



ROSie – RIDE OPERATING SYSTEM

OPERATOR'S MANUAL

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1.0 INTRODUCTION

This Operator's Manual is a detailed description of ROSie - Ride Operating System. ROSie is a control system for children's coin operated rides. The manual provides you with the information required to set-up, and get the best out of the child's ride to which ROSie is fitted.

This manual is supplied in the following circumstances:

1. With children's rides manufactured by **OMC Electronics** with ROSie installed into the ride. In this instance this manual will be provided in addition to the appropriate Ride Guide. Such users may ignore Section 3.0 (Installation), and proceed directly to Section 4.0 (Ride Operation).
2. With upgrade kits for those who are upgrading a ride to incorporate ROSie. Such users must read and understand Section 3.0 (Installation) thoroughly before installation commences. This section assumes the reader has some technical knowledge.
3. With software upgrades for ROSie. The software upgrade is supplied as an EPROM, which must replace the existing EPROM fitted into ROSie. This manual refers to ROSie Version 2.0 software. It supersedes any operators manual you may already have. Refer to section 3.4 if you have ROSie and are upgrading to version 2.0.

The manual fulfils both the needs of operators of the rides and also those, such as service engineers, who require a more detailed understanding of ROSie. Sections 3.0, and section 8.0 onwards are relevant only to those who need more detailed knowledge.

If you have a query or problem with ROSie, this manual will provide most of the answers. In case of difficulty, a phone call will get you help; call **Northern Leisure Group** on +44 (0) 113 239 1404. We will need to know:

- 1) Your name, address, and post code.
- 2) Your telephone number, and, if you have one, fax number.
- 3) Clear and concise details of your problem.
- 4) Which software version you have (it is announced when the ride is switched on).
- 5) The serial number of your ride.
- 6) When and where it was purchased.

IMPORTANT NOTE. SECTION 13 OF THIS MANUAL CONTAINS A PERSONAL IDENTIFICATION CODE (PIC), UNIQUE TO THE RIDE WITH WHICH THE MANUAL WAS SUPPLIED. KEEP THE MANUAL AND THE PIC IN A SAFE PLACE. IT IS NOT POSSIBLE, WITHOUT THE PIC, TO CHANGE PARAMETERS (SUCH AS PRICE OF RIDE, FOR EXAMPLE).

2.0 OVERVIEW

The ROSie - Ride Operating System, offers outstanding features to further enhance children's coin operated rides.

The ROSie controller includes a 68008 microprocessor, running at 8MHz, 68230 parallel interface, 68681 dual UART, two UM5100 sound processors, up to 64K bytes of program memory, up to 32K bytes of RAM, and up to 1.75 Mbytes of sound memory. This advanced technology allows features never seen before on children's rides.

If the technical jargon above does nothing for you, most of the features listed below should make a little more sense:

- Backwards compatible with earlier controller systems
- Interface to Coin Controls C120, C220, National Rejectors G13, Micro Mech S5
- Acceptance of 5, 10, 20, 25, 50, 100, and 200 unit coins
- Price of ride adjustable from 10p to 390p, in 10p increments
- Bonus rides may be issued for high value coins
- Internal or external Credit Control Unit
- Seven-segment display output shows credits
- Duration of ride up to 89 seconds, in 1 second increments
- Lights flash in patterned sequences
- Flashing Control panel lamps
- Extensive sampled digitised sounds, including theme tunes
- Friendly spoken advice and help for children
- Spoken assistance when coins are being inserted
- Sophisticated attract mode (4 modes, six messages)
- Anti-jolt slow start feature
- Safety overload protection
- Electronic Identification Label
- No fiddley DIP switches to set up
- All configuration done from control panel
- A Personal Identification Code required entering Set-Up
- Computer RS232 interface
- Software compatible with more powerful processors
- Alarm messages on unauthorised cash-box removal
- Remote communication possibilities
- Real time clock option
- Electronic and electromechanical metering
- Electronic metering cannot be cheated
- Individual coin income, and ride count is stored
- Income/time statistics stored
- Outputs for stepper motor for movement
- Computer downloading of configuration
- Computer uploading of statistical information
- Compliant with BS3456 (sample approved by BSI Testing)
- EMC Compatible
- Twelve months warranty
- Free software updates for twelve months
- Extensive documentation, and technical support available

3.0 INSTALLATION

This section is aimed at those who have purchased ROSie as an upgrade to an existing ride. If you have purchased a ride with ROSie already installed, it is not necessary to read this section. Proceed to section 4.0, Ride Operation. However, if you have purchased ROSie to upgrade a ride, then please read this section carefully, prior to the installation. If you are in receipt of a software upgrade, then refer to section 3.4.

3.1 UNPACKING

ROSie is backwards compatible with all children's rides manufactured by **OMC Electronics**. You must state the model number and serial number of the ride being updated, so that the appropriate EPROMs, cables, etc. may be supplied. Unpack the kit of parts supplied and make sure you have received the following items:

- ROSie PCB Ref. 103122 Issue 2.0, fitted with EPROMs appropriate to your ride. The EPROMs are labelled and prefixed with the following codes:

PMP	Postman Pat
-----	-------------

FMS	Fireman Sam
RAJ	Rosie & Jim
SMB	Super Mario Bros
PAD	Paddington Bear

- Transformer. This is only supplied for old Postman Pat rides whose VA rating is insufficient for ROSie.
- Mounting Plate (not all rides)
- Motor Extension Loom (with 1/4 spade earth)
- Coin Mechanism Loom
- Tyrap
- Additional items (listed later) if you have requested an upgrade from an OMC Ref. 101822 PCB, Issues 1, 2, or 3.

3.2 UPGRADE FROM A 101822 ISSUE 4.X PCB TO ROSIE

Issue 4.x means OMC Ref. 101822 PCBs with any of the following issue numbers; 4.0, 4.1, 4.2, 4.3, or 4.4. Generally, the connectors on ROSie are of the same type and in the same positions as those on 101822 Issue 4.x PCBs. However, they do not have the same reference numbers. The table below is a cross-reference to the connectors on 4.x PCBs and ROSie PCBs.

4.x	ROSie	Description	Conn Type
P1	P6	Transformer Secondary	4 SIL 0.156
P2	P7	Motor Drive	3 SIL 0.25
P3	P2	Vehicle interface	18 SIL 0.156
P4	-	Volume	4 SIL 0.156
P5	P3	CCU	6 SIL 0.156
P6	P11	Sundries	6/9 SIL 0.156
P7	P5	Transformer Primary	6 REC 0.25
P8	P8	Choke	2 SIL 0.25
P9	P1	Safety cut-out switch	4 SIL 0.25
LED800	P4	LED display	14 DIP 0.1/0.3

POWER	POWER	Mains inlet	3 CEE22
EARTH1-EARTH4	EARTH1-EARTH4	Earth connections (4)	1 1/4 SPADE
-	P9	Coin Mechanism	15 SIL 0.1
-	P12	Coin Mechanism	10 DIL 0.1/0.1

Connector cross-reference table.

Some points to note:

- i).** The volume control connector (P4 on 4.x PCBs), does not exist on ROSie. It has never been used in the past.
- ii).** The sundry connector (P6 on 4.x, P11 on ROSie), has grown from a 6 way to 9 way connector on ROSie. The first six pins of P11 are electrically compatible with the six pins on P6.
- iii).** Connectors P9 and P12 do not exist on 4.x PCBs. These connectors cannot support two coin mechanisms simultaneously.

Follow the step by step procedure below, in the order shown, to upgrade your ride. A crosshead screwdriver and a pair of side cutters will be required.

- i).** Completely disconnect the ride from the mains supply.
- ii).** Remove the service door to gain access to the existing control electronics. Lift out the safety cover.
- iii).** Disconnect all of the connectors from the PCB. You may require side cutters to cut the tyrap holding the 14-way ribbon cable connector in place. Remove the six mounting screws holding the PCB in place. Note the spacers under the PCB. Remove the old PCB.
- iv).** Take the ROSie PCB out of its packaging. Place it in the ride in the same position as the old PCB. ROSie is slightly larger than previous controller PCBs; you will have to locate three new mounting holes in the MDF mounting board. Mount ROSie on the spacers and secure with the same six mounting screws.
- v).** Carefully re-insert all of the connectors. Take great care when replacing the 14 pin DIL header (ribbon cable connector). The pins of this connector are extremely delicate and easily damaged.
- vi).** Use the new motor extension loom supplied with ROSie and connect to the three-way connector P7. Connect the earth lead with the ¼ inch spade receptacle to one of the earth spades EARTH1 to EARTH4. **DO NOT USE THE OLD MOTOR EXTENSION LOOM.** If you do, the base and motor of the ride will not be earthed, and will not be compliant with safety regulations.
- vii).** If you have the internal CCU option installed on ROSie, remove or simply disconnect the existing CCU. Use the Coin mechanism loom supplied to connect the Coin Controls C220 coin mechanism to ROSie connector P9. Even if you are not using the external CCU, keep the 6-way connector to P3 intact. This will ensure that the coin entry is illuminated. Contact OMC Electronics if you have a different type of coin mechanism fitted to your ride.
- viii).** Change the meter connections to the red and blue wires on the meter connector (internal CCU option only).
- ix).** Fireman Sam Rides only. These rides were fitted with a Flasher/Driver PCB (Ref. 103322) mounted on connector P6 (old PCB). The Flasher/Driver PCB can be fitted to ROSie connector P11, aligned with pin 1 i.e. pins 7, 8, and 9 of P11 are not used. Pins 1 and 9 of this connector are identified on the component legend of ROSie. It is wise to connect the CCU connector to P3 first, as it is difficult to fit with the Flasher/Driver in place.
- x).** Now double check all of the connections and satisfy yourself that they are all correctly placed.
- xi).** Replace the service door.
- xii).** Installation is now complete.

3.3 UPGRADE FROM A 101822 ISSUE 1, 2, or 3 PCB TO ROSIE

This is somewhat more difficult than the upgrade from an issue 4.x PCB. The component parts of the kit supplied will comprise the items previously listed, plus the following additional items:

Armature Choke Loom.
Transformer Primary Loom.
Safety cutout switch loom.
Motor Extension Loom.

Follow the step by step procedure below, in the order shown, to upgrade your ride. The following tools will be required; screwdrivers, soldering iron, solder, side cutters, pliers.

- i). Follow steps i to iii above.
- ii). Pull the leads off the externally mounted bridge rectifier. Remove the bridge rectifier.
- iii). Pull the IEC socket/lead out of the IEC plug/switch/fuse. Remove the IEC/plug/switch/fuse and disconnect the wires from it.
- iv). De-solder the flying leads to the armature choke.
- v). De-solder the flying leads to the transformer primary.
- vi). Disconnect the in-line plug and socket in the lead to the motor.
- vii). Pull the flying leads off the door safety switch.
- viii). Remove the now disconnected mains wiring and connector associated with it. Use pliers to pull out the staples from the MDF mounting board.
- ix). Solder the choke loom supplied to the armature choke. The polarity of the connections is unimportant.
- x). Solder the transformer primary loom to transformer primary. The transformer should be clearly marked 0, 220, 240. If your transformer does not show these markings, contact **Northern Leisure Group**. The leads of the transformer primary loom should be soldered to the transformer as follows:

Wire Colour	Transformer connection
Brown Wire	240V
Orange Wire	220V
Blue Wire	0V

- xi). Connect the new safety switch loom supplied onto the safety cut out switch. The switch is a double pole, double throw type. There are two browns and two blue wires in the loom. Connect the two brown wires to a normally open pole of the switch (marked COM1 and NO1 or 2 and 6 respectively). Connect the two blue wires to the other normally open pole of the switch (marked COM2 and NO2 or 1 and 5 respectively).
- xii). Continue from step iv in the section above.

3.4 SOFTWARE UPGRADE

- i). Completely disconnect the ride from the mains supply.
- ii). Remove the service door to gain access to the existing control electronics. Lift out the safety cover.
- iii). Identify the system EPROM, component legend U500, grid reference H1. Using an IC removal tool, carefully remove the EPROM from its socket.
- iv). Place the new EPROM into the socket. Ensure that the device is correctly orientated (its orientation is the same as all other ICs on the PCB), and that all IC pins or legs are properly mated with the socket. Double check that all is well, and satisfy yourself that the device is correctly seated.
- v). A system SRAM (non-volatile) may or may not be supplied. If it is, identify the system SRAM, component legend U501, grid reference H2. Using an IC removal tool, carefully remove the SRAM from its socket.
- vi). Place the new SRAM into the socket. Ensure that the device is correctly orientated (its

orientation is the same as all other ICs on the PCB), and that all IC pins or legs are properly mated with the socket. If the device has 28 pins, align it such that pins 1, 2, 31, and 32 are unused.

Double check that all is well, and satisfy yourself that the device is correctly located and seated.

vii). Replace the service door.

viii). Installation is now complete. The ride may not function correctly at this stage, as some set-up may be required. In particular, coin channel assignments, coin enabling, price of ride, and bonuses may need attention.

4.0 RIDE OPERATION

With ROSie successfully installed, switch on the ride. You will note that indicator lamps will start to flash, and the dashboard pushbutton lamps will illuminate. The ride will remain in this state for twenty-five seconds. This state is termed the Set-Up Window. More about this later. When the twenty-five seconds have elapsed, the dashboard pushbutton lamps will start to flash. If ROSie has the Timekeeper option installed, an announcement of the time and day will be made. If it is incorrect, you are advised to enter Set-Up Mode (see below) to correct the time.

Following the time announcement, ROSie will confirm the operating mode. This is one of three modes, namely;

- a) Normal Operating Mode
- b) Free Play Mode
- c) Continuous Mode

In most circumstances, the correct mode of operation is 'normal operating mode'. However, if the mode you require is not the one announced, enter the Set-Up Mode (see below) to change it.

The indicator lights will now be flashing. The flash sequence varies depending upon the type of ride into which ROSie is installed. With one of the attract modes enabled (see below), messages will be announced either periodically, or when control panel button presses are detected (or both), again dependent upon the type of attract mode selected.

Inserting money into the ride will be greeted with a 'thank you' message. If this is insufficient to grant a credit (if 10p inserted on a 30p ride, say), then spoken assistance will be offered, indicating how much more money is required to grant a credit. Further spoken assistance will be given for children (or their parents) who are unsure how to proceed (if they don't realise the start button must be pressed to start the ride). The ride starts up when credits are available and the start pushbutton is pressed. The dashboard credit display will decrement and be held steady. Friendly spoken advice, followed by the start up sounds, and then the theme tune will follow. A slow start feature prevents abrupt movement. The pushbuttons on the dashboard produce sounds appropriate to the theme. The pushbutton sounds cannot be reproduced simultaneously, but work on a first come, first served basis. At the end of the ride, a message will indicate how many rides are left (if any). Credits are lost if the mains power supply is interrupted or turned off. The credit display will read zero when the power supply is resumed. Modes of operation other than normal operating mode are described in subsequent sections.

5.0 RIDE CONFIGURATION

All children's rides from OMC Electronics have previously had DIP (Dual In-line Package) switches to change the user configuration of the ride, ie., length of ride, price of ride etc. The need for keys, tools, and the fiddley and error prone nature of this task has now been superseded by an improved procedure, which requires no keys, tools or nimble fingers.

