



Taxi SelCall Dispatcher Software Applications Note



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1.0 Introduction

The Pentone Taxi SelCall Dispatcher system is designed to perform SelCall zoning, encoding, and decoding functions on a PC compatible under MS Windows 95. The system allows for a range of advanced features including:-

- ANI Call Stack
- 21 Plot Zones
- 100 Idents
- Colour Coded Cross-indexing of Radio ID's to text
- Auto/ Manual send House number to driver
- Auto send Position-In-Zone to driver
- Driver can query state of any zone
- Emergency Calls
- Call logging
- Flexible configuration of all Encode / Decode timing parameters
- Buffered Encode with Busy detection
- Designed to be driven with or without a Mouse
- Optimised for use with the ICOM F1010 mobile
- Upgradable to include multi-user job entry system

For simplicity this applications note discusses a real installed system configured for 20 geographical zones, colour coded Driver Idents, and Icom F1010 mobiles. The number, size, and names of zones are configured by Pentone at the time of ordering. For use with other mobiles please contact Pentone.

1.1 Future upgrades

A full-featured networked Job Entry (telephonist) module is scheduled for release in November 1998. This will allow systems with multiple job entry (telephonist) screens and single dispatcher screen. The module will be available as an upgrade to the existing software.

2.0 Hardware requirements

Pentium class PC, 166MHz
16Mb RAM
SVGA 1024*760 display
200Mb Hard disk drive space
3.5" Floppy disk
Sound card
Pentone PSD1 SelCall Interface Module

If a parallel printer is to be attached to the PC then the computer must be equipped with a second parallel port. These are available from Pentone if required.

Note: A faster PC will give quicker call response, particularly in noisy environments.

3.0 Driver Operation

{picture of F1010 here}

The up/down scroll buttons are used to scroll the display around the available zone names and status's. The following operations are available:-

P0 - Plot Clear. The driver uses the up/down buttons until the required zone is displayed and then presses P0. The car will be plotted into the zone as available for a job. The system will call the radio back and a two-digit number will appear on the radio display indicating the number of clear cars in that zone.

P0 - Enter status. The driver uses the up/down buttons until the required status is displayed (The status's are listed after the zones) and then presses P0. The status's available are:-

Mobile - The car is working as a Hackney. The car will be plotted as Busy in the No Plot zone

Out of Car - The driver is temporarily leaving the vehicle. The car will be marked as unavailable. If the driver plots 'In Car' within 10 minutes then the drivers position in the list will be preserved. If the driver fails to return within 10 minutes then the driver will lose their position in the queue

In Car (see above)

Sign On - At the start of shift the driver 'Signs On'. The car will be plotted Clear in the No Plot zone

Sign Off - At the end of the shift the driver 'Signs Off' and is removed from the dispatchers display.

House Number - If the driver forgets the house number of an intended pick-up, the driver selects the House Number status and presses P0. The system will automatically call the radio back and a three digit House Number will appear on the display. If the house number is not known the display will show '000'.

P1 - Plot Busy. The driver uses the up/down buttons until the required zone is displayed and then presses P1. The car will be plotted into the zone as busy. The system will call the radio back and the two-digit code "77" will appear on the radio display as an acknowledgement. The plot busy facility helps the dispatcher to efficiently allocate jobs when there are no free cars in a zone. If there are no free cars but a car has plotted as busy in that zone then the operator knows that a car will soon become available,

P2 - Enquiry - The driver uses the up/down buttons until the required zone is displayed and then presses P2. The system will automatically call the radio back and a two digit number will appear on the display indicating the number of cars plotted in the required zone. The car sending the call will not be re-plotted. Checking on the number of cars in other zones may help a driver to decide on which zone to go in order to find work.

P3 - The P3 button is reserved for future enhancement (e.g. emergency calls etc) but is not used in this particular installation.

