

# microSwitch USER MANUAL

Version 1.1.12 firmware

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## Chapter 1 - Introduction

### 1.1 General Description

The Marine Communications Limited MicroSwitch marine telephone exchange has been designed to meet the special requirements of all internal and external telephone calls made on board ship.

The key features of the MicroSwitch are:

- Internal communications
- Shore line, PA and SATCOM access
- Priority intrusion
- PC programmable
- Direct dial in and out
- Call logging
- Modular construction
- Automatic fax detection
- Music on hold

The MicroSwitch supports up to 32 extensions and 8 external lines, enabling connections to shore lines, SATCOM and Public Address lines. Facilities are available to enable a maximum of 4/8 connection circuits to be made at any time. The circuitry is enclosed in a compact case for easy fitting to bulkheads.

The MicroSwitch priority intrusion facility enables a caller to interrupt a call currently taking place on another extension.

The exchange is pre-programmed to provide specific facilities for Officer Class and Crew Class extensions. These facilities are held within the exchange memory and can be changed to suit individual requirements by using a telephone or an IBM PC (or compatible). The memory is provided with its own battery support and any changes made to the set-up will be maintained in the event of the exchange being disconnected from the power supply.

When connected to the external lines, incoming calls are directed to a pre-specified extension. Outgoing calls are enabled for Officer Class 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 outgoing and incoming calls to be logged. The information logged includes the source extension, the number dialled and the duration of the call. Output is through an RS232 serial interface.

Future expansion and servicing of the exchange is carried out simply by adding or replacing plug-in modules. To assist with maintenance and fault finding, a number of indicators are provided on the modules to show the status of the exchange and the extension lines.

MicroSwitch will detect an incoming fax call tone and automatically transfer it to the designated extension.

In the event of a power failure external lines are connected directly to specified extensions.

Please note that satisfactory performance cannot be guaranteed for every allowed combination of host and subsidiary apparatus, in particular, certain modern electronic phones when set to LD mode may not be recognised correctly.

## 1.2 Specifications

### 1.2.1 Basic Specifications

Capacity (maximum)	32 internal extensions (in blocks of 8). 8 external lines (in blocks of 2). Maximum of 8 circuits can be made at any time.
External Connections	Shore lines, SATCOMs, P.A. lines
External Signalling	Push-button dual tone multi-frequency (DTMF) preferred. Loop disconnect LD (Impulse) can be used, but with reduced facilities.
Battery life programme memory	5 years minimum
Frequency Range	300Hz to 5Khz at 3dB points
Cabling	2 wire throughout
Input Voltages	24V D.C. +/-10%, 5A peak, 4A nominal average. 250 mV ripple. Indicators show if the D.C. supply is available.
Fuses - DC	5A anti surge 20mm
MTBF	10,000 hours (fully loaded system)
MTTR	30 minutes
Dimensions	320mm (H) x 390mm (W) x 150mm (D)
Weight	Approx. 5Kg

### 1.2.2 Environmental Specifications

The MicroSwitch exchange has been tested and meets with Lloyds Register ENV2 type approval requirements.

Temperature	
Operating	0 to +55 deg C
Storage	0 to +70 deg C
Humidity	5 to 95% relative humidity
Vibration	1.0mm amplitude at 2 to 13.2Hz 1g at 13.2 to 100Hz

## 1.3 Configuration

The MicroSwitch is factory configured to provide the facilities described in Chapter 2. The exchange can be reconfigured to suit on-board requirements using the microAid utility program. However, satisfactory operation of the complete system should be ensured BEFORE any modifications are implemented. (microAid is available as an Engineering facility only.)

Limited reconfiguration is available using a security PIN number to allow access to the system via a telephone.

See Appendix A for a complete listing of the factory configuration.



## Chapter 2 - User Facilities

### 2.1 General

The MicroSwitch extensions are grouped into two user categories:

- Category 'A' - Officer Class extensions
- Category 'B' - Crew Class extensions.

The MicroSwitch is delivered with a set of pre-defined user facilities. These default settings can be modified to suit individual needs using the microAid utility and an IBM PC (or compatible). All changes are stored in a memory provided with its own battery support and will therefore be maintained even if the power is disconnected from the exchange.

Changing the configuration requires an access code which is only available as an Engineering facility.

