8877 ENG 3 Graphical Display System
User Documentation. Issue 3.0

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Document Release Note

From: Custom Electronics, 57a London Road, Biggleswade, Beds. SG18 8ED

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Document: 8877 ENG 3 Graphical Display System. User Documentation - Issue 3.0

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Reason for Release:

This is a formal release of the User Documentation prepared during the design phase of the project for the 8877 ENG 3 Graphical Display System Software.

There are several aims in issuing this specification:-

> To disseminate information about the ENG 3 Graphical Display System Software;

> To circulate the information to ensure the accuracy, especially of information
> relating to the operation of the system.

Accepted on behalf of Custom Electronics:

Signed: ....   Date: ....

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Revision History

Issue	Date	Released	Status	Description
1.0	13.4.99	DS	Draft	Released for client agreement
2.0	27.5.99	DS	Released	For client operation and maintenance
2.2	27.2.00	DS	Released	Extensions to FAQ's
3.0	20.2.01	DS	Released	Revised config and camera options

File

The present document is stored under the following file name:

Docs/docn/8877Manual.doc

Scope

The purpose of this document is to provide a reference for the operation, maintenance and application of the 8877 ENG 3 Graphical Display System Software.

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Related Documents

The following document(s) are related to this:

[1]   Custom Electronics Data Sheet:8877   PylonGDS ENG 3 Graphical Display System

[2]

[3]

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1   Preamble

The Pylon GDS system is a general purpose, graphic display system for operator inter-action and control of intelligent plant equipment. The ENG variant has been configured for use with broadcast antennas and equipment, to fully automate the remote control of ENG receive sites from a central location.
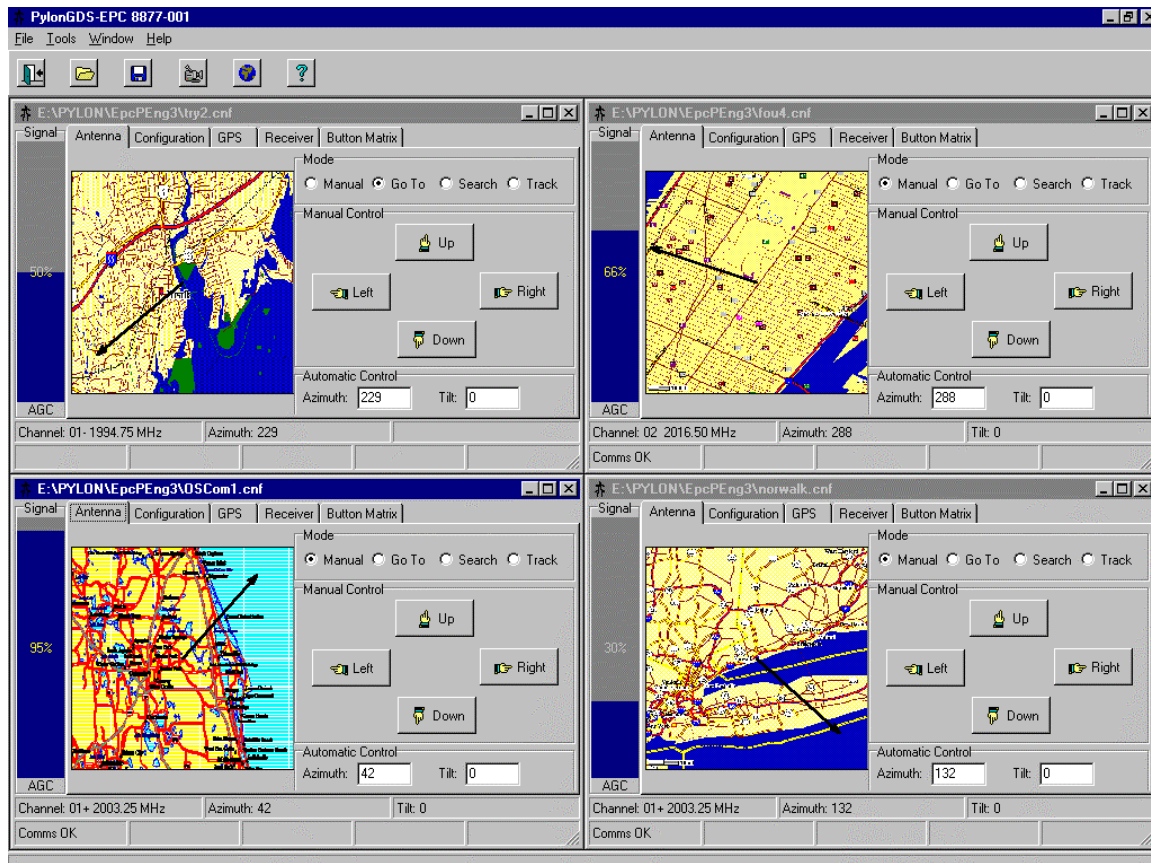
Features: -

- Industry standard IBM PC compatible

- Multi platform Windows GUI

- User configurable

- Full on-line diagnostics

- Complete manual and automatic receiver and antenna control

- GPS Location and Autotracking facilities

- Multi-Site User Interface

- Comprehensive context sensitive on-line help

- Continuous Alarm Supervision

The Pylon software is connected to the receiver site via standard PC serial communication channels, which operate high speed streaming protocols to ensure the fast secure execution of commands in the outstation.

Complete control of both rotator and fan beam antenna systems is provided through both manual control buttons and a full set of automatic control facilities which include: -

