Section 4 - 2.983 Application for type acceptance - User Operating Instructions

4.1 - (d)(9) Operating instructions for the LMP4213

75 - P4213 HANDPORTABLE
RADIO USER GUIDE

linear
modulation ⓛⓜ

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Linear Modulation Technology
an Intek Global company.

*linear
modulation*

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75 - P4213 Handportable Radio

Introduction

The 75 - P4213 handportable radio is a state-of-the-art radio offering outstanding performance and ease of use. Full trunking facilities, using Advanced Digital Network Trunking, are built in.

The radio uses linear modulation (LM), a modulation method which provides high quality voice communication while making more efficient use of the radio spectrum than conventional modulation. Signal fluctuations, typically experienced in a moving vehicle, are automatically corrected using digital signal processing techniques.

The radio also supports short data messaging (SDM) operation.

The radio can be used with a range of accessories which interface via the accessory connector.

*Features*_____

◆ Linear modulation technique.

◆ High receiver sensitivity and immunity to fading.

◆ Full data facilities.

◆ User friendly operation.

◆ Full alphanumeric display.

◆ ADNT (Advanced Digital Network Trunking).

Note: Not all the features and accessories described in this guide may be available on the radio supplied (check with your supplier if necessary).

75 - P4213 Handportable Radio

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Safety Information

WARNING

DANGER: SWITCH OFF RADIO
AT FILLING STATIONS

DANGER: SWITCH OFF RADIO
IN VICINITY OF EXPLOSIVES
OR EXPLOSIVE ATMOSPHERES
(e.g. in a blasting quarry)

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Safety Information

FCC Regulations

◆ You are required to obtain a license before transmitting from your radio.

◆ The radio transmitter frequency and operation should be checked by authorised service personnel before first use, and at least yearly thereafter.

Safe Use of Radio

◆ Proper use of this radio will result in exposure to radio frequency electromagnetic energy substantially lower than the limits recommended by the FCC.

◆ It is good practice to hold the radio upright.

◆ Do not operate the radio with the antenna touching eyes, face or exposed parts of the body.

◆ Keep the radio out of the reach of children.

◆ Avoid holding the transmit (Push to Talk or PTT) switch in the "on" position when not communicating

◆ If the radio is used frequently while driving, a "hands free" kit should be used.

◆ Use of the radio whilst driving may be illegal in some States.

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Safety Information

Repairs, Modifications and Maintenance

◆   If any operational difficulties should arise while using this product, report them to authorised service personnel as soon as possible.

◆   This radio contains no user serviceable parts. Unauthorised adjustments or modification will void the warranty and may lead to radio emissions outside FCC limits.

◆   DO NOT connect an external RF power amplifier to this equipment.

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75 - P4213 Handportable Radio

Initial Set Up

Initial set up _____

Screw the helical stub antenna into
the radio body as illustrated,
ensuring that the screw does not
cross-thread. Do not over tighten.

Fit the battery to the back of the unit.

The battery will normally be shipped
uncharged so it will be necessary to
charge it before use (see section on recharging).

Switch the unit on and check that it is operating
correctly.
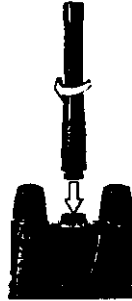
Troubleshooting:

◆   Is battery fitted correctly?

◆   Is battery charged?

◆   Is antenna fitted on correctly?

If the radio still does not operate correctly return it for
repair or replacement.

Mode of Operation _____

The 75 - P4213 is a trunked radio, which operates on
an Advanced Digital Network trunk (ADNT) system.
With the 75 - P4213 a user may make speech calls to,
and receive speech calls from other users in a fleet;
make and be involved in group calls within a fleet;
make calls to telephone networks (if allowed by the
network operator) and receive calls form telephone
networks (if allowed by the network operator). Data
communication is also possible using status or Short
Data Messaging (SDM).

