

No.CMT-

IS-136 TDMA DUAL MODE / DUAL BAND HANDHELD PHONE

MT-2531F0R6A

Instruction Manual (Draft)

CONFIDENTIAL

R0

 **MITSUBISHI ELECTRIC CORPORATION**

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1.SYSTEM CONFIGURATION

1.1. General

The IS-136 TDMA handportable cellular telephone MT-2531F0R6A system offered here is designed for use in a IS-136 TDMA network. This phone operates as a class 4 (peak 0.6 watts) mobile station and complies with the IS-136 Rev.A specifications.

1.2. Standard System

1.2.1. MT-2531F0R6A Basic kit

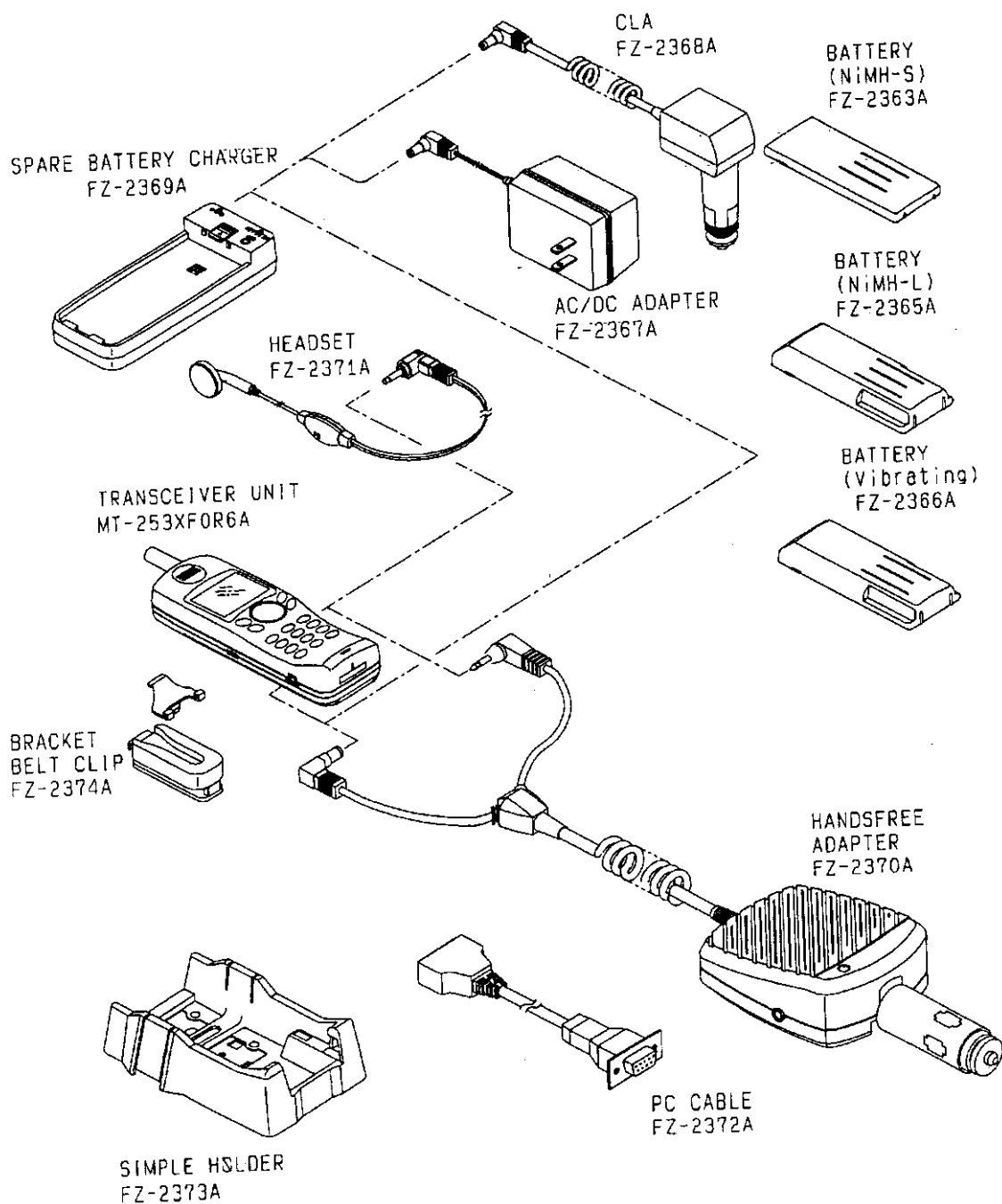
1) Transceiver	Retractable antenna type	MT-2531F0R6A
2) Battery Pack	NiMH-S 880mAh	FZ-2363A
3) AC/DC Adapter for battery rapid charging		FZ-2367A

1.3. System Options

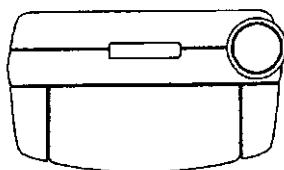
1) Battery pack	NiMH-L 1500mAh	FZ-2365A
	Vibrating NiMH-S 880mAh	FZ-2366A
2) Cigarette Lighter Adapter	CLA (without RF port)	FZ-2368A
3) Handsfree Adapter Kit		FZ-2370A
4) Headset		FZ-2371A
5) Simple Holder		FZ-2373A
6) Spare Battery Changer		FZ-2369A
7) PC Cable		FZ-2372A
8) BELT CLIP		FZ-2374A

1.4.

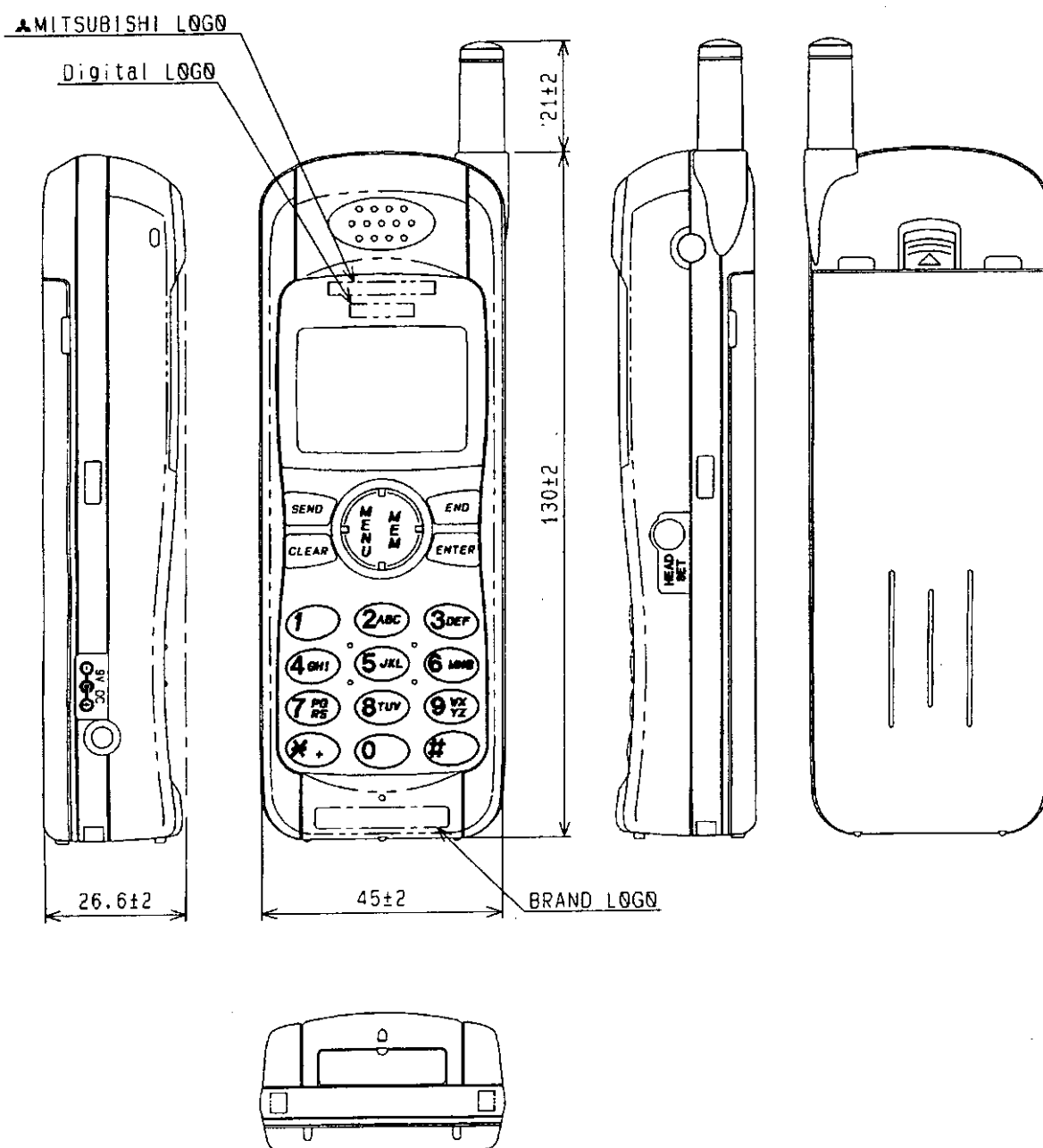
SYSTEM CONFIGURATION



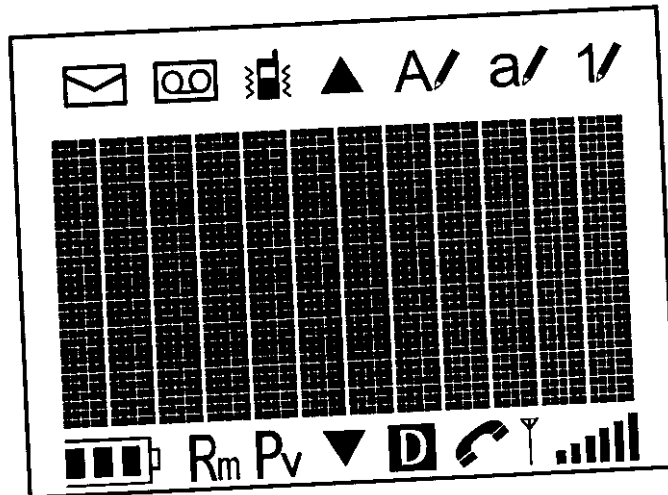
1.5. OUTLINE of MT-2531F0R6A with S-Battery (NiMH880mAh)



This figure will be replaced by new one.



1.6. LCD Display Design



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2. TRANSCEIVER

2.1. General

The unit shall meet all applicable requirement of IS-136 Rev.A and IS-137 Rev.A and be fully licensable by the FCC for operation in the USA and DOC in Canada.

2.2. Electrical Description

Hereinafter is a non-exclusive list of the electrical features for this phone:

2.2.1. Common

- | | | |
|----|-----------------------------|--|
| 1) | Frequency bands | |
| | Transmit | 824-849 MHz / 1850-1910 MHz |
| | Receive | 869-894 MHz / 1930-1990 MHz |
| 2) | Number of RF channels | 832 ch(800MHz) / 1999ch(1.9GHz) |
| 3) | Carrier Spacing | 30 kHz |
| 4) | Modulation type | |
| | (Analog Mode) | Frequency modulation |
| | (Digital Mode) | $\pi/4$ -DQPSK |
| 5) | Transmission rate | |
| | (Analog Mode) | 10Kbps Manchester |
| | (Digital Mode) | 48.6Kbps (24.3Ksymbols/sec) |
| 6) | Speech coding | Enhanced Full rate speech
ACELP(IS-641) , 7.4kbps |
| 7) | Operating Temperature Range | -30 to +60 degree C |
| 8) | Relative Humidity | 95% at 40 degrees C |

- 9) Power Supply Voltage nominal 4.8 V
- 10) Standby time
NiMH-S 880mAh tentative Analog:15 hours / Digital: tentative100 hours
NiMH-L 1500mAh tentative Analog:25 hours / Digital: tentative 180 hours

NOTE: Standby time will be varied according to system condition and temperature

- 11) Talk time (without DTX)
NiMH-S 880mAh tentative Analog:80 minutes / Digital: tentative 140 minutes
NiMH -L 1500mAh tentative Analog:130 minutes / Digital: tentative 230 minutes
- 12) LCD Back Light
LED Back Light

2.2.2. Transmitter

- 1) Frequency stability
(Analog Mode) < ± 2.5 ppm
(Digital Mode) < ± 200 Hz
- 2) Modulation Accuracy
(Analog Mode) Voice ± 10.8 kHz excl. SAT
SAT ± 2.0 kHz
10kbps data ± 8.0 kHz
DTMF 4.5 rad / tone
Stability ± 10 %
Symmetry ± 10 %

(Digital Mode) RMS Vector error < 12.5%
- 3) RF output 0.6 Watt at the antenna
(50 Ohm impedance, 25 Degrees, nominal voltage)
- 4) Power control 9 levels with step size of 4 dB

2.2.3. Receiver Sensitivity

(Analog Mode)	< -116 dBm (12dB SINAD)
(Digital Mode)	< -110 dBm (Static)

2.2.4. Display Type

LCD with back lighting is arranged in 4 rows of 12 digits with 5 x 8 dot characters for normal characters and 14 special status icons. (refer to attached section1.6)

2.2.5. Interfaces

- 1) External Interface is a custom interface with the following detail:
 - a) External DC power supply interface
 - b) Handsfree adapter interface
 - c) Headset interface
 - d) Serial data communication interface
- 2) External DC power supply interface
- 3) Headset interface
- 4) Battery Pack Interface Custom interface

2.3. Mechanical Description

- 1) Size (including S-battery Pack)

Height	approx. 130 mm
Width	approx. 45mm
Depth	approx. 26.6 mm
Overall volume	approx. 135 cc

- 2) Weight (including S-battery pack) approx. 178g

- 3) Outline refer to attached figure. (Section 1.5)

- 4) Case material ABS
- 5) Case surface and color
 - Texture: Texture finish
 - Color : Dark Blue(COVER)
 - Dark Gray(CASE)

2.4. Software Description

This phone include the following specification.

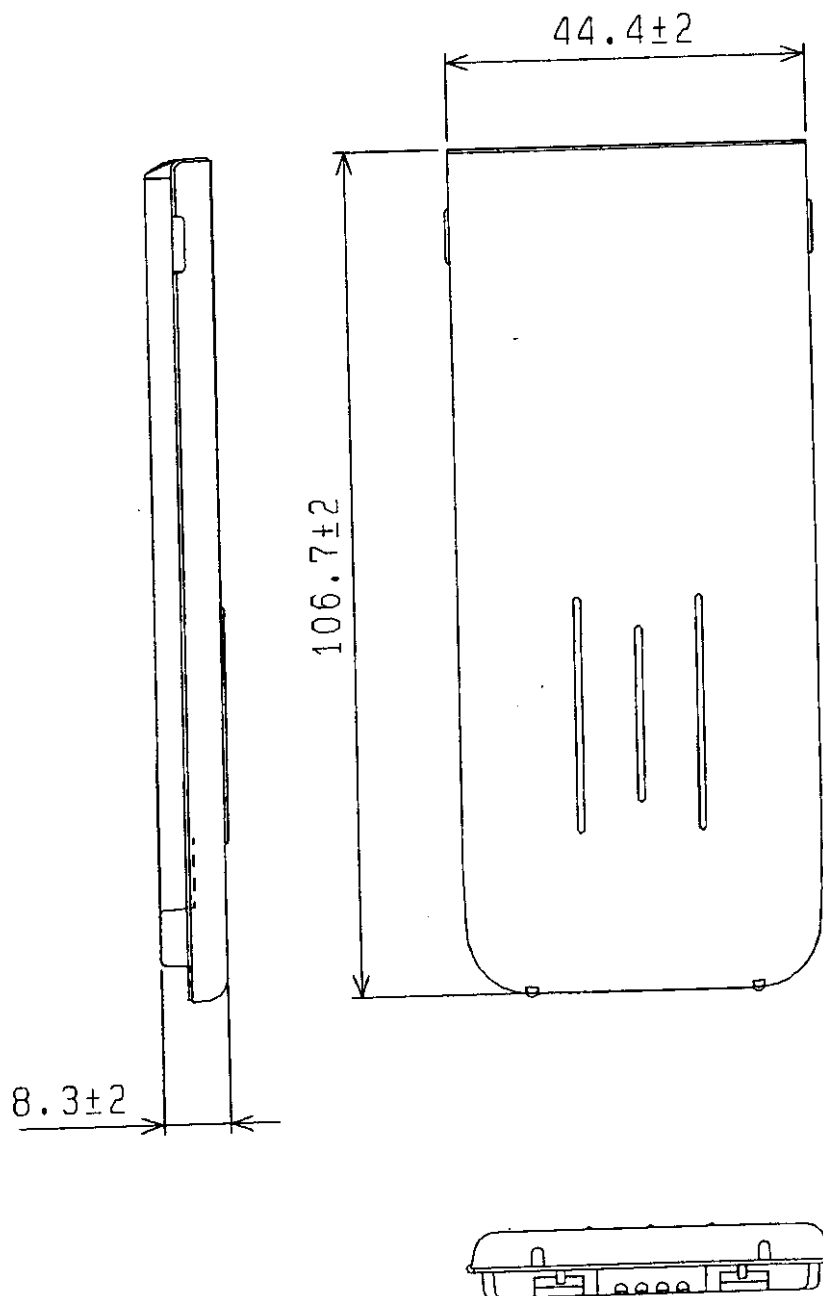
- 1) Intelligent Roaming
 - AT&T Wireless Services' document Specification for PCS Phone/ Appendix M*
 - "Intelligent Roaming Requirements for PCS Phones"*
 - or
 - TR45.3.6/97.12.15.24R1 Digital Cellular Standards "Intelligent Roaming"*
- 2) Non-Public Mode Operation
 - TDMA Forum Implementation Guide For Non-Public Mode Operation and*
 - Selection in IS-136 Compliant Mobile Stations*
- 3) Over the Air Activation
 - AT&T Wireless Service' document Specification for PCS Phone / Appendix K*
 - "Over-the-Air Activation"*
 - or
 - TDMA Forum Implementation Guide For Interim Over-the-Air Activation*

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3. ACCESSORIES

3.1. BATTERY PACK (NiMH-S) FZ-2363A



3.1.1. General

The battery pack (NiMH-S) is specially made as the dedicated d.c. source for the transceiver, and includes 4-cell 880mAh NiMH with an output short protection thermal switch.

3.1.2. Mechanical

3.1.2.1 Dimensions

Height	Approx. 106.7 mm
Width	Approx. 44.4 mm
Depth	Approx. 8.3 mm

3.1.2.2 Weight	Approx. 85 g
----------------	--------------

3.1.2.3 Outline	Refer to Figure in previous page
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3.1.2.4 Case surface and color

Texture:	Texture finish
Color:	Dark Gray

3.1.2.5 Case material	PC+ABS
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3.1.3. Electrical

3.1.3.1 Nominal output Voltage	Nominal 4.8 V
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3.1.3.2 Capacity	Nominal 880mAh
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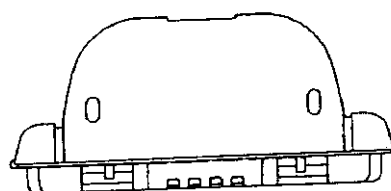
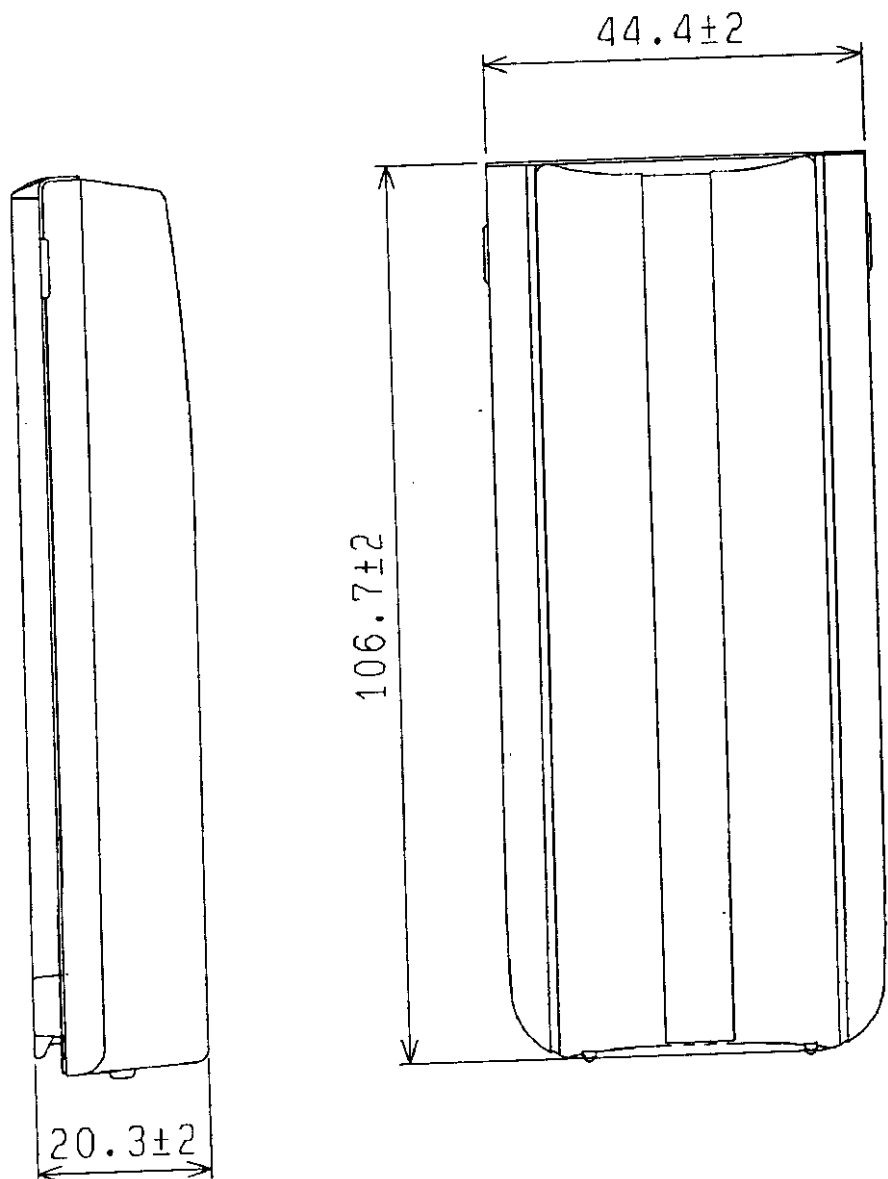
3.1.3.3 Operating Time

Standby Analog: tentative 15 hours / Digital: tentative 100 hours

Talk Analog: tentative 80 minutes / Digital: tentative 140 minutes

3.1.3.4 Life	(Recharge cycles at (1) C charging rate)	(500) cycles
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3.2. BATTERY PACK (NiMH-L) FZ-2365A



3.2.1. General

The battery pack (NiMH-L) is specially made as the dedicated d.c. source for the transceiver, and includes 4-cell 1500 mAh NiMH with an output short protection thermal switch.