4.0 Dispatcher Operation

On this site driver Idents have traditionally been colour coded (e.g. "Red Seven). The software allows this be cross-indexing the 2 digit radio Ident two digits of text. (e.g. radio Ident 45 might be cross indexed to the text "R7"). When the text is displayed on the dispatcher screen it is coloured dependant on the 1st letter of the text according to the following code:

- R - Red
- G - Green
- B - Blue
- A - Amber
- D - gold
- S - Silver

Any Ident text not starting in R/G/B/A/D/S will be displayed in black.

The main dispatcher screen contains the following elements:

Zone Box's. In this site there are two different zone sizes, to reflect the normal level of activity in the zones. The zone name is shown at the top of each zone box. Within each zone the system displays a list of cars in the zone. If a car is not available for a job then a status letter is shown after the Ident. The possible letters are:

- "b" - the car is busy
- "o" - the driver is temporarily out of the car
- "m" - the car is mobile, working as a Hackney

e.g. in the above display car Amber Three is in zone "A1" and is clear.
 Car Red Four is in zone "S1" but the driver is out of the car
 Car Blue Four is in zone "Box 4" and is busy

Clear cars are shown at the top of the zone in the order plotted (i.e.) the car that has been clear in the zone the longest is shown at the top of the zone. Busy cars are shown at the bottom of the zone (i.e. the car which has most recently plotted busy is shown last)

Call Stack. The call stack shows the Idents of the last 10 drivers to have made voice calls. The list can be cleared at any time by pressing the F1 key.

Encode Call Meter. When drivers send plot or enquiry calls the system automatically attempts to send a response call. If the dispatcher microphone is keyed then the system stacks the response call and the Encode Call Meter shows that a call is queued. If several calls are queued then the encode call meter will fill up, prompting the operator to release the microphone PTT for a moment and allow the automatic calls to go out. The system is capable of stacking an unlimited number of response calls for an unlimited time so no response calls should ever be lost.

Car Locator keys. Pressing the control key together with the required locator key will highlight all the cars of the required type. For example to locate all cars with disabled access the dispatch operator clicks the mouse on the "Wchair" locator button or presses CTL-W on the keyboard. Locator keys exist for:

- CTL S - Saloon - Locate all Saloon Cars
- CTL 6 - 6 Seaters Locate all vehicles with at least 6 Seats
- CTL 8 - 8 Seaters- Locate all vehicles with at least 8 Seats
- CTL A - Animals - Locate all cars that will carry pets
- CTL W - Wheelchair - Locate all cars with disabled access.

NB These search keys are configured by Pentone at the time of order. Different search keys are available.

The '?' key is a special locator key that causes the display to switch to view a table showing the state of all cars (working or inactive) in alphabetical order (as below). This is a useful way of locating a particular car. For example, if the operator wants to know where car G6 is, then rather than looking through all the zones, by pressing "?" the table below is shown.

Track All Cars							
038	Sign Off	063	Sign Off	088	Sign Off	B6	Sign Off
039	Sign Off	064	Sign Off	089	Sign Off	B8	No Pkt Busy
040	Sign Off	065	Sign Off	090	Sign Off	B9	A5 Clear
041	Sign Off	066	Sign Off	091	Sign Off	D1	Box 5 Clear
042	Sign Off	067	Sign Off	092	Sign Off	D2	A3 Busy
043	Sign Off	068	Sign Off	093	Sign Off	D5	Sign Off
044	Sign Off	069	Sign Off	094	Sign Off	D6	No Pkt Busy
045	Sign Off	070	Sign Off	095	Sign Off	G3	Box 4 Clear
046	Sign Off	071	Sign Off	096	Sign Off	G4	Box 5 Clear
047	Sign Off	072	Sign Off	097	Sign Off	G5	A4 Clear
048	Sign Off	073	Sign Off	098	Sign Off	G6	A5 Clear
049	Sign Off	074	Sign Off	099	Sign Off	G7	A5 Clear
050	Sign Off	075	Sign Off	A0	A5 Clear	G9	Box 5 Clear
051	Sign Off	076	Sign Off	A1	No Pkt Busy	R0	No Pkt Busy
052	Sign Off	077	Sign Off	A3	Sign Off	R1	No Pkt Busy
053	Sign Off	078	Sign Off	A3	A1 Clear	R2	No Pkt Busy
054	Sign Off	079	Sign Off	A4	No Pkt Busy	R4	South 1 Out of Car
055	Sign Off	080	Sign Off	A5	A4 Clear	R4	No Pkt Busy
056	Sign Off	081	Sign Off	A6	No Pkt Busy	R5	No Pkt Busy
057	Sign Off	082	Sign Off	B0	A5 Busy	R6	A4 Clear
058	Sign Off	083	Sign Off	b1	Sign Off	R9	No Pkt Busy
059	Sign Off	084	Sign Off	B2	A5 Clear	S1	A5 Clear
060	Sign Off	085	Sign Off	B3	A5 Busy	S2	No Pkt Busy
061	Sign Off	086	Sign Off	B4	Box 3 Busy	S4	A5 Clear
062	Sign Off	087	Sign Off	B5	Box 5 Clear	S5	No Pkt Busy

