	"Dial data"	

- Indicate number of messages by [JOG DOWN/UP].
- 20 seconds time out for no operation.
(Back to the idle mode with key beep.)
- By [JOG DOWN], indicate the data from newest to oldest.
- By [JOG UP], indicate the data from oldest to newest.

How to indicate the data followed by the JOG operation.



- Indicate "END OF LIST" after all data has been reviewed.
- Name data is maximum 15 characters by ASCII.
- By pressing [TALK] during indicating caller ID data, connect the line and send the dial. (Refer 2.4)
If no area code is stored, indicate "NO AREA CODE" and go back to the idle mode with error beep.
- When [PGM] key is pressed during indicating caller ID data, go to the programming mode. If no area code is stored, indicate "NO AREA CODE" and go back to the idle mode with error beep.
- Blinking of [NEW CALL] will implement when there is a new data which has not been reviewed yet and turn off when all data was old.
(500msec ON/OFF)
- If all new data has been reviewed, shift the data to old after going out from Caller ID reviewing mode.
- If some data has not been reviewed, keep all of the new data as unview even after going back to the idle mode.
- Indicate the received Caller ID data like follows.

(DN)

Arrange the indication based on the stored area code data.

Receiving data : 2121234567

Indication when area code matches.

(Out of area) : 1-212-123-4567

Add 1 automatically and insert “-“ like above.

(Same area with home) : 123-4567

No indication of area code and insert “-“.

(Same area with local) : 212-123-4567

10digit indication with “-“.

(DDN)

Indicate the data with no modification but add the “-“.

Receiving data : 12123456789

Indication : 1-212-345-6789

Receiving data : 3456789

Indication : 345-6789

Other indication

Out of Area

Private

Long Distance

- If new call has come when there is no new data and the user has answered to the call, the data should be treated as old because it has already been checked.
- The number of messages for NEW and OLD will be distinguished by the result of user's checking.

It means, if new call has come when there is no new data and the user has answered to the call, the data should be treated as old because it has already been checked.

If new data has already been stored, all of the new call will be treated as new in spite of answered or not.

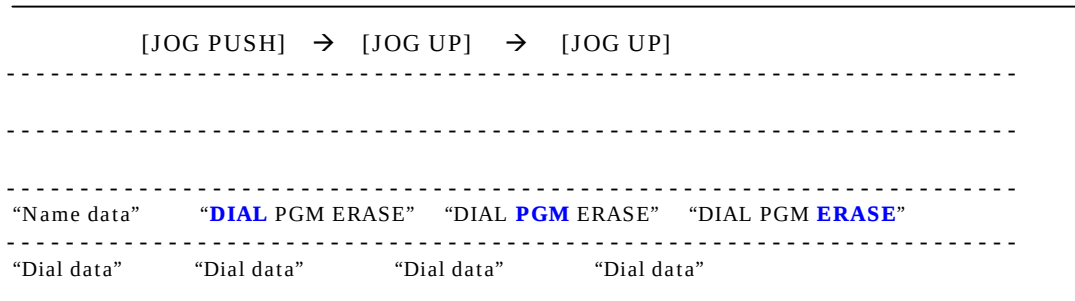
- Indicate the received day and time on the 3rd low.
Use the 12 hour indication.

HAND

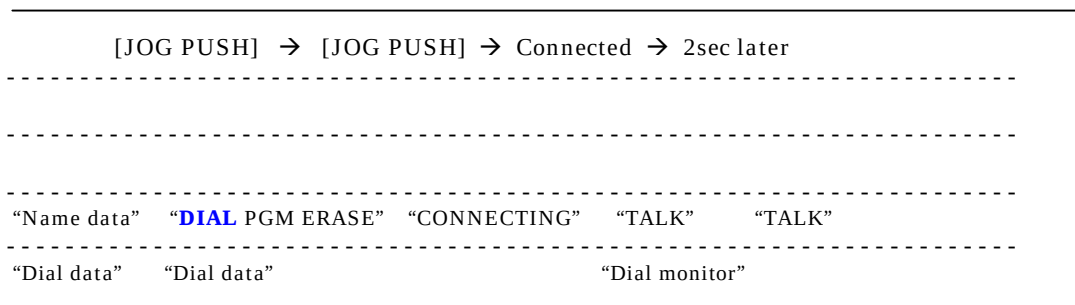
K NAKAJIMA
1-886-226-
3058
NEW

2.5.2 Operation from CALLER ID MEMORY

- By [JOG PUSH] during indicating caller ID data, the data can be dialed, programmed, and erased.
- When ring has come during indication, stop the indication and go to the ringing status.



2.5.2.1 Dialing from CALLER ID DATA (CALL BACK)



- By [JOG PUSH] when cursor is on "DIAL", connect the line and send dialing. If no area code is stored, indicate "NO AREA CODE" and go back to the idle mode with error beep.
- Send the dialing 2 second has passed after seizing the line.

2.5.2.2 Programming of CALLER ID DATA (DIRECTORY)

[JOG PUSH] → [JOG UP] → [JOG PUSH]			

"K NAKAJIMA"	"DIAL PGM ERASE"	"DIAL PGM ERASE"	"K NAKAJIMA"

"1-886-226-3058"	"1-886-226-3058"	"1-886-226-3058"	"18862263058"

[DIAL 1] → [JOG PUSH] → [DIAL 2] → [JOG PUSH]			
[PGM]		[PGM]	

Confirmation beep			

"K NAKAJIMA1"	"K NAKAJIMA1"	"K NAKAJIMA1"	"K NAKAJIMA"

"18862263058"	"18862263058"	"18862263058"	"1-886-226-3058"

- By [JOG PUSH] while cursor is on "PGM", this unit will go to the modification mode of CALLER ID data.
If memory was full, indicate "MEMORY FULL" with error beep and go back to the previous indication.
If no area code is stored, indicate "NO AREA CODE" and go back to the idle mode with error beep.
- Movement of the cursor and character input will be same with 2.1.1.1
- 20 seconds time out for no operation.
(Back to the idle mode with key beep.)
- If name data was nothing, "OUT OF AREA", or "PRAIVATE", indicate "ENTER NAME" at the name entering mode.
- If number data was nothing, "OUT OF AREA", "PRAIVATE", or "LONG DISTANCE", indicate "ENTER NUMBER" at the number entering mode.
- When [OFF] key is pressed during indication, stop the modification and go back to the previous caller ID data indication.
- Cancel the modification and go back to the idle mode with a key beep when handset is put back on the cradle.

2.5.2.3 Erasing of CALLER ID DATA

[JOG PUSH] → [JOG UP] → [JOG UP] →			

“K NAKAJIMA”	“DIAL PGM ERASE”	“DIAL PGM ERASE”	“DIAL PGM ERASE”

“1-886-226-3058”	“1-886-226-3058”	“1-886-226-3058”	“1-886-226-3058”

[JOG PUSH] → [JOG UP] → [JOG PUSH]			

Confirmation beep			

“ERASE NO YES”	“ERASE NO YES”	“Next data” (Older one)	

“1-886-226-3058”	“1-886-226-3058”	“Next data” (Older one)	

- By [JOG PUSH] while cursor is on "ERASE", this unit goes to the erasing mode of caller ID data.
- 20 seconds time out for no operation.
(Back to the idle mode with key beep.)
- When [OFF] key is pressed during above indication, go back to the previous caller ID data indication.
- Cancel the erasing and go back to the idle mode with a key beep when handset is put back on the cradle.
- Go back to the previous indication for caller ID by [JOG PUSH] while the cursor is on "NO".
- Erase the caller ID data by [JOG PUSH] while the cursor is on "YES".
After sending confirmation beep, indicate next data. (Older one)
- When oldest data was erased, next data will be "END OF LIST".

2.5.2.4 Erasing all of CALLER ID DATA

[JOG PUSH] → [JOG UP] → [JOG UP] →			

"K NAKAJIMA"	"DIAL PGM ERASE"	"DIAL PGM ERASE"	"DIAL PGM ERASE"

"1-886-226-3058"	"1-886-226-3058"	"1-886-226-3058"	"1-886-226-3058"

[JOG PUSH] → [JOG UP] → [JOG UP]			

"ERASE NO YES ALL"	"ERASE NO YES ALL"	"ERASE NO YES ALL"	

"1-886-226-3058"	"1-886-226-3058"	"1-886-226-3058"	

[JOG PUSH] → [JOG UP] → [JOG PUSH]			

Confirmation beep			

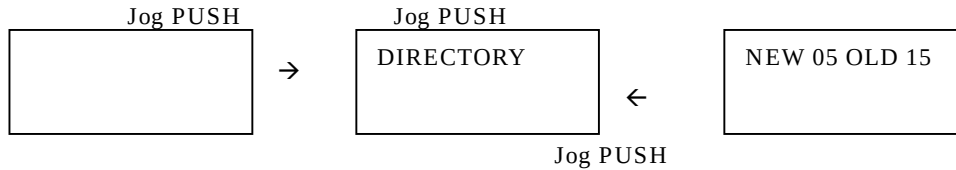
"ALL ERASE NO YES"	"ALL ERASE NO YES"	"NEW 00 OLD 00"	

"1-886-226-3058"	"1-886-226-3058"		

- Only when all of the caller ID data were old, indicate "ERASE NO YES ALL". If it still has new calls, indicate "ERASE NO YES".
- 20 seconds time out for no operation.
(Back to the idle mode with key beep.)
- When [OFF] key is pressed during above indication, go back to the previous caller ID data indication. (without error beep)
- Cancel the erasing and go back to the idle mode with a key beep when handset is put back on the cradle.
- Go back to the previous indication for caller ID by [JOG PUSH] while the cursor is on "NO".
- Erase all of the caller ID data by [JOG PUSH] while the cursor is on "YES". After sending confirmation beep, indicate number of messages.