3.2.2. Mechanical

3.3.2.1 Dimensions

Height	Approx. 106.7 mm
Width	Approx. 44.4 mm
Depth	Approx. 20.3 mm

3.3.2.2 Weight Approx. 132 g

3.3.2.3 Outline Refer to Figure in previous page

3.3.2.4 Case surface and color

Texture:	Texture finish
Color:	Dark Gray

3.3.2.5 Case material PC+ABS

3.2.3. Electrical

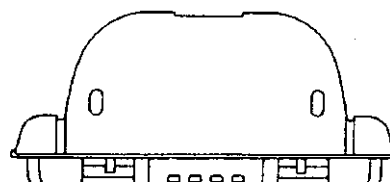
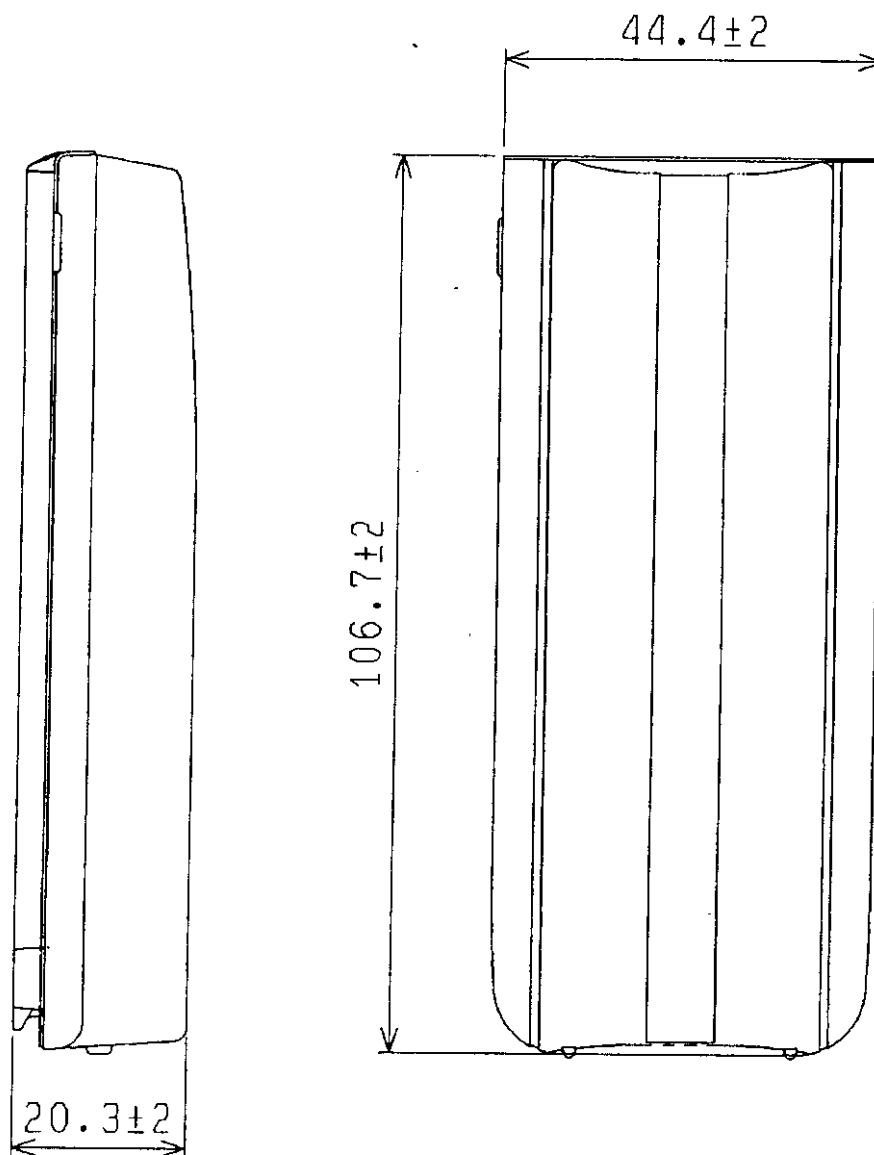
3.3.3.1 Nominal output Voltage Nominal 4.8 V

3.3.3.2 Capacity Nominal 1500mAh

3.3.3.3 Operating Time

Standby	Analog: tentative 25 hours	/ Digital: tentative 180 hours
Talk	Analog: tentative 130 minutes	/ Digital: tentative 230 minutes

3.3.3.4 Life (Recharge cycles at (1) C charging rate) (500) cycles

3.3. BATTERY PACK (Vibrating NiMH-S) FZ-2366A

3.3.1. General

The battery pack (Vibrating NiMH-S) is specially made as the dedicated d.c. source for the transceiver, and includes 4-cell 880 mAh NiMH with an output short protection thermal switch.

3.3.2. Mechanical

3.3.2.1 Dimensions

Height	Approx. 106.7 mm
Width	Approx. 44.4 mm
Depth	Approx. 20.3 mm

3.3.2.2 Weight (TBD)

3.3.2.3 Outline Refer to Figure in previous page

3.3.2.4 Case surface and color

Texture:	Texture finish
Color:	Dark Gray

3.3.2.5 Case material PC+ABS

3.3.3. Electrical

3.3.3.1 Nominal output Voltage Nominal 4.8 V

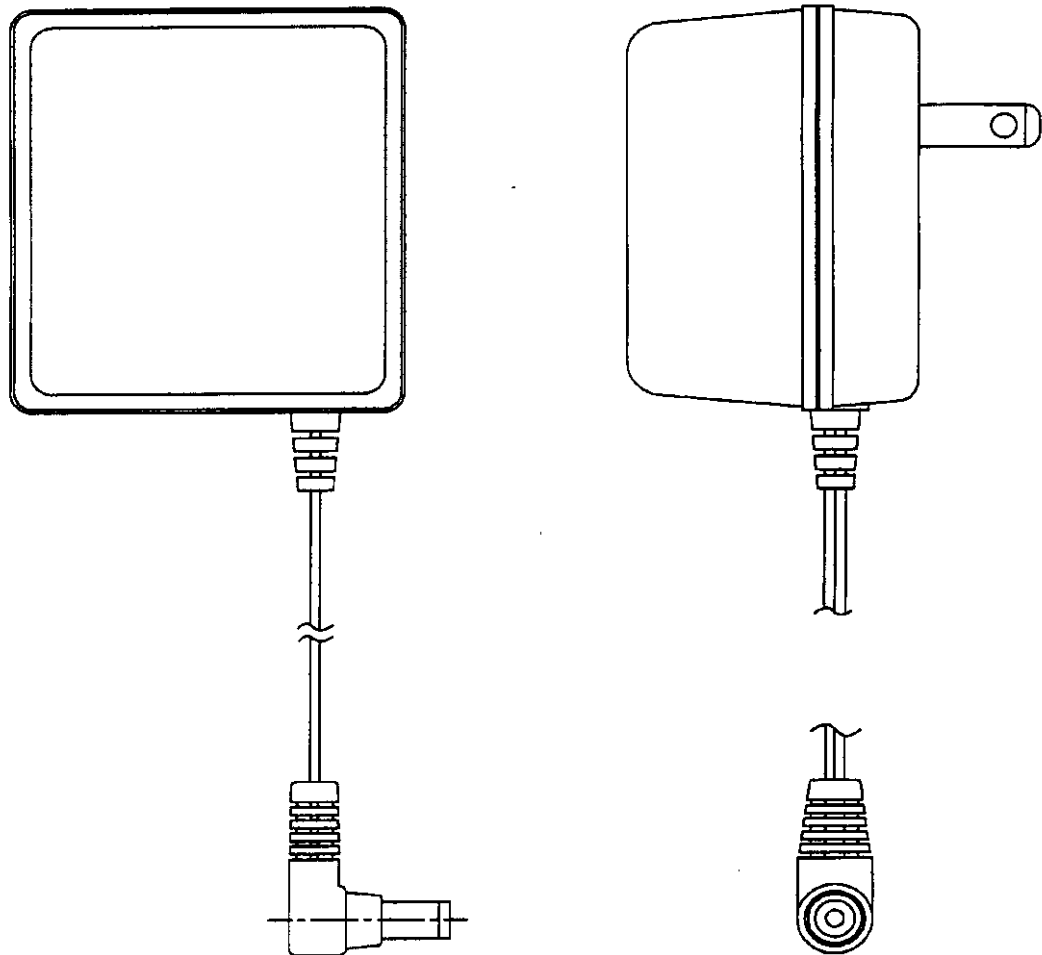
3.3.3.2 Capacity Nominal 880mAh

3.3.3.3 Operating Time

Standby	Analog: tentative 15 hours / Digital: tentative 100 hours
Talk	Analog: tentative 80 minutes / Digital: tentative 140 minutes

3.3.3.4 Life (Recharge cycles at (1) C charging rate) (500) cycles

3.4. AC/DC ADAPTER FZ-2367A



(Note: Case Design Subject to change)

3.4.1. General

This drawing specifies the functions of the AC/DC adapter for power feeding MT-2531F0R6A IS-136 handportable phone and rapid charging its battery.

AC/DC Adapter(FZ-2367A) for battery rapid charging

3.4.2. Mechanical

(Note: Case Design Subject to change)

3.4.2.1. Dimensions

Height	Approx. 77.0 mm
Width	Approx. 49.0 mm
Depth	Approx. 42.0 mm

3.4.2.2. Weight

TBD

3.4.2.3. Case surface and color

Texture:	Texture finish
Color:	Black

3.4.2.4. Case material

Equivalent PPO(Noryl)

3.4.2.5. Cable length

Approx. 1800 mm

3.4.3. Electrical

3.4.3.1. Power Supply Voltage

120V A.C. +/-10%

3.4.3.2. Output Voltage
600mA

9.0V D.C. +/-5% at

3.4.3.3. Output current

600mA nominal

3.4.3.4. Charging Time (with handheld phone)

Batt.(NiMH-S) Approx. 2.5 Hours

Batt.(NiMH-L) Approx. 4.5 Hours

3.4.3.3. Operating Temperature

-10 to +50 Degrees C

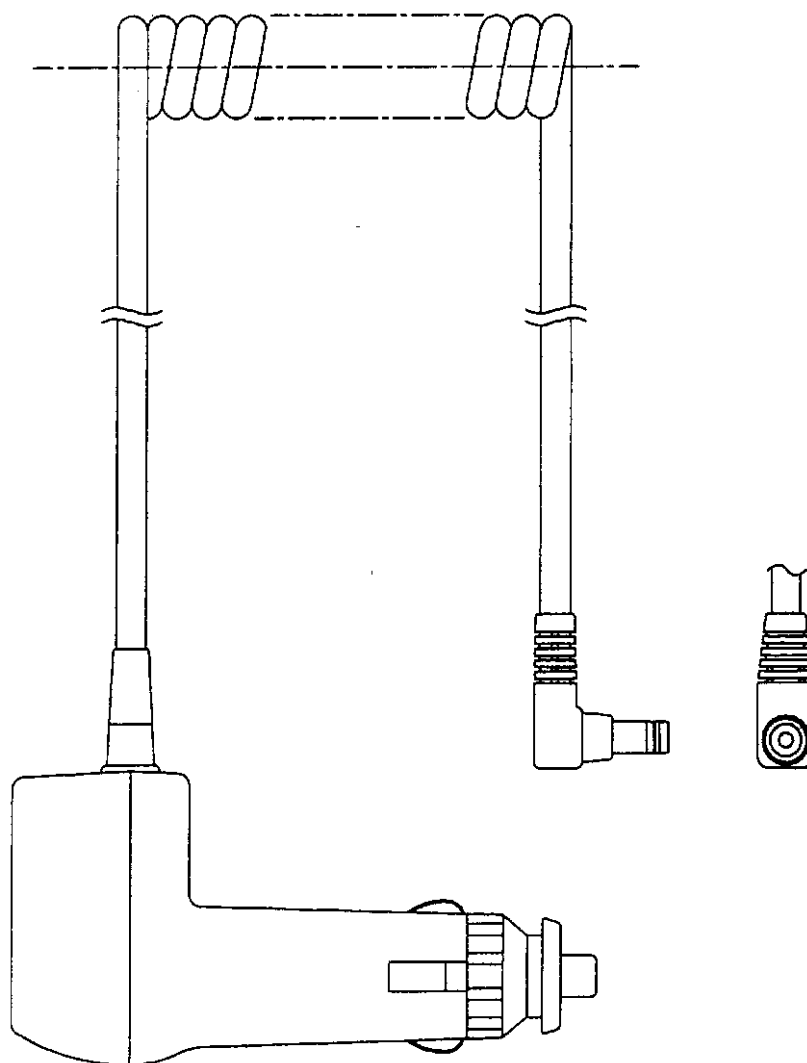
Storage Temperature

-40 to +65 Degrees C

3.4.3.4. Humidity

95% at 60 Degrees C

3.5. CIGARETTE LIGHTER ADAPTER FZ-2368A



3.5.1. General

The Cigarette Lighter Adapter supplies D.C. power for the full operation of MT-2531F0R6A IS-136 handportable phone.

3.5.1.1.	Configuration	Cigarette Lighter Adapter	FZ-2368A
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3.5.2. Mechanical

3.5.2.1.	Case color	Black
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3.5.2.2.	Case material	Equivalent ABS
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3.5.2.3.	Cable length	(total) (700+/-80) mm
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3.5.3. Electrical

3.5.3.1.	Power Supply Voltage	13.8V D.C. +/-20%
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3.5.3.2.	Output Voltage	8.5V D.C. +/-5%
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3.5.3.3.	Output current	600 mA typical
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3.5.3.4.	Charging Time	
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Batt.(NiMH-S)	Approx. 2.5 Hours
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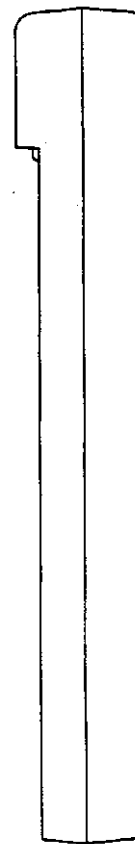
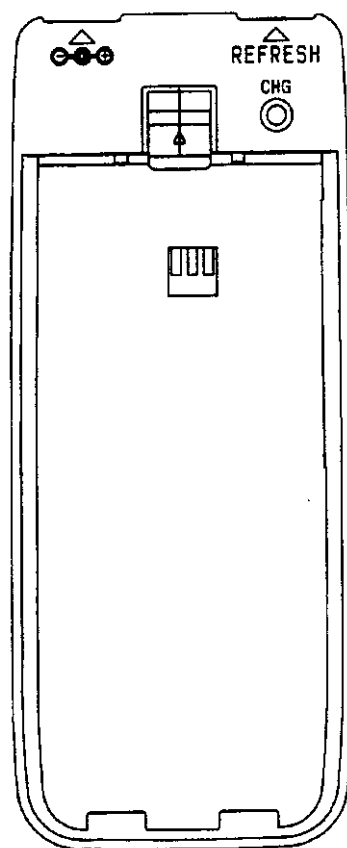
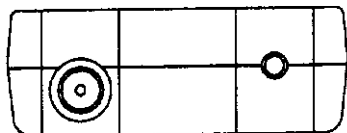
Batt.(NiMH-L)	Approx. 4.5 Hours
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3.5.3.5. Operating Temperature -30 to +60 Degrees C

Storage Temperature -40 to +85 Degrees C

3.5.3.6. Humidity 95% at 60 Degrees C

3.6. SPARE BATTERY CHARGER FZ-2369A



3.6.1. General

The Spare battery charger FZ-2369A enables the following operations with AC/DC Adapter described in 3.4 for MT-2531F0R6A IS-136 handportable phone.

- Charging Spare Battery Pack Only

3.6.2. Mechanical

3.6.2.1. Dimensions

Height	Approx. 19.3 mm
Width	Approx. 52.6 mm
Depth	Approx. 130.0 mm

3.6.2.2. Case surface and color

Textuer:	Texture finish
Color:	Black

3.6.2.3. Case material

Equivalent ABS

3.6.3. Electrical

3.6.3.1. Power Supply Voltage

9.0V D.C. +/- 10% at 600mA

3.6.3.2. Charging Time

Batt.(NiMH-S)	Approx. 2.5 Hours
Batt.(NiMH-L)	Approx. 4.5 Hours

3.6.3.3. Discharging Time

Batt.(NiMH-S)	Approx. 2.5 Hours
---------------	-------------------

Batt. (NiMH-L)

Approx. 4.5 Hours

3.6.3.4. Operating Temperature

- 0 to +45 Degrees C

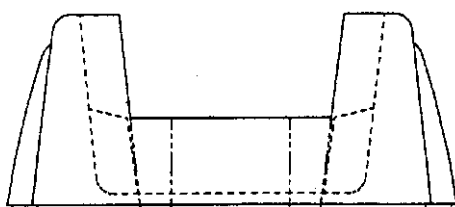
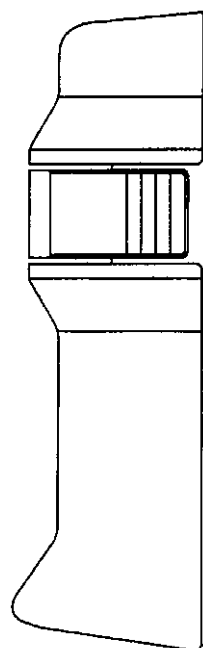
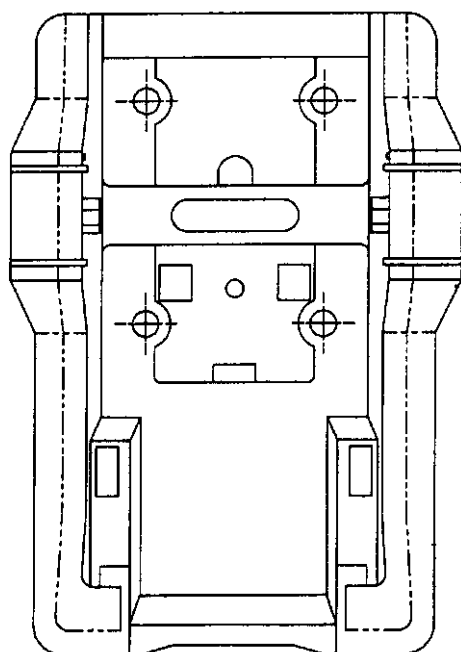
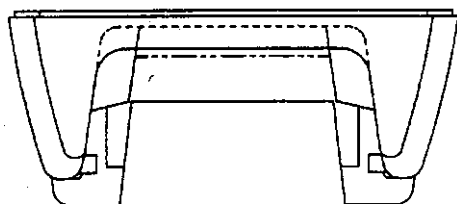
Storage Temperature

-40 to 85 Degrees C

3.6.3.5. Humidity

95% at 60 Degrees C

3.7. SIMPLE HOLDER FZ-2373A



3.7.1. General

The Simple Holder (FZ-2373A) is car mounting holder for MT-2531F0R6A IS-136 handportable phone.

3.7.2. Mechanical

3.7.2.1. Dimensions

Height	Approx. 86 mm
Width	Approx. 61 mm
Depth	Approx. 33 mm

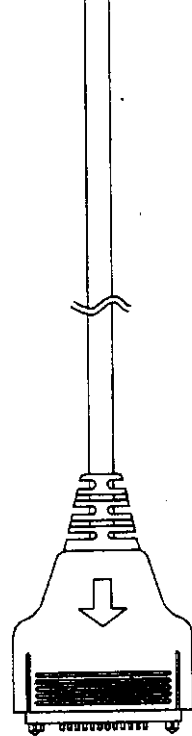
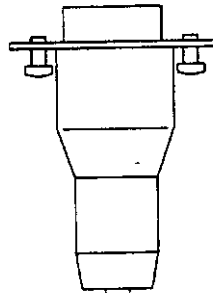
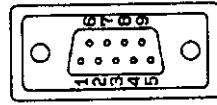
3.7.2.2 Outline Refer to Figure in previous page

3.7.2.3 Surface and color

Texture:	Texture finish
Color:	Black

3.7.2.5 Material Equivalent ABS

3.8. PC cable FZ-2372A



3.8.1. General

PC cable is used to connect between the phone and PC.

3.8.2. Mechanical

3.9.2.1 Cable Length Approx. 1000 mm

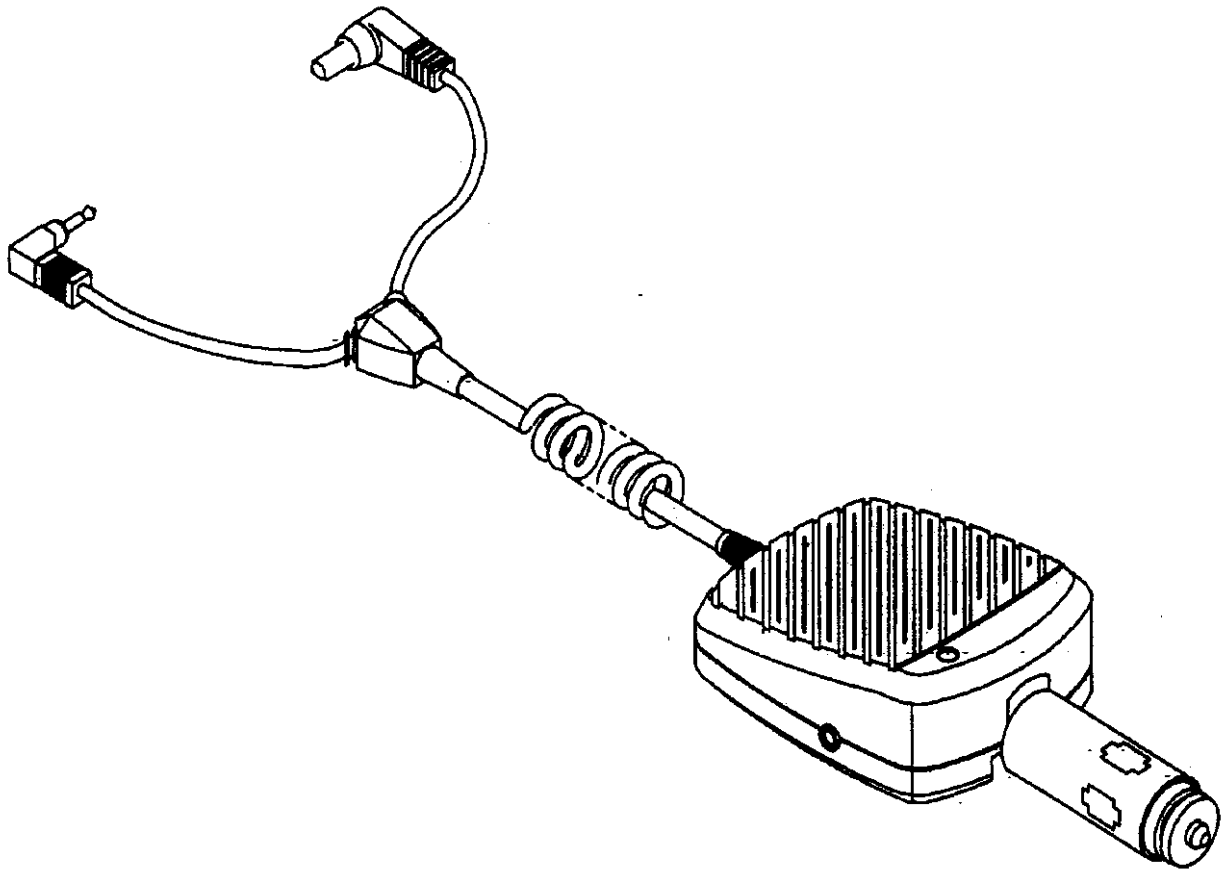
3.9.2.2 Outline Refer to Figure in previous page

3.8.3. Electrical

3.9.3.1 Operating Temperature 0 to +70 Degrees C
Storage Temperature -40 to +85 Degrees C

3.9.3.2 Humidity 80%

3.9. HANDSFREE ADAPTER Kit FZ-2370A



3.9.1. General

The Handsfree Adapter Kit enables the following operation for MT-2531F0R6A IS-136 handportable phone;

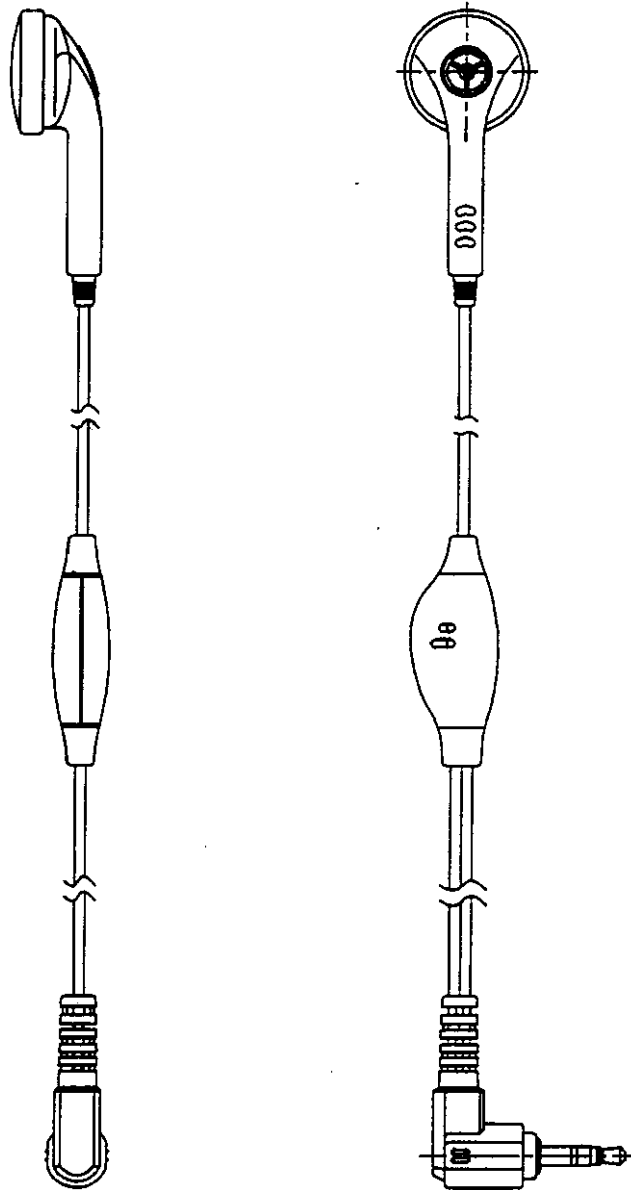
- 1) Handsfree operation with handsfree speaker and microphone.
- 2) D.C. power supply for charging battery attached to phone.

