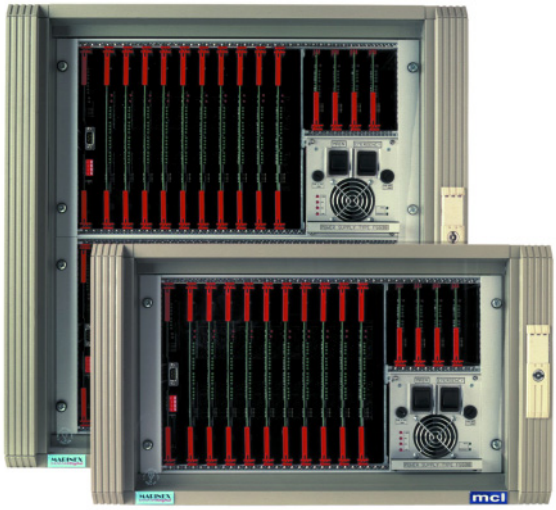
MARINEX Digital

Digital Telephone Exchange



Version 2.25 firmware

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July 2003

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Chapter 1 Introduction

This manual provides all the necessary information to install, program, operate and maintain the Marine Communications Limited's Marinex Digital Exchange MNXD Series.

1.1 Regulatory information

The Marinex Digital Exchange has been designed to meet British Telecom standards.

The Marinex Digital Exchange is designed for use on-board ships. It may not comply with specific statutory local PTT requirements for use in some countries.

1.2 Maintenance

Maintenance of the Marinex Digital Exchange must only be performed by Marine Communications Limited or its authorised agent. The user may not make any changes and/or repairs except as specifically noted in this manual. Unauthorised alterations or repairs may affect the approval status of the system and void any remaining warranty.

There are no serviceable components in the exchange. Board replacement is the only method of service. Faulty boards to be returned to Marine Communications Limited.

1.3 Radiated Emissions

The Marinex Digital Exchange complies with the current rules regarding radiation and radio frequency emission as defined by the European EMC CE marking.

WARNING

This equipment generates and uses R.F. energy and if not installed and used in accordance with the instruction manual may cause interference. It has been designed and tested to meet European regulations.

1.4 Telephone Compatibility

Marine Communications Limited Marinex Digital Exchange has been designed to work with most telephone instruments worldwide. However satisfactory performance cannot be guaranteed for every allowable combination of host and subsidiary apparatus.

In particular, certain modern electronic telephones when set to impulse (loop disconnect LD) mode may not be recognised. Operation using DTMF tone signalling is recommended.

LD telephones over 15 years old, should be replaced with modern DTMF telephones.

1.5 General Description

1.6 Introduction

The Marinex Digital Exchange is a fully digital telephone system designed to meet the current and planned future requirements of all internal and external telephone calls made on-board ship.

The Marinex Digital system incorporates state of the art digital technology for command processing and voice switching, using Pulse Code Modulation/ Time Division Multiplexing (PCM/TDM) distributed switching matrix. The system supports both “A” and “Mu” law encoding.

The Marinex Digital achieves a high level of flexibility by:

- Using a standard 6U (265mm) high 19 inch rack
- Plug in printed circuit boards to support different types of interfaces and instruments
- Expandable by joining two units together
- Future expansion to a full node system using fibre optic cables
- No limit on speech paths (non-blocking) giving communication at all times

The Marinex digital is available in a bulkhead mounting cabinet, with a built-in distribution frame, or as units to be mounted in a customer rack.

The system architecture has been designed to allow a high level of software control over the system’s hardware. The software has a large range of features and capabilities including PC Database Administration, Call diversions and pickups, voice prompting and mail etc.

All of the features can be controlled at extension, group and user levels.

The Marinex Digital Exchange has extra features for the marine environment including:

- External shore line, SATCOM, cellular and Public Address access
- Dual AC and DC operation
- Alarm output on failure of AC supply
- Priority intrusion
- Direct dial in and out with voice prompting (DISA)
- Modular construction
- Built-in Main Distribution Frame if required

The Marinex Digital Exchange in a 6U rack supports up to 160 extensions for internal telephones, 24 external connections and 4 Public Address interfaces. Joining two 6U units together gives a maximum capacity of 320/48/8.

The bulkhead mounting cabinet meets Lloyds Register of Shipping, VDE, Det Norske Veritas, UL, CSA, TUV and Russian Maritime Register of Shipping approvals.

The exchange configuration (database) is held in an internal solid state hard disk. The facilities within the exchange can be changed to suit individual requirements using a Windows™ computer.

The exchange is provided with both AC and DC power supplies. A Power Fail Relay with voltage free contacts provides warning in the event of failure of the AC mains failure through an external lamp or siren (not supplied). The power supplies have independent switches to isolate the power inputs, which are also independently fused. Each 6U rack has an independent power supply.

Every telephone and tie line can be individually configured to meet customer's specific requirements. Using a telephone equipped for Calling Line Indication (CLI) the caller's telephone number can be displayed on the receivers telephone unit (*future feature*).

The exchange is pre-programmed to provide specific features for Officer and Crew/Passenger extensions.

When connected to external lines, incoming calls are directed to a pre-specified extension. Outgoing calls are enabled for Officer phones and can be dialled directly by prefixing the telephone number with a specific code.

Call-logging facilities are provided by the exchange to enable all internal, outgoing and incoming calls to be logged. The information logged includes the source extension, user name, number dialled and duration of the call. Output is through an RS232 serial interface for a printer.

The Marine Communications Limited simple callManager program can be used to analyse and print individual bills.

The system uses -48V bias on telephone lines giving superior performance over 24V systems. The volume on telephones can also be set electronically under engineering control to ensure clarity in reception.

By adding or replacing plug-in modules, users can carry out future expansion and servicing of the exchange. To assist with maintenance and fault finding, a number of indicators are provided on the modules to show the status of many areas of the exchange.

1.7 System Specifications

The following tables provide general system specifications.

1.7.1 System Port Capacities

Description	6U (1 rack)	12U (2 racks)
Internal Extension Ports	160	320
External Tie Line Ports	24	48
External Public Address Outputs	4	8

1.7.2 Environment Specifications

	degrees C	degrees F
Operating Temperature	0 - 50	32 - 122
Optimum Operating Temperature	18 - 26	64 - 79
Storage Temperature	-10 - 70	14 - 158
Relative Humidity	0 to 95% non-condensing	

1.7.3 Electrical Specifications

For each 6U rack

AC Voltage Input	90-264Volts AC @ 43-63Hz
AC Current	3A maximum
AC Input Fuse	3.15A anti-surge 20mm
DC Voltage Input	24V ±20%
DC Current	18A maximum
DC Input Fuse	20A anti-surge 20mm
Power Fail	Set of uncommitted relay contacts in event of AC. power failure

1.7.4 Dimensions and Weights

Cased System	6U	12U
Height	345mm	611mm
Width	600mm	600mm
Depth	515mm	515mm
Maximum Weight	60Kg	100Kg

Individual Boards	Height	Width	Depth	Weight
F5538 Power Supply	128mm	123mm	235mm	2300g
D6002 Processor Board	20mm	233mm	220mm	320g
D6003 Analog Subscriber Board	20mm	233mm	220mm	320g
D6005 Analog Tie Line Board	20mm	100mm	220mm	150g

1.7.5 Miscellaneous Specifications

Main System Memory	4MB RAM; 8MB Solid State Hard Disk
Optional Expansion Card	8MB-96MB Compact Flash Card
Numbering System	2-8 digits (free numbering)
Clock Memory	Battery Backed clock. Minimum Life 10 years
Frequency Range	300-3200Hz at 3dB points
Modem Transmission Rate	28.8kB maximum
Mean Time Before Failure (MTBF)	10,000 hours (full system)
Mean Time To Repair (MTTR)	30 minutes (assuming spares available)
Signalling	Dual Tone Multifrequency (DTMF) preferred Loop Disconnect (LD/Impulse) possible with reduced facilities Calling Number Indication (CLI) with appropriate instrument (*future feature*)
Cabling	2 wire throughout (Except PA - 4 wire)

1.7.6 Board Specifications

Part No	Description	Capacity
D6001	Motherboard	1 per 6U rack
D6002	Processor Card	1 per 6U rack
D6003	Analogue Subscriber (Extension) Card	16 extensions per card 24/35mA loop current per line -48VDC line bias 90V RMS 25Hz ringing voltage 600R nominal impedance
D6005	Analogue Tie Line (Exchange) Card	6 Tie Lines - 2wire; 600R impedance 1 Public Address - 4 wire; 0dBm level
F5538	Power Supply	1 per 6U

Chapter 2 System Components

2.1 Bulkhead Cabinet

The Marinex Digital exchange can be supplied either in a bulkhead mounting cabinet or as 19" sub-racks for mounting in customer supplied frames.

The bulkhead cabinet has three parts. The base box is mounted on the bulkhead and contains the built-in distribution frame (if supplied). The section has removable gland plates on the top and bottom, which can be drilled away from the equipment for cable access.

The hinged centre section contains the electronics' sub-rack. This can be swung open to allow free access to the base box. The electronics' sub-rack is described below.

The final part is the front door made from aluminium extrusion with die-cast corners and 4mm safety glass. The door frame conceals the fastener of the centre section to the base box.

The same key opens the front and centre sections. The all-round knife edge guarantees an excellent seal (protection category IP55 to EN 60 529/10.91)

The bulkhead cabinet meets Lloyds Register of Shipping, VDE Det Norkse Veritas, UL, CSA, TUV and Russian Maritime Register of Shipping approvals.

Adequate ventilation must be provided in customer installed rack mount systems. MCL recommend that 2 1U vents are provided above and below the rack.

2.2 Electronics Sub-Rack

The electronics sub-rack contains a motherboard with 37-way D-type connectors for connection to the MDFs on one side and DIN 64137 connectors on the other for connection to the plug in PCBs.

The system is made up of either one 6U sub-rack or 2 6U sub-racks physically joined to make 12U. The two units are physically the same and the boards are interchangeable.

