Management Module

User Guide

Revision A

May 1997

NetComm®

Publication Date: May 1997

Contents

Before You Begin your Installation

The Rack system allows you to connect it to networks running TCP/IP, via an RS232 connection running SL/IP or directly to your Ethernet network . Your network must support TCP/IP to use the management functions of the Rack System.

Because the Rack Management Module supports SNMP (or "Simple Network Management Protocol"), you can control your Rack system using network management tools such as IBM®'s NetView®/6000, Novell's NMS™, DomainView™, HP OpenView® and SunNet™ Manager, CastleRock's SNMPc.

Before attempting to use the NetComm Rack Management Module and network management software, be familiar with both the following procedures:

- How to connect a SL/IP (Serial Line Innterface Protocol) device to your existing TCP/IP Ethernet (Transmission Control Protocol/ Internet Protocol) Network.
- How to use the Network Manager Software (in particular how to load a custom MIB, i.e., Management Information Base).

This installation manual contains detailed instructions for the installation of your product. We recommend reading and following these instructions thoroughly first.

If you require technical assistance, refer to *Appendix A - Troubleshooting*.

Introduction

The NetComm Rack Series enables the building of complete data communication networks using NetComm's quality technology in both existing rack and stand-alone environments. The Rack Series offers V.34 technology with a powerful 16-bit processor, 33,600bps data transmission speed, V.42bis data compression, V.42 error correction, and 14,400bps fax transmission.

Rack Frame (RK). The Rack Frame supports up to 135 modems with 1 SNMP management card (or 136 modems without a controller card), and two power supplies. It is 19 inches wide and comes with rear-mounted data and telephone interfaces.

Power Supply (RP). The rack frame can hold up to two power supplies thereby minimising disruption to communications should one supply fail.

Modem Cards (RM). Up to 17 modem cards into one rack. Each card is a self-contained modem. Modem cards can be 'hot'-swapped without interrupting the operation of the other modem cards.

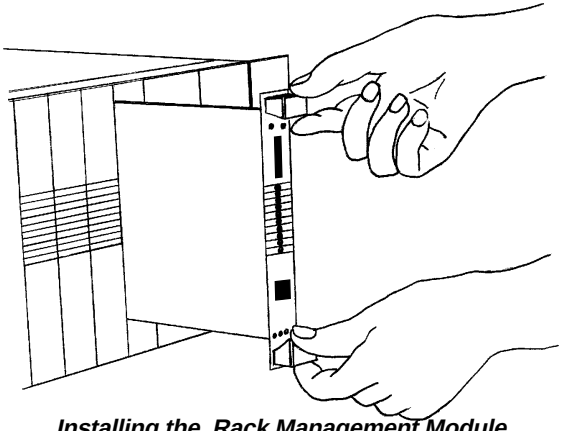
Rack Management Module. The Rack Management Module uses SNMP (Simple Network Management Protocol) as defined by RFC 1157. This is a recognized standard of communication between managed devices and the management station over a computer network. It communicates to a TCP/IP network via an RS-232 SL/IP or via ethernet with the Ethernet Management module. The Rack Management Module allows remote diagnosis and configuration, analysis of system usage, malfunction notification, as well as full access to AT commands, S-Registers, and individual modem statistics. (The Rack Management Module cannot be used as a modem.)

Management Module Installation

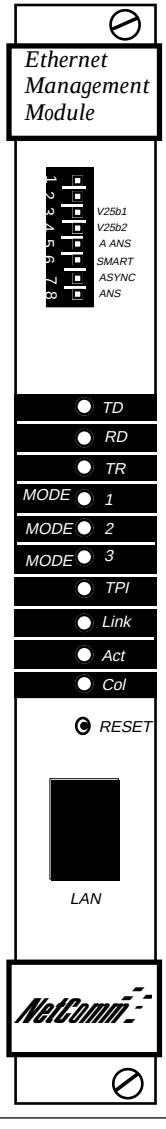
The Management Module allows SNMP-compatible network management tools to interrogate modems thereby allowing network managers to view information such as modem statistics and state information as well as access to remotely configure modems.