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Initial Set Up

Linear Modulation

Linear Modulation (LM) has been developed to provide a means of mobile radio communication which makes efficient use of the radio spectrum, and provides a high level of performance. Using radio channels that are only 5 kHz wide, LM equipment can achieve a speech quality and coverage area that are comparable to 12.5 kHz FM systems. In addition data transmission rates of up to 14.4 kbps are provided.

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75 - P4213 Handportable Radio

Display

Display

The LCD display has a row of 8 custom icons below which there are two rows of 16 dot-matrix characters:
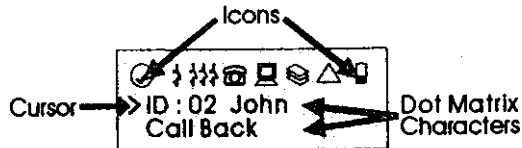
Icons

The eight icons indicate the following conditions:

In Service. On when the radio has found a network and is able to make or receive calls.

Individual Call. On when an individual identity is selected or an individual call is received.

Group Call. On when a group identity is selected or a group call is received.

Telephone Call. On when a telephone identity is selected or a telephone call is received.

Data call. On when a data call is in progress or a data call is in the stack. Flashes when stored data message is downloaded via the serial port.

Calls in stack. On when unanswered voice calls or data messages are in the stack.

Emergency. On when an emergency call is in progress or selected.

Battery Low. On when only limited battery power remains.

Transmit LED

A red LED is used to indicate when the unit is transmitting (see diagram on inside back cover).

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Controls

Controls

The 75 - P4213 has the following controls:
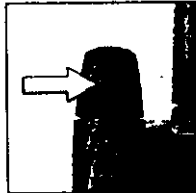
On/Off/Volume Control.
Located at the top of the radio on the left side. Press and release to turn radio on and off (see page 18 for more details). Rotate to set speaker volume.
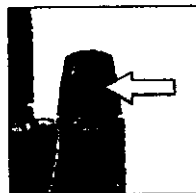
Select Control.
Located at the top of the radio on the right side. Press to toggle cursor between upper and lower display lines, e.g. between ID and status when display is in ID/Status mode. Rotate to select required ID, status or stack item, or scroll through a list of menu options.
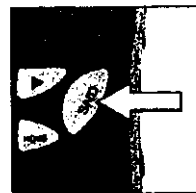
SND Key.
Pressing the send (SND) key sends the currently displayed status message to the selected identity i.e. to the desired receiving party. In stack mode sends stored message to serial port.

HOME Key.
Pressing this key sets the identity to the programmed default value (often the dispatcher's identity) and returns to the ID/Status display.

Controls
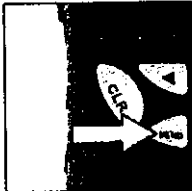
MENU Key.
Pressing the menu key cycles
between the ID/STATUS, SETTINGS
and STACK menus:

ID / STATUS

Press
Menu

SETTINGS

Press
Menu

STACK

Press
Menu
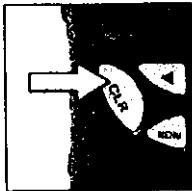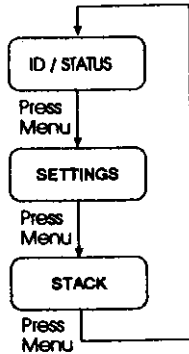
CLR (Clear) Key.
The function of the clear key varies
depending on the display selected.
Some functions are listed below:

♦ Clear items from the stack.

♦ Call clear.

♦ Selects a selectable group.
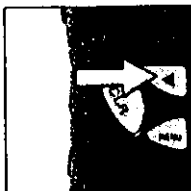
Softkey #1.
Its use depends on the internal
programming of the unit.

Softkey #2.
Its use depends on the internal
programming of the unit.