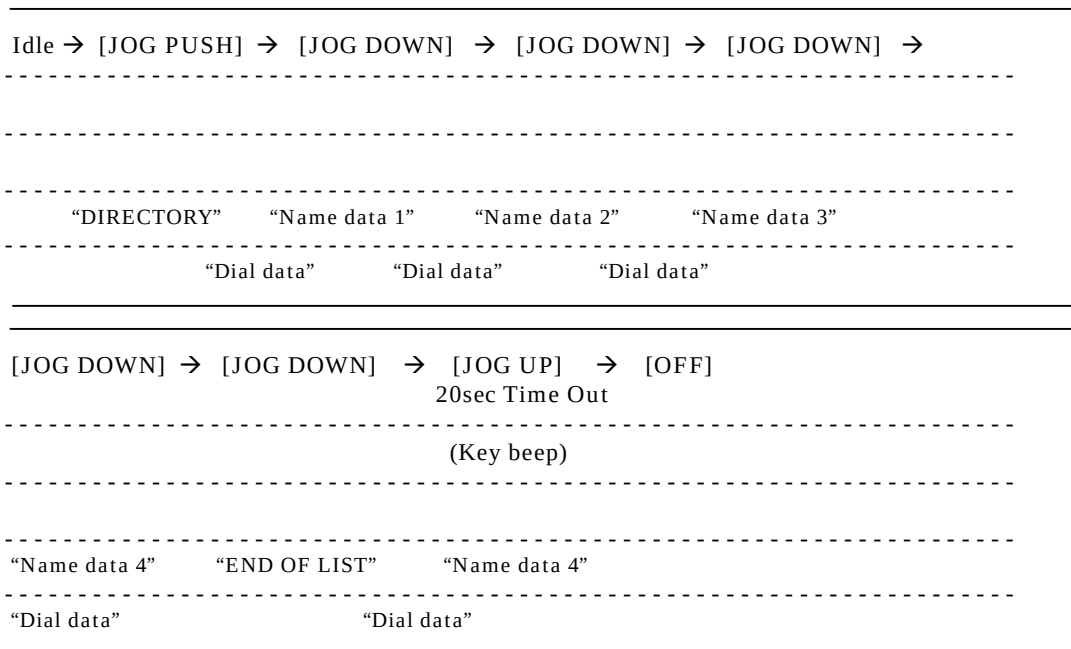
2.6 DIRECTORY HAND

- Switch the indication of CALLER ID MEMORY and DIRECTORY by [JOG PUSH].
- Cancel the programming and go back to the idle mode without sending error beeps when [OFF] key is pressed or handset is put back on the cradle.



2.6.1 Confirmation of DIRECTORY (JOG)

- 50 memories for DIRECTORY.



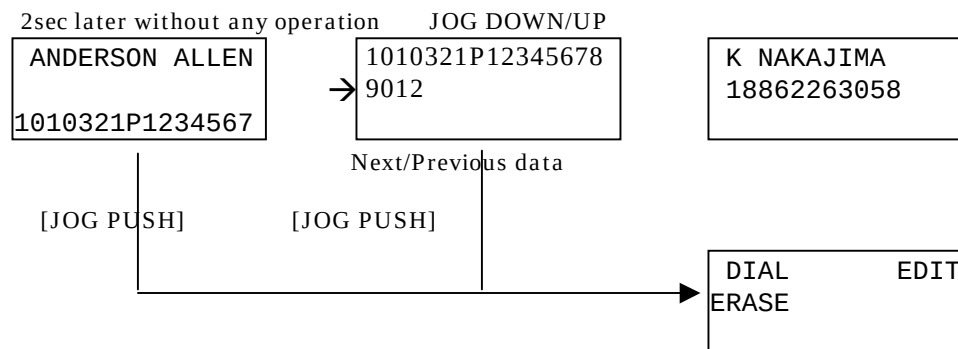
- 20 seconds time out for no operation.
(Back to the idle mode with key beep.)
- Indicate the data of the directory by [JOG UP/DOWN].
- Indicate "END OF LIST" after reviewed all of the data.
- When [TALK] was pressed during indicating DIRECTORY DATA, go to TALK mode and send the dial 2 seconds later after seizing the line.
- When [PGM] was pressed during indicating DIRECTORY DATA, go to the modification mode.

- Following is the image of the indication.

K NAKAJIMA

18862263058

- When the digit of the dialing data which has been stored in the directory is over 16, the indication will be like follows.



- The order of the data indication by [JOG DOWN] is like follows.
 - 1 : A to Z
 - 2 : Other ASCII code
 - 3 : *, #
 - 4 : 0 to 9

2.6.2 Confirmation of DIRECTORY (DIAL)

- When [DIAL] key was pressed during indicating "DIRECTORY" or data, index the corresponded data with the alphabet or number which is assigned on each key and switch the indication to the first one of them.
- Scroll the corresponded data by pressing the [DIAL] again or [JOG] operation.
- After all of the corresponded data was viewed, indicate "END OF LIST".

[JOG PUSH] → [DIAL 6] → [JOG DOWN] → [JOG DOWN] →
[DIAL 6] [DIAL 6]

“DIRECTORY”	“MATSUO TAKASHI”	“MORIYA YUMI”	“NAKAJIMA KAZU”
“12019307644”	“3367894”	“18862263058”	

[JOG DOWN] → [JOG DOWN] → [JOG DOWN] → [JOG DOWN]
[DIAL 6] [DIAL 6] [DIAL 6] [DIAL 6]

<u>“OKACHI SATOSHI”</u>	<u>“OZAWA MASAO”</u>	“END OF LIST”	“MATSUO TAKASHI”
“5962310”	“17835962410”	“12019307644”	

- Mapping of character to the [DIAL] key is like follows.

DIAL 1 = **1**

DIAL 2 = **A , B , C , 2**

DIAL 3 = **D** , **E** , **F** , **3**

DIAL 4 = **G , H , I , 4**

DIAL 5 = J , K , L , 5

DIAL 6 = **M** , **N** , **O** , **6**

DIAL 7 = **P , Q , R , S , 7**

DIAL 8 = **T , U , V , 8**

DIAL 9 = **W, X, Y, Z, 9**

DIAL 0 = **0**

DIAL * = *

DIAL # = # (and other characters that have been assigned on this key)

- When other [DIAL] key was pressed during indicating the data, switch the indication to the corresponded one.

[DIAL 7] → [JOG DOWN] → [DIAL 8] → [DIAL 9]

"SASAKI SHU"	"SATO HIDEKAZU"	"TAJIRI TOSHIO"	"YAMAZAKI MITSUO"
"8974561"	"16019307677"	"8862705894"	"3687454"

2.6.3 Operation from the DIRECTORY

- By [JOG PUSH] during indicating caller ID data, the data can be dialed, modified, and erased.
- When ring has come during indication, stop the indication and go to the ringing status.

[JOG PUSH] → [JOG UP] → [JOG UP] →

"K NAKAJIMA"	" DIAL EDIT ERASE"	"DIAL EDIT ERASE"	"DIAL EDIT ERASE "
"18862263058"	"18862263058"	"18862263058"	"18862263058"

2.6.3.1 Dialing from DIRECTORY DATA

[JOG PUSH] → [JOG PUSH] → Connected → 2sec later

"Name data"	" DIAL EDIT ERASE"	"CONNECTING"	"TALK"	"TALK"
"Dial data"	"Dial data"		"Dial monitor"	

- By [JOG PUSH] when cursor is on "DIAL", connect the line and send dialing.
- Send the dialing 2 second has passed after seizing the line.

2.6.3.2 Modification from DIRECTORY DATA

[JOG PUSH] → [JOG UP] → [JOG PUSH] →			

"K NAKAJIMA"	"DIAL EDIT ERASE"	"DIAL EDIT ERASE"	"K NAKAJIMA"

"18862263058"	"18862263058"	"18862263058"	"18862263058"

[DIAL 1] → [JOG PUSH] → [DIAL 2] → [JOG PUSH]			
[PGM]		[PGM]	

Confirmation beep			

"K NAKAJIMA1"	"K NAKAJIMA1"	"K NAKAJIMA1"	"K NAKAJIMA1"

"18862263058"	"18862263058"	"18862263058"	"18862263058"

- By [JOG PUSH] while cursor is on "EDIT", this unit will go to the modification mode of DIRECTORY data.
- Movement of the cursor and character input will be same with 2.1.1.1
- 20 seconds time out for no operation.
(Back to the idle mode with key beep.)
- When [OFF] key is pressed during indication, stop the modification and go back to the data indication before pressing jog.
- Cancel the modification and go back to the idle mode with a key beep when handset is put back on the cradle.
- If modification doesn't finish correctly, keep the data before modification.

2.6.3.3 Erasing of DIRECTORY DATA

[JOG PUSH] → [JOG UP] → [JOG UP] →			

"K NAKAJIMA"	"DIAL EDIT ERASE"	"DIAL EDIT ERASE"	"DIAL EDIT ERASE"

"18862263058"	"18862263058"	"18862263058"	"18862263058"

[JOG PUSH] → [JOG UP] → [JOG PUSH]			

Confirmation beep			

"ERASE NO YES"	"ERASE NO YES"	"Next data"	

"18862263058"	"18862263058"	"Next data"	

- By [JOG PUSH] while cursor is on "ERASE", this unit goes to the erasing mode of DIRECTORY data.
- 20 seconds time out for no operation.
(Back to the idle mode with key beep.)
- When [OFF] key is pressed during above indication, go back to the previous data indication before pressing jog.
- Cancel the erasing and go back to the idle mode with a key beep when handset is put back on the cradle.
- Go back to the previous indication before pressing JOG, when [JOG] is pressed while the cursor is on "NO".
- Erase the caller ID data by [JOG PUSH] while the cursor is on "YES".
After sending confirmation beep, indicate next data.
- When the last data was erased, next indication will be "END OF LIST".