To install a Rack Management card:

1. Unscrew the blanking panel from any slot.
2. Insert the Management Module and secure it using the screws provided.



Installing the Rack Management Module



SWITCH 1: Reserved for future use

SWITCH 2: Reserved for future use

SWITCH 3: LEFT (V.25bis command set or Management Mode) /RIGHT (AT command set)

SWITCH 4: LEFT (V.25bis synch bit-oriented or Management Mode) /RIGHT (V.25bis character-oriented)

SWITCH 5: LEFT (Disable auto-answer)/RIGHT (Enable auto-answer)

SWITCH 6: LEFT (DUMB Mode)/RIGHT (SMART Mode)

SWITCH 7: LEFT (Synchronous Mode)/RIGHT (Asynchronous Mode)

SWITCH 8: LEFT (Originate Mode)/RIGHT (Answer Mode)

TD: TRANSMIT DATA. Flashes whenever the modem is sending data

RD: RECEIVE DATA. Flashes whenever data is being received

TR: TERMINAL READY. Reflects the state of the DTR signal. Most computers assert the DTR signal when ready to begin communication with the modem

MODE 1, 2, 3: Indicates modem's operating mode

TPI: Test Pattern Indicator. Glows when a predefined test pattern is recieved by the modem. TPI is also toggled when the Rack Controller polls the slave modems.

Link: Good connection to another Ethernet terminal

Act: Signal transmitted or received

Col: Collision - simultaneous transmission from more than one source

Connecting Your Rack System

There are three methods to connect your rack to your network and Management station:

1. Direct connection via SL/IP to management station.
2. Connect to TCP/IP network via Router.
3. Direct Ethernet connection to TCP/IP network .

Before proceding make sure the Frame Addresses are set correctly.

Frame Addresses

The Rack System allows you to connect up to 8 full Rack frames, all under the control of a single Management Module.

To connect another Rack frame to an existing frame you must first set the “frame address”. This allows the Management Module to identify different racks during communication.

1. Set the address switches to match the frame address of the Rack frame for the applicable number of card frames:

☞ For location of address switches see illustration on next page.

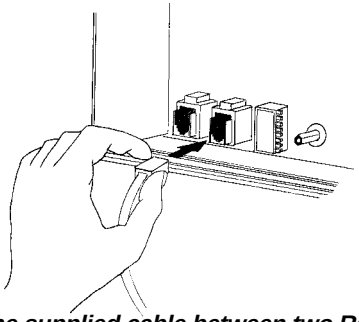
Frame No	Sw 4	Sw 3	Sw 2	Sw 1
1	Down	Down	Down	Down
2	Down	Down	Down	Up
3	Down	Down	Up	Down
4	Down	Down	Up	Up
5	Down	Up	Down	Down
6	Down	Up	Down	Up
7	Down	Up	Up	Down
8	Down	Up	Up	Up

(Down = On)

Default: down.

The Management Module can be placed in any position. Frame addresses must not be duplicated and we recommend sequential numbering.

2. Having set the frame address of a Rack frame, connect it to the other Rack frames. Two RJ11 frame connectors are provided at the rear of the Rack frame. Connect Rack frames by daisy-chaining them:



Connect the supplied cable between two Rack frames

☞ When daisy-chaining racks, the supplied bus termination resistor must be used in the first and last rack. If using only one rack then both connections must have a termination resistor.

Rack SNMP Setup Instructions

The Simple Network Management Protocol is a recognized standard of communication between the managed devices and the management station over the computer network.

There are a number of software packages designed to manage SNMP devices - SunNet Manager, HP OpenView, Novell's NMS, Cray Communications Domain View and and Castlerock's SNMPc just to list a few. There are many other packages available, running on Unix, MS-DOS/Windows and Macintosh mach ines.