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Controls

PTT
Switch
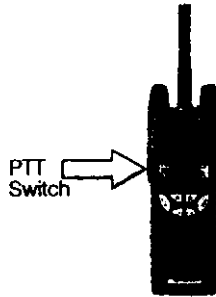
Push to Talk (PTT) Swich
If the unit is in idle mode
pressing the PTT switch initiates
a call. If the unit is on a voice
channel the radio switches to
transmit.
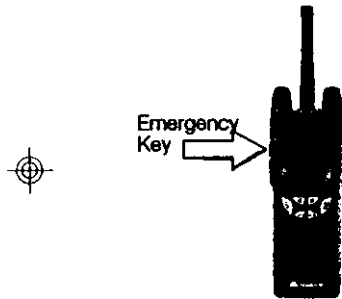
Emergency
Key

Emergency Key.
The key has to be held pressed
for a short period to activate an
emergency call.

Note: The display and all front panel keys are illuminated during
key operation and for a short period afterwards (unless backlight is
turned off).

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Accessory Connector

Accessory Connector

The accessory connector allows connection to:

◆ External speaker, microphone and PTT switch.

◆ External emergency switch/man down device.

◆ External devices requiring + 7.2 V supply (unregulated).

◆ RS-232C serial port device.

◆ External controlling devices e.g. vehicle adapter.

◆ External antenna via coaxial socket.

Fitting Accessory Connector

See the diagram at the back of this book for the location of the accessory connector. It is necessary to power off the radio in order to fit any external accessory and it will be necessary to power down the radio and then power it up after removing any programming leads. To fit the mating half of the connector insert the tab on the connector into the locating slot in the side of the radio (this is on the right hand side of the radio near the bottom). Then pivot the connector towards the mating half on the radio and use the knurled screw to secure it.

Using the Radio - General

Setting Up

The following sections explain how to set up the radio prior to making or receiving calls and how to power the radio down.

Power Up

Power the radio up by pressing and holding down the ON/OFF/VOLUME control.
A short tone is heard indicating that the control may be released.

The radio performs a self-test during which all segments of the display, the backlight and the indicator LED turn on. When the test is complete "POWER ON" is displayed, followed by the radio's own identity. If the test fails, an error message is displayed. If this happens return the radio to your dealer.

The radio then starts hunting for a network control channel. At this time the "IN SERVICE" icon will be off.

When a control channel is found the "IN SERVICE" icon comes on and the current status and ID is displayed. If the control channel is subsequently lost the "IN SERVICE" icon will go out.

If, after some time, a control channel is not found or if, during normal operation, the control channel is lost for some time, the radio enters low power mode. The radio then periodically "wakes up" and checks to see if a control channel has appeared.

At any time control channel hunting can be manually initiated by pressing the HOME key.

If the state of the "IN SERVICE" icon changes a message is displayed to alert the user. Pressing the clear key clears the message.

Using the Radio - General
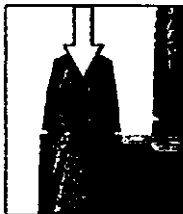
Power Down
Press and hold down the ON/OFF/
VOLUME control. A tone is heard
and the message "POWER OFF" is
displayed. After a short period the
radio powers down. Releasing the
control before the second tone stops
cancels power down.
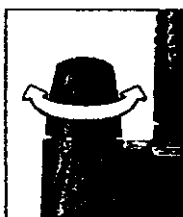
Setting the Volume
Rotate the ON/OFF/VOLUME control
clockwise to increase the received
audio volume and anti-clockwise to
reduce it. The volume of the confidence
tones is not changed (see "Setting
Confidence Tone Level" to adjust).

Setting Own Status
Press MENU key until ID/ STATUS menu is displayed.
Select your own status setting by pressing the SELECT
control so that the cursor is on the status (bottom) line
of the display and rotating the SELECT control to scroll
through the available statuses until the desired status is
displayed. Once set the selected status may be sent to
another radio by pressing the SND key, or may be
interrogated by another system user.

Note: Some of the following features may be disabled on your radio.

Changing Display Backlight Brightness
Press the MENU key until the SETTINGS menu is
displayed. Rotate the select control until "BACKLIGHT"
is displayed. Press the SELECT control and the
brightness setting is displayed (0 to 10). Turn the
SELECT control clockwise to increase brightness or
anticlockwise to decrease brightness. Press the
SELECT control to return to the menu display.

