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SYSTEM: UTC

# **SIESPACE**

## **OPERATOR HANDBOOK**

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## **1. INTRODUCTION**

The Siespace Park Guidance Information (PGI) system is designed to provide real time information to motorists regarding the availability of car park spaces within a given area.

Once configured the system is designed to work in a fully automatic mode with only minor attention required by the operators to clear paper from printers etc. On power-up the system will start automatically.

Further information as to the configuration of the PGI see PGI SYSTEM CONFIGURATION, page 58.

## 2. SYSTEM OVERVIEW

The object of the system is to assist drivers when entering an urban area, by directing them to the most convenient car park for their needs that has spaces available. The geographical area containing car parks monitored by the system is typically divided into regions, so that drivers can first be directed to an area before selecting a specific car park.

For example a city may be divided into north, south, east and west regions. On entering the city, signs will indicate the availability of parking spaces in each region and on entering the required region signs will indicate the occupancy of specific car parks.

The system user interface is the Siespace Instation. The Instation is used to carry out initial setting up of equipment within the system. The system will normally run automatically, with no operator intervention after initial setting up is complete, however it is possible for the operator to manually override the output to signs and occupancy data of car parks under emergency conditions. It is also possible for the operator to edit the set-up of the system. Reports can be obtained in various forms, based on data collected by the system, and a status panel can be displayed to indicate the live operational state of the system.

### 2.1 Simplified Block diagram

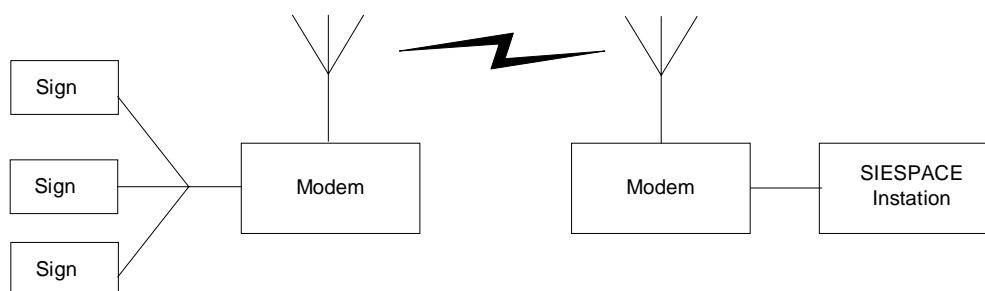


Figure 1 Simplified System Block diagram

### 2.2 Logical Elements of the System

The logical elements of the system are Count Sites, Zones and Signs. Count sites are positioned at the entrances and exits of car parks and pass data to the system which is used to calculate car park occupancy. The occupancy data for one or more car parks is passed to a Zones. The output from a Zone is used to set the output of a sign.

If a Zone contains more than one car park then the output to the sign will be the state of the car park that has the lowest occupancy. For example if the Zone contains four car parks, and two are full, one is almost full and one has spaces, then the Sign will be set to SPACES.

Due to the uniform structure of the system where Signs are always driven by the output from a Zone, in order to display the occupancy of an individual car park, it must be allocated its own Zone.

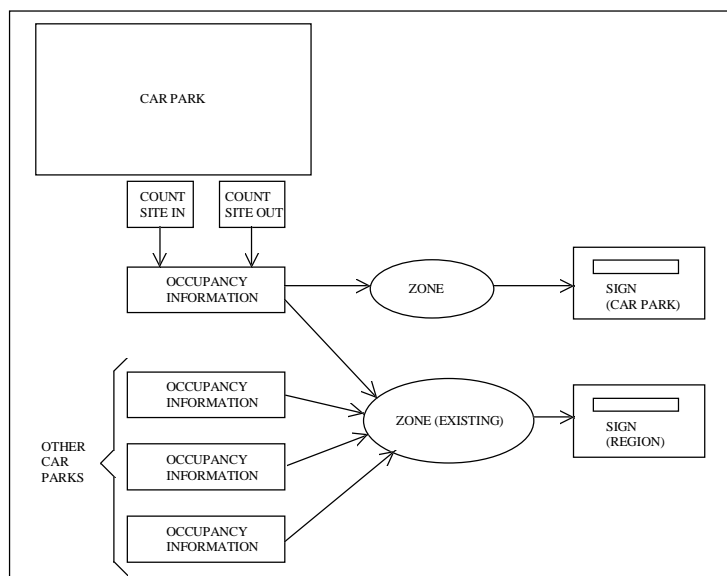


Figure 2 Logical Elements of the System

## 2.3 Physical Elements of the System

The Physical system consists of the Siespace Instation, Outstation Transmission Units (OTUs), Signs, Count Sites and Communication Systems. The system is expandable, very flexible and configurable in that different types of Sign and Count Site can be used, also communications can be direct by Radio Modem or via an Urban Traffic Control System (UTC). A combination of the two types of communication can also be used.

The diagram below shows how the system elements are *typically* connected. The OTU is the interface between the instation and the equipment for rotating plank signs (an OTU is not required for flip-dot signs). It has a handset port to accept input from a radio modem, and a telecom socket to connect a leased line modem. There are two output ports (8 bits each) and 4 input ports (8 bits each).

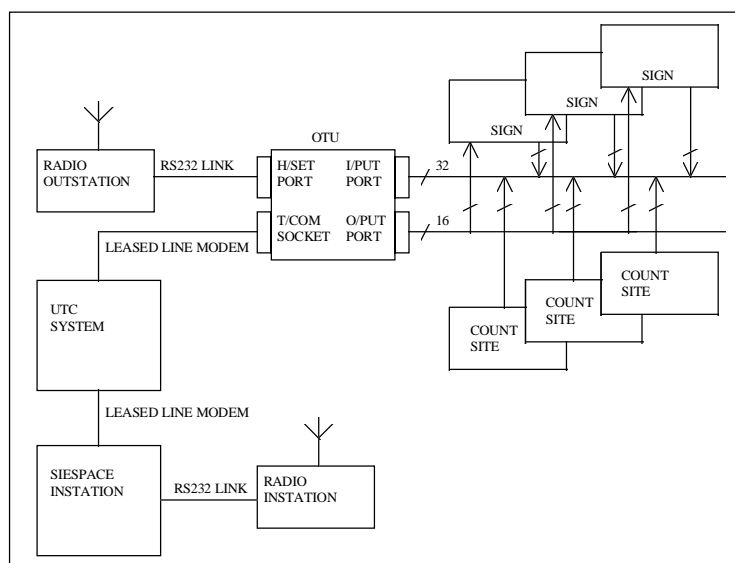


Figure 3 - Physical Elements of the System using an OTU and Radio Modem

The diagram shows typical connections to one OTU, but because of the expansion capabilities and flexibility of the system the connections will not be exactly as shown. All signs will need output lines to drive them and input lines to read their current state. The number of lines required will depend on the type of sign and the number of messages to be displayed. Similarly count sites require input lines, but the number will vary depending on the complexity of the count site.

The number of pieces of equipment connected to an individual OTU will depend upon it's geographical location relative to the equipment, and the number of input and output lines required by the equipment.

Communications between the OTU and the Siespace Instation can be direct by radio modem, or indirectly via a UTC system. A combination of the two systems may also be used.



### **3. USER INTERFACE**

The following sections describes how to Log On and Log Off the system and then the Main Tool Bar Button functions.

The user interface is based on an industry Windows standard as produced by Microsoft. The facilities of Microsoft Windows are utilised to provide the user with a familiar interface using a keyboard and mouse.

A VDU displays an overview map of the area being controlled. At the top of the map is a tool bar with buttons that can be selected by the operator in order to carry out various functions. The equipment used by the system must initially be defined, the way this is done is explained below. The equipment consists of Car Parks, Count Sites and Signs. Once allocated, the position of each piece of equipment is shown on the overview map by a location dot to show the position, an icon to show the type of equipment and a banner with additional information. When the system is running in information mode, the equipment icons on the map can be selected in order to view and edit details of the equipment.

#### 4. LOGGING ON/OFF

The system is a single user system. Each user must log on using a user name and a password before the facilities of the system can be fully accessed. The level of access that each operator is allowed is defined when the user account is set up by the system administrator via the security menu.

To log onto the system the operator must first bring up the logon window. This is done by clicking the mouse anywhere on the overview map while no other user is logged onto the system.

The following window will appear:-



Name	<p>This is a text field into which the user is required to enter their user name</p> <p>The user gains access to this field by clicking the mouse pointer within the data entry area.</p>
Password	<p>This is a text field into which the user is required to enter their password.</p> <p>The user gains access to this field by clicking the mouse pointer within the data entry area.</p> <p>Changes to the password are made via the security menu</p>
OK	<p>Operation of the OK button initiates the logon following the entry of the user name and the password.</p>



Logoff Button

Logging Off is achieved by the operation of the Logoff button on the menu bar.

## 5. MAIN TOOL BAR BUTTONS



### 5.1 Main Tool Bar



Information button

Selecting the information button puts the system in normal operating mode. This allows the system to run and the operator to carry out various editing and interrogation functions on the equipment. The operator can also use the system report functions.



Equipment Definition button

Selecting the Equipment definition button allows new equipment (signs, car parks and count sites) to be defined on the overview map. When the icon is selected, the Equipment Definition tool bar is added to the display.



Move Equipment button

Selecting this button enables the equipment or icons on the overview map to be repositioned. When a piece of equipment is initially placed, it's position is indicated by a dot on the overview map, an icon is also shown to indicate the type of equipment. The equipment appears on the map as an icon with the location dot at the bottom left hand corner.

If the position of the icon is inconvenient it can be repositioned by selecting the move equipment button, then selecting the icon for the equipment to be moved. The equipment icon and it's location dot will both turn green, if the icon is selected it can be dragged to a new position and a leader line is added from the icon to the location dot.

If the actual position of the equipment is to be changed, the procedure above is followed, but when the icon and dot turn green the location dot is selected and dragged to a new position. A window will automatically be opened to enable a new location to be entered for the equipment.



Reports button

Selecting this button opens a reports window from which various reports can be selected, they can be displayed on the screen or printed.



Status Panel button

Selecting this button opens a window showing the status panel. This panel shows the current logged on user, and any recent cleared/uncleared-cleared faults.



Filter button

When this button is selected a window is opened that gives various options for the amount of information about equipment that is displayed on the overview map. For each type of equipment it is possible to display a dot showing the location of the equipment, an icon showing the type of equipment and a banner showing the name. The filter gives the option of displaying the dot only, the dot and the icon or the dot, icon and banner.



Help button

When this button is selected the help text is enabled.



Zone Creation/Deletion button

Selecting this button will open a Zone Configuration window. This enables the creation of a Zone and the allocation of a sign and car parks to the Zone.



Set Signs to Blank button

Selecting this button will manually override all signs to their blank state as defined by the Zone. See Zones.



Set Signs to Auto button

Selecting this button will set all signs to their automatic mode (set by the output from a zone).



Log Off button

Selecting this button will log the current user off the system.

## 5.2 Equipment Icons on the Overview Map

The overview map shows an icon at the position of each piece of equipment to indicate the equipment type. If the icon is selected a window is presented with various options. The icons and associated windows are described below.



Sign icon

When a Sign icon on the map is selected, a window is opened with options to display, edit and override various functions of the sign.



Car Park icon

When a Car Park Icon on the map is selected, a window is opened with options to display, edit and override various functions of the car park.



Count Site icon

When a Count Site Icon on the map is selected, a window is opened with options to display and edit various functions of the count site.

## 6. USER INTERFACE - EQUIPMENT DEFINITION

### 6.1 Equipment Definition Button



Equipment Definition button

Selecting the Equipment definition button allows new equipment (signs, car parks and count sites) to be defined on the overview map. When the icon is selected from the main tool bar the Equipment Definition tool bar is added to the display.

### 6.2 Equipment Definition Tool Bar



Add Sign button

When this button is selected, the cursor turns to a cross, and a point can be selected to position a sign on the overview map. When a point is selected, the add sign window is opened and details of the sign can be added.



Add Car Park button

When this button is selected, the cursor turns to a cross, and a point can be selected to position a car park on the overview map. When a point is selected, the add car park window is opened and details of the car park can be added.



Add Count Site button

When this button is selected, the cursor turns to a cross, and a point can be selected to position a count site on the overview map. When a point is selected, the add count site window is opened and details of the count site can be added.

### 6.3 UTC system

An external Urban Traffic Control system which is linked to the PGI system. The UTC system can have count sites connected to its own communications system. The information from these count sites can be passed to the PGI system for the purposes of determining car park occupancies.

## 7. ADDING / REMOVING EQUIPMENT



New equipment can be added to the system by a user who has the required level of permissions, by selecting the Equipment Definition button from the main tool bar.

### 7.1 Equipment Definition Button

This will bring up the Equipment Definition tool bar which can be used to add equipment, Car Parks, Signs and Count Loops, to the overview map.

### 7.2 Move Equipment button



Once the equipment has been added, the equipment itself or its map icon can be moved by selecting the move button on the main tool bar.

### 7.3 Add Car Park



When the Add Car Park Button is selected from the equipment definition tool the following window will be presented.