With the ROSie system, there are no DIP switches to change, but all changes are made via the three control panel pushbuttons, in what is termed Set-Up Mode. Thus the user needs no keys or be in close proximity with the electronics; but simply requires a PIC (Personal Identification Code); that is, the knowledge of a special sequence of keystrokes entered on the dashboard pushbuttons. ROSie allows much greater flexibility and control over the features of the ride than previous control electronics. The following features may be 'configured':

Attract Mode, Number of Coins, Coin Set, Length of Ride, Price of Ride, Coins allowed, Bonuses for high

value coins, Operating Mode, PIC customisation, Time, Date, access to electronic coin counts.

Note that not all of these features may be available to you, depending on the optional features installed in ROSie. Contact **Northern Leisure Group** if the feature you required is not available.

5.1 ENTERING SET-UP MODE

When the ride is switched on, the operator is given the opportunity to enter a sequence of button presses or keystrokes on the control panel pushbuttons. This time period is called the Set-Up Window, and the sequence of pushbutton presses required is referred to as a PIC (Personal Identification Code). The Set-Up Window duration is twenty-five seconds, within which you may enter the PIC. During this period, the pushbutton lamps will be on.

If the wrong PIC is entered, or not entered within the Set-Up Window, the ride will assume the configuration already stored within it; that is, continue working as when it was last used.

If the correct PIC is entered, the ride will enter Set-Up Mode, whereby the configuration of the ride may be changed.

The Set-Up Window will be terminated early if coins are inserted into the ride.

The ride will be supplied with a PIC that is unique to that particular ride. The PIC will be recorded in this manual. **Northern Leisure Group** have details of original PICs also; so if you forget it or lose the documentation, we can let you know what it is if you call us and provide the serial number of the ride.

The PIC may also be customised by the user to your own code so that only the person who has entered the new PIC may access Set-Up Mode. Note however, that in this instance, **Northern Leisure Group** will not be able to offer instant assistance should you forget or lose your PIC. The ride can be restored to either a default PIC or your original PIC, but the level of technical knowledge required is demanding to non-technical personnel (a computer with a communication package will be required). **Northern Leisure Group** can rescue ROSie from unknown PICs, but the ROSie PCB would have to be returned to our factory.

The method of entering Set-Up Mode is as follows:

- 1). Switch on the ride.
- 2). Wait for the dashboard pushbutton lamps to illuminate (this will take less than one second). Rosie will announce 'ROSie, version 4' and the dashboard pushbutton lamps illuminate. The announcement confirms the software version fitted in your ride, and may differ from the announcement shown here.
- 3). You may enter your PIC immediately following the version announcement described above. Do not start entering your PIC before the announcement is over and the dashboard pushbutton lamps are illuminated (your keystrokes will be ignored). Your PIC is shown in section 13.0 of this manual. Remember you have twenty-five seconds in which to do it. If you take longer, you will not be granted access to Set-Up Mode. If specifically requested, rides can be supplied with a 'default' PIC, but this is not normal practice. However, for reference, the method of entering the default PIC is described below:

- i). Press and hold down the START button.
- ii). Press the CAT (or equivalent) button three times.
- iii). Press the HORN (or equivalent) button three times.
- iv). Release the START button.

Look at the back of this manual for your PIC. If the correct PIC is entered, the ride will enter Set-Up Mode, whereby the configuration of the ride may be changed. You will hear audible confirmation that you have successfully entered Set-Up Mode, and the pushbutton lamps will flash at a rapid rate until you exit Set-Up Mode.

Twenty-five seconds are allowed in which to enter the PIC. If the wrong PIC is entered, or not entered within twenty-five seconds, the ride will assume the configuration stored within it; that is, continue working as it was previously. The pushbutton lamps will then start to flash at the normal rate.

Section 5.3 describes the procedures once in Set-Up Mode. When you have finished changing any parameter(s), leave Set-Up Mode by following the procedure in section 5.2 below.

5.2 LEAVING SET-UP MODE

Leave Set-Up Mode by the following means:

- a). Turn the ride off. Any changes you made in Set-Up Mode will be asserted when the ride is switched on again.
- b). Put money into the ride to grant a credit. Any changes you made in Set-Up Mode will be asserted and the ride will enter the programmed operating mode.
- c). Issue command <3,-,1>. This is described in more detail later.

Needless to say, do not leave the ride unattended in Set-Up Mode. Don't forget to leave Set-Up Mode after making any changes to the configuration.

5.3 CHANGING VALUES IN SET-UP MODE

At first sight these procedures may seem a little alarming. Experiment a little and you will soon find it is a relatively simple procedure. Section 6.11 shows by example how to change the length of ride and price of ride. This is probably the best means of learning the procedures.

The diagram below represents the dashboard layout for the Postman Pat ride. Upon entering Set-Up Mode, the pushbuttons and the display cease to operate in the normal manner, but take on new roles. The words shown in brackets [] are the assignments assumed by the pushbuttons in Set-Up Mode.

CAT	HORN	START	8
[STEP]	[MENU]	[ENTER]	DISPLAY

All other rides from **OMC Electronics** have equivalent pushbuttons and display, though the pushbutton names will be different. In all cases however, the left-most pushbutton, shown above as CAT, becomes [STEP], the middle pushbutton (or right-most pushbutton if the START pushbutton is not grouped with the sound pushbuttons) becomes [MENU], and the right-most or START pushbutton becomes [ENTER].

The table below shows the [STEP], [MENU], and [ENTER] equivalent pushbuttons for current products:

Product	[STEP]	[MENU]	[ENTER]
Postman Pat	Cat	Horn	Start
Fireman Sam	Station Officer	Siren	Start
Rosie & Jim	Narrator	Duck Quack	Start
Super Mario Bros.	Brake	Accelerator	Start
Paddington Bear	Narrator	Horn	Start

Huxley Pig	Caw	Oink	Start
Pingu	Yodel	Squawk	Start

By pressing [STEP] and [MENU] in an ordered sequence, and observing the display, you'll find your way or 'navigate' to a particular VALUE which may then be updated by pressing [ENTER]. The procedure to change a VALUE is not dissimilar to changing the time on a digital watch. The procedure to change a VALUE is referred to as a 'Command'.

In Set-Up Mode, the display does not show the number of rides remaining as it normally does. The digit it shows is from one of three possible MENUS. To indicate which MENU is being displayed, it remains steady, flashes slowly, or flashes rapidly to indicate one of three MENUS. The MENUS available are called FUNCTION, SUB FUNCTION, and VALUE. The table below shows the relationship between the flash rate of the display and the MENU being shown.

DISPLAY STATUS	MENU SHOWN
STEADY	FUNCTION
SLOW FLASH	SUB FUNCTION
RAPID FLASH	VALUE

A summary of the types of VALUE that may be changed is shown in section 7.0. It is presented in the form of <F,S,V> commands, representing [F]unction, [S]ub-function, and [V]alue.

The operation of [STEP], [MENU], and [ENTER] is as follows:

[STEP]

This pushbutton STEPs or increments through the options available on the MENU being displayed.

[MENU]

This button switches to another available MENU, and the display will change its flash rate accordingly to show the MENU selected. There are three menus; FUNCTION (display steady), SUB-FUNCTION (display flashes slowly), and VALUE (display flashes rapidly).

[ENTER]

Pressing [ENTER] executes a command. When pressed, the VALUE being displayed is stored and remembered, even if power is later removed from the ride. The VALUE entered will be stored and used by the ride until it is changed again.

Upon entering Set-Up Mode, the display will be steady, showing the FUNCTION 0 (attract mode). Pressing [STEP] will step through the range of FUNCTIONS available. When you have reached the function you require, press [MENU]. If there are SUB-FUNCTIONS associated with the FUNCTION you have selected, the display will flash slowly, showing the current SUB-FUNCTION. Pressing [STEP] will now step through the range of SUB-FUNCTIONS available. When you have reached the SUB-FUNCTION you require, press [MENU]. The display will now flash rapidly, showing the current VALUE stored.

If there is no SUB-FUNCTION associated with the FUNCTION you have selected, pressing [MENU] results in the current VALUE being shown. The display will flash rapidly, showing the current VALUE stored.

With a rapidly flashing display, press [STEP] to reach the VALUE you wish to enter. Once the display is showing the required VALUE, press [ENTER] to store the VALUE which will be used until changed again.

If you lose your way at any time, press [MENU] a few times which will clarify just which <F,S,V> is being shown.

5.4 FUNCTION SUMMARY

A summary of the FUNCTIONS are shown in the table below.

Function	Description	Note
0	Operating Mode	-
1	Duration of ride	-
2	Attract mode & volume	-
3	Special features	-
4	Price of ride	Internal CCU only
5	Bonus rides	Internal CCU only
6	Coin selection	Internal CCU only
7	Coin assignment	Internal CCU only
8	Set time	Timekeeper only
9	Set date	Timekeeper only

Pressing [STEP] will step through these functions. You may notice that some of the FUNCTIONS are missing. For example, if your ride has a multi-coin mechanism with an external CCU, then FUNCTIONS 4, 5, 6, and 7 will not be available to you and the DISPLAY will STEP as follows: 0, 1, 2, 3, 8, 9, and back to 0.

There are several ride configurations which affect which FUNCTIONS are present or missing. These are:

- Type of Coin Mechanism
- Internal or External CCU
- Timekeeper present/not present.

FUNCTIONS 0, 1, 2, and 3 will always be present.

FUNCTIONS 4, 5, 6, and 7 are present only with a multi-coin mechanism and internal CCU.

FUNCTIONS 8 and 9 will be present only if the timekeeper option is fitted.

6.0 COMMANDS

This section describes in detail the commands available to configure the ride. The Set-Up Mode commands are presented in the form <F,S,V>, where:

F = Function, S = Sub Function, V = Value

e.g. Command <4,1,5> means Function 4, Sub-Function 1, and Value 5 (which sets the price of ride least significant digit to 50 units).

Where a '-' is shown in a command, such as <0,-,2>, this indicates that there is no Sub-Function associated with this command. Pressing [MENU] results in only two menus being shown, that of Function (steady display) and Value (rapid flash display).

Sometimes, a range of commands is shown with a '?'. This represents any digit from 0-9 (Computer users familiar with MSDOS will recognise the usage of ? as the same as the wildcard character ?).

When you enter a command (by pressing the [ENTER] pushbutton), there is normally a verbal acknowledgement from ROSie (OK, entered). The only exception to this rule is with commands which, after execution, automatically leave Set-Up Mode and move on to the programmed operating mode of the ride.

6.1 OPERATING MODE

ROSie is able to operate in one of four operating modes, namely normal, free play, and continuous. The operating modes are changed by issuing the command <0,-,?>, as shown below:

<0,-,1> Normal Operating Mode
<0,-,2> Free Play Mode
<0,-,3> Continuous Mode
<0,-,4> Diagnostic Mode

Command <0,-,1> causes the ride to enter normal operating mode. This is the default and usual operating mode of the ride. However, other non-standard operating modes are available. Command <0,-,2> is the Free play mode. Upon entering free play mode, one credit will be shown on the credit display. Pressing the start pushbutton will use the credit. The credit becomes available again at the end of the ride.

Command <0,-,3> is Continuous operation. This is used to soak test rides during outgoing inspection at the factory. Sounds are not operative in this mode, and there are no responses to the pushbuttons.

Command <0,-,4> is still to be defined.

6.2 RIDE DURATION

The duration of ride is programmable from 01 to 89 seconds. The default setting is 65 seconds. Note that the maximum recommended duration of ride is 90 seconds. Ride duration in excess of 90 seconds would cause some repetition of the theme tune.

The procedure to change the duration of ride is best shown by example. You wish to program the duration of the ride to 48 seconds. The MSD (Most Significant Digit) is 4, and the LSD (Least Significant Digit) is 8. Commands <1,0,?> and <1,1,?> represent the MSD and LSD respectively. Thus the programming required is to issue commands <1,0,4>, and <1,1,8>.

In summary, the length of ride for any time period from 01 to 89 seconds can be taken from the table below:

<1,0,0> Length of Ride, MSD, 00 seconds
<1,0,1> Length of Ride, MSD, 10 seconds
<1,0,2> Length of Ride, MSD, 20 seconds
<1,0,3> Length of Ride, MSD, 30 seconds
<1,0,4> Length of Ride, MSD, 40 seconds
<1,0,5> Length of Ride, MSD, 50 seconds
<1,0,6> Length of Ride, MSD, 60 seconds
<1,0,7> Length of Ride, MSD, 70 seconds

<1,0,8> Length of Ride, MSD, 80 seconds
<1,1,0> Length of Ride, LSD, 0 seconds
<1,1,1> Length of Ride, LSD, 1 second
<1,1,2> Length of Ride, LSD, 2 seconds
<1,1,3> Length of Ride, LSD, 3 seconds
<1,1,4> Length of Ride, LSD, 4 seconds
<1,1,5> Length of Ride, LSD, 5 seconds
<1,1,6> Length of Ride, LSD, 6 seconds
<1,1,7> Length of Ride, LSD, 7 seconds
<1,1,8> Length of Ride, LSD, 8 seconds
<1,1,9> Length of Ride, LSD, 9 seconds

Note: MSD = Most Significant Digit
LSD = Least Significant Digit

If the length of ride is set to 00 seconds, this will be detected as an erroneous entry and will be adjusted to 10 seconds.

6.3 ATTRACT MODE & VOLUME CONTROL

ROSie features what is termed an attract mode, whereby tunes and messages may be played/spoken to attract attention to the ride. The attract mode can be activated in two ways; either periodically when the ride is not in use, or when button presses are detected (again when the ride is not in use). ROSie Version 2 allows control of the attract mode, by issuing commands <2,-,?>. With ROSie version 3, these same commands appear as <2,0,?>. Four attract modes are possible, as listed below:

For ROSie Version 2:

<2,-,1> Attract off.
<2,-,2> Periodic attract.
<2,-,3> Presence detect attract.
<2,-,4> Full attract (periodic and presence).

For ROSie Version 3:

<2,0,1> Attract off.
<2,0,2> Periodic attract.
<2,0,3> Presence detect attract.
<2,0,4> Full attract (periodic and presence).

Command <2,-,1> or <2,0,1> is 'Attract mode off'. All attract mode messages are suppressed.

Command <2,-,2> or <2,0,2> is 'Periodic attract mode'. The attract messages are issued at approximately two minute intervals when the ride is not in use.

Command <2,-,3> or <2,0,3> is 'Detect presence attract mode'. The attract messages are issued when control panel pushbutton presses are detected when the ride is not in use.

Command <2,-,4> or <2,0,4> is 'Full attract mode'. The attract mode messages are issued periodically and also when control panel pushbutton presses are detected.

(Use the command according to the version of ROSie you are using. The version is announced when the ride is powered up).

6.3.1 ATTRACT MODE CUSTOMISATION

This feature is not available with ROSie Version 2. ROSie Version 3, by means of commands <2,1,?>

allows customisation of the following attract mode message:

"For further information about our rides, call OMC Electronics, on 01684 298004."

This is the default attract message. However, for customers who require their own customised message to replace the one shown above, then there are three forms of customised message which can replace the default message by issuing commands <2,1,1>, <2,1,2>, and <2,1,3>.

- <2,1,1> Customised attract message type 1 (with telephone no.)
- <2,1,2> Customised attract message type 2 (without telephone no.)
- <2,1,3> Customised attract message type 3 (composed telephone no.)
- <2,1,4> Standard attract message (OMC & telephone no.)

The format of the messages is as follows.

TYPE 1 Messages <2,1,1>

"For further information about our rides, call 'My Company Ltd.', on '0123 456789'"

Where 'My Company Ltd.' and '0123 456789' can be substituted by your own company and telephone number.

This is referred to as a Type 1 message. It will only work if both your company name and telephone number have been digitised and stored within ROSie. If this type of message is selected and your company name and telephone number is not found, no message will be generated. If your company name is found, but not your telephone number, ROSie will issue a Type 2 message, see below.