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Using the Radio- General

Setting Confidence Tone Volume
Press the MENU key until the settings menu is displayed.
Rotate the SELECT knob until TONE VOLUME is displayed.
Press the SELECT control and the pointer will move from
TONE VOLUME to the current value setting. Turn the
SELECT control clockwise to increase the confidence tone
level, anticlockwise to decrease it. A representative tone will
be heard at each change of level. Press the MENU button
until normal operational display is seen (this shows current
set ID and STATUS values).

Displaying Radio's Own Identity
Press the MENU key until the SETTINGS menu is displayed.
Rotate the SELECT control until "OWN ID" is shown on the
upper line of the display. The radio's identity will then be
shown on the lower line.

Selectable Groups
The handportable may be programmed with one or more
user selectable groups. Incoming calls to the group will not
be answered by the handportable unless they are selected.
Only one selectable group may be selected at once, but
the handportable will continue to respond to indirect calls
and permanent group calls. With the handportable in the
standard display state, that is when showing an ID number
and a status (ST) number, then depressing the CLR button
will display either NOT SELECTABLE on an ID that is not
selectable group or GROUP SELECTED on an ID that is a
selectable group.

Once GROUP SELECTED is displayed then the right hand
rotary control - the *select control* - becomes inoperative.
The MENU and HOME keys are however fully operative and
all functions associated with these keys are available.

To withdraw from selectable group mode either push HOME
at any time or push CLR if the display shows the ID of the
selectable group and the message GROUP SELECTED.

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Using the Radio- General

Selecting Serial Port Baud Rate
Select the SETTINGS menu. Rotate the select control
until "BAUD RATE" is displayed. Press the SELECT
control and the current baud rate setting will be shown
in the lower line of the display. Turning the SELECT control
clockwise will increase the baud rate setting, and turning it
anti-clockwise will reduce it. Available settings are 300,
1200, 2400, 4800, 9600, 19200 bits per second.

Battery Monitor
Select the SETTINGS menu. Rotate the select control until
"BATTERY MONITOR" is displayed. A bar-graph of the
battery level is displayed in the bottom line of the display.

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Making and Receiving Calls

Making a Speech Call

Select the ID/ STATUS menu. Select the identity of the party to be called by pressing the SELECT control so that the cursor is on the identity (top) line of the display and rotating the SELECT control to scroll through the available identities. This may be an individual identity when the Individual Icon will be displayed or a group identity when the Group Icon will be displayed (as shown below).

```
 ⊘      ⅍⅍⅍

>ID : 02  Group 2
  ST : 21   On round
```
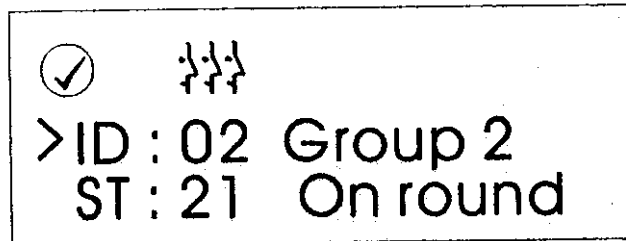
Press the PTT switch on the left side of the unit to initiate the call. The display will briefly show "calling" while the call is being set up. If the call is successful a confidence tone sounds and the call time remaining is displayed on the bottom line of the display:

```
 ⊘      ⅍⅍⅍

>ID : 02  Group 2
  Call  Time  2:36
```
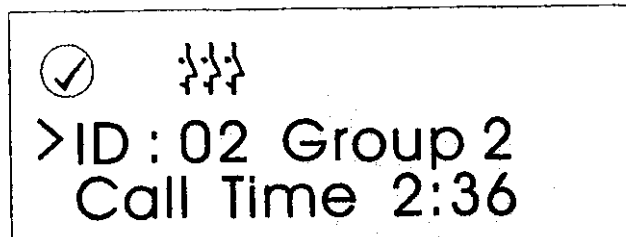
When only 10 seconds of call time is remaining a tone is sounded, to warn of imminent cleardown.