☞ To manage via SL/IP in Win95 the TCP/IP stack provided by Microsoft can not be used. Frontier Technologies SuperTCP which is provided with NetComm's Rackview can be used in SL/IP mode.

If using Castlerock's SNMPc under Win95, Castlerock's SNMPc version 4.1G or later will be required. Earlier versions will not work in Win95. Upgrades can be obtained via their website at http://www.casterock.com.

For communication between the management station and the managed device a permanent network connection is required over a network capable of routing IP packets. Once you have your manager set up you should confirm the network connection between your manager and the NetComm Rack from your management machine. Please refer to your manager's user manual for further details.

AT#S1 - SNMP Configuration Menu

Before you use the Management Module you must configure its SLIP or Ethernet interface using one of the following configurations.

☞ The following commands must be typed from a host in terminal mode, which is attached to the Management Module card serial port. The #S1 command will bring up a security password protected menu which allows you to:

- Set the SNMP community strings and specify their access level
- Set the local and remote IP addresses, and the netmask for the SLIP or ethernet link.
- Select the frame type (i.e. 17 slot)
- Set the number of modems in the system.

The current settings are displayed when you start the menu.

1. Type AT#S1

   The following screen is displayed.

```
Rack Up Address:  192.168.7.139 Remote IP/Router Address: 192.168.7.1
Netmask         : 255.255.255.0  Ethernet MAC address 00606400100F
Slots Per Frame:  Ethernet 16 Slots + Huax Modem  017

Community Scring        Access Level
public                  Read
private                 Read + Write + SecureRead + SecureWrite
SNMP_Trap               Traps

+ Add Community String or Change Access
- Delete String
T Set Community String for Traps
S Set Rack Controller IP address
> Add Inbound IP Address
< Delete Inbound IP Address
L List Inbound IP Address
F Select No. Slots Per Fram 16/17
M Set Max Modem Number
Q to exit
Command?
```

Setting the SNMP community strings

SNMP community strings allow the network manager to control access to the modems. Access is controlled by setting priveleges for different groups of people.

- Press "+" to add a community string

  You will be prompted to enter the string, and then to enter the access level associated with that string. The access levels are specified as:

R	Read All Except Security Tables
W	Write All Except Security Tables
S	Read Security
X	Write Security

  Specifying no access level is equivalent to deleting a currently defined community string.

- Press "-" to delete a community string

  You will be prompted for the name of the community string to delete.

Setting the IP addresses and the netmask

- Type S to enter the IP addresses

  You will be prompted separately for the IP addresses of:

  - ❑ The Management Module.
  - ❑ The Remote IP/Router., and
  - ❑ The Netmask.

Setting Inbound IP Addresses

Inbound IP addresses restrict access to the controller to the IP addresses entered. If no inbound IP addresses are set, all IP addresses can access it. To access security variables the inbound address of the management stationmust be entered and given security read and/or write access

- Press > (Add), < (Delete), or L (List) to add, delete, or list an Inbound IP Address.
- Press Q to exit the SNMP configuration menu.

The settings entered in the menu are automatically stored in the non-volatile RAM and will only be reset by the AT&F command or by changing them again using AT#S1.

Setting the No. of Slots per Frame

The NetComm Rack Frame has 17 modem slots. To identify the correct rack configuration to be used the “Select No. Slots Per Frame 16/17” variable needs to be set: This is a SNMP MIB variable and can be set in terminal mode using the #S1 menu:

- Type F to set the number of slots in the frame

  The screen will toggle between 16 or 17.

☞ Ensure the number of slots per frame is always set to 17.