There are eleven 6U high slots in each 6U sub-rack. The left most slot is assigned for the processor card (D6002) The slot is marked "PROCESSOR". The remaining 10 slots, numbered 1 - 10, house the extension cards (D6003/D6004)

The Power supply is mounted in the bottom right hand space.

Above the power supply are four 3U high slots for tie line (D6005) and Public Address (D6007) cards. These slots are marked "A" to "D".

The rear of the sub-rack has 12 37-way D-Type connectors for connecting each extension card and pairs of Tie Line cards to the MDF.

The right hand panel has five connectors for connecting the optional VGA video, keyboard and twisted pair network ports. The high density 26way D-Type is used to link the two 6U racks in a 12U system. The final 9-way D-Type port is used to connect to a serial printer.

2.3 Power Supply Unit (F5538)

The power supply unit converts the AC (90-264V @ 50/60Hz) and DC (24V ±20%) input voltages to the system DC voltages, regulates the voltages, and provides the appropriate DC voltages to the motherboard for distribution to the system cards. Four DC outputs are provided: ±5VDC, ~-48VDC, +95VDC. LEDs in the PSU front panel indicate valid outputs as well as the presence of AC input power.

The two switches on the front panel independently turn on the AC and DC input supplies. When both input power sources are available, the AC source will be used, with the DC only used when the AC fails.

Due to the EMC filters on the input to the power supply, the contacts will remain live for 5 minutes after the unit is disconnected.

WARNING

The contacts on the Power Supply will remain live for up to 5 minutes after the unit is disconnected from the input supplies.

2.4 Processor Card (D6002)

The Processor Card incorporates the system's RAM, solid-state hard disk, master clock, two RS-232C ports, and watchdog circuitry as well as the system PCM voice processing and main microprocessor. The microprocessor is a 32bit high speed CPU which receives and transmits signalling information from/to the other PCBs, controls feature activation and PCM time-slot interchange.

The processor contains 4MB of DRAM and 8MB of solid-state hard disk, which contains the configuration and operating software.

The processor card has the capability to have an optional module added. The Video module allows an external VGA monitor and keyboard to be attached to allow programming and system fault finding.

A Compact Flash card can be added to give extra hard disk space for call logging and voice prompts.

The Processor card also provides announcements for voice prompting and user greetings. The standard 64KBps PCM signals are stored for high quality voice reproduction. Voice Prompting is normally in English, but can be updated by the user to any language or message.

2.4.1 Video Module (D6601)

The processor card can be optionally equipped with a video module to allow connection of a VGA monitor and keyboard. The display can then be used for showing the status of the system, monitoring the call logs, and for updating the configuration.

2.4.2 Compact Flash Memory Card (CFxx)

An optional Compact Flash memory card can be installed in the system to increase the number of voice messages in the system or to increase the number of call logs stored. Various capacities are available from 8MB to 96MB

2.5 Analogue Extension Card (D6003)

The Analogue Extension Card has 16 single line analogue (POTS) telephone ports. The card provides the appropriate A/D and D/A conversions, on/off-hook detection and ring generation. For each extension there is an LED, which shows the status of the line (on/off-hook, ringing), this allows easy diagnostics of problems. A telephone can be connected up to 5000 metres from the system using 22AWG wire.

The card provides each extension with approximately -48V line bias and 70V 25Hz ringing. The loop current can be set to either 24mA or 35mA under software control. To reduce the power used and the heat generated, each line can be placed into power-down mode which is only removed when the line goes off-hook or is rung. This feature can be enabled/ disabled on a line per line basis as some telephones are not be able to retain their memory during power down.

With suitably equipped telephones, an extension can have a message waiting light illuminated using line reversal, or display caller information.

2.6 Analogue Tie Line Card (D6005)

The Analogue Tie Line Card has 6 PABX Loop Start lines with circuitry for ring and loop current detection, A/D and D/A conversions, and pulse and flash signalling. Each line has a LED to indicate the status of the line. The LED shows the on/off-hook status and the incoming ring cadence.

The card also has 1 Public address output with two zone switching relays. The “microphone” output is at approximately 0dBm (line-level). The two voltage free relays can be operated independently to allow different PA zones to be contacted from the one voice output. There are two LEDs to show the status of the PA relays.

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Chapter 3 Installation

3.1 Introduction

As with any sophisticated communications device, installation of the Marinex Digital System requires care and forethought. There are four main steps in installation:

- Site Preparation
- Marinex Digital Enclosure Installation
- PCB Installation
- System Wiring

3.2 Site Preparation

3.2.1 General Site Considerations

The first step is to locate an acceptable site for the equipment. When locating the mounting site, the following points should be considered:

- Marinex Digital is designed for bulkhead mounting. The system must be firmly mounted to the bulkhead to reduce the effect of vibration
- The location must have access to a dedicated 93-264 AC 50/60Hz circuit with a circuit breaker or fuse rated at 5Amps
- The DC supply should be from a stable source and be connected to a source where there are **NO** high voltage transients or surges. The circuit breaker or fuse should be rated at 25Amps
- Both power supplies for a 12U system must be the same phase
- The location must have access to a good earth ground
- The location should be well ventilated with a recommended temperature of 15^{o}C to 25^{o}C and a relative humidity of 5% - 90% non-condensing. The area should be suitable for office type equipment
- The equipment should be away from radio transmitting equipment, generators and other equipment capable of generating electrical equipment. The system should be protected from flooding and heavy machinery as well as excessive dust and vibration
- The location should have adequate accessibility, space and lighting for future servicing
- Telephone cables should be terminated in the integral Main Distribution Frame (MDF) or an external unit located within 3 metres of the telephone exchange

3.2.2 Check on-site Equipment

Once the equipment installation location has been identified and its suitability checked, verify that all the equipment required is onboard and has not been damaged during shipment.

Unpack the Marinex Digital, checking that there is no damage. Check that the type and quantity of boards received is correct and any optional equipment is available. A packing list is included with all systems. Note that the individual boards should not be unpacked at this time.

> If any equipment is missing or damaged, notify Marine Communications Limited or your agent to correct the situation.

3.2.3 Rack Based Systems

The Marinex Digital Exchange can consist of either one or more 19” rack mounted frames holding the component boards and power supplies all enclosed in an outer case or as individual 19" rack mounted frames.

Where the system is part of a larger system such as entertainment centre then this will be rack mounted as per the total system supplier’s instructions. Terminations for power and telephones may be different than for the standard cased system.

3.3 System Installation - Cased Version

It is suggested that the card frame is removed from the unit by opening the front door and then the rear section using the special key provided. The cables from the card frame should then be disconnected, the rear door closed and locked and the card frame(s) removed and stored in the packing case until required. The case can then be mounted separately and the card frame electronics fitted at a later date when required.

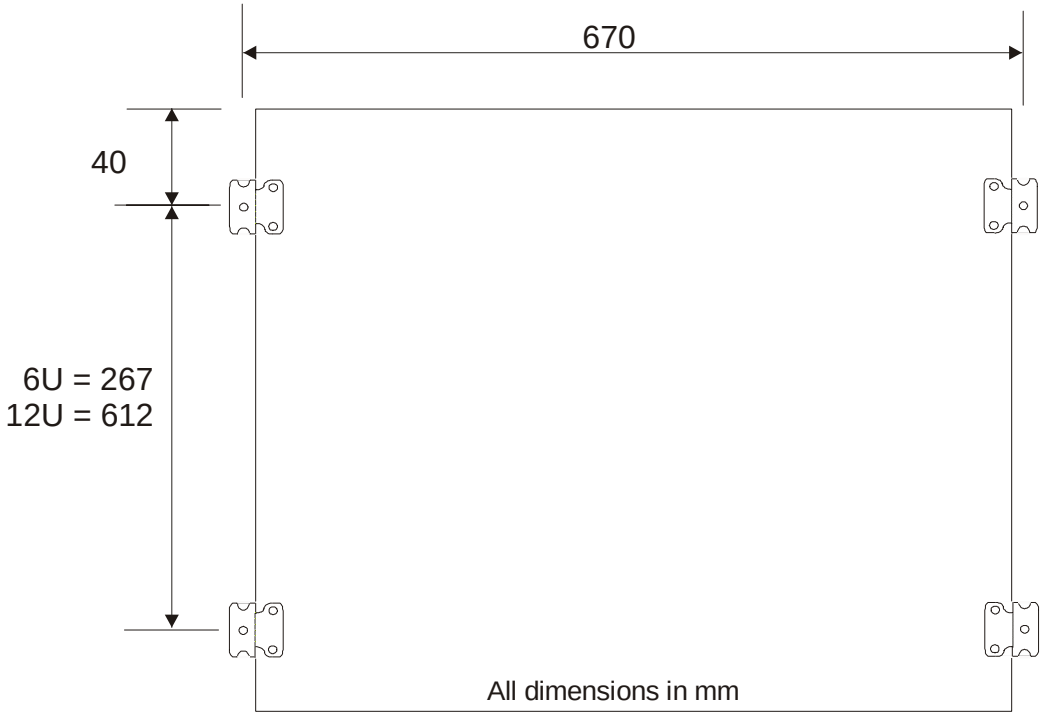
3.3.1 Mounting the Case

The cabinet is designed for bulkhead mounting but can be floor mounted if required. The mounting positions are as shown in Figure 4a. Bolts of M8 size should be used for fixing the mounting brackets.