At any time during the call or call set up the call can be terminated by pressing the CLR key. The message "call end" will be displayed for a short period before the radio returns to normal operation.

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Making and Receiving Calls

Call Procedure

Once the call is established, press the PTT switch and speak clearly into the microphone, with the radio held about 15 cm from your mouth. Speak slowly and clearly. The radio can be programmed to send a short tone at the end of each transmission. If this is not enabled it is good practice say "over" before releasing the PTT switch in order to listen to the other party and to wait for the other party to do the same before transmitting.

Call Set Up Failure

If the call set up is not successful the display will show the reason for the failure to connect:

1. If the called party is busy or the system is busy the call will be queued, a *Wait to connect* message will be displayed. If the call cannot be setup in a pre-determined time the call will be cleared down and either a message saying *Called Prty Busy* or *No Ch Resource* will be displayed.

```
 ⊘

>ID : 02 John
  WAIT TO CONNECT
```

2. If the called party is in "callback mode" (this is often the case for a despatcher or if a mobile user is out of the vehicle), then your radio's identity will be placed in the called radio's stack and your radio will display the "call back" message:

```
 ⊘

>ID : 02 John
  CALL BACK
```

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Making and Receiving Calls

3. If the called unit is unavailable (e.g. if the called unit is out of radio coverage or switched off) then your radio will display the "not available" message:

> ⊘
> >ID : 02 John
>   NOT AVAILABLE
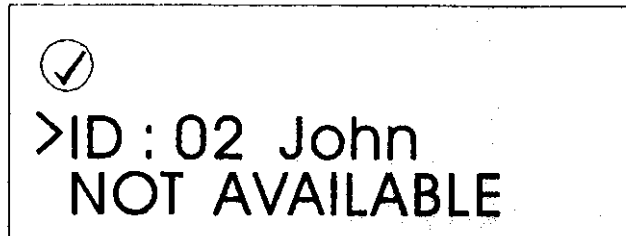
4. If the call is rejected by the trunking system (e.g. if the radio's identity is invalid) the "call rejected" message will be displayed:

> ⊘
> >ID : 02 John
>   CALL REJECTED
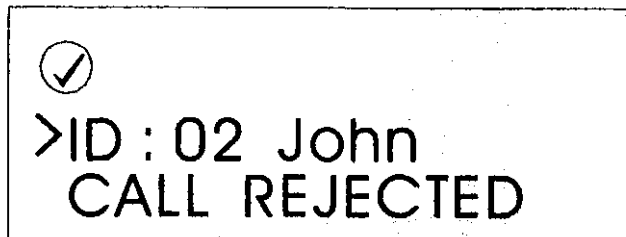
Externally Set Up Speech Calls
Speech calls can also be set up using the serial port or the external PTT facility.

Receiving a Speech Call _____

When the radio receives a call a tone is generated and the identity of the calling party is displayed, together with the group, individual or telephone icon as appropriate. To accept the call press the PTT switch and speak into the microphone. The display shows the remaining call time in minutes and seconds.
After being accepted the call can be terminated by pressing the CLR key. The message "call end" will be displayed for a short period before the radio returns to normal operation. If the incoming call is a group call

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Making and Receiving Calls

then pressing the CLR key drops you out of the call but the rest of the group stays on.

If a call is received by your radio, but not answered, the identity of the caller is placed in the Call Stack.

Telephone calls

Telephone calls can be made to any telephone-programmed identity. The identity is selected in the normal way (see "Making a Call") and the telephone icon is displayed.

Receiving a Data Call

If a Short Data Message (SDM2) is received, the whole message (of up to 23 characters) is displayed and stored in the Call Stack. If a Long Data Message is being received the message "Receiving LDM" is displayed (see section on Call Stack for method of scrolling through the message).