3.9.2. Mechanical (TBD)

3.9.3. Electrical

3.10.3.1 Power Supply Voltage	13.8V D.C. +/-20%
3.10.3.2 Output Voltage	8.5V D.C. +/-5% / 600 mA
3.10.3.3 Output current	600mA nominal for charging
3.10.3.4 Charging Time	
Battery NiMH-S	Approx. 2.5 Hours
Battery NiMH-L	Approx. 4.5 Hours
3.10.3.5 Microphone sensitivity	(TBD)
3.10.3.6 Speaker output range	(TBD)
3.10.3.8 Operating Temperature	-30 to +60 Degrees C
Storage Temperature	-40 to +85 Degrees C
3.10.3.9 Humidity	90% at 40 Degrees C

3.10. Headset FZ-2371A



3.10.1. General

The headset allows handsfree operation.

3.10.2. Mechanical

3.10.2.1. Cable Length Approx. 1200 mm

3.10.2.2. Outline Refer to Figure in previous page

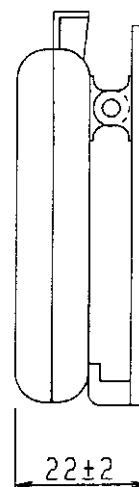
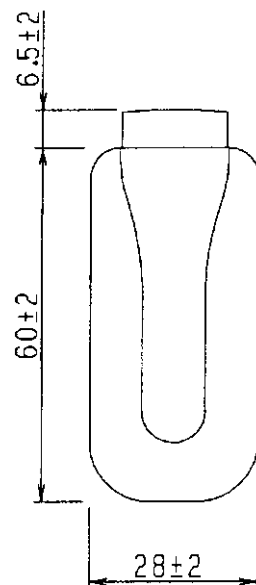
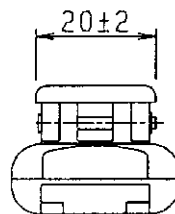
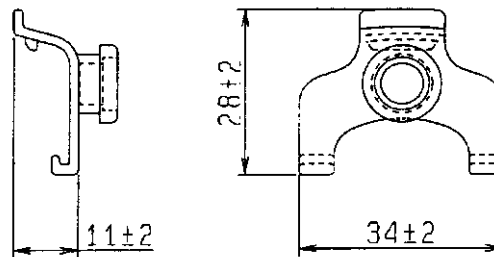
3.10.3. Electrical

3.10.3.1. Microphone

sensitivity	$-41 \pm 4\text{dB}$ (0dB=1V/Pa , at 1kHz)
impedance	MAX.2.2k Ω (at 1kHz)

3.10.3.2. Ear piece

Sound Pressure Level	$106 \pm 5\text{dB}$ (0dB=0.00002Pa , at 1kHz , 1mW input)
Impedance	$32\Omega \pm 7\Omega$

3.11. Belt Clip FZ-2374A

3.11.1 General

3.11.2. Mechanical

3.11.2.1 Dimensions

Height	Approx. 66.5 mm
Width	Approx. 28 mm
Depth	Approx. 22 mm

3.11.2.2 Outline

Refer to Figure in previous page

3.11.2.3 Surface and color

Texture:	Texture finish
Color:	Black

3.11.2.4 Material

ABS

4. Reserved

5. Reserved

6. Reserved

7. Reserved

8. Reserved

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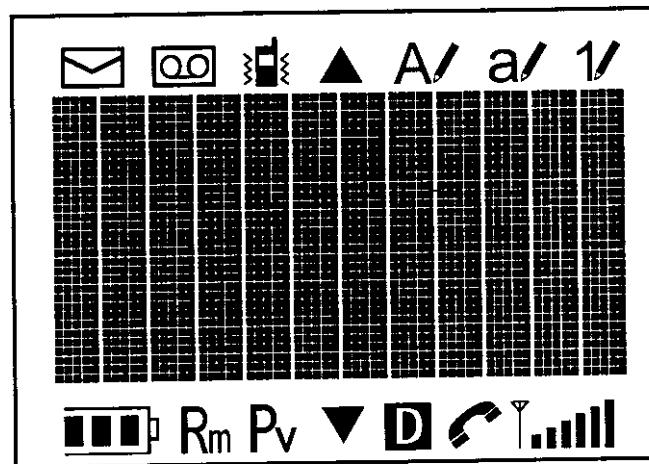
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9. USER OPERATING

9.1 OPERATING OVERVIEW

9.1.1 Liquid Crystal Display

The screen has a main display and special indicators. The main display consists of 4 lines of 12 characters, each being 5*8 dots. Two rows of indicators are located on the screen above and below the main display with a total of 14 icons showing the special status of the phone operation.



The main display shows the user data as well as the general status of the phone operation. The contents of the user area will vary depending on the current function.



These indicators are displayed when Up/Down cursor keys are used to scroll through the menu or data.



This indicator is displayed when a Short Message is received.



This indicator is displayed when a Voice Mail message is waiting.



This indicator is displayed when an optional vibrator is available.



This indicator is displayed when the phone menu is in the upper case text entry mode.



This indicator is displayed when the phone menu is in the lower case text entry mode.



This indicator is displayed when the phone menu is in the enter numeric digit mode.



This indicator has three segments showing the capacity level of the battery that are displayed continuously. The icon will start flashing when the battery is nearly exhausted and it will continue flashing until the battery is recharged or the battery is depleted.



This indicator is displayed when the phone is roaming.



This indicator is displayed when the phone is on a private system.



This indicator is displayed when the phone is using a digital channel.



This indicator is displayed when the phone is in conversation mode.



This indicator displays the received signal strength.

9.1.2 Audible Indicators

Wake-up

A half second high-pitched tone indicates when the phone is switched on.

Power-off

A short high-pitched tone indicates when the phone is switched off.

Ringling

Indicates that a call has been received.

Reorder

A fast busy tone indicates that the system has not accepted your call.

Intercept

A siren tone indicates an incorrect keying sequence.

Voice privacy warning

When the voice privacy tone setting is ON, and the system does not support the voice privacy feature on digital voice channels or the phone is on an analog voice channel, a warning tone sounds to alert the user during a conversation.

Message tone

Indicates that messages (i.e. SMS, Voice Mail) have been received.

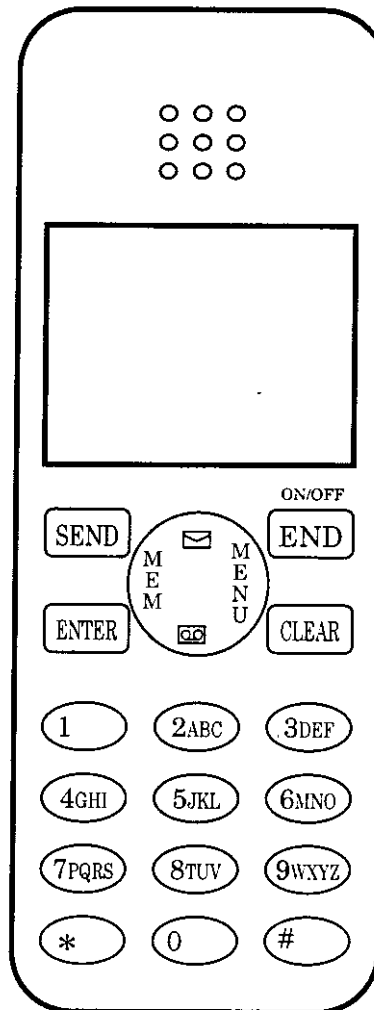
Battery warning

A short triple high-pitched tone generated every 20 seconds indicates that the battery needs to be charged.

Incorrect key

An error tone sounds when an unexpected key is pressed.

9.1.3 Function Keys

**SEND**

Initiates a phone call to the number shown in the display.

Answers the call when a ringing tone is heard.

A momentary press during a conversation provides a "hook flash" request.

END (ON/OFF)

A 0.5 second press will power on the phone.

A 1.0 second press will power off the phone.

Ends a call.

If the phone is in the extended function mode, the END key can be used to exit from any stage of the function mode.

When the phone is receiving a call, the "END" key can be used to mute the ring tone.

Round Cursor Key - UP

- (1) During standby mode:
Enter the text message sub menu.
- (2) During menu mode:
Moves the cursor up one item in the menu.
- (3) During conversation mode:
Increases the audio volume.
- (4) During edit mode:
Moves the cursor up one line.

Round Cursor Key - DOWN

- (1) During standby mode:
Initiates a call to your voice mailbox.
- (2) During menu mode:
Moves the cursor down one item in the menu.
- (3) During conversation mode:
Decreases the audio volume.
- (4) During edit mode:
Moves the cursor down one line.

Round Cursor Key - LEFT

- (1) During standby or conversation mode:
Enter the memory management sub menu.
- (2) During menu mode
Return to the previous menu level.
- (3) During edit mode:
Moves the cursor to the left.

Round Cursor Key - RIGHT

- (1) During standby or conversation mode:
Enter the menu mode.
- (2) During menu mode:
Selects the menu item.
- (3) During Edit mode:
Moves the cursor to the right.

ENTER

- (1) During Menu mode:
Acknowledges the menu operation and selects menu item.
- (2) During Edit mode:
Enters a character.

CLEAR

- (1) During Menu mode:
Cancels a menu selection process and returns to the previous menu.
- (2) During Edit mode:
Deletes a character.

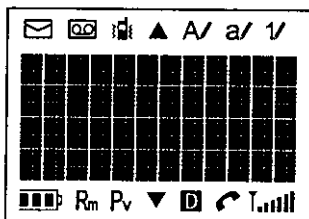
9.2 BASIC OPERATIONS

9.2.1 Initial Operation

9.2.1.1 Turning The Phone On

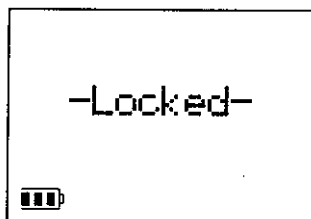
Press the END(PWD) key for more than one-half second.

The LCD display will momentarily illuminate all fields in the display. Display back-lighting will come on, followed by a tone.



9.2.1.2 Lock Function

If the "Locked" message appears on the display the mobile telephone is electronically locked. Enter the pre-set three digit unlock code. When the phone is locked, calls cannot be initiated or received. The one exception is emergency calls (911).

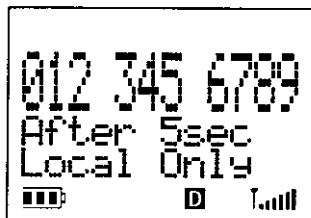


9.2.1.3 Displaying information

The mobile telephone number will be displayed.

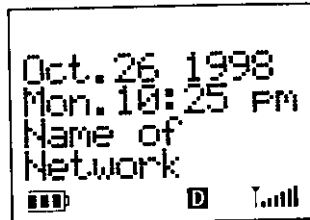
If the "Automatic Answer Mode" is activated, the automatic answer message will be displayed.

If the call restriction is enabled, the selected restriction level message will be displayed.

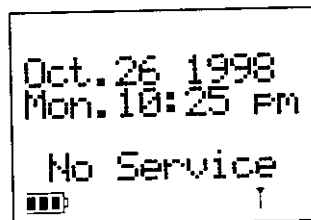


9.2.1.4 Standby Mode Display

After the power-up display, the time, date and the name of the network (Alpha Tag), if available from the cellular provider, will be displayed.

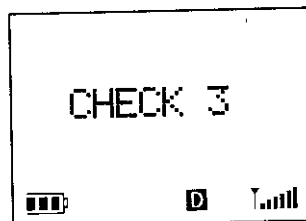


- After turning on the phone, if the "No Service" indicator remains in the display or appears at a later time, it may indicate that you are out of the cellular service area. Calls cannot be initiated or received when "No Service" is displayed.



9.2.1.5 Self-diagnosis

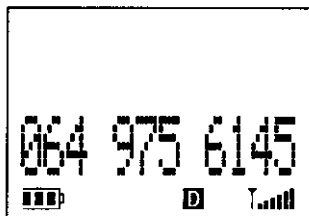
If an error message, such as "CHECK 3", appears in the display, the phone should be taken in for service.



9.2.2 Placing A Call

9.2.2.1 Normal Operation

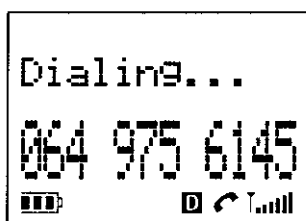
- (1) After the phone has registered with the network and the network name is displayed, a normal call can be initiated. When the display is showing the default screen, use the numeric keys to enter the desired telephone number.
- (2) Dial the desired telephone number. Each digit dialed will appear on the display.



- Press the "CLEAR" key to clear the last entered digit.
- To clear the entire number, hold down the "CLEAR" key for 1 second.
- Spaces will be automatically inserted between digits for clarity. The format for space insertion is as follows.

7 digits:	3 digits, space, 4 digits (double height characters)
10 digits:	3 digits, space, 3 digits, space, 4 digits (double height characters)
11 digits:	1 digits (third line)
	3 digits, space, 3 digits, space, 4 digits (bottom line)
International:	No spaces

- (3) Press the "SEND" key. The display will then show the "Dialing..." message and "☎" (Off Hook Indicator)". If the call is established, the dialed telephone number will disappear, the talk timer will appear and normal network tones will be heard from the ear-speaker.



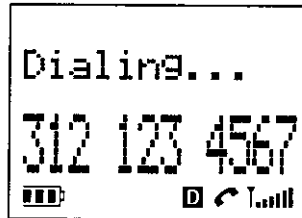
- If a busy tone is heard, press the "END" key.
 - If a reorder (fast busy) tone is heard, press the "END" key and wait a period of time, then press the "SEND" key again.
 - An intercept (siren) signal indicates a mistake was made by a user. Try again.
- (4) When the called party answers, proceed with the conversation. The talk timer indicates the elapsed time of the present call. (Refer to 9.2.4.1)

9.2.2.2 Super-Speed Dialing

Super speed dialing allows you to place a call without recalling a telephone number from the memory. A telephone number stored in the memory addresses 01 to 09 can be dialed just by entering the one digit memory address number (1 to 9) and "SEND".

EX. If memory address "01" has the telephone number "312-123-4567".

"1" + "SEND" or Press and hold "1" key



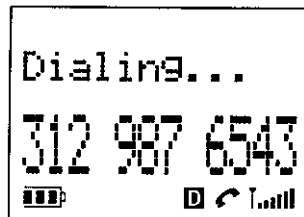
The operation "0" + "SEND" is an operator call.

9.2.2.3 Speed Dialing

A telephone number stored in the memory addresses 01 to 99 can be dialed just by entering the two digit memory address number (01 to 99) and "SEND".

EX. If memory address "10" has the telephone number "312-987-6543".

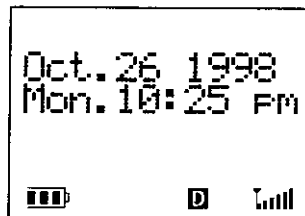
"1" + "0" + "SEND"



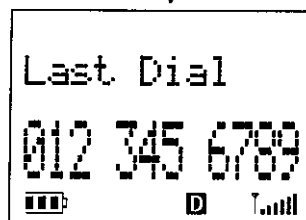
- The operation "0" + "0" + "SEND" is an operator call.

9.2.2.4 Last Number Redial

If no dial number has been entered, press the "SEND" key to call the last number dialed.



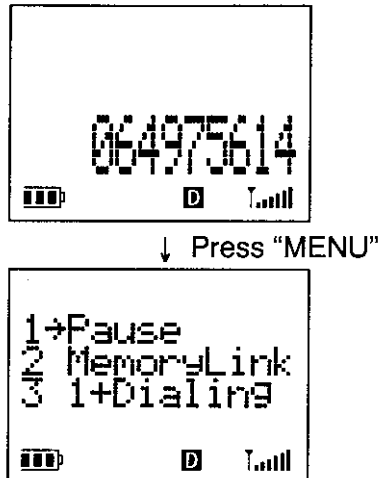
↓ Press "SEND" key.



9.2.2.5 Automatic DTMF (Pause Function)

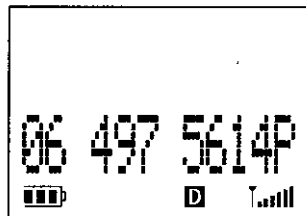
To enter a string of DTMF tones to send after you dial a telephone number, do the following.

- (1) Enter the desired telephone number .
- (2) Press "MENU" (round cursor key-Right) to display the dial sub menu.

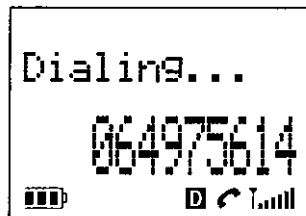


The items in the menu can be scrolled through by pressing the "UP" or "DOWN" key. To select an item from a menu, press "ENTER" when the cursor is positioned beside the item.

- (3) Select "1 Pause"



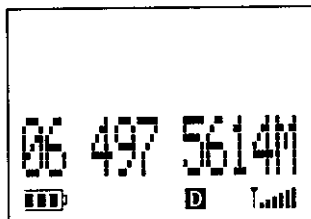
- (4) Enter the DTMF strings on the keypad.
- (5) If necessary, repeat steps (2), (3) and (4) to add additional DTMF strings.
- (6) Press "SEND" to dial the telephone number.



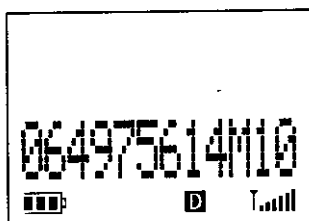
- (7) After the call connects, press "SEND" to transmit each DTMF string.

9.2.2.6 Recalling DTMF Strings From Memory

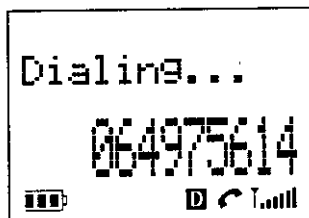
- (1) Enter the desired telephone number .
- (2) Press "MENU" (round cursor key-Right) , then "2". An "M" appears after the telephone number, as a separating mark.



- (3) Enter the memory address of the DTMF string you want to send.



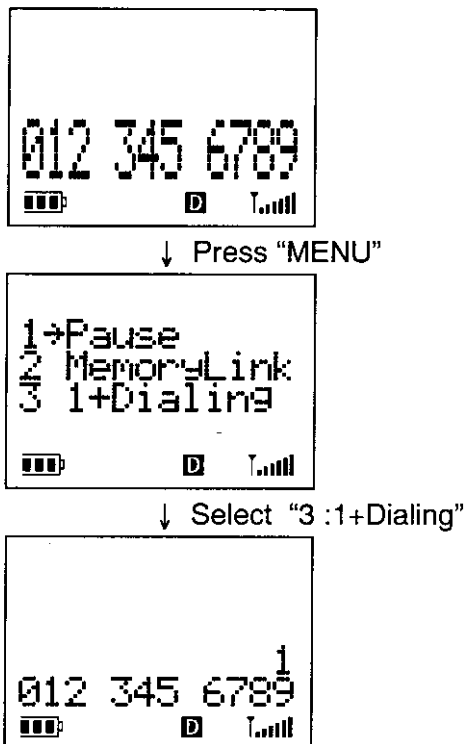
- (4) If necessary, repeat steps (2) and (3) to add another DTMF string to be sent.
- (5) Press "SEND" to dial the phone number.



- (6) After the call connects, press "SEND" to transmit each DTMF string.

9.2.2.7 Add a "1" Before The Dialing Number

When the telephone number is displayed, press "MENU" (round cursor key-Right) , then "3". A "1" appears before the dialing number.



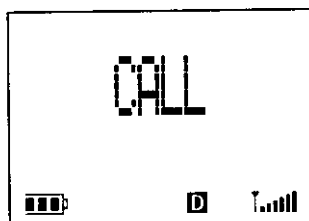
9.2.2.8 Automatic Redial

This function is a selectable option. (Refer to 9.7.5.2). When enabled, the mobile telephone will re-attempt a call every 3 seconds for a total 10 times if it was unable to access the cellular system. When the system is accessed, a short beep sounds from the beeper. If 10 attempts are unsuccessful, a reorder tone is heard from the ear-speaker. During this automatic retry procedure, the retry message is displayed, as shown below. This procedure can be canceled by pressing the "END" key.

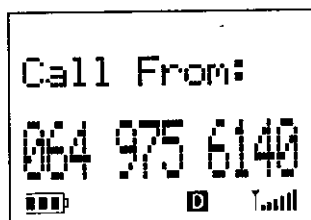


9.2.3 Receiving A Call

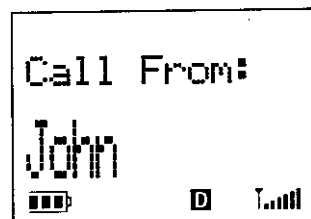
When the phone is turned on and is not displaying the "No Service" message, an incoming call will result in a ringing tone while the "CALL" message flashes on the display.



If the calling number is available (dependent upon the network), it will be displayed instead of the normal call message.

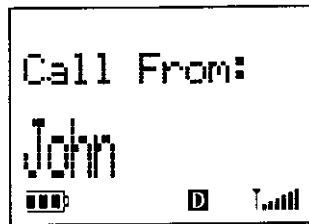


If the caller name is available (dependent upon the network), it will be displayed. Alternately, if the network sends the number only and it matches a number in memory, the programmed name tag from memory will be displayed.

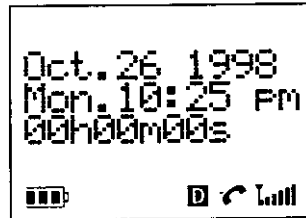


9.2.3.1 Any Key Answer

Press any key except "END" to answer a call.



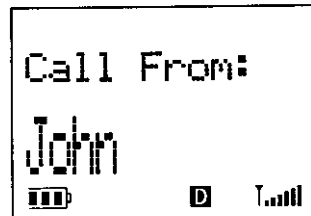
↓ Press any key except "END".



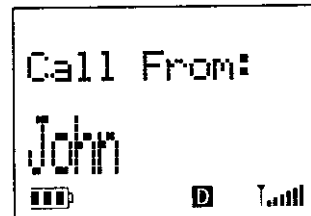
- The any key answer function is always active when receiving a call.
- If an incoming call is left unanswered, the ringing tone will automatically increase one volume level per ring cycle, starting from the user's setting level, until the maximum is reached. The maximum level will then be maintained until the call is answered.

9.2.3.2 Call Mute

When the mobile telephone is ringing, press the "END" key to mute the ring tone.



↓ Press "END".

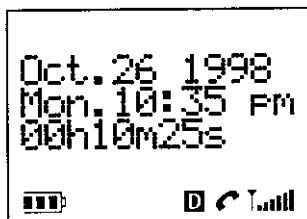


- Although muted, the phone is still capable of receiving a call.

9.2.4 During Conversation Operations

9.2.4.1 Talk Timer

During the conversation mode, the talk timer will be displayed.



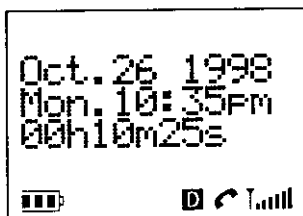
9.2.4.2 Conversation Volume Control

The round cursor key UP or DOWN is used to control volume of the ear-speaker during conversation mode.