- Goto preset targets

- Goto GPS Lat./Long targets

- Search facility for the peak signal

- GPS Auto-tracking system

- Full previous transmit site recall from a stored database of over 1000 records

2   System Overview:

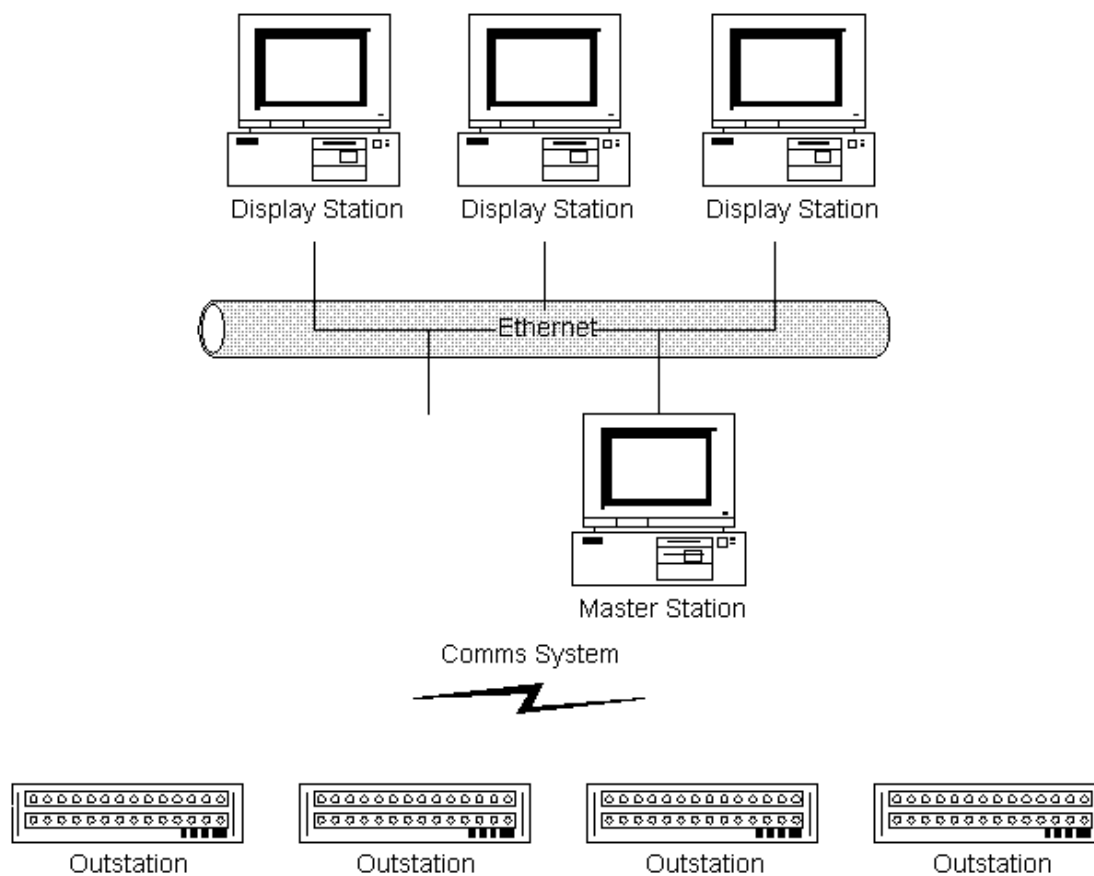A minimum ENG control system consists of the following areas: -
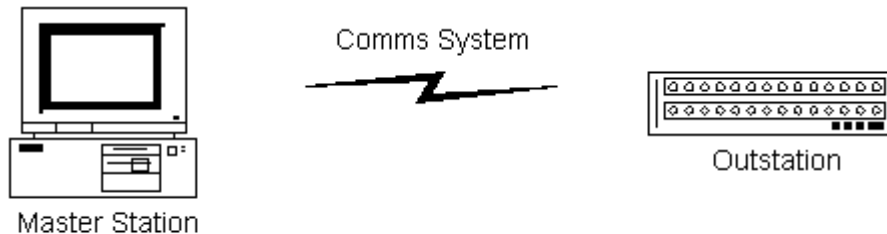
The master station comprises an industry standard PC platform on which the Pylon GDS software system is installed. The recommended machine requirements are a minimum of Pentium III 350mHz CPU, 64mb ram, 1.44mb floppy disc, 50mb free hard disc space, Microsoft WindowsNT Workstation 4.0. A Windows compatible locator such as a mouse or touch screen is also required.

The communications system required to connect the master station to the slave outstation, needs to carry asynchronous data communications in full duplex at a minimum of 9600 bits per second. Examples of suitable communications mediums would be direct RS232 connection, 2 wire leased line audio modem, 4 wire leased line audio modem or public switched telephone network (PSTN) dial-up connection. The Pylon GDS system contains configurable facilities for initialising and dialing through Hays compatible modems.

The control outstation employed within the system, may be one or a number of types and manufacture. The Pylon GDS system contains communication drivers for all industry standard PLC devices, popular process control outstations and purpose designed ENG outstations.

The following diagram shows an expanded system containing multiple workstations and outstations.

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3 Operation

PylonGDS-ENG 3 has a MDI (Multiple Document Interface) as shown below:
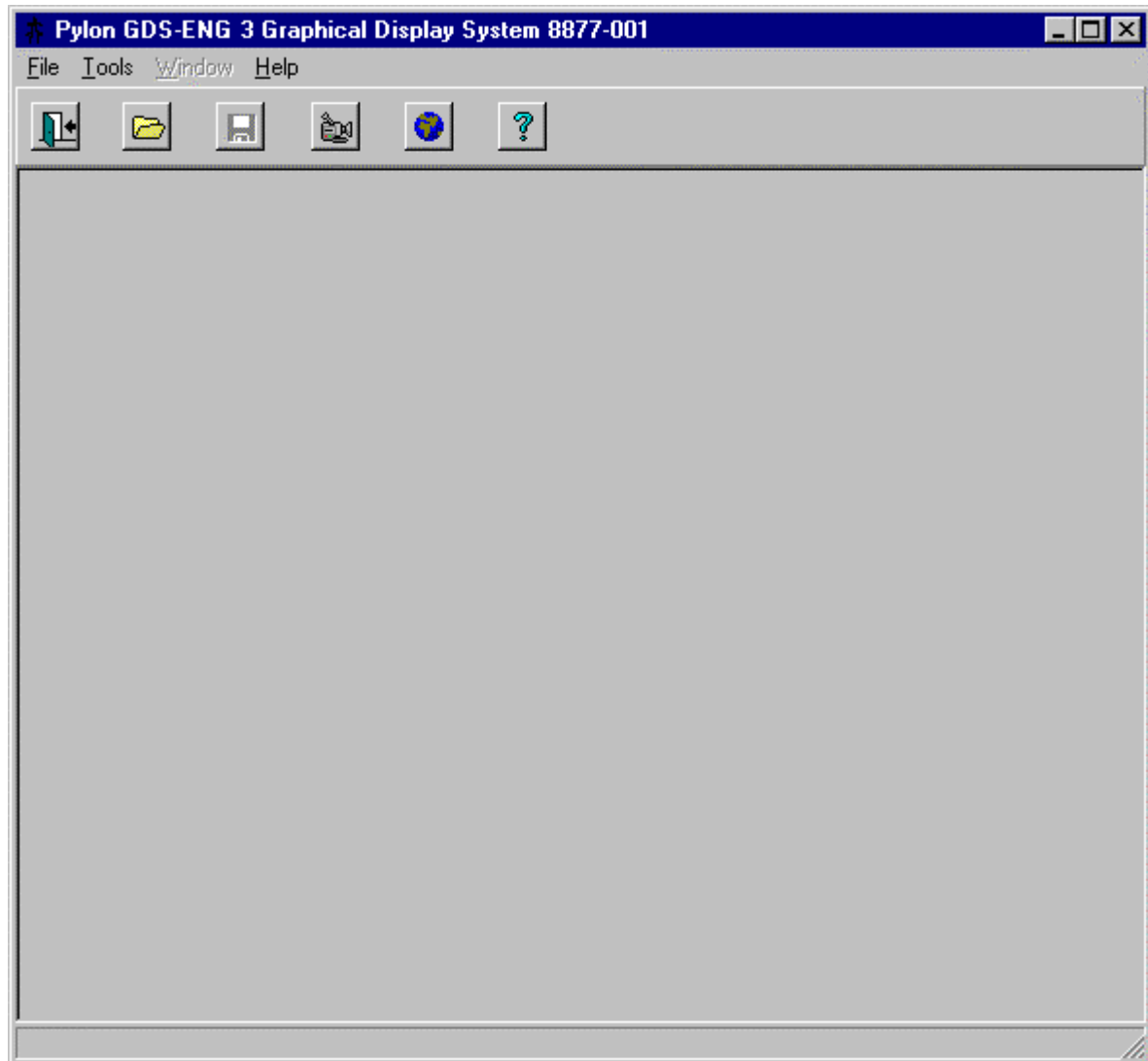
It contains a menu with the following structure:

File |

New

Open

Close

Save

Save As

Exit

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Tools |

       Video

       Map

Window |

       Tile Vertically

       Tile Horizontally

       Cascade

       Arrange Icons

       Minimize All

Help |

       About

There are five Speed Buttons on a toolbar that correspond to the File | Exit, File | Open, File | Save, Tools | Video, Tools | Map and Help | menu options respectively.

3.1 Opening a Receiver Site for Monitoring and Control

The File | Open menu option opens an existing site configuration using a standard file chooser. The receiver site window is then opened, which updates in real-time as the receiver site information varies and contains the following screen areas:

Signal – AGC Receiver Signal bargraph (0-100%)

Statusbar – Continuously showing Channel, AGC, Azimuth, Tilt, Comms and equipment status.

Together with a the main window area which has Tabs for the following:

3.1.1 Antenna Control:
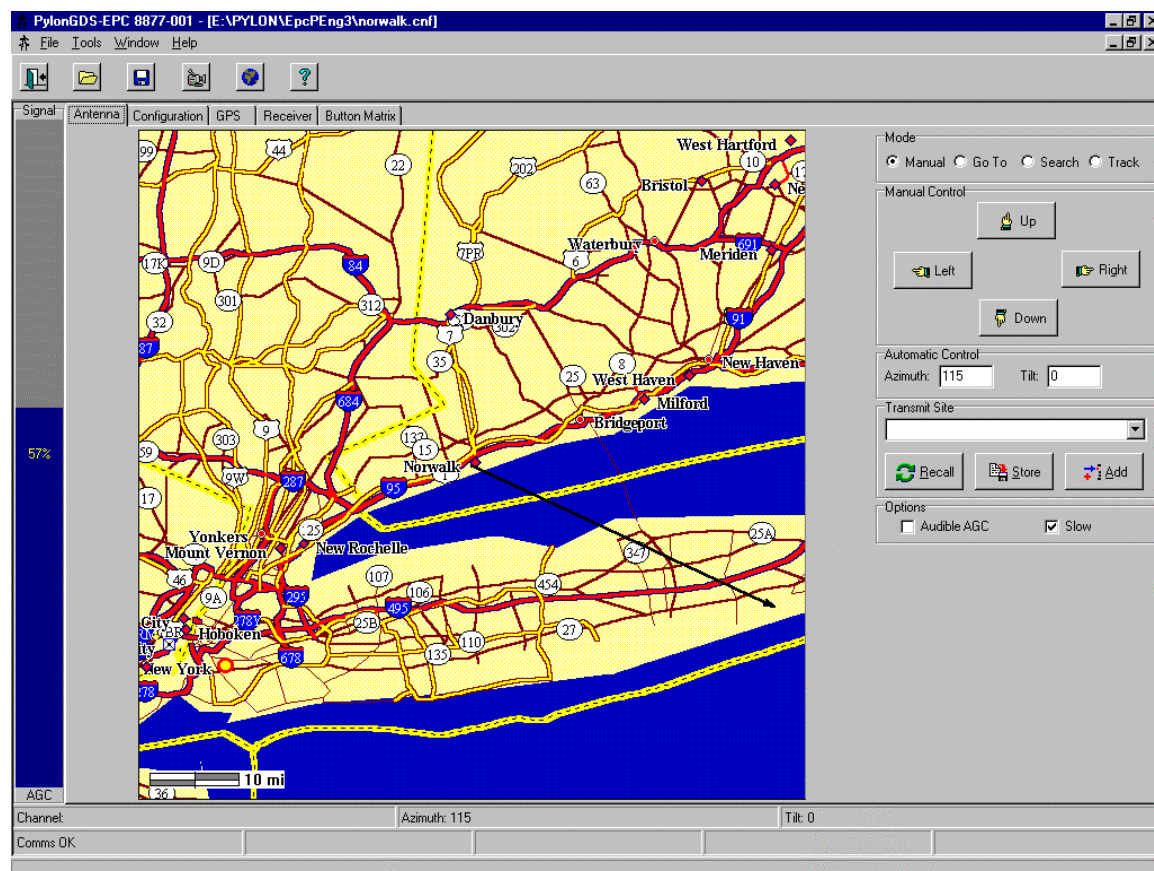
This form allows the user to control both steerable and horn antennae using user-configurable BitMaps for convenience. In normal operation the user drags the azimuth pointer on the display to the correct area of transmission and then releases to signal the outstation to automatically steer to that point.

As alternatives the user can also type setpoints into the Automatic Control group and then select Goto mode, or select a previously stored Transmit site from the database and Recall.

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The peak Search mode, Manual Control buttons and keyboard cursor controls can then be used for fine-tuning. During this time the Audible AGC facility can be used in multimedia PC's to give an audible guide to signal changes.

3.1.2 Receiver Equipment Control:

This form provides indication of the current receiver features selected, together with the condition of three spare relay controls. The check box indicators are ticked if a control output is currently active and the operator can click on these controls to operate the mute, video invert, saw filter, spare 1, spare 2 and spare 3 control outputs, which all operate as latching push-buttons.

The receiver channel is selected by clicking on the channel combo box. This operates as a drop down list of the channel settings configured to be available and the particular channel of interest is selected by dragging the mouse cursor to the desired entry and releasing the left mouse button. If the desired entry is not currently displayed within the drop down window, the list can be scrolled in the normal fashion by moving the mouse pointer above or below the displayed list. As normal, a selection can be cancelled by moving outside of the list area before releasing.

Note that the channel identities shown in the channels database are factory set to match the receiver type installed but can be edited through the configuration editor using the channels database editor.