Dumping Messages to the Serial Port

With the radio in stack mode and a suitable DTE connected to the radio via the accessory port press the SND key. This will dump the message through the accessory port to the DTE. The message still remains in the stack after this operation and can be cleared manually using the CLR key.

Making a Status Call

Routine status messages can be sent to any other party. To send a status message first select the destination identity by pressing the SELECT control until the cursor is opposite the identity (upper) display line and then rotating the SELECT control until the desired destination identity appears. Then press the SELECT control to allow the status to be adjusted (cursor moves to bottom line of the display). Rotating the SELECT control then changes the status code and displays the alphanumeric string associated with

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Making and Receiving Calls

it. By repeatedly pressing the SELECT control the display cursor can be toggled between the status and identity lines of the display, allowing setting of either field. When the correct identity and status have been set press the SND key to send the status message. The display will briefly show "sending" and, if the call is successful "sent", before returning to normal. If the call is unsuccessful the message "not available" or "call rejected" may be displayed to show the reason for the call failure (see paragraphs 3 and 4 under 'call set up failure' on page 23, for a fuller explanation).

Receiving a Status Call

If your radio receives a status call it will enter stack mode, and the status received will be displayed, together with the identity of the sender. The status message can be cleared from the call stack by pressing the CLR key. If you wish to call the sender press the PTT switch and a call will be set up.

Using the Call Stack

If you do not answer an incoming call or your radio is in callback mode the call will be placed in the stack. Incoming status calls, SDM2s and LDMs are automatically placed in the stack. The radio can stack a total of 10 calls, although only one of these may be a LDM. If the stack icon is on this indicates that the radio has previously received a call which was not answered and the details of which it has stored
To look at the contents of the Call Stack press the MENU key until the STACK menu is displayed. The most recent message is displayed after an unanswered call. To scroll through items in the Call Stack rotate the SELECT control. To clear a particular item from the Call Stack press the CLR key.

Making and Receiving Calls

```
 ✓                        ⧆

>ID : 02  John
 ST : 22  On round
```
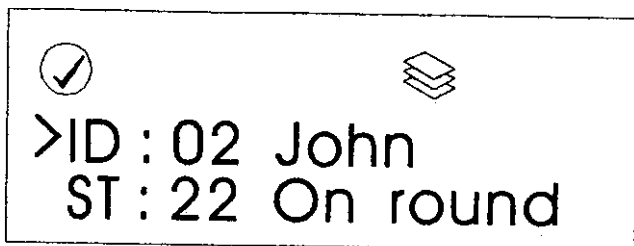
To return a call select it in the Call Stack and press the PTT switch. Stacked voice calls will be deleted when called back in this way.

Scrolling Through a Data Message
In order to scroll through a data message, once it is selected, press the SELECT control again and rotate to scroll through the message. Pressing Softkey #1 moves to the beginning of the message. Pressing softkey #2 causes the display to auto scroll. Press the SELECT control again to return to scrolling through stack entries.

Retention of Call Stack Entries
Call Stack entries are not lost when the radio is powered down but are retained for future use.

*Interrogating Status of Another Radio*_____

Select the SETTINGS menu and then rotate the select control until "INTERROGATE" is displayed. Press the select control and the current selected identity will be displayed. Scroll through the available identities by rotating the select control clockwise or anti-clockwise, until the required identity to be interrogated is shown. Press the SND key to interrogate. The status set on the interrogated radio will be retrieved, displayed, and placed on the call stack.

Making and Receiving Calls

Making an Emergency Call

The Emergency Key is located on the left side of the unit above the PTT switch. An emergency switch or man down device can also be used with the radio.

Emergency Key
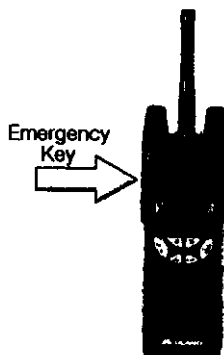
To make the call press and hold the key for more than 2 seconds. The behaviour of the unit after pressing the key depends on its personality programming.