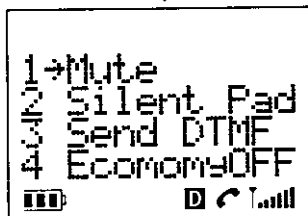


9.2.4.3 Menu During Conversation

While in conversation mode, pressing the "MENU" key will display the following menu.

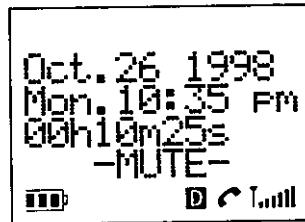


↓ Press "MENU" key.



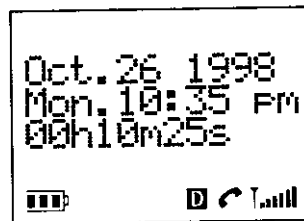
9.2.4.3.1 Mute Function

During a conversation, Press "MENU" (round cursor key-Right) , then "1" to turn the phone's microphone off and put a call on hold. "MUTE" displays. Press any key to return to the conversation. Alternately, you may press and hold the "MENU" key for Mute.

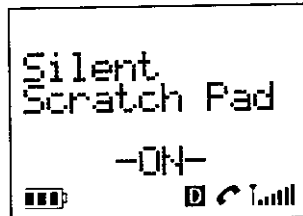


9.2.4.3.2 Silent Scratch Pad

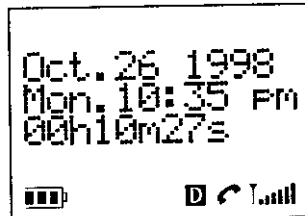
During the conversation, Press "MENU" (round cursor key-Right) , then "2" to enable or disable the silent scratch pad. When this function is active, DTMF tones are not heard from the beeper or transmitted. This function is disabled when call is ended.



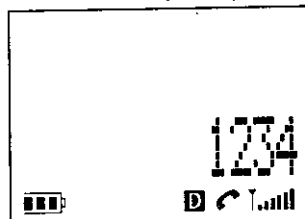
↓ Press "MENU" (round cursor key-Right) + "2".



↓ After 1 second.



↓ ex.) Press "1234".

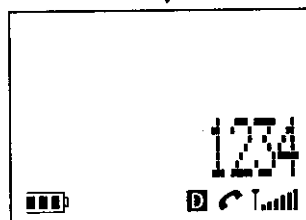


(DTMF Tones will not be heard)

↓ Press "MENU" + "2".



↓ After 1 second.



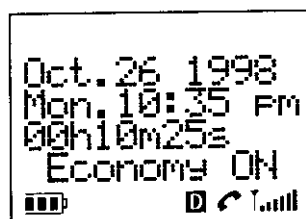
9.2.4.3.3 Automatic DTMF Tone Sequence

When DTMF tones need to be sent, the user can recall a DTMF sequence from memory for sending. Alternately the user may wish to enter a complete DTMF sequence on the display before sending it.

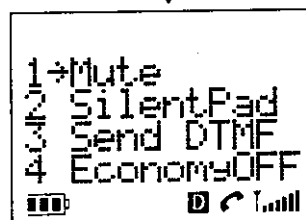
- (1) To send the DTMF strings on the display.
 - Press "MENU" (round cursor key-Right) and select "Send. DTMF".
 - The number shown on the display will be sent as DTMF.
- (2) To recall a DTMF sequence from memory and send it.
 - First recall a sequence from memory using numeric or alphabetic recall.
 - Press "SEND" to send the recalled sequence as DTMF.

9.2.4.3.4 Economy Mode (Voice Activated Transmission) Off

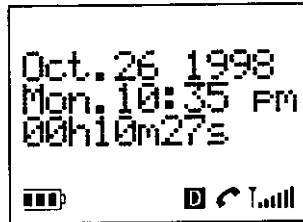
When Economy Mode is available, the user can disable this option. (Refer to 9.7.5.5)



↓ Press "MENU" (round cursor key-Right) .



↓ Select "4 Economy OFF".



9.2.4.4 Hook-Flash Request

Press the "SEND" key Momentarily.

The system operator will provide you with specific procedures concerning various services offered by the cellular system.

9.2.4.5 DTMF Tone Transmission

When the Silent Scratch Pad function is off, DTMF transmission is possible during the conversation mode. During conversation mode, each press of a numeric key will produce a DTMF tone for the duration that the key is pressed.

9.2.4.6 Memory Operation

Press "MEM" (round cursor key-Left) . The Memory Management sub menu will be displayed. (Refer to Chapter 9.4)

9.2.4.7 Ending A Call

Press the "END" key.

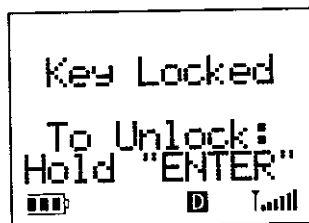
9.2.5 Turning The Phone Off

To turn off the phone, press the "END" key for more than 1.0 second. A short beep will sound from the beeper to indicate that the mobile phone has turned off.

9.2.6 Other Basic Operations

9.2.6.1 Keypad Lock Function

When the user presses the "ENTER" key for 1 second, the keypad lock function is turned on and the display is changed as following.



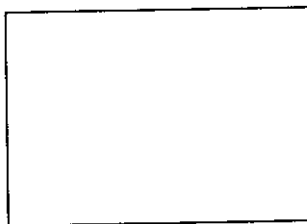
- When the keypad lock function is turned on, all of the keys including the "ON/OFF" key are disabled.
- This will prevent accidental key entry when the phone is in a handbag or briefcase. The user can not make a call (including an emergency call) when this function is ON.
- To turn off this function, the user should press the "ENTER" key for 1 second.
- When the phone receives the call with this function turned on, it is automatically turned off and the user can answer the call and continue to use the phone as usual.
- This selection is not preserved while the phone is turned off.

9.2.6.2 Battery Charging

While the mobile telephone's battery is being charged by an external power supply, appropriate status indications will be provided on the display.

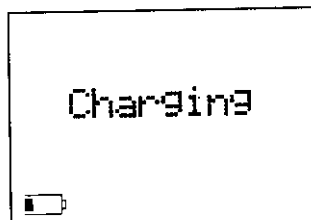
- (1) During power OFF - No external power source connected

The display is blank.

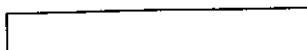


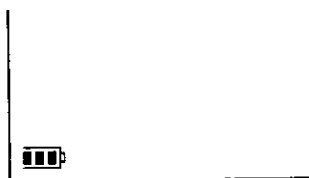
- (2) During power OFF - External power source connected

Upon connection of the external power supply to the phone, the battery icon flashes from empty to full. ( >  > )



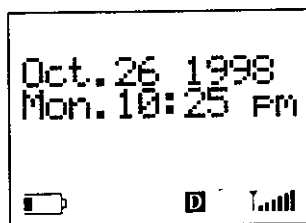
- In this case the phone is not fully operational (it is not possible to make or receive a call). To switch the phone on, press the power key as usual.
- When the battery is fully charged, the full battery icon will be displayed.



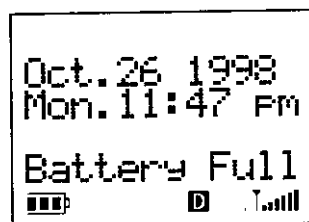


(3) During power ON - External power source connected

Upon connection of the external power supply to the phone, the battery icon flashes from empty to full. ( >  > )



- When the battery is fully charged, the following message will be displayed and the full battery icon will be displayed.



9.2.6.3 Back-light

The back-light will illuminate the keypad and the LCD display for 10 seconds after pressing any key, except for the "ON/OFF" key. Additional presses of any key (except for the "ON/OFF" key) will extend illumination for another 10 seconds.

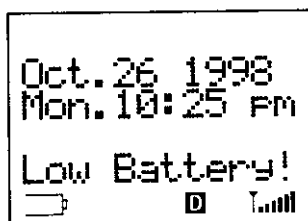
9.2.7 Messages and Indicator

9.2.7.1 Low Battery

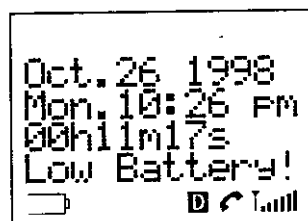
When the battery needs charging, three short tones will be heard. If the mobile phone is left on despite low battery alarm, it will automatically turn itself off to protect the battery from over-discharging.

To ensure long battery life, the battery should be used until the mobile phone turns itself off. (Refer to 9.2.6.2)

During standby mode:

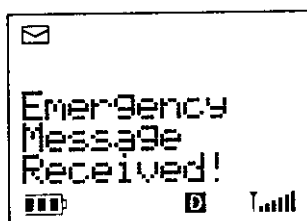


During conversation mode:



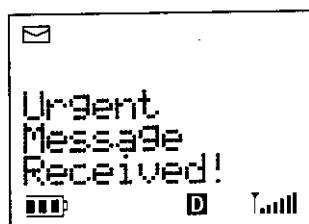
9.2.7.2 Emergency Short Messages

When an Emergency Short Message is received by the mobile phone, the message receive tone will sound, and the Short Message indicator "✉" will be displayed to indicate that a new message has been received. Additionally, the following message will be displayed. (Refer to Chapter 9.5.3)



9.2.7.3 Urgent Short Messages

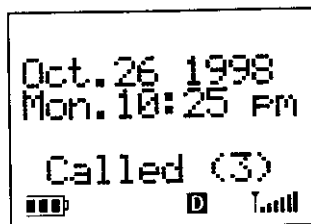
When an Urgent Short Message is received by the phone, the message receive tone will sound, and the Short Message indicator "✉" will be displayed to indicate that a new message has been received. Additionally, the following message will be displayed. (Refer to Chapter 6)



9.2.7.4 Unanswered Incoming Calls

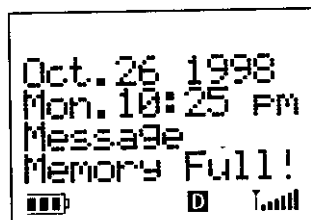
When an incoming call remains unanswered, the "Called" message will be displayed.

(Refer to 9.4.7)



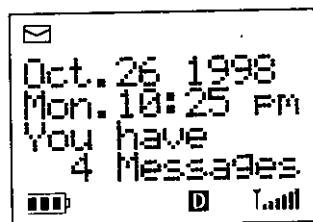
9.2.7.5 Short Message Memory Full

When the Short Message Memory is full, the following message will be displayed. (Refer to Chapter 9.6)

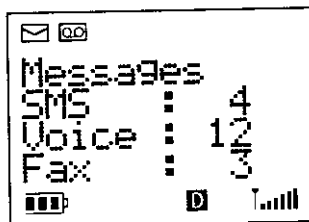


9.2.7.6 Normal Short Messages

When a Normal Short Message is received by the phone, the message receive tone will sound, and the Short Message indicator "✉" will be displayed to indicate that a new message has been received. Additionally, the following message will be displayed. (Refer to Chapter 9.6)

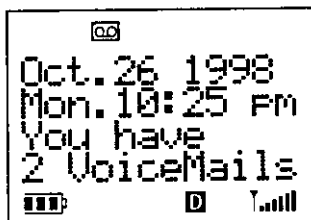


- When the voice mail indicator and/or the fax indicator is also received, the following message will be displayed instead of the clock.



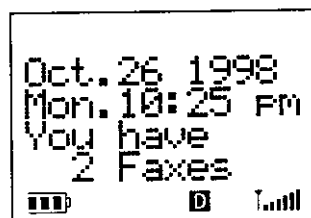
9.2.7.7 Voice Mail Indication

When the phone receives a voice mail indication, the phone sounds the message tone and displays the voice mail indicator "VM". (Refer to Chapter 9.5)



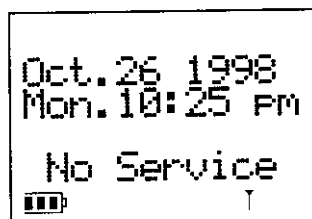
9.2.7.8 Fax Indication

When the mobile phone receives a fax indication, the phone sounds the message tone and displays the following message.



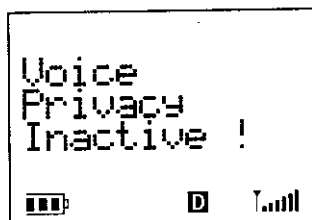
9.2.7.9 No Service

When the mobile phone is out of the cellular service area, the following message will be displayed. Telephone calls cannot be completed until the unit is returned to the service area.



9.2.7.10 Voice Privacy Warning

When the voice privacy tone setting is ON, but the system does not support the voice privacy feature on digital voice channels or the phone is on an analog voice channel, the phone displays the following message for 5 seconds and a warning tone sounds to alert the user during a conversation. (Refer to 9.7.5.4)



9.3 ALPHANUMERIC ENTRY

Alphanumeric entry is used in the memory and message operation.

The digits 0-9 and their associated characters as shown in the table below, can be entered directly to the display using the telephone keys. For example, one press of the number 6 key will enter "M", a second press will enter "N" in the same cursor position (replacing "M"), a third press will display "O", and so on. In order to enter a character, press the round cursor key or another digit key. Once the key has been released for 1 second, the cursor appears to the right of the letter entered.

The character table is as follows.

Upper-case letter mode	
key	Characters
1	0<>^[]()
2	ABC
3	DEF
4	GHI
5	JKL
6	MNO
7	PQRS
8	TUV
9	WXYZ
*	Shift
0	,.:;"'~_
#	Space ?!@#l

→

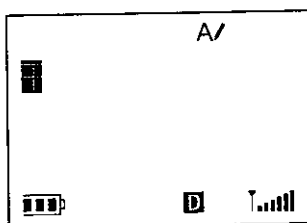
Lower-case letter mode	
key	Characters
1	0<>^[]()
2	abc
3	def
4	ghi
5	jkl
6	mno
7	pqrs
8	tuv
9	wxyz
*	Shift
0	,.:;"'~_
#	Space ?!@#l

→

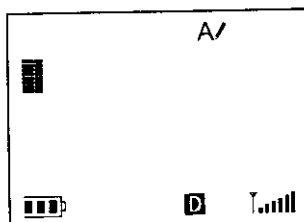
Digit mode	
key	Characters
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
*	Shift
0	0
#	#*+-=%

Example : Input a new message

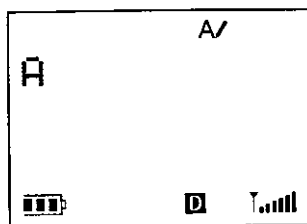
- (1) When the phone is in the edit mode, the "Edit Mode Indicator" and the appropriate character type indicator will be displayed. The "Cursor" will blink in the upper left-hand corner of the display.



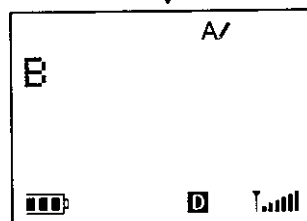
- (2) How to enter "C"



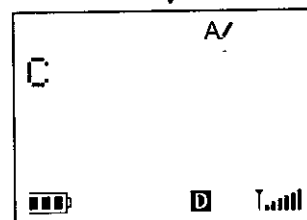
↓ Press "2 (ABC)"



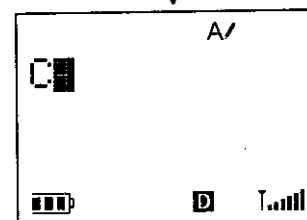
↓ Press "2 (ABC)"



↓ Press "2 (ABC)"

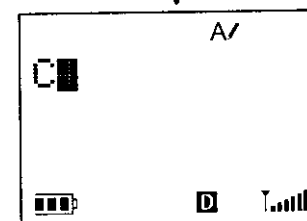


↓ Press "RIGHT"

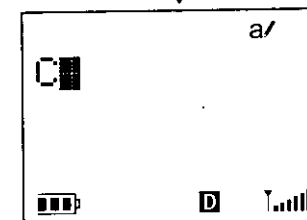


- (3) To enter a lower-case alphabetic or numeric character, change the entry mode by pressing the "*" key.

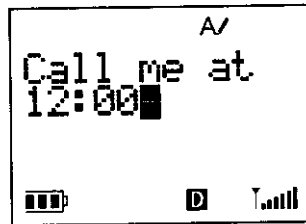
↓ Press "*"



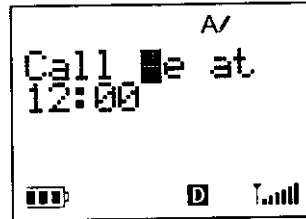
↓ Press "*"



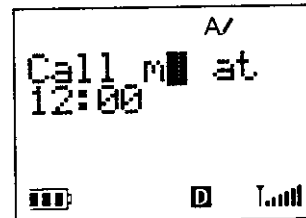
- (4) The "round cursor key" is used for moving the cursor.



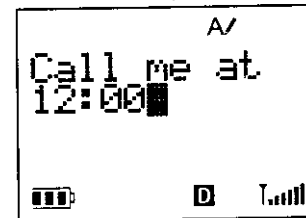
↓ Press "round cursor key-Up" key.



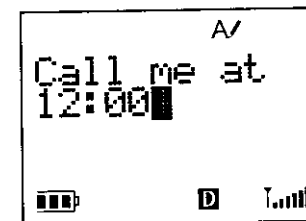
↓ Press "round cursor key-Right" key.



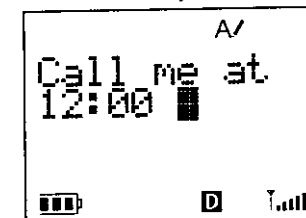
↓ Press "round cursor key-Down" key.



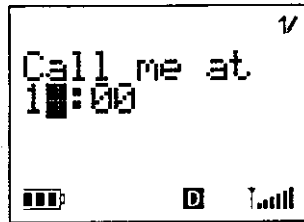
- (5) When the cursor is located at the end of the entered text, pressing the "round cursor key-Right" key will cause a "Space" to be entered.



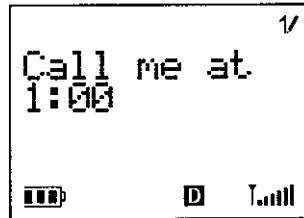
↓ Press "round cursor key-Right" key.



- (6) To delete the character at the cursor, press the "CLEAR" key.

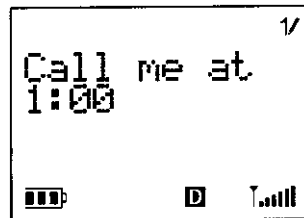


↓ Press "Round cursor key-Right" key.



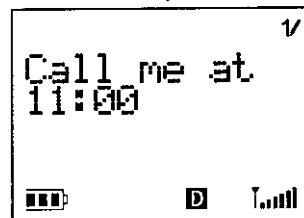
("□" is blinked.)

- (7) Entered characters are inserted at the cursor.



("□" is blinked.)

↓ Press "1" key.



("□" is blinked.)

- (8) To terminate text entry / editing, press "ENTER" key.

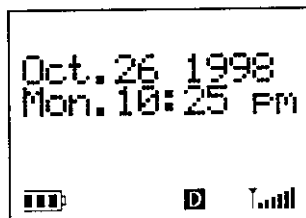
9.4 MEMORY MANAGEMENT

Since telephone number memory recall is the most often used memory management function, it is located at the top of the memory management menu. This function can be used even when the phone is in conversation mode. The memory management operations are described in further detail below.

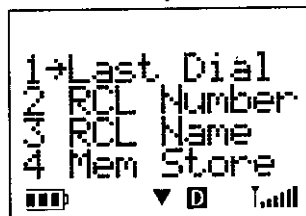
9.4.1 Memory Management Sub Menu

When the "MEM" (round cursor key-Left) key is pressed, the memory management sub menu is displayed. The following functions can be operated from the menu.

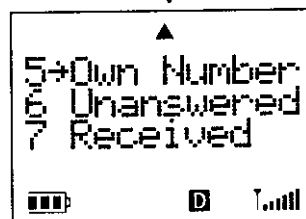
- (1) Recall Last Dialed Numbers
- (2) Recall by Number
- (3) Recall by Name
- (4) Memory Store
- (5) Mobile Telephone (Own) Number Display
- (6) Unanswered Incoming Calls Review
- (7) Received Calls Review



↓ Press "MEM" (round cursor key-Left)



↓ Press "round cursor key-Down" 4 times



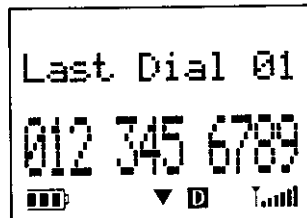
- This menu function can be accessed by using "UP" or "DOWN" key to select the desired function and then press "ENTER" or "Right" key.
- To exit from the memory management sub menu, press the "END", "CLEAR" or "round cursor key-Left" key.

9.4.2 Recall Last Dialed Numbers

- Up to 10 of the last dialed telephone numbers are stored and can be displayed.
- If the present telephone number is the same as the last number, the present phone number is not stored into the last number memory.

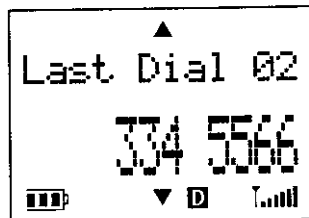
9.4.2.1 Last Dialed Numbers Memory Scan

- (1) Direct Operation: "MEM" (round cursor key-Left) + "1"

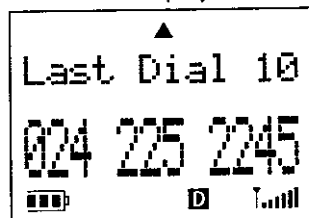


- The most recent last dialed numbers are displayed.
- Press the "CLEAR" key to exit the memory management sub menu.

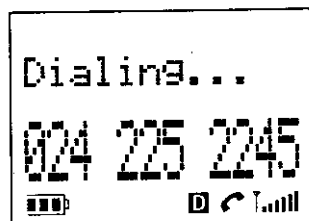
- (2) When "▼" / "▲" is displayed, the next / previous message can be displayed by pressing "DOWN" / "UP" key.



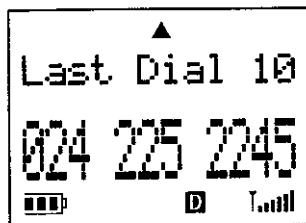
↑ ↓
Press "UP" key ↑ ↓ Press "DOWN" key



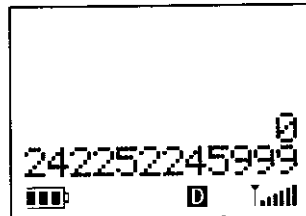
- (3) The indicated number can be called directly by pressing the "SEND" key.



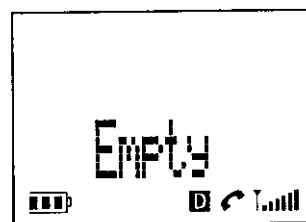
- (4) It is possible to add extra digits to the recalled telephone numbers. When the extra digits are entered, the mobile phone exits from this mode and all digits are displayed via the normal display mode.



↓ Enter "999"

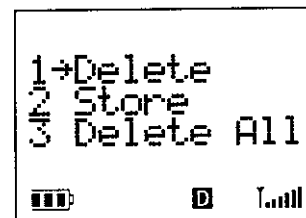


- (5) If no last dialed data has been stored, the following message will be displayed for 1 second.

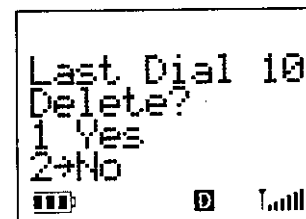


9.4.2.2 Last Dialed Numbers Sub Menu

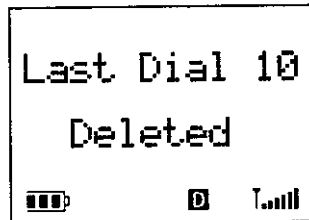
When the "MENU" key is pressed, the following message is displayed.



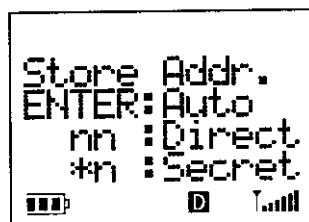
- (1) If "1 Delete" is selected, the user is prompted to confirm his choice as follows.



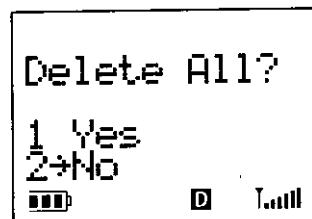
- If "Yes" is selected, then the indicated number is removed from the Last Dialed Number memory and the following message is displayed for 1 second.