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The polarisation to use is selected by the polarisation combo box. This operates as a drop down list with clockwise, anti-clockwise, vertical and horizontal selections available.

The LNA selection is controlled through the use of the LNA combo box. This operates as a drop down list through which 1 selected, 2 selected or Bypassed states can be set.

The receiver AGC signal at the receive site is monitored and displayed in real-time to the operator indicating the strength of the signal currently received.

Note that the names of the three Spare control relays and Indicators are on-line user configurable.

If a UCL receiver is configured and attached, details of its alarms are also given.

3.1.3 GPS Location and Auto-tracking:
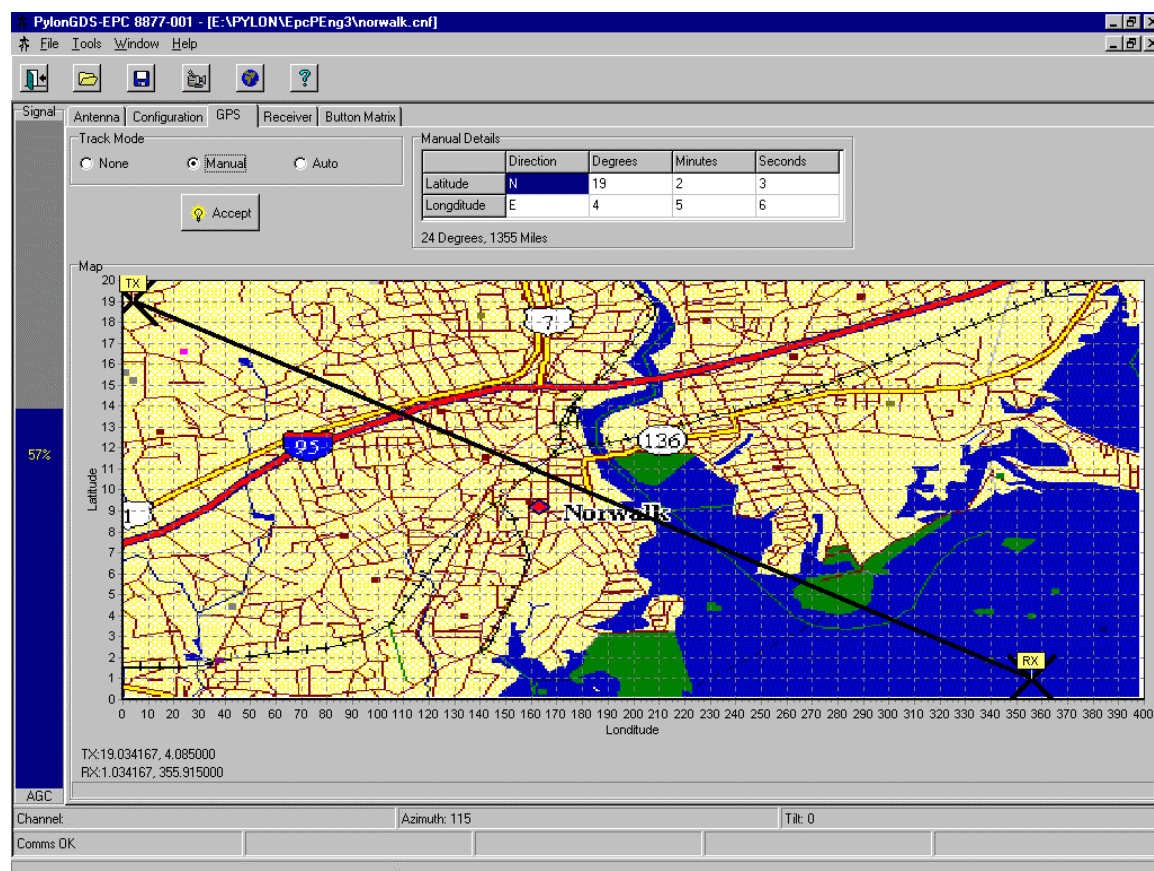
This form allows the user to make full use of GPS information. In Manual mode of operation, if the transmit site Lat./Long is given to the user he can simply enter this into the control system to

automatically point accurately at the source. As an alternative to mobile GPS receivers, PylonENG3 allows the use of popular CD mapping programs to obtain fixes from Street locations, area or zip codes, accessed via the configurable Tools | Map menu option.

In automatic mode, once acquired and accepted, then Auto-tracking can be used to maintain direction to a mobile transmission such as from a helicopter.

In both modes of operation a set of user-configurable maps is available which scale automatically to show the best view. These give the current Tx position and transmission path back to the receiver Rx site in real time and trace the movement of the transmission together with displaying the distance.

3.1.4 Camera Equipment Control:

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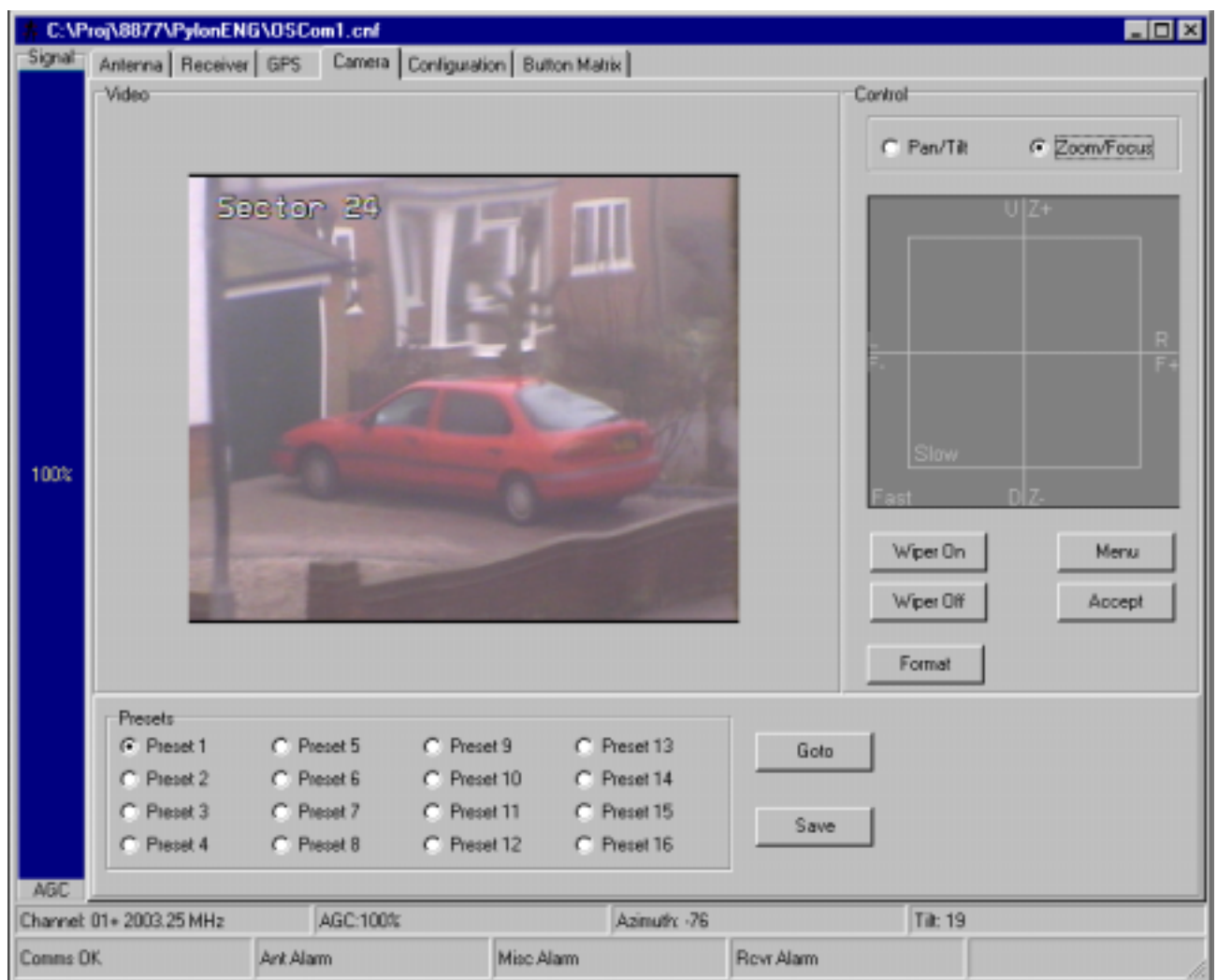
If a camera option has been configured, this form allows the user to control the camera mount and in addition (if a video for windows compatible capture card is fitted) will allow the video to be previewed.