Confidence Tones

The radio generates a series of audible tones to assist the user. These usually consist of low and high frequency tones of varying duration and repetition interval.

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Fault Finding, Maintenance and Battery Charging

Fault Finding

If the radio fails to turn on check the following:

♦   That the battery is correctly fitted.

♦   That the battery is sufficiently charged and that the battery charger is working correctly.

If poorer than usual reception or transmission is experienced check that the battery low warning icon is not on and that the antenna is correctly fitted and is undamaged.

If the above checks do not reveal the cause of the problem, or error messages appear on the display contact your dealer.

Maintenance

The 75 - P4213 needs no regular maintenance but periodic checks of the radio transmitter are mandated by the FCC (see page 9).

Recharging the Battery

In order to recharge the radio battery, follow the instructions supplied with the battery charger. A battery can be charged alone or whilst fitted to a radio. Only use a battery charger recommended by the supplier of your radio.

Note: Always power down the radio down BEFORE removing the battery. This will ensure all settings and data are retained.

Prolonging Battery Life

The following actions will help prolong battery life:

♦   If the battery is to be stored for long periods fully charge it first (also see battery notes below).

♦   Try to let the battery run down fully before recharging it. Repeatedly recharging a battery which is only partially discharged may reduce its capacity due to the "memory effect".

♦   Use the recommended charger.

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Battery Notes

Battery Notes

◆   Battery capacity, as stated by the manufacturers, is for operation at 25°C. Battery life will be adversely affected at the operating extremes of high and low temperatures.

◆   When operating the radio at high temperatures (i.e. above 40°C) the transmit mode should only be used for a maximum of 20% of the time. This is to prevent damage to the batteries due to overheating.

STORAGE:

◆   Storage temperature ranges:
Less than 30 days: -20 to 50°C
30 days to 90 days:-20 to 40°C
More than 90 days:-20 to 30°C

◆   Do not store at high humidity.
Humidity should be 65% ± 20%.

◆   Make sure no corrosive gases are present.

◆   If stored long-term, ensure the battery is not connected to the radio.

◆   The first charge after prolonged storage may not yield full capacity, but this problem is rectified by fully discharging the battery through use on the radio and recharging.

◆   Operating outside the temperature range 0 to 40°C and not charging at room temperature could adversely affect battery life.

◆   Make sure the contacts on the back of the battery are kept clean, by wiping with a dry cloth.

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Battery Notes

♦   The batteries contain a thermal fuse for safety
     reasons which will render them useless if
     exposed to extremely high temperatures
     (above 90°C).

High Temperatures
Very high temperatures may cause the LCD display to
temporarily blacken. Above 85°C the radio may fail to
work. When the temperature is reduced normal
operation should return. Also see battery notes above
for the effect of high temperatures on the battery.

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Accessories

Battery Chargers (SRC11C, SRC11/CR) _____

There are two different battery charger units
(SRC11C, SRC11/CR) both of which have a single
charging slot. The SRC11C only charges the battery.
The SRC11/CR charges the battery and allows the
unit to operate whilst in the charger.

LED indicators show that power is applied to the unit,
that the batteries are charging, that charging is
complete and if there is a fault.

Vehicle Adapter VA-11CR _____

The handportable sits in the Vehicle Adaptor VA-11CR
which is then powered and charged by the vehicle
electrical system. A lead is available to connect to the
external antenna. A separate lead is also available to
connect to an external data device.

Remote Speaker and Microphone (SMC5) _____

The remote speaker and microphone includes a
speaker, microphone and push-to-talk (PTT) switch.
Only the correct, factory supplied cable and connector
should be used with this unit.

Belt Clip _____

A detachable clip is available which fits onto the heat
sink belt button, and allows the radio to be attached
to the user's belt.

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The Serial Port

Serial Port & Data Facilities _____

An RS232C serial port, with hardware flow control, is
provided via the Accessory Connector.

