



# PDT3000 Service Manual

June 2008



[www.wipath.com](http://www.wipath.com)

# Contents

|            |                         |
|------------|-------------------------|
| Section 1. | Product Description     |
| Section 2. | User Instructions       |
| Section 3. | Programming using PDT3P |
| Section 4. | Technical Service       |

## **Section 1.**

### **PDT3000 - Product Description**

The PDT3000 Paging Data Terminal is an intelligent multi-function paging device capable of receiving and displaying messages on a large graphical LCD display as well as providing multiple output and control options.

It is able to print messages directly to a parallel or serial printer, output the message data via serial ports or control or receive data from external devices via its two serial ports.

The PDT3000 has four relay control outputs internally and may additionally be interfaced with an external RCM3000 relay board for multiple relay control.

The ruggedized case of the PDT3000 is constructed of glass reinforced ABS that gives it a strength similar to aluminium for operation in harsh environments such as mounting on forklifts for in-plant messaging. Depending on the connector configuration it can also be made weathertight to a rating of IP65.

Other options include an inbuilt POCSAG paging encoder for repeater or rebroadcast applications and other specialized serial data inputs and outputs for control of devices such as LED signs.

The PDT3000 is available in a number of configurations with different connector combinations and weathertightness ratings and has a number of mounting options to choose from. The following page shows the different back panel connector options. Other options are available on request (minimum order 500 pieces)

### **Specifications**

|                        |   |                     |   |
|------------------------|---|---------------------|---|
| Display Size           | 130 x 40mm (Approx 5 x 1.5in)                                   | Selectivity         | better than 60 dB   |
| Receiver               | Synthesised   | Image Rejection     | better than 55 dB   |
| Frequencies            | 148-174, 450-470, 929-932 MHz<br>(Other frequencies by request) | Spurious Rejection  | better than 55 dB   |
| Protocols              | Pocsag & Flex   | Frequency Stability | 10 ppm at -10C--+60C  |
| Channel Spacing        | 25 KHz  | Power               | 12-32 V DC/AC (12VDC Nominal)   |
| Data Transmission Rate | 512-2400 bps (Pocsag)<br>1600/2-6400/4 (Flex)                   | Physical            | 150mW @ 12V<br>230 x 94 x 56mm (-9 x 3.5 x 2in)<br>(Excluding brackets and antenna) |
| Frequency Deviation    | +/- 4,5 KHz   | Temperature Range   | -10oC to 70oC   |
| Receiving Sensitivity  | 5 uV at 1200 bps  |                     |   |

### **Synthesized Receiver Band Splits For PDT3000**

#### **Bands Normally Available**

##### **Ex Stock**

##### **VHF**

148-153

152-159

156-162

162-169

168-174

##### **UHF**

408-412

450-458

458-466

462-470

##### **900 MHz**

929-932

#### **Bands available on order**

##### **(min 50) 6-8 weeks**

##### **VHF**

135-139

146-149







##### **UHF**

410-418

442-450

492-500


## PDT3000 Back Case Options - Stock Versions


|    |   |  |
|----|---|--|
| 1C |    | <b>SMA Antenna (900MHz)<br/>Parallel &amp; Serial<br/>No Relays</b>                                  |
| 1D |    | <b>BNC Antenna (VHF/UHF)<br/>Parallel &amp; Serial<br/>No Relays</b>                                 |
| 2C |   | <b>SMA Antenna (900MHz)<br/>Parallel &amp; Serial<br/>4 Relays</b>                                   |
| 2D |  | <b>BNC Antenna (VHF/UHF)<br/>Parallel &amp; Serial<br/>4 Relays<br/>(Standard Configuration)</b>     |
| 3C |  | <b>SMA Antenna (900MHz)<br/>No Connectors<br/>1 Serial via Power Conn.<br/>(IP65 Configuration)</b>  |
| 3D |  | <b>BNC Antenna (VHF/UHF)<br/>No Connectors<br/>1 Serial via Power Conn.<br/>(IP65 Configuration)</b> |


## Section 2.

### PDT3000 - PAGING DATA TERMINAL USER INSTRUCTIONS

#### Receiving & Reading Messages

On receipt of a message the PDT will beep and an **unopened envelope**  will appear at the top of the LCD display. Press the green **Acknowledge** key (**A**) to display the message and the down key to scroll if the message is longer than one screen. You may use the left and right keys to scroll between different messages.

Once the message has been read the symbol will change to an **opened envelope** .

The PDT3000 will hold up to 40 messages in its standard message stack and up to 10 locked messages. Locked messages appear at the bottom left of the display thus .

To return to the main screen press the red **Mode (M)** key once.










#### Control Functions

To activate the control functions, press the red Mode (**M**) key once.

The following symbols will appear:



As the cursor is moved across the symbols a text description will appear below them.

|   |                                 |   |
|---|---------------------------------|---|
|  | <b>Exit</b>                     | Return to main screen   |
|  | <b>Delete Message</b>           | Delete the 1 message under which the message cursor is placed.  |
|  | <b>Delete All Read Messages</b> | Delete all messages that have been read (  . |
|  | <b>Delete All Messages</b>      | Delete all messages except locked messages.   |
|  | <b>Lock Message</b>             | Place the selected messages in the <b>Locked Messages</b> section. Note the same symbol is used to unlock locked messages.      |
|  | <b>Display Functions</b>        | Adjust <b>LCD Contrast</b> and <b>Backlight Brightness</b> . Use <b>Up/Down</b> to select and <b>Left/Right</b> keys to adjust  |
|  | <b>Print Message</b>            | Print the selected message. Note the same may be achieved by pressing the blue <b>Print (P)</b> key                             |
|  | <b>System Setup</b>             | Set various display, message, alerting and date/time functions. See below:  |

#### System Setup\*

Press the red **Mode (M)** key and move the cursor to the **System Setup** selection. Press **M** again and use **Up/Down** keys to select menu are. Press the **Right** key to select the Options Menu. The **Left** and **Right** keys are used to change the selection. The **A** key will return you to the previous screen and the **M** key will return you to the main screen.

#### Display Options

| <i>Function</i> | <i>Description</i> | <i>Settings</i> |
|-----------------|--------------------|-----------------|
|-----------------|--------------------|-----------------|

|                              |  |                                |
|------------------------------|--|--------------------------------|
| Backlight Time               | Set how long backlight is to remain on after a key press or message received (see next option)   | 5s/10s/30s/1m/5m/<br>Permanent |
| Backlight on Msg             | Turns the backlight on when message received.  | Y or N                         |
| Display Instantly            | Display message automatically when received  | Y or N                         |
| Display For                  | Sets how long the message will remain on display   | 5s/10s/30s/1m/5m/<br>Permanent |
| Display Lines                | No. of lines of text on display - Changes Text size  | 4 or 8                         |
| Scroll                       | Scroll text in message 1 or 3 lines at a time  | 1 or 3                         |
| Show [Name] Before Message   | Display the name assigned to the cap code/address at the beginning of the message (set via PDTP) | Y or N                         |
| Show Capcode Before Message  | Display Capcode at the beginning of the message.   | Y or N                         |
| Show [Number] Before Message | Display The number of the message 1-40 at the beginning of the message.                          | Y or N                         |
| Date Format                  | Display dates mm/dd/yy or dd/mm/yy   | US or International            |
| Time Format                  | 12 or 24 hour  | 12 or 24                       |
| Delete All Read Messages     | Turns the Delete All Read Messages option on and off to allow read messages only to be deleted.  | Y or N                         |
| Delete All                   | Turns the Delete All Messages option on and off to allow all messages to be deleted              | Y or N                         |

### Message/Alert Options

| <b>Function</b>                                  | <b>Description</b>   | <b>Settings</b>                |
|--|--|--------------------------------|
| Audible Alert                                    | Beeper sounds on receipt of message  | On or Off                      |
| Beep Continuously                                | Beeper sounds until message is acknowledged by pressing any key                                      | Y or N                         |
| Reminder Beep                                    | Reminder beep sounds until message is read   | On or Off                      |
| Initial Alert Time<br>5m                         | Time beeper sounds on initial receipt of message   | 1s/5s/10s/30s/1m/              |
| Reminder Interval                                | How often the reminder beep sounds<br>30s/1m/2m/3m/4m/5m   |                                |
| Reminder Period                                  | How long reminder beep continues for   | 5m/10m/15m/30m/<br>Forever     |
| Combine Duplicate Messages                       | If a message identical to a previous message is received display as separate message (N) or not (Y)  | Y or N                         |
| Relay Lockout Period<br>same capcode or message. | Period during which Relays will not respond to identical<br>1s/2s/3s/5s/10s/20s/<br>30s/1m/2m/3m/5m/ | commands on the<br>10m/20m/30m |
| Timestamp message                                | Place the date and time of receipt at end of message   | Y or N                         |

### Set Time & Date

Displays date and time in selected format - Use Up/Down keys to adjust, L/R to change selection

*\*Note: These settings may be set in PDT3P and locked out of the user interface.*

### Connecting the Paging Data Terminal

The PDT has four standard connectors on its back face plate plus, if fitted, an additional three optional connectors.

**Standard Connectors**

25 pin DB25 (P1) - Standard centronics parallel printer output.

9 pin DB9 (S1) - Standard RS232 serial port for programming and data I/O (pinout below.)

BNC connector is for connecting the external antenna.

DC Socket - Power in 11-32v AC or DC (recommended 12v DC).

**Optional Connectors**

An RJ11 4 pin socket (S2) provides a second serial port for multi I/O requirements.

2 RJ45 8 pin sockets (R1 & R2) provide connection for up to 4 relays. Either port may also be used as an alternative means to connect power input. (See pinout below)



|       |    | Pins     |           |          |          |           |          |          |         |    |
|-------|----|----------|-----------|----------|----------|-----------|----------|----------|---------|----|
|       |    | 1        | 2         | 3        | 4        | 5         | 6        | 7        | 8       | 9  |
| Ports | S1 | CD       | RXD       | TXD      | DTR      | GND       | DSR      | RTS      | CTS     | RI |
|       | S2 | Gnd      | -         | TXD      | RXD      |           |          |          |         |    |
|       | R1 | Rly 1 NC | Rly 1 Com | Rly 1 NO | Rly 2 NC | Rly 2 Com | Rly 2 NO | Alt +12v | Alt Gnd |    |
|       | R2 | Rly 3 NC | Rly 3 Com | Rly 3 NO | Rly 4 NC | Rly 4 Com | Rly 4 NO | Alt +12v | Alt Gnd |    |

**RJ11/45 Plugs**

Bottom view shows pins 1 and 8.

Front view shows pins 1 and 8.