Add Car Park

Car Park Name :

Description :

Location :

Capacity :

0

Overflow Threshold :

0

Increasing Thresholds :

To Almost Full :

0

To Full :

0

Decreasing Thresholds :

To Spaces :

0

To Almost Full :

0

State Change Delays (Minutes)

Increasing Delays:

From Spaces :

0

From Almost Full :

0

Decreasing Delays:

From Almost Full :

0

From Full :

0

Store

Close

☐ % Thresholds

## Fields to complete:-

Car Park Name	This is a field that must be completed and defines the name of the car park that will appear in the banner on the overview map.
Description	This is an optional field and can be used for any information that is of use to the operator. Typical uses are a contact name and phone number, or details of opening and closing times of the car park. The field length is limited to 50 characters.
Location	This is an optional field and can be used for any information that is of use to the operator. Typically it is used for the street name where the car park is located. The field length is limited to 50 characters.
Capacity	A numeric field to define the capacity of the car park.
Thresholds	<p>There are four thresholds which define when the car park changes state. When numbers are increasing, the state is defined as SPACES until the ALMOST FULL increasing threshold is reached, this state is maintained until the FULL threshold is reached. When numbers are decreasing from FULL the state changes to ALMOST FULL when the ALMOST FULL decreasing threshold is reached, then to SPACES when the decreasing SPACES threshold is reached.</p> <p>The FULL threshold can be set to any number up to the figure specified as CAPACITY, but it is advisable for it to be lower to introduce hysteresis into the system so it does not hunt between two states. The ALMOST FULL increasing threshold must be lower than the ALMOST FULL decreasing threshold also to introduce hysteresis. For obvious reasons, the decreasing SPACES threshold must be the lowest of the four values.</p>
State Change Delay	These fields define a delay in minutes (between 1 and 15) for changes from ALMOST FULL and from FULL. The delays have a similar effect to the differences between increasing and decreasing thresholds in that they introduce hysteresis. They are used for small capacity car parks, where it is not possible to have differences between increasing and decreasing thresholds that are large enough to stabilise the system.
Associated Zones	This field shows details of associated zones, but can not be changed from this window. Once the car park has been created it will become available to be allocated to zones (see Zones). When the car park has been allocated to a zone or a number of zones, the references will appear in this field.
Store Button	To save the data that has been added select the Store button, and to close the window select close.



## 7.4 Add Count Site



When the Add Count Site button is selected from the equipment definition tool bar the following window will be presented.

Descriptions of the fields within this window are shown below:-

Loop Name	This is a field that must be completed and defines the name of the COUNT SITE that will appear in the banner on the overview map
Description	This is a free format text field into which a short description of the site can be entered.
UTC SCN	If the count site is connected to the local UTC system then the SCN of that site is entered within this field. If the count site is not connected to a UTC system, this field must be left blank, as an entry in the SCN field will override entries within the RF Channel, OTU address and OTU Loop Fields.
Location	This is a free format text field which defines the location of the site.
Car Park	This is an information field which indicates to which car park the site is currently attached. The field cannot be altered by the user from within this menu. once this site has been added to the system it will become an available site and can be allocated to a car park by selecting the Associated Loops button in the car parks view/edit window.
RF Channel	This field defines the RF channel on the radio communications system through which the site is accessed.
OTU Address	This field defines the address on the RF channel of the OTU through which the site is accessed.

OTU Loop	This field defines which loop on the OTU is defined for this site.
Store	This button is used to store the updates done to the form in this edit session. If you wish to abandon the edits then select "Close" before selecting "Store".
Close	This button is used to close the current form. If this button is operated before the store button is selected then an option to store the current edits is presented to the operator. If store is not selected at this point the form will close without storing the current updates.

## 7.5 Add Rotating Plank Sign - OTU Comms

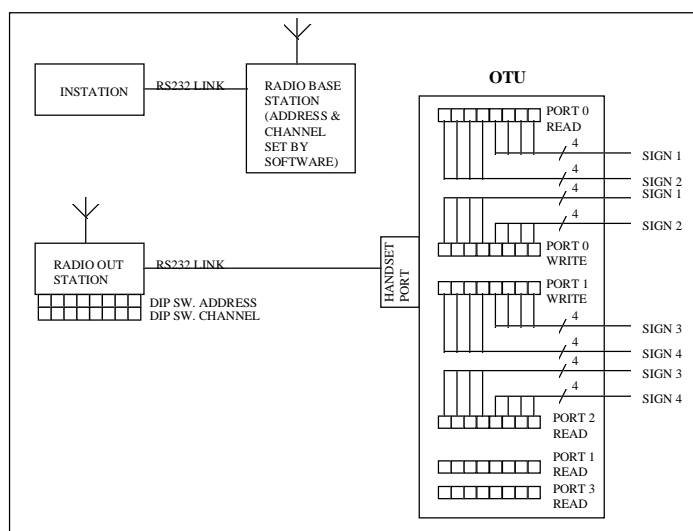


When the add sign button is selected from the equipment definition tool bar the following window will be presented. The window has three layers Sign Information, Communications, Sign Details.

Sign Information Layer	<p>To configure the sign to use OTU communications, OTU SIGN must be selected for the Type field. This is done by clicking on the right hand down arrow and selecting the appropriate entry.</p> <p>CAR PARK SIGN must be selected for the Application field in the same way as the previous field.</p> <p>The Name field must be completed and defines the name of the sign which will appear in the banner on the overview map.</p> <p>Location and Description fields are optional and any text can be entered that will be useful to the operator.</p>
Communications Layer	When the Communications layer is selected, the window shown below will be displayed.

RDT OTU HANDSET COMMS must be selected for OTU communications. This is done by clicking on the down arrow on the right hand side of the box then selecting the relevant entry. The other fields in the window will be completed automatically.

**Sign Details Layer** The Outstation Transmission Unit (OTU) is the device used to enable the Instation to communicate with Rotating Plank Signs. A Radio Base Station and Radio Out Station are also part of this system as shown in the diagram below.



**Figure 4 - OTU Communications System**

The Radio Outstation is allocated an Address and RF channel which is set up using DIP switches within the unit. When communicating with The Outstation, the Instation will send a command to the Radio Base Station to select the required address and channel.

The OTU has 2 write ports (0 and 1) and 4 read ports (0 to 3), both write ports and read ports 0 and 1 are used to communicate with signs, the other read ports (2 and 3) are reserved for use with Count Sites.

The number of bits required to drive a sign depends on the number of faces that are to be displayed. So it is not always necessary to use a complete port to control a sign, in the diagram the two OTU write ports are shown connected to four signs, each using four bits. Read ports 0 and 1 are also connected to the signs and are polled by the system software to check that the appropriate bits have been set.

When the Sign Details layer is selected, the window shown below will be displayed.

The RF channel and address are entered, by clicking on the down arrow at the right hand side of the box and selecting the relevant entry. The port number for this sign is then selected in the same way, in the illustration below, port 0 has been selected. Next the bits for the sign are selected, in the illustration, the most significant four bits have been selected. Referring to the diagram of the communications system above, this defines it as the bits to control Sign 1 (four most significant bits of Port 0). Next the bits to control each legend to be displayed are defined, in the example the two most significant bits are used to select Legend 0. Any other legends that are to be used will be defined in the same way.

## 7.6 Add Rotating Plank Sign - Remote Comms



When the add sign button is operated from the equipment definition tool bar the following window will be presented. The window has three layers, Sign Information, Communications, Sign Details.

Sign Information  
Layer

To configure the sign to use remote communications Remote Sign must be selected for the Type Field. This is done by

clicking on the right hand down arrow and selecting the appropriate entry.

Car Park Sign is selected for the Application field in the same way as the previous field.

Location and Description fields are optional and any text can be entered that will be useful to the operator

Communications  
Layer

As the sign has been configured as a remote sign, the Communications layer will not be available.

Sign Details Layer

When the Sign Details layer is selected, the window shown below will be displayed. The SCN number is added and the remote host selected.

The screenshot shows a software window titled "Add Sign". It has three tabs: "Sign Information", "Communications", and "Sign Details". The "Sign Details" tab is selected and active. Inside this tab, there is a text input field labeled "SCN" with a value of "123456789". To the right of this field is a text label: "This is the SCN number that is sent to the Remote System." Below the SCN field is a label "Select Remote Host" followed by a dropdown menu. The dropdown menu is open, showing the selected item "DORSET UTC SYSTEM" and a downward arrow. To the right of the main input area, there are two buttons: "Store" and "Close".

## 7.7 Add Sign



When the Add Sign Button is selected from the equipment definition tool bar an add sign window will be presented. The information added to the fields of the window will depend on the type of sign to be added. The system is designed to support a variety of sign types. Each sign requires to be configured with the messages it is going to display and the communications system used to initiate the required electro-mechanical actions. The current signs and communication systems supported on the system are

## **8. CAR PARKS**

### **8.1 Car Parks - Overview**

A car park is defined as an area with entrances and exits monitored by count sites. Data from the count sites are used to determine the occupancy of the car park.

During normal operation the car park is defined as having one of three states of occupancy:-

- Spaces
- Almost Full
- Full

Outside normal operation the car park can have two more states:-

- Closed (Set by an operator)
- Faulty (Set by the system if a fault is detected in the count site)

The states of occupancy are defined by comparing the occupancy state with a set of thresholds:-

- Almost Full Increasing
- Full
- Almost Full Decreasing
- Spaces

The reason for having separate increasing and decreasing thresholds for Almost Full is to introduce hysteresis into the system so the occupancy does not hunt between Spaces and Almost Full. If possible the Almost Full increasing threshold is set lower than the Almost Full decreasing threshold to a level where the system is stable. The capacity of the car park is also defined and for the same reason it is advisable to set the Full threshold lower than capacity. If it is impossible to stabilise the system using the thresholds, as in the case of very low capacity car parks, a change of state delay can be introduced. This is a delay specified in minutes, that can be placed between Full to Almost Full, and Almost Full to Spaces.

The status of the car park is passed to any Zones to which it is assigned. The Zone in turn passes the information to a Sign so the information can be displayed. The car park can be assigned to more than one Zone. It may be assigned to a Zone with other car parks, so that the occupancy of an area containing several car parks can be determined and displayed on a sign. An individual car park can also be assigned to a Zone, in order to display it's own occupancy (see Zones - Overview, page 79).

A car park can be added to the system by means of the user interface (see User Interface/Equipment Definition, page 14).

The configuration and occupancy details can also be viewed and edited by selecting the appropriate equipment icon on the overview map (see Equipment Icons on the Overview Map, page 12).

## 8.2 Car Park - Icon



A car park is defined as an area having entrances and exits monitored by count sites.

A car park has a defined capacity. The occupancy of a car park is defined as the number of cars currently parked within the car park and is determined from the information obtained from the car parks count sites. Depending upon the occupancy, the car park is defined to be in one of the following states during normal operation :-

- Spaces
- Almost Full
- Full

During abnormal operation the car park can also be set to the following states

- Closed (Set by an operator)
- Faulty (Set by the system when the car park detects that it has a faulty count site).

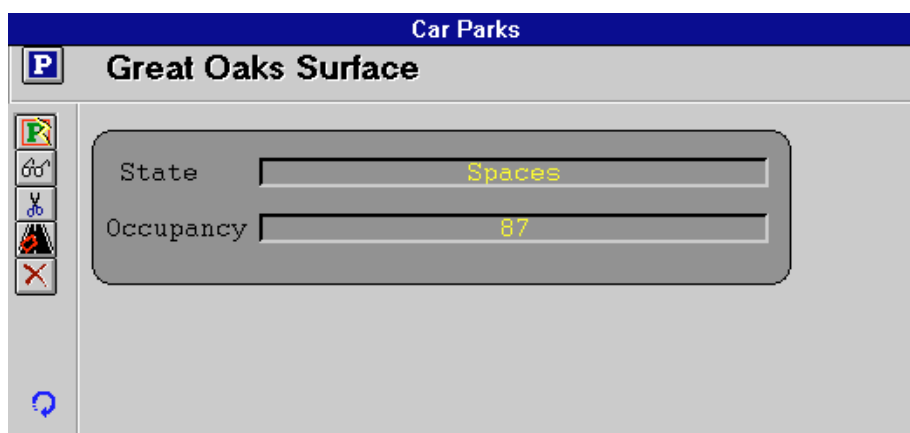
The status of the car park is passed to any Zones to which the car park is assigned. These in turn provide the information for the control of the signs

During normal operation the car park states are set automatically in response to the current occupancy value of the car park and a set of preset occupancy thresholds being passed. The car park has the following definable change of state thresholds:-

- Almost Full Increasing
- Full Increasing
- Full Decreasing
- Almost Full Decreasing

The actual change will occur at the designated value + 1 for increasing thresholds and value - 1 for decreasing thresholds. Decreasing thresholds may also have a time delay of between 1 and 15 minutes programmed to prevent rapid changes between states. The system also allows an operator to lock the car park into one of the states using a manual override.

Selecting the Car Parks Icon on the overview map will bring up the following window



The window displays the current state and occupancy of the car park.

The window contains the following buttons



Close button

Clicking this button will exit the operator from this window.



Manual override button

Clicking this button will open the manual override window.



View details button.

Clicking this button will open a windows showing the current configuration of the car park. The information contained within this window is the same as the information contained within the Edit Configuration form



Edit Configuration button

Clicking this button will open a window containing a form showing the current configuration of the car park. An operator with the correct level of access will be able to edit this form to change the configuration of the car park.



Assign Loops

Clicking this button opens a window which show which loops are currently assigned to this car park.