The serial port is used for the following functions:

♦ Sending and receiving data messages
   (e.g. SDM2s and LDMs).

♦ Machine controlled operation (e.g. control by
   external PC).

Note: Only authorised cables should be used with the 75 - P4213.

Sending Short Data Messages _____

Short Data Messages (SDM2s) can be sent using the
serial data port.

Sending Long Data Messages _____

A Long Data Message (LDM) can be sent to another
radio which has a device connected to the serial port
(e.g. a printer).

Serial Data Port _____

Details on the serial data port functionality may be
found in Publication OI/17 Data User Guide
75-M4000D.

Note however that the 75-P4213 Hand Portable does
not have High Speed Data (HSD) capabilities.

Battery

The battery comes in a detachable pack with classic, contoured and professional options giving varying capacities. The battery pack incorporates protection against high temperature and over current.

Battery Life

Approximate battery life is:

- ◆ Type 75 - B12   5 hours
- ◆ Type 75 - B21   8 hours
- ◆ Type 75 - B30   12 hours

These figures are based on a 5/5/90 transmit/receive/ stand-by duty cycle, and apply to radio operation at 25°C.

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Antenna

A detachable, helical-type antenna is used with the radio. Alternatively an external antenna can be connected to the accessory connector by means of the coaxial socket. Only the correct plug and cable kit should be used for this purpose.

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Personality Programming

A number of settings are programmed into the unit when it is commissioned to personalise its operation. These may include the radio (user) identity, other identities, including individual and group identities and identities associated with a telephone connection. Status messages can be preprogrammed to have associated text e.g. Status 03 On call. Settings associated with the radio protocol and the display and key functions can also be personalised.

The personality of the handportable is programmed using Linear Modulation Technology programming software which runs on a PC and a programming lead which connects the PC to the radio unit.

The programming software is available on a 3.5" floppy disk.
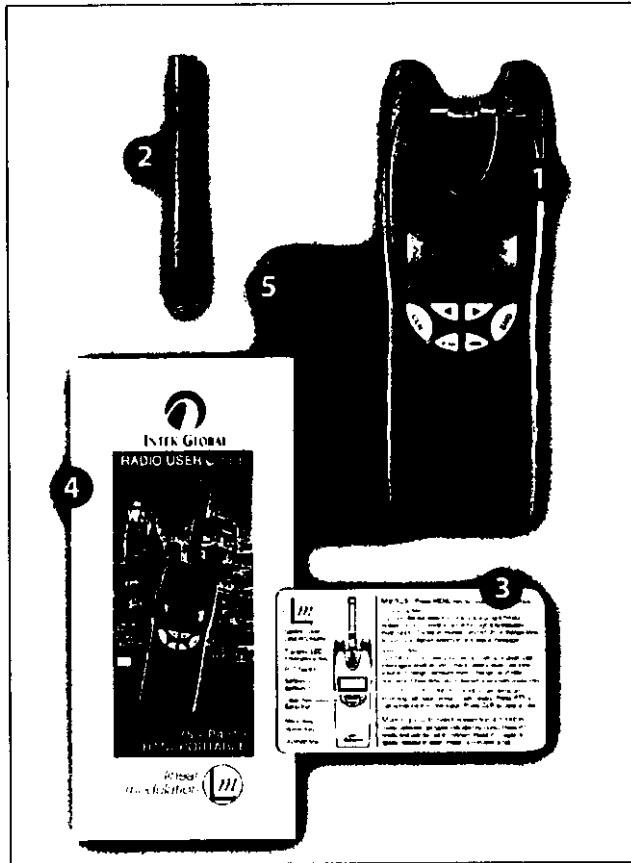
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75 - P4213 Handportable Radio

Unpacking and Initial Set Up

When you receive your 75 - P4213 radio check the
contents of the shipping carton:

1. **75 - P4213 Radio body**
2. **Helical antenna**
3. **Quick reference card**
4. **User Manual**
5. **Battery**

If any of the contents listed above are missing contact
the radio supplier.