2.7 How to change the digit of the Caller ID data HAND

See attached sheet.

When the area code is matched to the additional one, the initial indication will be 10 digit and the rotation will be like follows.

10 digit → 8 digit → 7 digit → 11 digit

3 TALK mode

3.1 Making call

3.1.1 Connecting

HAND

[TALK] → After established the link

"CONNECTING" "TALK"

"Talk time indication"

- Indicate "CONNECTING" when [TALK] is pressed.
- After establishing the link, indicate "TALK" and talk time on the Handset and go to the talk mode. On the base, turn on the [IN USE] LED.
- If the link can't be established within 5 seconds after pressing [TALK], go back to the idle mode with error beep. On the other hand, indicate "OUT OF RANGE" on Handset.

3.1.2 Dialing

HAND

[TALK] → Link OK → [DIAL 1] → [DIAL 2] → 10sec later

Turn on [LINE] LED on base

"CONNECTING" "TALK" "TALK" "TALK" "TALK"

"Talk time ind." " 1" " 12" "Talk time ind."

- Common spec for dialing will be described below.
 1. Dial data will be stored in the redial buffer.
 2. Chain dialing, for example redial followed by the directory dialing, will be available.
 3. [PAUSE] must be 2 seconds.
 4. Dial should be sent after 800msec has passed from seizing the line.
 5. [FLASH], [OFF], and "On charge" will be valid during dialing.

6. Monitor the dialing like follows.

When “1-212-345-6789” is dialed.



7. Dialing speed is only 10PPS setting and make ratio must be changed by internal setting. (33% and 40% and initial setting must be 40.)
8. The LCD indication will be switched to “Talk time” after 10 second has passed from the end of the dialing.

3.1.2.1 Redial

HAND

[TALK] → After established the link → [REDIAL]

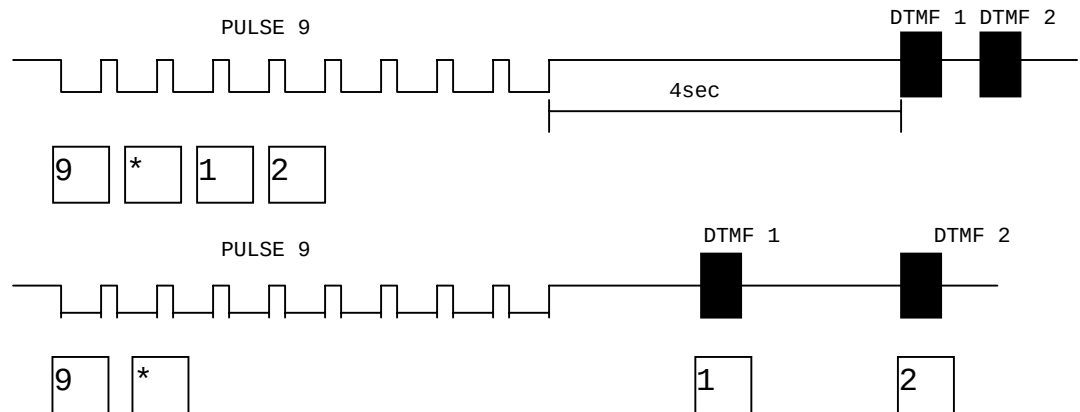
“CONNECTING” “TALK” “TALK”

“Talk time indication” “Dial monitor”

- REDIAL key will redial the last phone number dialed when it is first press after the line is connected.
When the line is connected and after sending any digit of dialing, REDIAL key will be ignored.
- Redial buffer should be 32 digits.
- Inhibit the redial and go back to the talk mode after sending the error beep when the key is pressed at the following situation.
 1. When more than 32 digits are dialed.
 2. When redial has been erased.

3.1.2.2 Mix dialing

- To change the Dialing Mode temporarily from PULSE to TONE, press */TONE during a call interval.
- Go back to the PULSE mode after releasing the line.
- When the key is pressed during sending the dialing pulse, set 4 seconds pause automatically then send the DTMF signals.



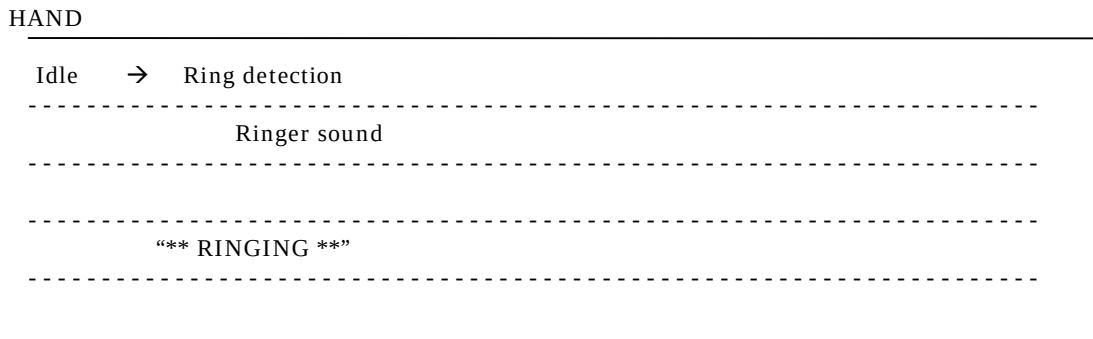
3.2 Receiving calls

3.2.1 Ring detection



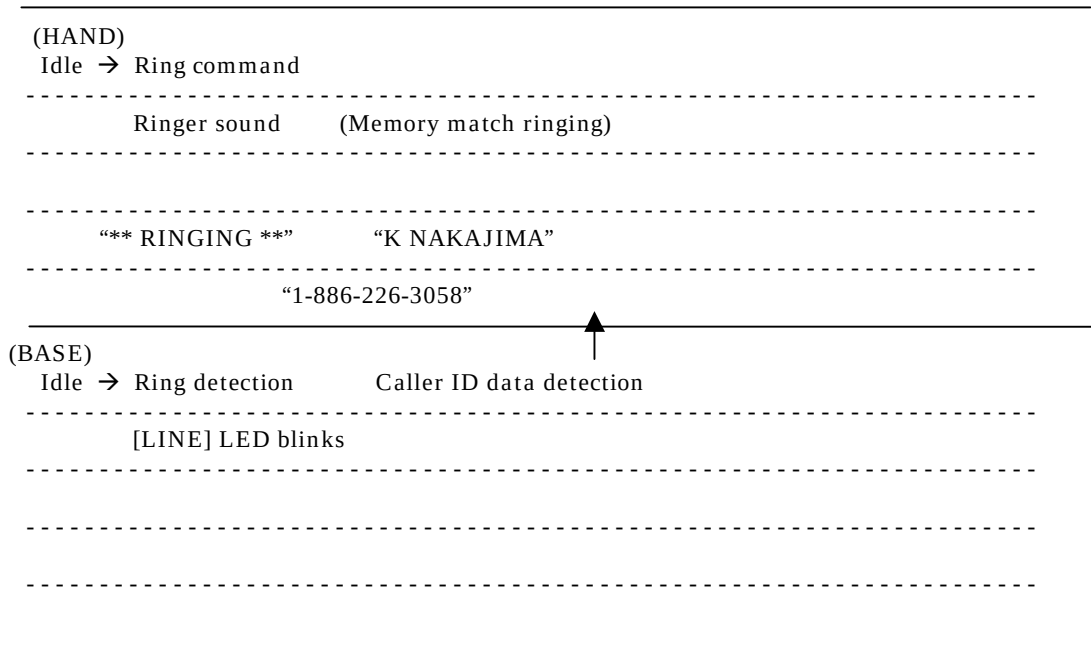
- Monitor the ring detection port and set RING ON when ring has come for more than 200msec.
- When the port is OFF for more than 6 seconds, the unit will judge that the ring has been disappeared.

3.2.2 Normal ringing



- Indicate "*** RINGING ***" when the ring data has come from base.
- When ring has been disappeared, stop the ringer and clear the LCD then go back to the idle mode.
- The [LINE] LED will blinks when ringing.

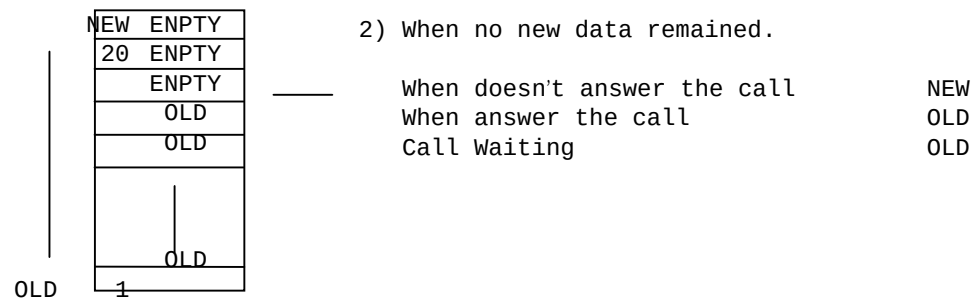
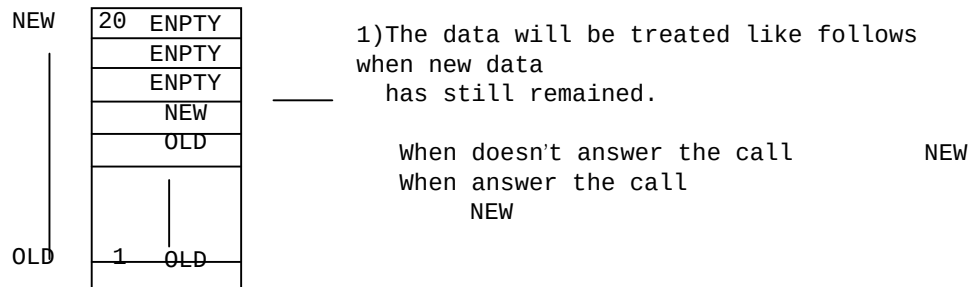
3.2.3 Ringing with CALLER ID data