*Note: The star (\*) special features can only be accessed from DTMF phones. There is no equivalent on LD phones.*

#### 2.1.1 Crew Class Extensions Facilities

Crew Class extensions are factory configured to have the following facilities:

- Extension in service
- Place incoming calls on hold
- Call transfer of incoming calls
- Call pickup
- Call back on busy or no reply
- Call forward

#### 2.1.2 Officer Class Extensions Facilities

Extensions which are assigned as Officer Class extensions have all of the facilities of Crew Class extensions plus the following :

- Interrupt priority
- Access to Public Address (P.A.)
- Direct dial out (shore or SATCOM)

### 2.1.3 Engineer Facilities

Below is a list of Engineer facilities. These are generally maintenance type facilities and an engineering access PIN code is required.

- Date and time set
- Direct Dial In (DISA)
- Pin No change/allocation
- Class of service change
- Extension number change
- Bell check
- Locked out extensions
- Print-outs of engineering checks

(See the MicroSwitch Technical Manual for details of Engineer facilities.)

### 2.1.4 Group Facilities

The following group facilities are available :

- Multiple call forward (6 telephones max)
- Hunt group (6 telephones max)
- Group pickup (6 telephones max)

### 2.1.5 Automatic Fax Detection

MicroSwitch is able to automatically detect Fax tone and to transfer the call automatically to the a designated fax extension and connected to the fax machine.

This facility is set via microAid and requires the DISA function to be enabled.

## Chapter 3 - Extension Facilities

### 3.1 Call Transfer



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

- ① Depress the recall button or the 'hook' switch momentarily 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.

### 3.2 Call Back On Busy

If the extension you call is busy, you can dial a code which will cause your phone to ring immediately 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 the exchange will call the extension.

### 3.3 Call Back On No Reply

If there is no reply when you ring an extension you can dial a code 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 the caller's telephone will ring and the exchange will call the extension.

#### 3.3.1 Cancel Call Back

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

### 3.4 Holding Incoming Calls

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

- ① Press the recall button or the hook switch momentarily and listen for the intermittent dial tone.
- ② Dial a 'hold' number. The factory configured numbers for this facility are 51 to 58.
- ③ 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.

### 3.5 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.

## 3.6 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.

### 3.6.1 Reset Call Forward

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

## 3.7 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 microAid program.

*Note:* Any extension can pick up the call by dialling **\*8**.

## 3.8 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**.

### 3.8.1 Cancel Alarm

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

## 3.9 Interrupt Priority

This facility allows you to interrupt a call currently taking place on another extension. To select interrupt priority, dial the extension and if it is engaged, dial **\*1**. A background 'pip' will be heard on the extension then you are free to interrupt the conversation. The third party also hears a 'pip' and is put on hold while the priority call is taking place.

### 3.10 Direct Dial In (DISA)

The Direct Dial In facility allows an on-shore caller to dial an on-board extension directly. This facility is disabled when the MicroSwitch is supplied, if it is required it needs to be configured using the microAid programming utility.

Direct Dial In works as follows:

- When an incoming call is received, the exchange answers after 4 seconds of ringing tones and presents a dial tone.
- The caller, **using a tone type telephone**, dials the required telephone extension on-board the vessel.
- If no extension is dialled within 5 seconds, the normal designated telephone rings for 10 seconds. If there is no answer from the first designated telephone the call transfers to the second designated telephone, such as a night bell and rings for 30 seconds.
- In either case, after the 30 second ringing period, if the telephone has not been answered, the connection through the shore line or SATCOM will be disconnected.
- If the called extension is engaged, 5 seconds of the busy tone is heard, then the line will be disconnected.

### 3.11 Direct Dial Out

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

- ① Lift the receiver and listen for the dial tone.
- ② Dial the pre-set digit '9' followed by:
  - 5-7 for individual shore lines (E.g. 95, 96 or 97)
  - 9 for any shore line
  - 2-4 for individual SATCOMs
  - 8 for any SATCOMs
- ③ Dial the required external number.

There is a facility for the second digit (2-9) to be automatically added using an engineering function. If this has been enabled, then Direct Dial Out access is '9' followed by the PIN number if required. To access an individual tie line group, '7X' is used.

### 3.12 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 the pre-set digit '6' followed by:
  - 1-4 for individual Public Address lines
  - 5-8 for Public Address zones

### 3.13 Remote Call Forward

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.*

#### 3.13.1 Reset Remote Call Forward

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

### 3.14 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 Depress the recall button or the 'hook' switch momentarily 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.

### 3.15 Conference

Conference allows between three and seven parties to be connected to a conversation simultaneously. This is different from Broker. (The Broker facility lets you connect to two extensions but one connection is put on hold while you are connected to the other.)