Setting the Maximum Modem Number

It is important for the maximum modem number to be set correctly to allow efficient operation of the system. This is a SNMP MIB variable and can be set in terminal mode using the #S1 menu:

- Type M to set the Max Modem number

  The screen will prompt you for the number of modems currently installed in the ProRack. Enter the appropriate number and enter.
- Type: Q to exit

Configuring the Management Module for Dumb Mode SL/IP

1. Ensure you have configured the community strings and the IP addresses using the AT#S1 command.
2. Issue AT%F2.

   This command instructs the Management Module to go into Dumb Mode SL/IP mode whenever the switch V25b1 (switch 3) is ON (switched to the left)
3. Issue AT&W to save the configuration.
4. Lock the RS232 speed to the speed of the RS232 port on the router or bridge, using the ATR command (this is recommended but is not essential).
5. Switch the V25b1 switch (#3) ON.

The Management Module will now communicate in SL/IP mode whenever the DTR is high. When DTR is low the Management Module will accept AT commands.

Configuring the Management Module for Dumb Mode Ethernet

1. Ensure you have configured the community strings and the IP addresses using the AT#S1 command.
2. Issue AT%F2.

   This command instructs the Management Module to go into Dumb Mode Ethernet mode whenever the switch V25b1 (switch 4) is ON (switched to the left)
3. Issue AT&W to save the configuration.
4. Switch the V25b1 switch (#4) ON.

The Management Module will now communicate in Ethernet mode.

The Management Information Base (MIB)

The Rack Management MIB is incorporated in, and released in conjunction with the NetComm Rack Modem Firmware and may alter as new versions of code are released. The MIB on your disk has the same released code as your controller and may have extra features to those noted in this overview. Check your MIB file.

NetComm Rack MIB is a definition of the parameters that can be accessed or set in NetComm's Rack® Modems using SNMP Management software. This information is organized into a series of Tables.

The NetComm Rack Management Information Base (MIB) is compiled in accordance with ASN.1 format. The current pre-standard modem MIB is grouped into modules under the identity of ID, Line Interface, DTE Interface, Call Control Statistics and Signal Convertor. This has been modified to support NetComm's modems and will be published as an enterprise MIB (registered with the IANA).

The MIB is supplied on a DOS 3.5" disk and can also be obtained from the NetComm Bulletin Board (02 9878 3755). Use the facilities of your network management software to incorporate the NetComm MIB. This will allow your management software to perform management functions on the Rack Modems.

Network Management provides the capability of monitoring and configuring various remote devices via computer network. Before you can use the Management program to manage NetComm Rack modems you must first allow the manager to load NetComm's MIB into the program's 'managed devices' database. Please refer to the user manual of your particular manager for details of loading the NetComm MIB into the manager's database.

RFC Compliance

RFC's are the guidelines issued by the Internet Activities Board (IAB) to standardize the various areas of TCP/IP networking. NetComm's Rack Controller is an SNMP v1 agent (RFC 1157 compliant) and supports MIB-II (RFC 1213) TCP/IP management. The MIB described in this document is NetComm's enterprise specific MIB for the Rack modems. This MIB is described using the structure of management information (SMI) defined in RFC 1155. To load the MIB into a management system the RFC 1155/ SMI must also be present. This is usually supplied with the management system, as is the MIB defined by RFC 1213.

Information Table

These variables will return the modem's Identity Strings

ID String 0 - Displays numeric identity code
ID String 1 - Reports OK or ROM checksum number
ID String 2 - Verify modem firmware checksum and return a result of OK or ERROR
ID String 3 - Returns ROM and revision level
ID String 4 - Displays Hayes-compatible coded strings containing product and feature specific information
ID String 9 - Displays product identity and revision level

Capabilities Table 1

This table contains variables which may be queried to determine the modem's capabilities and settable options.

Product Type
Telephone Line Types
Basic Capabilities
Character Formats Command Mode
Locked DTE Speeds
Autobaud DTE Speeds
PSTN Modulation Standards
PSTN V.34 Modulation Standards
Leased Line Modulations
Leased Line V.34 Modulations
Command Styles
Echo Controls
Response Codes
Command Timeout
Connect Messages
Dial Signals
Pulse Timings
Dial Modifiers
Number of Stored Phone Numbers
Call Progress Decodings
Calling tones
Guard Tones
Data Modes
Flow Control Mechanisms
Error Correction Standards
Inactivity Timeouts
Compression Standards
V.42bis Maximum Table Size
V.42bis Maximum String Length
Encryption Standards
Adaptive Error Correction Standards

Capabilities Table 2

This table contains variables which may be queried to determine the modem's capabilities and settable options.