TYPE 2 Messages <2,1,2>

"Look out for other rides, from 'My Company Ltd.'"

This is referred to as a Type 2 message. It will only work if your company name has been digitised and stored within ROSie. If this type of message is selected and your company name is not found, no message will be generated.

TYPE 3 Messages <2,1,3>

"For further information about our rides, call 'My Company Ltd.', on '0123 456789'"

This is referred to as a Type 3 message. It appears identical to the Type 1 message, but there is one important difference. The telephone number is not sampled and digitised as a composite number, but is compiled from individually digitised numbers stored within ROSie. The effect is that the message flows far less smoothly, and has a 'robotic' feel to it. This may not be desirable in some circumstances. This command will only work if your company name has been digitised and stored within ROSie. If this type of message is selected and your company name is not found, no message will be generated. If your telephone number has been digitised, then this command serves no purpose and ROSie will issue a Type 1 message.

It is important to realise that ROSie will only respond to these customising commands if your company name has been sampled, digitised, and stored within ROSie. If your company name has not been detected, then ROSie will revert to the default attract message. If your company name has not been stored and you are interested in this feature, then call **Northern Leisure Group** on 0113 239 1404 who will provide you with information on the procedure necessary to implement it.

Command <2,1,4> will cause the attract message to resume to the default message. Customisation of attract mode messages is not available in earlier versions of ROSie software.

The digitised telephone numbers used in ROSie version 4 are stored using the new UK area codes which become obligatory on Phoneday, 16th April 1995.

6.3.2 ELECTRONIC VOLUME CONTROL

ROSie hardware issue 3.0 incorporates an electronic volume control. It is controlled by function <2,2,?>, as follows:

- <2,2,1> Volume down
- <2,2,2> Volume up
- <2,2,3> Volume minimum
- <2,2,4> Volume 'normal'
- <2,2,5> Volume maximum

For volume up and volume down functions, repeated pressing of the Enter button (Start) will gradually increase or decrease the volume accordingly. Listen to the acknowledgement 'OK, entered' to set the volume you require. The volume is stepped in the range 1 (min) to 50 (max).

For the minimum, normal, and maximum values, just a single press of the Enter button will set the volume accordingly. The default setting is normal.

Note that the electronic volume control is in series with the manual volume control located at ROSie PCB grid ref. A10. If you intend to use the electronic volume control only, then turn the manual volume control to maximum (fully clockwise). If you wish to use the manual volume control and not make use of the electronic volume control, then set the electronic volume control to maximum <2,2,5>. In both instances, setting a control to maximum allows the full range of the other control to be utilised.

Note that the electronic volume control is not available on ROSie hardware issue 2.0.

6.4 SPECIAL FEATURES

Commands <3,-,?> are special features. These are some of the most powerful commands and you should fully understand what they do prior to using them. Note that the special features, when executed, may subsequently leave Set-Up Mode upon completion of the command. A summary of the special feature functions are listed below:

- <3,-,1> Leave Set-Up Mode
- <3,-,2> Speaking meters
- <3,-,3> Serial port meters
- <3,-,4> Cash-box clear and authorised removal
- <3,-,5> Leave Set-Up Mode with one free credit granted
- <3,-,6> No function
- <3,-,7> Enter new PIC (Use with caution!)
- <3,-,8> No function
- <3,-,9> Reveal key numbers

6.4.1 LEAVE SET-UP MODE

Command <3,-,1> forces ROSie to leave Set-Up Mode. Any changes you made whilst in Set-Up Mode will now be active. This is the recommended technique for leaving Set-Up Mode.

6.4.2 SPEAKING METERS

ROSie stores information electronically relating to the amount of rides credited and the amount of income generated by the ride. This is in addition to the electromechanical meter, which counts income in 10p units. The electronic meters may be accessed in two ways; it can be spoken by ROSie, or transmitted to the RS232 serial port (see <3,-,3> below).

Command <3,-,2> causes the ride to provide the meter readings in a spoken form. The spoken message is

largely a list of numbers and it is thus wise to be prepared with pen and paper to record the spoken information. The information provided is number of rides, total income, and income of each coin. Coins are assigned a letter, A to H, which always have the same value; as shown in the table below:

- Coin A: 100 units
- Coin B: 50 units
- Coin C: 25 units
- Coin D: 20 units
- Coin E: 10 units
- Coin F: 5 units
- Coin G: 200 units
- Coin H: Not defined

The units may be pence, cents etc. appropriate to the country in which the ride is sited. Regardless of the units of currency, the values assigned to each coin letter are absolute.

The information is spoken in the form shown by the following example:

Spoken message	Explanation
Ride Count: 8989	Total rides = 8989
Income: 17978	Total income = 1797.80
Coin A: 21	100 unit coin = 21.00
Coin B: 212	50 unit coin = 106.00
Coin C: 0	25 unit coin = 0.00
Coin D: 8230	20 unit coin = 1646.00
Coin E: 248	10 unit coin = 24.80
Coin F: 0	5 unit coin = 0.00
Coin G: 0	200 unit coin = 0.00

The information provided is cumulative; that is, it represents the income from the ride for all time. The information is not user resettable. When the internal CCU option is not fitted, only the ride count information is available.

On completion of the spoken information, the ride will automatically leave Set-Up Mode (you will see the control panel lamps cease to flash at the rapid rate).

6.4.3 METERS TO THE SERIAL PORT

A detailed record of the income of the ride is stored electronically within the ride. The data stored is dependent upon the ROSie options installed; internal or external CCU and Timekeeper/no Timekeeper. The most detailed reports will be available for rides with internal CCUs and Timekeepers fitted. A record of number of rides credited, amount of money taken, and amounts of each coin taken are stored. In addition, if the timekeeper option is installed, historical data for each of the records above are stored, that is data in the current and last hour, day, week, month, and year.

Command <3,-,3> causes the ride to transmit this extensive metering to the serial port, and this data may be captured by a terminal or computer connected to the serial port.

Your computer will require an RS232 serial port (such as COM1: found on most PC compatible computers, and terminal emulation software. An example of a suitable arrangement would be a PC compatible laptop computer, running a communication package such as Procomm, or the Microsoft Windows Terminal.

The electrical interface connection details are given below:

Signal	ROSie Con/Pin	ROSie Ext Con/Pin	PC Con/Pin	PC Con/Pin
Receive	P10 pin 3	Pext pin 3	9D pin 3	25D pin 2
Transmit	P10 pin 4	Pext pin 2	9D pin 2	25D pin 3
Ground	P10 pin 5	Pext pin 5	9D pin 5	25D pin 7

Notes:

- i). Signal directionality is with respect to ROSie. Therefore, transmit means ROSie transmits, and the computer/terminal thus receives.
- ii). The fourth column shows the connections to a 9 way D Type female connector, suitable for direct connection to a 9 way male PC COMn: port (n = 1 to 4)
- iii). The fifth column shows the connections to a 25 way D Type female connector, suitable for direct connection to a 25 way male PC COMn: port (n = 1 to 4)
- iv). The connections to P10 may be brought out to the ride body, onto which is discreetly mounted a 9 way female D type connector (Pext). These connections are shown in the third column.

6.4.3.1 CONNECTING ROSie TO AN IBM COMPATIBLE PC

ROSie can connect to COM1: or COM2: of your PC using a cable supplied by **Northern Leisure Group**. Make connections to the PC and to the ride with the power turned off.

On the ride, remove the service door to gain access to ROSie. Identify connector P10, PCB grid reference H8. Connect the cable supplied to this connector, such that the three wires connect to pins 3, 4, and 5 of P10 (Pin 1 is identified on the PCB). Note that the connector is not polarised, but no damage results if the connector is inserted the wrong way around. However, do make sure the connector shell is correctly aligned with the pins on the PCB.

At the PC, connect the 9 way D socket to COM1: or COM2: (If your computer uses a 25 way serial connector, you will need a 9 way to 25 way adaptor).

6.4.3.2 SETTING UP THE COMMUNICATION LINK

If you are using Microsoft Windows 3.1 to communicate with ROSie, proceed as follows.

- i) Start Microsoft Windows.
- ii) From the Program Manager, double click on the Accessories icon.
- iii) Double click on the Terminal icon.
- iv) Select Settings/Terminal Emulation and choose DEC VT100 (ANSI).
- v) Select Settings/Terminal Preferences and choose Line Wrap Off.
- vi) Select Settings/Text Transfers and choose Standard Flow Control.
- vii) Select Settings/Communications, and set the parameters as follows:

Connector: COM1: or COM2: as appropriate.
Baud Rate: 19200
Data Bits: 8
Stop Bits: 1
Parity: None
Flow Control: XON/XOFF

These are now the correct settings for communication with ROSie. So that you do not have to set them up each time, it is recommended that you save them. Select File/Save and save the settings as ROSIE.TRM. Next time you wish to communicate with ROSie, select File/Open and select ROSIE.TRM.

If you are using some other communication software, the 'flavour' of the communication parameters can be gleaned from the above.

6.4.3.3 POWER UP

With the ride connected to the PC, and the computer running the Windows Terminal as described above, turn on the ride. You should see information appear on the screen similar to that shown below:

Type of Ride: PMP
Serial Number: KR9999
Date of Manufacture: 6/6/94
Model Number: 1021
Voltage: 240
Country: 044
Customer: My_Company Ltd
Customer phone no: 0123 456789

As the ride is used, messages showing the status of the ride are transmitted and will be shown on the PC (such as Credit Granted, starting ride, end of ride etc.).

6.4.3.4 READING THE ELECTRONIC METERING

A detailed record of the income of the ride is stored electronically within the ride. Records of number of rides credited, amount of money taken, and amount of each coin taken are stored. In addition, if the timekeeper option is installed, historical data for each of the records above are stored, that is data in the current and last hour, day, week, month, and year.

To gain access to this information, you must enter Set-up Mode. Enter your PIC when the ride is powered up (refer to the Operator's manual). Issue Command <3,-,3>.

The income information will appear on the PC. Most likely it will scroll off the screen. Use the Windows scroll bars to look back at information that has scrolled off the screen.

Alternatively, you may capture the information in a file by selecting Transfer/Receive Text File prior to issuing the Command <3,-,3>. The transmitted information will be stored in a filename of your choice. The logged data will be an ascii text file, and thus it may easily be printed out. For computers running MSDOS, the command PRINT FILENAME.EXT will print the results.

On completion of the Command <3,-,3>, the ride will automatically leave Set-Up Mode.

An example of the type of printout to expect from ROSie follows.

Time and Date: 10:53, 08-03-94 (Please correct the time and date if it is incorrect).

Ride Serial Number: PMP0123

NUMBER OF	-		-		-		-		-	
-----------	---	--	---	--	---	--	---	--	---	--

RIDES METERED					
This hour	Today	This week	This month	This year	In cash-box
0	0	0	0	0	0
Last hour	Last day	Last week	Last month	Last year	All time
0	0	0	0	0	0
RIDE INCOME, ALL COINS, IN UNITS OF COIN E[10]	-	-	-	-	-
This hour	Today	This week	This month	This year	In cash-box
0	0	0	0	0	0
Last hour	Last day	Last week	Last month	Last year	All time
0	0	0	0	0	0
COIN A [100] AUDIT (Quantity of coin, NOT value of coin)	-	-	-	-	-
This hour	Today	This week	This month	This year	In cash-box
0	0	0	0	0	0
Last hour	Last day	Last week	Last month	Last year	All time
0	0	0	0	0	0
COIN B [50] AUDIT (Quantity of coin, NOT value of coin)	-	-	-	-	-
This hour	Today	This week	This month	This year	In cash-box
0	0	0	0	0	0
Last hour	Last day	Last week	Last month	Last year	All time
0	0	0	0	0	0

COIN C [25] AUDIT (Quantity of coin, NOT value of coin)	-	-	-	-	-
This hour	Today	This week	This month	This year	In cash-box
0	0	0	0	0	0
Last hour	Last day	Last week	Last month	Last year	All time
0	0	0	0	0	0
COIN D [20] AUDIT (Quantity of coin, NOT value of coin)	-	-	-	-	-
This hour	Today	This week	This month	This year	In cash-box
0	0	0	0	0	0
Last hour	Last day	Last week	Last month	Last year	All time
0	0	0	0	0	0
COIN E [10] AUDIT (Quantity of coin, NOT value of coin)	-	-	-	-	-
This hour	Today	This week	This month	This year	In cash-box
0	0	0	0	0	0
Last hour	Last day	Last week	Last month	Last year	All time
0	0	0	0	0	0
COIN F [5] AUDIT (Quantity of coin, NOT value of coin)	-	-	-	-	-
This hour	Today	This week	This month	This year	In cash-box
0	0	0	0	0	0
Last hour	Last day	Last week	Last month	Last year	All time

0	0	0	0	0	0
COIN G [200] AUDIT (Quantity of coin, NOT value of coin)	-	-	-	-	-
This hour	Today	This week	This month	This year	In cash-box
0	0	0	0	0	0
Last hour	Last day	Last week	Last month	Last year	All time
0	0	0	0	0	0

End of Set Up Procedure.

Operating Mode: Normal

On completion of the information transfer, the ride will automatically leave Set-Up Mode (you will see the control panel lamps cease to flash at the rapid rate). When the internal CCU option is not fitted, only the number of rides metered will be available. When the timekeeper option is not fitted, only the final column figures will be available.

6.4.4 EMPTYING THE CASHBOX

Command <3,-,4> is a pre-cursor to emptying the cash-box and clearing the cash-box counts. To discourage unauthorised access to the cash-box, the withdrawal of the cash-box causes the following announcement to be made:

"Stop, thief! This ride is protected by an alarm system. The Police are being notified of unauthorised access."

The announcement will continue until the cash-box is replaced. Note that this feature offers no protection when the ride is switched off. It is a deterrent; not an alarm system. A separate alarm system is recommended to protect the ride whilst power is off.

To prevent this annunciation, the cash collector may do one of two things:

- a). Turn off the ride whilst the cash-box is emptied; or
- b). Put the ride in Set-Up Mode prior to removal of the cash-box.

If the ride is placed in Set-Up Mode prior to removal of the cash-box, then the message will be suppressed.

The recommended procedure however is to issue command <3,-,4> prior to removal of the cash-box. This is not obligatory, but has the following advantages:

- a). The internal counts of the amount of money in the cash-box are reset to zero when the cash-box is replaced. By this means, the amount of money in the cash-box can be monitored.
- b). If the level of money (according to the internal counts) exceeds 4000 units (400 pounds or its equivalent), then each time the ride is switched on, the following message will be announced:

"Please contact the operator."

The will prompt site managers to call the operator.

Note that if the level of money (according to the counts) exceeds 8000 units (800 pounds or its equivalent), then the counts will automatically be reset. The presumption here is that the cash collector is not using command <3,-,4>, and has simply been emptying the cash-box in Set-Up Mode or with the ride turned off. In this instance, the cash-box counts will no longer tally with the amount of money in the cash-box.

The cash-box count information can be accessed from the RS232 port, function <3,-,3>.

If you use the command <3,-,4>, note that replacement of the cash-box will cause the ride to automatically leave Set-Up Mode (you will see the control panel lamps cease to flash at the rapid rate).

6.4.5 GRANT FREE RIDE

Command <3,-,5> is not dissimilar to command <3,-,1>, leave Set-Up Mode. It differs only in that a single credit is granted, and thus a free ride is made available.

6.4.6 NULL FUNCTIONS

Commands <3,-,6>, and <3,-,8> perform no function. They are reserved for future use.