[Enter] OK

Showing that car G6 is in zone A5, and is Clear.

Manual Plot Key. Pressing "P" brings up the manual plot window.

Manual Plot

Car:

Zone:

Normally drivers are responsible for maintaining their plot, but under some circumstances it may be necessary to over-ride the automatic plot system (e.g. a driver finishes shift without signing off). The Manual plot system allows the following operations:

Plot clear: Type in the Car Ident (e.g. R7) and required zone (e.g. Air) and press enter (or click the mouse on the Clear button)

Plot busy: Type in the Car Ident (e.g. R7) and required zone (e.g. Air) and press function key 1 (or click the mouse on the Busy button)

Replotting cars 'on a black'. When a car arrives at a pickup to find no fare the dispatcher can use this function to replot the car in any zone. When the car is re-plotted it will be given the position within the zone queue that it would have occupied had it not been sent on the bogus job. If no zone is specified then the car will be returned to its last clear zone. If a different zone is specified (e.g. the zone that the car has gone to for the job) then the car will be plotted in the new zone and its position in the queue will reflect the time at which it last plotted clear.

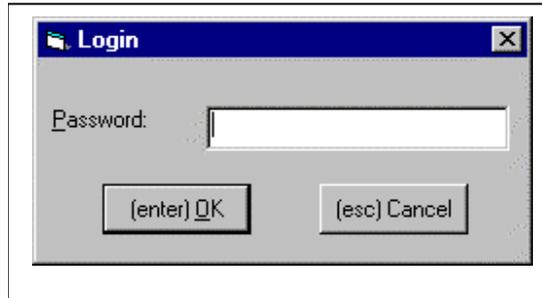
Manual Dispatch Window. To dispatch a car the dispatch operator makes a voice call to the car, then types in the car Ident (and optionally a house number) then presses {return}. The car will be automatically plotted as Busy in the No Plot zone. If a house number has been entered then the system will store the number and it will be available for the driver to query. The system may optionally be configured to automatically send the house-number on dispatch, in which case it will appear on the drivers display as a three digit number.

5.0 Management Operation

Management - level operations are only available after logging on with the management-level password. The system is supplied with the default management password "Manager". Although management operation is possible using only the keyboard it is easier if a mouse is available.

5.1 Logging On

Click the Log-On menu. The Logon dialogue box will appear:

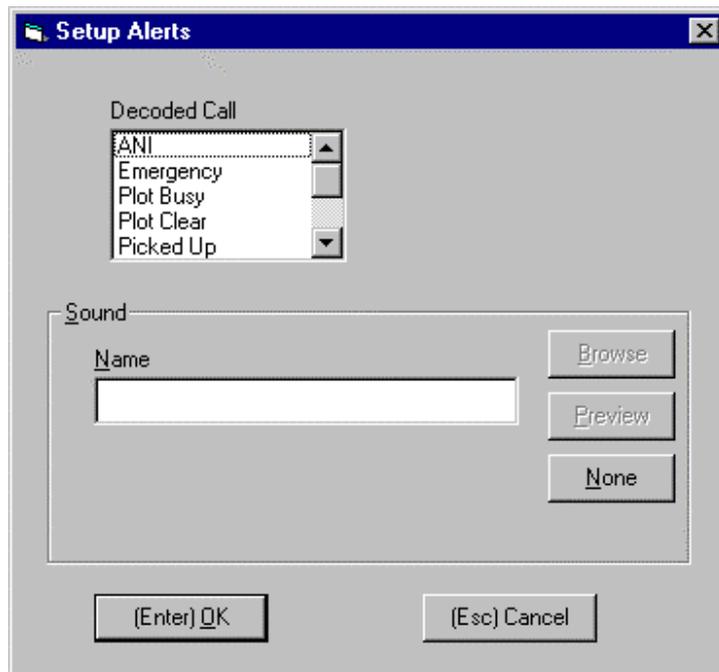


Enter the password and press the enter key. The title of the main screen will change to show Manager Level.

NOTE: a number of windows functions that are disabled at user-level (e.g. the keyboard 'Start' key, CTL-ALT-DEL, ALT-TAB etc) are enabled at Manager and Dealer levels. This prevents users accidentally switching out of the software.

5.2 Setup Audible Alerts

Select the Setup/Alerts menu item.



A sound (.WAV) file may be associated with each type of incoming call.

5.3 Setup Radio Idents

Select the Setup/Idents menu item.

The screenshot shows a window titled "Set Radio ID names". It has two input fields: "ID No (3 Digits)" containing "000" and "ID Text" containing "b1". Below these is a "Vehicle Type" section with radio buttons for "Hackney", "Saloon", "Estate", and "MiniBus", where "Saloon" is selected. There is also a "Seats" field with "4" and checkboxes for "Disabled" (checked), "Luggage", "Pets", and "Smoking". To the right is a list of ID entries from "000 b1" to "024 R2". To the left of this list are large letters: A (red), B (blue), D (green), G (green), R (red), and S (black). At the bottom are "(Enter) OK" and "(Esc) Cancel" buttons.

For example: A new driver has joined and is assigned radio 70. The driver has a saloon car with four available seats. The driver does not permit smoking in his car, but is happy to carry pets. The driver has a bad back so does not take heavy luggage. The driver is assigned the code Silver Nine.

Type in the ID No 070. The display scrolls to the current state of ID 070:

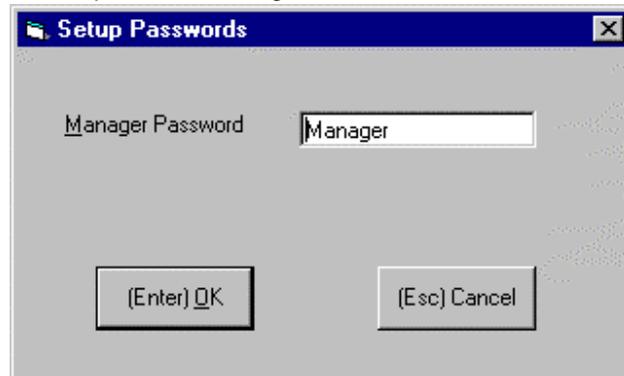
Type in the ID Text as S9.
Click the Saloon button
Click the Pets box
Click OK

5.4 Setup Logs

The system can maintain text logs which are particularly useful when attempting to diagnose problems. This menu should only be accessed under instruction from Pentone.

5.4 Setup Passwords

Select the Setup/Passwords menu. The existing Manager level password will be displayed and may be changed as required Note: If the password is forgotten then contact Pentone for assistance.



6.0 Dealer Operation

Dealer - level operations are only available after logging on with the dealer-level password. The system is supplied with the default dealer password "Dealer".

Although dealer operation is possible using only the keyboard it is easier if a mouse is available.