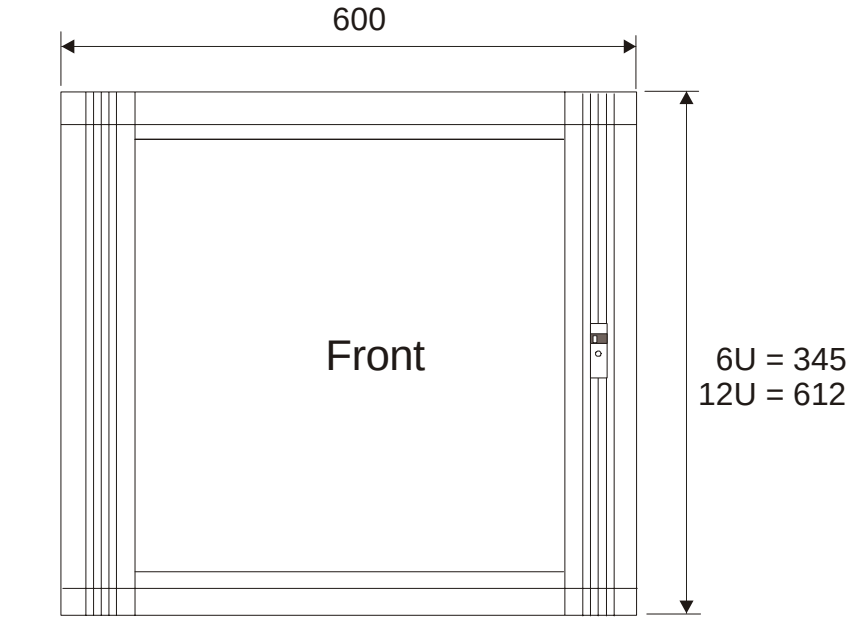
Once the unit has been mounted, remove the top/bottom gland plate(s) and cut gland holes in the appropriate position. The cables can then be connected to the in-built MDF mounted in the rear of the case. If the MDF is not used then cables terminated in a “D” connector should have been supplied allowing connection directly to the rear of the exchange. You should allow a length of up to 1 metre free cable inside the case. The other end of the telephone cables can then be connected to a separate Main Distribution Frame (not supplied by MCL).

On final assembly of the card rack(s) into the exchange, check that there is no loose material in the case area and that all the cards and the power supply are properly inserted.

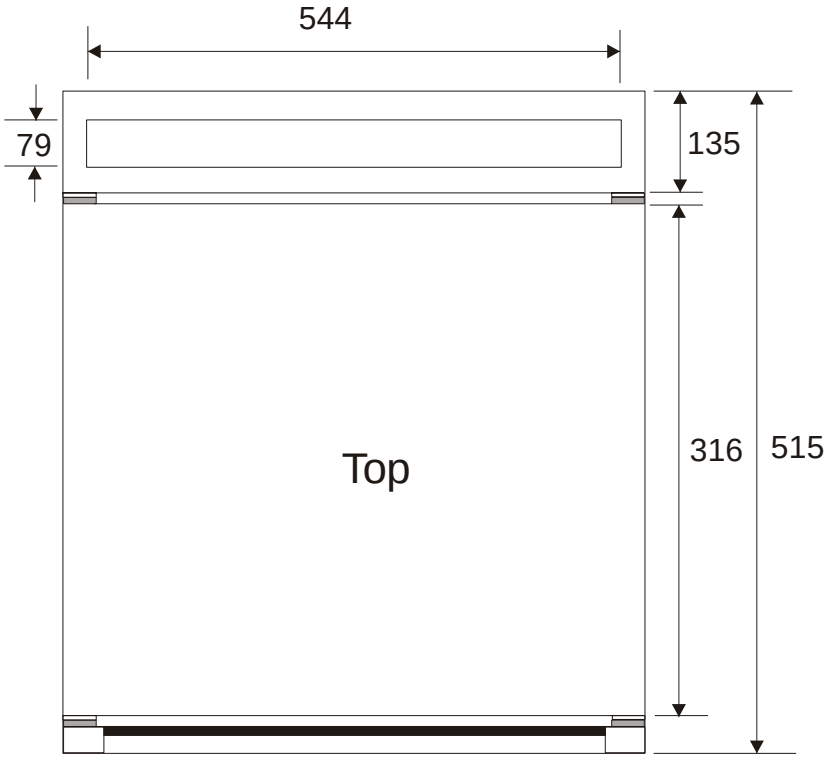
Connect the telephone cables from the Main Distribution Frame to the card frame rear.



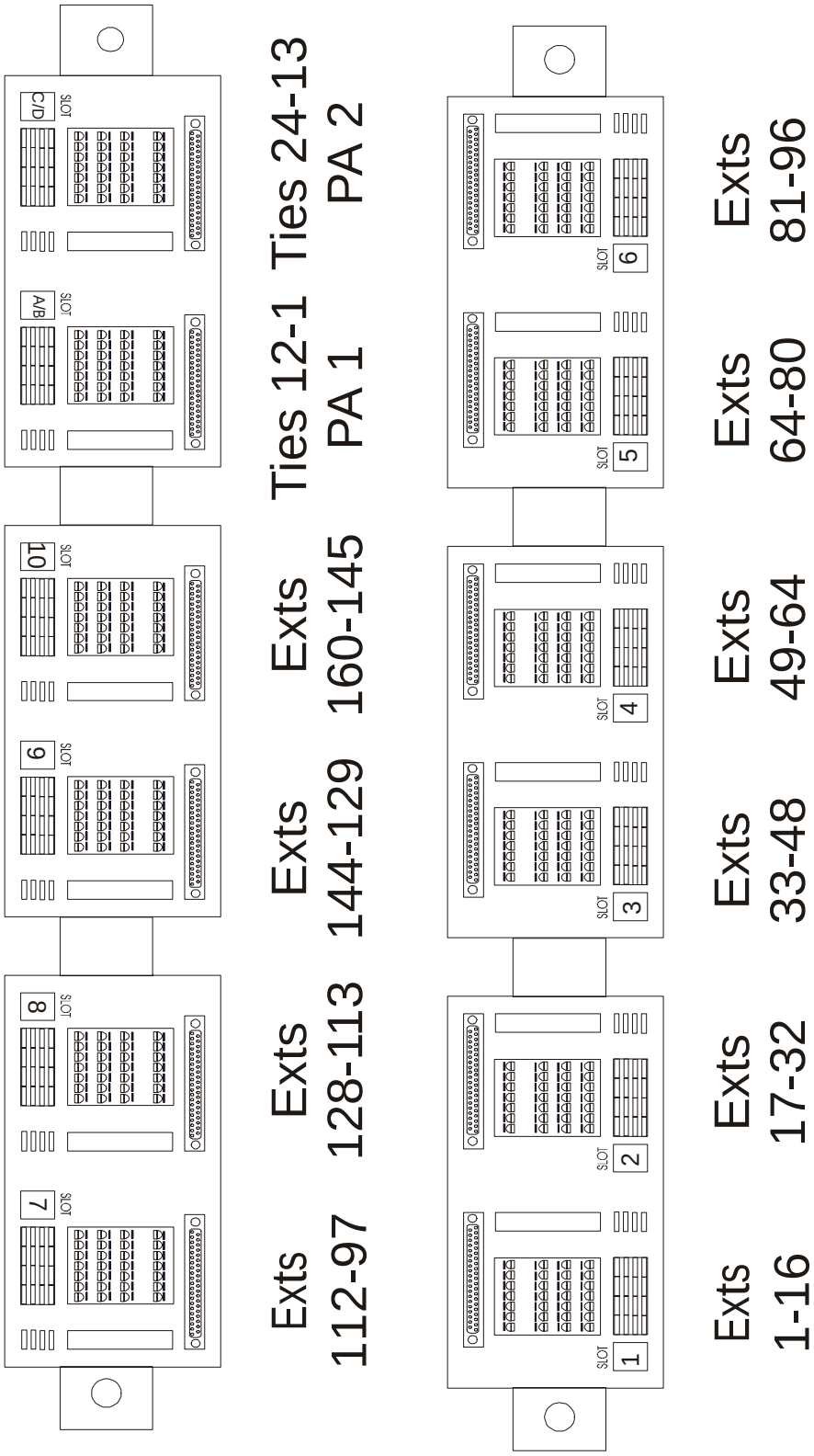
Mounting position template



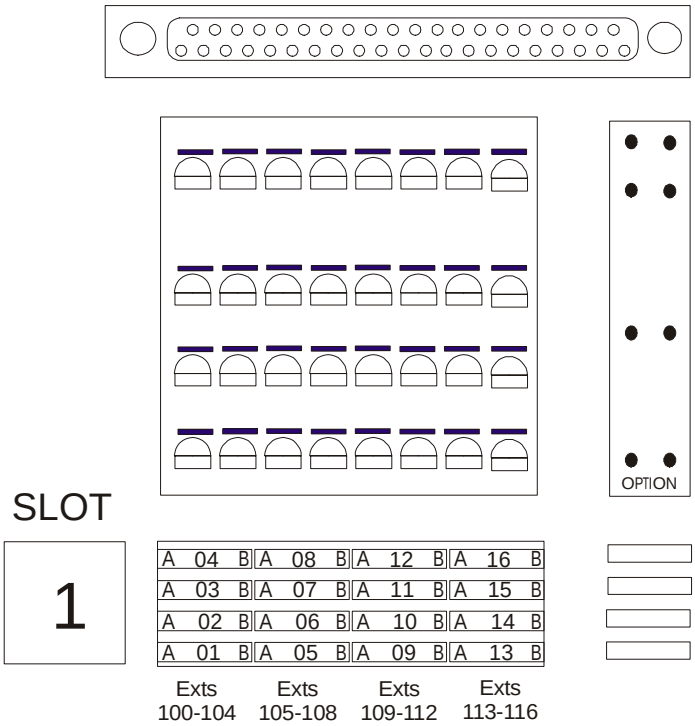
All dimensions in mm



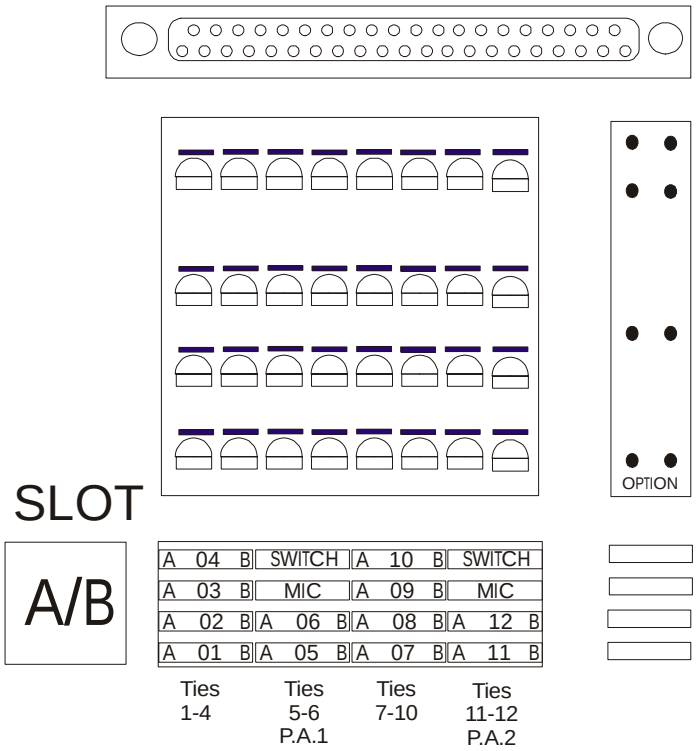
Case Dimensions



General Layout of MDF Rails



Example of Extension Block



Example of Tie Line Block

3.3.2 Ground (Earthing) Point

Two connecting points are available on the left-hand side in the rear section of the case. These should be bonded to a good quality ground point on the bulkhead.