Delete car park button

Operation of this button by an operator with the correct level of access will delete the car park..

### 8.3 Car Parks - Associated Count Sites

The parameters provided can be configured by a user with the correct level of privilege by selecting the edit icon.

Selecting the overview and then the edit icons presents the following form



**Edit OTU Loop Entry**

**Cannon in**

Loop Name:

Description:

Location:

Car Park:

UTC SCN:

RF Channel:

OTU Addr:

OTU Loop:

Modem:

The form provides the following fields

Loop Name	This field allows the site name to be entered. The text entered within this field will be used on the overview banner for the site name.
Description	This is a free format text field into which a short description of the site can be entered.
UTC SCN	If the count site is connected to the local UTC system then the SCN of that site is entered within this field. If the count site is defined as existing then this field must be left blank. An entry in the SCN field will override entries within the RF Channel, OTU address and OTU Loop Fields.
Location	This is a free format text field which defines the location of the site.
Car Park	This is an information field which indicates to which Car Park the site is currently attached. The field cannot be altered by the user from within this menu.
RF Channel	This field defines the RF channel on the radio communications system through which the site is accessed.
OTU Address	This field defines the address on the RF channel of the OTU through which the site is accessed.
OTU Loop	This field defines which loop on the OTU is defined for this site.
Store	This button is used to store the updates done to the form in this edit session. If you wish to abandon the edits then select

"Close" before selecting "Store".

Close

This button is used to close the current form. If this button is operated before the store button is selected then an option to store the current edits is presented to the operator. If store is not selected at this point the form will close without storing the current updates.

## 8.4 Car Parks - Override Status



Manual override button

Clicking this button will open the manual override window.

The screenshot shows a window titled "Car Park Override Panel". It contains two labels: "State :" and "Occupancy :". The "State :" label is followed by a dropdown menu currently showing "None" and a small downward arrow button. The "Occupancy :" label is followed by a text input field. To the right of the dropdown menu are two buttons: "Store" and "Close".

This panel is selected from the car park top window.

**State** The panel allows manual override of the current state of the car park. The override states available are

**None** No override. The car park is working in automatic mode .

**Spaces** The car park is locked into the Spaces state.

**Almost Full** The car park is locked into the Almost Full state.

**Full** The car park is locked into the Full state

**Closed** The car park is locked into the Closed state. This state cannot be set automatically.

Selection of the override state is by opening the state menu by clicking the side arrow and then selecting the required state. Selecting None will return the car park operation to automatic mode. During an override condition the car park occupancy continues to be updated.

**Occupancy** The panel allows the current occupancy of the car park to be altered. To alter the current occupancy of the car park the operator will select the occupancy field by clicking the mouse onto it and then typing the required value into the box.

**Store** Following the completion of any edits to the state or the occupancy

the button store need to be selected before the selection is actioned.

**Close** The close button will close the panel. If the close panel is selected prior to the store button being selected then the operator is given the option of abandoning the current edits.

## 8.5 Car Parks - View/Edit Car Park Details



View details button.



Edit Configuration button.

This windows provides information as to the configuration of the car park. The field are not alterable by the operator when in the View mode. In Edit mode the fields are alterable by the operator.

**View Car Park Details**

Car Park Name :

Description :

Location :

Capacity :  Overflow Threshold :

Increasing Thresholds : Decreasing Thresholds :

To Almost Full :  To Spaces :

To Full :  To Almost Full :

☐ % Thresholds

**State Change Delays (Minutes)**

Increasing Delays: Decreasing Delays:

From Spaces :  From Almost Full :

From Almost Full :  From Full :

**Associated Zones :**

CITY  
Regency

Store

Close

This window provides information as to the configuration of the car park. The fields in this panel are alterable by an operator with the correct level of access. The fields are defined as follows:-

**Car Park Name** This is a text field which defines the name of the car park. This name will appear on the banner on the overview map.

**Description** This is a text field which allows a short description of the car park to be entered.

Location	This is a test field which allows a short description of the location of the car park to be entered.
Capacity	This is a numeric field which defines the capacity of the car park. This value is used to check if an overflow condition exists within the car park. This is indicated by turning the icon on the overview red.
Thresholds	The following fields are numeric values which define the threshold values at which the car park changes state. The fields are defined as increasing thresholds and decreasing thresholds. The actual change of state will occur at value + 1 for increasing thresholds and value - 1 for decreasing thresholds.
Change State Delays	The following fields define a delay time for the change from Full to Almost Full and the change from Almost Full to Spaces. The delays can have the value 1 to 15 minutes. A value of 0 removes the delay. The delays are used to prevent rapid changes between the states. This is particularly useful in small capacity car parks who's change points between the increasing and decreasing thresholds are very close.
Associated Zones	This is an information field which shows which zones the car park is currently assigned to. This field cannot be changed from this window.

## 9. COUNT SITES

### 9.1 Count Sites - Overview

A count site is a location on the system at which the number of passing vehicles can be determined. Count sites are configured to individual car parks

A count site can be added to the system by means of the user interface (see User Interface/Equipment Definition).

The configuration details can be viewed and edited by selecting the appropriate equipment icon on the overview map (see User Interface/Equipment Icons on the Overview Map).

### 9.2 Count Site - Icon

The parameters provided can be configured by a user with the correct level of privilege by selecting the edit icon.

Selecting the overview and then the edit icons presents the following form :

**Edit OTU Loop Entry**

**Cannon in**

Loop Name:

Description:

Location:

Car Park:

UTC SCN:

RF Channel:

OTU Addr:

OTU Loop:

Modem:

The form provides the following fields

Loop Name	This field allows the site name to be entered. The text entered within this field will be used on the overview banner for the site name.
Description	This is a free format text field into which a short description of the site can be entered.
UTC SCN	If the count site is connected to the local UTC system then the SCN of that site is entered within this field. If the count site is defined as existing then this field must be left blank. An entry

	in the SCN field will override entries within the RF Channel, OTU address and OTU Loop Fields.
Location	This is a free format text field which defines the location of the site.
Car Park	This is an information field which indicates to which car park the site is currently attached. The field cannot be altered by the user from within this menu.
RF Channel	This field defines the RF channel on the radio communications system through which the site is accessed.
OTU Address	This field defines the address on the RF channel of the OTU through which the site is accessed.
OTU Loop	This field defines which loop on the OTU is defined for this site.
Store	This button is used to store the updates done to the form in this edit session. If you wish to abandon the edits then select "Close" before selecting "Store".
Close	This button is used to close the current form. If this button is operated before the store button is selected then an option to store the current edits is presented to the operator. If store is not selected at this point the form will close without storing the current updates.

### 9.3 Count Sites - Loop Definition

The parameters provided can be configured by a user with the correct level of privilege by selecting the edit icon.

Selecting the overview and then the edit icons presents the following form :



**Edit OTU Loop Entry**

**Cannon in**

Loop Name:

Description:

Location:

Car Park:

UTC SCN:

RF Channel:

OTU Addr:

OTU Loop:

Modem:

The form provides the following fields

Loop Name	This field allows the site name to be entered. The text entered within this field will be used on the overview banner for the site name.
Description	This is a free format text field into which a short description of the site can be entered.
UTC SCN	If the count site is connected to the local UTC system then the SCN of that site is entered within this field. If the count site is defined as existing then this field must be left blank. An entry in the SCN field will override entries within the RF Channel, OTU address and OTU Loop Fields.
Location	This is a free format text field which defines the location of the site.
Car Park	This is an information field which indicates to which car park the site is currently attached. The field cannot be altered by the user from within this menu.
RF Channel	This field defines the RF channel on the radio communications system through which the site is accessed.
OTU Address	This field defines the address on the RF channel of the OTU through which the site is accessed.
OTU Loop	This field defines which loop on the OTU is defined for this site.
Store	This button is used to store the updates done to the form in this edit session. If you wish to abandon the edits then select "Close" before selecting "Store".

Close	This button is used to close the current form. If this button is operated before the store button is selected then an option to store the current edits is presented to the operator. If store is not selected at this point the form will close without storing the current updates.
-------	---



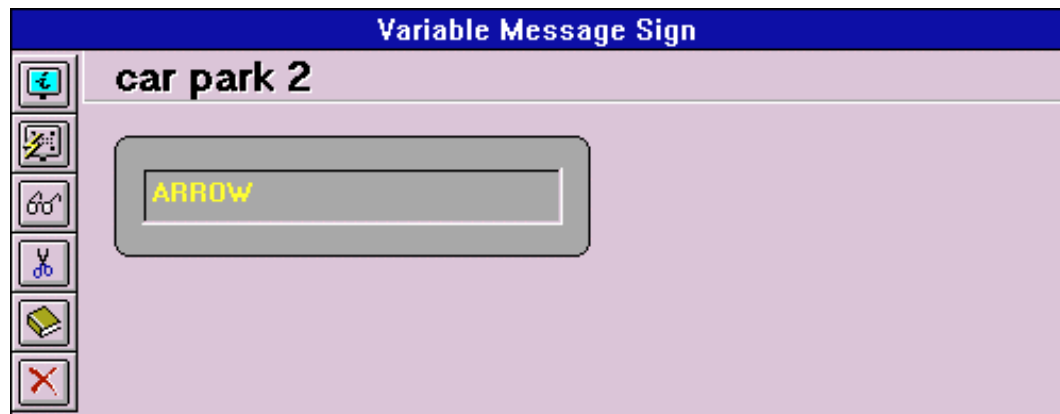
## 10. ROTATING PLANK SIGNS

### 10.1 Rotating Plank Sign Overview

Rotating plank signs use electro-mechanical technology to display a fixed set of messages. The messages are attached to the faces of mechanical components which rotate within the sign enclosure. To display a message the required face is moved into a visible position. The messages available at each site are determined at installation time and cannot be changed by the instation. At the instation the configuration of the sign requires the display information to be entered to enable the messages to be shown on the user interface.



Selection of the Signs Icon from the overview map will present the following form:



Sign Close Button

Operation of this button will close the current window.



Sign Override Button

Operation of this button bring up the sign override menu. From within this menu an operator, with the correct level of access, can manually set the sign to any of the available messages. The sign will retain this message until instructed to return to automatic mode.



View Sign Details button

Operation of this button provides the operator with information regarding the current configuration of the sign. The operator cannot edit any parameters from this menu.



Edit Sign Details button

Operation of this button brings up the sign configuration menus. From this menu an operator with the correct level of access can alter the sign parameters.



#### Legends Button

Operation of this button brings up the legends definition window. From this menu an operator with the correct level of access can assign which messages are output in response to message numbers requested by an associated zone



#### Delete the sign

Operation of this button will delete the sign. To perform this function the operator must have the correct level of access.

## 10.2 Rotating Plank - Legends - Assign Legends



#### Legends Button

When the Legends button is operated from within the signs window the following window will be presented. The window has three layers each layer is accessed by selecting the layer tag. If a layer is grey then it is unavailable for this sign type. The layers are Assign Legends, legend details and Legend text.

### 10.2.1 Assign Legends Layer

SCN	Bank Label
OTU 22	

ID	Legends Assigned
0	0
1	1
2	2

ID	Legends Available
3	3
4	4

SCN: Bank Label

For a rotating plank sign the SCN field is assigned automatically when the sign is created. The identification number is used internally by the software and does not relate to any user defined configuration information.. The bank label is not used by rotating plank signs and is left blank.

ID: Legends Assigned

This field shows the messages that are currently available for selection on this sign. The ID number is the message

	number that is passed from the associated zone The legend is the data which is output to the sign.
ID Legends Available	This field shows the Legends that are defined and currently NOT available for selection on this sign. Any Legend defined by sign of the same type is visible to all signs of that type. This removes the need to retype the same message many time into signs of the same type.
Assign Button	A message within the Legends Available field can be removed and placed into the Legends Assigned field by highlighting the message with the mouse and then selecting the "Assigned" button.
Available Button	A message within the Legends Assigned field can be removed and placed into the Legends Available field by highlighting the message with the mouse and then select the "Available" button.
New Legends Button	This button allows a new legend to be defined. (see Rotating Plank - Legends - Legend Details)
Delete Legend Button	This button allows a legend to be deleted from the form. The legend to be deleted is highlighted using the mouse and then the delete legend button is selected.
Save Legend	This button is greyed out in this form unless a new legend has been defined.
Store	The store button is used to store the current edit session. actions.
Close	The Close button is used to close this window. If the Close button is selected before the Store button then the operator has the option to abandon the current edits.

The ID number defines the message number which is received from the zone. The Legend Assigned shows the defined legend which will be output to the sign. In the case of a rotating plank sign this legend is expressed as a number. The number as expressed in the Legend Assigned field is interpreted by the sign control software into a bit pattern. This bit pattern is used to drive the sign via an OTU.

This field shows the mapping between the messages number which is passed to the sign from the associated zone and the legend number which is output to the sign.

On a rotating plank sign the legend number is translated into a bit pattern. This bit pattern is defined within the Rotating Plank View/Edit -OTU Details form.