**General Specifications**

|                       |  |
|-----------------------|--|
| Receiver type         | Synthesized FSK FM receiver  |
| Freq. bands available | 135-174, 450-470, 929-932 MHz (5MHz band splits), 25kHz band width   |
| Sensitivity           | Typically better than -118 dBm into 50 ohms                          |
| Decoding format       | Pocsag or Flex™  |
| Capcodes/Addresses    | Up to 1000 (Varies according to format selected and other functions) |
| LCD Display Format    | Blue/White Graphical 240x64, high brightness, LED backlight          |
| Operating Temp        | 0-70degC   |
| Display area          | 127x 34mm (5"x1.5") 8 or 4 lines text                                |
| Physical              | 227x75x42mm (~9x3x1.5") excluding bracket and antenna connector      |
| Power                 | 10-32 VDC or AC  |
| Consumption           | Up to 500mA on start up, 100-250 continuous                          |
| Relays                | Switch contact ratings 0.5A @125VAC, 1A @24VDC resistive load        |
| Approvals             | FCC CFR 47 Part 15, C-Tick   |

## **Section 3.**

### **Programming the PDT3000 using PDT3P**

#### **Contents**

- User Instructions For PDT3P
  - Contents
  - Introduction
  - PDT3P Version Information
  - Installing the software
  - Connecting the PDT3000
    - Required Items:
  - The Main PDT3P Window
    - Title Bar
    - Upload To Pager Button
    - Download From Pager Button
    - Check Pager Version Button
    - The Set Time & Upload Button (PDR Templates Only)
    - Menu Options
      - File - New Open, Save, Save As
      - File - Set Template
      - File - Set Template Set ID
      - File - Comport
      - File - Program Mode
      - File - Import Capcodes
      - File - Exit
      - ES - Read, Write
      - ES - Upgrade
      - ES - Set password
      - ES - Set Time & Write
      - ES - Upload a specific SES file
      - ES - Get OTAP Capcodes
  - The Capcodes Window
    - Adding Capcodes (Addresses)
    - Output Options
      - Serial 1
      - Serial 2
      - Print
      - Maildrop
      - Type
      - Level
      - Relays 1-4
      - Global Option Clear By Keys
      - Output to Transmitter
      - Output to Control Relay Board
      - Capcode Control Relay Board Settings Window
      - Capcode Alarm Options
      - Capcode Alarm Settings Window
  - The Printer Options Window
    - Output Options
      - Output to Printer
      - Output Time & Date
      - Output Capcode
      - Output Form Feed
      - Put Header on Separate Line
      - Printer Page Width
      - Output Lines Between Messages
      - Printer Type
      - Number of copies to print
      - Printer



- The Serial Options Window
  - Serial
    - Serial Format
    - Header String
    - Footer String
  - Transmitter
    - Type
    - Retransmit all capcodes
    - Invert Transmitting Data
    - Stop receiving during retransmitting
    - Key up Delay
    - Transmit Input Response
    - Output Response on Serial
    - Setup Response Messages
    - Response Input Options Window
    - Response Serial Input Options:
    - Response for Logical Level Input Options:
- Message Relay Options Window
  - Adding Text to Control Relays
  - Control Relay Options
    - Relays 1-4
    - Global Option Clear By Keys
    - Only match at beginning
    - Output to Control Relay Board Options
    - Message Control Relay Board Options Window
- The Alert Options Window (PDR/PSR Only)
- The Frequency & Notes Window
  - Frequency
  - Invert Decoder Bit Steam
  - Set Decoder Baud Rate
  - Allow Paging Network to set time
  - Receiver type
  - Allow decoding errors
  - Remove unreadable characters
  - Remove leading characters
  - LCD contrast base
  - Notes
- OTAP Options Window
  - Enable Over The Air Programming Capcode Option
  - OTAP Pager ID
  - Capcodes Levels
- The PDT UI Settings Window
  - Use the following settings
  - Settings
- PDT3000 Peripherals
  - Port Pin-out
  - Serial Port2 to PC Cable
  - Alarm Inputs
- [PDT3000 ROM Limitation](#)

## **Introduction**

Paging Data Terminal 3000 Programmer (PDT3P) software is used to set up configurations for Paging Data Terminal 3000 (PDT3000).

There are 3 components to programming a PDT3000; this software (PDT3P), the templates that are loaded by PDT3P when it is first started and the firmware contained in the hardware.

It is very important to understand the difference between these three components.

Templates determine the type of product and model of product that is to be programmed. When PDT3P is first loaded onto a PC a template ID key is requested. This key determines which templates will be visible. There are about 30 templates however you will only receive a key for the templates that you require. When PDT3P is started subsequently a template window will pop up to allow you to select the correct template. If the key you were originally provided was for a single template then this window will not appear and PDT3P will automatically load that template. Additional templates can be activated by changing the template ID key. Note that it is possible to program a unit with an incorrect template and this will cause the product to act in an incorrect manner. This will not, however, damage the unit. The current template loaded will always appear in the title bar at the top of PDT3P. When a download from a unit is carried out, PDT3P will automatically load the current template contained in that unit.

PDT3P is used to set the programmable configuration parameters of the unit such as frequency, cap codes, I/O settings etc. The user interface and the functions visible in PDT3P will change according to which template is loaded.

The firmware contained in the PDT3000 determines its basic operational capabilities. There is only one version of firmware (rom file) available for each of three different types of product. All other differences between different models of the same product are set using the templates.

## **PDT3P Version Information**

PDT3P version 6.0 or over can only be used for the PDT3000 with the M16/62PE(M30626FHPFP) type of the processor and does not support the M16/62P(M30624FGPFP) and M16/62A(M30624FGAFP) processor types used on the PDT3000.

If the PDT3000 has M16/62PE(M30626FHPFP) processor type on board but with an old version firmware, the steps below must be followed to upgrade:

1. "Download from pager" to read the pager configure first.
2. "Upload to pager" to write the pager configure into the new ROM area for version 6.0 or over ROM.
3. "Upgrade" the "pdt\_flash\_PEV6.0.rom" to PDT from the "ES | Upgrade | flash" folder.
4. Then "Upgrade" the "pdtVx.x.rom" to PDT from the "ES | Upgrade" menu.

## **Installing the PDT3P software**

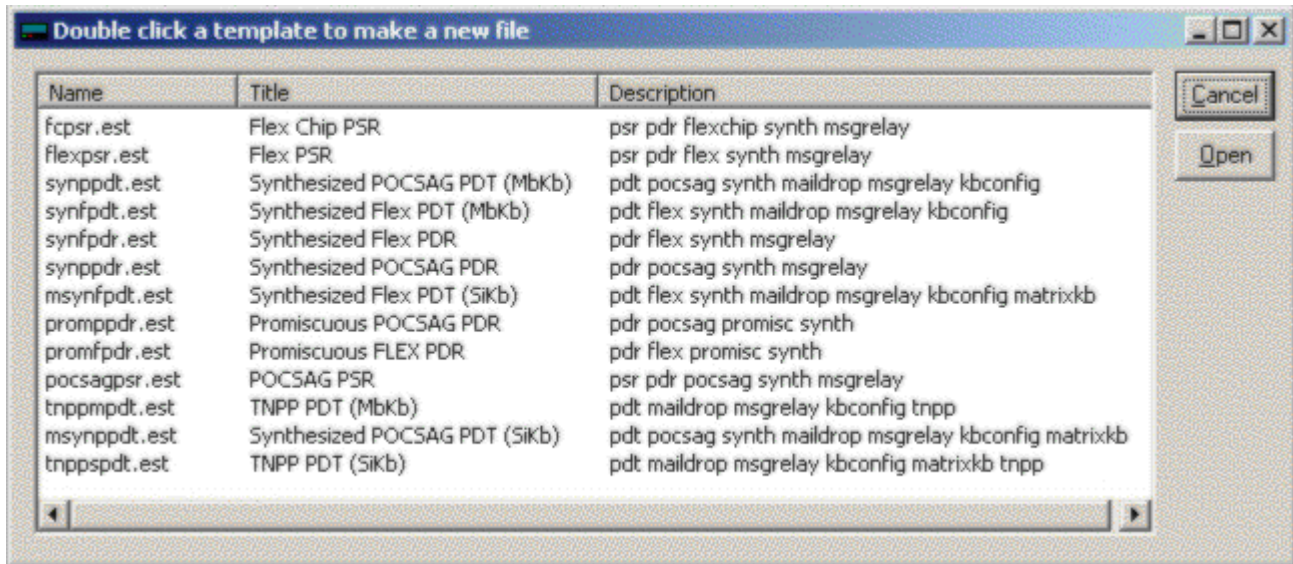
PDT3P requires a PC running Windows 2000/NT/XP and at least 32MB RAM.

1. Run the installer by double clicking on PDT3Px.xx.exe.
2. Follow the instructions in the installer wizard.
3. Once installed run PDT3P by clicking on the shortcut in the Start menu or selecting PDT3P.exe from the folder in which it is installed.
4. You will be prompted to Enter Set ID . The key will have been provided to you or may be contained on the CD in a notepad file called PDT3P Key.txt.
5. Hit OK.
6. If your key permits access to more than one Template then a selection of templates will appear in a new window. If your key only allows access to one template then PDT3P will start automatically in that template.

## Connecting the PDT3000

### Required Items:

- 1 x Serial Null Modem DB9 female-to-female cable.
  - 1 x 12v DC Power supply rated at 0.5 amps (or greater) with 2.5mm center positive plug attached.
1. Plug the serial cable into the PC (COM1 is the default port)
  2. Open PDT3P
  3. Select the template appropriate to the PDT3000 that you are programming. Note: if you only have a key for one template then PDT3P will open automatically with that template active.



4. Plug the PDT3000 into a 12-volt supply and plug in the DB9 plug into the back of the PDT3000.

{PDT3P does not read or write to the PDT3000 unless instructed to do so. It is recommended that, unless you need to change the basic template of the PDT3000, you download the program in the unit first. Click on the "Download From Pager" button. This will download the current settings from the PDT3000. It will also automatically select the template that is currently loaded in the PDT3000. If you need to change the basic template of the PDT3000 do not do a download. Just select your template, change the settings and press "Upload To Pager" (Please consult) }

## The Main PDT3P Window



### Title Bar

The blue Title Bar at the top shows the current Template selected.

### Upload To Pager Button

This button is used to upload new settings to the PDT3000. This will overwrite any settings currently in the PDT3000.

### Download From Pager Button

This button is used to download the current settings from the PDT3000. This will overwrite any settings currently in PDT3P and will change the template in PDT3P to that programmed in the PDT3000 if different from that showing.

### Check Pager Version Button

This button is used to read the software and hardware versions from the PDT3000.