- ① Dial the first extension.
- ② Put that extension on hold.  
**Reminder:** To place a call on hold, depress the recall button or the hook switch momentarily, listen for the intermittent dial tone then dial the 'hold' number.
- ③ Dial the next extension.
- ④ Connect the parties together by dialling \*5.
- ⑤ Repeat steps 3 and 4 for the other extensions.

***NOTE:** Only one conference is allowed at any one time. if you hear the engaged tone after \*5 has been entered will signify that a conference is already taking place. Brokering will still be available using \*0.*

### 3.16 Rapid Ring

If the caller has the Rapid Ring option enabled the telephone makes a rapid ringing tone when making an internal call to another extension.

### 3.17 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 incoming calls.

The default designated extension can be changed using an Engineering facility or using the microAid programming utility.

### 3.18 Emergency Phone

Emergency telephones can be accessed simultaneously by several users, so enabling anyone on the ship to interrupt in an emergency.

The emergency telephone can be configured with dialling disabled (intermittent dial tone) using the microAid programming utility.

The emergency phone utilises the Conference facility. If the emergency number is dialled any conference currently taking place will be disconnected.



## Chapter 4 - Group Facilities

### 4.1 Multiple Call Forward

A group can be allocated up to 6 extensions maximum for Multiple Call Forward. If the number that is dialled is not answered within approximately 15 seconds, 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.

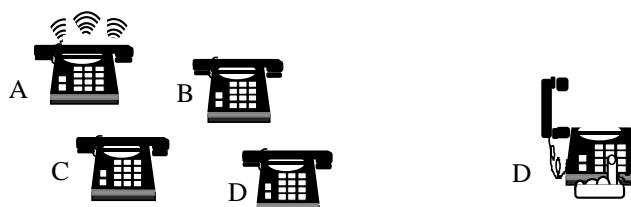
Multiple Call Forward is particularly useful for extensions that are often unmanned.

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

### 4.2 Group Pickup

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

The Group Pickup facility is set up using the microAid 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.

### 4.3 Hunt Groups

A Hunt Group number can be created for up to 6 extensions. 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 the microAid programming utility.

## Chapter 5 - Pin Number

A PIN number is a four digit Personal Identification Number. This allows access to an outside line or the PA system from an extension which does not have that facility. (Crew class extensions do not normally have access.) A PIN number can only be assigned as an Engineer facility.

If a PIN number system is in use then ALL access to external lines will need the use of a PIN number.

### 5.1 Using a PIN Number (to access an outside line)

Once a PIN has been assigned you can obtain an outside line as follows:

- ① Dial 9 followed by the 4 digit PIN number
- ② The access digit (**2-9**)
- ③ The outside call number required.

If the PIN number is entered incorrectly then an unobtainable tone will be heard. If the correct PIN number is entered then an intermittent dial tone will be heard before the access digit is required.

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

### 5.2 Using a PIN Number (P.A. access)

The procedure is the same as for accessing an outside line (see previous paragraph) **EXCEPT** you dial **6** instead of **9**.

## Chapter 6 - Call Logging

Details of all internal and incoming/outgoing calls can be logged by a printer connected to the RS232 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.

For connection details to the RS232 serial interface refer to The MicroSwitch Technical Manual.

Examples of the recorded information are shown below:

### Internal calls

Date	Time	Duration	Extension	ID	Dialled	
----	----	-----	-----	--	-----	
25/10/94	10:21:08	00:01:14	112	-	187	-
25/10/94	11:01:24	00:08:58	103	-	155	-
25/10/94	15:00:02	00:03:07	172	-	123	-

### Outgoing Calls

Date	Time	Duration	Extension	ID	Dialled	
----	----	-----	-----	--	-----	
03/11/94	00:21:08	00:02:14	102	-	SATCOM 3	940987#128883
03/11/94	04:55:24	00:05:58	167	-	Land 2	9506546798765

### Incoming Calls

Date	Time	Duration	Extension	ID	Dialled	
----	----	-----	-----	--	-----	
03/11/94	06:21:08	00:12:00	198	-	SATCOM 1	Incoming
03/11/94	16:55:24	00:05:58	130	-	Land 1	Incoming

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.

## Chapter 7 - List of Features

Call-back	*6
Cancel Call-back	**6
Call transfer	Momentarily press 'hook' switch, then dial extension.
Return to held call	1
Three Party Conversation	*5
Broker between second and third parties	*0
Call forward all calls	*3 + extension
Cancel call forward	**3
Remote Call forward all calls (follow me)	*2 + extension
Remote Cancel Call Forward	**2 + extension
Pickup ringing phone	*8 + extension
Group pickup	*9
Intrude on busy	*1
Alarm Set	*5 + Time (HHMM) 24 Hour
Cancel Alarm	**5
Self test ring back	*6

**Direct Dial**

Direct dial public address lines	61-68
Pick up night bell	8
Direct dial Shore	99
Direct dial Satcomms	98
Direct dial other tie lines	9X

**Call Forward Variants**

The following variations are available when using the call forward (\*3) function.