## 10.2.2 Legend Details Layer

Legend ID	The Legend ID is a number identifies the message. The Legend ID is used by the zone to select the message to be output on the sign in response to a zone state.
Scenarios	This is a free format text field into which information as to the use of the sign can be entered.
Comments	For a rotating plank sign the comment entered into this field will be displayed in the sign overview when this message is selected.  For non rotating plank signs this field has a specific function to that sign type.
Next	Toggles the display to the Legend Text layer.
New Legends Button	This button allows a new legend to be defined. (see Rotating Plank - Legends - Legend Details)
Delete Legend Button	This button allows a legend to be deleted from the form. The legend to be deleted is highlighted using the mouse and then the delete legend button is selected.
Save Legend	This button is greyed out in this form unless a new legend has been defined.
Store	The store button is used to store the current edit session. actions.
Close	The Close button is used to close this window. If the Close button is selected before the Store button then the operator has the option to abandon the current edits.

## 10.2.3 Legend Text Layer



For rotating plank signs the legend text field contains the bit pattern number which is to be used to select the required plank face.

The actual bit pattern is defined in section Rotating Plank - View/Edit - OTU Details

The values select the following bit patterns

0 = Legend 0

1 = Legend 1

2 = Legend 2

3 = Legend 3

4 = Legend 4

5 = Legend 5

6 = Legend 6

7 = Legend 7

8 = Legend 8

9 = Legend 9

10 = Legend 10

( i.e. if bit pattern 0 is used to activate the aspect "closed" then the character "0" is entered into the legend text field).

## 10.3 Rotating Plank - Legends - Legend Details



## Legends Button

When the Legends button is operated from within the signs window the following window will be presented.

The Legends window is composed of three layers. Each layer is accessed by selecting the layer tag. If a layer is grey then it is unavailable for this sign type.

## 10.3.1 Legend Details Layer

**Legend ID** The Legend ID is a number identifies the message. The Legend ID is used by the zone to select the message to be output on the sign in response to a zone state.

**Scenarios** This is a free format text field into which information as to the use of the sign can be entered.

**Comments** For a rotating plank sign the comment entered into this field will be displayed in the sign overview when this message is selected.

For non rotating plank signs this field has a specific function to that sign type.

**Next** Toggles the display to the Legend Text layer.

**New Legends Button** This button allows a new legend to be defined. (see Rotating Plank - Legends - Legend Details)

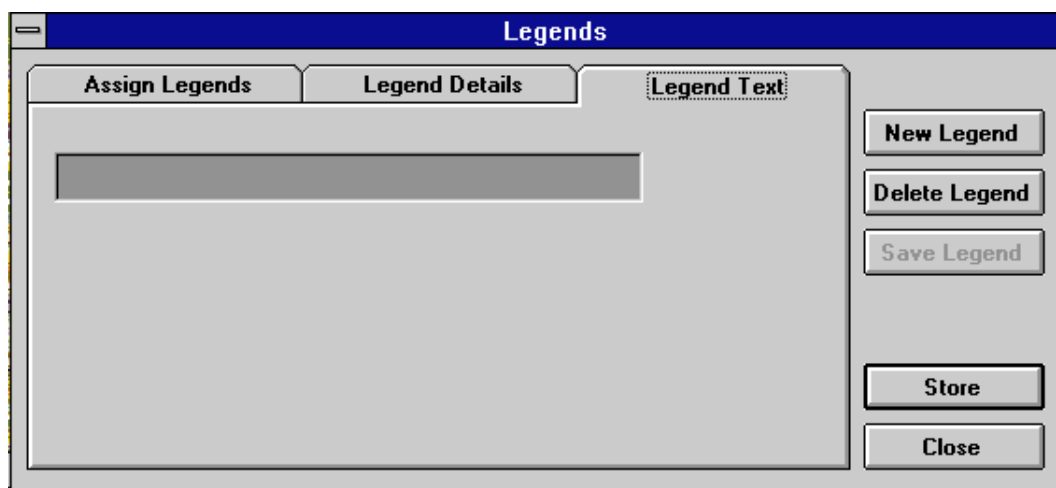
**Delete Legend Button** This button allows a legend to be deleted from the form. The legend to be deleted is highlighted using the mouse and then the delete legend button is selected.

**Save Legend** This button is greyed out in this form unless a new legend has been defined.

**Store** The store button is used to store the current edit session. actions.

**Close** The Close button is used to close this window. If the Close button is selected before the Store button then the operator has the option to abandon the current edits.

### 10.3.2 Rotating Plank - Legends - Legend Text



For rotating plank signs the legend text field contains the bit pattern number which is to be used to select the required plank face.

The actual bit pattern is defined in section Rotating Plank - View/Edit - OTU Details

The values select the following bit patterns

- 0 = Legend 0
- 1 = Legend 1
- 2 = Legend 2
- 3 = Legend 3
- 4 = Legend 4
- 5 = Legend 5
- 6 = Legend 6
- 7 = Legend 7
- 8 = Legend 8
- 9 = Legend 9
- 10 = Legend 10

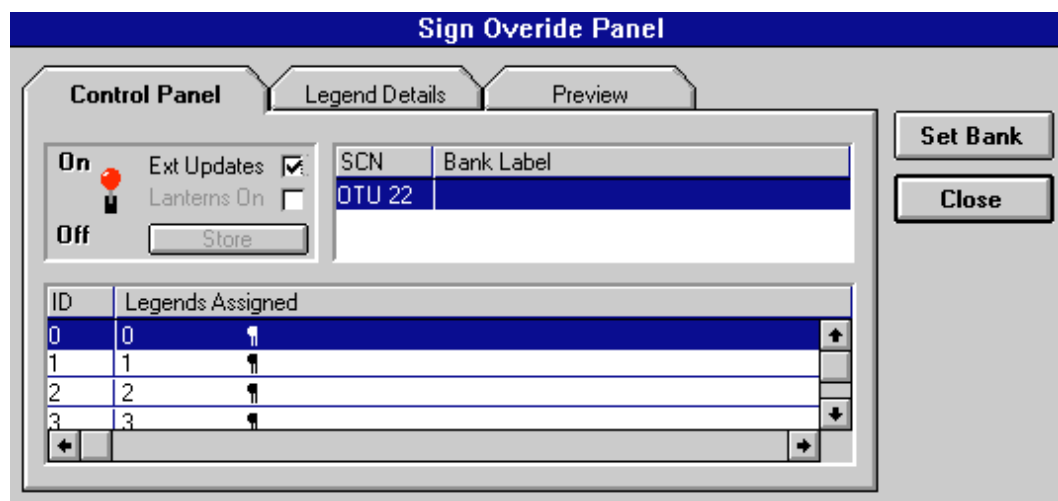
( i.e. if bit pattern 0 is used to activate the aspect "closed" then the character "0" is entered into the legend text field).

## 10.4 Rotating Plank - Sign Override Panel



When the Sign Override button is selected from within the Signs window the following window will be presented, which allows an operator with the required

level of access to manually set legends to be shown on a sign. The window has three layers, Control Panel, Legend Details and Preview.



- |                |   |
|----------------|---|
| Control Panel  | This allows the operator to select and set the required message.  |
| Legend Details | The legend details tag provides details of the message selected.  |
| Preview        | Preview shows a simulation of the indication on the sign if the message is set.   |
| On/Off         | This icon is used to indicate if the sign is currently switched on or off. For the rotating plank signs this switch should always be in the ON position. Setting the switch to Off will prevent any changes to the sign being made. Either automatic or manual. |
| SCN            | This is an identifier for the sign. The SCN is assigned by software and does not need to be changed.  |
| ID             | The ID number identifies the message number to which the legend is assigned. The message number is used by the Zone to request a legend to be set by the sign. Any legend can be assigned to any message number.  |

#### 10.4.1 Legend Details

The legend details tag provides details of the message selected.



**Sign Override Panel**

**Control Panel** | **Legend Details** | **Preview**

**Legend ID**

**Scenarios**

**Comments**

**Set Bank**

**Close**

- Legend ID** This is the ID number assigned to the selected legend. For the definition of legends see Rotating Plank - Assign Legends.
- Scenarios** This is a text field where the conditions under which the message is to be used can be entered.
- Comment** For rotating plank signs the comment field indicates the actual messages which are displayed. This is different than the legend details which indicates the legend bit pattern number to be output.
- Set Bank** Set Bank allows the currently selected message to be sent to the sign.
- Close** Allow the Sign Override Panel to be closed.
- Preview** The preview panel shows a preview of the message which will be displayed on the sign.

**Sign Override Panel**

**Control Panel** | **Legend Details** | **Preview**

**Legend ID**

**Scenarios**

**Comments**

**Set Bank**

**Close**

- Set Bank** Set Bank allows the currently selected message to be sent to the sign.
- Close** Allow the Sign Override Panel to be closed.

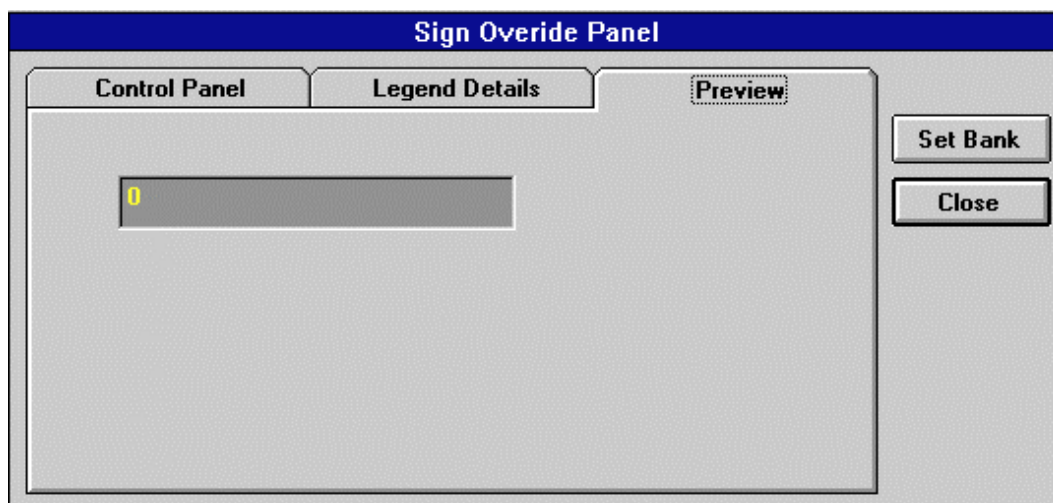
## 10.5 Rotating Plank - Sign Override/Legend Details

The Preview panel is accessed from the Rotating Plank - Sign Override /Control Panel

Preview	The preview panel show a simulation of what will be displayed if the selected message is output to the sign.
Control Panel	This allows the operator to select and set the required message.
Legend Details	The legend details tag provides details of the message selected.
Legend ID	This is the ID number assigned to the selected legend. For the definition of legends see Rotating Plank - Assign Legends.
Scenarios	This is a text field where the conditions under which the message is to be used can be entered.
Comment	For rotating plank signs the comment field indicates the actual messages which are displayed. This is different than the legend details which indicates the legend bit pattern number to be output.
Set Bank	Set Bank allows the currently selected message to be sent to the sign.
Close	Allow the Sign Override Panel to be closed.

## 10.6 Rotating Plank - Sign Override/Preview

The Preview panel is accessed from the Rotating Plank - Sign Override/Control Panel



Preview	The preview panel show a preview of the message which will be displayed on the sign.
Control Panel	This allows the operator to select and set the required message.
Legend Details	The legend details tag provides details of the message selected.
Set Bank	Set Bank allows the currently selected message to be sent to the sign.
Close	Allow the Sign Override Panel to be closed.

## 10.7 Rotating Plank - View/Edit - Communications



### View/Edit Sign Details

When the view sign details or Edit sign details button is operated from within the signs window the following window will be presented.

The View and Edit sign details menus are composed of four layers. Each layer is accessed by either selecting the layer tag or by operating the next button. If a layer is grey then it is unavailable for this sign type.

#### 10.7.1 Communications Layer:

Selection of the communications tag bring up the following Menu.

**View Sign Details**

Sign Details **Communications** Bank Details OTU Details

Comms Desc: OTU\_RADIO\_MODEM

Protocol: OTU Interface: RADIO

Flow: None Type: 0 Timeout: 5000

Setup: baud=1200 parity=E data=7 stop=1

Next >>

Store

Close

The system caters for a variety of signs each of which have their own communications protocol requirement. This field allows the communications parameters for the sign to be set up.

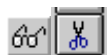
Comms Desc. Allows the type of communications to be assigned

For rotating plank signs select OTU\_RADIO\_MODEM.

All the other fields on the form are defined by the Comms Desc field.

These fields cannot be changed.

## 10.8 Rotating Plank - View/Edit - OTU Details



### View/Edit Sign Details

When the view sign details or Edit sign details button is operated from within the signs window the following window will be presented.

The View and Edit sign details menus are composed of four layers. Each layer is accessed by either selecting the layer tag or by operating the next button. If a layer is grey then it is unavailable for this sign type.

### 10.8.1 OTU Details Layer

Selection of the OTU Details tag bring up the following Menu.

For the control of rotating plank signs a piece of equipment called an OTU is used. To enable the system to select the required faces in response to message requests from the associated zone the " OTU Details" form needs to be configured.

**Address** This field defines the radio address on which the OTU is operating.

**RF Channel** This field defines the radio channel number on which the OTU is operating.

**Port Number** Defines which output/input port on the OTU the current sign control bits are designated to.

Port No 0 designates the "Bits for Sign" to reference output port 0 and input port 0 of the controlling OTU

Port No 1 designates the " Bits for Sign" to reference output port 1 and input port 1 of the controlling OTU.