### The Set Time & Upload Button (PDR Templates Only)

This button is used to set the time and upload the new settings to the PDR2000. Time is set on the PDT in the PDT User Interface or by selecting the set time and write function in the ES menu.

## **Menu Options**

### **File - New Open, Save, Save As**

Open, save or create new configuration files which are saved as .ses files.

### **File - Set Template**

Change the current template. (This option is only available if you are authorized for more than 1 template option.)

### **File - Set Template Set ID**

Change the key that authorizes the templates available. (This option is only available if you are authorized for more than 1 template option.)

### **File - Comport**

Change the comport to which the PDT3000 is connected.

### **File - Program Mode**

Local ---- Program a unit which is directly connected to a PC serial port

Remote -- Program a unit when it is connecting to a PC serial port through a virtual serial connection(for example: serial---ethernet---serial) and the unit must be setup to be controlled remotely first. Some functions like "Set time" and "Get OTAP Capcode" can not work in this mode.

### **File - Import Capcodes**

Provides the capability to load a large number of cap codes from a .csv file. The csv file format should follow the sample files in PDT3P/data folder.

### **File - Exit**

Finish the program and exit.

### **ES - Read, Write**

Read and write configuration settings to and from the PDT3000. These are the same as the Upload and Download Buttons on the main screen (see below)

### **ES - Upgrade**

Use this option to upgrade the Flash ROM in the PDT3000. Only use this option if instructed to do so by a service representative. The latest rom file will always have the same version number as the PDT3P version currently loaded.

### **ES - Set password**

Set up a password to prevent an unauthorized person from reading or writing program from or into the PDT3000

### **ES - Set Time & Write**

Set the time and write configuration settings to the PDT/PDR. This is the same as the Set Time and Upload button on the main screen (see below)

## ES - Upload a specific SES file

Upload the configuration in the SES file to ES without changing anything in the file.

## ES - Get OTAP Capcodes

Read Over The Air Programming Capcodes from the PDT3000. The OTAP capcodes which the unit had can be displayed on the OTAP option window if this reading operation was successful.

## The Capcodes Window

This window is used to set the cap codes (addresses) and the output settings for each cap code.

| Capcode | Range | Name          | Type  | Serial1 | Serial2 |
|---------|-------|---------------|-------|---------|---------|
| 1       | 0     | Network lost  | Alpha | 0       | 0       |
| 2       | 0     | Network Fo... | Alpha | 0       | 0       |
| 1234567 | 10    | Test CAP      | Alpha | 1       | 0       |
| 999132  | 0     | Test Number   | Alpha | 1       | 0       |

Capcode and Options

Capcode: 1234567    OK

Range: 10    New

Name: Test CAP    Delete

Output on Serial 1

Output on Serial 2    Alpha    Capcode Type

Output on Printer     Maildrop

Output on Transmitter

Relay    Action    Time(ms)    Global option: Clear by Keys

1:    No Action    0   

2:    No Action    0   

3:    No Action    0   

4:    No Action    0   

Transmitter options

Capcode: 999132    Level: A

Output to control msg relay board options

32    Total of Relays    Select relay action

Capcode alarm options

Set capcode alarm    Capcode alarm

### Adding Capcodes (Addresses)

1. Enter a new CAP code by clicking on the "New" Button.
2. Enter the new CAP code in the "Capcode" box and the name in the name box below. i.e., 1234567 TEST CAP. The name is just an identifier and is not compulsory.
3. If a range of cap codes is required then select the first cap code and the range that you wish to monitor e.g entering cap code 1000000 and a range of 50 will monitor cap codes 1000000 to 1000050.
4. Set each of the desired outputs individually for each cap code by highlighting the cap code in the Left hand window and then selecting the outputs on the Right.

## **Output Options**

### **Serial 1**

The message received on this address/cap code will output on serial 1 - Set serial options (global) in the Serial Options window. For some serial formats, such as: "Control Input", "GPS Input", "IPage Input", "TNPP Output", "TNPP Input", "Output to Relay Board", "Message Direct to Relay Board" and "Message Manager", it is default to input or output all data through the serial and does not need to tick this option.

### **Serial 2**

The message received on this address/cap code will output on serial 2 - Set serial options (global) in the Serial Options window. For some serial formats, such as: "Control Input", "GPS Input", "IPage Input", "TNPP Output", "TNPP Input", "Output to Relay Board", "Message Direct to Relay Board" and "Message Manager", it is default to input or output all data through the serial and does not need to tick this option.

### **Print**

The message received on this address/cap code will be output on the Printer port (parallel printer) or Serial 1 (serial printers). Set printer options (global) in the Printer Options window.

### **Maildrop**

Sets this address as a maildrop capcode. Messages will be stored and overwritten automatically in the Maildrop area of the display and will not be stored in the normal messages area.

### **Type**

This option allows the type of message received to be set. In Flex Templates the options are Alpha, , Alpha Warning and Alpha Watch. In pocsag the tone and numeric options are added. Note: Alpha Warning and Alpha Watch are special settings that allow different initial alerts to be set for messages received on that capcode.

### **Level**

Sets the pocsag levels for the capcode(ONLY in POCSAG Templates)

### **Relays 1-4**

Sets the action that will occur on each of the 4 on board relays on receipt of any message on that capcode. Relays are Normally Open. Options are

1. Close Relay
2. Open Relay
3. Momentary Close Relay for a period (in msecs)

### **Global Option Clear By Keys**

If selected any relay action initiated on that selected relay, by any capcode, will be cancelled (reset to normal condition) by hitting any key.

### **Output to Transmitter**

When a transmitter is connected this sets the output capcode and pocsag level to which the message received on this address will be transmitted in pocsag.

### **Output to Control Relay Board**

This sets the actions of any one or more of the relays contained on the RCM2000 module. Each RCM2000 adds 32 additional relays and may be daisy chained. (Note: This only works when one of the serial output format is selected as "Output to Relay Board").

Select the "Total of Relays" which are determined by the number of the chained RCM2000 modules.

Click the "Select relay action" Button to start up the Capcode Control Relay Board Settings Window.

## Capcode Control Relay Board Settings Window

| Relay | Action     | Time  |
|-------|------------|-------|
| 1     | Close      | 0     |
| 2     | No Action  | 0     |
| 3     | No Action  | 0     |
| 4     | No Action  | 0     |
| 5     | No Action  | 0     |
| 6     | No Action  | 0     |
| 7     | Momenta... | 30000 |
| 8     | No Action  | 0     |
| 9     | No Action  | 0     |
| 10    | Close      | 0     |
| 11    | No Action  | 0     |
| 12    | No Action  | 0     |
| 13    | No Action  | 0     |
| 14    | No Action  | 0     |
| 15    | No Action  | 0     |
| 16    | Momenta... | 60000 |
| 17    | No Action  | 0     |
| 18    | No Action  | 0     |
| 19    | Open       | 0     |
| 20    | No Action  | 0     |
| 21    | No Action  | 0     |
| 22    | Close      | 0     |
| 23    | No Action  | 0     |
| 24    | No Action  | 0     |
| 25    | Clear All  | 0     |
| 26    | No Action  | 0     |
| 27    | No Action  | 0     |
| 28    | No Action  | 0     |
| 29    | No Action  | 0     |
| 30    | No Action  | 0     |
| 31    | No Action  | 0     |
| 32    | No Action  | 0     |

Relay board options

OK

Reset

Capcode:  
1234567

Relay:  
16

Relay Action:  
Momentary Close

Momentary Close Time (ms)  
60000

Click any number of relays at the relay list table in this Window, then select the action in the "Relay Action" and "Momentary Close Time" box. After finishing all settings, click the "OK" Button to save the settings and return to the last window.

Click the "Reset" button to clear the relay list table and give up the current settings.

### Capcode Alarm Options

This sets the alarm actions of any capcode in the Capcodes Window. When a capcode is not received within a certain time period, it will trigger an alarm which can be the relays or the buzzer.



## Capcode Alarm Settings Window

| Relay | Action    | Time(ms) | Global option:<br>Clear by Keys |
|-------|-----------|----------|---------------------------------|
| 1:    | Close     | 0        | <input type="checkbox"/>        |
| 2:    | No Action | 0        | <input type="checkbox"/>        |
| 3:    | No Action | 0        | <input type="checkbox"/>        |
| 4:    | No Action | 0        | <input type="checkbox"/>        |

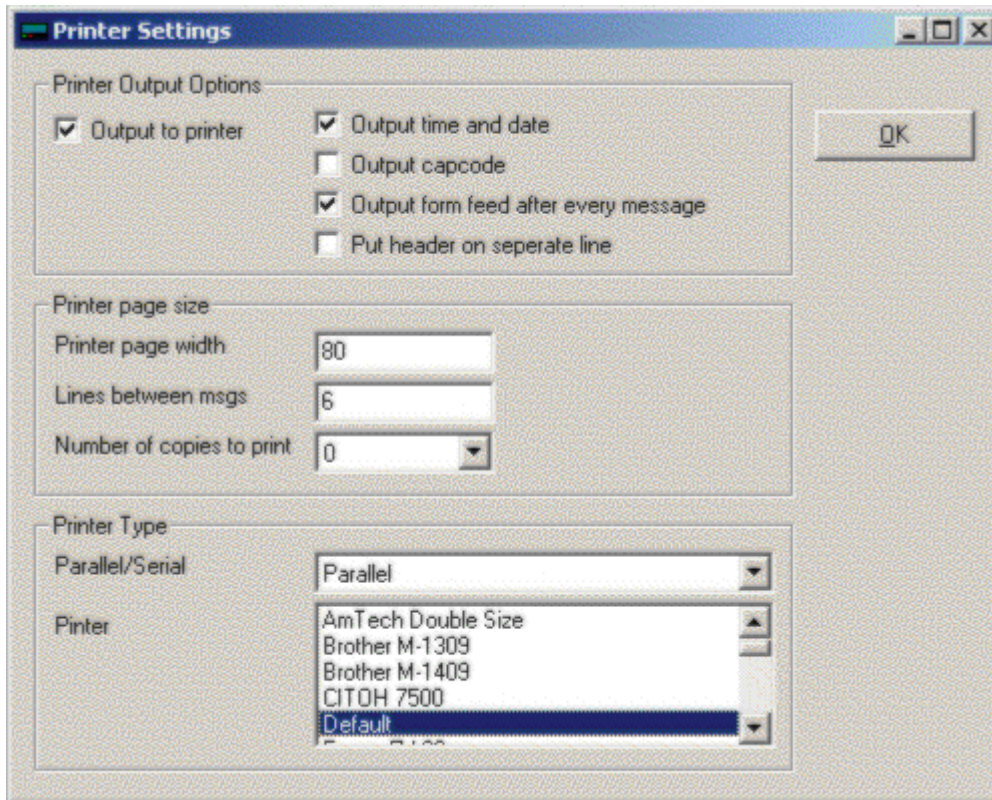
Input a certain time period in the "Alarm goes off time(ms)" text-box. After this period time(ms), if the unit does not receive the capcode, it will trigger alarms.