The form is split into three main areas. The Video area simply displays the captured video. The Control area allows the manual remote control of the camera. The presets area handles the saving and recall of preset positions.

Note that the camera type is configurable and that the controls available vary depending on the camera type and facilities.

To pan and tilt the camera, select the Pan/Tilt radio button in the control group. You can then click in the centre and drag the mouse in the joystick area to control the pan and tilt. The speed of movement is governed by the distance from the centre and two speed regions are available. Zoom and Focus can also be controlled in a similar fashion if the Zoom/Focus radio button is selected.

If a capture card is fitted, the video format and size dialogs can be displayed using the Format button.

Preset positions can be saved and recalled using the controls in the Presets group.

3.1.5 Button Matrix Control:
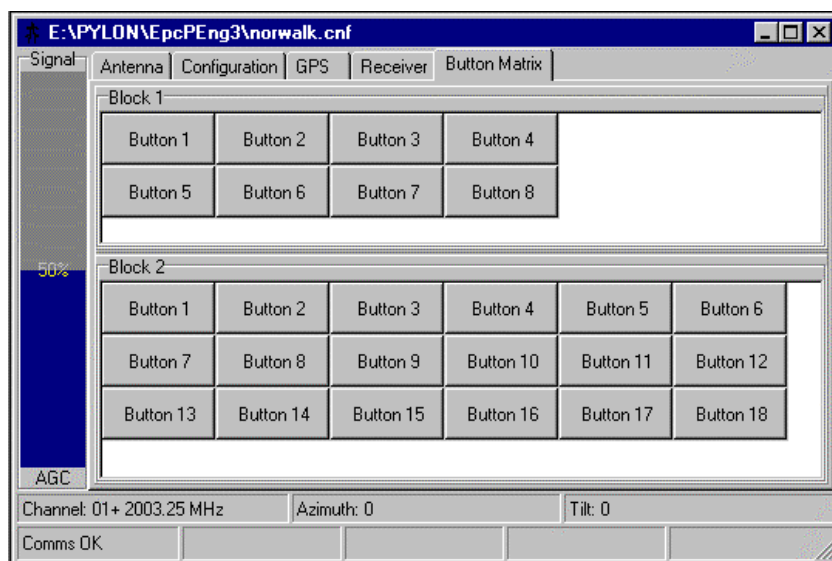
PylonGDS-ENG3 allows the control of other system functions using powerful user-configurable push-button grids. The buttons have configurable legends, colors, bitmaps and multi-action

operating scripts when activated and released. These facilities are normally reserved for project specific operations.

3.1.6 On-Line User Configuration:

All aspects of the Pylon GDS configuration are available on-line and all communication parameters, site contents and databases are fully selectable and editable through this on-line configuration system.
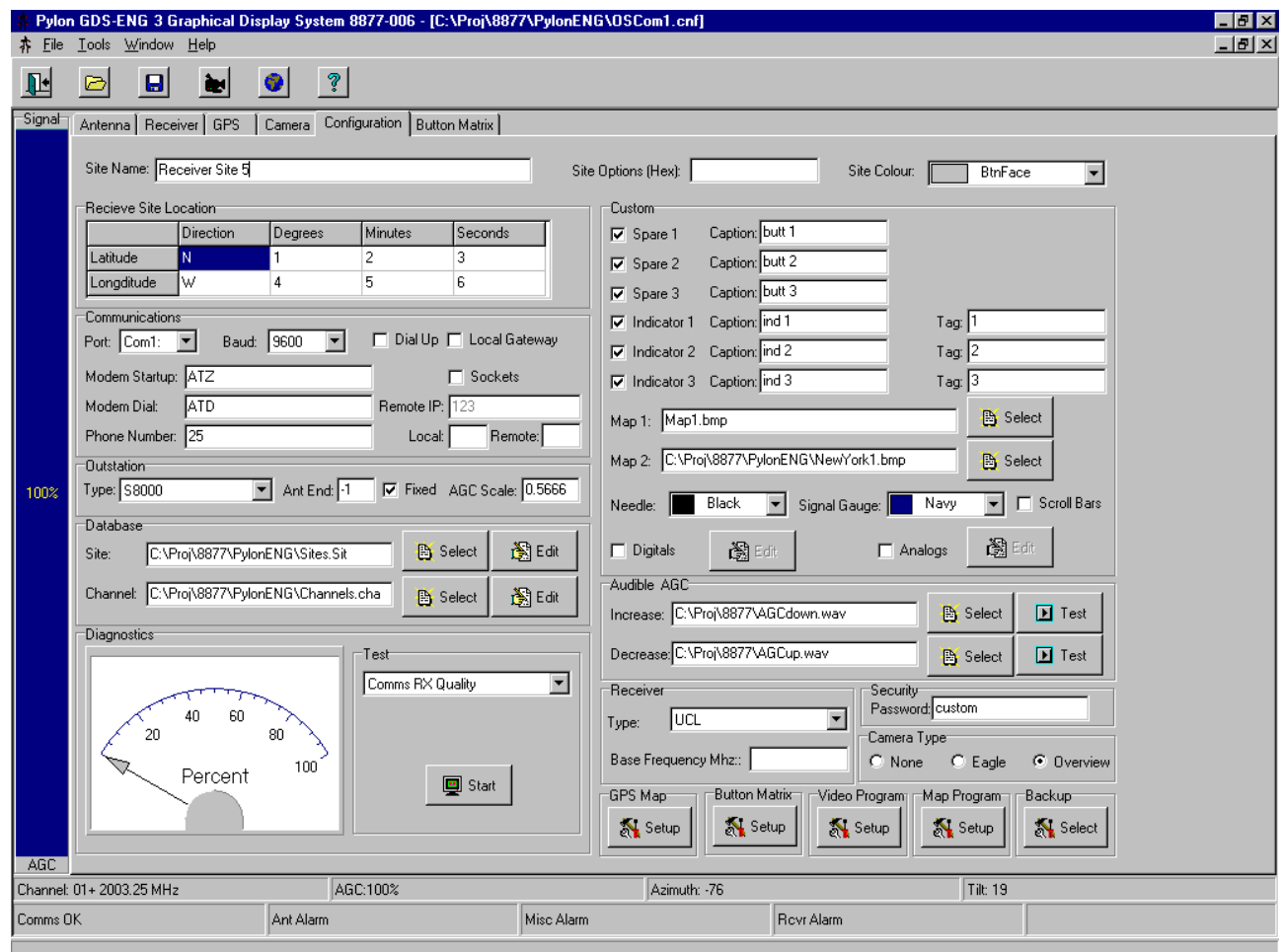
Complete diagnostics of the Pylon GDS software and its communications with the remote sites are easily available through the use of the Pylon Test Meter, which provides on-line testing of all elements of the communication system, including the intervening modems and also provides facilities to exercise the relay and control functions in the distant outstation.