6.4.7 CHANGING THE PIC

Command <3,-,7> is an extremely powerful command and should only be used after comprehensively understanding this section. **DO NOT ATTEMPT TO USE THIS COMMAND IF YOU DO NOT UNDERSTAND THE FOLLOWING PROCEDURE.** Incorrect use of this command may result in Set-Up Mode becoming unobtainable by the user. Engineering support is required to correct this problem.

Command <3,-,7> enables the user to customise the PIC of the ride. Enter Set-Up Mode in the usual manner with the current PIC, and navigate your way to <3,-,7>. With the display showing '7' (rapid flash), press ENTER (note that this does not form part of the PIC sequence).

ROSie will now record the sequence of key strokes entered on the three control-panel pushbuttons. REMEMBER THEM! Up to fourteen key transitions (or 7 key presses) may be entered. A transition is a press or release of a single button (thus, for example, pressing PBL seven times would result in the maximum of 14 transitions). In this instance, pressing PBL seven times would become the PIC.

Only a single pushbutton transition is allowed at a time. Thus pressing PBL and PBR at the same time is an invalid step (it would be interpreted as one followed by the other, whichever was detected first). Note however, that as in the default PIC, inputs may be held pressed whilst others are in transition. If 14 transitions are exceeded, the fifteenth and subsequent transitions are ignored; the PIC is automatically accepted and ROSie will leave set up mode. It is wise to end your sequence with all buttons released. PICs of less than fourteen transitions are acceptable. If ten seconds have elapsed after a pushbutton transition, then that transition is considered to be the last and the PIC is accepted, and ROSie will leave set up mode. Similarly, if a credit is granted, the PIC is accepted at that time. If no keystrokes are entered prior to the ten-second time-out or acceptance of a credit, then the PIC (which is now effectively NO pushbutton transitions) is still accepted. The result of this is that ROSie will automatically enter set up mode without any intervention from the user. This precaution helps first time users who may delay entering keystrokes because of lack of procedural knowledge. Thus the ride will automatically enter Set-Up Mode on power up. Once you start entering the sequence, remember you have only ten seconds after each press or release of a pushbutton before the next must be entered. If it is not entered, the PIC sequence is terminated and the PIC is accepted as-is.

REMEMBER YOUR PIC! Firstly, write down the sequence that you intend to use. Practice the keystroke sequence a few times with the ride turned off, so that you are proficient at entering it. If your memory is

better than mine, then commit to memory. Alternatively, make a written note of the PIC and keep it in a safe place. It is not possible, without a high level of engineering support, to gain access to the Set-Up Mode if the PIC is unknown. So extreme caution is advised when PIC programming. You have been warned!

6.4.8 REVEAL KEY NUMBERS

A record of the key numbers of the ride (e.g. cash-box keys, service door key etc.) is stored electronically within the ride.

To gain access to the key numbers, you must enter Set-Up Mode and issue Command <3,-,9>, which will cause the ride to transmit the key number information to the serial port, which may be simply read or captured by a terminal or computer connected to the serial port.

Your computer will require an RS232 serial port (such as COM1: found on most PC compatible computers, and terminal emulation software. An example of a suitable arrangement would be a PC compatible laptop computer, running a communication package such as Procomm, or the Microsoft Windows Terminal. See Section 6.4.3. above which explains how to connect a computer.

6.5 PRICE OF RIDE

This command is only available when ROSie is working with an internal CCU. If an external CCU is fitted, then price of ride and coin enabling is performed by DIP switches on the CCU.

Command <4,?,?> is the price of ride. It has two sub-functions, <4,0,?> and <4,1,?>. Command <4,0,?> is the price of ride in 100 units, and command <4,1,?> is the price of ride in 10 units. The total price of ride is the sum of these two values. The minimum increment of price of ride is 10 units. The price of ride can range from 10 units to 390 units. The value of a 'unit' is dependent upon the currency for which the coin mechanism is programmed. In the UK, one unit is 1 pence. In the USA and Australia, one unit is 1 cent.

E.g. for a price of ride of \$1.20	Units
Command <4,0,1> represents	100 units
Command <4,1,2> represents	20 units
Total	120 Units

The procedure to change the price of ride is best shown by example. You wish to program the price of ride to 50p per ride. The MSD (Most Significant Digit) is 0, and the LSD (Least Significant Digit) is 5. Commands <4,0,?> and <4,1,?> represent the 100 unit and 10 unit values respectively. Thus the programming required is commands <4,0,0>, and <4,1,5>.

In summary, the price of ride is programmable from 10 units (10p in UK currency) to 390 units, and can be taken from the table below:

- <4,0,0> Price of ride, 0 units, MSD
- <4,0,1> Price of ride, 100 units, MSD
- <4,0,2> Price of ride, 200 units, MSD
- <4,0,3> Price of ride, 300 units, MSD

- <4,1,0> Price of ride, 0 units, LSD
- <4,1,1> Price of ride, 10 units, LSD
- <4,1,2> Price of ride, 20 units, LSD
- <4,1,3> Price of ride, 30 units, LSD
- <4,1,4> Price of ride, 40 units, LSD
- <4,1,5> Price of ride, 50 units, LSD
- <4,1,6> Price of ride, 60 units, LSD
- <4,1,7> Price of ride, 70 units, LSD
- <4,1,8> Price of ride, 80 units, LSD
- <4,1,9> Price of ride, 90 units, LSD

The command <4,?,?> is only available when ROSie is working with an internal CCU.

6.6 BONUS RIDES

This command, <5,?,?> is only available when ROSie is working with an internal CCU. If an external CCU is fitted, then bonus rides are granted by setting DIP switches on the CCU. Command <5,?,?> determines how many additional rides should be granted for high value coins. This is an inducement to insert higher denomination coins into the ride. The table below shows the function of this command:

- <5,0,0> No additional rides for Coin C, 25 unit coin
- <5,0,1> One additional ride for Coin C, 25 unit coin
- <5,0,2> Two additional rides for Coin C, 25 unit coin
- <5,0,3> Three additional rides for Coin C, 25 unit coin

- <5,1,0> No additional rides for Coin B, 50 unit coin
- <5,1,1> One additional ride for Coin B, 50 unit coin
- <5,1,2> Two additional rides for Coin B, 50 unit coin
- <5,1,3> Three additional rides for Coin B, 50 unit coin
- <5,1,4> Four additional rides for Coin B, 50 unit coin
- <5,1,5> Five additional rides for Coin B, 50 unit coin

- <5,2,0> No additional rides for Coin A, 100 unit coin
- <5,2,1> One additional ride for Coin A, 100 unit coin
- <5,2,2> Two additional rides for Coin A, 100 unit coin
- <5,2,3> Three additional rides for Coin A, 100 unit coin
- <5,2,4> Four additional rides for Coin A, 100 unit coin
- <5,2,5> Five additional rides for Coin A, 100 unit coin
- <5,2,6> Six additional rides for Coin A, 100 unit coin
- <5,2,7> Seven additional rides for Coin A, 100 unit coin

- <5,3,0> No additional rides for Coin G, 200 unit coin
- <5,3,1> One additional ride for Coin G, 200 unit coin
- <5,3,2> Two additional rides for Coin G, 200 unit coin
- <5,3,3> Three additional rides for Coin G, 200 unit coin
- <5,3,4> Four additional rides for Coin G, 200 unit coin
- <5,3,5> Five additional rides for Coin G, 200 unit coin
- <5,3,6> Six additional rides for Coin G, 200 unit coin
- <5,3,7> Seven additional rides for Coin G, 200 unit coin
- <5,3,8> Eight additional rides for Coin G, 200 unit coin
- <5,3,9> Nine additional rides for Coin G, 200 unit coin

6.7 COIN SELECTION

This command only has any effect when a coin mechanism with individual coin enable/disable lines on its electrical interface (Coin Controls C220, Mars MS111, ME111) is fitted to the ride. The command will be present, but will have no effect if other types of coin mechanism are fitted. Coin channels can be disabled (by entering a 0 in the command value), or enabled (by entering a 1 in the command value). All coins are normally enabled. Note that the sub-function refers to the coin channel as shown on the coin mechanism.

The table below summarises the function of each of the commands <6,?,?>:

<6,0,n> No function
<6,1,n> Select coin channel 1, n=0 disable, n=1 enable
<6,2,n> Select coin channel 2, n=0 disable, n=1 enable
<6,3,n> Select coin channel 3, n=0 disable, n=1 enable
<6,4,n> Select coin channel 4, n=0 disable, n=1 enable
<6,5,n> Select coin channel 5, n=0 disable, n=1 enable
<6,6,n> Select coin channel 6, n=0 disable, n=1 enable
<6,7,n> Select coin channel 7, n=0 disable, n=1 enable
<6,8,n> Select coin channel 8, n=0 disable, n=1 enable

6.8 COIN ASSIGNMENT

You will rarely (if ever) need to be concerned with this command <7,-,?>. It only becomes relevant if for some reason you fit a coin mechanism with different coin channel assignments.

Coin mechanisms are a device to validate one or more coins. They have a number of 'channels', each of which is assigned to validating a particular type of coin. There are usually up to eight channels, numbered one to eight (although some coin mechanisms exceed eight). Coin mechanisms are programmable such that any one of the channels may validate any coin. The channel to which a coin is assigned is normally labelled on the side of the coin mechanism.

A typical coin mechanism may show the following detail:

Channel 1: 10p
Channel 2: 20p
Channel 3: 50p
Channel 4: 100p
Channel 5: -
Channel 6: -
Channel 7: -
Channel 8: -

This means the 10p coin is routed through channel 1, 20p coin through channel 2, and so on. In this example, no coins are assigned to channels 5 to 8. There is no standard to which coin channels are assigned; different manufacturers use different channel assignments. To overcome this non standard, ROSie uses a look-up table to enable several type of coin mechanism to be used.

ROSie deals with coin values and assigns them a letter, A to H. The table below shows the assignments:

Coin A: 100 units
Coin B: 50 units
Coin C: 25 units
Coin D: 20 units
Coin E: 10 units
Coin F: 5 units
Coin G: 200 units
Coin H: Not assigned.

The currency is not defined here, but may be any as long as the values correspond to the ratios above. The coin letters A to H are ALWAYS associated with the values shown and never change.

ROSie is able to translate coin mechanism channels 1-8 to coin values A to H by using a look up table. The table is of the form below:

Coin Mech	Type 1	Type 2	Type 3	Type 4	Type 5	Type 6	Type 7	Type 8
Channel 1	5	100	100	10	200	000	000	000

Channel 2	10	50	25	10	100	000	000	000
Channel 3	20	20	10	20	50	000	000	000
Channel 4	100	-	-	100	10	000	000	000
Channel 5	100	-	-	100	10	000	000	000
Channel 6	-	-	-	-	-	000	000	000
Channel 7	-	-	-	-	-	000	000	000
Channel 8	-	10	-	-	-	000	000	000

Types 6, 7, 8 to be assigned.

By issuing command <7,-,?>, any one of the eight coin assignment types may be used. A summary of the coin assignments is shown below:

- <7,-,1> Coin assignment Type 1
- <7,-,2> Coin assignment Type 2
- <7,-,3> Coin assignment Type 3
- <7,-,4> Coin assignment Type 4
- <7,-,5> Coin assignment Type 5
- <7,-,6> Coin assignment Type 6
- <7,-,7> Coin assignment Type 7
- <7,-,8> Coin assignment Type 8

Your ride will have been pre-programmed for the appropriate type of coin mechanism and channel assignment, so you rarely, if ever, need to be concerned with this look up table. However, should you wish to change the coin mechanism for one with different coin channel assignments, then this look up table is your reference.

Type 1: This is the arrangement used by **OMC Electronics** for NRI G13 coin mechanisms.

Type 2: This is typical of a Coin Controls Sentinel assignment, but with an additional 10 unit coin on channel 8. This has been used in countries where a change in 10 unit coin type has occurred and both old and new types are concurrently legal tender (the UK passed through this transitional period but the old 10p coin is no longer valid tender. At the time of writing, Eire has two 10p coins which are concurrently legal tender).

Type 3: Again, channel assignments used by Coin Controls Sentinel but for countries with a 25 unit coin rather than the 50 unit coin. Holland is one such example.

Type 4: This is the arrangement used by **OMC Electronics** for NRI G13 coin mechanisms, with two concurrent 10 unit coins as legal tender.

Type 5: For countries with a 200 unit coin, e.g. Australia with a two dollar coin.

6.9 THE TIME

If ROSie has a Timekeeper installed, Set-Up Mode will present Function 8 when stepping through the Functions. Command <8,?,?> allows the user to set or adjust the time. The general format of the time is Hh:Mm:Ss, where the command for each digit is as shown in the table below:

Digit	Command
H = Hours MSD	<8,0,?>
h = Hours LSD	<8,1,?>
M = Minutes MSD	<8,2,?>
m = Minutes LSD	<8,3,?>
S = Seconds MSD	<8,4,?>
s = Seconds LSD	<8,5,?>

(MSD = Most Significant Digit, LSD = Least Significant Digit)

The hours must be entered in 24 hour clock format.

The '?' in each instance is the time digit itself, so for example to enter a time of 08:23:54, the following commands would have to be entered:

<8,0,0>
 <8,1,8>
 <8,2,2>
 <8,3,3>
 <8,4,5>
 <8,5,4>

The commands may be entered in any order. Not all the time commands need to be entered. For example, if the hours are correct but the minutes are not, only the minute's command need be entered.

6.10 THE DATE

If ROSie has a Timekeeper installed, Set-Up Mode will present Function 9 when stepping through the Functions. Command <9,?,?> allows the user to set or adjust the date. The general format of the date is Dd-Mm-Yy, where the command for each digit is as shown in the table below:

Digit	Command
Y= Year MSD	<9,0,?>
y = Year LSD	<9,1,?>
M = Month MSD	<9,2,?>
m = Month LSD	<9,3,?>

D = Date MSD	<9,4,?>
d = Date LSD	<9,5,?>

(MSD = Most Significant Digit, LSD = Least Significant Digit)

Note the date is discussed in the UK format and not US format. This means, for example, that 04-12-93 is the 4th December 1993, not the 12th April 1993.

The '?' in each instance is the date digit itself, so for example to enter a date of 04-12-93, the following commands would have to be entered:

<9,0,9>
 <9,1,3>
 <9,2,1>
 <9,3,2>
 <9,4,0>
 <9,5,4>

The commands may be entered in any order. In addition, the day also should be entered. The command is of the format <9,6,?>, where the final VALUE represents the day as follows:

<9,6,0> Monday
 <9,6,1> Tuesday
 <9,6,2> Wednesday
 <9,6,3> Thursday
 <9,6,4> Friday
 <9,6,5> Saturday
 <9,6,6> Sunday

6.11 COMMANDS BY EXAMPLE

Example 1. The current duration of ride is 65 seconds, and you wish to change this to 47 seconds.

- 1). Look up the <F,S,V> codes for duration of ride in the section 7.0. You will find it to be <1,0,4> and <1,1,7>, that is, 40 seconds and 7 seconds respectively, totalling 47 seconds altogether.
- 2). Enter Set-Up Mode (See 'Entering Set-Up Mode above).
- 3). The display will show '0', and be steady (the FUNCTION menu).
- 4). Press [STEP] repeatedly until the display shows '1'. Note that if you go beyond the number you require by mistake, just keep pressing [STEP] until the number appears again.
- 5). Press [MENU]. The display will now show '0', flashing slowly (the SUB-FUNCTION menu).
- 6). In this instance, '0' is the Sub-function you require, so there is no need to press [STEP]. If you do, just keep pressing until the '0' re-appears.
- 7). Press [MENU]. The display will now show '6' (the current value in this example, yours could be different), flashing rapidly (the VALUE menu).
- 8). Press [STEP] repeatedly until the display shows '4'.
- 9). Press [ENTER]. The command <1,0,4> will be issued, the new value stored, and will be used until changed again. The command will be verbally acknowledged (OK, entered). You have now entered 40 seconds.
- 10). Press [MENU]. The display will now show a steady '1' (the FUNCTION menu). This is the function you require for the second command <1,1,7>.