- \*3 6X + number Call forward internal calls only
- \*3 7X + number Call forward internal and external calls only
- \*3 8X + number Call forward external calls only

Replace the X by the following number for additional functions

- 1 = All Calls
- 2 = On busy, not to a busy phone
- 3 = On busy unconditional
- 4 = Busy or no reply (busy only if called phone not busy)
- 5 = Busy or no reply unconditional
- 6 = No reply
- 7 = Cancel



## Appendix A - Factory Configuration

### A.1 First Dialed Digit

0		Public address '65'
1	+ xx (00-99) or +x (0-9)	For 3 digit extension number For 2 digit extension number
2	+ xx (00-99) or +x (0-9)	For 3 digit extension number For 2 digit extension number
3	+ xx (00-99) or +x (0-9)	For 3 digit extension number For 2 digit extension number
4	+ xx (00-99) or +x (0-9)	For 3 digit extension number For 2 digit extension number
5	+ x	Hold numbers
6		Public Address access
7		Reserved
8		Night Bell pick-up
9		Outsides line access
*		Star features
#		Engineering

### A.2 Dial 6 Access

A pin number may be required to be entered before the access digit.

1	Individual P.A. access number
2	Individual P.A. access number
3	Individual P.A. access number
4	Individual P.A. access number
5	Group P.A. access or '0' access
6	Group P.A. access
7	Group P.A. access
8	Group P.A. access

A.3 Dial 9 Access

A pin number may be required to be entered before the access digit.

2	SATCOM 1
3	SATCOM 2
4	SATCOM 3
5	Land 1
6	Land 2
7	Land 3
8	SATCOM hunt group
9	Land hunt group

A.4 \* (Star) Features From Dial Tone

*2	+ extension number	Remote call forward	**2 cancel
*3	+ extension number	call forward	**2 cancel
*5	HHMM	Alarm Set	
*6		Self test ring back	
*8	+ extension number	Pick up ringing phone	
*9		Group Pickup	

A.5 Features from Recall

1	+ xx (00-99) +x (0-9)	or	Transfer to a 3 digit extension number Transfer to a 2 digit extension number
2	+ xx (00-99) +x (0-9)	or	Transfer to a 3 digit extension number Transfer to a 2 digit extension number
3	+ xx (00-99) +x (0-9)	or	Transfer to a 3 digit extension number Transfer to a 2 digit extension number
4	+ xx (00-99) +x (0-9)	or	Transfer to a 3 digit extension number Transfer to a 2 digit extension number
5	+x		Hold numbers

A.6 \* (Star) Features from Recall

*5	Conference
*0	Broker



A.7 Features from Recall – Engaged or NU

1	Return to original call
---	-------------------------

A.8 \* (Star) Features from Engaged

*1	Priority (intrusion)
*6	Call back when free

A.9 \* (Star) Features from Ringing

*6	Call back when free
----	---------------------

## A.10 Default Extension Names

Equip No.	Ext. No.	Class	Name	System Failure Tie Line Fall Through
1	100	Officer	Captain	Land 1
2	101	Officer	First Officer	
3	102	Officer	Officer 2	
4	103	Officer	Officer 3	
5	104	Officer	Radio Officer	Satcom 1
6	105	Crew	Crew 1	
7	106	Crew	Crew 2	
8	107	Crew	Crew 3	
9	108	Crew	Crew 4	Land 2
10	109	Crew	Crew 5	
11	110	Crew	Crew 6	
12	111	Crew	Crew 7	
13	112	Crew	Crew 8	Satcom 2
14	113	Crew	Crew 9	
15	114	Crew	Crew 10	
16	115	Crew	Crew 11	
17	116	Crew	Crew 12	Land 3
18	117	Crew	Crew 13	
19	118	Crew	Crew 14	
20	119	Crew	Crew 15	
21	120	Crew	Crew 16	Satcom 3
22	121	Crew	Crew 17	
23	122	Crew	Crew 18	
24	123	Crew	Crew 19	
25	124	Crew	Crew 20	Land 4
26	125	Crew	Crew 21	
27	126	Crew	Crew 22	
28	127	Crew	Crew 23	
29	128	Crew	Crew 24	Satcom 4
30	129	Crew	Crew 25	
31	130	Crew	Crew 26	
32	131	Crew	Crew 27	