6.1 Logging On

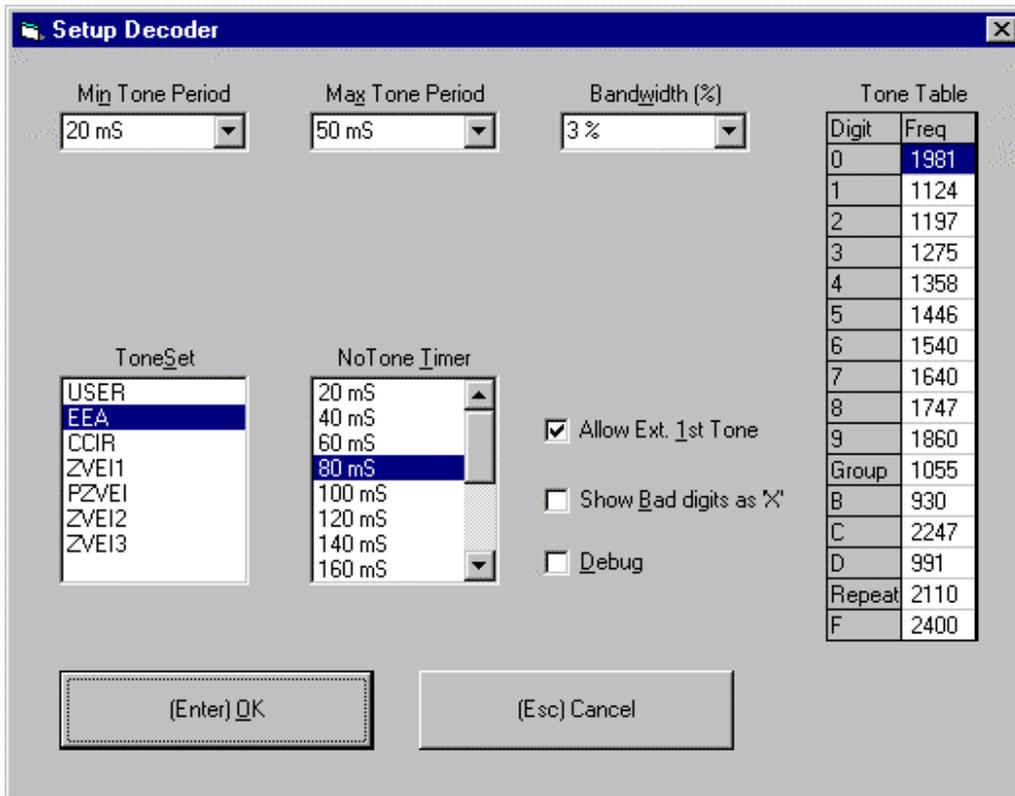


Click the Log-On menu. The Logon dialogue box will appear:

Enter the password and press enter. The title of the main screen will change to show Dealer Level.

6.2 Setup Decoder

Select the Setup/Decoder menu item.



The Min Tone parameter defines the minimum tone duration that will be accepted as a valid SelCall tone. For best decode reliability this should be set to 20mS less than the expected tone period. (e.g. for EEA 40mS, set the Min Tone period to 20mS)

The Max Tone parameter defines the maximum tone duration that will be accepted as a valid SelCall tone. For best decode reliability this should be set to 10mS more than the expected tone period. (e.g. for EEA 40mS, set the Max Tone period to 50mS)

The ToneSet parameter allows any of the common standard toneset parameters to be used. If a non-standard toneset is required then this should be specified to Pentone at the time of ordering and the appropriate data will be programmed into the 'USER' toneset.

The NoTone Timer parameter defines the period of 'no-tone' (e.g. silence) that should be taken to indicate the end of a decode sequence. This is commonly set to 1.5* the expected tone duration (e.g. for EEA 40mS, set the NoTone Timer to 60mS).

The Bandwidth parameter defines the tone accept bandwidth and is typically set at 3% (e.g. the standard frequency for EEA tone "6" is 1540Hz. At a bandwidth setting of 3% frequencies ranging from 1493 Hz to 1586 Hz will be successfully decoded.

