# CONTENTS

1. INTRODUCTION 3  
   1.1 About This Guide 3  

2. OPERATING INSTRUCTIONS FOR THE PDT 4  
   2.1 Equipment Overview 4  
   2.2 Setting Up A Terminal 5  
   2.3 Operational Modes And Setup 6  
      2.3.1 TX MSG 6  
      2.3.2 Status 6  
      2.3.3 Test 6  
      2.3.4 Code Manual/Auto 6  
      2.3.5 New Code Y/N 7  
      2.3.6 Call Sign 7  
      2.3.7 Data Rate Slow/Fast 7  
      2.3.8 Auto Ack On/Off 7  
      2.3.9 Append On/Off 7  
      2.3.10 Allow Gps Fix Request 7  
      2.3.11 Normal / Rebro / Retrans 8  
   2.4 Keyboard Functions 8  
      2.4.1 Command keys 8  
      2.4.2 Shifted Keys 9  
      2.4.3 Erase Key And Reset Default Settings 11  
      2.4.4 Receiving A Message 11  
      2.4.5 Rolling Through The Message Stack 11  
      2.4.6 Deleting Messages 12  
      2.4.7 Decrypting Messages 12  
      2.4.8 Manual Message ACK/NAK 12  
      2.4.9 Message Storage Suggestion 12  
      2.4.10 Printing A Message 13  

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1. INTRODUCTION

1.1 About This Guide

This guide provides information to ensure optimum performance from Portable Data Terminal (PDT). Please ensure that you read it fully before operating the PDT.
2. OPERATING INSTRUCTIONS FOR THE PDT

2.1 Equipment Overview

The PDT is housed in a metal case, CNC machined from a single block of aluminium. The equipment is immersion proof and rugged enough to be able to withstand high intensity tactical operations.

With the equipment facing towards you (the MS socket toward you) the unit’s 9V battery is housed in a compartment on the left hand side of the case (external power can also be supplied via the MS connector). The membrane keyboard is mounted in a recess on the top of the case and is both edge sealed and bolted and glued to the case. This keyboard is impervious to most chemicals (including petrol, AVTUR). The back lit 2 x 16 screen is protected by a Lexan™ window bonded to the case by epoxy resin.

The 6 pin standard MS is used for the PDT radio and printer connection. The left hand rubber covered button next to the radio socket operates the screen backlight while the right hand button is the unit on/off switch. The top and bottom of the unit is sealed by a TEMPEST waterproof ‘O’ ring with 6 x M4 hex head bolts holding the case together.
2.2 Setting Up A Terminal

Because the PDT was designed for use during tactical operations by stressed users, setting the unit for radio operation was designed to be an easy task. If you are unsure of the units operation, or have not had experience with the equipment then you should read the instruction card supplied with the PDT. This instruction card contains practical, useful information about getting the most out of your PDT Portable Data Terminal. When you have sufficient information about the basics of the terminal to begin using it remove the unit from its carry bag, install a battery (PP3 9V) under the left hand cover plate marked (9V battery inside) and switch the PDT on.

Except during tactical operations (where other factors may be in play) make sure the ‘B’ is not flashing in the top right hand corner of the screen. This cue indicates that the internal 9V battery is low. Check the back light is working and, unless you need to use it, switch it to OFF.

The back light draws a considerable amount of current (about twice that of the terminal) and should only be used when required. If possible use the solid state illuminator supplied with the kit.

HINT: The KEVLAR® plate inside the bag is designed to protect the keyboard from impacts when the unit is in place. Remember to insert the terminal into its carry bag so that the keyboard IS AGAINST the KEVLAR® plate.

With the unit switched on use CURSOR LEFT/RIGHT to select SELF TEST. When complete this will indicate pass or fail for the modem, CPU, internal communication and crypto. Once the unit has passed the self test the user can continue the setup prior to on-air operations.
2.3 Operational Modes And Setup

Operating the right hand on/off switch displays three modes of operation. Highlighting one of these options, by moving the cursor right (CURSOR RIGHT) or left (CURSOR LEFT) keys, the operator can then select the item with the ENTER key.

These start-up modes are below and covered in more detail:

- TX MSG
- STATUS
- TEST

2.3.1 TX MSG

Entering this mode the operator is able to enter a free-text message, navigate to the RX MSG (SHIFT+RX MSG) area, or select a formatted message type (SHIFT+FORMAT). Other functions can also be accessed from this screen.

2.3.2 Status

Sets the operating parameters of the terminal.

2.3.3 Test

Uses the internal built in test equipment (BITE) to check the operation of the terminal.

This mode checks the full operation of the terminal at both slow and fast speeds by a ‘loop back’ operation between the TX and RX sections. This test can be carried out without the terminal connected to the radio. Results appear as either:

- FAULTY CPU BOARD or
- FAULTY MODEM BOARD or
- CPU and MODEM OK.

This mode promotes user confidence and allows the MTTR to be reduced by quickly identifying the cause of any failure.