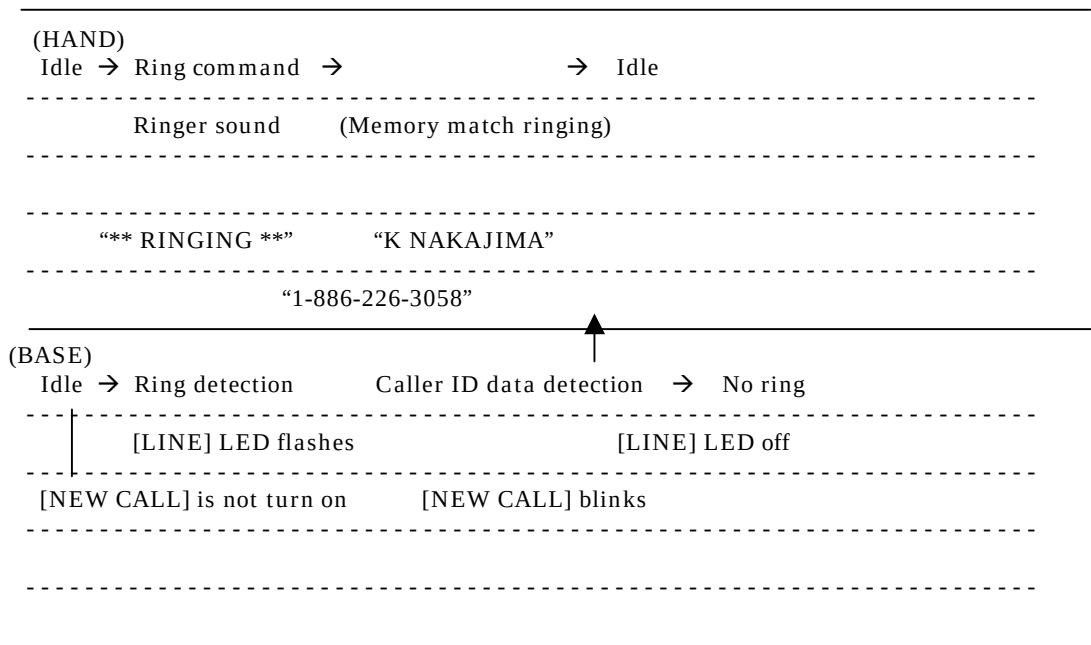
- When base unit detect the caller ID data, it will be send to H/S.
- H/S indicates the data and store it to the memory.
- When the receiving data is same with the stored number on the directory, change the ringing sound to notify the memory match ringing.
(The sound must be distinguished completely.)
- The indication will be like follows.

K NAKAJIMA
1-886-226-
3058

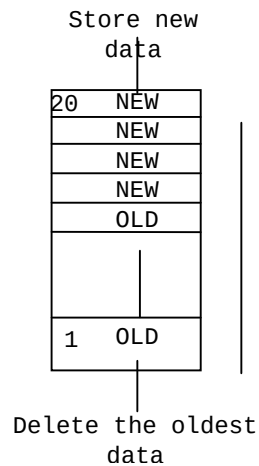
- Below description will show how to treat the data as new message or old.



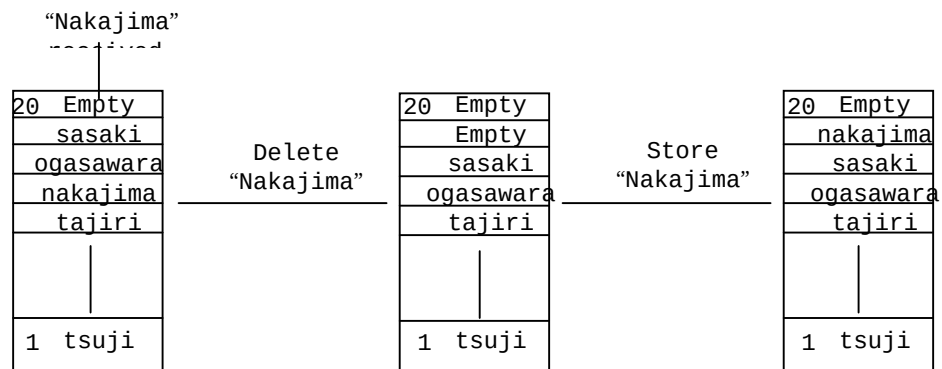
- When new data is existing, blink the new call indicator on the base. And if no new data remained, turn off the new call indicator.



- When caller ID data is received in memory full status, delete the oldest data and store the receiving data.



- When the new data is same with the previous one, delete the previous data and store the receiving data as a newest one.

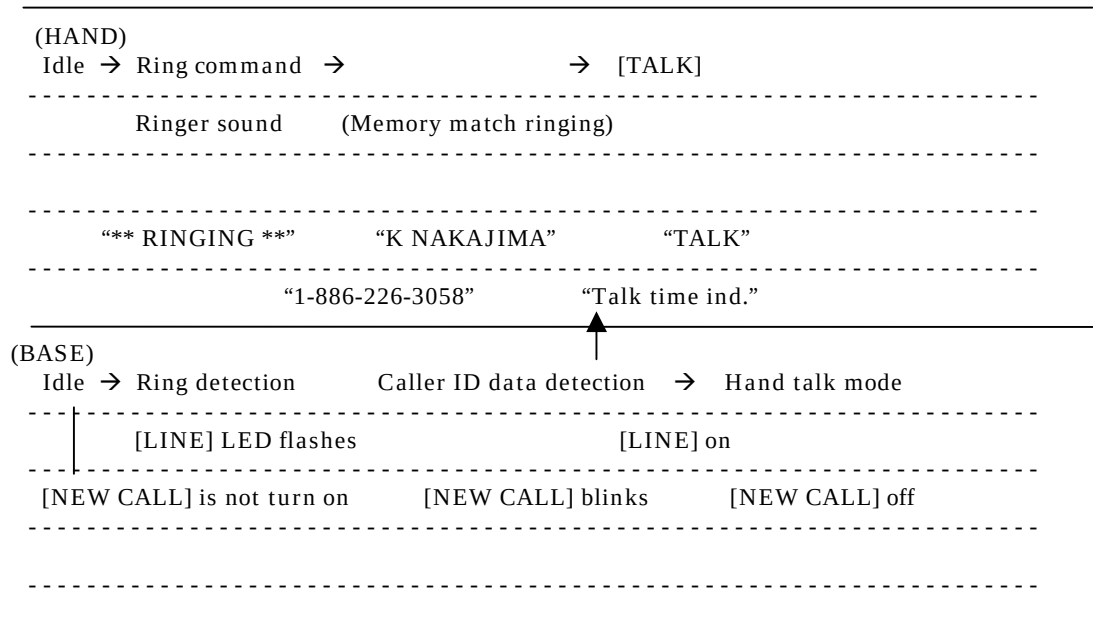


- In this case, indicate "*" on the right side to notify the user that this call has repeated. (like follows)

K	NAKAJIMA
*	
1-886-226-	
0050	

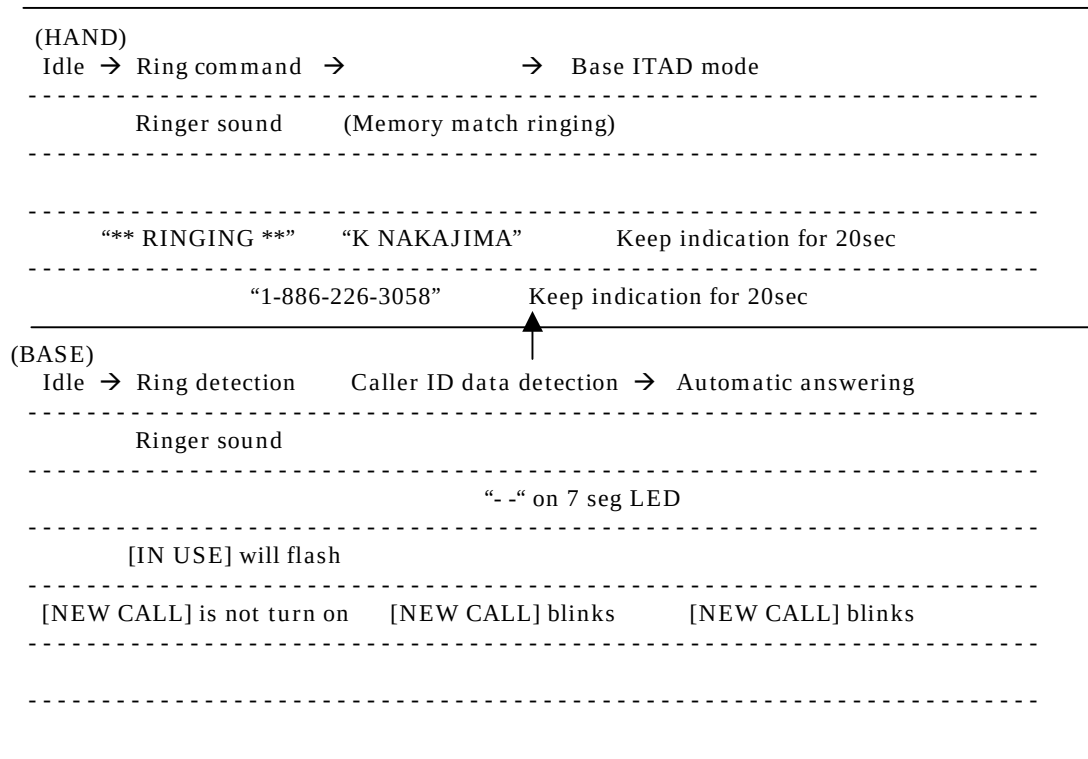
3.2.4 Answering the calls

3.2.4.1 When handset answered



- When TALK key is pressed, H/S stops the ringing and indicates "TALK" on LCD and start the counting of talk time.
- At the same timing, base turns on the [IN USE] LED.
- When answered the call without any new calls previously, the [NEW CALL] LED will be off because the received data will be treated as old.