- 11). Press [MENU]. The display will now show '0', flashing slowly (the SUB-FUNCTION menu).
- 12). Press [STEP] until the display shows '1', only one press in this instance. Note that if you go beyond the number you require by mistake, just keep pressing [STEP] until the number appears again.
- 13). Press [MENU]. The display will now show '5' (the current value in this example, yours may be different), flashing rapidly (the VALUE menu).
- 14). Press [STEP] repeatedly until the display shows '7'.
- 15). Press [ENTER]. The command <1,1,7> will be issued, the new value stored, and will be used until changed again. The command will be verbally acknowledged (OK, entered).
- 16). Leave Set-Up Mode by:
 - a). Turning the mains power off and on again, or
 - b). Putting money in the ride up to or more than the value of one credit.
 - c). Issue the command <3,-,1>.

Example 2. The current price per ride is 20p, and you wish to change this to 30p.

- 1). Look up the <F,S,V> code for a 30p price of ride in the section 7.0. You should find it to be <4,1,3>.
- 2). Enter Set-Up Mode (See 'Entering Set-Up Mode').
- 3). The display will show '0', and be steady (the FUNCTION menu).
- 4). Press [STEP] repeatedly until the display shows '4'. Note that if you go beyond the number you require by mistake, just keep pressing [STEP] until the number appears again.
- 5). Press [MENU]. The display will now show '0', flashing slowly (the SUB-FUNCTION menu).
- 6). Press [STEP] until the display shows '1', only one press in this instance. Note that if you go beyond the number you require by mistake, just keep pressing [STEP] until the number appears again.
- 7). Press [MENU]. The display will now show '2' (the current value in this example), flashing rapidly (the VALUE menu).
- 8). Press [STEP] repeatedly until the display shows '3' (only one press in this instance).
- 9). Press [ENTER]. The command <4,1,3> will be issued, the new value stored, and will be used until changed again.
- 10). Leave Set-Up Mode by:
 - a). Turning the mains power off and on again, or
 - b). Putting money in the ride up to or more than the value of one credit.
 - c). Issue the command <3,-,1>.

The procedures described above are the same for any <F,S,V>.

7.0 COMMAND REFERENCE TABLE

Menu	Display Status
Function (F)	Steady
Sub function (S)	Slow Flash
Value (V)	Rapid Flash

<F,S,V> Description

<0,-,1> Normal operation

<0,-,2> Free play
<0,-,3> Continuous operation
<0,-,4> Diagnostic Mode

<1,0,0> Length of Ride, MSD, 00 seconds
<1,0,1> Length of Ride, MSD, 10 seconds
<1,0,2> Length of Ride, MSD, 20 seconds
<1,0,3> Length of Ride, MSD, 30 seconds
<1,0,4> Length of Ride, MSD, 40 seconds
<1,0,5> Length of Ride, MSD, 50 seconds
<1,0,6> Length of Ride, MSD, 60 seconds
<1,0,7> Length of Ride, MSD, 70 seconds
<1,0,8> Length of Ride, MSD, 80 seconds
<1,0,9> Length of Ride, MSD, 90 seconds

<1,1,0> Length of Ride, LSD, 0 seconds
<1,1,1> Length of Ride, LSD, 1 second
<1,1,2> Length of Ride, LSD, 2 seconds
<1,1,3> Length of Ride, LSD, 3 seconds
<1,1,4> Length of Ride, LSD, 4 seconds
<1,1,5> Length of Ride, LSD, 5 seconds
<1,1,6> Length of Ride, LSD, 6 seconds
<1,1,7> Length of Ride, LSD, 7 seconds
<1,1,8> Length of Ride, LSD, 8 seconds
<1,1,9> Length of Ride, LSD, 9 seconds

<2,0,1> Attract mode off
<2,0,2> Attract mode periodic
<2,0,3> Attract mode detect presence
<2,0,4> Attract mode maximum

<2,1,1> Customised attract message type 1 (with telephone no.)
<2,1,2> Customised attract message type 2 (without telephone no.)
<2,1,3> Customised attract message type 3 (composed telephone no.)
<2,1,4> Standard attract message (OMC & telephone no.)

<2,2,1> Volume down
<2,2,2> Volume up
<2,2,3> Volume minimum
<2,2,4> Volume 'normal'
<2,2,5> Volume maximum

<3,-,1> Leave Set-Up mode
<3,-,2> Speaking meters
<3,-,3> Serial Port meters
<3,-,4> Cash-box clear and remove cash-box
<3,-,5> Leave Set-Up Mode with one credit granted
<3,-,6> No function
<3,-,7> Enter new PIC - **READ SECTION 6.4.7 FIRST!**
<3,-,8> No function
<3,-,9> Reveal key numbers

<4,0,0> Price of ride, 000 units
<4,0,1> Price of ride, 100 units
<4,0,2> Price of ride, 200 units
<4,0,3> Price of ride, 300 units
<4,1,0> Price of ride, 00 units
<4,1,1> Price of ride, 10 units
<4,1,2> Price of ride, 20 units
<4,1,3> Price of ride, 30 units
<4,1,4> Price of ride, 40 units
<4,1,5> Price of ride, 50 units
<4,1,6> Price of ride, 60 units
<4,1,7> Price of ride, 70 units
<4,1,8> Price of ride, 80 units
<4,1,9> Price of ride, 90 units

<5,0,0> No additional rides for 25 unit coin
<5,0,1> One additional ride for 25 unit coin
<5,0,2> Two additional rides for 25 unit coin
<5,0,3> Three additional rides for 25 unit coin

<5,1,0> No additional rides for 50 unit coin
<5,1,1> One additional ride for 50 unit coin
<5,1,2> Two additional rides for 50 unit coin
<5,1,3> Three additional rides for 50 unit coin
<5,1,4> Four additional rides for 50 unit coin
<5,1,5> Five additional rides for 50 unit coin

<5,2,0> No additional rides for 100 unit coin
<5,2,1> One additional ride for 100 unit coin
<5,2,2> Two additional rides for 100 unit coin
<5,2,3> Three additional rides for 100 unit coin
<5,2,4> Four additional rides for 100 unit coin
<5,2,5> Five additional rides for 100 unit coin
<5,2,6> Six additional rides for 100 unit coin
<5,2,7> Seven additional rides for 100 unit coin

<5,3,0> No additional rides for 200 unit coin
<5,3,1> One additional ride for 200 unit coin
<5,3,2> Two additional rides for 200 unit coin
<5,3,3> Three additional rides for 200 unit coin
<5,3,4> Four additional rides for 200 unit coin
<5,3,5> Five additional rides for 200 unit coin
<5,3,6> Six additional rides for 200 unit coin
<5,3,7> Seven additional rides for 200 unit coin
<5,3,8> Eight additional rides for 200 unit coin
<5,3,9> Nine additional rides for 200 unit coin

<6,0,n> No function
<6,1,n> Select coin channel 1, n=0 disable, n=1 enable
<6,2,n> Select coin channel 2, n=0 disable, n=1 enable
<6,3,n> Select coin channel 3, n=0 disable, n=1 enable
<6,4,n> Select coin channel 4, n=0 disable, n=1 enable
<6,5,n> Select coin channel 5, n=0 disable, n=1 enable
<6,6,n> Select coin channel 6, n=0 disable, n=1 enable
<6,7,n> Select coin channel 7, n=0 disable, n=1 enable
<6,8,n> Select coin channel 8, n=0 disable, n=1 enable

<7,-,1> Coin assignment Type 1
<7,-,2> Coin assignment Type 2
<7,-,3> Coin assignment Type 3
<7,-,4> Coin assignment Type 4
<7,-,5> Coin assignment Type 5
<7,-,6> Coin assignment Type 6
<7,-,7> Coin assignment Type 7
<7,-,8> Coin assignment Type 8

<8,0,0> Time, Hours MSD = 0
<8,0,1> Time, Hours MSD = 1
<8,0,2> Time, Hours MSD = 2

<8,1,0> Time, Hours LSD = 0
<8,1,1> Time, Hours LSD = 1
<8,1,2> Time, Hours LSD = 2
<8,1,3> Time, Hours LSD = 3
<8,1,4> Time, Hours LSD = 4
<8,1,5> Time, Hours LSD = 5
<8,1,6> Time, Hours LSD = 6
<8,1,7> Time, Hours LSD = 7
<8,1,8> Time, Hours LSD = 8
<8,1,9> Time, Hours LSD = 9

<8,2,0> Time, Minutes MSD = 0
<8,2,1> Time, Minutes MSD = 1
<8,2,2> Time, Minutes MSD = 2
<8,2,3> Time, Minutes MSD = 3
<8,2,4> Time, Minutes MSD = 4
<8,2,5> Time, Minutes MSD = 5

<8,3,0> Time, Minutes LSD = 0
<8,3,1> Time, Minutes LSD = 1
<8,3,2> Time, Minutes LSD = 2
<8,3,3> Time, Minutes LSD = 3
<8,3,4> Time, Minutes LSD = 4
<8,3,5> Time, Minutes LSD = 5
<8,3,6> Time, Minutes LSD = 6
<8,3,7> Time, Minutes LSD = 7
<8,3,8> Time, Minutes LSD = 8
<8,3,9> Time, Minutes LSD = 9

<8,4,0> Time, Seconds MSD = 0
<8,4,1> Time, Seconds MSD = 1
<8,4,2> Time, Seconds MSD = 2
<8,4,3> Time, Seconds MSD = 3
<8,4,4> Time, Seconds MSD = 4
<8,4,5> Time, Seconds MSD = 5

<8,5,0> Time, Seconds LSD = 0
<8,5,1> Time, Seconds LSD = 1
<8,5,2> Time, Seconds LSD = 2
<8,5,3> Time, Seconds LSD = 3
<8,5,4> Time, Seconds LSD = 4
<8,5,5> Time, Seconds LSD = 5
<8,5,6> Time, Seconds LSD = 6
<8,5,7> Time, Seconds LSD = 7
<8,5,8> Time, Seconds LSD = 8
<8,5,9> Time, Seconds LSD = 9

Note: <8,*,*> only available when Timekeeper fitted. The hours are in 24-hour clock form. The general format of the time is Hh:Mm:Ss, where;

H = Hours MSD; h = Hours LSD; M = Minutes MSD; m = Minutes LSD; S = Seconds MSD. s = Seconds LSD

<9,0,0> Date, Year MSD = 0
<9,0,1> Date, Year MSD = 1
<9,0,2> Date, Year MSD = 2
<9,0,3> Date, Year MSD = 3
<9,0,4> Date, Year MSD = 4
<9,0,5> Date, Year MSD = 5
<9,0,6> Date, Year MSD = 6
<9,0,7> Date, Year MSD = 7
<9,0,8> Date, Year MSD = 8
<9,0,9> Date, Year MSD = 9

<9,1,0> Date, Year LSD = 0
<9,1,1> Date, Year LSD = 1
<9,1,2> Date, Year LSD = 2
<9,1,3> Date, Year LSD = 3
<9,1,4> Date, Year LSD = 4
<9,1,5> Date, Year LSD = 5
<9,1,6> Date, Year LSD = 6
<9,1,7> Date, Year LSD = 7
<9,1,8> Date, Year LSD = 8
<9,1,9> Date, Year LSD = 9

<9,2,0> Date, Month MSD = 0
<9,2,1> Date, Month MSD = 1

<9,3,0> Date, Month LSD = 0
 <9,3,1> Date, Month LSD = 1
 <9,3,2> Date, Month LSD = 2
 <9,3,3> Date, Month LSD = 3
 <9,3,4> Date, Month LSD = 4
 <9,3,5> Date, Month LSD = 5
 <9,3,6> Date, Month LSD = 6
 <9,3,7> Date, Month LSD = 7
 <9,3,8> Date, Month LSD = 8
 <9,3,9> Date, Month LSD = 9

<9,4,0> Date, Date MSD = 0
 <9,4,1> Date, Date MSD = 1
 <9,4,2> Date, Date MSD = 2
 <9,4,3> Date, Date MSD = 3

<9,5,0> Date, Date LSD = 0
 <9,5,1> Date, Date LSD = 1
 <9,5,2> Date, Date LSD = 2
 <9,5,3> Date, Date LSD = 3
 <9,5,4> Date, Date LSD = 4
 <9,5,5> Date, Date LSD = 5
 <9,5,6> Date, Date LSD = 6
 <9,5,7> Date, Date LSD = 7
 <9,5,8> Date, Date LSD = 8
 <9,5,9> Date, Date LSD = 9

<9,6,0> Day, Monday
 <9,6,1> Day, Tuesday
 <9,6,2> Day, Wednesday
 <9,6,3> Day, Thursday
 <9,6,4> Day, Friday
 <9,6,5> Day, Saturday
 <9,6,6> Day, Sunday

8.0 OPTIONS

ROSiE will come to you pre-configured for the type of ride/environment in which it is to be installed. Listed here for reference are some notes on the options available.

8.1 JUMPER LINK SETTINGS

The jumper link settings need only be changed if a memory device is changed or if the coin mechanism is changed. For reference, the jumper link settings modify the system requirements as follows:

8.1.1 SYSTEM EPROM

Device U500	LK500 Links
64K*8	None fitted
128K*8	2-3

128K*8 Flash	1-2
--------------	-----

8.1.2 SYSTEM RAM

Device U501	LK501 Links
2K*8	1-2, 5-6
8K*8	2-3, 5-6
32K*8	2-3, 4-5
128K*8	2-3, 4-5

8.1.3 THEME CHANNEL EPROM

Device U100x	LK900	LK901
64K*8 (27C512)	2-3	2-3
128K*8 (27C101)	2-3	2-3
256K*8 (27C201)	1-2	2-3
512K*8 (27C401)	1-2	1-2

Note: Links LK900 and LK901 are not present on ROSie hardware issue 3.0. The hardware is auto-configured for 27C401 devices.

8.1.4 PUSHBUTTON CHANNEL EPROM

Device U1201	LK120	LK121
32K*8 (27C256)	1-2	1-2
64K*8 (27C512)	1-2	2-3
128K*8 (27C101)	1-2	2-3
256K*8 (27C201)	2-3	2-3

Note: Only link LK120 is present on ROSie hardware issue 3.0. Link 2-3 for 27C201 devices (linking 1-2

accepts 27C401 devices). Smaller devices are not accepted.

8.2 TIMEKEEPING

If you have the Timekeeper option installed in ROSie, commands <8,?,?> and <9,?,?> become available in Set-Up Mode. These commands do not appear if the Timekeeper option is not installed. Device U501 is where the Timekeeper is installed.

8.3 INTERNAL OR EXTERNAL CCU

ROSie can accommodate an internal or external CCU, and will be pre-programmed for one or the other. ROSie is far more flexible when fitted with an internal CCU, since commands relating to coins become available in Set-Up Mode. Note that if you are using an external CCU, then the DIP switches on the CCU are used in the normal manner, and Set-Up Mode will not show commands relating to coins.