3.4 System Installation - Rack Version

When installing the system into a customers own racking, care must be taken to make sure there is sufficient airflow around the racks. In particular, if the Marinex Digital is being mounted near Public Address amplifiers that the heat generated from the amplifiers is not forced into the Marinex. If the PA amplifiers are mounted below the exchange, then extra fan trays must be installed to remove the excess heat.

The Marinex must be connected to a good earth connection.

In the rack version, cables for connection to an external MDF (not supplied) are provided. These cables must be securely fastened.

3.5 PCB Installation

3.5.1 PCB Handling and General Installation

Boards should not be installed or removed with applied power

Power must be turned off prior to insertion or removal of the PCB.

The system PCBs contain digital circuitry, which while extremely reliable, can be damaged by exposure to excessive static electricity. When handling PCBs, a grounded wrist strap should be used to protect the cards from static discharges. Also, use common sense when handling the PCBs. For example, do not place a PCB in positions where heavy objects might fall on the PCB and damage components.

To insert a PCB, hold the PCB by the injectors and, with the components facing right, align the top and bottom edge of the PCB in the card guides. Slide the card into the system and use the injectors to seat the PCB firmly into the motherboard connectors.

To remove a PCB, reverse the procedure.

3.5.2 Processor Card (D6002) Installation

The Processor Card is installed in the left most PCB slot (slot Processor) of the 6U rack. There are two Processor Cards in a 12U system. The card contains a lithium coin battery to maintain the real-time clock function. The battery is held in a PCB mounted socket. The processor board has one plug in module which contains the CPU, ram and solid state hard disk. There may be up to two other optional modules; a card with video controllers (D6601) and/or a compact flash memory card (CFxx) for storing voice messages and extra configuration.

CAUTION: Danger of explosion if the battery is incorrectly replaced. Replace only with the same or equivalent type recommended by Marine Communications Limited. Dispose of used batteries according to the manufacturers instructions.

The Processor Card also has an eight position DIP switch. The functions of the switches are below.

Switch 1	Not Used
Switch 2	On enables hardware handshaking for printer port
Switch 3	On enables hardware handshaking for the programming port
Switch 4	Not Used
Switch 5	Not Used
Switch 6	Not Used
Switch 7	Not Used
Switch 8	Not Used

The Processor Card has ten LEDs. The functions of the LEDs are below.

LED 1	Off	System in Normal Mode
	On	System in Administration Mode
	Flashing	Invalid Configuration
LED 2	On - Incoming calls stacked waiting to be answered	
LED 3	Not Used	
LED 4	Not Used	
LED 5	Inter Rack communications	
LED 6	Not Used	
LED 7	Not Used	
LED 8	Off	6U system
	On	Slave in 12U system
	Flashing	Master in 12U system
LK	Reserved	
LN	Reserved	

3.5.3 Analogue Subscriber Card (D6003) Installation

The Analogue Subscriber Card provides connection for 16 analogue telephones. Up to 10 boards can be inserted into slot positions 1 to 10. All features on the boards are software controlled.

3.5.4 Analogue Tie Line (D6005) Installation

The Analogue Tie Line Card provides connection for 6 analogue tie lines and 1 Public Address. Up to 4 boards can be inserted into slot positions A to D. All features on the boards are software controlled.

3.5.5 Power Supply Module (F5538) Installation

The Power Supply provides the required power rails to the boards in one 6U rack. The module fits at the bottom right hand side on 4 rails (2 at the top and 2 at the bottom).

Before inserting the module, make sure that both switches on the front are off (no colour showing on the switches).

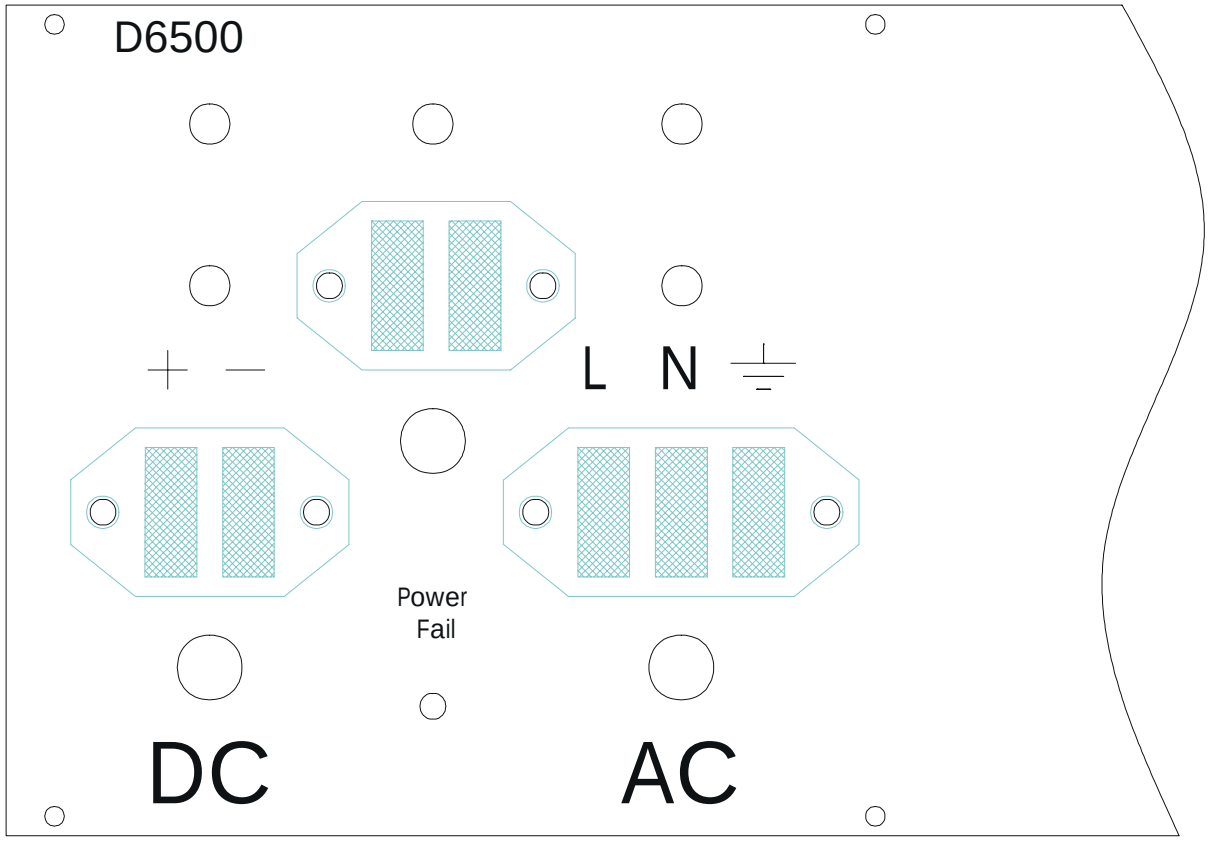
Once the module is inserted, screw the fixing screws to firmly secure the module.

3.6 System Wiring

3.6.1 Power Wiring

Power is connected to the exchange through terminal block connections on the rear of the exchange. The terminals also provide link terminals for power to other Marinex Digital Exchange card racks, if supplied. It is recommended that only one set of power cables are connected to the equipment mounted in the same location and interconnecting cables are used to connect modules. This will reduce the possibility of ground loops causing interference.

All cables should be securely fastened to prevent damage due to vibrations.



Power cables are not provided

3.6.2 Processor Programming Port Wiring

The Processor Card has a standard RS232C 9 way D-Type plug that is used for programming. The wiring for the connector is as below:

Marinex Digital 9 - Way	Marinex Digital Name	Computer Purpose	Computer 9 - Way	Computer 25 - Way
1	Carrier Detect	Not Used		
2	Receive Data	Transmit Data	3	2
3	Transmit Data	Receive Data	2	3
4	Data Terminal Ready	Not Used		
5	Signal Ground	Signal Ground	5	7
6	Data Set Ready	Not Used		
7	Request to Send	Clear to Send	8	5
8	Clear to Send	Request to Send	7	4
9	Ring Indicator	Not Used		

RS232C Programming Port Wiring

The terminal port is configured to operate at 9600 baud, no parity, 8-bit data and one stop bit. The Programming port wiring must include the CTS/RTS wires if hardware handshaking has been enabled by switch 3 of the processor card.

3.6.3 Processor Rear Wiring

On the rear of the frame there is a connector panel with five sockets and plugs.

The VGA Video port, Keyboard Port and 10BaseT network ports are only used if the optional modules are installed.