Stored Configuration
Transmit Level Adjust
Leased Line Options
DTR dial
DTR Options
DSR Options

DCD Options
CTS Options
Synchronous Clock Options
Break Options
Long Space Disconnect
Autosynchronous
On-line Help Text
Speaker Modes
Speaker Volumes
Handshake Abort
MNP block sizes
Xon-Xoff Passthrough
V.42 phase detection
Command Verification
Disconnection Delay
Readable EQM
Readable Receive Level
Voice Synchronous
Lock Modulation
Compromise Equalizer
Fax Supported
Voice Supported
Remote Access
Password Security
Security Database Size
Blacklisting Supported
Analog Loopback
Analog Loopback with Selftest
Remote Loopback
Remote Loopback with Selftest

State Table 1

These entries return details regarding the modem's current state.

Major State
Detail State
Modulation Method
Line Speed
Data Mode
Compression Method
V.42bis Code Words
V.42bis String Length
Encryption Method
Port Speed
Port Parity
Asynchronous Data Length
Receive Level
Transmit Level
Scaled EQM
RS232 CTS
RS232 DSR
RS232 DCD
RS232 DTR
RS232 RTS
RS232 RING
RS232 AL
RS232 RDL

State Table 2

These entries return details regarding the modems current switch settings and LED status.

Switch Dumb Mode
Switch Auto Answer
Switch Sync
Switch Originate
Switch AL
Switch RDL
Switch V.25bis A
Switch V.25bis B

Led Auto Answer
Led 1
Led 2
Led 3
Led Transmit Data
Led Receive Data
Led Off Hook
Led Carrier Detect
Led Terminal Ready

Current Connection Statistics Table

This table contains statistical information relating to the current modem connection.

Time Elapsed
Bytes Transmitted To Line
Bytes Transmitted To Port
Bytes Received From Line
Bytes Received From Port
Frames Transmitted To Line
Frames Received To Line
Errors Transmitted To Line
Errors Received To Line
Retrains Initiated Locally
Retrains Initiated Remotely

Operational Statistics Table

Various operational counters.

Time Up Since Last Reset
Total Time Up
Total Time On-line
Incoming Connections Accepted
Incoming Connections Failed
Outgoing Connections Accepted
Outgoing Connections Failed
Bytes Transmitted To Line
Bytes Transmitted To Port
Bytes Received From Line
Bytes Received From Port
Frames Transmitted To Line
Frames Received To Line
Errors Transmitted To Line
Errors Received To Line
Retrains Initiated Locally
Retrains Initiated Remotely
Disconnects Initiated Locally
Disconnects Initiated Remotely
Disconnects Due To Carrier Loss
Disconnects Due To Handshake Fail
Disconnects Due To No Answer Tone
Disconnects Due To Wrong Speed
Disconnects Due To No Error Correction
Disconnects Due To Too Many Retransmits
Disconnect Due To Inactivity
Disconnect Due To Other Reasons

Connection Statistics Table

This table contains statistics on the types of connections which were established.

Speed V.21 V.32
Speed Bell
Speed V.22
Speed V.22bis
Speed V.32 4800 bps

Speed V.32 7200 bps
Speed V.32 9600 bps
Speed V.32 12000 bps
Speed V.32 14400 bps
Speed V.34 14400 bps
Speed V.34 16800 bps
Speed V.34 19200 bps
Speed V.34 21600 bps
Speed V.34 24000 bps
Speed V.34 26400 bps
Speed V.34 28800 bps
Protocol None
Protocol MNP
Protocol MNP10
Protocol V.42
Compression None
Compression V.42bis
Compression MNP 5
Encryption Statistics

AT Commands Table

The current setting of all the AT commands.