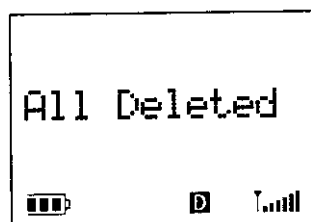
- If "No" is selected then the message simply remains in the memory.
- (2) If "2 Store" is selected, then the mobile phone enters the "Memory Store Mode". (Refer to 9.4.5)



- (3) If "3 Delete All" is selected, then the user is promoted to confirm his or her choice as follows.



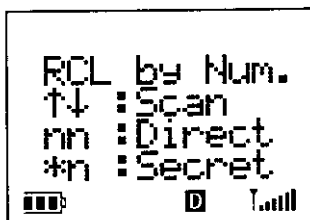
- If "Yes" is selected, then all Last Dialed Number data is removed from memory and the following message is displayed for 1 second.



9.4.3 Recall By Number

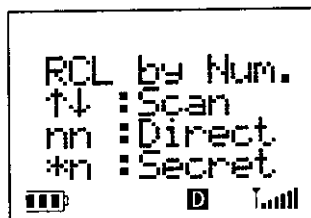
To recall number memories using the absolute numerical address.

Direct Operation: "MEM" (round cursor key-Left) + "2"

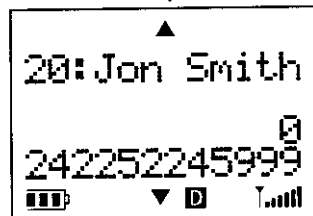


9.4.3.1 Memory Scan

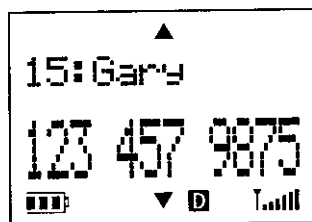
- (1) When the "UP" or "DOWN" key is pressed, last recalled memory address data is displayed. Pressing the "UP" or "DOWN" key scans forward or backward through the memory locations. Free memory locations are skipped.



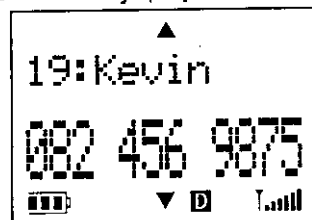
↓ Press "UP" or "DOWN" key.



- If there are entries (forward or backward) beyond the one currently displayed, then the arrow indicators (▲, ▼) are displayed.



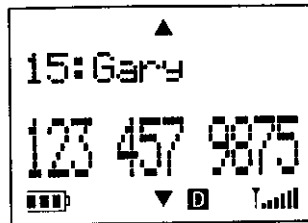
Press "UP" key ↑ ↓ Press "DOWN" key



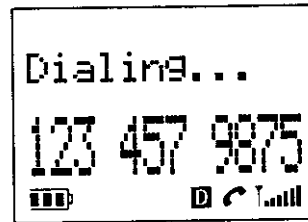
Press "UP" key ↑ ↓ Press "DOWN" key

- Holding the "UP" or "DOWN" key will cause the display to scroll to the next item every half-second.
- Press the "CLEAR" key to return to the previous stage.

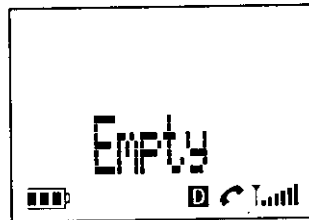
- (2) When the desired number has been selected, press "SEND" to initiate a call to the number.



↓ Press "SEND" key.



- (3) When the "MENU" key is pressed, the mobile phone enters the recall sub menu. (Refer to 9.4.3.4)
- (4) If no data has been stored, the following message will be displayed for 1 second.

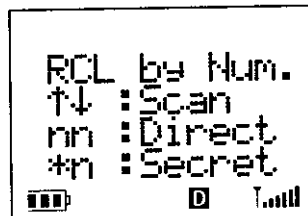


9.4.3.2 Memory Direct Recall (With Occupied Address Map)

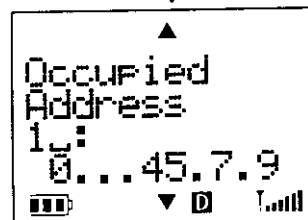
The contents of the 99 recall memories are recalled by entering the address number. These 99 memory locations are numbered 01 to 99.

- (1) When the first digit of the memory address number is entered, the "Occupied Address Map" of that address group is displayed.

Ex. If first digit of the address number is "1", the "Occupied Address Map" of memory addresses 10 - 19 is displayed.

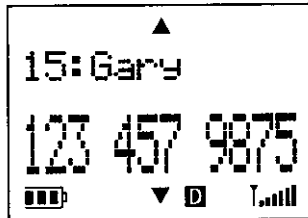


↓ Press "1".



- The "Occupied Address Map" shows the status of a memory group consisting of ten locations (01-09 or 10-19 etc., up to 90-99). The "." character indicates that the memory address is vacant. (In this example, the memory addresses 10,14,15,17 and 19 are occupied.)
 - When the "Occupied Address Map" is displayed, the information from another memory group (01-09 or 10-19, -----, or 90-99) can be displayed by pressing the "UP"/"DOWN" keys.
- (2) When the second digit of an occupied address number is entered, the telephone number will appear with the address number and it's alphabetical name (if used).

Ex. Press "5"

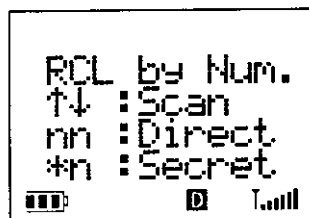


- If the recalled memory address is vacant, An error tone will be sounded.
- (3) When the memory address data is displayed, the mobile telephone will be in the "memory scan mode" (refer to 9.4.3.1).

9.4.3.3 Secret Number Recall

The secret number of the special memory address (*0 - *9) can be recalled with the following procedure.

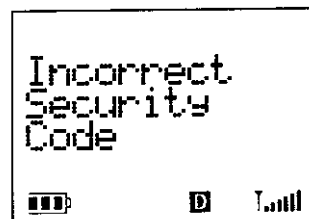
- (1) When "*" key is entered, the following message is displayed. Then the phone enters the "security code waiting state" and waits for entry of the four digit security code.



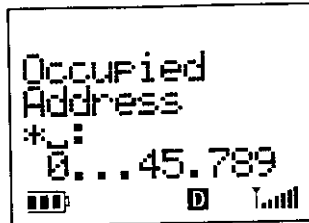
↓ Press "*".



- If the entered security code is incorrect, the phone will show the following message for 1 second and will exit this mode.

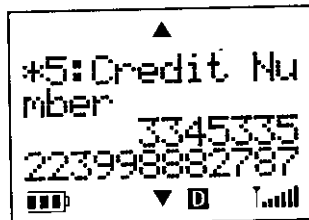


- (2) If entered security code is correct, the "Occupied Address Map" of the special memory addresses is displayed.



- The "." character means that address is vacant.
(In this example, the memory addresses *0, *4, *5, *7, *8 and *9 are occupied.)
- (3) When the corresponding digit of an occupied address number is entered, the telephone number will appear with the address number and it's alphabetical name (if used).

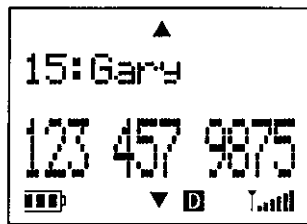
Ex. Press "5"



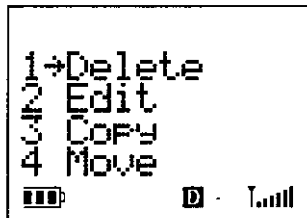
- If the recalled memory address is vacant, An error tone will be sounded.
- Pressing the "UP" / "DOWN" keys will scroll backward or forward through the special memory address (*0 - *9).
- When the required number has been selected, press "SEND" to initiate a call to the number.
- When the "MENU" key is pressed, the phone will enter the recall sub menu. (Refer to 9.4.3.4)

9.4.3.4 Recall Sub Menu

While recall data is displayed, pressing the "MENU" key will cause the mobile phone to enter the recall sub menu.

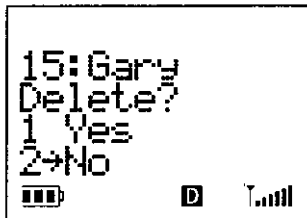


↓ Press "MENU" key.

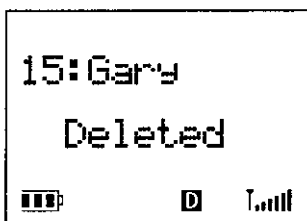


9.4.3.4.1 Delete Item

If "1 Delete" is selected, the user is prompted to confirm his or her choice as follows.



- If "Yes" is selected then the indicated item is removed from memory and the following message is displayed for 1 second.

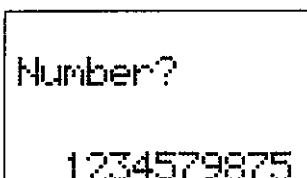


- If "No" is selected, the message simply remains in the memory.

9.4.3.4.2 Edit Item

If "2 Edit" is selected, then the phone will enter the edit mode.

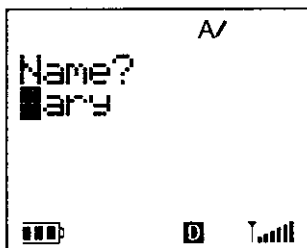
- (1) First, the stored number is displayed.





- Press the "CLEAR" key to delete the last digit.

(2) If the "ENTER" key is pressed, the phone will enter the name edit mode.



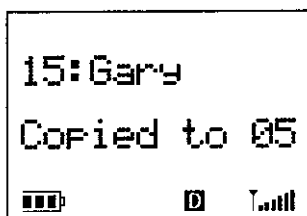
9.4.3.4.3 Copy Item

If "3 Copy" is selected, the following message will be displayed.

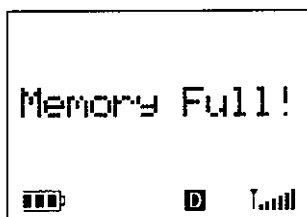


(1) if the "ENTER" key is pressed, then the indicated item data is copied to the first free memory address.

Ex. The first free memory address number is "05"

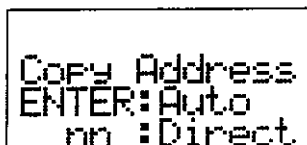


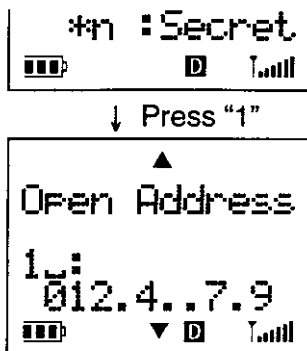
If no free memory address is available, the following message will be displayed.



(2) if a digit (0-9) is entered, then the "Open Address Map" of that address group is displayed.

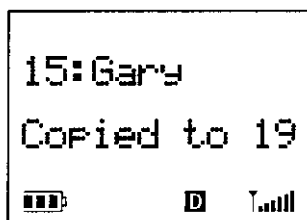
Ex. If first digit of the address number is "1", the "Open Address Map" of the memory addresses 10-19 is displayed.





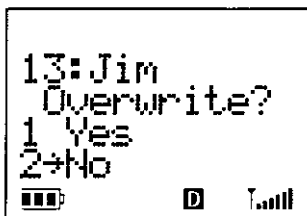
- The "." character means that address is already used. (In this example, the memory address 13,15,16,18, are already used.)
- When the "Open Address Map" is displayed, the information of another memory group (01-09 or 10-19, ---, or 90-99) can be scanned by using the "UP"/"DOWN" keys.
- When the second digit of a vacant address number is entered, the indicated item data is copied to that address.

Ex. The entered second digit was "9".



- If the chosen memory address already contains data, the following confirmation message will be displayed.

Ex. Press "3". The memory address 13 has following data.

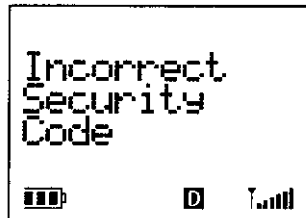


- (3) When the "*" key is entered, the following message is displayed. The phone then enters the "security code waiting state" and waits for entry of the four digit security code.

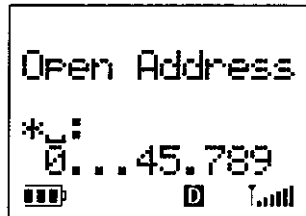




- If the entered security code is incorrect, the phone will display the following message for 1 second then will exit this mode.



- If entered security code is correct, the "Open Address Map" of the special memory addresses is displayed.



- The remaining operations are the same as for addresses 01-99.

9.4.3.4.4 Move Item

If "4 Move" is selected, then the following message is displayed.



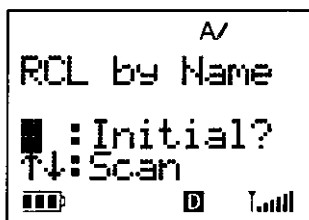
- This feature will change the memory address number of the indicated item.
- The remaining operations are the same as for the "Copy Item" function.

9.4.4 Recall By Name

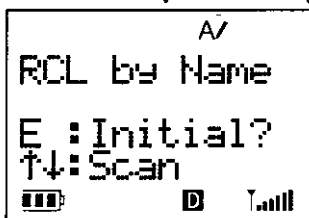
It is possible to recall memories by using the name tag. After selecting the first character, the name tags which have the same first character can be scanned using the "UP" and "DOWN" keys.

Direct Operation: "MEM" (round cursor key-Left) + "3"

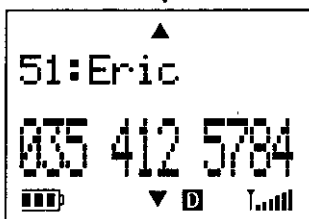
- The first letter of the name to search for is entered using the selected alphanumeric entry method (Refer to chapter 9.3).



↓ Press "3(DEF)" 2 times.



↓ Press "ENTER" or "UP / DOWN" key



- If there is no name tag that has the selected first character, the next alphabet character is scanned; "A" → "B" → "C" →
- When the memory address data is displayed, the same procedures apply as in the case of "recall by number" function (i.e. "MENU", "SEND"). (refer to 9.4.3).

9.4.5 Memory Store

Direct Operation: "MEM" (round cursor key-Left) + "4"

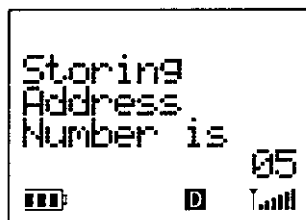


9.4.5.1 Memory Automatic Store

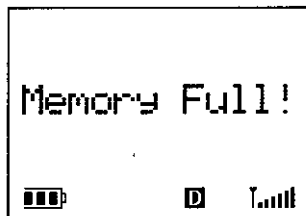
This feature automatically searches for the first free memory address and stores the telephone number and name into the memory.

(1) Press the "ENTER" key. The following message is displayed for 1 second.

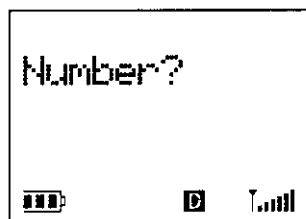
Ex. The first free memory address number is "05".



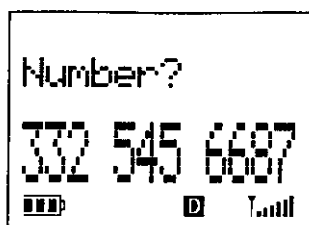
- If no free memory address is available, the following message will be displayed for 1 second.



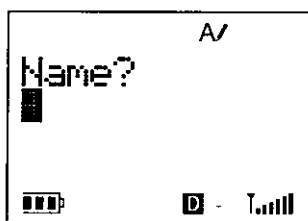
(2) Enter telephone number



- If a number was in the display before the "MEMORY MANAGEMENT SUB MENU" was entered, that number will be displayed.
- The "CLEAR" key can be used to clear the display if the displayed number is not needed.



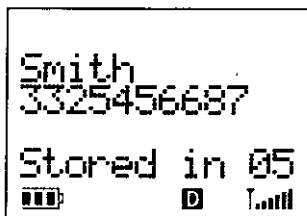
- (3) Press "ENTER" to enter the number. Then, the name tag is entered.



- If no name tag is needed, press "ENTER". A blank name tag will be stored with the number and the mobile telephone will display a confirmation message.

- (4) To end alphanumeric entry press "ENTER".

- The following message will be displayed for 1 seconds.

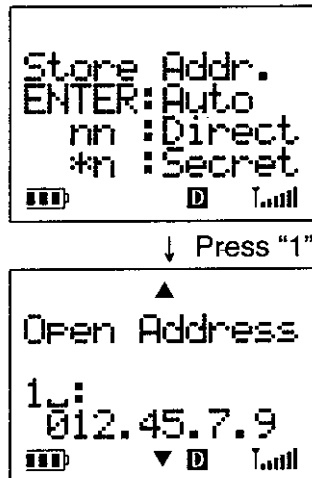


9.4.5.2 Memory Direct Store (With Open Address Map)

A maximum of 99 frequently used telephone numbers, of up to 32 digits each, may be stored in the mobile phone's memory. These 99 memory locations are numbered 01 to 99.

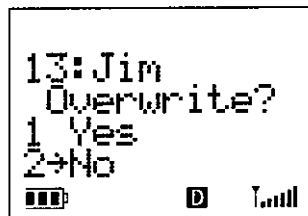
- (1) When the first digit memory address number is entered, the "Open Address Map" of that address group is displayed.

Ex. If first digit of the address number is "1", the "Open Address Map" of the memory addresses 10 - 19 is displayed.



- The "Open Address Map" shows the status of a memory group consisting of ten locations (01-09 or 10-19 etc., up to 90-99). The "." character indicates that the memory address is already used. (In this example, the memory address 13,16,18, are already used.)
 - When the "Open Address Map" is displayed, the status of another memory group (01-09 or 10-19, -----, or 90-99) can be scanned by pressing the "UP"/"DOWN" keys.
- (2) When the second digit of a vacant address number is entered, the same procedures apply as in the case of "Memory Automatic Store" (i.e. Enter the telephone number or name). (refer to 9.4.5.2).
- If the memory address is already occupied, the following confirmation message will be displayed.

Ex. Press "3". The memory address 13 has following data.

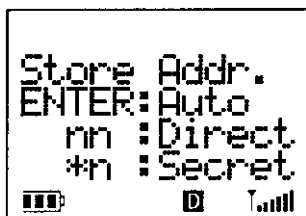


- Select No and press "ENTER" to return to the "Open Address Map".
- Select Yes and press "ENTER" to initiate "Data Entry".

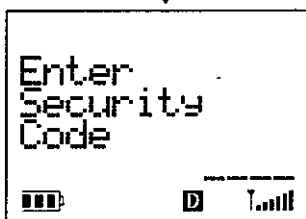
9.4.5.3 Secret Number Store

The secret number of the special memory address (*0 - *9) can be recalled by the following procedure.

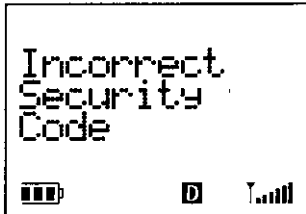
- (1) When "*" key is entered, the following message is displayed. The phone then enters the "security code waiting state" and waits for entry of the four digit security code.



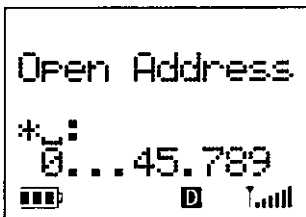
↓ Press "*".



- If the entered security code is incorrect, the phone will show the following message for 1 second and will exit this mode.

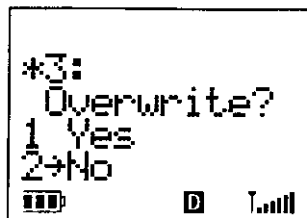


- (2) If entered security code is correct, the "Open Address Map" of the secret address group is displayed.



- (3) When the second digit of a vacant address number is entered, the same procedures apply as in the case of "Memory Automatic Store" (i.e. Enter the telephone number or name). (refer to 9.4.5.1).
- If the memory address is already occupied, the following confirmation message will be displayed.

Ex. Press "3". The memory address *3 has following data.

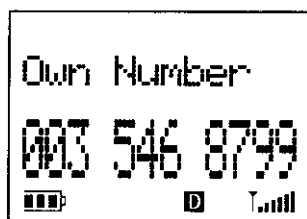


- Select No and press "ENTER" to return to the "Open Address Map".
- Select Yes and press "ENTER" to initiate "Data Entry".

9.4.6 Own Number Display

The user can confirm the mobile telephone's own number by selecting the "Own Number" option in the settings menu. The mobile telephone number will then be displayed.

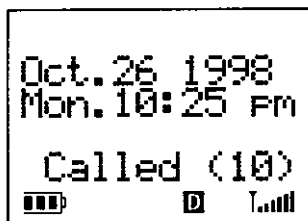
Direct Operation: "MEM" (round cursor key-Left) + "5"



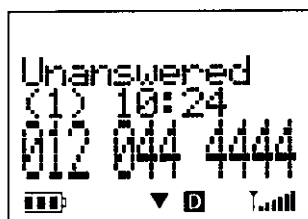
- Press the "CLEAR" key to return to the "memory management sub menu".

9.4.7 Unanswered Incoming Call Review

When an incoming call remains unanswered, the "Called" message is displayed, along with the number of unanswered calls (1 to 10).

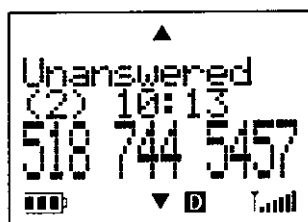


Direct Operation: "MEM" (round cursor key-Left) + "6"

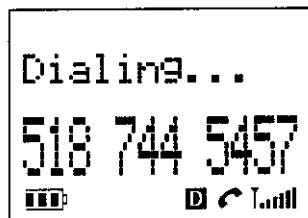


- The calling party number (if available from the network) and "call time stamp" is stored for the last 10 unanswered calls received.
- Use the "UP" and "DOWN" keys to scroll through the entries.

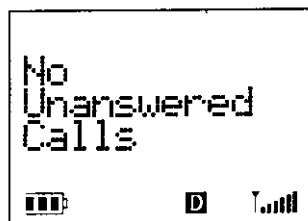
Ex. Press "DOWN"



- If a number is displayed, the "SEND" key may be used to initiate a call to that number.



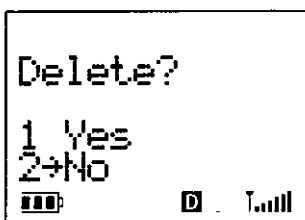
- If the unanswered call memory is empty, the following message will be displayed.



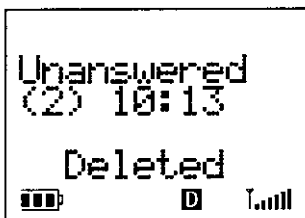
- When the "MENU" key is pressed, the following message will be displayed.



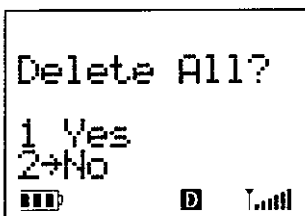
- (1) If "1 Delete" is selected, the user is prompted to confirm his or her choice as follows.



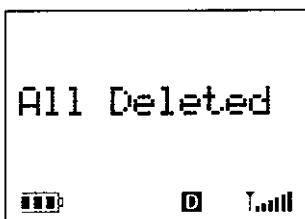
- If "Yes" is selected, then the indicated number is removed from the unanswered call memory and the following message is displayed for 1 second.



- (2) If "2 Delete All" is selected, the user is prompted to confirm his or her choice as follows.

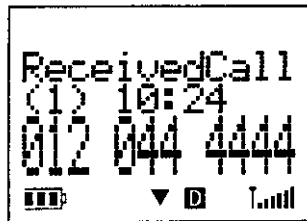


- If "Yes" is selected, then all unanswered call data is removed from memory and the following message is displayed for 1 second.