See OTU Equipment Description

**Bits for the sign** A rotating plank sign is controlled by opening and closing a set of contract connected to the drive electronics. The OTU provides a means of operating the contacts. Each address and port number designates a set of 8 bits which can be used. The number of bits actually required for each type of sign is dependent upon the number of faces being driven. In the above form the sign only requires 4 of the 8 bits defined by that address and port number. The bits not designated to this sign will not be used and are available for use by another sign

See OTU Equipment Description

**Legend to Define/Defined Legend.** A rotating plank sign can support up to 10 legends.

For each legend a bit pattern is require. The bit pattern is translated by the OTU hardware into a combination of open and

closed contract which will cause the required sign face to be moved into the visible position. For information regarding the required bit patterns and sign faces available refer to the sign manufacturers sign data.

The system uses the bits returned on the associated input port to confirm that the sign has set the correct aspect. The sense of the inputs must be identical to that sent out .(i.e. if a 1 is used as a demand then the returned bit must also be a 1)..

The translation between the zone message number and the legend number selected is defined within the message definition menu

## 10.9 Rotating Plank Signs - OTU Communications - View/Edit - Sign Details



### View/Edit Sign Details

When the view sign details or Edit sign details button is operated from within the signs window the following window will be presented. The window has three layers Sign Information, Communications, Sign Details.

Edit Sign Details		
Sign Information	Communications	Sign Details
Type	OTU SIGN	
Application	CAR PARK SIGN	
Name	car park 2	
Location		
Description		

### Sign Information Layer

To configure the sign to use OTU communications, OTU SIGN must be selected for the Type field. This is done by clicking on the right hand down arrow and selecting the appropriate entry.

CAR PARK SIGN must be selected for the Application field in the same way as the previous field.

The Name field must be completed and defines the name of the sign which will appear in the banner on the overview map.

Location and Description fields are optional and any text can be entered that will be useful to the operator.

### Communications Layer

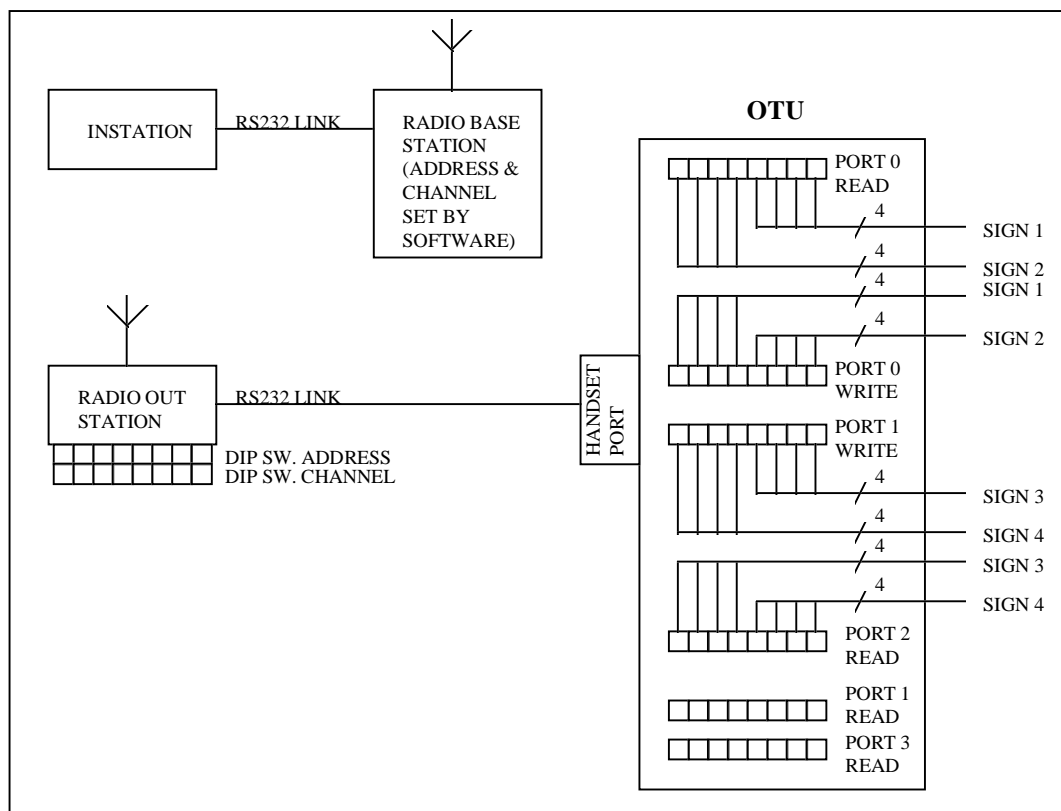
When the Communications layer is selected, the window shown below will be displayed.

RDT OTU HANDSET COMMS must be selected for OTU communications. This is done by clicking on the down arrow on the right hand side of the box then selecting the relevant entry. The other fields in the window will be completed automatically.

The screenshot shows a software window titled "Edit Sign Details" with a blue header bar. Below the header are three tabs: "Sign Information", "Communications" (which is selected and highlighted with a dashed border), and "Sign Details". The "Communications" tab contains several input fields: "Comms Desc" with a dropdown menu showing "RDT OTU HANDSET COMMS" and a down arrow; "Protocol" with a text box containing "OTU"; "Interface" with a text box containing "RS232"; "Flow" with a text box containing "None"; "Type" with a text box containing "I"; and "Setup" with a text box containing "baud-1200 parity-E data-7 stop-1". To the right of the input fields are two buttons: "Store" and "Close".

### Sign Details Layer

The Outstation Transmission Unit (OTU) is the device used to enable the Instation to communicate with Rotating Plank Signs. A Radio Base Station and Radio Out Station are also part of this system as shown in the diagram below.



**Figure 5 - OTU Communication System**

The Radio Outstation is allocated an Address and RF channel which is set up using DIP switches within the unit. When communicating with The Outstation, the Instation will send a command to the Radio Base Station to select the required address and channel.

The OTU has 2 write ports (0 and 1) and 4 read ports (0 to 3), both write ports and read ports 0 and 1 are used to communicate with signs, the other read ports (2 and 3) are reserved for use with Count Sites.

The number of bits required to drive a sign depends on the number of faces that are to be displayed. So it is not always necessary to use a complete port to control a sign, in the diagram the two OTU write ports are shown connected to four signs, each using four bits. Read ports 0 and 1 are also connected to the signs and are polled by the system software to check that the appropriate bits have been set.

When the Sign Details layer is selected, the window shown below will be displayed.



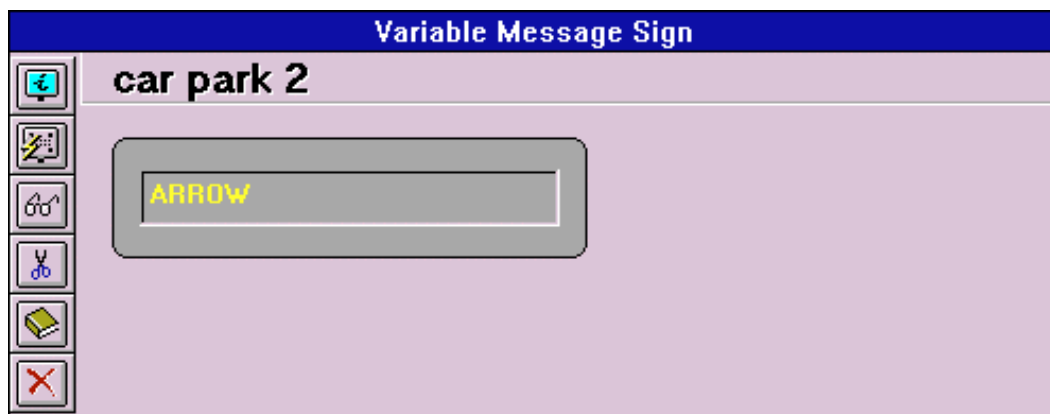
The RF channel and address are entered, by clicking on the down arrow at the right hand side of the box and selecting the relevant entry. The port number for this sign is then selected in the same way, in the illustration below, port 0 has been selected. Next the bits for the sign are selected, in the illustration, the most significant four bits have been selected. Referring to the diagram of the communications system above, this defines it as the bits to control Sign 1 (four most significant bits of Port 0). Next the bits to control each legend to be displayed are defined, in the example the two most significant bits are used to select Legend 0. Any other legends that are to be used will be defined in the same way.

## 10.10 Rotating Plank Sign Overview-Remote

Rotating plank signs use a electro mechanical technology to display a fixed set of messages. The messages are attached to the faces of mechanical components which rotate within the sign enclosure. To display a message the required face is moved into a visible position. The messages available at each site are determined at installation time and cannot be changed by the instation. At the instation the configuration of the sign requires the display information to be entered to enable the messages to be shown on the user interface.



Selection of the Signs Icon from the overview map will present the following form:



#### Sign Close Button

Operation of this button will close the current window.



#### Sign Override Button

Operation of this button bring up the sign override menu. From within this menu an operator, with the correct level of access, can manually set the sign to any of the available messages. The sign will retain this message until instructed to return to automatic mode.

(Select Sign Override Button above for help on this topic)



#### View Sign Details button.

Operation of this button provides the operator with information regarding the current configuration of the sign. The operator cannot edit any parameters from this menu.

The information available is detailed as:-

- Sign Information
- Communications
- Sign details.



#### Edit Sign Details button

Operation of this button brings up the sign configuration menus. From this menu an operator with the correct level of access can alter the sign parameters.

- Sign Information
- Communications
- Sign details.



#### Legends Button

Operation of this button brings up the legends definition window. From this menu an operator with the correct level of access can assign which messages are output in response to message numbers requested by an associated Zone



#### Delete the sign

Operation of this button will delete the sign. To perform this function the operator must have the correct level of access.

### 10.11 Rotating Plank Signs - Remote Comms

When the view sign details or edit button is operated from within the signs window the following window will be presented. The window has three layers, Sign Information, Communications, Sign Details.

The screenshot shows the 'Edit Sign Details' window. It features a blue title bar and three tabs: 'Sign Information', 'Communications', and 'Sign Details'. The 'Sign Information' tab is active, displaying several input fields: 'Type' is a dropdown menu currently showing 'REMOTE SIGN'; 'Application' is a dropdown menu showing 'CAR PARK SIGN'; 'Name' is a text box containing 'car park 2'; 'Location' is an empty text box; and 'Description' is a larger empty text box. To the right of the tabs, there are two buttons: 'Store' and 'Close'. A small icon of a notepad and pencil is located in the top right corner of the window's content area.

#### Sign Information Layer

To configure the sign to use remote communications Remote Sign must be selected for the Type Field. This is done by clicking on the right hand down arrow and selecting the appropriate entry.

Car Park Sign is selected for the Application field in the same way as the previous field.

Location and Description fields are optional and any text can be entered that will be useful to the operator.

#### Communications Layer

As the sign has been configured as a remote sign, the Communications layer will not be available.

### Sign Details Layer

When the Sign Details layer is selected, the window shown below will be displayed. The SCN number is added and the remote host selected.

The screenshot shows a software window titled "Edit Sign Details" with a blue header bar. Inside the window, there are three tabs: "Sign Information", "Communications", and "Sign Details". The "Sign Details" tab is currently selected and highlighted with a dashed border. Below the tabs, there is a form area with the following elements:

- An "SCN" label followed by a text input field. To the right of the field is a descriptive text: "This is the SCN number that is sent to the Remote System."
- A "Select Remote Host" label followed by a dropdown menu. The dropdown menu currently displays "DORSET UTC SYSTEM" and has a small downward arrow icon to its right.

On the right side of the window, outside the main form area, there are two buttons: "Store" and "Close". Above the "Store" button is a small icon of a pencil and eraser.

## 11. VARIABLE MESSAGE SIGNS



Signs icon

When the signs icon is selected from the overview map the Variable Message Sign Window will be presented. This allows the operator to view and edit various functions, these will vary depending on the type of sign and communication system being used.

The system is designed to support a variety of signs types. Each sign requires to be configured with the messages it is going to display and the communications system used to initiate the required electro mechanical actions. The current signs and communication systems supported on the system are :

- Urban VMS Signs - Radio Modems
- Urban VMS Signs - PSTN Modems
- Rotating Plank Signs - OTU Communications
- Rotating Plank Signs - Remote Communications
- NMCS2 Message Signs - OTU Communications
- NMCS2 Message Signs - OTU Communications

### 11.1 Signs - Overview

Owing to the flexibility and configurability of the system, signs of different types can be used with various systems of communication. The system needs to be configured in order to operate with the specific combination of sign and communication system.

Signs use different techniques to display variable messages, they can be of the rotating plank type, where a fixed number of faces can be selected to show different messages, or matrix signs, where the characters in the message are made up from a matrix of dots which can be changed to show different messages.

The communication systems used are, direct via a Radio Modem or remote via an Urban Traffic Control (UTC) System.

The status of the sign is controlled by the output from a Zone (see Zones - Overview, page 79).

A sign can be added to the system by means of the user interface (see User Interface/Equipment Definition ).

The configuration and status details can also be viewed and edited by selecting the appropriate equipment icon on the overview map (see User Interface/Equipment Icons on the Overview Map).

### 11.2 Signs - Icon



Signs icon

When the signs icon is selected from the overview map the Variable Message Sign Window will be presented. This allows the operator to view and edit various

functions, these will vary depending on the type of sign and communication system being used.