3.2.4.2 When answering machine answered (CPX-953 only)



When answering machine is answered during ringing, the unit stops the ringing and go to the ITAD mode.

At the same timing, the 7 segment LED will indicate "- -" to show that the answering machine is active.

The caller ID data will be kept to indicate for 20sec after answered the call.

When answering machine answered, the received data will be treated as new and the blink of [NEW CALL] LED will be kept.

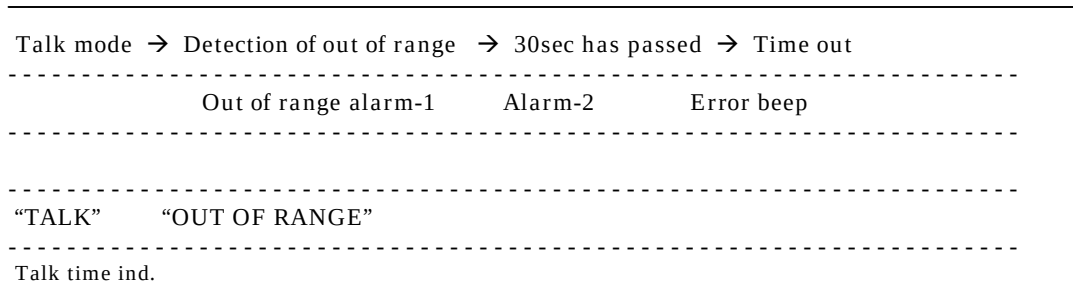
When answered the call by pressing corresponding line key while answering machine is active without any new calls previously, the [NEW CALL] LED will be off because the received data will be treated as old.

3.3 TALK mode

3.3.1 Volume control

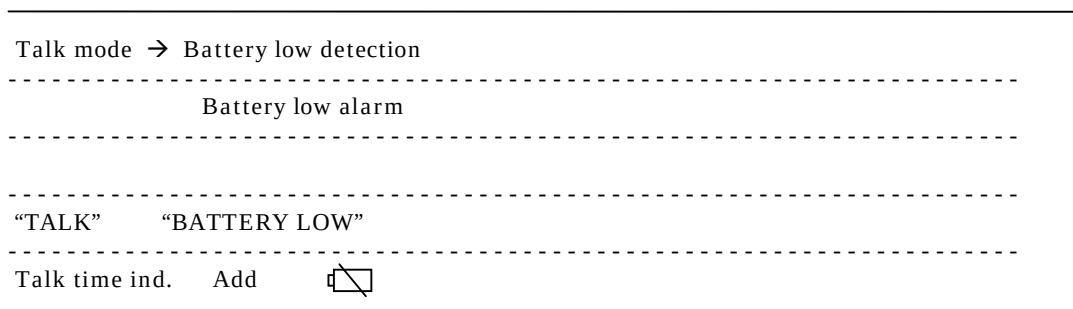
Implement 3-position slide switch for H/S volume control.

3.3.2 Out of range



- Send out of range alarm for 60 seconds when ring is broken between H/S and base.
- Send alarm-1 for first 30seconds then change to alarm-2 for another 30 seconds.
- Indicate "OUT OF RANGE" when out of range is detected.
- If link is established again during sending the alarm, go back to the talk mode and continue the conversation.
- If 60 second has passed, both unit will go back to the idle mode.

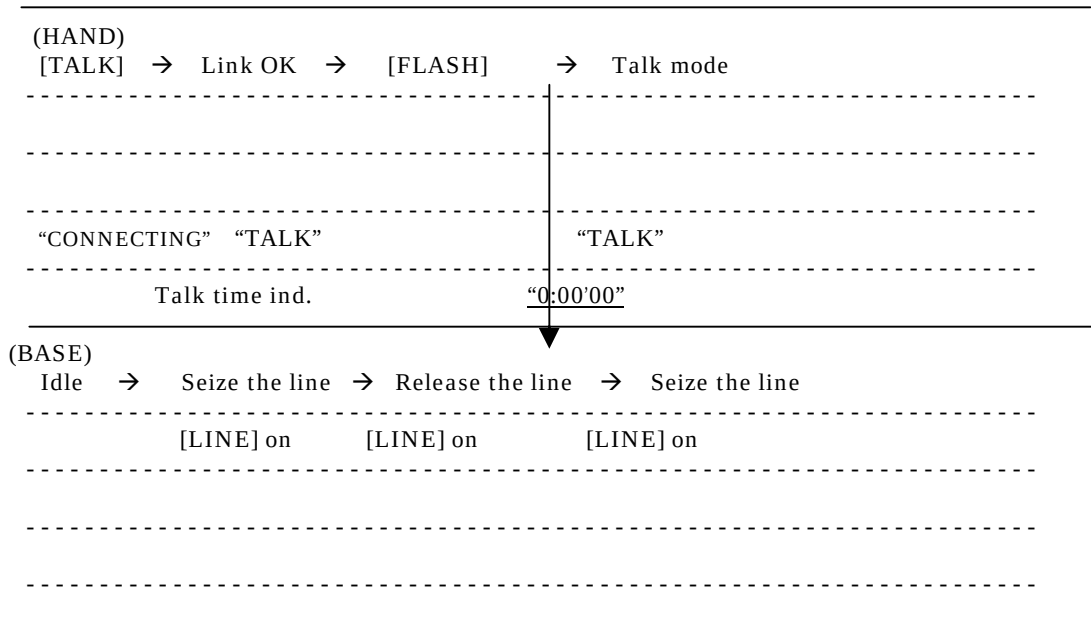
3.3.3 Battery low indication



- Send the battery low alarm (40msec ON / 3 sec OFF) when the battery low is detected.
The battery low alarm will be sent only 5 times for each call or operation.
- When battery low is detected during idle mode, the unit doesn't send the alarm. (LCD indication only)

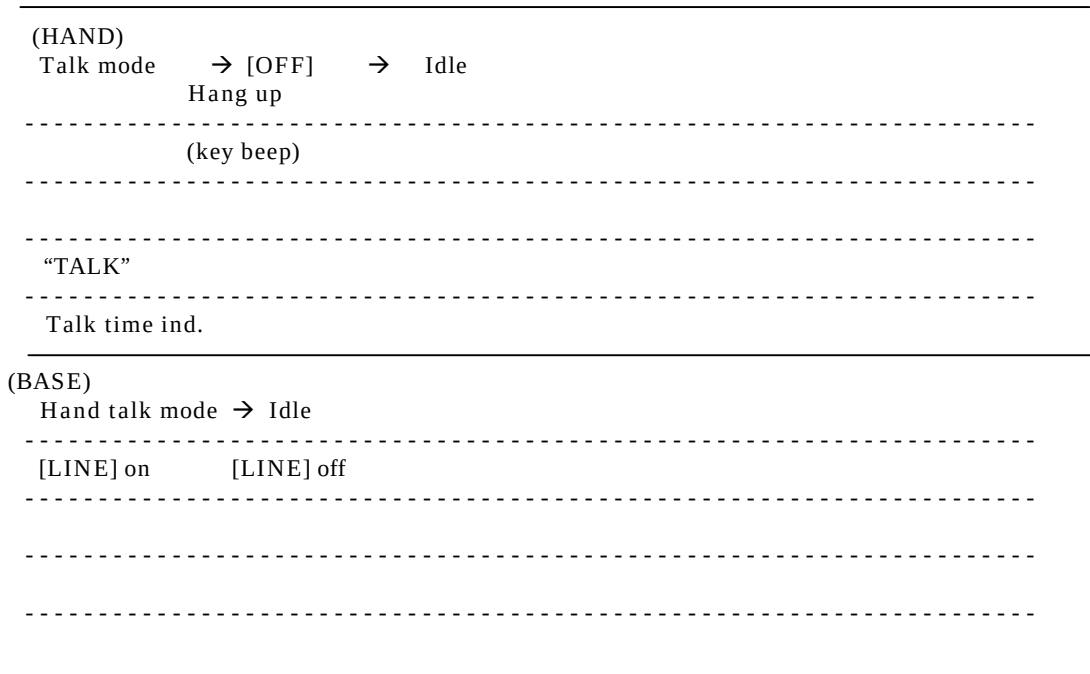
3.3.4 Flash

- After flashing, the unit will be the same status when TALK button is pressed from the idle mode.



- Clear the indication while FLASH operation.
- Base will disconnect the line for 650ms.
- After flashing, indicate "TALK" again and restart the counting of talk time.
- Go back to the idle mode when [OFF] key is pressed or H/S is back on the cradle during flashing.
- Ignore FLASH key while flashing.
- Wait 500msec to send the dial after flashing.