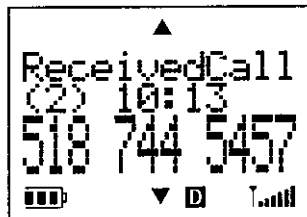
9.4.8 Received Call Review

Direct Operation: "MEM" (round cursor key-Left) + "7"



- The calling party number (if available from the network) and "call time stamp" are stored for the last 10 calls received.
- Use the "UP" and "DOWN" keys to scroll through the entries.

Ex. Press "DOWN"



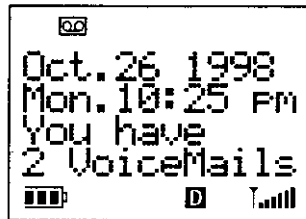
- When the received call data is displayed, the same procedures apply as in the case of "Unanswered Incoming Calls Review" (i.e. "MENU", "SEND"). (refer to 9.4.7)

9.5 VOICE MAIL ACCESS

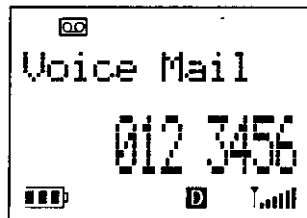
The mobile telephone can receive voice messages, provided this service is available from the cellular carrier.

9.5.1 Listening to Voice Mail

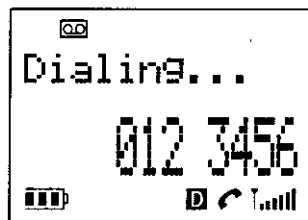
Press "00" (round cursor key-Down), the following message is displayed.



↓ Press "00" (round cursor key-Down).



When the "SEND" key is pressed, the phone will initiate a call to the voice mail center.
(Ex. When the Voice Mail Center Number is 012-3456.)



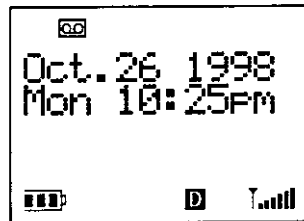
- If the voice mail center telephone number has not been set, the phone will display the following message.



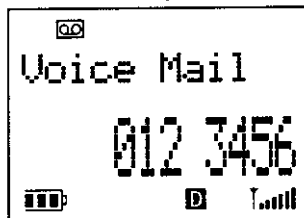
- This message will be displayed for 1 second, then the telephone will switch to the voice mail center number setting mode. (See section 9.5.3)

9.5.2 Quick Voice Mail Access

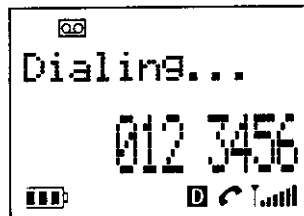
When the voice mail indicator is displayed, the phone can initiate a call to the voice mail center by pressing "00" (round cursor key-Down) for 1 second.



↓ Press "00" (Round key Down).

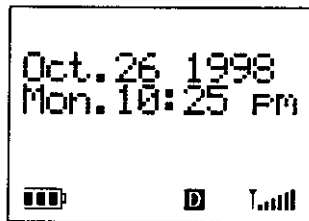


↓ Hold "00" for 1 second.

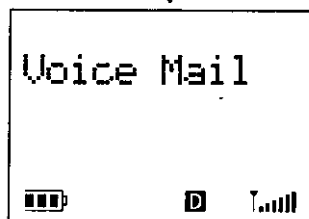


9.5.3 Voice Mail Center's Number Storing

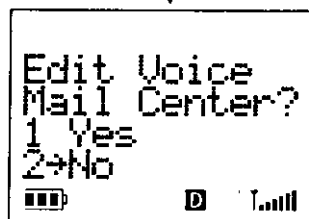
When the user calls the voice mail center by pressing "⏏" (round cursor key-Down) in standby mode, the phone will use this stored number to place the call. This number must be specified before voice mail retrieval can occur.



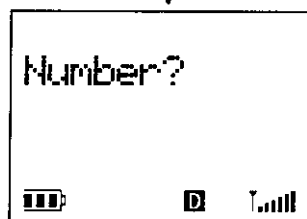
↓ Press "⏏" (round cursor key-Down).



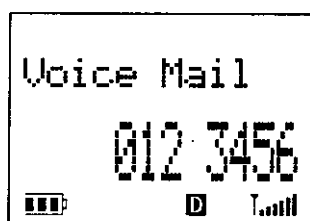
↓ Press "MENU" (round cursor key-Right).



↓ Select "Yes" and press "ENTER"



- Enter the voice mail center number and press the "ENTER" key. The display will then return to the previous menu.



9.6 SHORT MESSAGE SERVICE

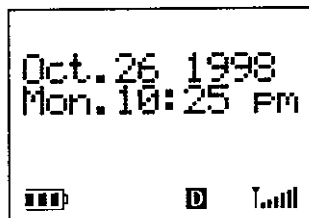
The phone is capable of receiving Short Messages addressed specifically to the phone. (Message character length is dependent upon the cellular carrier's system.)

If the user sends a Short Message which does not reach its final destination on the first attempt, the message center will save the message and will continue to attempt to send the message for a limited time period.

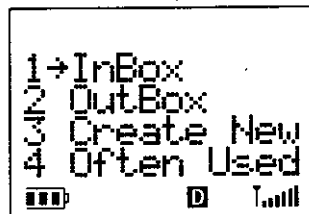
9.6.1 Short Message Sub Menu

When the "✉" (round cursor key-Up) key is pressed, the "short message sub menu" is displayed. The following functions can be operated from the menu.

- (1) Open the In Box
- (2) Open the Out Box
- (3) Create a New Message
- (4) Edit Often Used Messages



↓ Press "✉" (round cursor key-Up)



- This menu function can be accessed by using the "UP" or "DOWN" key to select the desired function, then pressing the "ENTER" or "Right" key.
- To exit from the "short message sub menu", Press the "END", "CLEAR" or "round cursor key-Left".

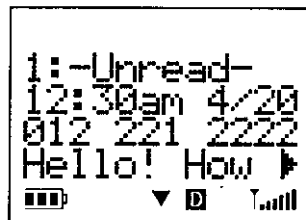
9.6.2 In Box

This function allows the user to view the received short messages. The mobile phone can store short messages up to a total (including out box and often used message memory) of 2400 characters in length. The message buffer length is still under consideration and may be subject to change in the final design.

9.6.2.1 Message Index

Direct Operation: "☐" (round cursor key-Up) + "1"

- If messages are stored, they are displayed as follows.



- Message state
- Date / time stamp
- Origin address
- First line of message

1:

The serial number of the message.

-Unread-

Shows the message state.

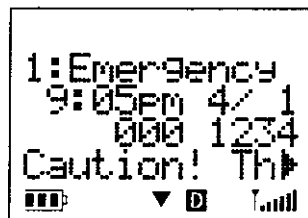
- Unread- shows Unread Message
- Urgent- shows Urgent Message
- Emergency shows Emergency Message
- (Blank) shows read Message

The remaining lines display the heading of the message.

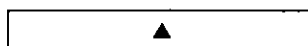
- If no messages are stored, the following message is displayed for 1 second.

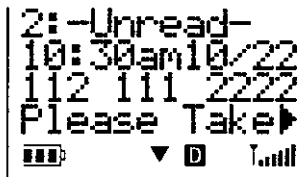


- When "▼" / "▲" is displayed, the next / previous message can be displayed by pressing the "DOWN" / "UP" keys.

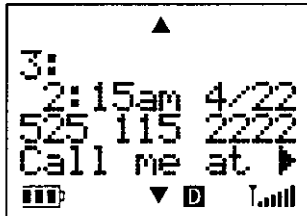


Press "UP" key ↑ ↓ Press "DOWN" key





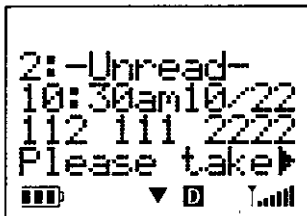
Press "UP" key ↑ ↓ Press "DOWN" key



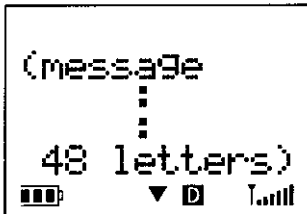
Press "UP" key ↑ ↓ Press "DOWN" key

9.6.2.2 Read Message

When a message index is displayed, pressing the "RIGHT" or "ENTER" keys will allow the displayed message to be scrolled one line at a time by pressing the "UP" / "DOWN" keys. To exit press the "Left" or "Clear" keys.

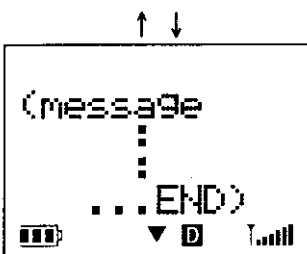


Press "LEFT" or "CLEAR" key ↑ ↓ Press "RIGHT" or "ENTER" key



→ First line of message

↑ ↓
Press "UP" key ↑ ↓ Press "DOWN" key

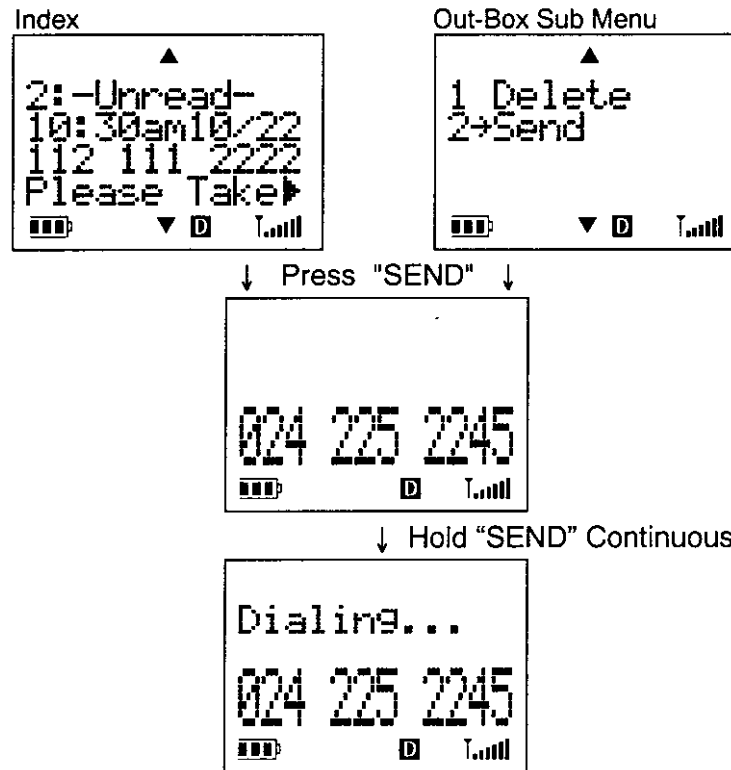


→ End line of message

9.6.2.3 One Button Call Back

When a message index or a message content is displayed, pressing the "SEND" keys will cause the phone to enter the call Back Mode.

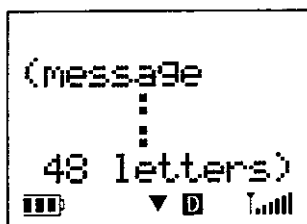
- If the short message contains a callback number or an embedded telephone number, the mobile phone will go into standby mode and will display the number as follows.



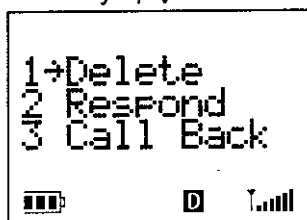
- If the short message contains a callback number and an embedded telephone number or multiple embedded telephone numbers, the operation is same as with the call back function (refer to 9.6.2.4.3)
- If no number is provided in the short message, the operation is same as with the call back function (refer to 9.6.2.4.3)

9.6.2.4 In-Box Sub Menu

When a received message is displayed, pressing the "MENU" (RIGHT) or "ENTER" key will cause the phone to enter the In-Box sub menu.

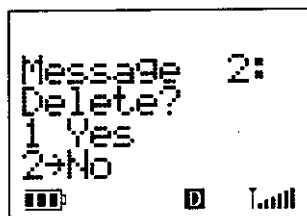


Press "LEFT" or "CLEAR" key ↑ ↓ Press "MENU" or "ENTER" key

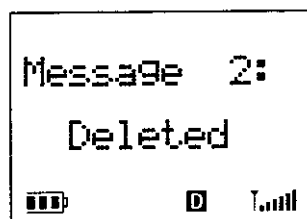


9.6.2.4.1 Delete message

If "1 Delete" is selected, the user is prompted to confirm his or her choice as follows.



- If "Yes" is selected, the displayed message is removed from In-Box memory and the following message is displayed for 1 second.



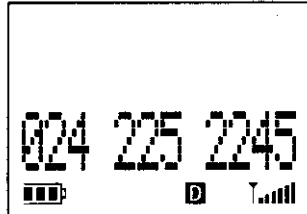
9.6.2.4.2 Respond

If "2 Respond" is selected, the phone will enter the "Edit Text Message" mode.
(Refer to 9.6.4.1)

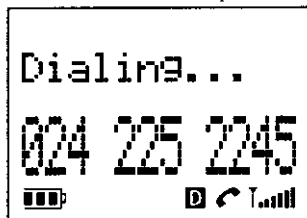
9.6.2.4.3 Call Back function

If "3 Call Back" is selected, the phone will enter the Call Back Mode.

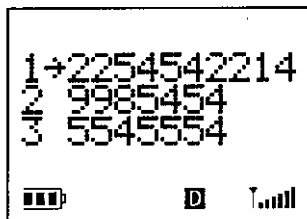
- (1) If the short message contains a callback number or an embedded telephone number, the mobile phone will go into standby mode and will display the number as follows.



- If the "SEND" key is pressed, the mobile telephone will place a call to that telephone number.

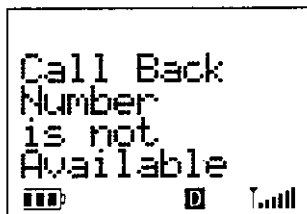


- (2) If the short message contains a callback number and an embedded telephone number or multiple embedded telephone numbers, the display will indicate as follows.



- When the user selects a number and presses the "ENTER" key, the phone will go into standby mode and will display the selected telephone number

- (3) If no number is provided in the short message, the phone will display the following message.



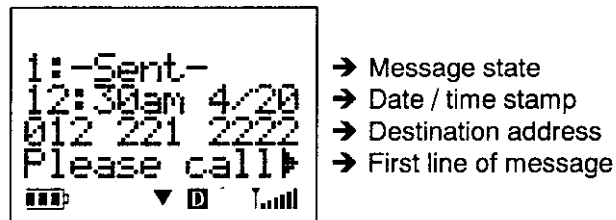
9.6.3 Out Box

This function allows the user to manage outgoing short messages. The mobile phone can store short messages up to a total (including in-box and often used message memory) of 2400 characters in length. The message buffer length is still under consideration and may be subject to change in the final design.

9.6.3.1 Message Index

Direct Operation: "ⓧ" (round key Up) + "2"

If any messages exist, they are displayed as follows.



1:
The serial number of the message.

-Sent-
Shows the message state.

-Sent- indicates that the message has been sent.

-NotSent- indicates that the message has not been sent.

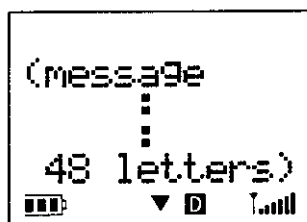
The remaining lines display the heading of the message.

9.6.3.2 Read Message

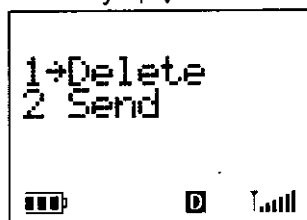
When a message index is displayed, pressing the "ENTER" key or "Right" key will allow the displayed message to be scrolled one line at a time by pressing the "UP" / "DOWN" keys. This function operates the same as with the In-Box. (Refer to 9.6.4.1)

9.6.3.3 Out-Box Sub Menu

When a message index or sent message is displayed, pressing the "MENU" key will cause the phone to enter the Out-Box sub menu.



Press "LEFT" or "CLEAR" key ↑ ↓ Press "MENU" or "ENTER" key



9.6.3.3.1 Delete message

If "1 Delete" is selected, the displayed message will be removed from Out-Box memory and the "Deleted" message is displayed for 1 second. This function operates the same as with the In-Box. (Refer to 9.6.2.4.1)

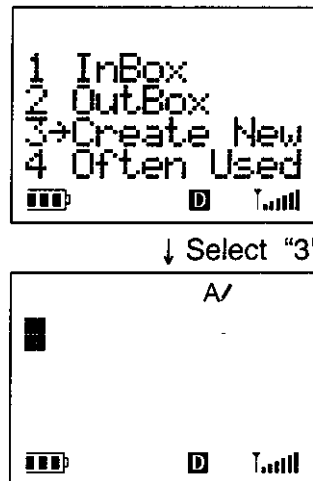
9.6.3.3.2 Send message

If "2 Respond" is selected, the mobile phone will enter the "Edit Text Message" mode.
(Refer to 9.6.4.1)

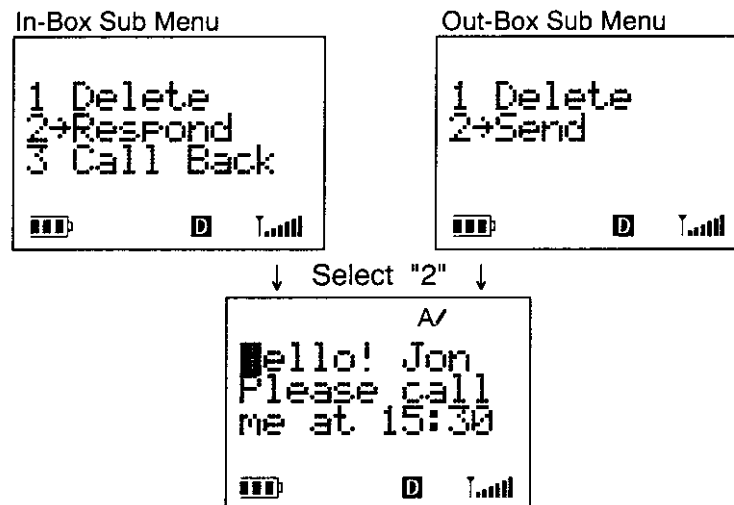
9.6.4 Create New Message

9.6.4.1 Edit Text Message

- (1) If the user selects "Create New" from the "Short Message sub menu", a blank message will be displayed with a blinking cursor. (Refer to 9.6.1).



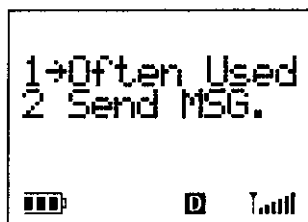
- (2) This mode may be entered from the In-Box or Out-Box sub menu.



- The message text will be displayed with a blinking cursor.

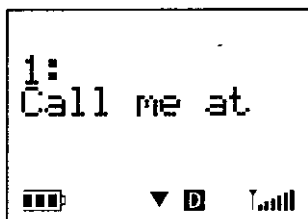
9.6.4.2 Create Message Sub Menu

When the user terminates the alphanumeric entry mode, the following menu will be displayed.



9.6.4.3 Insert the Often Used Message

If "1 Often Used" is selected from the "Create Message sub menu", the mobile phone will enter the "Insert Often Used Message" mode, and the stored messages will be displayed.

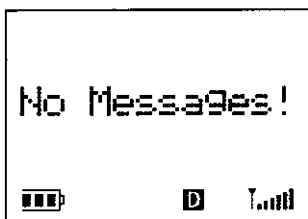


Press "UP" key ↑ ↓ Press "DOWN" key



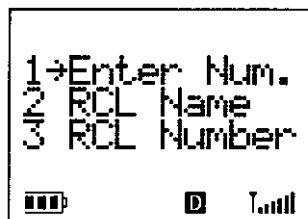
Press "UP" key ↑ ↓ Press "DOWN" key

- Insert the desired message text by scrolling through the available messages then pressing "ENTER". The phone will return to the "Edit Text Message" mode. (Refer to 9.6.4.1)
- If no "Often Used" messages exist, the following message is displayed for 1 second.

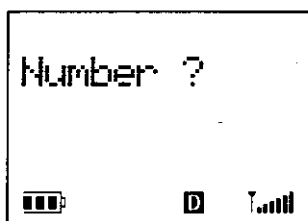


9.6.4.4 Enter Number

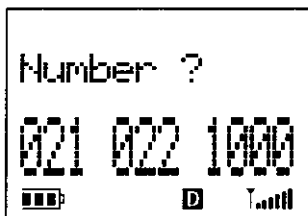
If "2 Send MSG." is selected from the "Create Message sub menu", the phone will enter the "Enter Number" mode. The following menu will then be displayed.



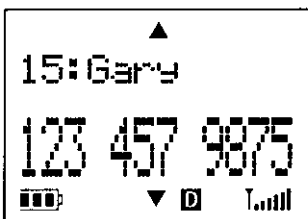
- (1) If "1 Enter Num." is selected, the user will be prompted to enter a telephone number as the destination of the short message.



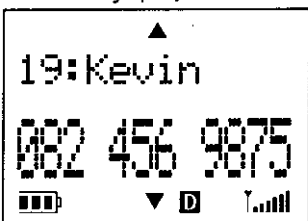
- If the mobile telephone entered this mode from the In-Box or Out-Box sub menu, the origin number will be displayed.



- Enter the telephone number followed by "SEND" or "ENTER". The phone will enter the "Send Message sub menu". (Refer to 9.6.4.5)
- (2) If "2 RCL Name" or "3 RCL Number" is selected, the user will be able to select a number from the list of numbers in the mobile phone's memory.



Press "UP" key ↑ ↓ Press "DOWN" key



- If the user selects the desired number by scrolling through the list and pressing "SEND" or "ENTER", the mobile phone will enter the "Send Message sub menu". (Refer to 9.6.4.5)
- If the "MENU" key is pressed, the phone will return the previous stage.

9.6.4.5 Send Message Sub Menu



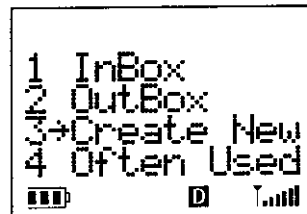
(1) If "1 Send+Store" is selected, the following messages are displayed



↓ If the transmission was successful.



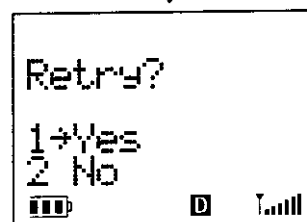
↓ 1 second.



- When the transmission failed, the following message is displayed.



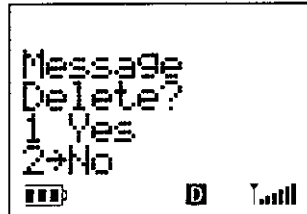
↓ If the transmission failure.



(2) If "2 Send+Del." is selected, the following messages are displayed



↓ If the transmission was successful..



- If "Yes" is selected, the displayed message is removed from the In-Box memory and the following message is displayed for 1 second.



- If "No" is selected, the message will be stored in the Out-Box memory.

(3) If "3 Store" is selected, the message will be stored in the Out-Box memory and the following message will be displayed for 1 second.

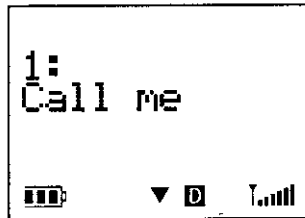


9.6.5 Often Used Message

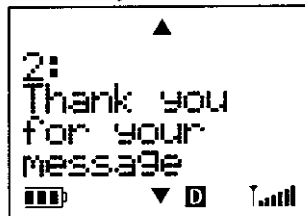
This function allows the user to send a short message by using items from the often used message memory. The mobile phone can store short messages up to a total (including in-box and out-box message memory) of 2400 characters in length. The message buffer length is still under consideration and may be subject to change in the final design.

9.6.5.1 Display Often Used Message Index

Direct Operation: "✉" (round cursor key-Up) + "4"

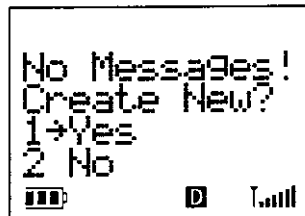


Press "UP" key ↑ ↓ Press "DOWN" key



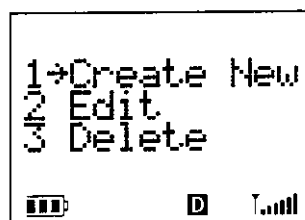
Press "UP" key ↑ ↓ Press "DOWN" key

- If no messages have been stored, the following message is displayed.