The File | Save menu option must be used to save configuration changes when they have been made. The File | Save As option also provides a convenient way of creating new configurations based on a similar installation.

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The site name can be entered into the site name edit box as required.

The Lat./Long location of the receiver site can be entered in the Receiver Site Location area.

The comport can be configured by using the Port combo box which presents a drop down list of connections supported.

The baud rate can be configured by the baud rate combo box, which operates as a drop down list and presents the available baud rates, which can be used. Note however that the system is designed to operate at its optimum using 9600 bits per second.

A modem start-up string can be configured by entering the desired string into the modem start-up edit box. This is useful for dial-up modems which have a command mode entered on start-up and can typically be used to fetch factory default settings and override particular parameters.

A modem dial prefix can be entered into the modem dial prefix edit box for use on dial-up connections and will typically be "ATDP".

The phone number for a dial-up receiver site can be configured by entering the phone number required into the phone number edit box.

The outstation type can be selected from the outstation type combo box, which operates as a drop down list and presents the list of available communication drivers.

The AGC receiver signal-scaling factor can be configured by entering a value into the AGC scale edit box. This is the multiplying factor necessary to convert the value that the outstation returns for 100% AGC, to a 100% figure on the display and can be calculated from the formula: -

$$AGC \text{ scale factor} = 100/\text{outstation FSD value}$$

For example: -

$$100/4095 = 0.0244$$

The legends for the three spare latching controls, Spare 1, Spare 2 and Spare 3, can be configured by editing the desired identification into the Spare 1, Spare 2 and Spare 3 edit boxes. The legends for

the three indicators, Ind 1, Ind 2 and Ind 3, can be configured by editing the desired identification into the edit boxes, and setting the tags to the desired inputs. (27,28,29 are Spare1,2,3)

The site database file name is shown in the site database edit control on the screen. This filename can be set-up by pushing the 'Select' push-button and selecting the filename from the Tx sites sub-directory. The 'Edit contents' push-button provides access to the site database editor

The channel database filename is shown in the edit box associated with 'Channel data' and can be selected by pushing the 'Select' push-button and selecting the database of interest from the 'Channel' sub-directory. Access to the channel database editor can be obtained by pushing the 'Edit' push-button.

The button matrix can be setup from the configuration tab 'Setup' button. Two blocks are available with a configurable number of rows and columns. Once the format of the blocks has been defined, the properties attached to each button in the matrix can be set by double clicking on its position within the grid. The Buttons caption can be entered along with a bitmap to show. There are also areas to write scripts for execution when the button is pushed and released. These consist of lines of single PylonScript commands from the following set:

GOTO=<*Bearing 0-359*>

LNA=<*1, 2, or 0 for Bypassed*>

POL=<*Polarisation setting, as combobox text*>

CHANNEL=<*Channel setting, as combobox text*>

RECALL=<*Tx Site Name, as combobox text*>

SETRELAY=<*Relay Number 1-32*>

RESETRELAY=<*Relay Number 1-32*>

SEARCH

STOP

SOUND=<*Wave Filename*>

POINT=<*Session1,Site1,Session2,Site2 etc*>

Modified configuration parameters can be saved by using the File | Save menu option, in which case they are saved and the operator is prompted to remember restart the communications before the modified settings will take effect.

3.2   Creating a New Receiver Site Configuration:

The File | New menu option creates a new site configuration which may then be edited using the configuration tab and saved under a new name using the File | Save As option.

Alternatively the Example.cnf file can be opened and edited with the 'custom' password and saved with a new name.

3.3   File Options

File | Close

>   Closes the currently opened window.

File | Save

>   Saves current configuration.

File | Save As

>   Saves current configuration under a new name as shown below:

File | Exit

>   Exits the application.

3.4   Tools | Video

This menu option runs the configured video capture software tool.

3.5   Tools | Map

This menu option runs the configured map location software tool.

3.6   Window Management

Window | Cascade

>   Cascades all opened windows.

Window | Tile Vertically

Tiles all opened windows vertically.

Window | Tile Horizontally

Tiles all opened windows horizontally.

Window | Arrange Icons

Arranges all Icons.

Window | Minimize All

Minimizes all opened windows.

Window | Close All

Closes all opened windows.

3.7 Help

Help | Contents displays the contents of the on-line help file using the Windows help system.

Help | About displays program information and gives access to the support options.

4   Getting Started

4.1   System Requirements

- IBM PC compatible provided with Windows NT Workstation 4.0.

- 1024x768 SVGA Display Monitor

- TCP/IP Network Protocol installed.

- 50MB of free disk space

- RS232 port for outstation connection.

4.2   Installation

Run d:\setup.exe from the issue CD, where ‚d:' is the drive letter of your CD drive.