8.4 COIN MECHANISM

ROSie can accept a wide range of coin mechanisms. The following coin mechanisms (and variants) may be connected to ROSie:

Coin Mechanism	Category
Coin Controls C120	Multi-coin, type B
Coin Controls C220/C230	Multi-coin, type A
Mars MS111	Multi-coin, type A
Mars ME111	Multi-coin, type A
Micro Mech S5	Multi-coin, type B
National Rejectors Inc. G13	Multi-coin, Type B

Note that they fall into two broad categories, those that have individual coin enable/disable signals on the interface (type A), and those that do not (Type B). ROSie must be correctly configured for the type of coin mechanism (A or B) to which it will interface. If it is not, damage to ROSie and/or the coin mechanism can occur. The configuration involves two aspects; downloading a specific value to the non-volatile memory in ROSie, and setting links LK700 to LK703 correctly.

The four i/o lines PB4 to PB7 of the 68230 are programmable as inputs or outputs. Links LK700 to LK703 inclusive control the directionality of these lines, and are associated with the type of coin mechanism used.

Coin Mechanism	LK700	LK701	LK702	LK703
C120/NRI G13/Micro Mech S5	1-2	2-3	2-3	2-3

C220/C230/MS111/ME111	1-2	1-2	1-2	1-2
-----------------------	-----	-----	-----	-----

Link pin 1-2 for output (O), and pins 2-3 for input (I).

9.0 SERIAL COMMUNICATION PORT

The information supplied to the ride in Set-Up Mode is stored within a special area of memory within ROSie. This area of memory is 'non volatile', which means it does not lose the information when the power is removed. This special memory area is called the Environment Customisation Table (ECT). The ECT is sub divided into four sections, namely;

- ECT-1) Customer Data
- ECT-2) Hardware Configuration
- ECT-3) User Configuration
- ECT-4) Income Statistics

The Customer data contains details of the operator of the ride, its serial number, key numbers, date of manufacture etc. This is an 'electronic identification label' and is a valuable aid to identifying stolen rides. The Hardware Configuration identifies coin mechanism type, internal/external CCU, and Timekeeper fitted/not fitted. The User Configuration is used to store data entered from Set-Up Mode. Finally, Income Statistics stores numerous details about the income of each coin type, and time related income rates.

The ECT occupies 640 bytes, from 3FC00H to 3FE7FH. When the configuration of the ride is changed in Set-Up Mode, the information is stored in ECT-3, User Configuration.

There is another technique for changing data in the ECT. Data may be 'downloaded' to it by connecting a computer to the RS232 serial port of ROSie. A file, called the ROSECT (Ride Operating System Environment Customisation Table) file, can be downloaded to ROSie. The file must be in a specific format (Motorola S Record).

The ROSECT file can replace the entire ECT or selected parts of it. It is generally downloaded to ROSie during the manufacturing stages. So what use is it to the operator?

Firstly, it is by this means that one can recover from an unknown PIC. Operators who have sufficient technical knowledge may link ROSie to a computer. OMC can supply a PC compatible floppy disk containing a 'PIC recovery' file. Downloading this file will restore the ride to the default PIC.

Secondly, the hardware configuration of ROSie may be altered. The following may be configured:

- i) Type of Coin mechanism
- ii) Internal/External CCU
- iii) Timekeeper installed/not installed
- iv) Sound memory configuration

9.1 THE ENVIRONMENT CUSTOMISATION TABLE

The designated area of memory for the ECT is 3FC00H to 3FE7FH, a total of 640 bytes. It is split into four distinct sections. The table below shows the section name, the memory range that section occupies, if it can accept a download from a computer interface, and if it can accept changes from the control panel.

Ref	Size	Section	Memory range	RS232	Control Panel
ECT-1	128	Customer Data	3fc00 - 3fc7f	Yes	No
ECT-2	8	Hardware Configuration	3fc80 - 3fc87	Yes	No

ECT-3	40	User Configuration	3fc88 - 3fc9f	Yes	Yes
ECT-4	464	Statistics	3fcb0 - 3fe7f	Yes	No
Total bytes	640	-	3fc00 - 3fe7f	-	-

The table below lists in more detail each byte of data in the ECT.

Customer Data 3fc00H Type of Ride
Customer Data 3fc03H 0
Customer Data 3fc04H Serial Number
Customer Data 3fc0bH 0
Customer Data 3fc0cH Date of Manufacture
Customer Data 3fc14H 0
Customer Data 3fc15H Model Number
Customer Data 3fc19H 0
Customer Data 3fc1aH Mains Voltage
Customer Data 3fc1dH 0
Customer Data 3fc1eH Country/Language code
Customer Data 3fc21H 0
Customer Data 3fc22H Customer Name
Customer Data 3fc36H 0
Customer Data 3fc37H Customer Phone Number
Customer Data 3fc47H 0
Customer Data 3fc48H Cash-box key left
Customer Data 3fc52H 0
Customer Data 3fc53H Cash-box key right
Customer Data 3fc5dH 0
Customer Data 3fc5eH Meter key
Customer Data 3fc68H 0
Customer Data 3fc69H Service door key
Customer Data 3fc73H 0
Customer Data 3fc74H Alarm key
Customer Data 3fc7eH 0
Customer Data 3fc7fH Custom1 (\$e6 = customer data loaded)

Hardware Configuration 3fc80H Coin mechanism type:

00H - Coin Controls C220/C230, Mars MS111/ME111, 4 coin mode
01H - NRI G13, Coin Controls C120, 6 coin, no individual disables
02H - Micro Mech S5, 6 coin, no individual disables
03H - Coin Controls C220/230, 8 coin mode, coded output
04H - Uni coin validator, mechanical

Hardware Configuration 3fc81H CCU internal/external:

00H - Internal CCU
01H - External CCU

Hardware Configuration 3fc82H Timekeeper configuration:

00H - No Timekeeper fitted
01H - Timekeeper fitted
02H - Timekeeper fitted with external sync

Hardware Configuration 3fc83H Sound memory configuration:

00H - Pushbutton channel 32k, Theme channel 64k
10H - Pushbutton channel 32k, Theme channel 128k

20H - Pushbutton channel 32k, Theme channel 256k
30H - Pushbutton channel 32k, Theme channel 512k
40H - Pushbutton channel 64k, Theme channel 64k
50H - Pushbutton channel 64k, Theme channel 128k
60H - Pushbutton channel 64k, Theme channel 256k
70H - Pushbutton channel 64k, Theme channel 512k
80H - Pushbutton channel 128k, Theme channel 64k
90H - Pushbutton channel 128k, Theme channel 128k
A0H - Pushbutton channel 128k, Theme channel 256k
B0H - Pushbutton channel 128k, Theme channel 512k
C0H - Pushbutton channel 256k, Theme channel 64k
D0H - Pushbutton channel 256k, Theme channel 128k
E0H - Pushbutton channel 256k, Theme channel 256k
F0H - Pushbutton channel 256k, Theme channel 512k

Note: ROSie hardware issue 3.0 defaults to Pushbutton channel 256k, Theme channel 512k.

Hardware Configuration 3fc84H Enable/Disable ride:

EEH - Enable ride
DDH - Disable ride

Hardware Configuration 3fc85H Reserved for future configuration

Hardware Configuration 3fc86H Reserved for future configuration

Hardware Configuration 3fc87H Custom2 (\$c9 or \$e6 is non default)

C9H - Control Panel Customisation
E6H - RS232 port Customisation
/C9H or /E6H - Use default configuration

User Config. 3fc88H attract mode
User Config. 3fc89H coinmech assignment
User Config. 3fc8aH length of ride (bcd msd)
User Config. 3fc8bH length of ride (bcd lsd)
User Config. 3fc8cH price of ride (bcd 10 coin units)
User Config. 3fc8dH coin enable/disable
User Config. 3fc8eH bonuses for 100 coin
User Config. 3fc8fH bonuses for 50 coin
User Config. 3fc90H operating mode
User Config. 3fc91H pic0
User Config. 3fc92H pic1
User Config. 3fc93H pic2
User Config. 3fc94H pic3
User Config. 3fc95H pic4
User Config. 3fc96H pic5
User Config. 3fc97H pic6
User Config. 3fc98H pic7
User Config. 3fc99H pic8
User Config. 3fc9aH pic9
User Config. 3fc9bH pic10
User Config. 3fc9cH pic11
User Config. 3fc9dH pic12
User Config. 3fc9eH pic13
User Config. 3fc9fH pic14
User Config. 3fca0H custpic (\$c9 or \$e6 is non default)
User Config. 3fca1H custom3 (\$c9 or \$e6 is non default)
User Config. 3fca2H bonuses for 200 coin
User Config. 3fca3H bonuses for 25 coin
User Config. 3fca4H attract mode customisation
User Config. 3fca5H time set
Reserved 3fca6H to 3fcafH

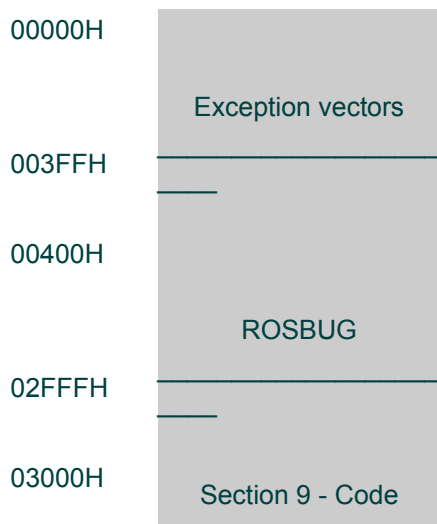
Statistics 3fcb0H lhour_cc last hour (on the hour)

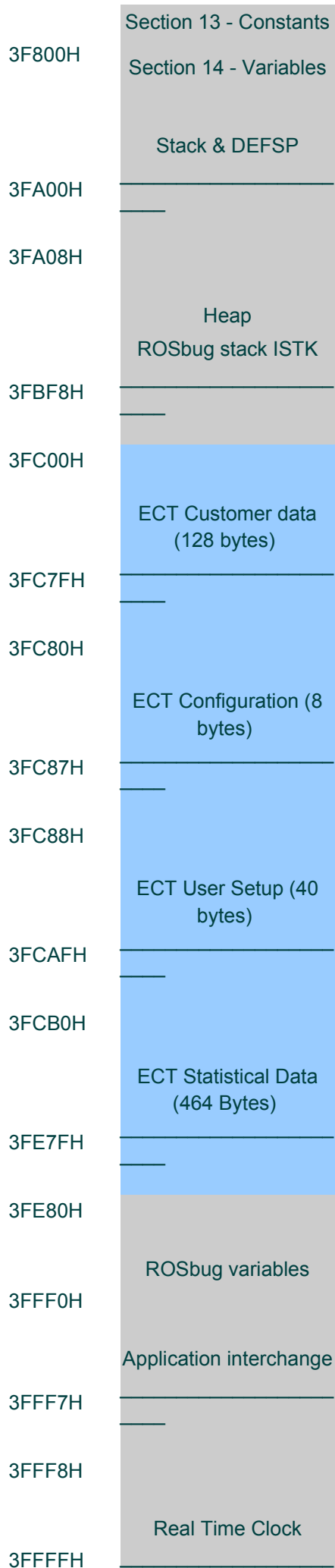
Statistics 3fcb4H phour_cc previous hour (on the hour)
Statistics 3fcb8H lnite_cc last midnight
Statistics 3fcbch pnite_cc previous midnight
Statistics 3fcc0H lsun_cc last sunday
Statistics 3fcc4H psun_cc previous sunday
Statistics 3fcc8H leom_cc last end of month
Statistics 3fccch peom_cc previous end of month
Statistics 3fcd0H leoy_cc last end of year
Statistics 3fcd4H peoy_cc previous end of year
Statistics 3fcd8H ccnt_cc cumulative count of 200p coins
Statistics 3fcdch cbox_cc 200p coin since cash-box emptied
Statistics 3fce0H rcnt ride count
Statistics 3fce4H ccnt_xu income count (10p units)
Statistics 3fce8H ccnt_v cumulative count of 5p coins
Statistics 3fcecH ccnt_x cumulative count of 10p coins
Statistics 3fcf0H ccnt_xx cumulative count of 20p coins
Statistics 3fcf4H ccnt_xxv cumulative count of 25p coins
Statistics 3fcf8H ccnt_l cumulative count of 50p coins
Statistics 3fcfcH ccnt_c cumulative count of 100p coins
Statistics 3fd00H lhour last hour (on the hour)
Statistics 3fd04H phour previous hour (on the hour)
Statistics 3fd08H lnite last midnight
Statistics 3fd0cH pnite previous midnight
Statistics 3fd10H lsun last sunday (midnight)
Statistics 3fd14H psun previous sunday (midnight)
Statistics 3fd18H leom last end of month (midnight)
Statistics 3fd1cH peom previous end of month (midnight)
Statistics 3fd20H leoy last end of year (midnight)
Statistics 3fd24H peoy previous end of year (midnight)
Statistics 3fd28H lhour_v last hour (on the hour)
Statistics 3fd2cH phour_v previous hour (on the hour)
Statistics 3fd30H lnite_v last midnight
Statistics 3fd34H pnite_v previous midnight
Statistics 3fd38H lsun_v last sunday (midnight)
Statistics 3fd3cH psun_v previous sunday (midnight)
Statistics 3fd40H leom_v last end of month (midnight)
Statistics 3fd44H peom_v previous end of month (midnight)
Statistics 3fd48H leoy_v last end of year (midnight)
Statistics 3fd4cH peoy_v previous end of year (midnight)
Statistics 3fd50H lhour_x last hour (on the hour)
Statistics 3fd54H phour_x previous hour (on the hour)
Statistics 3fd58H lnite_x last midnight
Statistics 3fd5cH pnite_x previous midnight
Statistics 3fd60H lsun_x last sunday (midnight)
Statistics 3fd64H psun_x previous sunday (midnight)
Statistics 3fd68H leom_x last end of month (midnight)
Statistics 3fd6cH peom_x previous end of month (midnight)
Statistics 3fd70H leoy_x last end of year (midnight)
Statistics 3fd74H peoy_x previous end of year (midnight)
Statistics 3fd78H lhour_xx last hour (on the hour)
Statistics 3fd7cH phour_xx previous hour (on the hour)
Statistics 3fd80H lnite_xx last midnight
Statistics 3fd84H pnite_xx previous midnight
Statistics 3fd88H lsun_xx last sunday (midnight)
Statistics 3fd8cH psun_xx previous sunday (midnight)
Statistics 3fd90H leom_xx last end of month (midnight)
Statistics 3fd94H peom_xx previous end of month (midnight)
Statistics 3fd98H leoy_xx last end of year (midnight)
Statistics 3fd9cH peoy_xx previous end of year (midnight)
Statistics 3fda0H lhour_xxv last hour (on the hour)
Statistics 3fda4H phour_xxv previous hour (on the hour)
Statistics 3fda8H lnite_xxv last midnight
Statistics 3fdacH pnite_xxv previous midnight
Statistics 3fdb0H lsun_xxv last sunday (midnight)
Statistics 3fdb4H psun_xxv previous sunday (midnight)
Statistics 3fdb8H leom_xxv last end of month (midnight)
Statistics 3fdbch peom_xxv previous end of month (midnight)
Statistics 3fdc0H leoy_xxv last end of year (midnight)