The system is designed to support a variety of signs types. Each sign requires to be configured with the messages it is going to display and the communications system used to initiate the required electro mechanical actions. The current signs and communication systems supported on the system are

Rotating Plank Signs - OTU Communications

Rotating Plank Signs - Remote Communications

## 12. INSTANTION CONTROL COMPUTER

The instation control computer is a PC based unit produced by HI-GRADE COMPUTERS with specifications similar or identical to the following :-

Case with PSU.

Pentium PCI Motherboard

Intel Pentium .CPU 3.3V

Pentium Heatsink/Fan

64MB (4 x 16) 72 Pin SIMMs Without Parity

2 x IDE Hard Disk Drive

Diamond Stealth64 Dram PCI 2MB

3.5" 1.44MB Floppy Disk Drive

102-key Keyboard (Cherry)

Digiboard 8-Port Intelligent Comms Card

Digiboard 8 way Cable

Parallel Printer Card

3COM Ethernet card or other similar specification

US Robotics Sportster Internal or External Modem(s)

Microsoft Serial Mouse

17" or 21" Colour Monitor

Optionally :

HP Deskjet Colour Printer

The system is loaded with the following proprietary software:-

Microsoft Windows NT V3.51

Crystal Reports V4.5

Oracle Database V7

The system requires no additional hardware configuration from that as delivered.

Loading of the applications software and of incremental backups in detailed in the section System Backups.

### 13. MOVING EQUIPMENT

Each piece of equipment displayed on the overview map has two items associated with it. These are :-

- The Equipment Icon
- The Location Dot

The equipment icon and the location dot are connected by a tie line.

The equipment icon defines the equipment type. The equipment icon is an active screen button which can be selected using the mouse to reveal status information and configurable items. The equipment location dot is an indication on the map at the location where the equipment is physically located. Both icons can be moved independently of each other.

To move either the icon or the dot perform the following procedure:-



From the filter options select the type of equipment to be moved and enable the display of the icon and the dot



Select the equipment move mode button from the top of the menu bar

To move a piece of equipment it must first be activated by clicking on it with the mouse. To move the equipment place the mouse pointer over the equipment and hold down the left hand mouse button.

With the button held down drag the icon to its new location.

To move the dot, click on the equipment's icon first and then drag the dot to the new location.



When movement of the equipment is complete reselect the information mode button from the overview menu

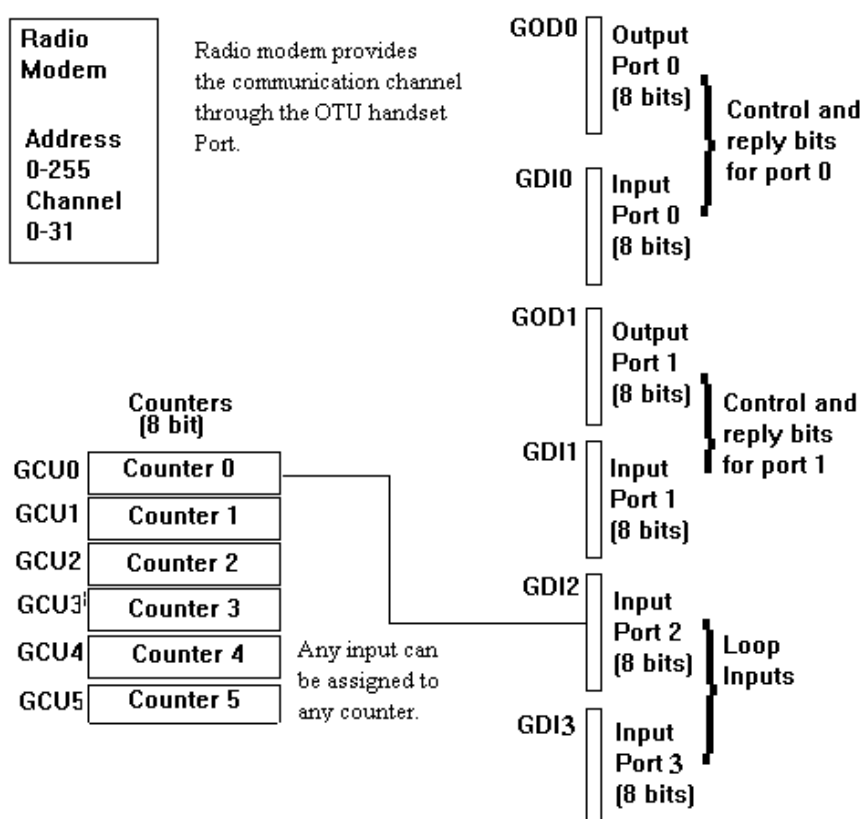


## 14. OTU EQUIPMENT DESCRIPTION

The equipment used is the standard Siemens OTU as used for urban traffic equipment.

Full details are provided in Siemens handbook part No 666/HB/43100/000 and installation guide 666/HE/43100/000. The unit is driven only through the handset port and therefore does not require any configuration for connection to Tele 12 equipment.

### OTU and Radio Modem Schematic



The OTU and the radio modem provide the physical connection to the external count and sign equipment. The system interrogates the OTU via the modem using the indicated commands. Port 0 and Port 1 in/out are used for sign control. In ports 2 and 3 are used for loop counts.

**Figure 6 - OTU and Radio Modem schematic**

## 15. PGI SYSTEM CONFIGURATION

The system has been created to implement a parking guidance system for town centres.

The system is composed of the following Items

### **Instation components**

- Instation control computer

- Instation multi channel multiplexer

- Instation leased line modem OR Radio modem OR PSTN modem

- Instation leased line OR

### **Base Station Components**

- Base station leased line modem

- Base station multi channel multiplexer

- Base station radio modem

- Base station radio modem aerial

### **Outstation Components**

- Outstation radio modems

- Outstation sign control equipment (OTU)

- Outstation Rotating Plank signs.

- Communication System

- Radio Based communication system

## 16. RADIO BASED COMMUNICATION SYSTEM

The system has the option of using a radio based communications system to replace the hard wire connections between the instation and the outstation equipment.

The type of radio modem used will be dependent upon the type of equipment to be driven. The system will currently support the following protocols:-

OTU handset protocol	(RS485)
NMCS2 protocol	(RS485)
EEV signs Protocol	(RS485)
Siemens Urban Signs Protocol	(UVMS)

The protocol used is defined within the equipment set-up of the individual equipment.

Each protocol requires its own data channel.

The radio based communications system is composed of equipment housed at the instation and a base station radio housed at a location within the control area. The instation and the base station are linked using a leased line.

The instation equipment comprises of a 4 channel multiplexer and a leased line modem. The base station comprises of a leased line modem, a four channel multiplexer and a base station radio modem with aerial.

The outstation equipment is fitted with a radio which communicates with the radio base station. Information from the instation is used to control the transferring of data from the base station to the outstation radios. Information received from the outstation by the base station is passed to the instation.

The four channel multiplexer units allow up to four RS232 serial channels to be sent down a single leased line.

For information about the individual components and their configuration see sections:-

## 17. MODEM CONFIGURATION

### 17.1 Leased Line Modem Set-up

The following set-up procedure is exclusively for use with US Robotics Courier modems as supplied for the project. Note: US Robotics modems use a two wire leased line circuit. The leads from the modem to the BT supplied socket require to be leased line leads. These can be obtained from US Robotic UK (See manual for address).

The set-up procedure requires a terminal to be available. This may be port 2 of the PC running the terminal emulator provided with windows NT.

Connect the terminal to the 25 way Dtype terminal of the modem.

With the modem switched off set the DIP switches on the underside of the modem as follows.

Dip#	Position
1	Up - Off
2	Up - Off
3	Down - On
4	Up - Off
5	Down - On
6	Up - Off
7	Up - Off
8	Down - On
9	Up - Off
10	Down - On

Power Up the modem

Using the terminal send the following commands

AT&F	Reset factory defaults
AT&M1	Sync, when online
AT&X0	Modems generate internal clock
AT&R0	Delay before CTS after RTS high
AT&S1	Modem Control DSR
AT&B1	Fixed DTE rate
ATS26=5	Set in 10 ms units of delay between RTS and CTS
AT&L1	Set leased line
ATX0	Results code options (all disabled)
AT&W	Store all commands to NVRAM

Now set the Dip switches to the following

Dip#	Position	
1	Down-ON	DTR forced on
2	Up -OFF	Verbal result codes
3	Up -OFF	Suppress results codes
4	Down-ON	No Echo
5	**** See Below	This switch is different between the instation and the base station ends.
6	Up	OFF Normal Carrier detect
7	Up	OFF Normal results codes
8	Down	ON Enable results codes
9	Down	ON No disconnect with +++
10	Up	OFF Use NVRAM settings

Instation and base station configuration.

\*\*\*\* Dip switch 5

In the Instation

Down-On Disable Auto Answer

In the Base Station Cabinet

Up -OFF Enable Auto Answer

Power down the modems.

Connect the modems to the leased line sockets and to the Cray multiplexers

Power up the modems and they will connect.

Using the volume control on the side of the modems adjust the connection sound volume as required.

## 17.2 PSTN Modem Set-up

The following set-up procedure is exclusively for use with US Robotics Courier modems as supplied for the project. Note: This procedure differs from the Radial Modem Set-up as PSTN (normal dial-up telephone lines) are used.

The set-up procedure requires a terminal to be available. This may be port 2 of the PC running the terminal emulator provided with windows NT.

There are two distinct set-ups, the first for a modem set up at the Instation and, if configured, a modem at the sign.

### 17.2.1 Instation Modem Set-up

Connect the terminal to the 25 way Dtype terminal of the modem.

With the modem switched off set the DIP switches on the underside of the modem as follows.

Dip#	Position
------	----------

1	Up - Off
---	----------

2	Down - On
---	-----------

3	Down - On
---	-----------

4	Down - On
---	-----------

5	Down - On
---	-----------

6	Up - Off
---	----------

7	Down - On
---	-----------

8	Down - On
---	-----------

9	Up - Off
---	----------

10	Up - Off
----	----------

Power Up the modem

Using the terminal send the following commands

AT&F	Reset factory defaults
------	------------------------

AT&A0	ARQ result codes are disabled
-------	-------------------------------

ATX0	Results code options (all disabled)
------	-------------------------------------

AT%N6	9600 bps
-------	----------

AT&W	Store all commands to NVRAM
------	-----------------------------

Now set the Dip switches to the following

Dip#	Position
------	----------

1	Down-ON	DTR forced on
---	---------	---------------

2	Up -OFF	Verbal result codes
---	---------	---------------------

3	Up -OFF	Suppress results codes
---	---------	------------------------

4	Down-ON	No Echo
---	---------	---------

5	****	See Below - This switch is different between the instation and the base station ends.
---	------	---

6	Up -OFF	Normal Carrier detect
---	---------	-----------------------

7	Up -OFF	Normal results codes
---	---------	----------------------

8	Down-ON	Enable results codes
---	---------	----------------------

9 Down-ON      No disconnect with +++

10 Up -OFF                      Use NVRAM settings

Instation and base station configuration.

\*\*\*\* Dip switch 5

In the Instation

Down-On      Disable Auto Answer

In the Base Station Cabinet

Up -OFF      Enable Auto Answer

Power down the modems.

Connect the modems to the leased line sockets and to the Cray multiplexers

Power up the modems and they will connect.

Using the volume control on the side of the modems adjust the connection sound volume as required.

### 17.3 Radio Modem Set-up

The radio modems are set-up to different configurations depending upon which protocol they are required carry. The two protocols currently available are the OTU protocol and the NMCS2 protocol.

Each protocol requires its own base station radio.

Not all systems will use all the protocols. Systems which do not have any outstation equipment connected for one of the protocols will not have any associated base station radio modems fitted.

#### 17.3.1 OTU Protocol

To implement the OTU protocol the modems at the base station and the outstations need to be set-up as follows.

##### 17.3.1(a) OTU Base Station

The base station modem for the OTU protocol requires to be fitted with software version "serial V2.0" This software allows the instation to change the address and channel number of the outstation with which it is communicating.

Power up the modem

Set all the DIP switches to OFF

Set SW1.1 = ON

Set the following switched as indicated

SW1.2 = OFF : Async Mode

SW1.3 = OFF

SW1.4 = OFF : RS232

SW1.5 = OFF : 500mW

SW1.6 = OFF

SW1.7 = OFF

SW 1.8 = OFF

SW2.1 = OFF :1200 baud

SW2.2 = OFF

SW2.3 = ON

SW2.4 = ON :Parity Enabled

SW2.5 = OFF :Even Parity

SW2.6 = OFF :7 Bits

SW2.7 = ON

SW2.8 = OFF :1 Bit

Set SW1.1 to OFF ( This captures the settings of the other switches into memory).

Without moving SW1.1 set all the other switches to OFF

Without moving SW1.1 set switch SW1.4 to ON. (Default Channel 1 )

#### 17.3.1(b) OTU Outstation modems

The outstation modems require to be fitted with the standard RDT software version 2.2 or above.

Power up the modem

Set all the DIP switches to OFF

Set SW1.1 = ON

Set the following switched as indicated

SW1.2 = OFF : Async Mode

SW1.3 = OFF

SW1.4 = OFF : RS232

SW1.5 = OFF : 500mW

SW1.6 = OFF

SW1.7 = OFF

SW 1.8 = OFF

SW2.1 = OFF :1200 baud

SW2.2 = OFF

SW2.3 = ON

SW2.4 = OFF :Parity Disable

SW2.5 = OFF



SW2.6 = ON :8 Bits

SW2.7 = OFF

SW2.8 = OFF :1 Bit

Set SW1.1 to OFF (This captures the settings of the other switches into memory).