Click the "Use audible alert" check-box, the unit will trigger the buzzer alarm.

Sets the action that will occur on each of the 4 on board relays when any message on that capcode is not received within above setting time.

The buzzer and relays can be triggered at the same time.

## The Printer Options Window



### Output Options

#### Output to Printer

Turns printing on (global option). (Note printing still needs to be set for each individual capcode in the Capcodes window).

#### Output Time & Date

Outputs Time & Date to Printer.

#### Output Capcode

Outputs Capcode to Printer.

#### Output Form Feed

Outputs a Form Feed to Printer.

#### Put Header on Separate Line

Puts the Header (Date/Time, Capcode) on the first line followed by the message after a line feed.

#### Printer Page Width

Set the width of the paper. It may refer number of characters per line if a printer is set up as double size font.

#### Output Lines Between Messages

Outputs a selectable number of line feeds following each message.

#### Printer Type

Set printer type as parallel or serial.

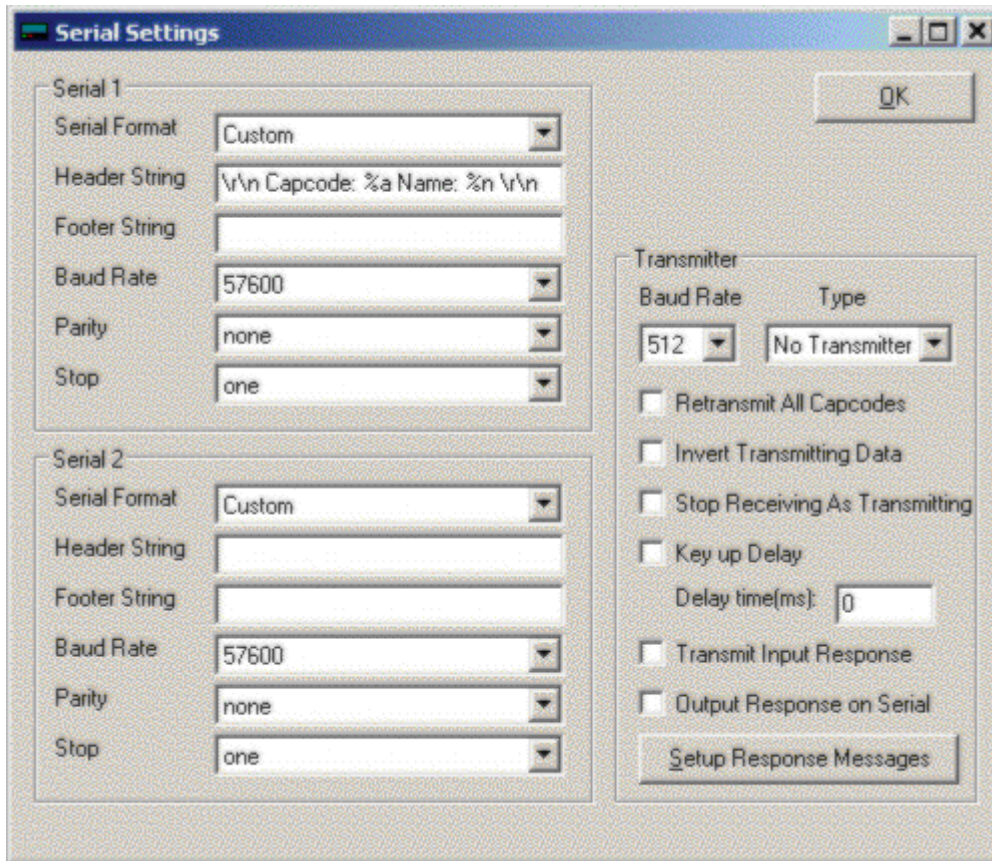
#### Number of copies to print

Output a number of copies to printer

#### Printer

Contains a number of common printer drivers.

## The Serial Options Window



### Serial

Set up serial output or input options

#### Serial Format

Contains a number of standard settings for serial options to commonly used equipment and software applications. For some serial formats, such as: "Control Input", "GPS Input", "IPage Input", "TNPP Output", "TNPP Input", "Output to Relay Board", "Message Direct to Relay Board" and "Message Manager", it is default to input or output all data through the serial port.

#### Header String

Sets the header string at the beginning of the serial output mainly for the "Custom" format.

#### Footer String

Sets the footer string at the end of the serial output mainly for the "Custom" format.

## Header & Footer String Standard Settings

Some standard settings for header and footer strings are:

\r\n ----- new line

%n or %N ----- name of address

%a ----- address in decimal

%c ----- address in 7-digit decimal (If address is larger than 7-digit, it will be cut to 7-digit. If it is less than 7 digits, zero will be padded)

%A ----- address in hexadecimal

%p ----- protocol

%m ----- message type

%b ----- baud rate in 4-digit decimal, i.e. 0512

%B ----- baud rate in hexadecimal

%l ----- numeric level, i.e. 0-3

%L ----- alpha level, i.e. A-D

%t ----- 24 hour with second

%T ----- 24 hour time

%s ----- 12 hour with second

%h ----- 12 hour time

%d ----- day

%M ----- month

%y ----- year

%Y ----- day/month/year

%U ----- month/day/year

%l ----- year/month/day

For example: \r\n Name:%n Capcode:%a Protocol:%p Time:%T Date:%Y \r\n

## **Transmitter**

Select and set up a transmitter

### **Type**

Salcom 11-72 transmitter connected to serial port one

Tait 800 connected to the DB25 port(TTL)

Maxon SD-125 radio connected to the DB25 port(TTL)

Apollo TX-125 transceiver connected to the DB25 port(TTL)

### **Retransmit all capcodes**

Output all capcodes and messages to the transmitter

### **Invert Transmitting Data**

Output inverted bit stream data to the transmitter

### **Stop receiving during retransmitting**

The receiver will stop receiving while it is transmitting. This must be set if retransmitting on the same frequency.

### **Key up Delay**

The unit will hold data for a period of time(ms) before transmitting it. This will stop receiving as well before and after transmitting if set above "Stop receiving during retransmitting"

### **Transmit Input Response**

Transmit data from serial control input or logical level input pins (DB25 TTL) on the selected transmitter.

### **Output Response on Serial**

Output the data from serial control inputs and logical level input pins to the other serial port when one serial format is "Control Input" and the other serial format is "Control Output", or "TNPP Output", or "Custom"

### **Setup Response Messages**

Set messages for serial control inputs and logical level input pins

## Response Input Options Window

This window is used to set the messages and transmit them with the specific capcodes.

| Response Serial Input Options |                       |         |  |  |        |  |  |
|-------------------------------|-----------------------|---------|--|--|--------|--|--|
| Catch Input Message Text      |                       |         |  |  | OK     |  |  |
| Output Message Text           |                       |         |  |  | New    |  |  |
| Output Message Capcode        |                       | 666666  |  |  | Delete |  |  |
| Input Message Text            | Output Message Text   | Capcode |  |  |        |  |  |
| fuel                          | Fuel level is too low | 1234567 |  |  |        |  |  |
| pump                          | Water pump is running | 666666  |  |  |        |  |  |

| Response for Logical Level Input Options |                    |                   |                     |                     |                    |                       |                                     |
|--|--------------------|-------------------|---------------------|---------------------|--------------------|-----------------------|-------------------------------------|
| Input Pins                               | Individual Capcode | Debounce Time(ms) | Retrigger Delay(ms) | Repeat Interval(ms) | State High Message | State Low Message     | Normal High                         |
| <input checked="" type="checkbox"/> 1    | 1234567            | 1000              | 0                   | 0                   | High1              | Low1                  | <input checked="" type="checkbox"/> |
| <input checked="" type="checkbox"/> 2    | 1234567            | 2000              | 0                   | 0                   | High2              | Low2                  | <input type="checkbox"/>            |
| <input checked="" type="checkbox"/> 3    | 1234567            | 1000              | 0                   | 0                   | High3              | Low3                  | <input checked="" type="checkbox"/> |
| <input checked="" type="checkbox"/> 4    | 1234567            | 1000              | 0                   | 0                   | High4              | Low4                  | <input type="checkbox"/>            |
| <input type="checkbox"/> 5               | 1234567            | 0                 | 0                   | 0                   | High               | Low                   | <input type="checkbox"/>            |
| <input type="checkbox"/> 6               | 1234567            | 0                 | 0                   | 0                   | High               | Low                   | <input type="checkbox"/>            |
| <input type="checkbox"/> 7               | 1234567            | 0                 | 0                   | 0                   | High               | Low                   | <input type="checkbox"/>            |
| <input type="checkbox"/> 8               | 1234567            | 0                 | 0                   | 0                   | High               | Low                   | <input type="checkbox"/>            |
| <input checked="" type="checkbox"/> 9    | 12345              | 100               | 5000                | 20000               | High9              | Low9 this is a long r | <input checked="" type="checkbox"/> |
| <input checked="" type="checkbox"/> 10   | 1234               | 1000              | 0                   | 0                   | High10             |                       | <input type="checkbox"/>            |
| <input checked="" type="checkbox"/> 11   | 123                | 2000              | 0                   | 0                   | High11             | Low11                 | <input checked="" type="checkbox"/> |
| <input checked="" type="checkbox"/> 12   | 12                 | 3000              | 10000               | 20000               | High12             | Low12                 | <input type="checkbox"/>            |

### Response Serial Input Options:

Set the input messages which correspond to the output messages with the specific capcodes. A finished sign for input messages should be a line feed, or a carry return.

If the "Catch Input Message Text" is '\*' and the "Output Message Text" is '\*', this function will output all input messages except the finished signs.

**Response for Logical Level Input Options:**

Set output messages for input pin states. The messages will be transmitted or output on serial when the input pin state changes.

Input Pins: set pins whose states will be monitored.

Capcode: a different capcode can be assigned per input.

Debounce Time: time that contact must be triggered for before the alarm signal is generated.

Retrigger Delay: a period during which a new alarm will not be triggered again after the first trigger if multiple triggers occur. This only applies to non normal alarm trigger. Zero will disable this function.

Repeat Interval: this is the time interval after which if the state of contact has not reverted to its normal state then the message will be retransmitted and will continue to be retransmitted on this interval until the alarm reverts to normal. This only applies to non normal alarm trigger. Zero will disable this function.