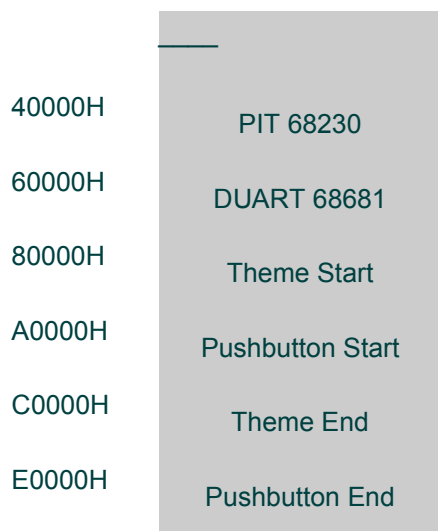
Statistics 3fdc4H peoy_xv previous end of year (midnight)
 Statistics 3fdc8H lhour_l last hour (on the hour)
 Statistics 3fdcch phour_l previous hour (on the hour)
 Statistics 3fdd0H lnite_l last midnight
 Statistics 3fdd4H pnite_l previous midnight
 Statistics 3fdd8H lsun_l last sunday (midnight)
 Statistics 3fddcH psun_l previous sunday (midnight)
 Statistics 3fde0H leom_l last end of month (midnight)
 Statistics 3fde4H peom_l previous end of month (midnight)
 Statistics 3fde8H leoy_l last end of year (midnight)
 Statistics 3fdecH peoy_l previous end of year (midnight)
 Statistics 3fdf0H lhour_c last hour (on the hour)
 Statistics 3fdf4H phour_c previous hour (on the hour)
 Statistics 3fdf8H lnite_c last midnight
 Statistics 3fdcH pnite_c previous midnight
 Statistics 3fe00H lsun_c last sunday (midnight)
 Statistics 3fe04H psun_c previous sunday (midnight)
 Statistics 3fe08H leom_c last end of month (midnight)
 Statistics 3fe0cH peom_c previous end of month (midnight)
 Statistics 3fe10H leoy_c last end of year (midnight)
 Statistics 3fe14H peoy_c previous end of year (midnight)
 Statistics 3fe18H lhour_a last hour (on the hour)
 Statistics 3fe1cH phour_a previous hour (on the hour)
 Statistics 3fe20H lnite_a last midnight
 Statistics 3fe24H pnite_a previous midnight
 Statistics 3fe28H lsun_a last sunday (midnight)
 Statistics 3fe2cH psun_a previous sunday (midnight)
 Statistics 3fe30H leom_a last end of month (midnight)
 Statistics 3fe34H peom_a previous end of month (midnight)
 Statistics 3fe38H leoy_a last end of year (midnight)
 Statistics 3fe3cH peoy_a previous end of year (midnight)
 Statistics 3fe40H cbox_r Rides since cash-box emptied
 Statistics 3fe44H cbox_a Income since cash-box emptied
 Statistics 3fe48H cbox_v 5p coin since cash-box emptied
 Statistics 3fe4cH cbox_x 10p coin since cash-box emptied
 Statistics 3fe50H cbox_xx 20p coin since cash-box emptied
 Statistics 3fe54H cbox_xv 25p coin since cash-box emptied
 Statistics 3fe58H cbox_l 50p coin since cash-box emptied
 Statistics 3fe5cH cbox_c 100p coin since cash-box emptied
 Reserved 3fe60H to 3fe7eH
 Statistics 3fe7fH custom4 (\$e6 indicates clear down)

10.0 MEMORY MAP

The memory space is allocated as shown in the memory map below.







Total ECT memory is 640 Bytes (3FC00H - 3FE7FH)

11.0 HARDWARE FUNCTIONAL DESCRIPTION

ROSie - Ride Operating System, is a single PCB whose application is to control the running of a child's ride or 'Kiddie ride'. It is backwards compatible with the PMP Controller 101822, Issues 4, 4.1, 4.2, 4.3, 4.4, and, with adaptor looms, 101822 Issues 2 and 3. The design is based around LSI devices 68008 (8 bit microprocessor), 68230 (parallel interface), 68681 (Dual UART), and UM5100 (Sound processor).

On board DIP switches are not employed, but user options will be set by use of control panel pushbuttons (in Set-Up Mode).

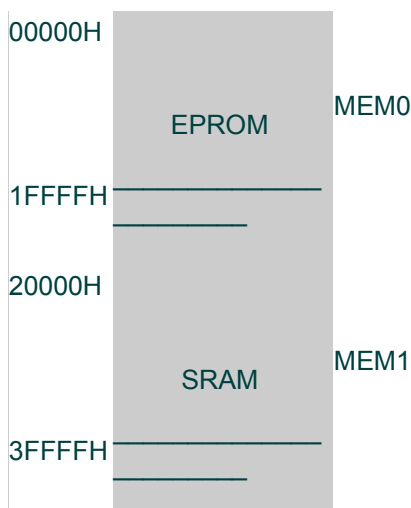
Channel 1 (theme channel) Sound memory supports up to 480 seconds of sound (which could range from 384 segments of 1.25 seconds to 6 segments of 80 seconds).

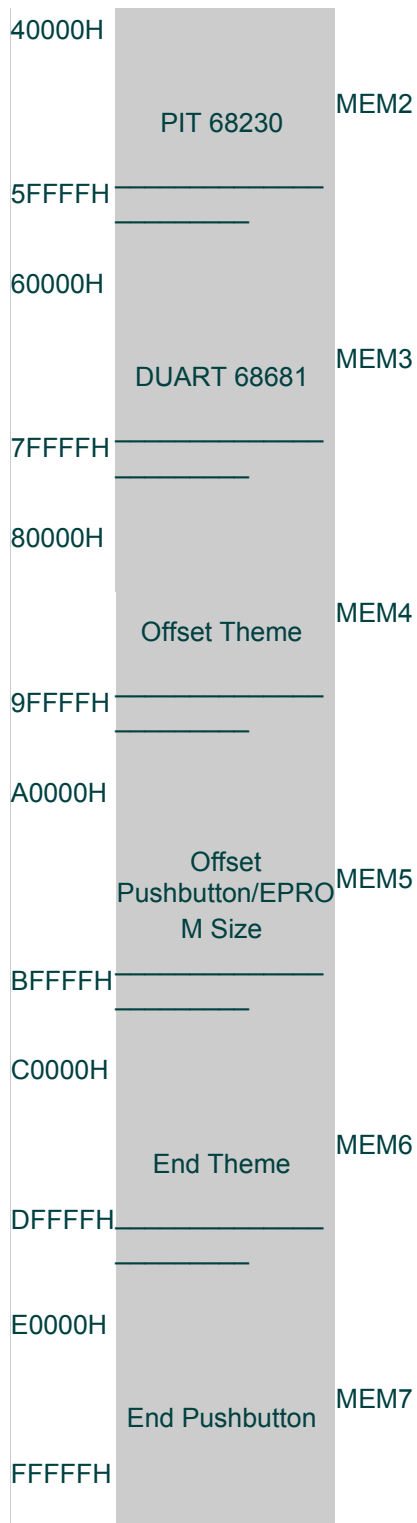
Note that the sound time periods quoted are approximate, and based upon a fixed sampling rate of 6.4K bytes per second.

11.1 MEMORY ALLOCATION

The 68008 memory space is fully allocated, not because it is all required, but to simplify memory decoding logic. The table below shows the entire memory map.

All addresses in hexadecimal bytes





Memory Map - 128K bytes per section.

11.2 MEM0 - EPROM

A 64K*8 [27512] or 128K*8 [27C010] device can be fitted in socket (U500), by changing link LK500. No links are required for 64K*8 devices, but see table below for 128K*8 devices. Attempted writes to EPROM are not trapped, and result in bus contention. A 64K*8 device will appear twice in MEM0.

Device	Links	No. of times in map
64K*8	None fitted	2

128K*8	2-3	1
128K*8 Flash	1-2	1

11.3 MEM1 - SRAM

Three device types can be fitted in (U501), namely 2K*8, 8K*8, and 32K*8, by changing link LK501. Link pins as follows:

Device	Links	No of times in map
2K*8	1-2, 5-6	64
8K*8	2-3, 5-6	16
32K*8	2-3, 4-5	4

The socket will accept ZeroPower RAM devices, where non-volatility is required. Similarly, TimeKeeper RAM will be accepted.

11.4 MEM2 - 68230

Port A (configured as output)

68230 PA0 SOURCE2- Source I from +12V
68230 PA1 SINK2- Sink I to -12V
68230 PA2 SOURCE3- Source I from +12V
68230 PA3 SINK3- Sink I to -12V
68230 PA4 SOURCE4- Source I from +12V
68230 PA5 SINK4- Sink I to -12V
68230 PA6 SOURCE5- Source I from +12V
68230 PA7 SINK5- Sink I to -12V

SRC/SINK2, SRC/SINK3, SRC/SINK4, and SRC/SINK5 are bi-directional outputs. They can be used independently, or used together to drive up to two stepper motors.

Port B (configured as input/output)

68230 PB0 CA1- Coin Accept 1 input
68230 PB1 CA2- Coin Accept 2 input
68230 PB2 CA3- Coin Accept 3 input
68230 PB3 CA4- Coin Accept 4 input
68230 PB4 CI1-/C5Acc Coin Inhibit 1 output/Coin 5 Accept in
68230 PB5 CI2-/C6Acc Coin Inhibit 2 output/Coin 6 Accept in
68230 PB6 CI3-/Acc Coin Inhibit 3 output/Accumulate input
68230 PB7 CI4-/YoYo Coin Inhibit 4 output/YoYo cheat input

The function of PB4 to PB7 is link selectable, by links LK700 to LK703 inclusive.

Links	Port Direction
-------	----------------

1-2	Output
2-3	Input

Port C

- 68230 PC0 PLYT- Play Theme output
- 68230 PC1 PLYPB- Play Push Button output
- 68230 PC2 RSTT- Reset Theme output
- 68230 PC3 TOUT- Timer Out (INT7-)
- 68230 PC4 RSTPB- Reset Push Button output
- 68230 PC5 PIRQ- PIT Interrupt Request (INT2-)
- 68230 PC6 PIACK- PIT Interrupt Acknowledge
- 68230 PC7 TIACK- Timer Interrupt Acknowledge
- 68230 H1 ENDT- End Theme input (interrupt)
- 68230 H2 DISPEN- Ticket Dispense Output (Vend interface)
- 68230 H3 ENDPB- End Pushbutton (interrupt)
- 68230 H4 TAEXT+ Theme Channel extension bit

040000	PORT GENERAL CONTROL REGISTER
040001	PORT SERVICE REQUEST REGISTER
040002	PORT A DATA DIRECTION REGISTER
040003	PORT B DATA DIRECTION REGISTER
040004	PORT C DATA DIRECTION REGISTER
040005	PORT INTERRUPT VECTOR REGISTER
040006	PORT A CONTROL REGISTER
040007	PORT B CONTROL REGISTER
040008	PORT A DATA REGISTER
040009	PORT B DATA REGISTER
04000A	PORT A ALTERNATE REGISTER
04000B	PORT B ALTERNATE REGISTER
04000C	PORT C DATA REGISTER
04000D	PORT STATUS REGISTER
04000E	RESERVED

04000F	RESERVED
040010	TIMER CONTROL REGISTER
040011	TIMER INTERRUPT VECTOR REGISTER
040012	RESERVED
040013	COUNTER PRELOAD REGISTER HIGH
040014	COUNTER PRELOAD REGISTER MIDDLE
040015	COUNTER PRELOAD REGISTER LOW
040016	RESERVED
040017	COUNT REGISTER HIGH
040018	COUNT REGISTER MIDDLE
040019	COUNT REGISTER LOW
04001A	TIMER STATUS REGISTER
04001B	RESERVED
04001C	RESERVED
04001D	RESERVED
04001E	RESERVED
04001F	RESERVED

PIT Register Addressing.

11.5 MEM3 - 68681

Dual UART inputs.

- 68681 IP0 PBL- Push Button Left (Cat)
- 68681 IP1 PBR- Push Button Right (Horn)
- 68681 IP2 START- Start Push Button
- 68681 IP3 CCU- Credit Control Unit

68681 IP4 SERV- On board service switch
 68681 IP5 TICKET- Ticket Sense

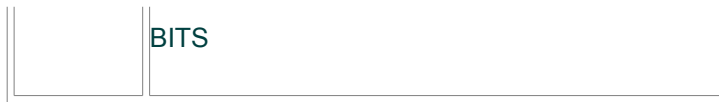
All inputs can be programmed to interrupt (level 5).

Dual UART Outputs.

68681 OP0 BCDA+ BCD output for seven segment display
 68681 OP1 BCDB+
 68681 OP2 BCDC+
 68681 OP3 BCDD+
 68681 OP4 SOURCE0- Source I from +12V
 68681 OP5 SOURCE1- Source I from +12V
 68681 OP6 OPTO- Drives motor opto-coupler
 68681 OP7 METER- Meter Pulse

The 68681 interrupts on interrupt level 5.

060000	MODE REGISTER A
060001	STATUS/CLOCK SELECT REGISTER A
060002	COMMAND REGISTER A
060003	RX/TX HOLDING REGISTER A
060004	IN PORT CHANGE/AUX CONTROL REGISTER
060005	INTERRUPT STATUS/MASK REGISTER
060006	COUNTER/TIMER UPPER REGISTER
060007	COUNTER/TIMER LOWER REGISTER
060008	MODE REGISTER B
060009	STATUS/CLOCK SELECT REGISTER B
06000A	COMMAND REGISTER B
06000B	RX/TX HOLDING REGISTER B
06000C	INTERRUPT VECTOR REGISTER
06000D	INPUT/OUTPUT PORT CONFIG. REGISTER
06000E	START COUNTER/SET OUTPUT PORT BITS
06000F	STOP COUNTER/RESET OUTPUT PORT



DUART Register Addressing.

11.6 MEM4 - OFFSET THEME

This is a write only location. No bus error results if an attempt is made to read this location, but the data will be corrupted. A write loads the data into a latch, stored as TSA0+ to TSA7+ (from D0+ to D7+ respectively). TSA is Theme Start Address. It dictates where the Theme sound system will start. The TSA is added to the most significant bits of the Theme Address (TA) bus, TA0 to TA20 (2M Bytes, about 320 seconds of sound storage). Thus, the TSA points to one of 256 8Kbyte boundaries. 8K bytes represents about 1.25 seconds sound duration.

Note that 32K*8, 64K*8, 128K*8, and 256K*8 devices can be fitted (four onboard devices thus up to 1M byte onboard, with an expansion bus for a further 1M byte off-board). The application software must be aware of the type of devices fitted.

11.7 MEM5 - OFFSET PUSHBUTTON

This is a write only location. No bus error results if an attempt is made to read this location, but the data will be corrupted. A write loads the data into a latch, stored as PBSA0+ to PBSA3+ (from D0+ to D3+ respectively). Only bits PBSA0+ to PBSA3+ are used for the offset feature. PBSA is Push Button Start Address. It dictates where the Pushbutton sound system will start. The PBSA (4 bits) is added to the most significant bits of the Pushbutton Address (PBA) bus, PBA0 to PBA17 (256K bytes, about 40 seconds of sound storage). Thus, the PBSA points to one of 16 16Kbyte boundaries. 16K bytes represents about 2.5 seconds sound duration.

Note that a 32K*8, 64K*8, 128K*8, or 256K*8 device can be fitted. (one onboard socket with no expansion). The application software must be aware of the type of devices fitted.

The upper four bits loaded from D4+ to D7+ are used to select the EPROM size fitted in the Theme and Pushbutton systems (ROSie Issue 2.0) or to control the electronic volume control (ROSie Issue 3.0).