2.3.4 Code Manual/Auto

This allows the operator to select if they wish to use a MANUAL key (entered of each operation) or an AUTO key (which is only entered once).

For MANUAL operation the user is prompted for the key each time an encrypt or decrypt is required.

In AUTO operation, after the initial entry, no further key information is requested.
2.3.5 New Code Y/N

This is displayed if AUTO is selected and allows the operator to change/update the crypto key.

2.3.6 Call Sign

This prompt allows you to enter YOU RADIO CALL SIGN. This call sign is how your PDT is recognised on the net. It tells a receiver who sent them a message and who to send messages to. If you enter this call sign incorrectly other users will not be able to contact you, unless a station send an ALL CALL or can guess your call sign. Normally a call sign is comprised of three alpha numeric characters which in military terms are called a tri-graph. Tri-graphs are universally accepted as military call signs. In reality a call sign would be letters and numbers but the PDT will accept any symbol that is available on the keyboard.

The ‘-’ symbol is used as a ‘wildcard’. This means that a message sent to ‘L2-’ will be received by all stations whose call signs begin with ‘L2’.

The word ‘ALL’ is used as a broadcast or ‘all call’ and messages sent with this as the recipients call sign will be received by all terminals able to hear the transmission.

NOTE: This is not to say however that if there are mismatched crypto codes the message will be correctly decrypted.

2.3.7 Data Rate Slow/Fast

This prompts the operator to select the 300 or 600 baud speed depending on the link type and atmospheric conditions. SLOW for HF and hopping operation and FAST for VHF/UHF and good quality HF operation is recommended.

2.3.8 Auto Ack On/Off

This allows the operator to switch on the auto ACK/NACK. In this mode (not recommended for radio silence operations) the terminal will receive messages, count the errors and if above 2.5% request a ‘SEND AGAIN’(NACK) and if below 2.5% confirm receipt with an ‘ACKNOWLEDGED’(ACK)

HINT: This is an automatic mode and unlike the GPS poll mode, does not rely on correct encryption keys before responding and therefore should be switched off during radio silence.

2.3.9 Append On/Off

This mode allows GPS enabled terminals to add their current/last GPS location and the time of the fix to their outgoing messages.

2.3.10 Allow Gps Fix Request

This mode prevents a terminal providing its GPS location when a remote terminal makes a ‘FIND’ request.
2.3.11 Normal / Rebro / Retrans

Normal

This is the normal tactical point-to-point mode for use on manpack and vehicle mounted transceivers. This mode reduces the start-up preamble to the minimum.

Rebro

This mode is used when a military VHF/UHF/HF repeater is in operation. These devices are notoriously slow to respond and any loss of pre-amble will render the Cypher text message useless. In this mode the pre-tone of the preamble is lengthened to allow the repeater/rebroadcast system to come up to full power.

Retrans

This is quite a unique facility where a single simplex radio can become a ‘store and forward’ device to transmit PDT data to other terminals which would otherwise be out of range of the sending station. When processing crypto messages in this mode there is no need for the terminal in RETRANS to contain a valid crypto key (hence if it is captured no useful information is revealed) to execute this function and as a result it can retransmit data from networks using different crypto keys.

HINT: The only way out of a partial status setup is to turn the PDT power off and start again.

2.4 Keyboard Functions

2.4.1 Command keys

2.4.1.1 Cursor Left

Moves the blinking cursor to the left

2.4.1.2 Previous/Abort

When allowed (FORMAT), goes back to the previous operation or (SHIFT+SEND) aborts transmission

2.4.1.3 Cursor Right

Moves the blinking cursor to the right

2.4.1.4 Enter/Next

Enters the selection or goes to the next operation (FORMAT)
2.4.1.5 Block Move

Moves the screen display 16 characters (one screen) to the left. This simplifies reading longer messages on a 16 character screen.

HINT: After moving a multi-screen message the quickest way back to the first screen position is to select either TXMSG or RXMSG.

2.4.1.6 Msg Roll

Rolls through the received message stack starting with the most recent message.

2.4.1.7 Shift

Accesses the shifted functions of the keyboard

HINT: SHIFT on the PDT is not the same as a normal computer keyboard. You do not need to hold it down to obtain the ‘shifted’ operation. As an example SHIFT+FORMAT means press the SHIFT key and then the FORMAT key.

2.4.2 Shifted Keys

2.4.2.1 Formats

This allows access to the stored format message templates. The use of formats is a universally accepted method of ensuring consistent and logical presentation of required data. The PDT reduces the ‘on-air’ in this mode by only transmitting the entry data and a message indicator which prompts the receiving terminal to re-insert the headings. The terminal is supplied with ‘generic’ format messages loosely based on ADFORMS. For a nominal fee customers can request changes to these formats to suit their own operational requirements.

2.4.2.2 Status

See 2.3.2 for information/

2.4.2.3 TXMSG

This enters the free text message mode and re-sets the cursor to the beginning of the message.