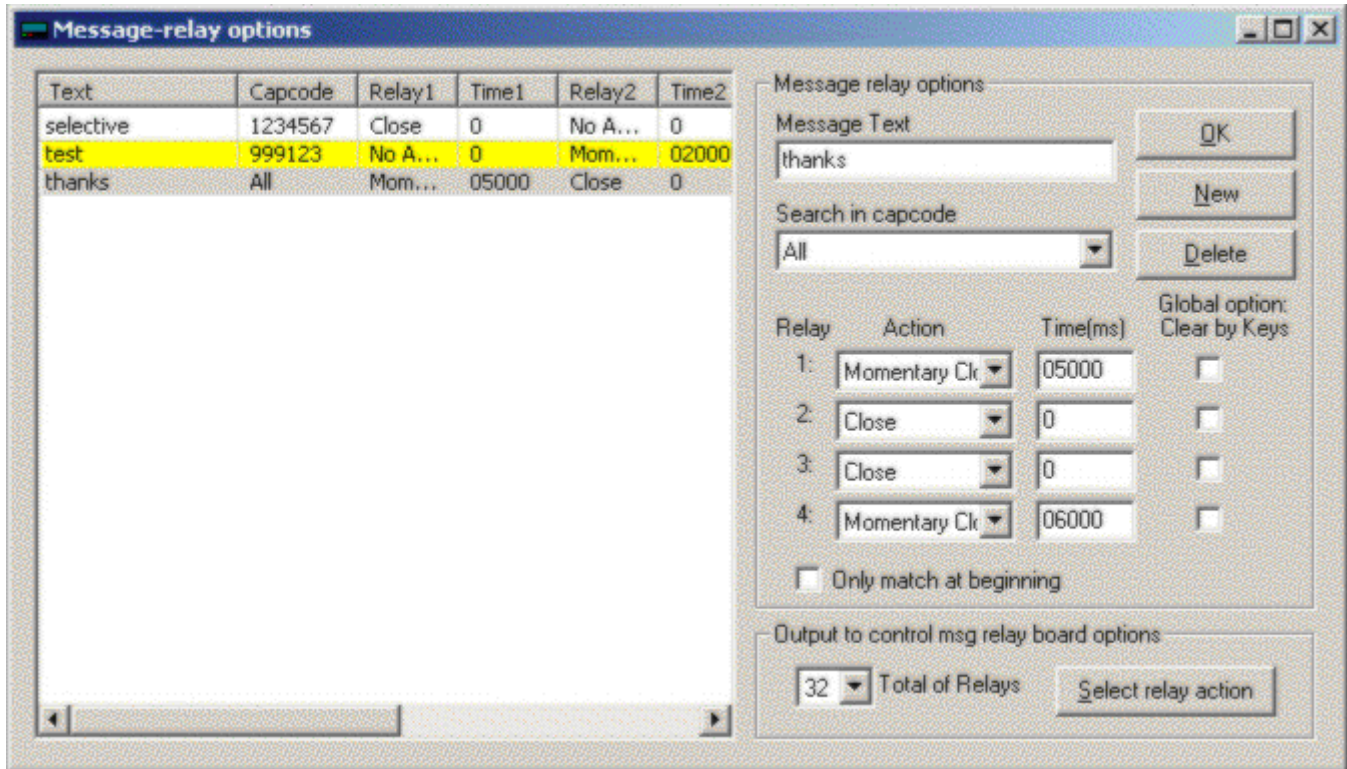
State High Message: a message will be transmitted or output on the serial when the pin state high occurs. If no message is entered then no alarm transmission will occur on the change to high state.

State Low Message: a message will be transmitted or output on the serial when the pin state low occurs. If no message is entered then no alarm transmission will occur on the change to low state.

Normal High: Set normal or start pin state as high. If not selected then the normal state is low.

## Message Relay Options Window

This window is used to set global relay control actions according to the text contained in a message received on the selected capcodes. Up to 128 actions may be set for the PDR and PSR and 80 for the PDT. Sets the action that will occur on each of the 4 on board relays and the relays contained on the RCM2000 module (if connected) on receipt of matched text in the message on a specified capcode.



### Adding Text to Control Relays

1. Click on the "New" Button to create a list in the message relay options table.
2. Enter the new text to be matched in the specified message in the "Message Text" box.
3. Select the specified capcode whose messages will be searched to match the text in the "Message Text" box.
4. Set the action that will occur on each of the four on board relay and the relays contained on the RCM2000 relay board.

### Control Relay Options

#### Relays 1-4

Sets the action that will occur on each of the 4 on board relays on receipt of any message on that capcode. Relays are Normally Open. Options are

1. Close Relay
2. Open Relay
3. Momentary Close Relay for a period (in msecs)
4. Clear by Keys - resets the relay to open on pressing any key.

#### Global Option Clear By Keys

If selected, any relay action initiated by any Message Text will be cancelled (reset to normal condition) by hitting any key.

#### Only match at beginning

If selected only text at the beginning of the message will be matched with the target text



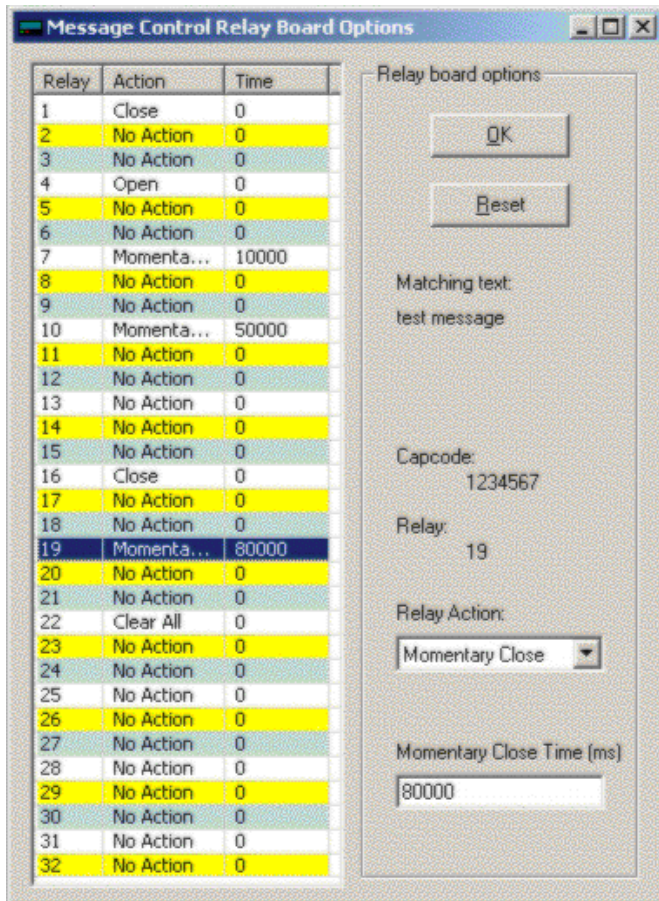
## Output to Control Relay Board Options

This sets the actions of any one or more of the relays contained on the RCM2000 module. Each RCM2000 adds 32 additional relays and may be daisy chained. (Note: The RCM2000 connects to a serial port and the serial output format must be set to "Output to Relay Board").

Select the "Total of Relays" which is determined by the number of chained RCM2000 modules connected (x32).

Click the "Select relay action" Button to start up the Message Control Relay Board Options Window.

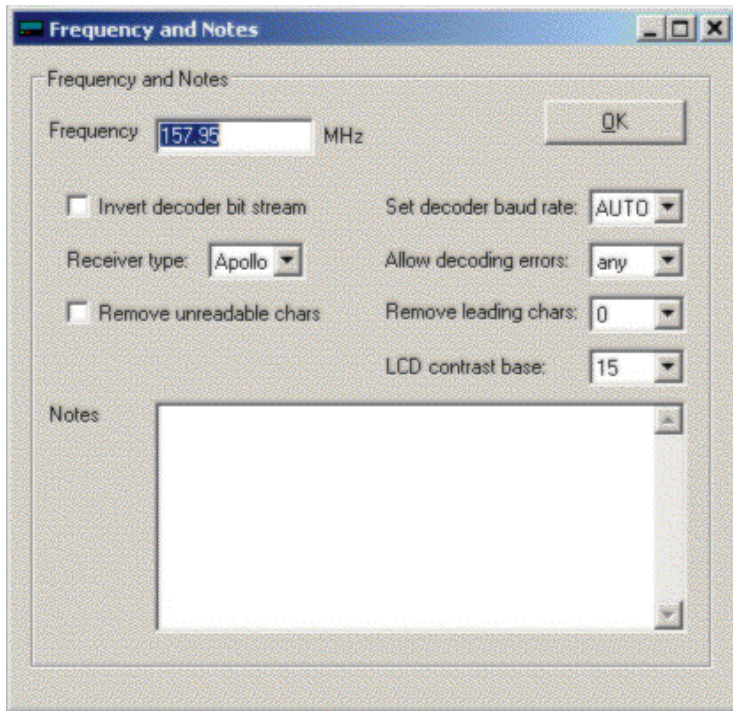
## Message Control Relay Board Options Window



Click any number of relays at the relay list table in this Window, then select the action in the "Relay Action" and "Momentary Close Time" box. After finishing all settings, click the "OK" Button to save the settings and return to the last window.

Click the "Reset" button to clear the relay list table and give up the current settings.

## The Frequency & Notes Window



### **Frequency**

Set the synthesized frequency. Note: the frequency must be within the frequency band of the receiver supplied. This will normally be noted in the Notes section.

### **Invert Decoder Bit Steam**

Use this if your pager is set to data inverted. Consult your carrier before using this option.

### **Set Decoder Baud Rate**

Use to set the baud rate (pocsag only). This may be set to auto although better performance may be experienced if all pagers are on one baud rate and the unit is set to that baud rate.

### **Allow Paging Network to set time**

Allow Flex Paging Network to set the unit time by air (Flex only).

### **Receiver type**

Unless otherwise advise use only the RCM option. The RCM receiver is almost exclusively used on the PDT3000.

### **Allow decoding errors**

Selects the number of character errors that the receiver will accept before it discards (ignores) the message.

### **Remove unreadable characters**

Add a filter to remove some control(unreadable) characters in a message before it outputs the message.

### **Remove leading characters**

Removes the selected number of leading characters in a message before it outputs the message or applies any message filters. This is used to ignore special characters used by some systems for special decoding options.