Without moving SW1.1 set all the other switches to OFF

The modem now requires to have its individual address and channel number set.

This must be done without moving switch SW1.1

RF channels are set on SW1.4 to SW1.8 as a binary code indicating the channel Number. SW1.4 is the least significant bit. Channel numbers are in the range 0 to 31.

Unit addresses are set on SW2.1 to SW2.8 as a binary code indicating the unit address. SW2.1 is the least significant bit. Addresses are in the range 0 to 255.

#### 17.3.1(c) NMCS2 Protocol

For NMCS2 protocol the base station and the outstations are set the same. The Modem software for both the base station and the outstation is the standard RDT software version 2.2 or above.

Power up the modem

Set all the DIP switches to OFF

Set SW1.1 = ON

Set the following switched as indicated

SW1.2 = OFF : Asynch Mode

SW1.3 = OFF

SW1.4 = ON : RS485

SW1.5 = OFF : 500mW

SW1.6 = OFF

SW1.7 = OFF

SW 1.8 = OFF

SW2.1 = ON :2400 baud

SW2.2 = ON

SW2.3 = OFF

SW2.4 = OFF :Parity Disable

SW2.5 = OFF

SW2.6 = OFF :9 Bits

SW2.7 = OFF

SW2.8 = OFF :1 Bit

Set SW1.1 to OFF (This captures the settings of the other switches into memory).

Without moving SW1.1 set all the other switches to OFF

The modem now requires to have its individual address and channel number set.

This must be done without moving switch SW1.1

RF channels are set on SW1.4 to SW1.8 as a binary code indicating the channel Number. SW1.4 is the least significant bit. Channel numbers are in the range 0 to 31.

Unit addresses are set on SW2.1 to SW2.8 as a binary code indicating the unit address. SW2.1 is the least significant bit. Addresses are in the range 0 to 255.

## 18. REPORTS

The system can produce a selection of reports regarding the operation of the system.

The reporting menus are initiated by the selection of the reports button from the overview menu bar.



The reports may be either system wide or on an individual car park basis.

Available reports are:

Active Fault.	These are faults which are currently present on the system. If no faults exist on the system then the fault log will be empty.
Car Park States	This log records the changes of state that have occurred on each car park. The data is held for up to 7 days depending upon the amount of activity on the car parks.
Fault Log	This log records the occurrences and clearances of faults on the system. The data is held for up to 7 days depending upon the amount of fault occurrences/clearances on the system.
Occupancy Data	This data is held on a per car park basis. The information indicates the occupancy of each car park once an hour on the hour. This data is stored for 7 days and the current day.
Operational Log	The operational log records user actions occurring on the car park. The log records any sign or car park overrides initiated by an operator together with the time and operator identity.
Sign Settings	The log record setting of signs on an individual car park basis. The data is held for up to 7 days depending upon car

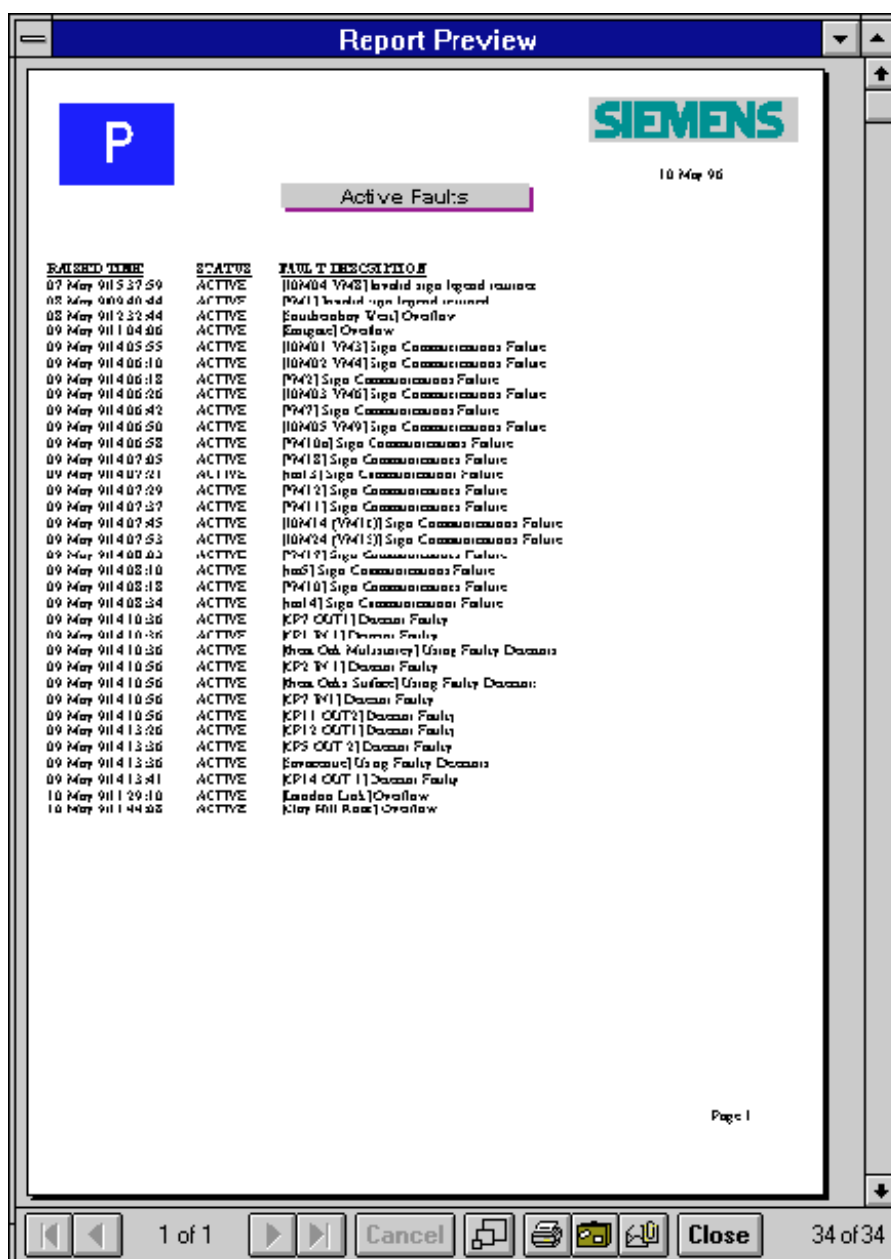
## Weighted Averages

park activity.

Weighted averages files are available on a per car park basis. The information held in the file indicates an average occupancy value for the car park for each day of the week. The data is averaged from the previous 6 weeks occupancy data. The weighted average file data is used to provide a car park state to an associated zone when a loop fault exists on the selected car park.

## Report Format

A report is obtained by first selecting the required report and then selecting the car park required from the initial reports form. and then selecting "Preview" if you wish to view the report or "Print" if you wish to get a hard copy of the report.



The report is presented on a standard report display. For reports composed of multiple pages the following icons allow the pages to be manipulated:-



Front Button

Operation of this button will bring up the front page of the report.



Next page

Allows the selection of the next page.



Previous page

Allows the selection of the previous page



Back page

Allows selection of the last page of the report.



Print

Allows the current report to be printed to the system printer.



Zoom

Allows the size of the text to be viewed to be altered.



Export

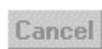
Allows the report to be sent to another system.

This function is currently not commissioned for the Essex system.



Mail

Allows the report to be sent as a mail message attachment.



Cancel

Allows an action to be terminated before it has completed the operation.



Close

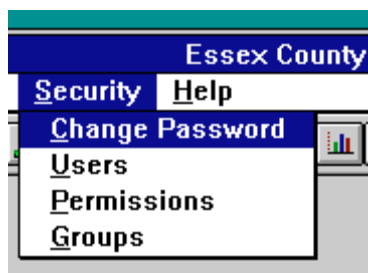
Closes the report.

## 19. SECURITY

### 19.1 Security- Overview

System security is controlled by the limiting of the use of the system to defined users. Each user is required to have a user name and an individual password. The facilities which the user is allowed to access are also definable.

The security functions are accessed from the overview menu bar which is present when a user is logged on.



The menu presents facilities for the operator to

- Change Passwords
- Define Users
- Alter Permissions
- Assign Access Groups

### 19.2 Security - Change Password

Change Password

This option is available to all users. The option allows the user to change his own password. If the user selects this option the following menu is presented:-

A screenshot of a 'Change Password' dialog box. The dialog box has a title bar with the text 'Change Password'. Inside the dialog box, there are four input fields: 'Login name:' with the value 'USER3', 'Old password:', 'New password:', and 'Verification:'. To the right of the input fields are two buttons: 'OK' and 'Cancel'.

Log in Name                      This field shows the name of the currently logged on user.

Old Password:                    The user is required to enter their old password into this

field. If the password has never been set or has been reset then this field is left blank

New Password:	The user enters the new password which they wish to use for future logging in.
Verification:	The user enters the new password a second time to ensure that a typing error has not occurred on the first entry.
OK	Operation of this button completes the data entry and initiates the password change.
Cancel	Operation of this button cancels the current data entry. The old password is retained.

### 19.3 Security - Groups

#### Groups

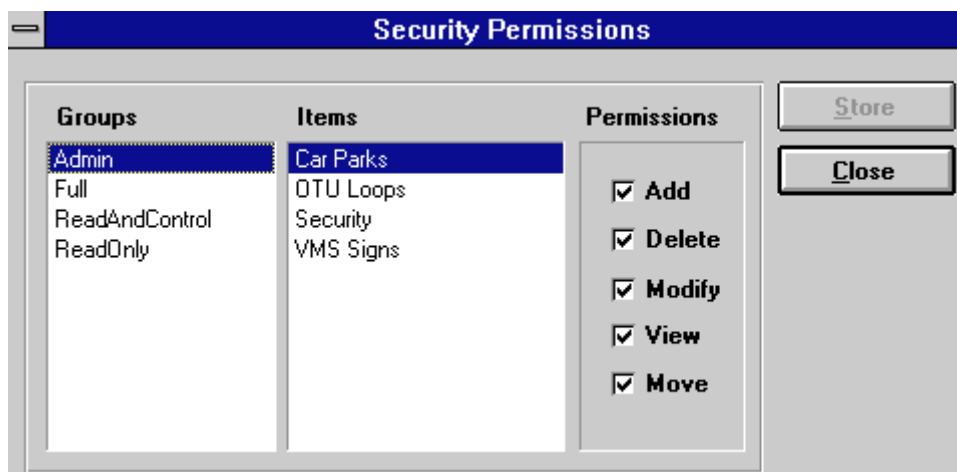
The Groups window allows new group names to be defined and current group names to be deleted.



Once a group name has been defined it must have its attributes set from within the Security Permissions set-up menu.

### 19.4 Security - Permissions

The Security Permissions menu defines what levels of access are allowed to members within the defined groups.



Groups	The Groups field shows the groups which are currently defined within the system.
Items	The items field shows the current device types to which permissions may be defined.
Permissions	<p>The permissions field shows the current allowed levels of access for the currently highlighted equipment type within the currently highlighted group.</p> <p>The permissions within a group are defined on a per equipment basis as shown in the type field.. To fully complete the definition for a group each type of device must be selected in turn. A single device may have different permissions assigned to it when it belongs to different groups.</p>
Store	Operation of the store button saves the current changes made to the Security Permissions window.
Close	Operation of this button closes the Security Permissions menu. If the Close button is operated before the Store button then the current edits can be abandoned.

## 19.5 Security - Users

This function allows new users to be defined onto the system. The menu is only available to users with the required permissions to assign users.

The menu allow the following functions to be performed.

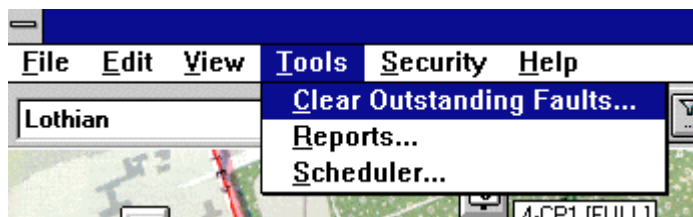
Name	Selection of the name menu button allows all the currently configured users to be displayed. A user can be selected by clicking onto the user with the mouse pointer.
New	Selection of this button will allow new user to be added to the system by typing in the new user name within the name field.



Delete	Selection of this button allows the current user displayed in the name field to be deleted from the system.
Clear Password	Selection of this button allows the password of the indicated user to be cleared. The user will now not require a password to log on.
Group Membership	Group Membership is used to assign the level of access that a user has. A group is defined as a set of permissions which are assigned to a user in the group. A user may be a member of a set of groups. A user who is a member of a set of groups will have a level of access equivalent to the aggregated access levels of all the groups that they are a member of.
Available Groups	This field shows the groups which can be assigned to the selected user.
Member Of	This field shows the groups to which the user is currently assigned.
Add	<p>Selection of the Add button assigns a selected group from the "Available groups" field to the "Member of " field.</p> <p>A group can be selected by clicking the mouse over the required group name..</p>
Remove	Selection of the Remove button removes the selected group from the "Members Of" field to the "Available Groups" field.
Save	Selection of the Save button saves the current changes into permanent storage.
Close	Selection of the close button closes the window. Selection of the close button before the save button allows the current edits to be abandoned.