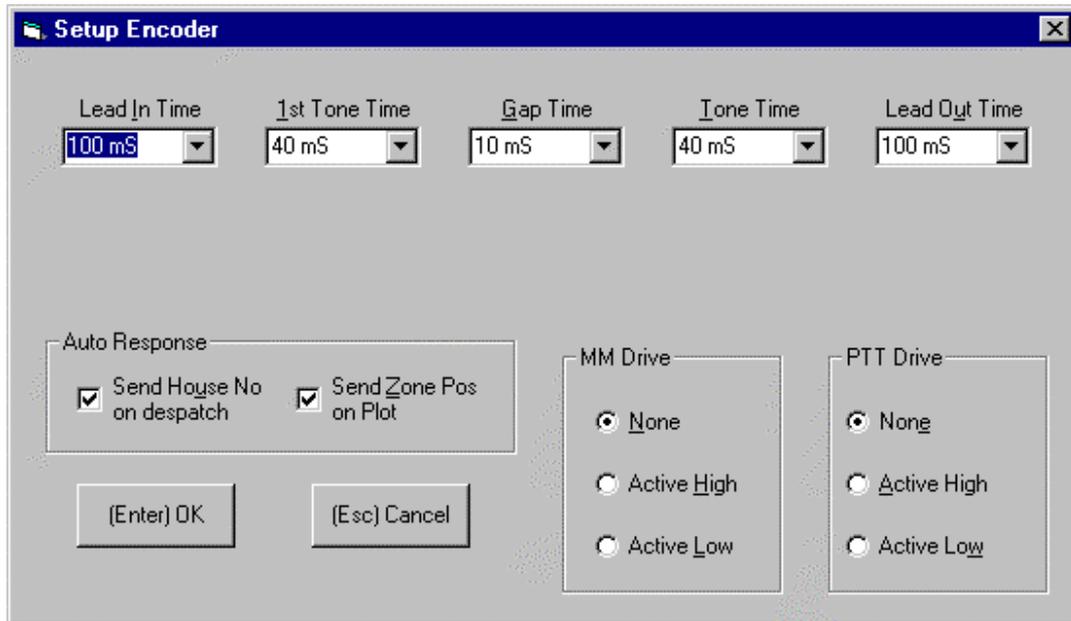
The Allow Ext 1st tone parameter allows sequences with extended 1st tone to be decoded, even when the length of the first tone is outside the Max Tone parameter. Extended first tones are often used to allow the transmission path to stabilise.

The Show Bad Digits as 'X' parameter should only be used under instruction from Pentone.

The Debug parameter should only be used under instruction from Pentone.

6.3 Setup Encoder

Select the Setup/Encoder menu item.



The Lead In Time parameter defines a period of PTT assertion before the start of the first encode tone. A Lead in is often used to allow the transmitter to stabilise before the first tone is generated.

The 1st Tone Time parameter defines the duration of the first tone in a sequence.

The Gap Time parameter defines an optional period of silence between each tone in the encode sequence. This is normally set at 0mS (no gap) but may need to be set at 10mS for use with some mobile equipment.

The Tone Time parameter defines the duration of all tones except the first tone.

The Lead Out Time parameter defines a period of PTT assertion at the end of the encode sequence.

If the Send House Number on Despatch parameter is set then when a car is dispatched the house number for pick-up will be automatically encoded for display on the mobile as a three digit number.