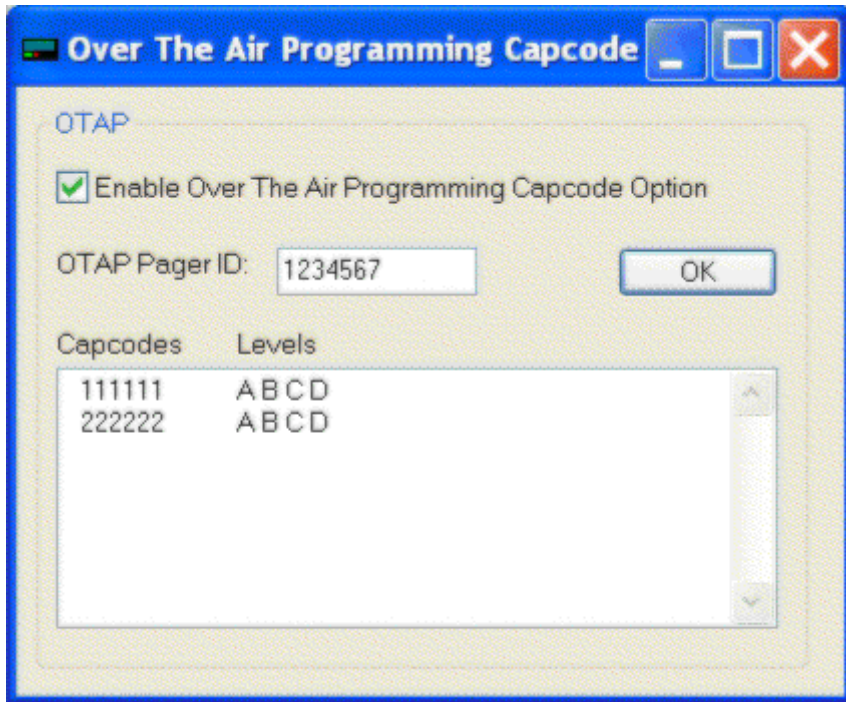
### **LCD contrast base**

This option sets the base contrast value for the LCD display. Recommended setting: 15~30.

### **Notes**

An area to make general notes on this unit. This information is stored on the PDT so that it can be read whenever the unit is programmed.

## OTAP Options Window



Over The Air Programming capcode options give the PDT3000 ability to add or to delete capcodes for receive and display only (consider other settings e.g. print, relay etc).

### **Enable Over The Air Programming Capcode Option**

Set the PDT3000 to have Over The Air Programming capcode function which can add or delete capcodes. This function can decrypt OTAP messages which are created by the "OTAP Encrytion" program in the PDT3P folder.

### **OTAP Pager ID**

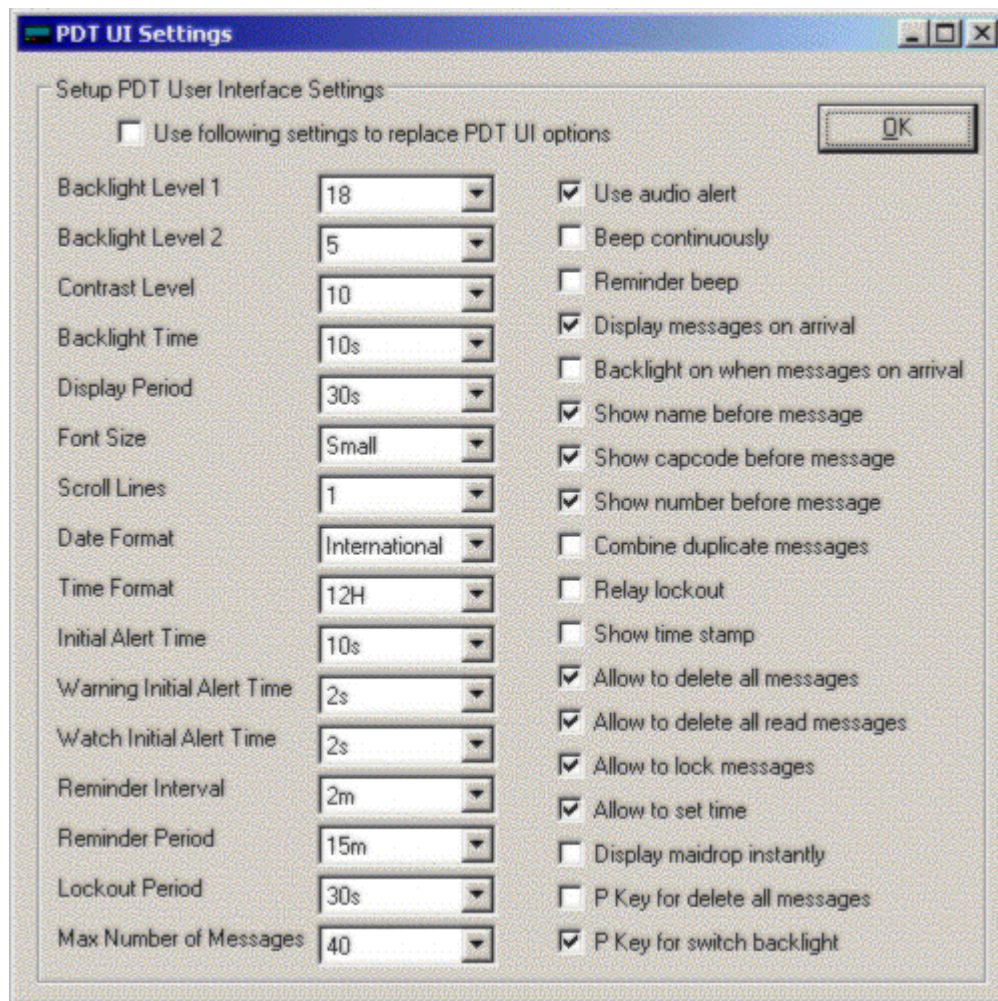
Set the PDT3000 to have a unique 7-digit number id to decode the OTAP message. The pager only processes the OTAP message when it contains its id or broadcast id or its group id. The 1200000 is broadcast id which can program all units. The first 3-digit following by 5 zero is a group id which can program all starting with that 3 digits. For example: 1230000 would program all starting with 123 and following any 5 digits like 1234567.

### **Capcodes Levels**

This window is displays the OTAP capcode and levels after selecting "Get OTAP Capcode" from the ES tool bar (you can not edit the contents in this window)

## The PDT UI Settings Window

This window is used to set standard User Interface settings that are normally set by the user via the PDT3000 display.



### Use the following settings

If this box is checked the settings will be settable only from PDT3P and not from the PDT3000 user interface. (Except Backlight and contrast levels and the date and time).

### Settings

| Function          | Description  | Settings                   |
|-------------------|--|----------------------------|
| Backlight Level 1 | Sets the initial display backlight level 1   | 1-20                       |
| Backlight Level 2 | Sets the initial display backlight level 2   | 1-20                       |
| Contrast Level    | Sets the initial display contrast level  | 1-20                       |
| Backlight Time    | Set how long backlight is to remain on after key press   | 5s/10s/30s/1m/5m/Permanent |
| Display Period    | Set the amount of time the message will display for before reverting to main screen.           | 5s/10s/30s/1m/5m/Permanent |
| Font Size         | Sets the size of the message font on the display. Small, medium, large                         |                            |
| Scroll Lines      | Sets the number of lines to scroll when the down button is pushed when a message is displayed. | 1,3                        |
| Date Format       | Display dates mm/dd/yy or dd/mm/yy   | US or International        |
| Time Format       | 12 or 24 hour  | 12 or 24                   |

| Function                          | Description   | Settings  |
|-----------------------------------|---|---|
| Initial Alert Time                | How long beeper sounds on initial receipt of message  | 1s/5s/10s/30s/1m/ 5m                                  |
| Warning Initial Alert Time        | How long beeper sounds on initial receipt of a message on a Warning capcode.  | 0, 1s,2s,3s,4s,5s, 10s,30s,60s,300s                   |
| Watch Initial Alert Time          | How long beeper sounds on initial receipt of a message on a Watch capcode.  | 0, 1s,2s,3s,4s,5s, 10s,30s,60s,300s                   |
| Reminder Interval                 | How often the reminder beep sounds - every  | 30s/1m/2m/3m/4m/5m                                    |
| Reminder Period                   | How long reminder beep continues for  | 5m/10m/15m/30m/Forever                                |
| Lockout period                    | The period during which no additional activation of relays shall occur given the same activation instruction.       | 0, 1s,2s,3s,5s, 10s,20s,30s, 1m,2m,3m,5m, 10m,20m,30m |
| Max Number of Messages            | The Max number of messages can be displayed on PDT screen.  | 1,2,3,5,10,15,20,25,30,35,40                          |
| Audible Alert                     | Beeper sounds on receipt of message   | On or Off   |
| Beep Continuously                 | Beeper sounds until message is acknowledged by pressing any key   | On or Off   |
| Reminder Beep                     | Reminder beep sounds until message is read  | On or Off   |
| Display Messages on Arrival       | Display message automatically when received   | On or Off   |
| Backlight On When Messages Arrive | Turn the backlight on on receipt of a message   | On or Off   |
| Show [Name] Before Message        | Display the name assigned to the cap code/address at the beginning of the message (set via PDT3P)                   | On or Off   |
| Show [Capcode] Before Message     | Display Capcode at the beginning of the message.  | On or Off   |
| Show [Number] Before Message      | Display the slot number of the message at the beginning of the message (1-40)                                       | On or Off   |
| Combine Duplicate Messages        | If set to on & a message identical to a previous message is received it will not be displayed as a separate message | On or Off   |
| Display Lines                     | Set no of lines of text on display - Changes Text size  | On or Off   |
| Relay Lockout                     | Turns the relay lockout function on or off - See Lockout period above   | On or Off   |
| Show Timestamp                    | Place the date and time of receipt at end of message  | On or Off   |
| Allow to delete all messages      | Turns the delete all function on  | On or Off   |
| Allow to delete all Read messages | Turns the delete all read messages function on.   | On or Off   |
| Allow to lock messages            | Allows user to lock messages  | On or Off   |
| Allow to set time                 | Allows user to set time   | On or Off   |
| Display maildrop instantly        | Displays maildrop messages instantly  | On or Off   |
| P key to delete all messages      | Changes P key from print to purge all - same as Delete All  | On or Off   |
| P key to switch backlight levels  | Changes P key from print to switch two backlight levels   | On or Off   |

## PDT3000 Peripherals

This part describes how to connect a PDT3000 to supported peripherals.