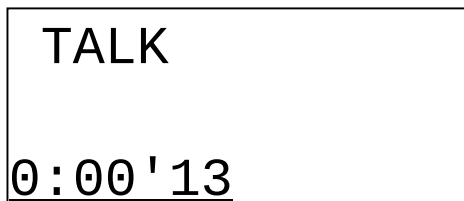
3.4 End of the conversation



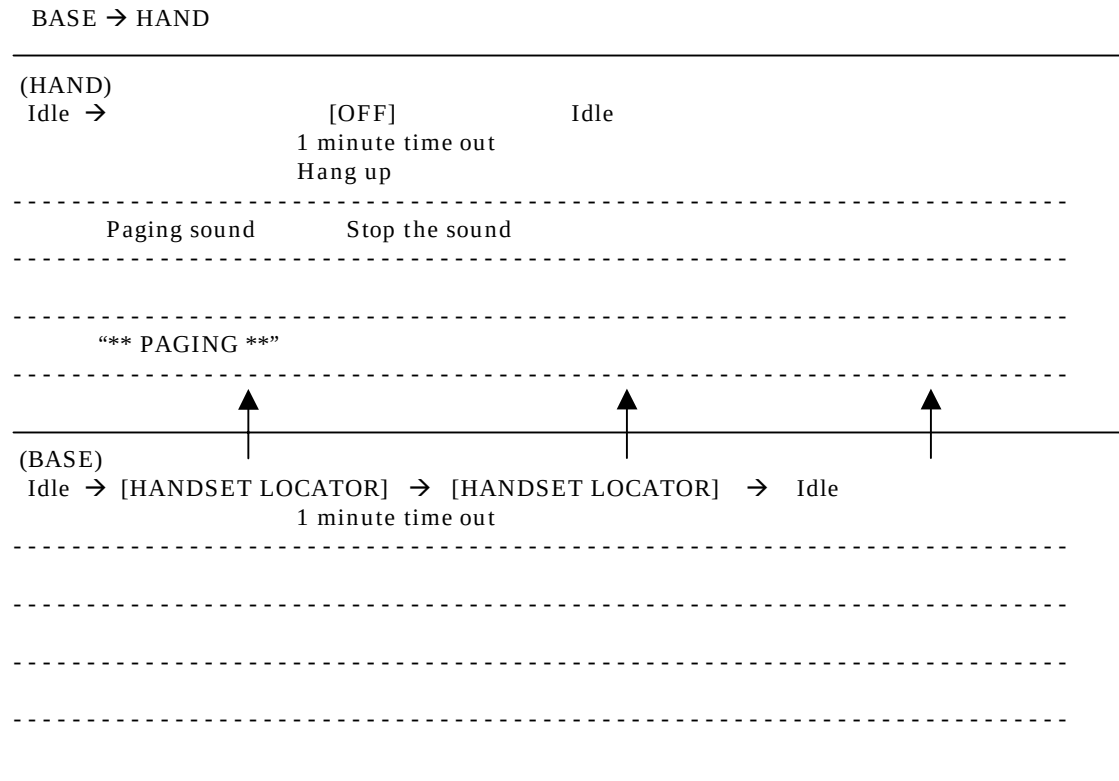
- When pressed OFF or H/S is backed to the cradle during talk mode, clear the indication and go back to the idle mode.

3.5 Talk time indication

- While connecting the line, indicate the talk time on the 2nd line of LCD.
- The maximum count will be 9 hours 59 minutes and 59 seconds and when it has been passed, recount from 0:00' 00.
- The count will continue even if the mode was changed with keep seizing the line.



4 . Paging



- When [HANDSET LOCATOR] is pressed at the idle mode, page H/S for 1 minute. At the same timing, indicate "*** PAGING ***" on H/S LCD.
- To stop the paging, press [HANDSET LOCATOR] again or press [OFF] on H/S.
- When H/S is backed on the cradle, stop the page sound and go back to the idle mode after sending a key beep.
- When 1 minute has passed, stop the page sound automatically and go back to the idle mode.
- When ring has come during the paging, change the status to ring mode soon.
- (Refer section 3.2)
- When handset is in programming mode, the unit doesn't indicate "*** PAGING ***" not to interrupt the operation.
In this case, only paging sound will appear.

5. CALLER ID with CALL WAITING

HAND

Hand talk mode → Caller ID with Call waiting → [FLASH] → Hand talk mode

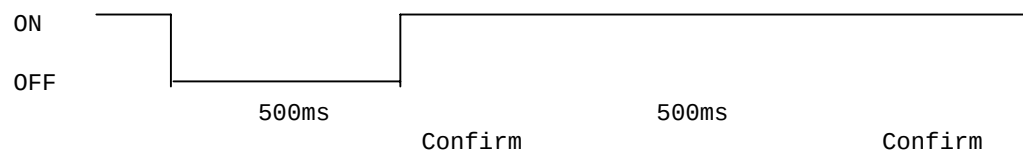
Call waiting sound

"TALK" "Name data" "TALK"

Talk time ind. "Dial data" "0:00'00"

- When caller ID data is detected during conversation, indicate the data for 20 seconds.

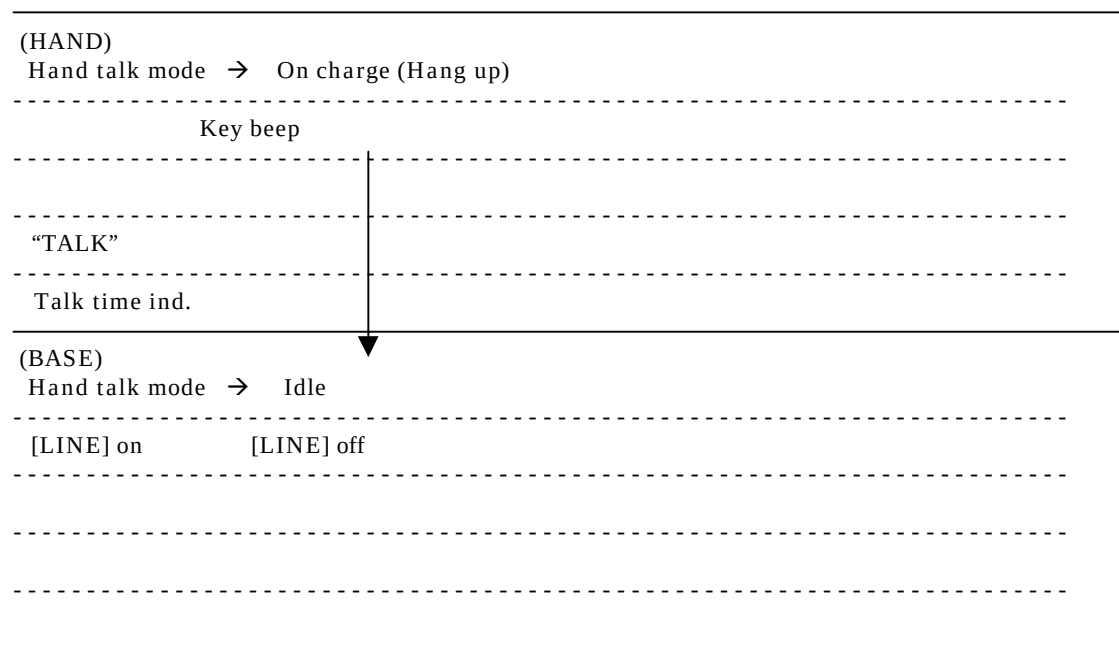
6 Charge detection



- The charge detection should be confirmed by 500msec stable.

6.1 On charge (Hang up)

6.1.1 From talk mode Quick Off



- When H/S is back to the cradle while in talk mode, go back to the idle mode with sending a key beep.

6.1.2 During ringing

(HAND)	
During ringing	→ On charge (Hang up) → Keep ringing
Ringer sound	Key beep
*** RINGING ***	*** RINGING ***

6.1.3 During paging

(HAND)	
During paging	→ On charge (Hang up) → Idle
Raging sound	Key beep
*** PAGING ***	“ “

6.2 Off charge (Picking up the H/S)

6.2.1 During ringing

(HAND)	
During ringing	→ Off charge → <u>Keep ringing</u>
Ringer sound	
*** RINGING ***	<u>*** RINGING *** or Caller ID indication</u>

For caller ID models, there is no “Bell in Quick Talk” function.

7. Special function

7.1 Memory match ringing

When received caller ID data is same with the directory data which has been stored in the memory, change the ringer sound to notify the user that the call is coming from acquaintance.

If the last 7 digit matches, it will regard as the same number.

The ringer must be distinguished from the normal ringer and it must be changed from the second ringing.

7.2 Visual Message Waiting Indicator (CPX-946 only)

To indicate that messages have been stored in CO, implement VMWI LED on base. When message has been stored, flash VMWI LED. (500msec on/off)
Adapt both method of FSK and stutter tone to detect the message waiting.

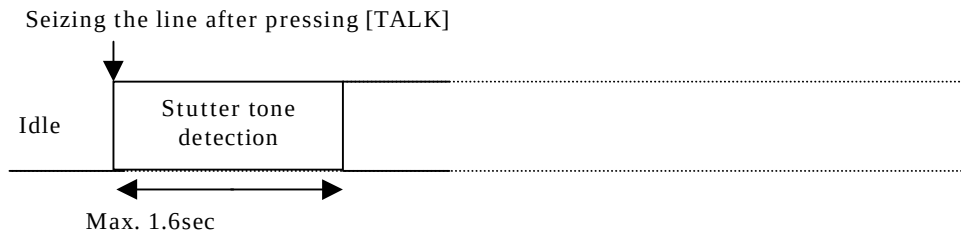
7.2.1 How to detect the stutter tone

Following description shows the method how to detect the stutter dial tone.

(Basic rule)

- a) The conversation which has been continued more than 20sec will be treated as a complete call.
- b) Check the stutter dial tone 27 seconds later after the complete call.
- c) Check the stutter dial tone 3 minutes and 57 seconds later after an unanswered call.
- d) Every time the unit is off hooked by the user, it also checks the stutter dial tone.
- e) Off hook duration for the checking should be 1.6 seconds.
- f) Start to check the stutter dial tone soon after seizing the line.
- g) When the unit detects 5 bursts within 1.6 seconds, the "MESSAGE" LED will be flashed.
- h) When FSK signal for VMWI is detected, the unit never check the stutter dial tone afterward until the unit is reset.
- i) CPU must detect on/off hook within 100msec. (Hardware limitation.)
- j) The detection cadence must be 100msec +- 20%.
- k) Don't mislead the on/off hook detection by the pulse dialing.

7.2.1.1 Detection of stutter tone in TALK mode



Every time the unit is off hooked by the user, it checks the stutter dial tone.