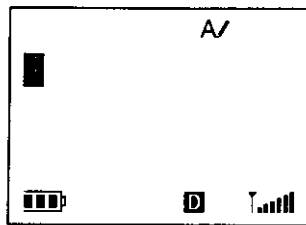


- When the "CLEAR" key is pressed, the phone will return to the previous menu.
- When the "ENTER" or "MENU" key is pressed, the phone will enter the "Often Used Message sub menu". (Refer to 9.6.5.2)

9.6.5.2 Often Used Message Sub Menu

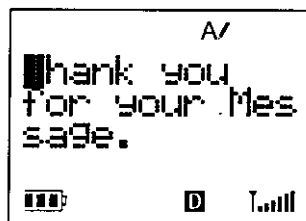


- (1) If "1 Create New" is selected, the phone will enter the edit mode as follows.

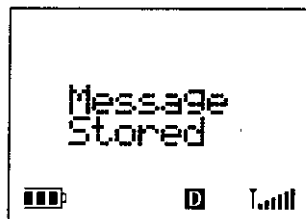


- A blank message will be displayed with a blinking cursor.
- When the user terminates the alphanumeric entry mode, the "Message Stored" message will be displayed.

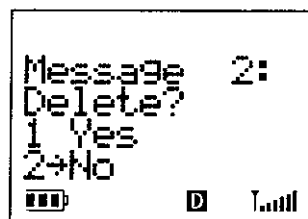
(2) If "2 Edit" is selected, the phone will enter the edit mode as follows.



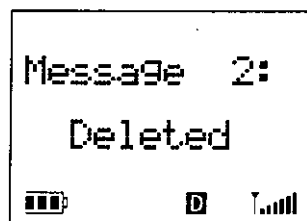
- When the user terminates the alphanumeric entry mode, the following message will be displayed for 1 second.



(3) If "3 Delete" is selected, the user will be prompted to confirm his or her choice as follows.



- If "1 Yes" is selected, the Often Used Message that was displayed will be deleted. The following message will then be displayed for 1 second.

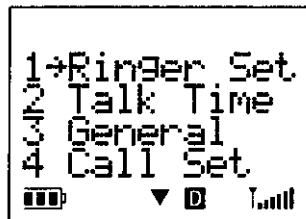


9.7 MENU OPERATION

User functions can be accessed through the main menu, which is displayed when pressing "MENU" key (round cursor key Right). The items in the menu can be scrolled through by pressing the "UP" or "DOWN" key. To select an item from a menu, press "ENTER" when the cursor is positioned beside the item.

While in a menu, the previous menu level can be restored by pressing the "CLEAR" key. To escape from the menu altogether, hold down the "CLEAR" key for one half second or press the "END" key.

- Main menu

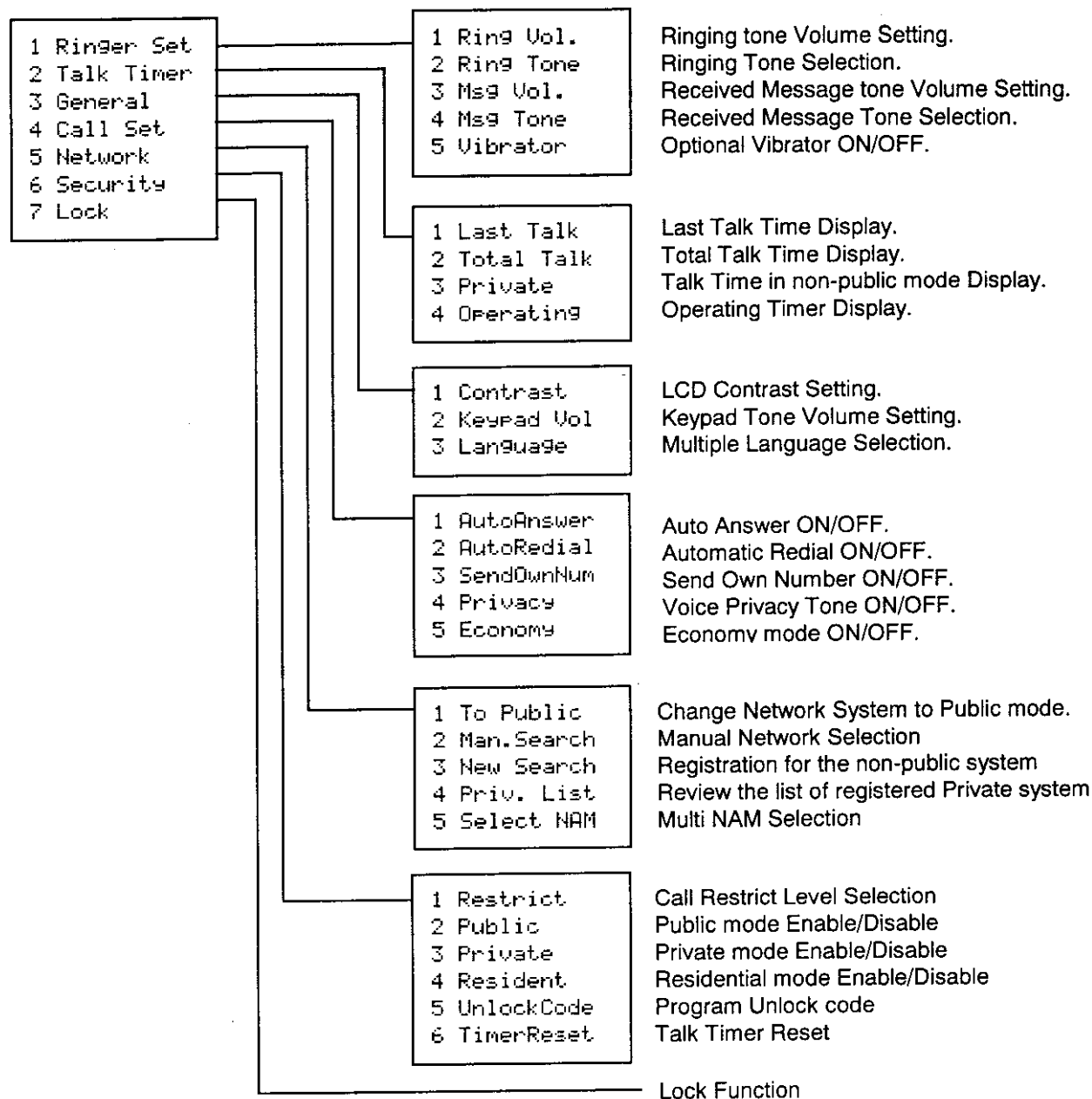


↓ Press "DOWN" key 4 times



- When there are more than four items in a menu, all of the items can not be displayed simultaneously. When the cursor is on the bottom line, pressing the "DOWN" key will scroll to the next page. When on the top line, pressing the "UP" key will scroll to the previous page.
- At the top of the menu, pressing the "UP" key will set the cursor to the last item of the last page.
- When an action is validated or finished within a menu, the display will return to the previous menu.

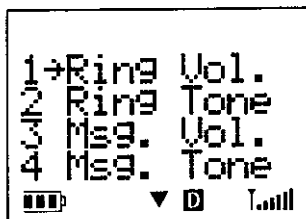
9.7.1 Menu List



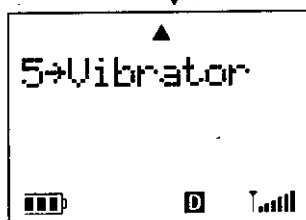
9.7.2 Ringer Setting

This menu allows ring tone and volume to be set, as well as keypad tone and speaker volume.

Direct Operation: "MENU" (round cursor key-Right) + 1

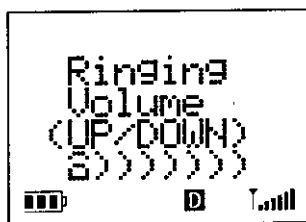


↓ Press "DOWN" key 4 times

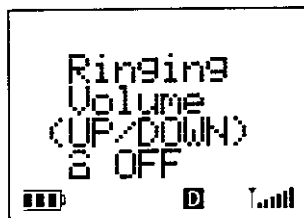


9.7.2.1 Ringing Tone Volume Control

Direct Operation: "MENU" (round cursor key-Right) + 11



- The ring tone volume can be set between 0 and 7 by pressing the "UP" / "DOWN" keys. To facilitate adjustment, a ring tone is generated during the adjustment process.
- The minimum volume level is 0 (off).

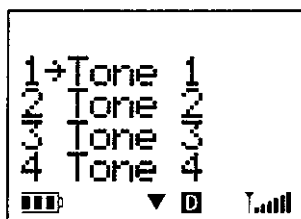


- To accept the new setting and exit from this mode, press the "ENTER" key.
- The volume setting is preserved when the phone is turned off.

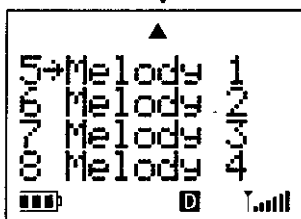
9.7.2.2 Ringing Tone Selection

Seven different ring tones are available. The user can select which ring tone to use from the menu. If the network doesn't send the alert type, the user's selection will be the default tone style.

Direct Operation: "MENU" (round cursor key-Right) + 12



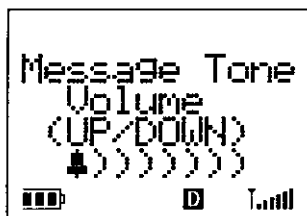
↓ Press "DOWN" key 4 times



- The user can scroll through the available ring tones using the "UP" and "DOWN" keys. When the cursor is placed beside a ring tone, that ring tone will sound after one half second. Once the cursor indicates the desired ring tone press "ENTER".
- This mode selection is preserved when the phone is turned off.

9.7.2.3 Received Message Tone Volume Control

Direct Operation: "MENU" (round cursor key-Right) + 13



- The message tone volume can be adjusted from 0 to 7 by pressing the "UP" / "DOWN" keys. To facilitate adjustment, a ring tone is generated while the adjustment is being made.
- The minimum volume level is 0 (off)

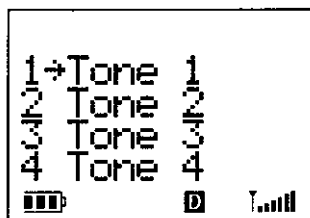


- To accept the new setting and exit from this mode, press the "ENTER" key.
- This volume setting is preserved when the phone is turned off.

9.7.2.4 Received Message Tone Selection

Seven different received message tones are available. The user can decide which tone type should be used as the received message tone. If the network doesn't specify a tone type, the user's selection will be the default.

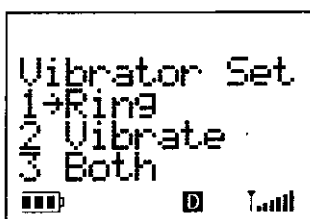
Direct Operation: "MENU" (round cursor key-Right) + 14



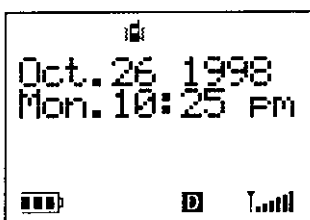
- The user can scroll through the available ring tones with the "UP" and "DOWN" keys. When the cursor is placed beside a ring tone, that ring tone will sound after one half second. Once the cursor indicates the desired ring tone press "ENTER".
- This mode selection is preserved when the phone is turned off.

9.7.2.5 Optional Vibrator ON/OFF Setting

Direct Operation: "MENU" (round cursor key-Right) + 15



- When the vibrating battery is installed, this setting will be available.
- When this function is set to "Vibrate", the ringing tone will be OFF.
- When the vibrator is available, the vibrator icon will be displayed.

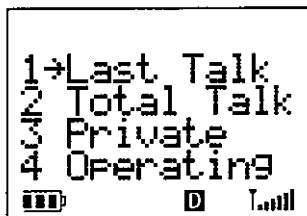


- This setting is preserved when the phone is turned off.

9.7.3 Talk Timer

This menu displays the talk time counter.

Direct Operation: "MENU" (round cursor key-Right) + 2



9.7.3.1 Display Last Talk Time

Direct Operation: "MENU" (round cursor key-Right) + 21

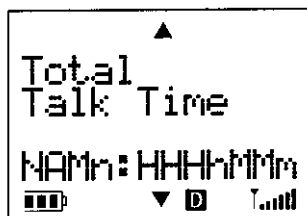


- "MMM" represents 000 to 999 minutes and "SS" represents 00 to 59 seconds.
- Pressing the "DOWN" key at this stage will enter next menu ("Display accumulated total talk time in public mode").
- Pressing the "UP" key at this stage will enter previous menu ("Display operating timer")
- To exit this mode, press the "CLEAR", "ENTER" or "LEFT" keys.

9.7.3.2 Display Accumulated Total Talk Time (in public mode)

The "accumulated total talk time" is displayed with the selected NAM number (n). This timer is incremented when making or receiving a call.

Direct Operation: "MENU" (round cursor key-Right) + 22



- "HHH" represents 000 to 999 hours and "MM" represents 00 to 59 minutes.
- Pressing the "UP" or "DOWN" key at this stage will enter the previous or next item.
- To exit this mode, press the "CLEAR", "ENTER" or "LEFT" keys.

9.7.3.3 Display Accumulated Total Talk Time (in private mode)

The "accumulated total talk time" is displayed with the selected NAM number (n). This timer is incremented when making or receiving calls in non-public mode.

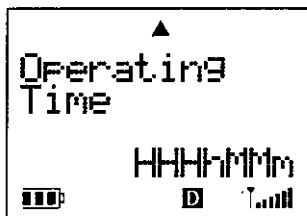
Direct Operation: "MENU" (round cursor key-Right) + 23



- "HHH" represents 000 to 999 hours and "MM" represents 00 to 59 minutes.
- Pressing the "UP" or "Down" key at this stage will enter the previous or next item.
- In order to exit this mode, press the "CLEAR", "ENTER" or "Left" keys.

9.7.3.4 Display Operating Timer

Direct Operation: "MENU" (round cursor key-Right) + 24



- This timer is incremented during every call with all NAMs and can not be reset by the user.
- "HHH" represents 000 to 999 hours and "MM" represents 00 to 59 minutes.
- Pressing the "UP" or "DOWN" key at this stage will enter the previous or next menu.
- In order to exit this mode, press the "CLEAR", "ENTER" or "LEFT" keys.

9.7.4 General Setting

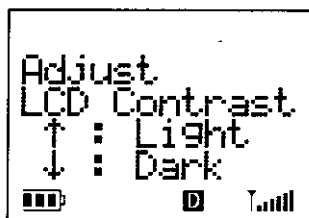
The menu provides access to the general function settings.

Direct Operation: "MENU" (round cursor key-Right) + 3



9.7.4.1 Adjust LCD Contrast

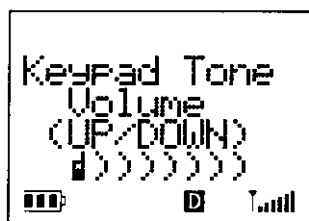
Direct Operation: "MENU" (round cursor key-Right) + 31



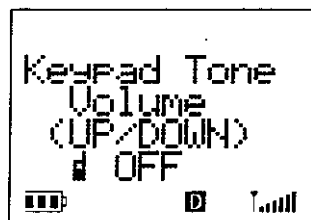
- The current setting is shown when the phone enters this mode.
- The LCD viewing angle can be controlled by pressing the "UP" or "DOWN" keys.
- To accept the new setting value and exit from this mode, press the "ENTER" key.
- To exit from this mode, press the "CLEAR" or "LEFT" keys.

9.7.4.2 Keypad Tone Volume Control

Direct Operation: "MENU" (round cursor key-Right) + 32



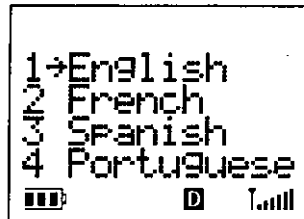
- The keypad tone volume can be adjusted from 0 to 7 by pressing the "UP" / "DOWN" keys. To facilitate adjustment, a tone is generated during the adjustment process.
- The minimum volume level is 0 (off)



- To accept the new setting and exit from this mode, press the "ENTER" key.
- This volume setting is preserved when the phone is turned off.

9.7.4.3 Multiple Language Selection

Direct Operation: "MENU" (round cursor key-Right) + 33



- When the phone enters this mode, the cursor is placed beside the current setting.
- The user can move the cursor with the "UP" and "DOWN" keys.
- To accept the new setting and exit from this mode, press the "ENTER" key.
- To exit this mode, press the "CLEAR" or "LEFT" keys.

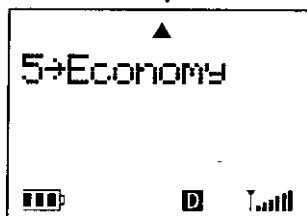
9.7.5 Call Setting

The menu contains the settings for enhanced call features.

Direct Operation: "MENU" (round cursor key-Right) + 4

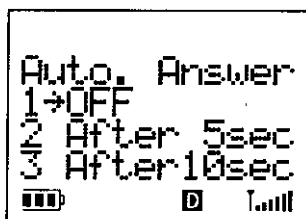


↓ Press "DOWN" key 4 times



9.7.5.1 Automatic Answer Selection

Direct Operation: "MENU" (round cursor key-Right) + 41

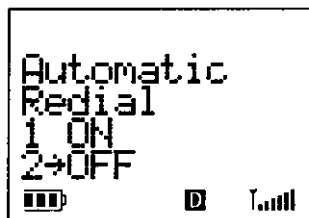


- When this function is activated and an incoming call occurs, the phone automatically answers the call after a selected time period.
- When the phone enters this mode, the cursor is placed beside the current setting.
- The user can move the cursor with the "UP" and "DOWN" keys.
- To accept the new setting and exit from this mode, press the "ENTER" key.

9.7.5.2 Automatic Redial Setting

"Automatic Redial" re-dials a number when the phone is unable to connect to the cellular system. If the call does not connect after 10 tries, a reorder tone sounds and the user must dial again.

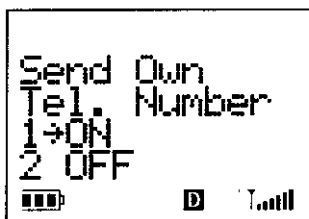
Direct Operation: "MENU" (round cursor key-Right) + 42



- When the phone enters this mode, the cursor is placed beside the current setting.
- The user can move the cursor with the "UP" and "DOWN" keys.
- To accept the new setting and exit from this mode, press the "ENTER" key.

9.7.5.3 Send Own Number ON/OFF Setting

Direct Operation: "MENU" (round cursor key-Right) + 43

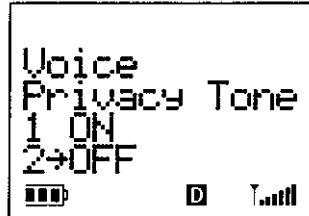


- When this function is OFF, your mobile telephone number will not be sent to the person you are calling for display on their equipment.
- The user can move the cursor with the "UP" and "DOWN" keys.
- To accept the new setting and exit from this mode, press the "ENTER" key.

9.7.5.4 Voice Privacy Tone Setting

When the voice privacy tone is ON, but the system does not support the voice privacy feature on digital voice channels or the phone is on an analog voice channel, the phone displays the "Voice Privacy inactive !" message and a warning tone sounds to alert the user during a conversation. (Refer to 9.2.7.10)

Direct Operation: "MENU" (round cursor key-Right) + 44

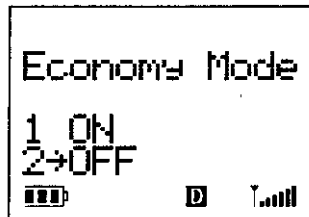


- When the phone enters this mode, the cursor is placed beside the current setting.
- The user can move the cursor with the "UP" and "DOWN" keys.
- To accept the new setting and exit from this mode, press the "ENTER" key.

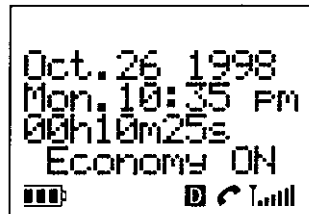
9.7.5.5 Economy Mode(Voice Activated Transmission) Setting

" Economy Mode" can be used to extend battery life, if supported by the cellular system. When enabled, the unit's transmitter operates only when the user is talking.

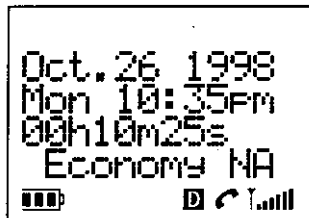
Direct Operation: "MENU" (round cursor key-Right) + 45



- During conversation mode, the "Economy ON" message will appear on the LCD display when "Economy" is enabled.



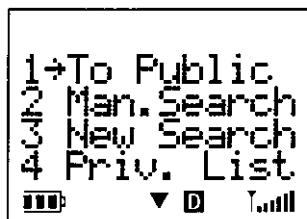
- If "Economy NA" is shown on the LCD display, this indicates that "Economy Mode" is not available from the cellular carrier.



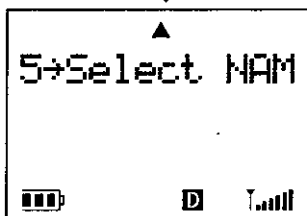
9.7.6 Network

The menu provides access to cellular network related options.

Direct Operation: "MENU" (round cursor key-Right) + 5



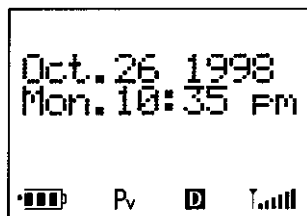
↓ Press "DOWN" key 4 times



9.7.6.1 Change Network System to Public Mode.

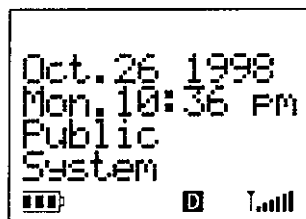
Direct Operation: "MENU" (round cursor key-Right) + 5 1

- When the mobile telephone is in the non-public mode (i.e. private mode or residential mode), and if the "Public Mode Enable / Disable" setting (Refer to 9.7.7.2) is enabled, then the user can change the network system from non-public to public.
- When the mobile telephone enters this mode, it will begin searching the public system channels and the following message will be displayed during the search.



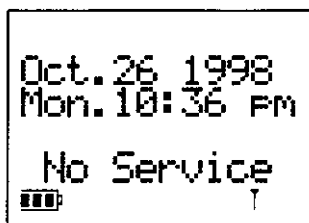
↓ Press "MENU" (round cursor key-Right) + 5 1

- If the phone could find a public network system channel.



->Alpha Tag of Public
->Network System.

- If the mobile telephone could not find a public network system channel.



- If the public mode was disabled, following message will be displayed for one second. (Refer to 9.7.7.2)

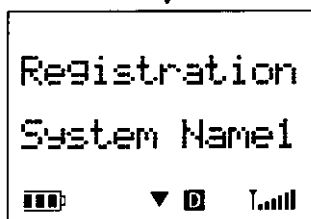
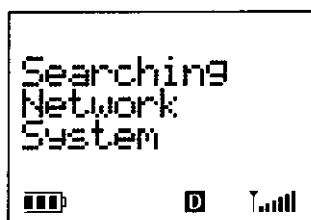


- This selection is not preserved when the phone is turned off.

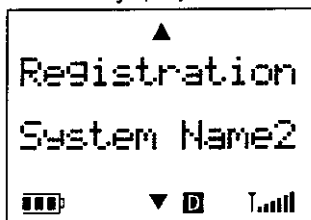
9.7.6.2 Manual Select Network

Direct Operation: "MENU" (round cursor key-Right) + 5 2

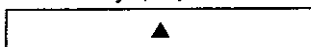
- Once a network has been selected by the phone, one of the other networks available in the current location may be selected at any given time in lieu of the current network. (The home system and private system are selectable.)
- When the mobile telephone enters this mode, it will begin searching for private system channels. The following message will be displayed during the search.

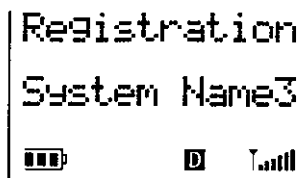


Press "UP" key ↑ ↓ Press "DOWN" key



Press "UP" key ↑ ↓ Press "DOWN" key





- When the phone finds a network system channel (including private systems), the name of system will be displayed.
- If the user selects the system and presses "ENTER", the phone will register with that network system.
- To exit from this registration mode, press the "END" key.
- If the phone could not find a network system channel, the following message will be displayed.