### Port Pin-out

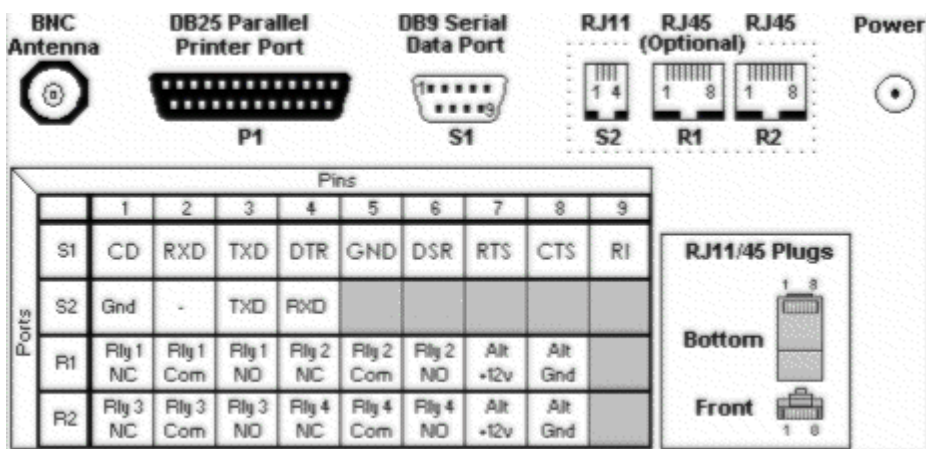
The usable ports on the PDT3000 are as follows:

DB25: parallel/printer output.

DB9: PC/serial output 1, and various other peripherals.

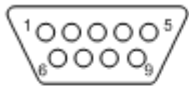
RJ11: PC/serial output 2.

RJ45: These two ports have 4 relays (2 each), they are wired for normally open, and normally closed outputs.



Serial Port2 to PC Cable

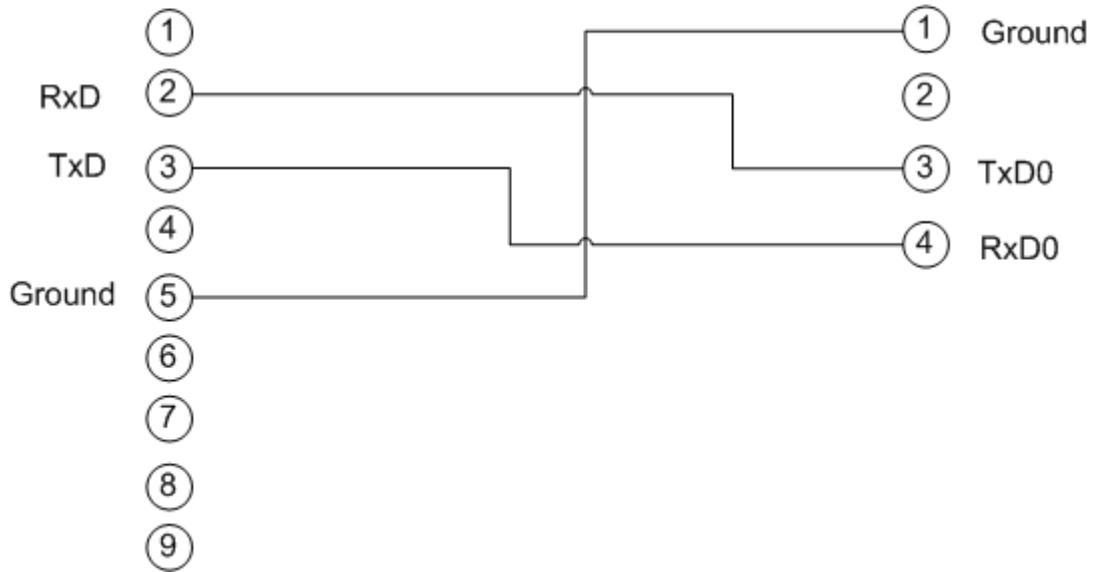
Serial output 2 RJ11 to PC DB9 cable



PC DB9 Female



PDT J3 RJ11



## **Alarm Inputs**

The parallel port (DB25) may be used for monitoring alarm inputs, use the following configuration.

PDT3000 DB25 ----- Input Pins in PDT3P

Pin25(Ground) ----- Signal Ground

Pin2(Input1) ----- Logic Input 1

Pin3(Input2) ----- Logic Input 2

Pin4(Input3) ----- Logic Input 3

Pin5(Input4) ----- Logic Input 4

Pin6(Input5) ----- Logic Input 5

Pin7(Input6) ----- Logic Input 6

Pin8(Input7) ----- Logic Input 7

Pin9(Input8) ----- Logic Input 8

Pin10(Input9) ----- Logic Input 9

Pin11(Input10) ----- Logic Input 10

Pin12(Input11) ----- Logic Input 11

Pin13(Input12) ----- Logic Input 12

Pin14(VCC) ----- 5VDC supply (needs to be factory set)

The signal is considered high when it is above +3.15v, and low when it's below +1.35v. For detailed specification on the tolerance of the input please look up the MC74HC245A converter IC manual. PDT DB25 Pins 10 to 13 have pull down resistors fitted as standard, the remainder need to have pull down resistors added (by request) if the unit is to be used for alarm monitoring.

## **PDT3000 ROM Limitation**

Max message length: 1024

Max number of Flex CTAP cap code: 1

Max number of cap codes for message relay: 80



## **Section 4.**

### **Technical Service**

#### **1: First Time Programming**

First Time Programming (FTP) is carried out at the factory. In rare instances, however, such as when a PDT3000 has been misprogrammed with an incompatible version of PDTP an FTP may be required to recover the unit.

This a 3 stage process, FTP, ES|Flash, ES|Upgrade

##### **FTP Instructions**

Open winflash  
Select your comport  
Place a 2.54mm jumper over JP1  
Click on the . button and select the rom file  
Click the "Flash" button  
Apply power to the unit - wait to the bar at the bottom goes to 100%  
Remove power  
Remove the Jumper on JP1

Once the FTP is done the unit should be have its Embedded System (ES or firmware) upgraded to ensure it is using the same version firmware as the programming software (PDT3P)

##### **ES Flash Instructions**

Remove power from the PDT3000  
Open Latest version of PDT3P (or specified version)  
Select the appropriate template  
From the drop down menus select ES|Upgrade|Flash|pdt\_flash\_PEV6.0.rom  
Immediately apply power to the unit - wait to the bar at the bottom goes to 100%

##### **ES Upgrade Instructions**

Remove power from the unit  
Click ES|Upgrade|pdtV6.x.rom  
Apply power to the unit - a warning will be displayed, click no and wait until the bar at the bottom goes to 100%  
Enter all the settings you want in the unit and click "upload to pager".

#### **2. Receiver tuning**

##### **Test Equipment Needed**

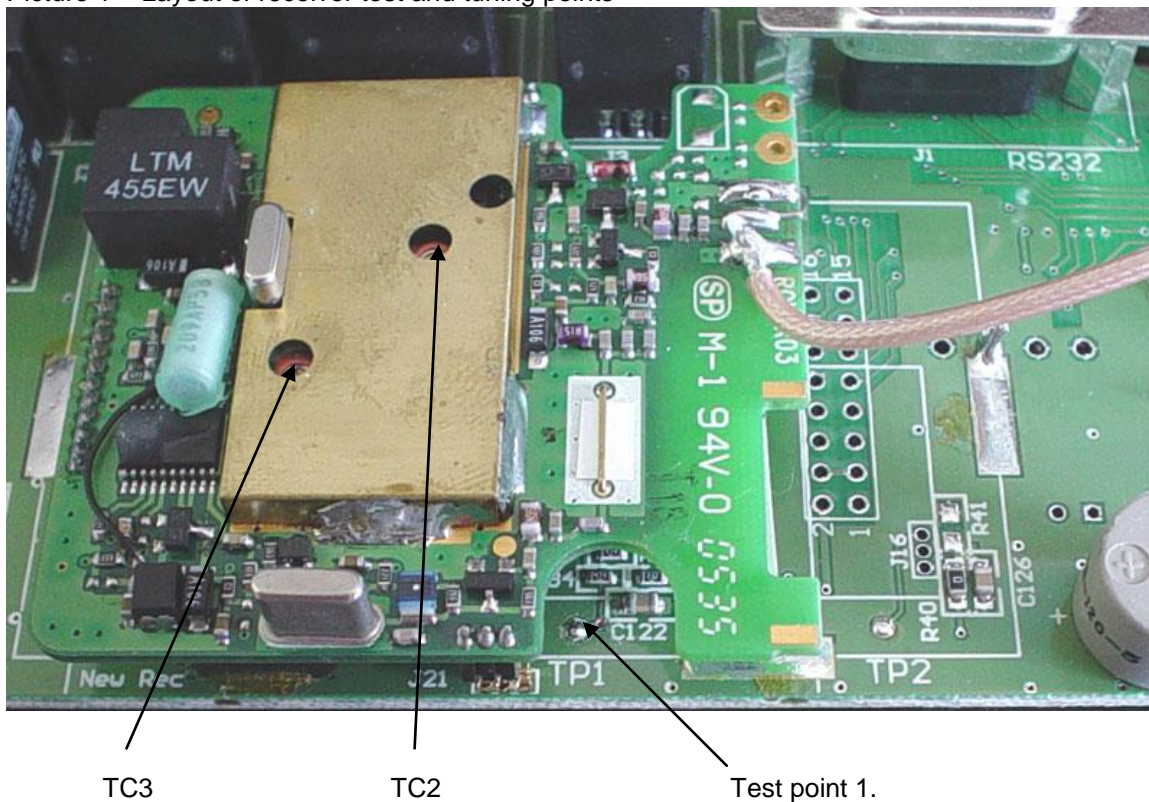
- 1 Paging signal generator
- 1 Oscilloscope
- 1 Ceramic tuning tool – 0.9mm