The detecting duration will be 1.6 seconds in maximum.

When 5 bursts are detected during 1.6 seconds, start to blink [MESSAGE] lamp.

When stutter tone is not detected during 1.6 seconds, turn off the [MESSAGE] lamp.

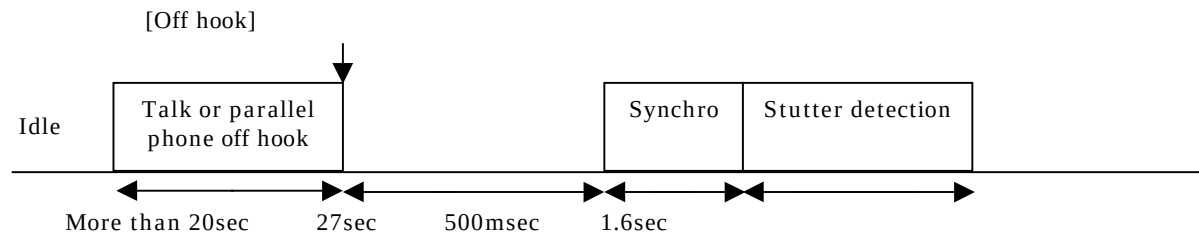
When dialed during detecting stutter tone, the unit has to stop the detection.

In this case, keep the previous indication for [MESSAGE] lamp.

When [OFF] key is pressed or handset is hanged up during detection, the unit stops the detection and goes back to the idle mode.

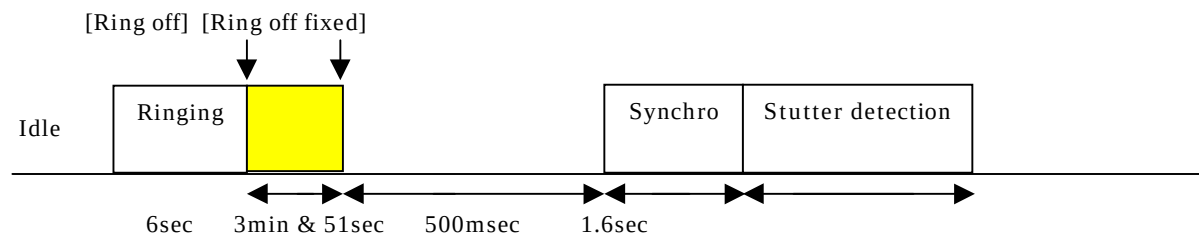
In this case, keep the previous indication for [MESSAGE] lamp.

7.2.1.2 Detection after a complete call



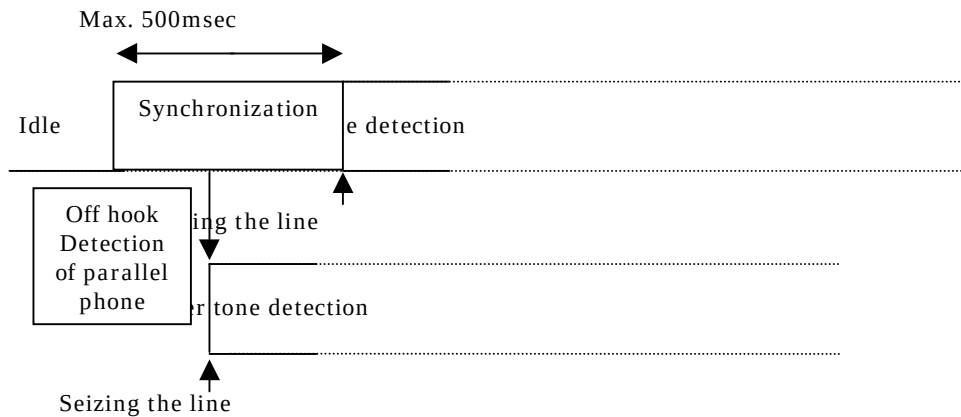
Check the stutter tone 27 seconds later after finished a call which has been last more than 20 seconds by this unit or parallel phone.

7.2.1.3 Detection after an unanswered call



Check the stutter tone 3 minutes and 57 seconds later after an unanswered call. (Including the duration to fix the ring off status.)

7.2.1.4 Synchronization



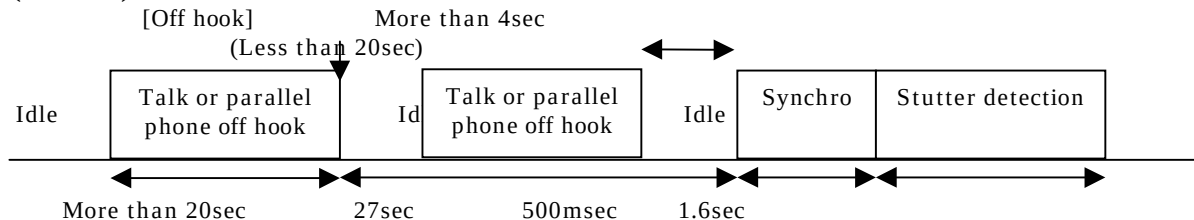
Just before starting the detection of stutter tone, monitor the line status for 500msec to check the parallel phone's off hook.

We determine this period as synchronization and if parallel phone is off hooked Within this period, the unit synchronizes and goes to check the stutter tone soon.

7.2.1.5 Happening during waiting the stutter detection

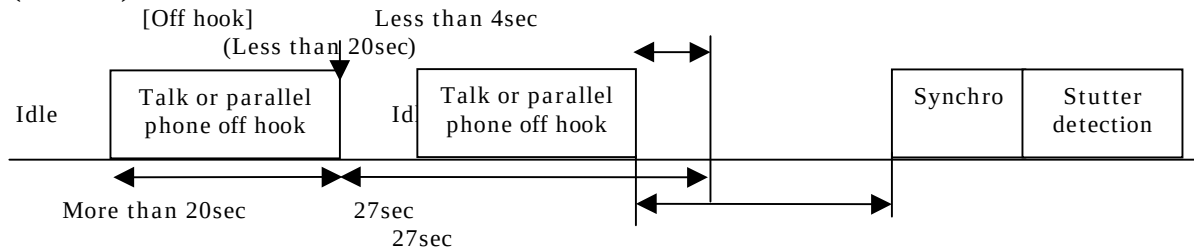
a) An uncompleted call is made within 27 seconds

(Case-1)



When an uncompleted call is made during waiting of the stutter tone detection and it was finished 4sec earlier than the start of detection, the counter of 27 seconds will be continued.

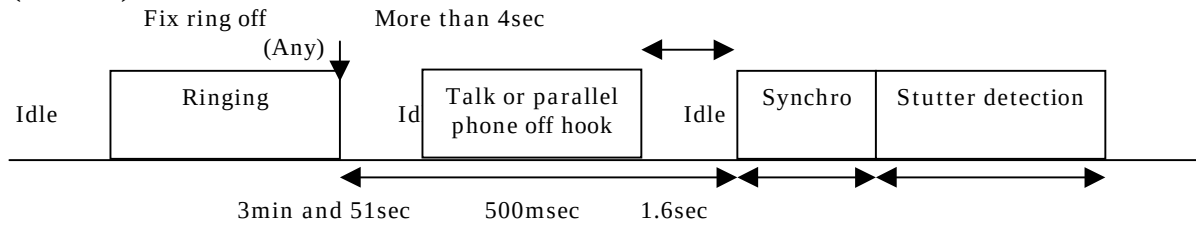
(Case-2)



When an uncompleted call is made during waiting of the stutter tone detection and it was finished within 4sec before starting the detection, the counter of 27 seconds will be reset and wait more 27 seconds to check the stutter tone.

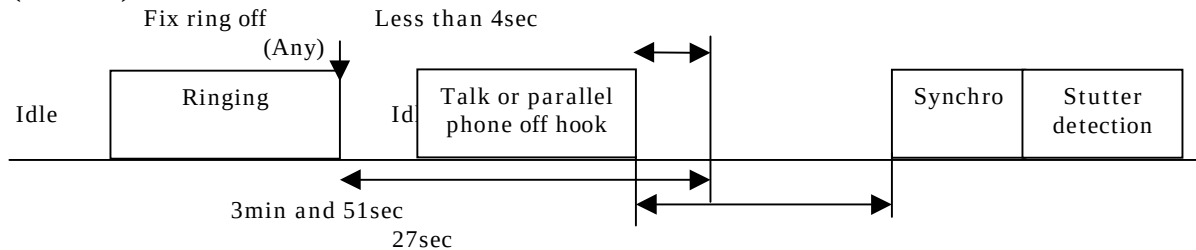
b) Any call is made within 3 minutes and 57 seconds

(Case-1)



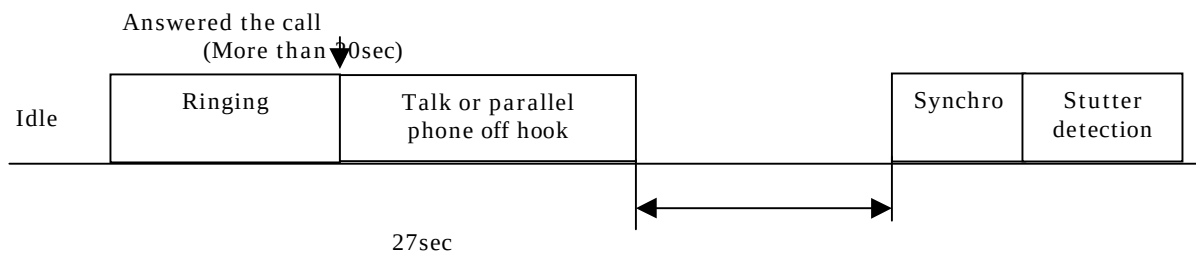
When any call is made during waiting of the stutter tone detection and it was finished 4sec earlier than the start of detection, the counter of 3 minutes and 57 seconds will be continued.