2.4.2.4 RXMSG

Places the operator at the top of the receive message buffer.
2.4.2.5 *Crypto*

This allows the operator to encrypt TXMSG text prior to transmission and to decrypt RXMSG text from other terminals.

2.4.2.6 *Send*

Allows the operator to send a message

*HINT:* The only way out of at this point is to either use the PREV/ABORT key or to switch the power off.

2.4.2.7 *Again*

Allows for the manual transmission of a ‘send again’ message.

2.4.2.8 *ACK*

Allows for the manual transmission of an ‘acknowledged’ message.

2.4.2.9 *Print*

Allows the operator to print, using a PDT PRINTER, a selected transmit or receive message.

2.4.2.10 *Clear*

This key clears the transmit buffer FROM the cursor position and after the prompt (CLEAR ALL YES/NO) the receive buffer.

2.4.2.11 *Insert*

This allows the operator to insert characters into a message from the cursor position. This mode is active until switched off by repeating the SHIFT+INSERT operation. The insert mode is flagged by ‘INSERT’ on the top left of the display.

2.4.2.12 *Delete*

This allows the operator to delete one character from under the cursor. This mode is a ‘single’ operation and needs to be toggled for each character to be deleted.

2.4.2.13 *Find*

This allows a GPS equipped terminal to poll a remote terminal and retrieve their current/last GPS location. To achieve this BOTH terminals must have the same crypto key loaded and have GPS enabled terminals. The station ‘FINDING’ must enter the callsign of the terminal it wants to ‘FIND’. This mode is reached by selecting SHIFT+FIND(F)
2.4.2.14 Fix

This mode reached by SHIFT+FIX(G), allows the user to view their own GPS location and universal time. If activated in the STATUS mode this GPS information can be appended to messages.

2.4.2.15 Erase

This erases all internal memory and settings and replaces them with the factory default settings.

2.4.3 Erase Key And Reset Default Settings

Several methods are available to conduct this task.

2.4.3.1 Software Erase

Panic erase, escorted transport, short term secure storage - preferred option. With the equipment powered (in any mode) select SHIFT+ERASE and wait for the on screen display to indicate that the PDT is erased.

2.4.3.2 Hardware Zero

Remove the battery, disconnect any external power and switch the unit on. The unit will not power up but any residual 'key-alive' voltage will be removed.

2.4.3.3 Permanent Zero

Fire one small calibre round through the back of the case into the area marked by the yellow dot. If the resulting damage seems insufficient and time and ammunition permit fire a second round into the area marked by the red dot. This method is guaranteed to permanently erase the PDT.

HINT: Don’t take the permanent zero option unless complete destruction of the equipment is preferable to its capture.

NOTE: Users who select the permanent zero option should abide by their employers OHS provisions applicable to this type of action.

2.4.4 Receiving A Message

The PDT will (in any mode except the start-up screen, status and self test) indicate that it is receiving a message by displaying a fixed * in the top right hand corner of the screen. The keyboard is also frozen during this reception phase, however if it was in use characters are not lost from the transmit buffer. When the * begins to flash the message has been received and is ready for decryption.

2.4.5 Rolling Through The Message Stack

The PDT keeps receive messages in a ‘stack’. The newest message is on top, the oldest message is on the bottom. If the stack is full then a new incoming message will ‘bump off’ the oldest message. For this reason it is good housekeeping to read/print/erase messages as often as possible. The
MSG ROLL key allows the user to view the stack starting at the top. Each key press displays the next message DOWN. The next message AFTER a blank screen is the top of the stack (newest) message.

2.4.6 Deleting Messages

Deleting messages releases memory and ensures that there is always enough spare RAM available. Erasure of messages in the middle of the stack is possible as is a full stack erasure. This is carried out by selecting SHIFT.

2.4.7 Decrypting Messages

Encrypted messages can be decrypted by first selecting them so that they are displayed on screen. Then select SHIFT+CRYPTO and the decrypt cycle will occur. The resulting decrypted message is then displayed on the screen.

2.4.8 Manual Message ACK/NAK

Manual ACK/NAK operations can only be accessed from the receive mode (because they are designed to respond to a received message). To use the function select the receive message you wish to respond to, then select either SHIFT+ACK or SHIFT+AGAIN and the transmit screen will display the call sign of the message sender. You can send the message selected by ENTER/NEXT.

2.4.9 Message Storage Suggestion

In the event of capture it is prudent to have an empty PDT. Erasure of messages when read/printed/transmitted is good housekeeping. If messages are to be stored in the PDT it is worthwhile to encrypt them. Even received messages can be re-encrypted. Using this technique a panic erase of the terminal would render the messages useless.
2.4.10 Printing A Message

Both transmit and receive messages can be printed on the PDT PRINTER. Obviously it is of little value to print an encrypted message.

To print a message select the message to be printed and then select SHIFT+PRINT. The message is then transferred to and printed by the PDT printer.

END OF MANUAL