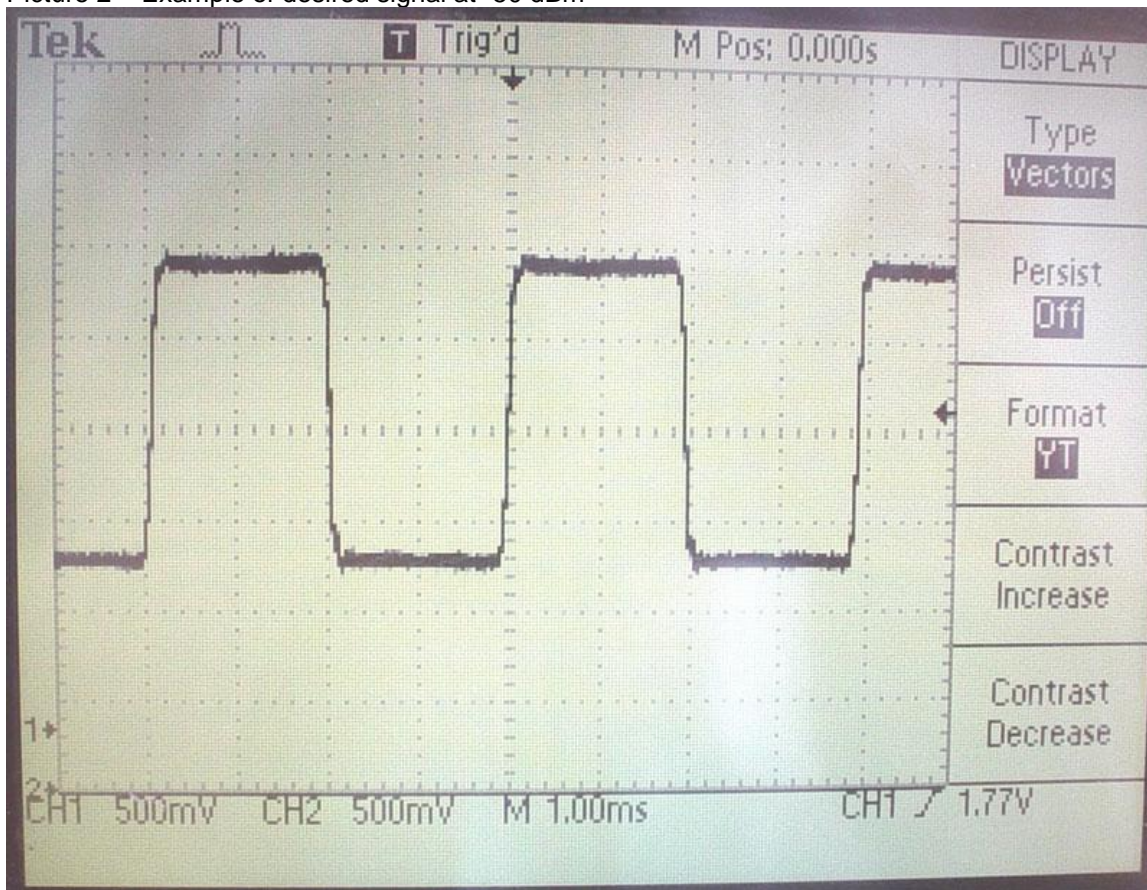
## Tuning method - RCM Receiver.

1. Connect the paging device directly to the signal generator and set the output to -50dBm
2. Set the oscilloscope to 500mv/division and 1ms
3. Connect the scope lead to any ground point and use the probe on TP1 on the PDT PCB (picture 1)
4. Using a ceramic tuning tool, adjust Tuning for the VCO output (TC2) till you get as clear as possible signal on the scope (picture 2).
5. Adjust TC3 for maximum amplitude on the scope.
6. Adjust the output of the paging signal generator to -115dbm (picture 3)
7. Repeat steps 4 and 5 in that order until the signal is as clear and large as possible (picture 4)
8. test the paging receiver for reception at -120dBm (see notes)

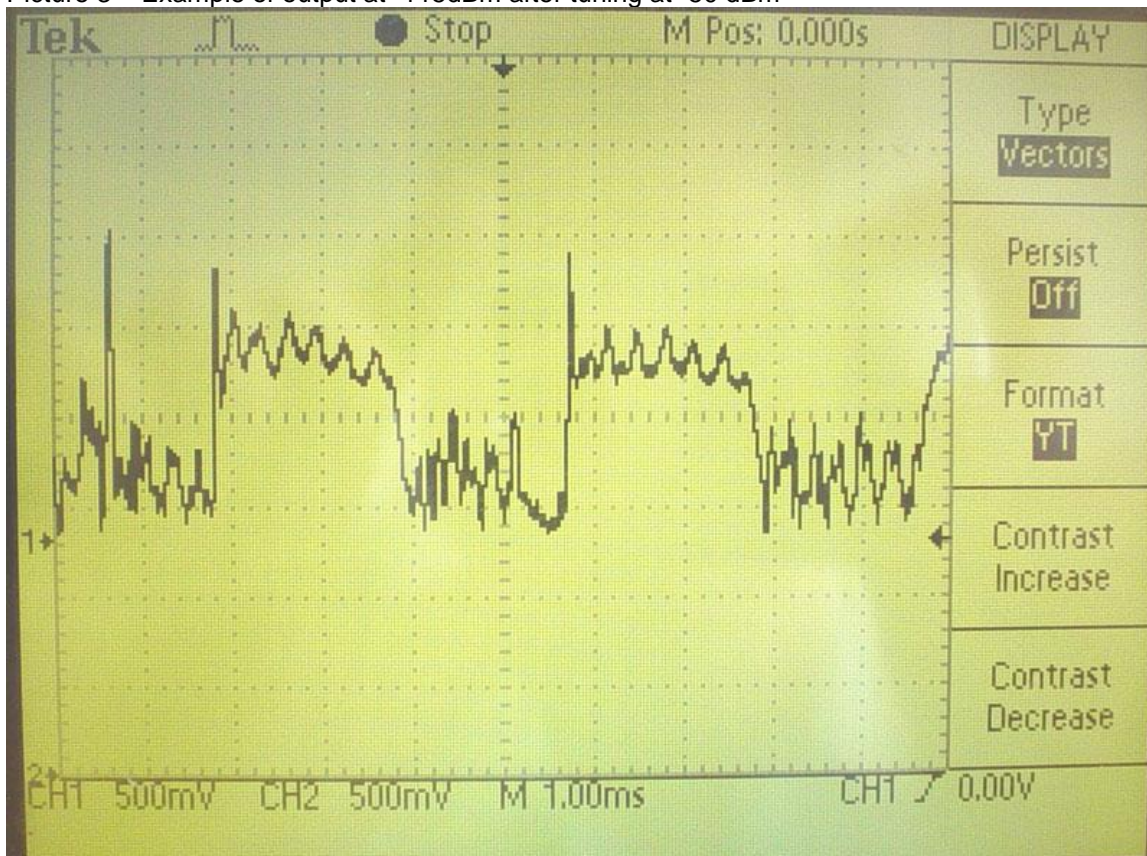
Picture 1 – Layout of receiver test and tuning points



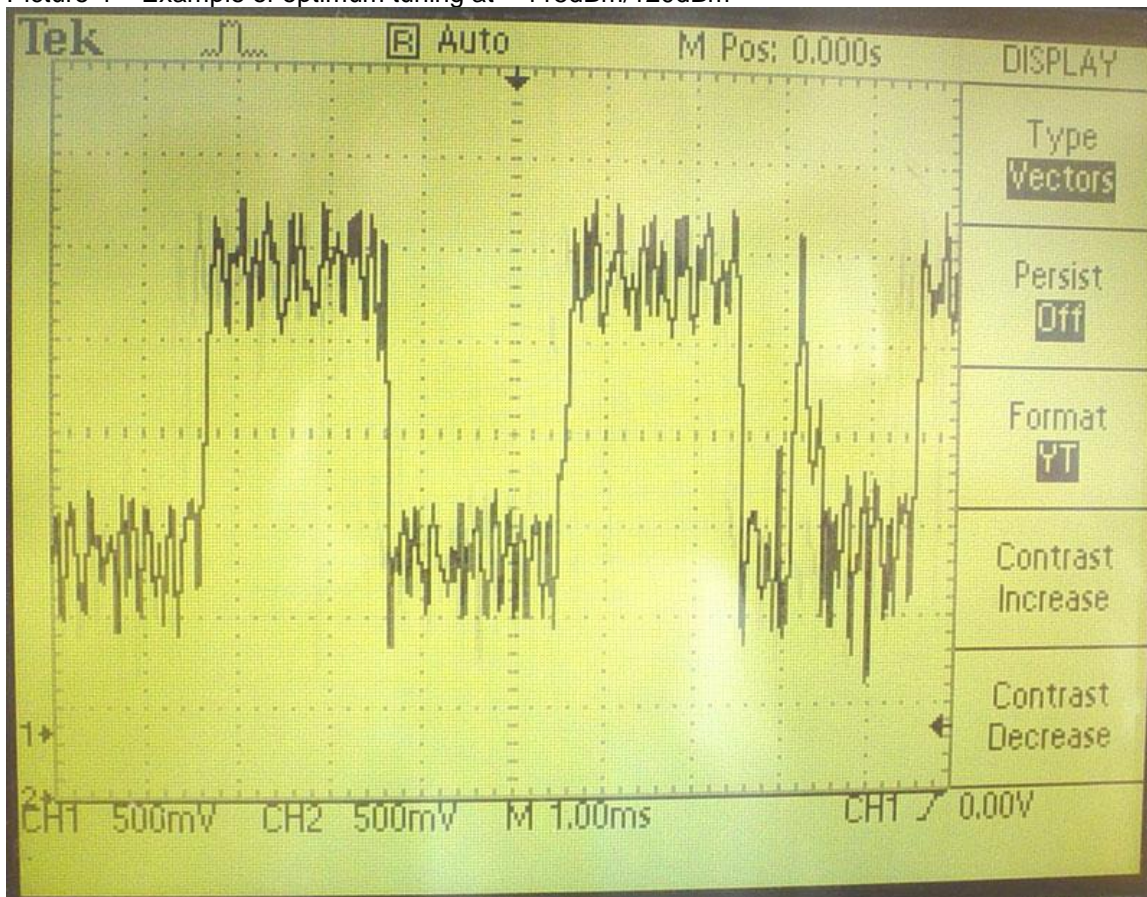
Picture 2 – Example of desired signal at -50 dBm



Picture 3 – Example of output at -115dBm after tuning at -50 dBm



Picture 4 – Example of optimum tuning at – 115dBm/120dBm



### Notes on Tuning

Only use a ceramic tuning tool. A standard screw driver will give poor results due to the magnetism affecting the capacitance of the trimmer capacitor.

Only use enough pressure on the trimmer caps to hold the ceramic tuning tool in place. Excess pressure will cause damage to the trimmer and give poor tuning results.

Only turn the trimmer capacitor in small and slow movements, harsh adjustments will cause damage to the trimmer and give poor tuning results.

When testing the paging device after tuning, it should receive at -120dBm (pocsag - different levels will be indicated on Flex (talk to WiPath)), however, if the device is set to a frequency that is used locally (i.e. a local telecommunications provider) you may need to test the device in a shielded environment, if this is not possible a reasonable pass level is -118dBm although strong local signals may reduce this and it is recommended that it be tuned at a close but different frequency.

### **3. The PDT3000 Mainboard**

#### **Schematic**

Insert schematic here

#### **Circuit Diagram**

Insert Cct diagram here

#### **Board Layout**

Insert board layout here