Bit	Mnemonic	ROSie Issue 2.0	ROSie Issue 3.0
D4	SST0+/VOL1+	Size Select Theme LSB	Volume Chip Select
D5	SST1+/VOL3+	Size Select Theme MSB	Volume Up/Down
D6	SSPB0+/VOL2+	Size Select Pb LSB	Volume Clock
D7	SSPB1+/PBAEXT+	Size Select Pb MSB	PB channel ext.

Theme Channel EPROM

SST1	SST0	Device U100x	LK900	LK901
0	0	64K*8 (27C512)	2-3	2-3
0	1	128K*8 (27C101)	2-3	2-3

1	0	256K*8 (27C201)	1-2	2-3
1	1	512K*8 (27C401)	1-2	1-2

Pushbutton Channel EPROM

SSPB1	SSPB0	Device U1201	LK120	LK121
0	0	32K*8 (27C256)	1-2	1-2
0	1	64K*8 (27C512)	1-2	2-3
1	0	128K*8 (27C101)	1-2	2-3
1	1	256K*8 (27C201)	2-3	2-3

Note: Only link LK120 is present on ROSie hardware issue 3.0. Link 2-3 for 27C201 devices (linking 1-2 accepts 27C401 devices). Smaller devices are not accepted.

11.8 MEM6 - THEME END

This is a write only location. No bus error results if an attempt is made to read this location, but the data will be corrupted. Two write operations must be performed to fill the latch, since the Theme End Address is a 16-bit value. The first write is data TEA0+ to TEA7+ (from D0+ to D7+ respectively), whilst the second write is TEA8+ to TEA15+ (from D0+ to D7+ respectively). TEA is Theme End Address. It dictates where the Theme sound system will produce an end flag to the 68230 H1 (which is capable of generating an interrupt). The TEA is compared to the most significant bits of the Theme Address (TA) bus, TA0 to TA20. The flag is generated when the comparison is equal. The Theme can thus be ended on 4.8mS boundaries.

11.9 MEM7 - END PUSHBUTTON

This is a write only location. No bus error results if they are attempted to be read, but the data will be corrupted. A write loads the data into a latch, stored as PBEA0+ to PBEA7+ (from D0+ to D7+ respectively). PBEA is Push Button End Address. It dictates where the Pushbutton sound system will produce an end flag to the 68230 H3 (which is capable of generating an interrupt). The PBEA is compared to the most significant bits of the Pushbutton Address (PBA) bus, PBA0 to PBA17. The flag is generated when the comparison is equal. The Pushbutton sound can thus be ended on 156mS boundaries.

11.10 INTERRUPT SUMMARY

The table below lists the interrupts and intended applications.

- INT 7 - 68230 PIT Timer (Debug 100mS timer)
- INT 6 - Not implemented in 68008 structure
- INT 5 - 68681 Int. Request (user (inc. timer), Debug RS232 Ports)
- INT 4 - Not implemented in 68008 structure
- INT 3 - Not implemented in 68008 structure
- INT 2 - 68230 PIT Interrupt Request (end of sounds, H1 and H3)
- INT 1 - Not implemented in 68008 structure

12.0 INTERFACE DESCRIPTION

This section describes the interfaces to the ROSie - Ride Operating System PCB. Where an interface is fully compatible with a specific manufacturer's device, the reader is referred to the manufacturer's data for further information. A total of sixteen connectors, referenced P1 to P16, are to be found on the PCB. The list below is a summary of the connectors:

- POWER Mains Input, IEC socket (CE22)
- P1 Mains Safety Switch, 4 way Mate and Lock
- P2 Vehicle Interface, 18 way 0.156" SIL
- P3 Coin Controls CCU, 6 way 0.156" SIL
- P4 Seven Segment Display, 14 way DIL (footprint DIP14)
- P5 Transformer Primary Interface, 6 way Mate and Lock.
- P6 Transformer Secondary Interface, 4 way 0.156" SIL
- P7 Motor Interface, 3 way Mate and Lock
- P8 Armature Choke, 2 way Mate and Lock
- P9 Coin Accept Interface, 15 way 0.1" SIL
- P10 RS232 Interface, 10 way 0.1" SIL
- P11 I/O expansion, 9 way 0.156" SIL
- P12 Coin Accept Interface, 10 way boxed header
- EARTH1 - EARTH4 Earth connections, 1/4" spades (4 off)

Sections 12.1 to 12.13 below detail the pin assignments of the connectors.

12.1 MAINS INPUT

The mains input connector, reference POWER, is a PCB mounted IEC CE22 socket, with line, neutral, and earth connections. Note this connector is fully backward compatible with the POWER connector on the PMP/FMS controller, ref. 101822, Issues 4.0, 4.1, 4.2, 4.3, and 4.4.

12.2 MAINS SAFETY SWITCH

The Mains Safety Switch connects to connector P1, a PCB mounted 4 way Mate and Lock connector (1*4) with socket contacts. The pin designations and colour coding are described below.

Designation	Mnemonic	Pin Ref.	Wire Colour
Mains Line	LINEIN	1	BRN
Mains Line switched	LINEOUT	2	BRN
Mains Neutral	NEUTRALIN	3	BLU
Mains Neutral Switched	NEUTRALOUT	4	BLU

Note this connector is fully backward compatible with the P9 connector on the PMP/FMS controller, ref. 101822 Issues 4.0, 4.1, 4.2, 4.3, and 4.4.

12.3 VEHICLE INTERFACE

The vehicle interface connector, reference P2, is a 18 way Molex KK 0.156 inch connector. It interfaces to all moving electrical parts within the vehicle. These are the coin mechanism (start switch), electromechanical meter, lights, loudspeaker, and sound buttons. The pin designations and colour coding are described below. Note pin 14 is used as a polarising position.

Designation	Pin Ref.	Wire Colour
Coin mech/Start switch N.O. START-	1	PNK
Ground (Coin mech/Start Gnd) GND	2	PNK
Meter Negative METER-	3	BLU
Meter Positive +12V	4	RED
Lamp Front Left SOURCE0+	5	YEL
Lamp Front Right SOURCE1+	6	YEL
Lamp Rear Left SOURCE1+	7	RED
Lamp Rear Right SOURCE0+	8	RED
Ground (Lamp Common)	9	BLK
(Cat) left push-button PBL-	10	WHT
Ground (Cat p/b return) GND	11	WHT
(Horn) right push-button PBR-	12	GRN
Ground (horn p/b return) GND	13	GRN
No connection (polarising)	14	-
Control Panel Lamp SRC/SINK2	15	VIO
Auxiliary Lamp(s) SRC/SINK3	16	-
Speaker Out SPEAKER+	17	GRY
Speaker Ground AGND	18	GRY

Note that connections to pins 1 and 2 are used as either connections to a uni-coin mechanism, or to a start pushbutton, dependent on whether the machine is configured with a uni-coin or multi-coin mechanism. This connector is electrically backward compatible with the P3 connector on the PMP controller, Ref 101820

Issue 3, and the PMP/FMS controller, ref. 101822 Issues 4.0, 4.1, 4.2, 4.3, and 4.4.

12.4 CREDIT CONTROL INTERFACE

The multi coin mechanism (CCU) connector (Ref. P3) is a 6 way Molex KK 0.156 inch connector. The pin designations and colour coding are described below. Note pin 2 is used as a polarising position.

Designation	Pin Ref.	Wire Colour
Meter	1	-
No Connection (polarising)	2	-
Credit	3	WHT
Credit Ground	4	GRN
-12V (Ground to CCU)	5	BLK
Ground (+12V to CCU)	6	ORG

This connects via a one-to-one cable-form to the Coin Controls CCU. The meter is not connected to this connector when the CCU is being used. Note that the 12V supply to the CCU, via pins 5 and 6, is derived from the -12V rail. This connector is electrically backward compatible with the P5 connector on the PMP controller, Ref. 101820 Issue 3, and the PMP/FMS controller, ref. 101822 Issues 4.0, 4.1, 4.2, 4.3, and 4.4.

12.5 LED DISPLAY INTERFACE

The credit display, a seven-segment LED type, connects to the PCB via component legend Ref. P4, a 14-pin DIL socket. The pinning is compatible with common cathode, 0.3 inch, 14 pin DIL LED seven segment displays, thus a direct one-to-one connection via ribbon cable is possible (the display may also plug directly into the PCB).

Designation	Pin Ref.
Anode F	1
Anode G	2
No Connection	3
Common (GND)	4

No Connection	5
Anode E	6
Anode D	7
Anode C	8
Anode Decimal Point	9
No Connection	10
No Connection	11
Common (GND)	12
Anode B	13
Anode A	14

Note this connector is electrically backwards compatible with the LED800 connector on the PMP controller, Ref. 101820 Issue 3, and the PMP/FMS controller, ref. 101822 Issues 4.0, 4.1, 4.2, 4.3, and 4.4.

12.6 TRANSFORMER PRIMARY

The Transformer Primary connects to connector P5, a PCB mounted 6 way Mate and Lock connector (2*3) with socket contacts. The pin designations and colour coding are described below. Note this connector is fully backward compatible with the P7 connector on the PMP/FMS controller, ref. 101822 Issues 4.0, 4.1, 4.2, 4.3, and 4.4.

Designation	Pin Ref.	Wire Colour
P2-0	1	BLU
P1-110	2	ORG
P1-130	3	BRN
P1-0	4	VIO
P2-110	5	YEL

No Connect	6	-
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12.7 TRANSFORMER SECONDARY

The power supply connector (connector Ref. P6) is a 4-way Molex KK 0.156 inch connector. The pin designations and colour coding are described below. The connector is not polarised and thus may be connected both ways around without damage. When connected either way around, the ride will function correctly.

Designation	Pin Ref.	Wire Colour
S1 - 9.5V AC	1	YEL or VIO
S1 - 0V AC	2	ORG
S2 - 9.5V AC	3	RED
S2 - 0V AC	4	BLK

Note this connector is fully backwards compatible with the P1 connector on the PMP controller, Ref. 101820 Issue 3, and the PMP/FMS controller, ref. 101822 Issues 4.0, 4.1, 4.2, 4.3, and 4.4.

12.8 MOTOR INTERFACE

The motor connector (Ref. P7) is a PCB mounted 3 way Mate and Lock connector (1*3), with socket contacts. The pin designations and colour coding are described below.

Designation	Pin Ref.	Wire Colour
Motor+	1	BRN
No Connection	2	GRN/YEL
Motor-	3	BLU

This connector is fully compatible with the PMP/FMS controller ref. 101822 issue 4.4. Note however it is only partly backwards compatible with the P7 connector on the PMP/FMS controller, ref. 101822 Issues 4.0, 4.1, 4.2, and the off-board connector used in conjunction with the PMP controller 101822 Issue 3. It differs in that pin 2 of the connector is no longer connected to earth. Motor extension cable-forms must have an earth connection terminated in a ¼ inch spade receptacle, which connects to one of the four PCB

mounted ¼ inch spade terminals EARTH1 to EARTH4.

12.9 ARMATURE CHOKE

The Armature Choke connector (Ref. P8) is a PCB mounted 2 way Mate and Lock connector (1*2), with socket contacts. The pin designations and colour coding are described below.

Designation	Pin Ref.	Wire Colour
Choke	1	BLK
Choke	2	BLK

Note this connector is fully backward compatible with the P8 connector on the PMP/FMS controller, ref. 101822 Issues 4.0, 4.1, 4.2, 4.3, and 4.4.

12.10 COIN VALIDATION INTERFACE

There are two connectors for the coin validation interface, namely P9 and P12. They cannot be used simultaneously; they are wired in parallel and only one may be used at any given time. Two connectors are provided to aid connector compatibility only.

The Coin Accept interface, reference P9, is fully compatible with the Mars MS125/6, Mars MS111, Sentinel 35, Sentinel C220, and Sentinel SMCH coin handling mechanisms. Refer to the Mars Electronics or Coin Controls interface specification for further information on this interface. Note that Pin 1 is tied to ground, thus the accept outputs are active low, that is, are pulled to ground when a coin is accepted. The interface connector, P9, is a 15 way 0.1 SIL connector, its pins being assigned as shown below.

C220/MS111	MicroMech S5	Pin	Note
GND	GND	1	—
Coin 1 Acc	C1A	2	—
-	-	3	Polarising Posn
Coin 2 Acc	C2A	4	—
Coin 3 Acc	C3A	5	—
-	-	6	No connection
Coin 4 Acc	C4A	7	—
Coin 4 Inhib (O)	Inhib (O)	8	* LK700 1-2

+12V	+12V	9	—
GND	GND	10	—
Coin 3 Inhib (O)	Yoyo (I)	11	* LK701
Coin 2 Inhib (O)	C6A (I)	12	* LK702
Coin 1 Inhib (O)	C5A (I)	13	* LK703
Coin 5/6 Inhib	—	14	No connection
Coin 7/8 Inhib	—	15	No connection

The Coin Accept interface, reference P12, is fully compatible with the NRI G13, and Coin Controls C120 coin handling mechanisms. Refer to the NRI or Coin Controls interface specification for further information on this interface. The interface connector, P12, is a 10 way boxed header, its pins being assigned as shown below.

Designation	Pin Ref.	Note
GND	1	—
+12V	2	—
Coin Channel 5- (I)	3	* LK703 2-3
Coin Channel 6- (I)	4	* LK702 2-3
Coin Reject- (I)	5	* LK701 2-3
Inhibit+ (O)	6	* LK700 1-2
Coin Channel 1-	7	—
Coin Channel 2-	8	—
Coin Channel 3-	9	—
Coin Channel 4-	10	—

* Link pin 1-2 for output (O), and pins 2-3 for input (I).

Links LK700 to LK703 are associated with lines marked with a * to determine whether these line are used as output (Sentinel/Mars) or input/output (NRI G13 and Micromech). Pin 6 of this interface is left floating. Its effect is to support only the four coin validator mode (Sentinel only). Refer to ROSie Functional Description for further information.

12.11 RS232 INTERFACE

Two RS232 interfaces are provided, on connectors P10, a 10-way 0.1 inch SIL connector.

Designation	Pin Ref.
-12V	1
+12V	2
RXA	3
TXA	4
GND	5
GND	6
TXB	7
RXB	8
+12V	9
-12V	10

12.12 I/O EXPANSION INTERFACE

The connector Ref. P11 is a 9 way Molex KK 0.156 inch connector. The pin designations and colour coding are described below. Note pin 7 is used as a polarising position.

Designation	Pin Ref.	Wire Colour
+12V	1	-
+5V	2	-
Ground	3	-
DISPEN- (was PLAY-)	4	-
TICKET- (input sense)	5	-
POR-	6	-

- (Polarising)	7	-
SRC/SINK4	8	-
SRC/SINK5	9	-

12.13 EARTH CONNECTIONS

EARTH1 - EARTH4 are 4 PCB mounted ¼ inch spade terminals for mains earth connections.

Note these connectors are fully backward compatible with the EARTH1 to EARTH4 connectors on the PMP/FMS controller, ref. 101822 Issues 4.0, 4.1, 4.2, 4.3, and 4.4.

13.0 YOUR PERSONAL IDENTIFICATION CODE (PIC)

The PIC for your ride has been recorded below. Keep this manual and PIC record with the ride at all times.

Ride Serial Number:

Action	Press and Hold	Release
First	Start	-
Second	Cat	-
Third	-	Cat
Fourth	Cat	-
Fifth	-	Cat
Sixth	Cat	-
Seventh	-	Cat
Eighth	Horn	-
Ninth	-	Horn
Tenth	Horn	-
Eleventh	-	Horn
Twelfth	Horn	-

Thirteenth	-	Horn
Fourteenth	-	Start

Please note: PRESS & HOLD means just that. Do not 'let go' of a pushbutton until indicated to do so in the RELEASE column.