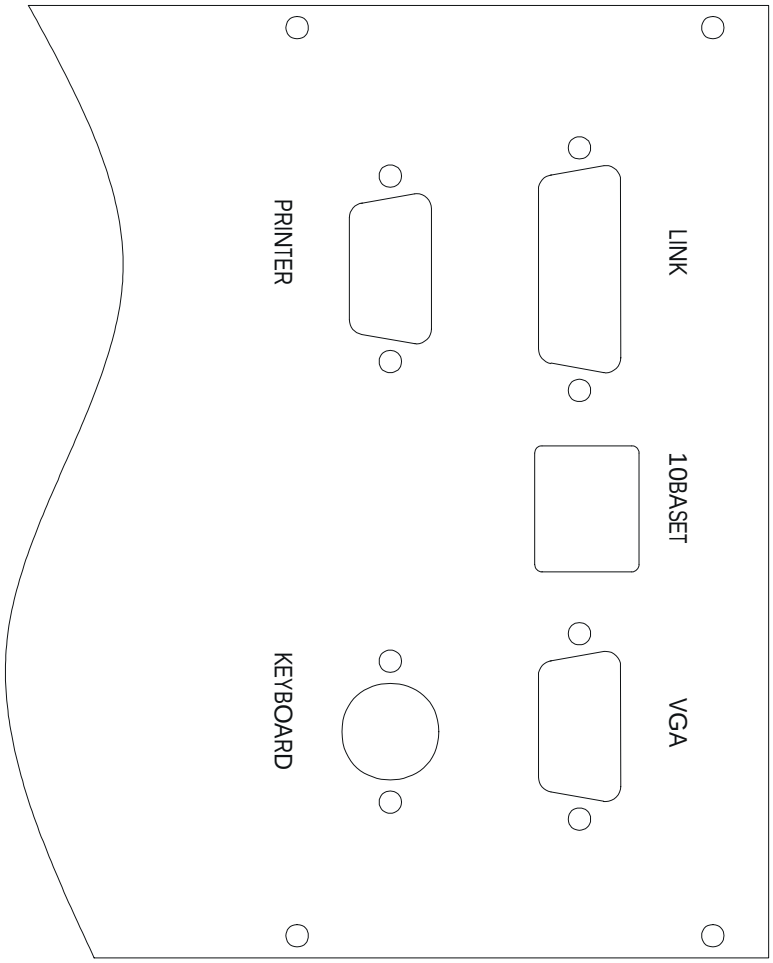
The Link Port is used to link two modules together to make a 12U module. This is a factory installed link.

The Printer Port is a standard RS232C 9 way D-Type plug. If a computer is connected to this port, it can be used for programming or call logging. In a 12U system only 1 printer needs to be connected, as all of the printer ports will print the same information. The wiring for the connector is as below:

Marinex Digital 9 - Way	Marinex Digital Name	Computer Purpose	Computer 9 - Way	Computer 25 - Way
1	Carrier Detect	Not Used		
2	Receive Data	Transmit Data	3	2
3	Transmit Data	Receive Data	2	3
4	Data Terminal Ready	Not Used		
5	Signal Ground	Signal Ground	5	7
6	Data Set Ready	Not Used		
7	Request to Send	Clear to Send	8	5
8	Clear to Send	Request to Send	7	4
9	Ring Indicator	Not Used		

RS232C Printer Port Wiring

The terminal port is configured to operate at 9600 baud, no parity, 8-bit data and one stop bit. The Programming port wiring must include the CTS/RTS wires if hardware handshaking has been enabled by switch 2 of the processor card. XON/XOFF handshaking is always available.



3.6.4 Extension Wiring

The connections to the exchange are made through 'D' type connectors on the rear.

Exchanges are either provided with an integral MDF to which the telephones are connected or 5 metre length cables terminated with 'D' types to suit the required configuration for connection to an external MDF. The telephone end of the latter cables are not terminated thereby allowing users to connect them to their own Main Distribution Frames.

Cable colours for each plugged cable are shown below:

Port	Tip	Ring	Port	Tip	Ring
1	Red	Brown	9	Black	Orange
2	Red	Orange	10	Black	Yellow
3	Red	Yellow	11	Black	Green
4	Red	Green	12	Black	Blue
5	Red	Blue	13	Black	White
6	Red	White	14	Green	Brown
7	Red	Black	15	Green	Orange
8	Black	Brown	16	Green	Yellow
-	Green	White	-	Green	Blue
-	Blue	White			

Wiring for an Extension Board

Slot	Port	Tip	Ring	Slot	Port	Tip	Ring
A/C	TIE 1	Red	Brown	B/D	TIE 1	Black	Orange
A/C	TIE 2	Red	Orange	B/D	TIE 2	Black	Yellow
A/C	TIE 3	Red	Yellow	B/D	TIE 3	Black	Green
A/C	TIE 4	Red	Green	B/D	TIE 4	Black	Blue
A/C	TIE 5	Red	Blue	B/D	TIE 5	Black	White
A/C	TIE 6	Red	White	B/D	TIE 6	Green	Brown
A/C	SW1	Red	Black	B/D	SW1	Green	Orange
A/C	SW2	Green	Blue	B/D	SW2	Green	White
A/C	MIC	Black	Brown	B/D	MIC	Green	Blue
-	-	Blue	White				

Wiring for Tie Line Boards

All cables should be securely fastened to prevent damage due to vibrations.

Chapter 4 Initial Testing

4.1 Powering Up

Once a system has been installed, check that all cards and modules are secure in their position and that there are no lose materials. Check that all cables are securely fastened

It is recommended that before any modification of the system configuration, the system is tested and all extensions are checked.

Power on the exchange, remembering to turn on both power supplies if the system is 12U high. The exchange will then enter its power up routine. This could take some minutes depending upon the system size.

During start-up, the LED's on the Extension boards and Tie Line boards will flash in sequence once they have been released from the RESET state by the main processor.

The Power supply will have one or two green LEDs illuminated depending on the power input being used. The four red LEDs should be on. If any of the LEDs are off then there might be a fault in the PSU. Please read the fault finding section to rectify the problem.

If the optional video module is installed on the Processor Board the start-up process will be displayed.

The processor LEDs will display the system information as described in Section 3.5.2. The extension board LEDs will be off unless an extension is off-hook. The tie line boards LEDs will be off.

4.2 Extension Testing

Each extension should be tested to make sure that it is working. There are three tests to be executed.

4.2.1 Bell Check

If you lift a receiver, dial *6, then replace the receiver, the telephone should then ring to enable the amplitude and operation of the bell to be checked.

4.2.2 Extension number Check

If you dial your own number then a high pitched 'busy' tone should be heard.

4.2.3 Extension Location Message Check

If the Engineer's Security Code is entered the following codes are also available from the *6.

1 - Ring back check.

2 - Voice Message saying Extension Number

3 - Voice Message saying Virtual Port

4 - Voice Message saying Physical Port

5 - Voice Message saying Current ACL

6 - Voice Message saying Default ACL

4.2.4 Voice Path Check

A known working extension is dialled and the incoming and outgoing voice quality is checked.

4.3 Tie Line Testing

Each Tie Line should be tested to make sure that it is working. There are two tests to be executed. These tests can only be executed from an extension with Officer Class Access. It is recommended that the default 1st Designated Extension is used (normally 104).

4.3.1 Outgoing Call

Dial the access code for the Tie Line (the range normally starts at 800), you should get the dial tone for the connected equipment. Ensure that a call can be placed and the voice quality is acceptable.

4.3.2 Incoming Call

Place a call through the connected equipment to the Tie Line. The 1st Designated Extension should ring. Pickup the extension and check the voice quality. The Incoming Tie Line LED will flash in cadence with the incoming ringing.

4.4 Public Address Testing

Each outgoing Public address line should be tested. The only test must be executed from an extension with Officer Class Access.

4.4.1 Outgoing PA

Dial the Access Code for the PA. The each PA line has two switch relays. The first relay is normally accessed by dialling 850-861 for each board. (Slot A Relay 1 = 850; Slot A Relay 2 = 851; Slot A Relay 1 & 2 = 852; Slot B Relay 1 = 853, etc).

4.5 Feature Description

4.6 System Capacities

The table below gives the system capacities of the Marinex Digital Exchange

Description	6U	12U
Maximum Number of Extensions	160	320
Maximum Number of Tie Lines	24	48
Maximum Number of PA outputs	4	8
Maximum Number of PA zones	8	16
Number of Groups	128	128
Number of Members in a Group	16	16
Number of Hold Locations	10	10
Number of User IDs	1024	1024
Number of User Groups	255	255
Number of System Speed Dials	255	255
Number of Virtual Exchanges	16	16
Number of Watches	16	16
Number of Call Log Records	Minimum 512	Minimum 512
Number of Voice Prompts	32	32
Total Length of Voice Prompts	120 seconds	120 seconds

4.7 System Features

4.7.1 Broker

This allows a user to switch alternately between two calls. While communicating with one line or extension, you can contact and speak with another line.

4.7.2 Call Back on Busy

If a called extension is busy, a code can be dialled which will cause the originating telephone to ring immediately the busy extension is free.

Only 1 call back can be set per extension at any one time.

4.7.3 Call Back on No Reply

If there is no reply when an extension is called, a code can be entered, which will cause the originating telephone to ring after the called extension is next used.

4.7.4 Call Forward

All calls can be re-directed to another extension by dialling a preset code. This is a useful feature if you are going to be away from the telephone or you do not want to be interrupted for a period of time.

The only extension able to call you is the extension to which you have diverted your telephone.

If the caller does not have the rights to access the new call forwarded number, then they will get the NU tone.

4.7.5 Calling Line Identification

(*Future Feature*) The system is able to automatically generate details of the internal originating caller. This at minimum is the extension number but callers name or location of the telephone can also be displayed if held on the system database.

For incoming Tie Line calls, the information will display the Tie Line Name.

4.7.6 Call Parking (On-Hold)

Calls can be parked, or placed on hold, at any time, in order to contact another extension. Following the conversation with the other extension the original call can be re-established.

The call returns to the extension that placed the call on hold after approximately 1 minute. If the call is not answered after another minute, the call will be cancelled and lost.

4.7.7 Call Pickup

An unattended ringing telephone can be answered remotely by dialling a specific code plus the ringing extension number.

Call pickup is not dependant upon any group definition.