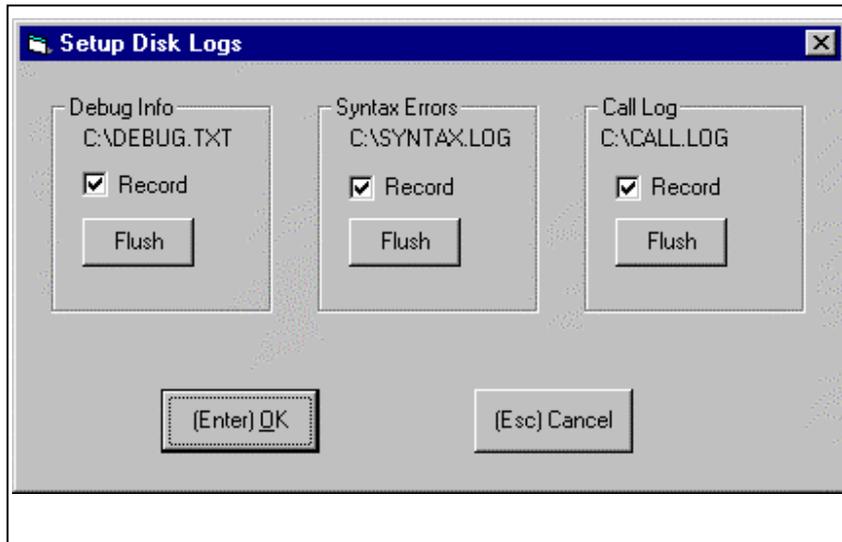
If the Send Zone Pos on Plot parameter is set then when a car plots clear in a zone, the number of clear cars in the zone will be automatically encoded for display on the mobile as a two digit number.

The MM Drive parameter defines the action of the Mic Mute output line from the PSD1 module during encode.

The PTT Drive parameter defines the action of the PTT output line from the PSD1 module during encode.

6.3 Setup Logs

Select the Setup/Logs menu item.



The system is capable of maintaining 3 text activity logs. Each log can be enabled by ticking the Record box, and emptied by clicking the Flush button.

C:\DEBUG.TXT contains a full list of all raw data received by the PSD1 in native format. This information is useful when attempting to analyse decode parameter setting problems. In a typical site the DEBUG.TXT file may accumulate 10Mb of data per day, so to prevent disk filling this option should only be enabled during configuration.

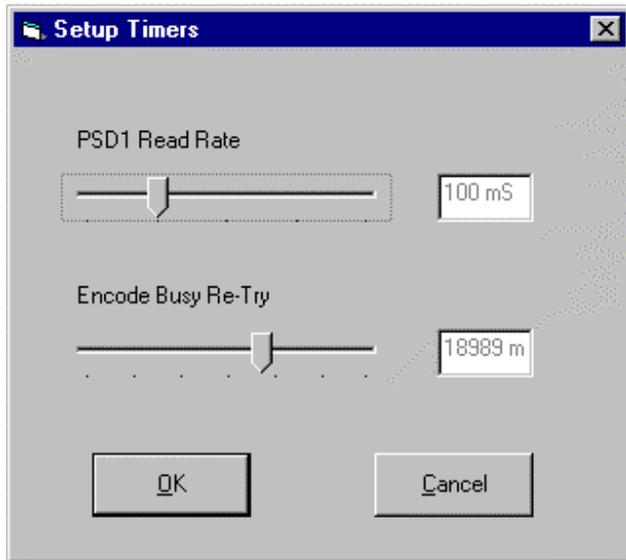
C:\SYNTAX.LOG contains a list of syntax errors generated during program execution. This log should normally be left enabled.

C:\CALL.LOG contains a time-stamped list of all decoded calls and dispatch operations.

The logs are in text format so may be examined using any standard text editor (e.g. Wordpad).

6.4 Setup Timers

Select the Setup/Timers menu item.