Accept all defaults offered. For a demo installation choose the compact setup.

4.3   Registration

The PylonENG3 system is licenced and copy protected on a per installation basis. After installation you must register by giving information to your dealer.

IMPORTANT – if you do not register the installation – it will not work after the 7 day evaluation period.

VERY IMPORTANT – if you have registered an installation – you cannot move it to another different PC.

To register – use the following proceedure:

1. Run PylonENG. 'OK' the licence dialog presented (e.g. 1 of 7 days trial period).

2. From Help | About menu, click the Support button.

3. If the PC has an internet email connection – click on the blue textlink by 'Register:', OR else click on the blue textlink by 'Tel/Fax:' and fax or email the number shown together with your software licence No, and a return email address.

4. When a key file has been received, use the 'Key' button from this form to navigate to and Open it, for permanent installation

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5   Getting Support

To offer the best level of support, Custom Electronics recommend the following:

1. First refer to the FAQ section of this manual for answers to frequently asked questions.

2. Next refer to the latest Pylon 8877 ENG3 FAQS in the tech support section of our website at the following address: HTTP://www.customelectronic.demon.co.uk. Unanswered questions can be referred to us by either of the following:

- E-mail to: support@customelectronic.demon.co.uk. This will be answered by E-mail at the earliest opportunity and is provided free of charge to all registered users.

- Telephone to Pylon ENG Technical Support at +44 1767 313167. This service is chargeable per minute and available at reduced rates to holders of the relevant support contracts.

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6   Frequently Asked Questions (FAQ's)

6.1   How Do I Connect the Communications?

The PylonGDS-EPC controller system is designed to use RS 232 asynchronous communications directly in accordance with popular industry standards. The communications system requires the correct presentation of all RS 232 handshakes with the PC workstation or its inter-posing modems.

The standard 9 pin connections for a PC DTE are as follows:-

Pin	Id
01	DCD
02	RD
03	TD
04	DTR
05	GND
06	DSR
07	RTS
08	CTS
09	RI

The standard PC connections used for a 25 pin DTE are as follows:-

Pin	Id
02	TD
03	RD
04	RTS
05	CTS
06	DSR
07	GND
08	DCD
20	DTR

and a standard 9-25 pin modem cable can be used to present these if necessary to an external DCE.

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The 25 pin presentation is directly compatible with EIA standard, RS232C and will operate with all compatible communications equipment (DCE equipment), such as dial-up, leased-line or limited distance modems.

To connect a PC workstation directly to a Pylon EPC controller a standard crossover (null modem) cable can be used (see section 6.2).

Whilst it is not recommended, a 3 wire RS232 connection can be adopted at potentially reduced performance at speeds of 9600 or less. In this case, the PC end of the connection must have its' TD, RD and Gnd pins connected through to the controllers RD, TD and Gnd respectively, whilst at both the master and slave end, the following links must be made between

a) RTS and CTS and

b) DTR, DCD and DSR.

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6.2   How Do I Make Up an RS232 PC-EPC Outstation Cable?

The controller may be connected to a local PC for file transfers as follows:

The connections for intervening 25 way connectors are also shown.

EPC				PC
D9S	D25S		D25S	D9S
1				
2	3	Rd/Td	2	3
3	2	Td/Rd	3	2
4	20	Dtr/Dsr	6	6
5	7	Ground	7	5
6	6	Dsr/Dtr	20	4
7	4	Rts/Cts	5	8
8	5	Cts/Rts	4	7
9				

****

6.3   How Do I Add A New Receiver Site?

Adding a new receiver site is simply performed by creating a new file for its configuration.

To add a new receiver site to an existing installation, proceed as follows: -

Open an existing receiver site configuration.

Use the File | Save As menu option to save this to the name for the new site.

Use the Configuration tab to set up the different options for the new site.

Save the changes using the File | Save menu option.

6.4   How Do I Delete A Receiver Site?

Simply delete the site configuration file (.cnf) from the runtime directory using Windows Explorer.

6.5   How Do I Set Up A Repeat Outside Broadcast?

From the main Pylon GDS receiver site antenna control screen, the user pushes the transmit site database button which causes a drop down list of transmit site identities to be presented. The user scrolls through this list in order to highlight the transmit site of interest. Selecting the desired site will close the transmit site combo box.

The user then pushes the Recall push-button, all settings from the transmit site for that location are automatically downloaded to the receiver site outstation and the outstation's automatic control is put into Goto mode.

When automatic control is complete, the Goto check box will clear and the user can either manually jog the antenna to obtain a better signal (using the manual control keys), or may choose to invoke the Search facility by clicking on the 'Search' check box in order to have the outstation search for a higher signal.

6.6   How Do I Set Up A New Broadcast Location?

The user will firstly set up the receiver parameters. The channel database button which will present a drop down list of the channels available for selection. The user will highlight the channel of interest by scrolling through this list and selecting the desired channel will close the box.

The user will select the polarisation of interest by dropping down the polarisation combo box and selecting a polarisation characteristic required.

On the Antenna control tab, If the bearing of the new transmit site is known, the user will enter the target azimuth setpoint to the desired angle and the elevation setpoint to the desired elevation. He will then push the Goto button to invoke the automatic outstation control to send the rotator to the target settings. When Goto is complete, the check-box for Goto will clear.

Alternatively, the user will manually rotate the antenna using the left, right, slow, up and down manual control buttons. From this point, the operator may choose to invoke the automatic Search facility, which will search around the current bearing and return to the position to the peak signal detected. Once the user is happy with the bearing, he may adjust the antenna elevation using the up and down controls.

The LNA set-up required can be adjust by using the LNA combo box control to select either LNA 1, LNA 2 or Bypassed on the receiver tab.

Finally, if the user wishes to store the current settings in the transmit site database, he would push the Transmit Site Add push-button. A name is entered for the new site and the OK pushbutton causes a new site to be created.

6.7   How Do I Make Adjustments to A Stored Tx Site?

Adjustments to a previously stored transmit site record can be made by recalling the existing setting for the transmit site of interest, modifying the control parameters as desired and pushing the Store push-button.

In this situation, a message box is presented requesting that you confirm that the existing site details are overwritten. If the operator chooses YES, then the corresponding site record details are updated.

6.8   How Do I Install The System For Demo/Training Purposes?

Follow the standard installation procedures, but use the 'Compact' install option instead of the 'Typical' one. This will include a 7-day evaluation license.

6.9   How Do I Change Modem Parameters?

Access the configuration tab from the Pylon GDS display screen. The Communications group allows you to set up the Comm port, Baud rate, modem start up, modem dial prefix and phone number fields of the configuration.

Baud rate sets the communication speed, modem start-up sets the modem initialisation string on start-up, dial prefix sets the string sent to the modem proceeding the phone number.