4.7.8 Call Transfer

Calls can be transferred by depressing the ‘recall button’, dialling the required number and when the new extension answers by replacing the original handset the call will be transferred.

The call returns to the extension that placed the call on hold after approximately 1 minute. If the call is not answered after another minute, the call will be cancelled and lost.

4.7.9 Conferencing Facilities

Conference allows between three and 15 people to be connected to a conversation simultaneously.

At any one time the maximum number of persons involved in conferences is a minimum of 15.

4.7.10 Data line security

In situations where a break or interruption in a call cannot be accepted such as data transmission, then the line can be protected against such interruptions.

4.7.11 Designated Incoming Extension

One or more extensions can be designated to receive incoming calls, which can then be used to transfer the call to the required extension. *See Call Transfer*.

4.7.12 Direct Dial In (DISA)

An incoming Tie Line can be automatically answered with a voice prompt so that the caller can immediately call the extension required or wait for an operator to answer.

4.7.13 Direct Dial Out

An extension or user can be allowed to access a tie line to make an outgoing call.

4.7.14 Distinctive Ringing

A calling line (internal or external) can change the ringing pattern of the called extension. This allows the different types of call to be recognised. The ring pattern can also be associated with an user code. This feature is programmed though a PC.

4.7.15 DTMF

Dual Tone Multi Frequency signalling. The international standard for telephone number signalling. This is replacing the old pulse or Loop Disconnect system.

4.7.16 Extensions

Extensions are the telephones on board the ship. Access to features and other extensions or Tie Lines can be programmed to be allowed or denied.

4.7.17 Full call logging with traffic analysis

A call logging and analysis program (callManager) is available to give full accounting of call activity on board. This program is available from Marine Communications Limited. The data is held on a P.C. connected to the exchange and can be used for billing purposes.

4.7.18 Group Pickup

A number of extensions can be set up to form a group. A call coming to an unattended member of the group can be picked up by another telephone in that group by dialling the appropriate group code.

Call pickup is dependant upon the group definitions programmed into the system. An extension can be a member of more than one group.

4.7.19 Hot line

The system can be configured that designated numbers are automatically rung on lifting an extension handset.

The hotline can be made to be a tie line or Public Address.

4.7.20 Hunt Group

A hunt group number can be programmed to search a group of extensions for the first free telephone. This facility is particularly useful where alternative persons could answer the calls.

The time before a call is transferred to the next extension in the group can be programmed to allow for specified telephones to ring for different periods before moving on to the next telephone.

4.7.21 Interrupt Priority

This facility allows a caller to interrupt a call currently in taking place on another extension. A background tone will be heard on the third party telephone which will be put on hold whilst the priority call is taking place.

The Priority Interrupt will only work if the call is in the standard call state. If is it transferring or setting up a call, then the interrupt will not be allowed.

4.7.22 Lithium battery for real time clock

A lithium battery is used to maintain the clock time. This battery will last for a minimum of 10 years. Changing the battery will not affect any other feature such as system configuration. The battery is on the Processor Board.

4.7.23 MODEM access

A modem can be incorporated in the exchange to allow for data transmission from a P.C. without the need of an external modem. (Available at a later date).

4.7.24 Message waiting light

With the appropriate telephone a light can be illuminated showing that there are messages waiting. By calling the appropriate number from that extension these messages can then be retrieved. This is set though a PC.

4.7.25 Mute Facility

The mute button switches off the microphone on the telephone so that the caller can be heard but the called person cannot be heard.

4.7.26 Night Bell Pick-up

A telephone can be designated as the Night Bell. Any unanswered incoming calls can be diverted after a period of time to ring the night bell. On hearing the extension ringing (a bell or flashing light) any extension can pick up the call by dialling the night bell code.

The night bell extension has an intermittent dialling tone.

4.7.27 Pager Access

Telephones can be programmed to allow access to paging systems. The method of operation is dependant on the Paging system.

4.7.28 PIN Access

A PIN number is a 2 - 8 digit Personal Identification Number, consisting of an ID code and a secret code. This allows access to an outside line or the PA system from an extension, which normally does not have that facility. (e.g. Crew class extensions do not normally have access). The system can also be used to control access to certain extensions.

4.7.29 Private group access

Extensions, Tie Lines and PAs can be placed into user groups so that only certain extensions or users are able to access these lines. This facility can be used to make virtual exchanges inside the main exchange. *See Virtual Exchanges.*

4.7.30 Programming Marinex Digital

Programming or re-configuration can be carried out using our configurAID program on P.C. This is a Windows based menu driven program.

If the optional Video Module is installed, configuration can be done though an attached monitor and keyboard.

4.7.31 Public Address Access

Designated users or extensions on the exchange can be used to access the Public Address system in order to broadcast messages. The rights of the user control the access. Also access is controlled on a line by line basis.

4.7.32 Release guard

This feature places a slight delay from the release of a tie line by one caller before a second call can be placed on that tie line. This allows a local exchange to revert to a known status before a second call is accepted.

4.7.33 Ring Group

A group can be set up as a Ring Group. If the first number in that group is dialled and not answered after a defined time then other telephones in that group in short succession will all ring until the call is picked up. Other extensions in the group will then revert to normal operation. The original extension can be incorporated in the Ring Group.

The time before the next extension is added to the ring group can be programmed to allow for specified telephones to ring for different periods. Each extension can be set to continue ringing or stop ringing after its timeout.

4.7.34 Single digit Intercom mode

Extensions can be programmed so that a single digit key entry will automatically dial another number.

4.7.35 Tie Lines

Tie lines allow access to the outside world, though SATCOM, Cellular networks, or Land Lines when in Port.

4.7.36 User Access

The exchange is able to control the rights and access that any user or extension has. *See PIN Access*

4.7.37 Virtual Exchange

A virtual exchange is a telephone exchange within a telephone exchange. For example there may be a need for a local network to be set up where some telephones only operate within a ‘closed’ network.

A casino could be an example of this where the extensions in the casino can only ring each other within the casino but not to extensions outside that group.

One or more extensions, for example, the ‘Pit Managers’ can however be given the facility to ring outside the group and receive calls to the group.

4.7.38 Voice Prompting

Marinex Digital provides voice prompting to help callers to access other extensions or facilities instead of going through an operator. Voice Prompting is normally in English, but can be updated by the user to any language or message.

4.7.39 Wake Up Alarm

Telephones can be programmed to give a wake-up ring and on lifting the handset a simple message. The setting of the alarm call is individually selectable and the time can relate to either GMT or to the ships time if programmed.

Only one alarm can be set for an extension. The alarm will need to be reset every day for a repeating alarm.

4.7.40 Warm Line

An extension can be configured to wait a short time before automatically dialling an extension number. This is often used to prevent the exchange accepting an off-hook situation for short periods of time due to handset vibrations.

The Warm Line can be made to be a tie line or Public Address. The time before calling the extension is programmable.

Chapter 5 Extension Operation

5.1 Introduction

This chapter describes how to access the different features available to extensions. Almost every feature can be disabled or enabled on an extension-by-extension basis. The rights to use a feature can also be assigned to a user or user group.

The user access his account by entering "#" followed by his user ID and passcode. The rights last for the length of the call. The system is described in Chapter 9.

If a user tries to access a feature, which is not allowed, the system will either ignore the request or give the continuous "NU" tone.

When a feature needs a confirmation that it was successful, three short beeps will be heard. If the command fails the continuous NU" tone will be heard.

5.2 Call Transfer

Call Transfer enables you to redirect a call to another extension.

① Press the recall button and listen for the intermittent dial tone

② Dial the required extension number

③ When the extension answers replace the receiver

If the extension to which the call is being transferred is engaged, does not answer or is unobtainable, then dial **1** to revert the call to the original extension.

To dial a different extension, repeat steps 1-3.

5.3 Call Back On Busy

If the extension you call is busy, you can cause your phone to ring immediately once the busy extension is free.

Note: *Only one 'call back' per extension can be set up at any time.*

① Dial the required extension. If it is busy, the engaged tone is heard

② Dial ***6**

③ Replace the receiver. When the busy extension becomes free the caller's telephone will ring and when the caller's handset is picked up the exchange will call the required extension

5.4 Call Back On No Reply

If there is no reply when you ring an extension, which will cause your phone to ring immediately after the called extension, is next used.

Note: *Only one 'call back' can be enabled at any time.*

① Dial the required extension. The ringing tone is heard but there is no reply

② Dial ***6**

③ Replace the receiver. When the dialled extension is next used, immediately the receiver is replaced your telephone will ring and the exchange will call the extension

5.4.1 Cancel Call Back

The current 'call back' can be cancelled by dialling ****6**.

5.5 Holding Calls

The Calls on Hold facility allows a call to be placed on hold while the person for whom the call is intended is informed.

① Press the recall button and listen for the intermittent dial tone.

② Dial a 'hold' number. The factory configured numbers for this facility are 591 to 599. If a two digit system is being used then the hold numbers are 50 – 59.

③ If a hold number is in use then the engaged tone will be heard. Replace the handset, wait for the call to be returned to you and try from stage 1 again with a different hold number.

④ Use the P.A. to announce the call and request the person for whom the call is intended to dial the 'hold' number.

The call returns to the extension that initially answered it after approximately 1 minute. If the call is not answered after another minute, it will be lost.

5.6 Call Pickup

If an extension is ringing, another extension can dial a code and take the call. The Call Pickup facility is not dependent upon any group definition.

① A ringing extension can be picked up by any other extension.

② Dial ***8** followed by the ringing extension number. If, for example the ringing extension is 104 then dial ***8** followed by 104.

5.7 Group Pickup

Any ringing extension within a pre-selected group can be picked up by dialling *9. To set up the extensions for this facility it is necessary to use the configurAID program.

5.8 Call Forward

You can re-direct all your calls to another extension by dialling a pre-set code. This is a useful feature if you are going to be away from your telephone or you do not want to be interrupted for a period of time.

① Lift the receiver.

② Dial ***3** followed by the new extension number.

When calls have been redirected, an intermittent dial tone is heard on the original extension.