## 20. SCHEDULER

The Scheduler function is selected from the overview map menus. The Scheduler is held within the Tools menu.



The Scheduler provides a means of programming operator actions into the system ahead of the required time.

The Scheduler also provides for regular events which occur on a weekly cycle to be programmed on a day of week basis.

Schedule Selection menu.

Selecting Scheduler from the Tools menu opens the following menu

Timetables		
Timetable Name	Day(s)	Date(s)
Monday	Mo	
Weekend	SaSu	
Christmas Day		25/12/1997
Christmas Day		

The menu displays a list of schedules and the days on which they are active.

Schedules which are defined for a number of specific days appear as an entry for each day.

They are however only one schedule. The entry which appears without any date against it should be selected for editing and viewing.

Schedules run between midnight and midnight. Two schedules cannot run on the same day.

If a schedule has a specific date associated with it then it will run in preference to any schedule designated to run on a "day of week" basis.

The functional buttons provide the following facilities:-

- Add            Provides a blank form into which a schedule can be entered. (See Schedule form)

View	Allows the viewing of a previously created schedule. The schedule to be viewed must first be selected from the list using the mouse. This mode does not allow any editing of the selected schedule.
Edit	Allows the editing of a previously created schedule. The schedule to be edited must first be selected from the list using the mouse. The mode allows all fields within the schedule form to be edited.
Delete	Allows the deletion of a previously created schedule. The schedule to be deleted must first be selected from the list of schedules using the mouse.
Close	This button closes this menu and returns the user to the overview screen.

## 20.1 Schedule Form

**Timetable Details**

Name:

Day(s):

☐ Monday ☐ Tuesday ☐ Wednesday  
☐ Thursday ☐ Friday ☒ Saturday  
☒ Sunday

Specific Date(s):

New Date:

04:00:00 Set Occupancy	2-Chalmers Street 150, 0	<input type="button" value="Add"/>
04:00:00 Set Occupancy	6-Greenside 850, 1	<input type="button" value="Delete"/>
04:00:00 Set Occupancy	1-Castle Terrace 800, 2	<input type="button" value="Close"/>
04:00:00 Set Occupancy	8-High Riggs 300, 3	
04:00:00 Set Occupancy	3-EICC 250, 4	

Time:

Car Park:

Command:

Open Car Park  
Set Occupancy  
Open Car Park  
Close Car Park  
Override Sign  
Cancel Sign Override

The schedule form allows the setting of events at specific times on days of the week or on specific days.

Schedules run from midnight to midnight. Only one schedule can run on any day. If a dated schedule is present then this will be run in preference to a day of week schedule for that day.

The form provides the following fields.

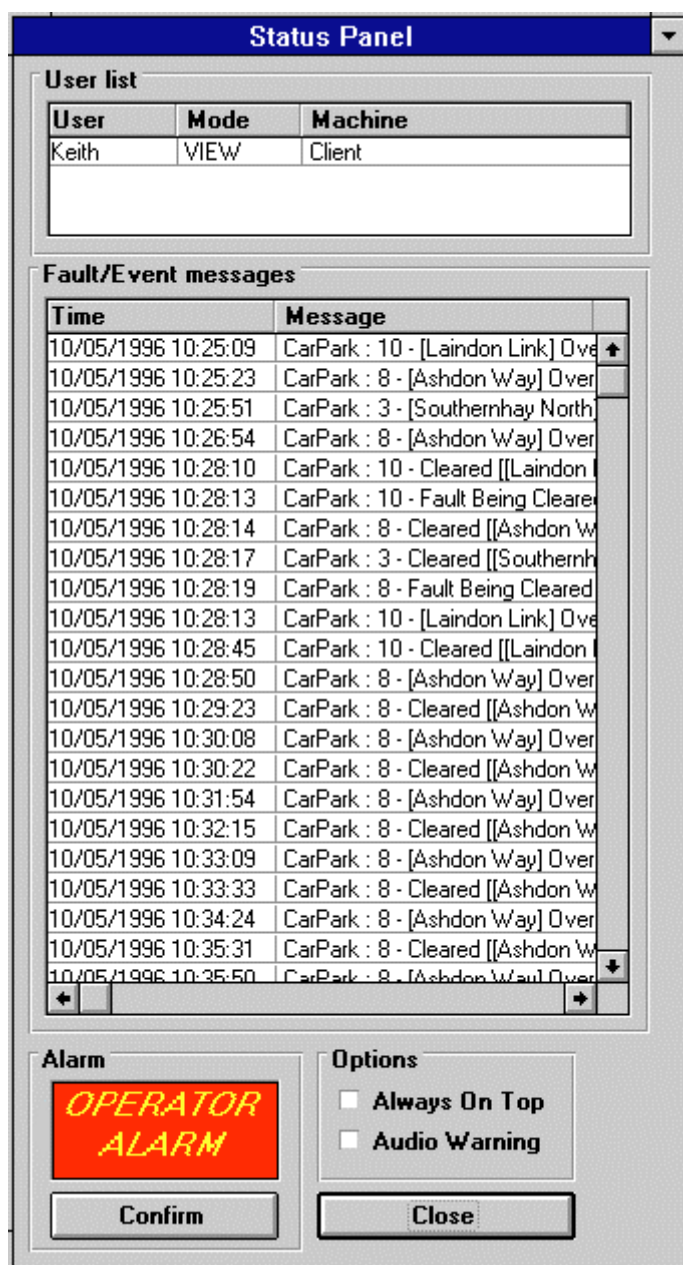
Name	This is a free format field into which the name of the schedule is entered.
Days	This field specifies on which days of the week this schedule will be run. Only one schedule can be active on any day. If the day has been already specified in another schedule then a fault will be

	flagged.
Specific Dates/Delete	<p>This field shows the specific dates that the schedule has been programmed for.</p> <p>When the delete button is operated the currently displayed date is deleted.</p>
New Date/Add	<p>This field is used to enter a new date following the operation of the Add button.</p>
Time	<p>This field specifies the time at which the action is to take place. The time is typed in using the format hh:mm:ss.</p>
Command	<p>This field allow the selection of the command that can be entered. If a car park control command is enter the two fields underneath change to reflect car park parameters. If the command entered refers to signs then the two fields underneath change to reflect sign control parameters. In both instances the operator will select from a list of options provided.</p>
Add	<p>This allows a new command to be added to the list. To modify a current command select the command to be modified and alter the parameters as required. Selection of the next line to modify or the close command will invite you to save the current modification on the current line.</p>
Delete	<p>This allows a command to be deleted from the list. The command to be deleted is selected using the mouse.</p>
Close	<p>Closes the menu.</p>

## 21. STATUS PANEL

The status panel is used to indicate live operational status of the system. The panel can be configured to provide an audible indication when a fault occurs and to automatically appear on the user interface.

If the automatic options are not selected then the status panel can be selected from the menu bar using the status panel button.



**Alarm** The alarm indicator flashes to indicate a new message has been added to the list. The flashing can be cancelled by the operation of the confirm button.

**Options** The options field allows the user to configure the operation of

	the panel.
	Always on top allows the user to configure the panel to always be displayed
	Audio warning allows the user to enable or disable an audible alert with the occurrence of messages.
Close Button	The close button removes the panel from the display.
User List	<p>The user list indicates which users are currently logged onto the system</p> <p>The name indicates the user name with which the user has logged on</p> <p>The mode indicates the current status of the user with respect to the interface</p> <p>The machine field indicates the name of the machine to which the user is logged on.</p>
Fault/Event Message	This field indicates the time and the event which has been has occurred.
System Backups	Not Applicable.

## 22. ZONES

### 22.1 Zones - Overview

A zone is defined as a controlled area composed of one or more car parks and controlling one sign. A zone provides the link between the car park states and the control of the driver information signs. From information regarding the state of the assigned car parks the zone will determine a state for itself. The zone will then use this state to determine the setting for the sign assigned to it.

The status of a Zone can be:-

- Spaces
- Almost Full
- Full
- Closed
- Blank

There are two methods by which a zone state is calculated.

#### (1) Zone State derived from Car Park states

The zone status is derived from the car park state by taking the least restrictive state of all the car parks connected.

i.e. For a zone with 3 car parks

If Car Park 1 state = Spaces (least restrictive)

Car Park 2 state = Almost Full

Car Park 3 state = Full

Zone state = Spaces

. If Car Park 1 state = Full

Car Park 2 state = Almost Full (least restrictive)

Car Park 3 state = Full

Zone State = Almost Full

Depending upon the zone status it will send a message to a configured sign to set an aspect. The sign connected to a zone can be configured independently of other signs in the system.

#### (2) Zone State calculated from Occupancy

The state of a zone can be calculated from the current occupancy of the associated car parks, based on the zone thresholds, defined in section Zones - Configuration, page 80.

## 22.2 Zones - Configuration



Zone Creation/Deletion Button

A Zone is configured by selecting the Zone Configuration button from the main tool Bar.

When the Zone Creation/Deletion button is operated from the main tool bar, the following window will be presented.

Zone Name	This field specifies the name of the current zone, other zones can be selected by clicking on the right hand down arrow and selecting another zone name. To create a new zone click onto the Zone Name field with the mouse. This will highlight the current zone name. Using the keyboard edit the current name to show the new name. Press enter and the new zone name will be created, car parks and signs can now be allocated to the zone using the buttons described below
Thresholds ...	See below
Delays ...	See below
Car Parks/Signs	This field selects the equipment to be displayed in the Available Equipment field. If Car Parks is selected the available car parks will be displayed and vice versa if Signs is selected.
Zone State:	This field shows the current status of the zone. This is calculated from the combined zones of the connected car parks.
Selected Equipment	This field shows the equipment currently associated with this zone. The equipment shown will depend on the state of the Car



Parks/Signs box as described above.

**Available Equipment** This field shows the equipment available which can be assigned to this zone. If the window is configured for Car Parks then the field shows the available car parks. If the window is configured for signs then the field shows the available signs.

Note:- A car park can be assigned to many zones. All car parks are available to every zone. A sign may only be assigned to one zone at a time. Once a sign has been assigned to a zone then it is removed from the list of signs available to other zones.

To assign a piece of equipment to the zone, select the required equipment from the Available equipment list with the mouse and click the Add button. With the mouse click the Store button. The selected equipment is now added to the Zone.

To remove a piece of equipment from the zone, select the required equipment from the Selected Equipment list with the mouse and click the Remove button. With the mouse click the Store button. The piece of equipment is now removed from the Zone.



Thresholds Button

On pressing the Thresholds button, the following window is displayed :

The 'Zone Thresholds' dialog box has a title bar 'Zone Thresholds'. It contains two columns of settings. The first column, 'Increasing Thresholds:', has 'To Almost Full' set to 70% and 'To Full' set to 90%. The second column, 'Decreasing Thresholds:', has 'To Spaces' set to 60% and 'To Almost Full' set to 80%. There are 'OK' and 'Cancel' buttons on the right.

Zone Thresholds	
<b>Increasing Thresholds :</b>	<b>Decreasing Thresholds :</b>
To Almost Full : 70 %	To Spaces : 60 %
To Full : 90 %	To Almost Full : 80 %

These parameters allow the increasing and decreasing thresholds to be defined as percentages of the car park capacity.



Delays Button

On pressing the Delays button, the following window is displayed :

The 'Zone State Change Delays' dialog box has a title bar 'Zone State Change Delays'. It contains two columns of settings. The first column, 'Increasing Delays:', has 'From Spaces' set to 0 and 'From Almost Full' set to 0. The second column, 'Decreasing Delays:', has 'From Almost Full' set to 0 and 'From Full' set to 0. There are 'OK' and 'Cancel' buttons on the right.

Zone State Change Delays	
<b>Increasing Delays:</b>	<b>Decreasing Delays:</b>
From Spaces : 0	From Almost Full : 0
From Almost Full : 0	From Full : 0

The values define the time delay, in seconds, for the sign display to change from one state to another.



### Message Button

When the Message button is operated from the Zone Configuration window, the following window will be presented.

A zone controls a sign by sending a message number (the legend ID) to it. Within the sign the message number will be associated to a sign message. The association between message number and actual message displayed is specific to each sign. Each sign will have a valid set of numbers associated with it. Check what message numbers are available on the sign which you are configuring before assigning this table. If a message number is selected which does not exist within the sign then a sign fault will be displayed on the overview map when the state selects the message.

This window allows a message number to be assigned to each state of the zone for each sign attached. The information is only available when the Zones configuration window is in Signs mode and a sign has been selected on the Selected Equipment menu. The information shown is for the sign selected within the Selected equipment menu. If no sign is selected then a default "All Signs" menu is shown. This is the message configuration for any signs which have not had a specific configuration made for them.

To configure the messages for the selected sign select the current message number field for the required state and insert the new message number. Following insertion of the required message number then click the Store button.

Clicking onto the Close button will close this menu.

- |               |  |
|---------------|--|
| Delete Button | This button is used to delete a zone. To delete a zone select the required zone into the Zone Name field and select Delete. This will delete the current zone. |
| Close Button  | This button closes the current window. If the Close button is clicked before the Store button an option to abandon the edits is presented to the operator.     |