These parameters must be set up to match your modem correctly (refer to the supplier's or user terminal emulator to determine the correct settings).

6.10 How Do I Change Slave Unit Modem Parameters?

The RFT-RCS slave unit modem (P3532R-02), is set-up during testing for two wire leased line (answer) operation with manual PSTN recovery. This allows it to be used on two wire leased line or PSTN without change (as in the absence of carrier on the leased line port the unit will answer calls on the PSTN port).

If changes to the modem configuration are required for either four wire operation or the many other parameters, if a local LCD control panel is fitted to the modem, this can be used. Alternatively, you can connect a 9600,N,8,1 terminal to the diagnostics port as outlined in section 3.14 of the modem manual. Use "connect *" to attach to the modem and modify it's parameters as per standard front panel operation.

The PylonEPC slave unit modem is set-up using the outstation software configuration settings described in the outstation software documentation.

6.11 How Do I Change Receiver Channel Relay Outputs?

Access the configuration tab from the Pylon GDS system and push the Database Channel 'Edit' push-button.

The ID and relay pattern associated with each record are displayed in the Channels section. A '1' indicates that the associated relay will be closed when the channel is selected and a '0' indicates that the relay will be open.

Set the relay pattern and ID as desired and then press the 'Ok' button. The changes are written to the database and will be adopted next time the channel is selected.

Records can be deleted from the channels databases by selecting the record of interest and pushing the 'Delete' button. New records can be added using the Append button.

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6.12 How do I Edit Tx Site Database Entries?

The site database editor is accessed by the 'Edit' button from the Configuration tab.

A Tx site database editor form is presented which in the content group shows the contents of one record of the database.

The transmit site ID, bearing and tilt, can be edited by altering the contents of the three edit boxes shown for any particular record of interest. Gps Lat./Long can also be used for multi-site installations sharing the same database.

Records can be selected by either using the 'Next' and 'Previous' push-buttons.

6.13 What Fault Finding Proceedures Can I Use?

The majority of problems experienced with remote control systems are caused by faults with the communication links between the master station and the outstations. In order to diagnose such problems one or two aspects of the system operation should be first understood.

1.   Communication between the master and slave devices is bi-directional and both the forward and return paths need to be complete for full operation.

2.   When a modem link is established most slave units will continually send data to the master unit (i.e. they do not have to be polled).

3.   The appearance of pushbuttons and indicators on the master screens is controlled by the condition of confirmation revertive signals from the slave outstation.

Problem - Dial Site fails to establish connection

Failure to establish connection will be indicated if a modem carrier and slave outstation communications have not been received within a preset time-out period.

This could be caused by one or more of the following:

1)   The COM port or phone number specified for the receiver site are incorrect.

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- Check configuration.

2) The COM port settings configured are incorrect.

- Check configuration.

3) The COM port is not connected to the modem.

- Check cable.

4) The modem is not switched on, or configured correctly.

- Check modem.

5) The modem is not connected to the phone line.

- Check connection.

6) The masters phone line is out of order.

- Check phone line.

7) The slaves phone line is out of order.

- Check phone line.

8) The slave outstation is not connected to the phone line.

- Check connection

9) The slave outstation is not switched on.

- Check power.

10) The outstation modem is not answering or the outstation is faulty.

- Check outstation.

Quick things to try:

Phone the outstation from a PSTN phone and listen for the slave modems answering tones.
If not present check 7-10 above.

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If OK, Repeat with a phone plugged into the master's phone line. If not present master's phone line is out of order.

If OK, dial the slave from the master PC and modem using a terminal emulator. If no connection check 3-5 above.

If OK, check 1-2 above.

Problem - Check boxes do not check

This is caused because PylonGDS did not detect the correct revertive response in the slave outstation and suggests that the output commands were not received by the slave outstation due to a fault in the outward link.

Quick things to try:

Run a terminal emulator on the master station and carry out a remote loopback test on the slave's modem.

If not OK, modems or line faulty.

If OK, slave faulty.

6.14 How Do I Use The Diagnostics (Pylon Test Meter)?

A complete set of diagnostics for the system are available on-line and accessed using the Configuration tab 'Diagnostics' group.

All the diagnostics available are very easy to use and are presented in the form of a user friendly 'Pylon Test Meter'.

The display comprises a test selection box together with a 'Start' button and a meter giving the results of the current test.

The following diagnostics are available:-

- Comms Rx Quality

- Comms Slave Loopback

- Comms Local Port

- Comms Local Modem

- Comms Remote Modem

- Outstation Relays

- Outstation Goto

The execution of all diagnostics start when the 'Start' selection is made and continue in real time from there. In other words, the diagnostics will not show what performance has been like, but will monitor what performance is like during the time that the test is selected. In many tests, totals and averages are calculated so that if problems are found and corrected, the test should be re-run in order to get a new set of figures.

The **Comms Rx Quality** indicates the speed and accuracy of the communications received from the outstation to the master station. Note that this tests the receive path only and that satisfactory remote control operation can only be obtained when there is good communications on both the transmit and receive paths.

Comms Slave Loopback checks the quality of both transmit and receive paths by modifying and reading values within the outstation. Note that a good Receive Quality test and a bad Slave Loopback test would obviously indicate a problem in the transmit path.

Comms Local Port tests the accessibility and loopback operation of the local port selected for communication and a pass on this test is essential to all system operation.

Comms Local Modem - this test, available only for systems employing dial-up communication and direct RS232 operation, provides a loopback check on both transmit and receive lines. If a dial-up modem is in use, with a Hays compatible auto dialler, the local modem is put into local analogue loopback mode before the loopback test commences.

If a direct RS 232 operation is used then a loopback connector must be employed in place of the modem, by connecting pins 2 - 3, pins 4 - 5, and pins 6 - 8 - 20.

In an RS232 (or indeed in a leased line communication system), this Comms Local Modem loopback test can be carried out with the loopback connector both local to the PC and local to the outstation in order to test the complete communications wiring.

The **Comms Remote Modem** test provides a remote digital loopback on the remote modem and otherwise provides an identical loopback test to that invoked by the Local Modem test.

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The **Outstation Relays** diagnostic can be used for factory testing of all Outstation Relays. This test **MUST NOT** be performed whilst the outstation is connected to the receive equipment or its antenna control system.

Outstation Goto diagnostic - this test performs random, auto control Goto specific bearings and elevations and can be used to exercise the antenna rotator system automatically for factory testing.

6.15 What is the configuration password for the Example.cnf file?

'custom'

This can be changed when on the configuration tab.

6.16 What Outstation Type should I configure?

All custom outstations (including the 3U and 1U PylonEPC types) are accessed using the S8000 outstation protocol.