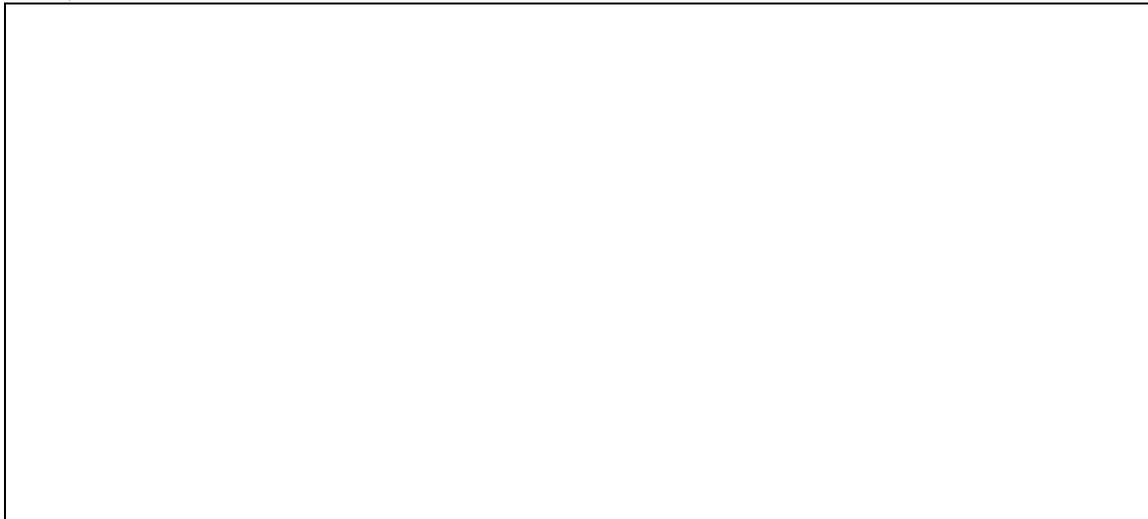


The PSD1 Read Rate parameter defines the rate at which the data from the PSD1 module is read. The ideal setting for this parameter depends on the amount of radio traffic and the speed of the host computer. This parameter should be adjusted for best call response speed. A value of 100mS , provides a reasonable approximate setting in most cases.

When the system attempts an encode (e.g. in response to a driver enquiry) the state of the microphone PTT line is checked. If the microphone is keyed then the encode is stacked. After a period defined by the Encode Busy Re-Try parameter a further attempt at the encode is made.

7.0 Hardware Installation

The system should be connected as outlined below.



System Connection Diagram - Fig 1

The PSD1 interface to the radio system involves the following signals:

PSD1 Pin	PSD1 Signal	Function
2,3,23	GND	Power / Signal Ground
8	MIC MUTE	Microphone Muting
9	PTT OUT	PTT Drive
14	LI	Mic PTT Detection
16	UDC	Unregulated 7-14v DC in
17	SO	SelCall Tones Out
22	SI	SelCall Tones In

NOTE: The MIC MUTE, and LI signals are configurable Active High or Low within the software.

The PSD1 Applications note should be studied before attempting to interface the module to the radio system.

7.1 Software Installation

The software is supplied on 4 floppy disks. Disk 0 contains the PSD1 device driver and disks 1-3 contain the applications software. Software installation should proceed as follows:

1. Boot the PC into DOS mode.
2. Insert disk 0 and copy the device driver to the root directory of drive C
COPY A\DESPATCH.SYS C:\
3. Set the Config.sys file to install the device driver on boot
EDIT C:\CONFIG.SYS
add the line
DEVICE=C:\DESPATCH.SYS
save the edited file.
4. Reboot the PC into windows. Assuming the PSD1 has not yet been connected / powered an error message will be displayed during boot-up. Ignore the message.
5. Use device manager to remove control of the PSD1 parallel port from windows control
click START
select SETTINGS / CONTROL PANNEL
double click on SYSTEM
click on the DEVICE MANAGER tab
click on PORTS
click on the port that will be used to communicate with the PSD1 (typically LPT1)
in the 'Device Usage' section set the 'Disable in this Hardware Profile' check box.
6. Shut down and turn off the PC.
7. Connect the PSD1 to the port and turn on power to the PSD1.
8. Reboot windows. If the PSD1 is not detected correctly an error message will be displayed.
9. Insert application disk1.
10. Click on MY COMPUTER / DRIVE A
11. Revue the 'README.TXT' file for any 'stop-press' information.
12. Double click on SETUP.
13. Follow the on-screen instructions.
14. Once installation is complete the PC should be configured to run the software on boot.
15. Click START
Select SETTINGS / TASK BAR
click on the Start Menu Programs Tab
click ADD
enter the path / name of the application EXE file (normally C:\Program Files\TAXI.EXE) then click NEXT

Select the STARTUP folder and click NEXT, then FINISH.
16. Reboot the PC.