Note: *The new extension is the only phone, which is able to ring the originating 'Call forwarded' phone.*

5.8.1 Reset Call Forward

A 'Call Forward' is reset to the original extension by dialling ****3**.

5.9 Night Bell

Any extension can be allocated to be a night bell. Incoming calls are normally directed to a designated extension; if that extension is engaged, or is not answered within 15 seconds, the incoming call will ring the night bell.

The night bell telephone has an intermittent dial tone.

This facility is added using the configurAID program.

Note: *Any extension can pick up the call by dialling the night bell extension number.*

5.10 Alarm Set

You can use the Alarm Set facility to set an extension to ring at a particular time. To activate the alarm:

① Dial ***5**

② Dial the time required using the 24 hour clock format HH MM. For example, to set the alarm for 3.40 PM, dial ***5** followed by the digits **1540**

Note: *Only one 'alarm' can be enabled at any time. A new alarm will replace the old one.*

5.10.1 Cancel Alarm

The 'Alarm' facility is cancelled by dialling ****5**.

5.11 Interrupt Priority

This facility allows you to interrupt a call currently taking place on another extension. To select interrupt priority:

① Dial the extension required

② If it is engaged, dial ***1**

A background 'pip' will be heard on the extension, you are then free to interrupt the conversation. The third party also hears a 'pip' and is put on hold while the priority call is taking place.

5.12 Direct Dial Out

External calls can be dialled directly by prefixing the number to be called with a pre-set digit. A PIN number may be required for access.

① Lift the receiver and listen for the dial tone

② Either

9	for tie line group 1 (normally shore lines)
800-847	for individual tie lines or tie line group

③ Dial the required external number

5.13 Public Address Access

If a PIN number system is in use then the PIN number is required to access the P.A. system.

① Lift the receiver and listen for the dial tone.

② Dial 60, 61 or 62

5.14 Remote Call Forward "Follow Me"

The Remote Call Forward facility allows you to re-direct all your calls from another extension and make your calls 'follow you'. This can be useful if you are moving around the vessel and you still want to receive your calls.

① Lift the receiver.

② Dial ***2** followed by your original extension number.

When calls are 'Called Forward', an intermittent dial tone is heard on the original extension.

NOTE: *The new extension is the only phone, which is able to ring the originating 'call forwarded' phone.*

5.14.1 Reset Remote Call Forward

A 'Remote Call forward' is reset to the original extension by dialling ****2** plus the original extension number.

5.15 Hot Line access

An extension can be set so that on lifting the handset another designated extension automatically immediately rings.

5.16 Warm Line Access

An extension can be set so that after a short delay, another designated extension automatically rings. The short delay is so that an alternative extension number can be entered before the automatic ringing of the designated extension.

5.17 Broker

The Broker facility allows you to switch alternately between two calls. While communicating with one line or extension, you can contact and speak with another person.

① Press the recall button and wait for the dial tone.

② Dial the other extension.

③ Dial ***0** when you want to switch back to the first call.

④ You can continue to switch between the two calls just by dialling ***0**.

5.18 Distinctive Ring

The exchange can be configured so that there are differences between ringing cadences. The standard are one ring for internal calls and two rings for incoming external calls. Other cadences such as three rings then pause or two rings-pause-single ring can be set up to differentiate the source of the incoming call. For example, each tie line or calls from the Captain's extension.

5.19 Designated Incoming Extension

One or more extensions can be designated to receive incoming calls, which can then be transferred to the required extension. The exchange is factory configured with extension 104 to receive all incoming calls.

The default designated extension can be changed using configurAID.

5.20 Emergency Phone

Emergency telephones can be accessed simultaneously by several users (max 15), so enabling anyone on the ship to interrupt in an emergency. After 15 users, anyone calling this extension they will be able to hear the conversation but not be able to speak.

The emergency telephone can be configured using configurAID.

The emergency phone utilises the Conference facility. The Emergency call uses the conferencing system, so it will drop any conferences in progress if it needs the conferencing ports.

5.21 Intercom Mode

An extension can be placed in a intercom group where each digit dials an extension. For Example, 1 calls the Bridge, 2 for the engine control room, 3 for the Captains Day room, etc. The telephone can call any extension by entering a users PIN code first.

This mode is enabled using configurAID.

Chapter 6 Tie Line Operation

6.1 Introduction

This chapter describes how to access the tie lines and how the incoming calls are dealt with.

Access to the tie line is controlled though the user rights. If the user does not have the right to access the tie line then the continuous “NU” tone will be heard.

6.2 Outgoing Calls

External calls can be dialled directly by prefixing the number to be called with a pre-set digit. A PIN number may be required for access.

① Lift the extension receiver and listen for the dial tone

② Either

9	for tie line group 1 (normally shore lines)
800-847	for individual tie lines or tie line group

③ Wait for the dial tone of the attached equipment

④ Dial the required external number

The call can be logged. The information recorded includes the extension used, user ID, tie line used, time and duration of the call and the number dialled.

6.3 Incoming Calls

When an incoming call is detected, the first designated extension will be rung. When the call is answered, the incoming call can be transferred to the relevant extension using the call transfer feature.

A group can be set up so that if the first designated extension is not answered the incoming call will be passed to either each phone in sequence or all together. The chapter on groups explains the types of groups available.

The only indication that the incoming call has been terminated before an extension has picked up the call is the ringing cadence. This means that the Marinex Digital Exchange has to wait for more that the cadence interval before the ringing termination is detected. This means that it is possible for an extension to hear the dial tone of the attached equipment and not the incoming call. This is normal behaviour.

An incoming Tie Line can be automatically answered with a voice prompt so that the caller can immediately call the extension required or wait for an operator to answer.

Chapter 7 Public Address Operation

7.1 Introduction

This chapter describes how to access the Public Address.

Access to the Public Address is controlled though the user rights. If the user does not have the right to access the tie line then the continuous “NU” tone will be heard.

7.2 Public Address Access

Public Address announcements can be dialled directly by prefixing the number to be called with a pre-set digit. A PIN number may be required for access.

① Lift the extension receiver and listen for the dial tone

② Dial

850-852 for Public Address Slot A

(850 = Zone 1; 851 = Zone 2; 852 = Zone 1 & 2)

853-855 for Public Address Slot B

(853 = Zone 1; 854 = Zone 2; 855 = Zone 1 & 2)

etc

③ Wait for the Public Address system (if required)

④ Make the Announcement

The Public Address Access can be logged. The information recorded includes the extension used, user ID, Public Address used, time and duration of the announcement.

Chapter 8 Group Facilities

8.1 Ring Group

A group can be allocated up to 15 extensions maximum for Ring Group. If the number that is dialled is not answered within a defined time, then the call is available to all extensions in the group and these will all ring rapidly in short succession until the call is picked up. The extensions then revert to normal operation.

The time before the next extension is added to the ring group can be programmed to allow for specified telephones to ring for different periods. Each extension can be set to continue ringing or stop ringing after its timeout.

Ring Groups are particularly useful for extensions that are often unmanned.

This facility is not factory defined; configurAID is required to set up the extensions to suit individual requirements.

8.2 Group Pickup

A number of extensions can be set up to form a group. For example, all the phones in one area could be assigned to a group.

The Group Pickup facility is set up using the configurAID programming utility.

① Extensions A, B, C, D belong to the same group. Extension A is ringing but the telephone is unattended

② Any other member of the group, for example D, can dial ***9** and take the call

Note: *An extension can be a member of more than one group.*

8.3 Hunt Groups

When the Hunt Group number is dialled, the first free telephone in the group rings. This facility is particularly useful for busy phones where alternative people could answer the calls.

Hunt Groups are set up using configurAID.

Chapter 9 Pin Number

A PIN number is a 2 – 8 digit Personal Identification Number, consisting of an ID code and a secret code. This allows access to an outside line or the PA system from an extension, which does not have that facility. (e.g. Crew class extensions do not normally have access).

A PIN number can only be assigned as an Engineer facility.

The system can be made to require a PIN number for **ALL** access to external lines.

9.1 Using a PIN Number

Once a PIN has been assigned you can use it as follows:

① Pickup handset

② Dial #

③ PIN code 1 - 4 digits

④ Dial PASS code 1 – 4 digits

Note: *If the PIN number is entered incorrectly then an unobtainable tone will be heard. If the correct PIN number is entered then the dial tone will be heard again. The extension now has your rights for that call.*

⑤ Dial the service required

Note: *Access is valid for the current call only.*

9.2 Setting Pass code

The secret code of the PIN can be changed from any DTMF telephone as follows:

① Pickup handset

② Dial *4

③ Enter PIN code (1 - 4 digits)

④ Enter current PASS code (1 – 8 digits)

Note: *If the PIN number is entered incorrectly then an unobtainable tone will be heard. If the correct PIN number is entered then a short tone will be heard. If the user has "Reset PIN" rights then the current PASS code can be bypassed by pressing the '#' key.*

④ Enter the new passcode (1 – 8 digits)

⑤ Press '#'

Note: *The new passcode has been set*

Chapter 10 Call Logging

Details of all internal and incoming/outgoing calls can be logged by a printer connected to the rear RS232C serial interface. Only the source extension number, the destination dialled and the duration of the call is recorded. Speech or data communicated over the telephone line is NOT recorded.

In a 12U system either printer port can be used as the same information will be generated.

For connection details to the RS232 serial interface see Section 3.6.3

Examples of the recorded information are shown below:

Internal calls

```
Date     Time      Duration From Port       User  To Port
>>Number Called<<
================================================================
25/10/00 10:21:08  00:01:14 Cabin 12 (112)   6    Cabin 24 (124)
>><<
25/10/00 11:01:24  00:08:58 Wheelhouse (103) 6    ECR (155)
>><<
```

Outgoing Calls

```
Date     Time      Duration From Port       User  To Port
>>Number Called<<
================================================================
03/11/00 00:21:08  00:02:14 Radio Rm (102)   5    Satcom 1 (800)
>>940987#128883<<
25/10/00 11:01:24  00:08:58 Capt Cabin (167) 12   Land 2 (9)
>>9506546798765<<
```

Incoming Calls

```
Date     Time      Duration From Port       User  To Port
>>Number Called<<
================================================================
25/10/00 10:21:08  00:01:14 Satcom 1 (800)   7    Radio Rm (102)
>><<
25/10/00 11:01:24  00:08:58 Land 2 (804)     7    Radio Rm (102)
>><<
```

In the examples above the format for the Date, Start time and Duration is DD/MM/YY or HH:MM:SS as appropriate

where DD/MM/YY is the date/month/year and
HH:MM:SS is the time in hours:minutes:seconds.