(Case-2)



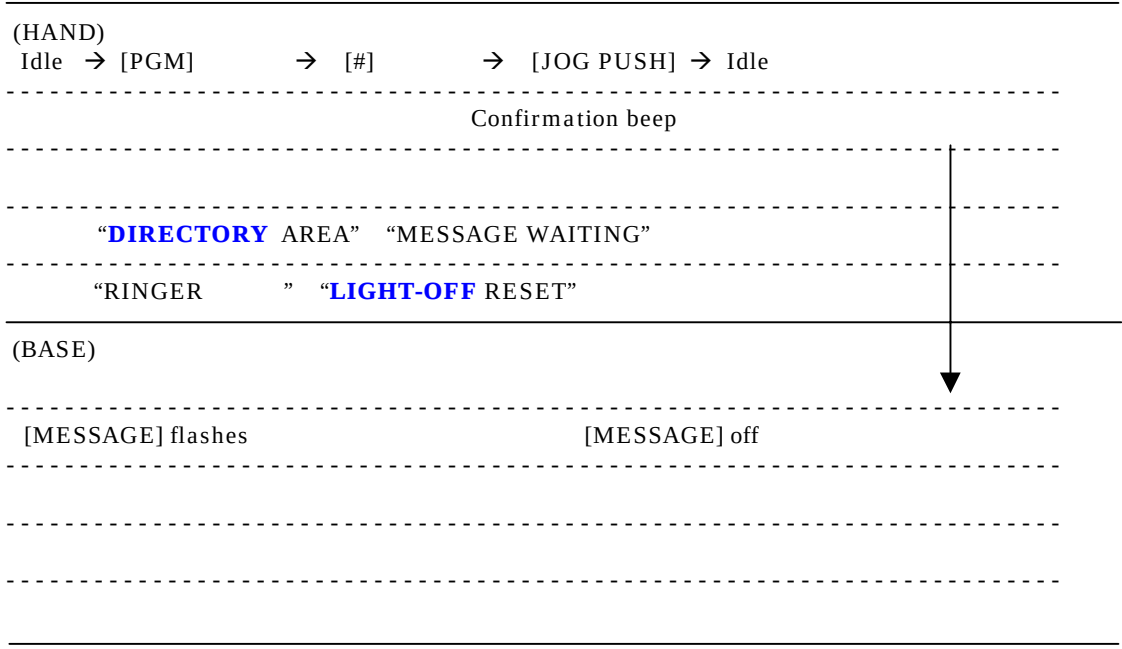
When any call is made during waiting of the stutter tone detection and it was finished within 4sec before starting the detection, once drop out the sequence and check the stutter tone 27 seconds later after finished the call.

7.2.1.6 When answered the call



When answer the call during ringing, the unit doesn't check the stutter tone.
If the call is continued more than 20 seconds, check the stutter tone 27 seconds later after the complete call.
If the call is less than 20 seconds, the unit doesn't check the stutter tone.

7.2.2 How to turn off the VMWI indication



By [JOG PUSH] when the cursor is on "LIGHT-OFF", the unit turn off the [MESSAGE] LED on the base and go back to the idle mode after sending a confirmation beep.
This operation will only turn off the [MESSAGE] LED.

7.2.3 How to reset the VMWI detection

(HAND)			
Idle	→	[PGM]	→
		[#]	→
		[JOG UP]	→
"DIRECTORY AREA" "MESSAGE WAITING" "MESSAGE WAITING"			
"RINGER" "LIGHT-OFF RESET" "LIGHT-OFF RESET"			
→ [JOG PUSH] → Idle			
Confirmation beep			
Reset the VMWI detection			

By [JOG PUSH] when the cursor is on "RESET", initialize the method of VMWI detection. Consequently the [MESSAGE] LED will be turned off.
When AC power is reset, the unit also resets the VMWI detection.
After above operation, both FSK and stutter tone will be valid for VMWI detection.

7.3 How to reprogram the security code

In case that you may want to change the security code or in rare case that the security code collapse, the security code can be reprogrammed again.

1. Make sure the handset and base are on idle mode.
2. Press **[PGM]** and then press “*” key on handset unit.
3. Press and Hold **[HANDSET LOCATOR]** button on base unit.
4. Put the handset back to the base cradle.
5. A confirmation beep will be heard when new security code will be assigned.
6. If error beep is heard, repeat from step 1.

8. ITAD function (CPX-953 only)

Basically the ITAD function will be same with SPP-A945 except slow playback function. The specification will be like follows.

“Press and hold REPEAT/SLOW key for more than 1 second will slow down the message playback speed to 70%. When the key is release, normal speed can be resumed.”

9. Tone list

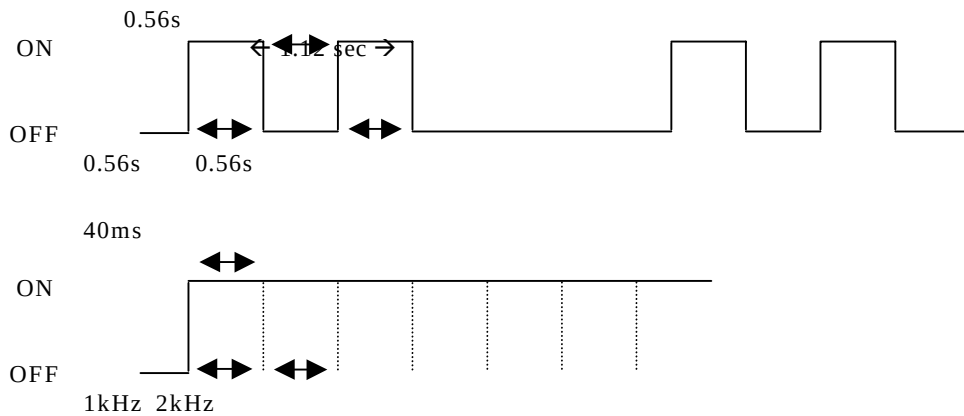
Hand

Ringer sound

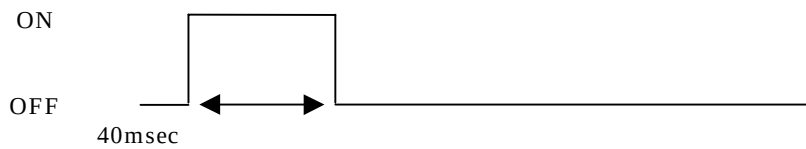


- There is 4 type of ringer sound on each line.

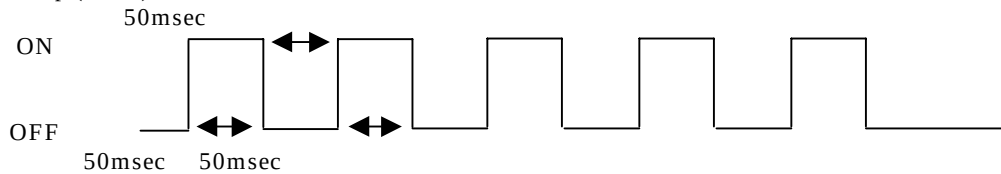
Page sound



Key beep (2kHz)

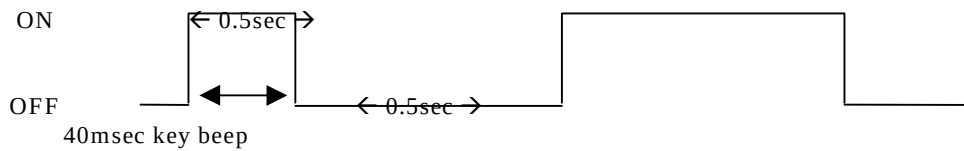


Error beep (2kHz)



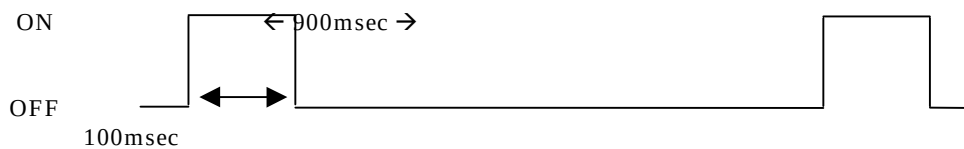
- When sending error beep, key beep will not be sent together.
(5 times repeat of short beep.)
-

Confirmation beep (2kHz)



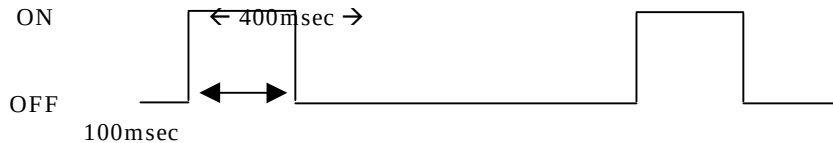
- Confirmation beep will be sent when programming is completed or redial has been erased.

Out of range alert 1 (2kHz)



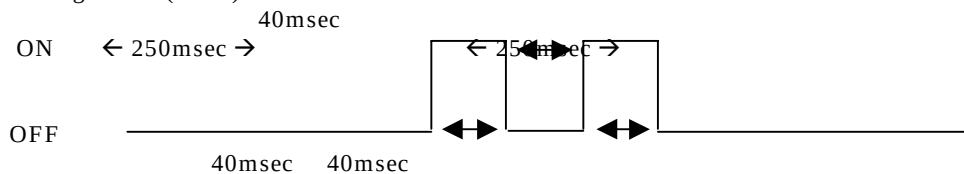
- When out of range is detected, send this alert for 30 seconds. (100msec beep in every second)

Out of range alert 2 (2kHz)



- After finishing the alert 1, send this alert for 30 seconds. (100msec beep in every 0.5 second)

Call waiting sound (2kHz)



- Even if other tone is in sending, stop it for a while and send call waiting sound as a first priority one.
 - After sending this tone, continue the previous tone sending again.
 - The volume level must be low.
-