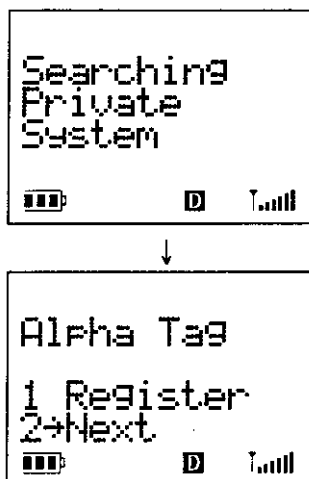


- This selection is not preserved when the phone is turned off.

9.7.6.3 New Network Search

Direct Operation: "MENU" (round cursor key-Right) + 5 3

- When the user wishes to register the phone with a private system, the user must press a button on the PBS (Personal Base Station) that will cause the PBS to accept the first phone to test-register. Then, the user must enter the test-registration (New Network Search) mode with the phone.
- When the mobile telephone enters this mode, it will begin searching for private system channels and the following message will be displayed during the search.

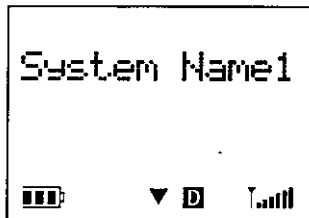


- When the mobile telephone finds a private system channel, the name of the system will be displayed.
- If the user selects Register and presses "ENTER", the phone will register with the private system.
- If the user selects Next and presses "ENTER", the phone will begin searching for other private system channels.
- To exit from this registration mode, press the "END" key.
- If the mobile telephone can not find any private system channels, the following message will be displayed.

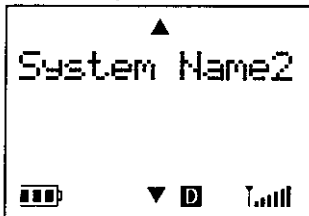


9.7.6.4 Review the List of Registered Private System

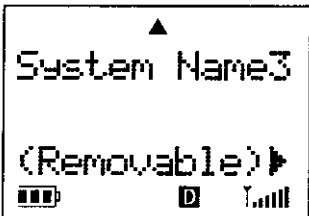
Direct Operation: "MENU" (round cursor key-Right) + 5 4



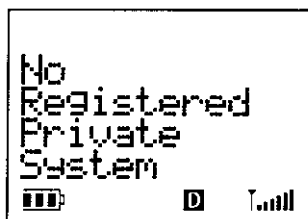
Press "UP" key ↑ ↓ Press "DOWN" key



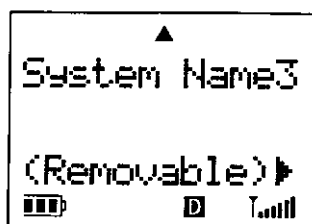
Press "UP" key ↑ ↓ Press "DOWN" key



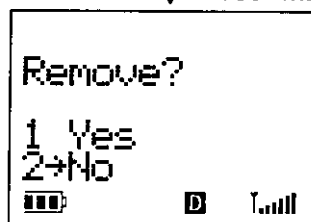
- If no system is registered, the following message is displayed for One second.



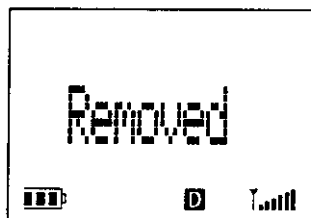
- The system that was registered by the New Search function can be removed as follow.



↓ Press "MENU" key.



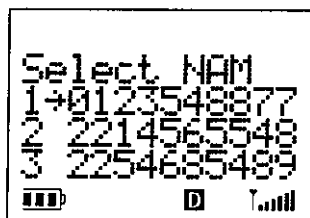
- If the user select "1 Yes", the following message will be displayed for one second.



9.7.6.5 Multi-NAM Selection

Different NAMs may be selected if the mobile telephone is programmed with more than one NAM. The mobile telephone can be programmed with up to 3 NAMs.

Direct Operation: "MENU" (round cursor key-Right) + 5 5



- When the phone enters this mode, the cursor is placed beside the current selection.
- The user can move the cursor with the "UP" and "DOWN" keys.
- To accept the new selection and exit from this mode, press the "ENTER" key.

9.7.7 Security Function

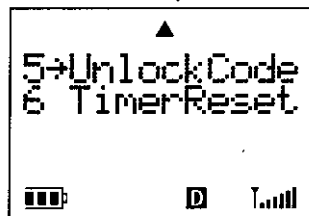
Direct Operation: "MENU" (round cursor key-Right) + 6



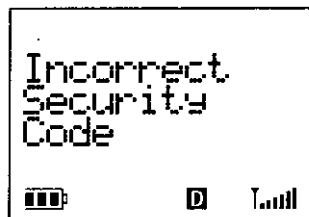
- The mobile telephone enters the "security code waiting state" and waits for entry of the four digit security code.
- The user can enter the security code directly using the numeric keys.
- If the entered security code is correct, the phone will enter the following menu.



↓ Press "DOWN" key 4 times



- If the entered security code is incorrect, the phone will display the following message for 1 second, then the display will return to the previous menu.



9.7.7.1 Call Restriction

The user may select the type of call restriction.

No restriction

All calling procedures are enabled.

Local Only:

Long distance calls and operator calls are inhibited. Only local calls, (7 digit telephone number) and toll free calls (1-800 +XXX... & 1-888 +XXX...) are accepted.

Recall 1-99:

The user can not enter new telephone numbers. The user can only place calls to recalled numbers from one of the 99 memory locations.

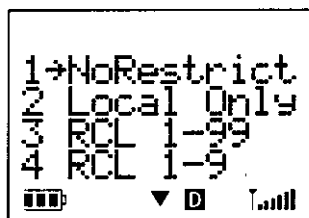
Recall 1-9:

The user can not enter new telephone numbers. The user can only recall numbers from the memory addresses 1-9 and place calls to them.

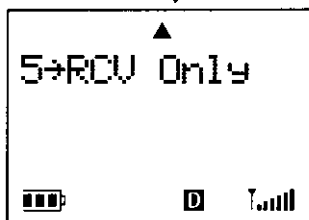
Receive Only:

The user is not able to place calls and can only receive them.

Direct Operation: "MENU" (round cursor key-Right) + 6 + Security Code + 1



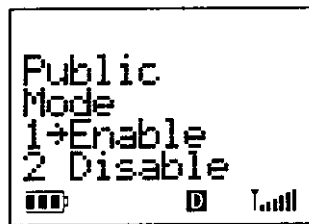
↓ Press "DOWN" key 4 times



- When the phone enters this mode, the cursor is placed beside the current selection.
- The user can move the cursor with the "UP" and "DOWN" keys.
- To accept the new selection and exit from this mode, press the "ENTER" key.
- Emergency calls (to 911) are always allowed at any restriction level.
- Manual DTMF transmission is available when no restriction or local only mode is selected within this function.
- When the phone is in private mode, the Call Restriction level is treated as "No Restriction", even if this function is set to another level.

9.7.7.2 Public Mode Enable / Disable

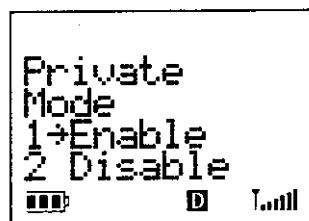
Direct Operation: "MENU" (round cursor key-Right) + 6 + Security Code + 2



- When public mode is enabled, the mobile telephone can be used in public mode.
- The user can move the cursor with the "UP" and "DOWN" keys.
- To accept the new setting and exit from this mode, press the "ENTER" key.

9.7.7.3 Private Mode Enable / Disable

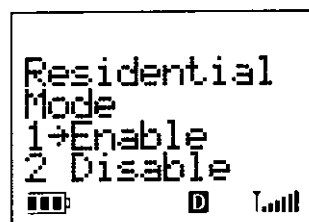
Direct Operation: "MENU" (round cursor key-Right) + 6 + Security Code + 3



- When private mode is enabled, the phone can be used in private mode.
- The user can move the cursor with the "UP" and "DOWN" keys.
- To accept the new setting and exit from this mode, press the "ENTER" key.

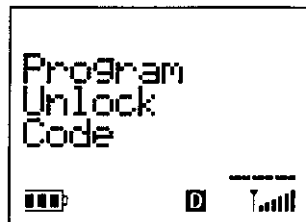
9.7.7.4 Residential Mode Enable / Disable

Direct Operation: "MENU" (round cursor key-Right) + 6 + Security Code + 4



9.7.7.5 Programmable Unlock Code

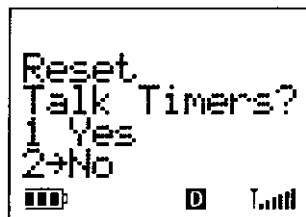
Direct Operation: "MENU" (round cursor key-Right) + 6 + Security Code + 5



- When the phone enters this mode, the current Unlock code is displayed.
- The user can directly enter the three-digit Unlock code using the numeric keys.
- Press the "ENTER" key to set the new Unlock code and return to the previous menu.

9.7.7.6 Talk Timer Reset

Direct Operation: "MENU" (round cursor key-Right) + 6 + Security Code + 6



- If the user selects No and presses "ENTER", the phone will exit this mode.
- If the user selects Yes and presses "ENTER", the talk timers will be reset to zero and the "Talk Timers Reset!" message will be displayed for 1 second.

9.7.8 Lock Function

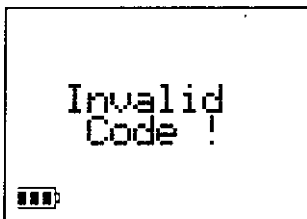
Direct Operation: "MENU" (round cursor key-Right) + 7



- The phone enters the "unlock code waiting state" to prevent careless miss-operation of the "Lock" function, and waits for the entry of the three-digit unlock code.
- The user can directly enter the unlock code using the numeric keys.
- If the entered unlock code is correct, the phone will be locked.



- In the locked mode, calls can not be placed or received. The exception is emergency calls (to 911).
- To unlock the phone, enter the three digit unlock code.
- To avoid confusion, the number "911" should not be used as an unlock code.
- If entered unlock code is incorrect, the phone shows the following message then exits from this mode.



- The locking status is preserved when the phone is turned off..

9.7.9 Default Settings

1)	Ringing Tone Volume	(MENU 11)	Standard
2)	Ringing Tone Selection	(MENU 12)	Tone 1
3)	Message Tone Volume	(MENU 13)	Standard
4)	Message Tone Selection	(MENU 14)	Tone 2
5)	Optional Vibrator ON/OFF	(MENU 15)	Ring
6)	LCD Contrast	(MENU 31)	Normal
7)	Keypad Tone Volume	(MENU 32)	Standard
8)	Multiple Language Selection	(MENU 33)	English
9)	Auto Answer	(MENU 41)	OFF
10)	Automatic Retry	(MENU 42)	OFF
11)	Send Own Number	(MENU 43)	ON
12)	Voice Privacy Tone	(MENU 44)	OFF
13)	Economy mode	(MENU 45)	OFF
14)	Voice Mail Center's Number	(MENU 46)	Void
15)	NAM Selection	(MENU 51)	NAM1
16)	Call Restrict Level	(MENU 61)	No Restriction
17)	Public Mode Enable/Disable	(MENU 62)	Enable
18)	Private Mode Enable/Disable	(MENU 63)	Enable
19)	Residential Mode Enable/Disable	(MENU 64)	Enable
20)	Programmable Unlock code	(MENU 52)	000

9.8 OTHER FEATURE

9.8.1 NAM Programmable Emergency Number

The emergency number is already programmed in the phone as the default number "911". However, another emergency number can be programmed while in the NAM programming mode. Therefore, two emergency numbers are allowed. They can be dialed even if the phone is locked or call restriction is activated.

9.8.2 Self-Diagnosis

Each time the phone is turned on, it performs a Power On Self Test (POST):

If an error occurs one of the following errors will be displayed.

CHECK 1	ESN checksum is incorrect
CHECK 3	Synthesizer did not achieve lock
CHECK 4	RF power status did not indicate an on condition
Program NAM	NAM check is incorrect. Reprogram NAM!
CHECK 5	No program down-loaded
CHECK 6	TCXO failure

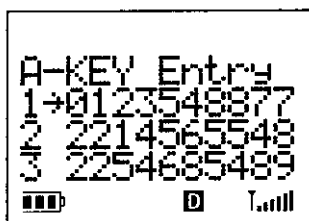
The display will show "CHECK" and the appropriate number.

9.8.3 A-Key Programming For Authentication

This mobile telephone supports the authentication function, according to the system specification of TAI/EIA/IS-136.

Authentication is a procedure used by base stations to validate the mobile telephone's identity during system access. The A-KEY is a secret data item used in the mobile telephone authentication process.

When the user enters "2539"(AKEY) followed by "ENTER" + "ENTER", the phone enters "A-KEY programming mode".



- When the phone enters this mode, the cursor is placed beside the current telephone number.
- The user can move the cursor with the "UP" and "DOWN" keys.
- To accept the telephone number selection and program the A-KEY for this number, press the "ENTER" key.



↓ Enter A-KEY (6-26 digits)



- The A-KEY is programmed by entering the 6 to 26 digit number provided by the carrier.
- When the complete digit sequence has been entered, press the "ENTER" key to store the number.
- At this point, the phone will validate the A-KEY based on the check sum. If the key is valid, the display shows the "A-KEY is stored" message for about 1 second and the phone restarts from the Power-ON sequence.
- If the key is invalid, the display shows the "Invalid A-KEY input" message for about 1 second and returns to the A-KEY entry state.

9.8.4 Status Monitor

The phone may be placed into the "Status Monitor" state of the Test Mode

When this function is ON, the phone displays status information during the standby or conversation mode. The display format of the status monitor is as follows.

(1) When the phone is using a DCCH

```

DCH B NNNN:S
I I I I CC-RRR
BBB% PFCP
MMMMMMMMMMMMMM
  
```

DCH: Indicates that the phone is using a DCCH
 B: Band (0= 800MHz, 1= 1.9GHz)
 NNNN: Channel Number
 S Slot
 I I I I SID/PSID/RSID
 CC DVCC
 RRR: Received RSSI
 BBB% BER
 P PFC
 MMM... Status Message (i.e. "Camping", "Idle")

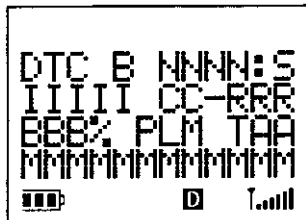
(2) When the phone is using ACC

```

ACC B NNNN:
I I I I CC-RRR
MMMMMMMMMMMMMM
  
```

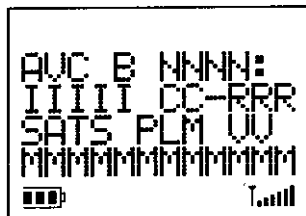
ACC: Indicates that the phone is using an ACC
 B: Band (0= 800MHz)
 NNNN: Channel Number
 I I I I SID/PSID/RSID
 CC DVCC
 RRR: Received RSSI
 MMM... Status Message (i.e. "Camping", "Idle")

(3) When the phone is using a DTC



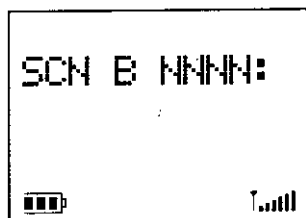
DTC: Indicates that the phone is using a DTC
 B: Band (1= 1.9GHz, 0= 800MHz)
 NNNN: Channel Number
 I I I I I SID/PSID/RSID
 CC DVCC
 RRR: Received RSSI
 BBB% BER
 M MAC (0-10)
 A Time Alignment (0-38)
 MMM... Status Message (i.e. "Wait Order", "Conversation")

(4) When the phone is using an AVC



AVC: Indicates that the phone is using an AVC
 B: Band (0= 800MHz)
 NNNN: Channel Number
 I I I I I SID/PSID/RSID
 CC DVCC
 RRR: Received RSSI
 S SAT (0=5970, 1=6000, 2=6030, 3=NG)
 M MAC (0-10)
 V VOX (0=Off, 2=8dbAtt, 3=NoLim)
 MMM... Status Message (i.e. "Wait Order", "Conversation")

(5) When the phone is Scanning.



SCN: Indicates that the phone is Scanning.
 B: Band (0= 800MHz, 1=1.9GHz)
 NNNN: Channel Number

9.8.5 Electronic Serial Number

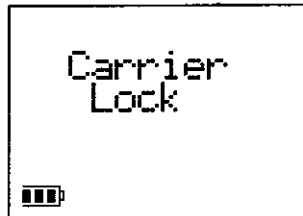
The circuitry which provides the electronic serial number is isolated from fraudulent contact and tampering. Changing the serial number circuitry is extremely difficult and could render the phone inoperative.

9.8.6 Subsidy Lock Feature

Handle with Care: This feature is for BellSouth ONLY

The mobile telephone may be placed into a "Carrier Lock" state with the following sequence:

1. Enter Test Mode (Factory Test Mode Only).
2. Send the following serial sequence if you would like to set the code to 123456: 80H, 12H, 34H, 56H, XXH,55H (XXH is the checksum).
3. Upon cycling power, the phone will indicate "Carrier Lock" on the display. In this mode, the phone will only allow entry of the unlock code, or entry into factory test mode (only with factory code).



Upon power-up, the phone will check the checksum of the carrier lock data. If this check fails, the following message will be displayed.



- The algorithm that will generate the carrier lock code will be provided by BellSouth Cellular.

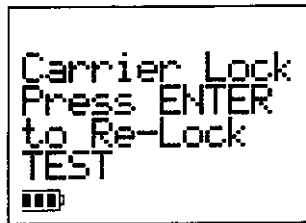
To unlock the phone

1. Power up the phone.
 2. As soon as the phone displays "Carrier Lock", the user may enter the 6 digit unlock code. The entered 6 digit code is not displayed on the LCD. After the 6 digit code is entered correctly, the phone will be re-booted from the normal power on sequence and no longer be locked
- If the entered 6 digits are incorrect, the phone will remain in the "Carrier Lock" state. The user should turn off the phone and try again from step 1 above.

To re-lock the phone

1. Power up the phone.
2. Enter Test Mode (supplier / dealer code ENTER).
3. Type 920+SEND+ENTER. The previously programmed code will reactivate. If any key other than ENTER is pressed after 920+SEND, the display will clear and the phone will return to test mode.

- If the "loyal carrier code" is not programmed, 920+SEND will be ignored and the display will clear.



Carrier Lock
Press ENTER
to Re-Lock
TEST
■■■

9.9 SERVICE INFORMATION

The phone will have two secret codes to be entered for the NAM programming mode. One code is prepared for the supplier and another is for the dealer. Dealer code is accepted only 20 times and only when the phone is not locked. The supplier's code has no such restriction.

Contents of the programmable number memories will be maintained even after entering this mode.

9.9.1 Ordinary NAM Programming

NAM is programmed by using the keyboard. The following operations start NAM programming mode.

Press "ON/OFF" (= END) to turn on the station, and hold down.

Enter the 7 digit supplier's NAM programming code within 10 seconds after power up, then release "ON/OFF".

Please refer to the next section for details of the programming procedure.

9.9.2 Easy NAM Programming

Press "ON/OFF" (= END) to turn on the station, and hold down.

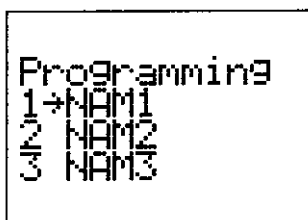
Enter the 7 digit dealer's NAM programming code within 10 seconds after power up, then release "ON/OFF".

----Detailed Programming Procedure ----

The NAM parameter is set according to the following method. The message is displayed on the upper 2 lines of the LCD display.

- Press the "CLEAR" key to clear the last entered digit.
- Press the "ENTER" key to set the parameter and enter the next setting stage.
- This programming mode can be finished and exited at any stage by pressing the "END" key.

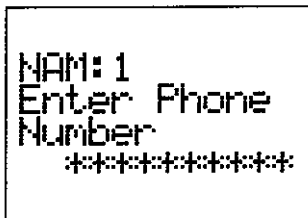
(1)



```
Programming
1-NAM1
2-NAM2
3-NAM3
```

↓ Select 1 - 3

(2)



```
NAM: 1
Enter Phone
Number
*****
```

↓ 10 digits + "ENTER"

(3)

```
NAM: 1
System ID
Code          ****
```

↓ 5 digits (00000-32767) + "ENTER"

(4)

```
NAM: 1
Security
Code          ****
```

↓ 4 digits + "ENTER"

- In ordinary NAM mode, message (5) is displayed.
- In simple NAM mode, the following message is displayed.

```
NAM: 1
Continue?
1→Exit
2 Continue
```

- If "Continue" is selected, programming of the ordinary NAM parameter can proceed.
- If "Exit" is selected, the phone exits from this mode and returns to the normal mode.

(5)

```
NAM: 1
Local use
1→ON
2 OFF
```

↓ Select 1 or 2

(6)

```
NAM: 1
MIN Mark
1→ON
2 OFF
```

↓ Select 1 or 2

(7)

```
NAM: 1
Ext. Address
1 ON
2 OFF
```

↓ Select 1 or 2

(8)

```
NAM: 1
MCC
*****
```

↓ 4 digits (0000-1023) + "ENTER"

(9)

```
NAM: 1
IPCH primary
*****
```

↓ 4 digits (0001-0799,0991-1023) + "ENTER"

(10)

```
NAM: 1
IPCH second
*****
```

↓ 4 digits (0001-0799,0991-1023) + "ENTER"

(11)

```
NAM: 1
FCCA
*****
```

↓ 5 digits (00000-65535) + "ENTER"

(12)

```
NAM: 1
LCCA
*****
```

↓ 5 digits (00000-65535) + "ENTER"

(13)

```
NAM: 1
FCCB
*****
```

↓ 5 digits (00000-65535) + "ENTER"

(14)

```
NAM: 1
LCCB
*****
```

↓ 5 digits (00000-65535) + "ENTER"

(15)

```
NAM: 1
FCCA2
*****
```

↓ 5 digits (00000-65535) + "ENTER"

(16)

```
NAM: 1
LCCA2
*****
```

↓ 5 digits (00000-65535) + "ENTER"

(17)

```
NAM: 1
FCCB2
*****
```

↓ 5 digits (00000-65535) + "ENTER"

(18)

```
NAM: 1
LCCB2
*****
```

↓ 5 digits (00000-65535) + "ENTER"

(19)

```

NAM: 1
ACCOLC
                                     **

```

↓ 2 digits (00-15) + "ENTER"

(20)

```

NAM: 1
Group ID
Mark
                                     **

```

↓ 2 digits (00-15) + "ENTER"

(21)

```

NAM: 1
ROAM Inhibit
1 → ON
2 OFF

```

↓ Select 1 or 2

(22)

```

NAM: 1
A-KEY Input
1 → ON
2 OFF

```

↓ Select 1 or 2

- When "ON" is selected, screen (23) is displayed, allowing entry of the A-key data.
- When "OFF" is selected, the A-key is not changed and screen (24) is displayed.

(23)

```

NAM: 1
Enter A-KEY
*****
*****

```

- When the valid data (6~26 digits) is input, followed by the "ENTER" key, screen (13) is displayed.
- When the invalid data (6~26 digits) is input, followed by the "ENTER" key, the A-key is not programmed.

(24)

```
NAM: 1
Emergency
Number      ***
```

↓ 3 or 4 digits + "ENTER"

(25)

```
NAM: 1
SOC          ****
```

↓ 4 digits (0000-4095) + "ENTER"

(26)

```
NAM: 1
1→Next NAM
2 Private
3 Residentia
```

- If "Next NAM" is selected, the phone return to screen(1).
- If "Private" or "Residentia"(Residential) is selected, the ordinary NAM parameter can then be programmed.
- If "Private" or "Residentia"(Residential) is selected, screen (27) will be displayed.

(27)

```
NAM: 1-NP1
SID          *****
```

↓ 5 digits (00000-32767) + "ENTER"

(28)

```
NAM: 1-NP1
SOC          ****
```

↓ 4 digits (0000-4095) + "ENTER"