A simple call analysis program is available from Marine Communications Limited.

Chapter 11 Fault Finding

The following information is intended to assist with fault finding to module level only.

All exchanges and modules are fully tested before dispatch from the factory. Should problems be experienced when the exchange is first powered up, you are advised to carefully check all wiring and the presence of power supplies before proceeding. No module should be removed from, or inserted into the exchange whilst the exchange is powered up. The exchange contains static sensitive devices and special anti-static precautions should be exercised when handling the modules.

If there is a problem with an extension, try a different telephone before assuming that there is a problem with the telephone exchange. Most problems are caused by the mistreatment of the telephones.

11.1 All Telephones Dead

If no sound can be heard at the telephone ear-piece when you blow into the mouth piece, then the telephone is considered to be dead. If all telephones exhibit this fault then check that the exchange is powered up and that the power indicators on the front of the Power Module. If they are not lit, check the fuses on that module. If the fuses are correct replace that Power module.

11.2 One Telephone Dead

If the symptoms are as described above for one telephone only :

Check the wiring to the telephone. Check the operation of the telephone on another extension. Replace as necessary.

Check that the appropriate LED on the front of the switch card lights when the telephone is ‘off-hook’. If it does not, replace the subscriber card.

11.3 All Telephones Live, But No Dial Tone

Sound can be heard at the earpiece when you blow into the mouthpiece, but no dial tones can be heard when calling another telephone. If all telephones exhibit this fault check that the exchange is powered up and that the power indicators are lit on the front of the PSU. If they are not lit, check the fuses. If the fuses are correct replace the Power module.

Try resetting the system by turning the power off and then back on after 10 seconds. If this cures the problem, then the system software experienced a glitch. If the problem can be reproduced then please report it to Marine Communications Limited.

If the telephones still have no dial tone, replace the Processor card, but note that any special programming for your exchange will need to be repeated.

11.4 One Telephone Live, But No Dial Tone

If the symptoms are as described above but affecting one telephone only:

Check the in/out of service telephones. Refer to the factory set configurations list. If you have re-programmed the exchange, print out the current configuration.

Check the wiring to the telephone. Check the operation of the telephone on another extension. Replace as necessary.

Replace the subscriber card.

11.5 Wrong Extension Obtained when Dialling

Check if ‘Call Forward’ set on telephone. Go to the extension which should be obtained and enter the Call Forward cancel code “**3”.

Check the directory to the equipment numbers. Re-allocate the number or re-wire the extension.

Check all wiring from the back-plane through to the telephone.

11.6 Telephone Always Busy when Dialled

Check if ‘Call Forward’ set on telephone. Go to the extension which should be obtained and enter the Call Forward cancel code “**3”.

Check that the telephone is not off-hook. Some telephone handsets need to be replaced firmly on the telephone, especially if extra retaining brackets or Velcro have been added.

Check the wiring to the telephone. Check the operation of the telephone on another extension. Replace as necessary.

Check that the appropriate LED on the front of the Switch module lights when the telephone is ‘off-hook’. If it does not, replace the subscriber card.

11.7 Telephone Always Unobtainable when Dialled

Check the in/out of service telephones. Check if extension set to ‘night bell’. Refer to the factory set configurations list. If you have re-programmed the exchange, print out the current configuration.

Check the directory to the equipment numbers. Re-allocate the number or re-wire the extension.

Check all wiring from the back plane through to the telephone.

Check the wiring to the telephone. Check the operation of the telephone on another extension. Replace as necessary.

Check that the appropriate LED on the front of the Switch module lights when the telephone is ‘off-hook’. If it does not, replace the subscriber card.

11.8 All Telephones Fail to Ring, But Ring Tone can be Heard by Caller

Check if 'DCRI' indicator on front of the P.S.U. is illuminated. If off, replace Power module.

If installing new system, ensure all telephones do not have the bell turned off. Check also, if 'master' boxes are required for telephone connection (Common problem with British Telecom telephones with a small white plug), and check the wiring of the telephones.

11.9 One Telephone Fails to Ring, But Ring Tone can be Heard by Caller

Check destination telephone by dialling *6 (self test) from the telephone. If telephone rings, check directory to the equipment numbers.

Check if the bell is turned off on the telephone. Check the wiring to the telephone. Check the operation of the telephone on another extension. Replace as necessary.

Check if a 'master' box is required for the telephone connection.

Replace the subscriber card.

11.10 Intermittent Dial Tone

Check if 'Call Forward' or 'Call Transfer' has been selected. The dial tone will automatically change to intermittent when these features have been selected, or during self test.

Check if dialling has been disabled. This is often the case with emergency telephones or the night bell.

11.11 Cross-talk on Conversation

Check for intrusion from officer class telephone.

Check if telephone set up as an emergency telephone, since this facility allows any other telephone to intrude on a current call.

Check the wiring. This is the most probable cause in a new installation.

Replace the subscriber card.

11.12 Unable to Obtain Shore Line.

Check that the line is connected correctly right through from the to the shore based exchange. If there is a break in the line, the will give no tone. Test the shore line by trying with a telephone at a point nearest the Marinex Digital as possible.

Check the programming to verify that the shore line is set and programmed correctly. See the factory set configurations list. If you have re-programmed the exchange, print out the current configuration to check that the correct access rights are available.

Check if PIN number access is required.

Change the Tie Line card.

11.13 Incoming Call Not Received

Check that the designated telephone is connected and operating correctly. If a night bell has been selected, check that this is operating correctly.

Check for ‘Call Forward’ of external calls.

Check the programming of the shore lines. Refer to the factory set configurations list. If you have re-programmed the exchange, print out the current configuration.

Change the Tie Line card.

11.14 Call Logging Not Outputting Data

Check that the printer is connected correctly and that the cable is plugged into the serial port and not the parallel port. It is important that transmitted data (pin 2) from the call logging output is connected to the printer receive data line. The system is set up for hardware handshaking operation as standard.

Check that the printer is set up to operate at 9600 baud with no parity, 8-bit data and one stop bit and hardware handshaking.

Check that the printer has paper, a useable ribbon and is ‘on-line’.

Change the Processor card.

Chapter 12 Factory Configuration

All systems when they leave Marine Communications Limited have a default configuration. This can be changed using configurAID. The following table shows the factory configuration

12.1 6U System (160 extensions Max)

SLOT	Rights	Numbering
1	Officer Class - Access to tie lines and PAs	100 - 115
2	Crew Class - NO access to tie lines and PAs	116 - 131
3	Crew Class - NO access to tie lines and PAs	132 - 147
4	Crew Class - NO access to tie lines and PAs	148 - 163
5	Crew Class - NO access to tie lines and PAs	164 - 179
6	Crew Class - NO access to tie lines and PAs	180 - 195
7	Crew Class - NO access to tie lines and PAs	196 - 211
8	Crew Class - NO access to tie lines and PAs	212 - 227
9	Crew Class - NO access to tie lines and PAs	228 - 243
10	Crew Class - NO access to tie lines and PAs	244 - 259
A	Tie Lines 1 - 6 & PA 1	800-805; PA = 850
B	Tie Lines 7 - 12 & PA 2	806-811; PA = 853
C	Tie Lines 13 - 18 & PA 3	812-817; PA = 856
D	Tie Lines 19 - 24 & PA 4	818-823; PA = 859

12.2 12U System (320 extensions Max)

RACK	SLOT	Rights	Numbering
A	1	Officer Class - Access to tie lines and PAs	100 - 115
A	2	Officer Class - Access to tie lines and PAs	116 - 131
A	3	Crew Class - NO access to tie lines and PAs	132 - 147
A	4	Crew Class - NO access to tie lines and PAs	148 - 163
A	5	Crew Class - NO access to tie lines and PAs	164 - 179
A	6	Crew Class - NO access to tie lines and PAs	180 - 195
A	7	Crew Class - NO access to tie lines and PAs	196 - 211
A	8	Crew Class - NO access to tie lines and PAs	212 - 227
A	9	Crew Class - NO access to tie lines and PAs	228 - 243
A	10	Crew Class - NO access to tie lines and Pas	244 - 259
A	A	Tie Lines 1 - 6 & PA 1	800-805; PA = 850
A	B	Tie Lines 7 - 12 & PA 2	806-811; PA = 853
A	C	Tie Lines 13 - 18 & PA 3	812-817; PA = 856
A	D	Tie Lines 19 - 24 & PA 4	818-823; PA = 859
B	1	Crew Class - NO access to tie lines and PAs	260 – 275
B	2	Crew Class - NO access to tie lines and PAs	276 – 291
B	3	Crew Class - NO access to tie lines and PAs	292 – 307
B	4	Crew Class - NO access to tie lines and PAs	308 – 323
B	5	Crew Class - NO access to tie lines and PAs	324 – 339
B	6	Crew Class - NO access to tie lines and PAs	340 – 355
B	7	Crew Class - NO access to tie lines and PAs	356 – 371
B	8	Crew Class - NO access to tie lines and PAs	372 – 387
B	9	Crew Class - NO access to tie lines and PAs	388 – 403
B	10	Crew Class - NO access to tie lines and PAs	404 – 419
B	A	Tie Lines 25 - 30 & PA 5	824-829; PA = 862
B	B	Tie Lines 31 - 36 & PA 6	830-835; PA = 865
B	C	Tie Lines 37 - 42 & PA 7	836-841; PA = 868
B	D	Tie Lines 43 - 48 & PA 8	842-847; PA = 891