Total Reset
ATA - Command Answer
ATB - Select Communication Standard
ATD - Command Dial
ATE - Echo
ATH - Hang Up
ATI - Identity
ATL - Speaker Volume
ATM - Speaker Monitor
ATO - Return On-line
ATP - Pulse Dial
ATQ - Quiet
ATR - Host Terminal Speed Lock
ATT - Tone Dial
ATV - Verbal
ATW - Connect Report
ATX - Extended
ATZ - Reset

AT& Commands Table

The current setting of all the AT& commands.

AT&B - Character Length
AT&C - DCD Control
AT&D - DTR Control
AT&F - Factory Defaults
AT&G - Guard Tone
AT&H - Clock Control
AT&K - Flow Control
AT&L - Leased Line
AT&M - Synch Asynchronous Mode
AT&N - Abort Connection
AT&P - Pulse Ratio Selection
AT&R - Rts Cts Control
AT&S - DSR Control
AT&T - Self Test
AT&W - Write Configuration
AT&X - Transmit Clock
AT&Y - Profile

AT\ Commands Table

The current setting of all the AT\ commands.

AT\A - MNP Block Size
AT\B - Generate Break
AT\J - Auto Reliable Fallback

AT\K - Break Control
AT\N - Asynchronous Mode
AT\Q - Extended Flow Control
AT\T - Inactivity Timer
AT\V - Error Correction Codes
AT\X - Xon Xoff Pass Through

AT# Commands Table

The current setting of all the AT# commands.

AT#A - Remote Access
AT#B - Hayes Compatibility
AT#C - V.25 calling Tones
AT#D - V.25bis Direct Calling
AT#E - Encryption
AT#F - Front Panel Test Loop
AT#I - V.22bis Leased Line Mode
AT#J - V.42 Detection Phase
AT#K - MNP10
AT#M - Command Mode
AT#N - V.25bis Character Encoding
AT#O - Buffer Overflow Handling
AT#Q - V.25bis Terminal Speed
AT#R - Enable Remote Control
AT#U - V.25bis Character Set
AT#V - Command Verifier

AT% Commands Table

The current setting of all the AT% commands.

AT%B - V.32bis Originate
AT%C - Compression Control
AT%D - Disconnect Delay
AT%E - Auto Retrain
AT%F - DTR DSR Override
AT%H - NMP 10 Link Negotiation
AT%K - CTS Dial Handshake
AT%L - Level Control
AT%M - LED Function
AT%P - DCD Timing
AT%Q - Display EQM
AT%R - CTS Control
AT%S - DSR Control
AT%T - DCD Control
AT%U - V.42 Response
AT%V - Synchronous Voice
AT%X - X.32 Enable

AT Miscellaneous Commands Table

The current setting of the miscellaneous AT commands.

AT! - LockSpeed
AT-K - V.42 to MNP10 switching
AT-Q - MNP10 Fallback
AT:E - V.32 compromise equalizer
AT)M - Power level adjustment in MNP10
AT*W - Welcoming Message

S Table

The current setting of the S registers.

Indexed by S Register number
S Register Value

Dial Table

Internally stored telephone numbers.

Dial Number
Stored Dial String 0
Stored Dial String 1
Stored Dial String 2
Stored Dial String 3
Stored Dial String 4
Stored Dial String 5
Stored Dial String 6
Stored Dial String 7
Stored Dial String 8
Stored Dial String 9

Firmware Upgrades

The firmware supplied with the Modem is the latest from NetComm. However, the firmware of each modem may need to be updated to take advantage of the latest command variables. This is done using the Load and Rackload programs.

To upgrade firmware in Rack Modems

The Load and RackLoad programs are not shipped with the NetComm ProRack. These programs as well as the latest firmware can be found on the NetComm BBS at (02 9878 3755).

There are two ways to upgrade the firmware; individually or by using RackLoad which can upgrade multiple racks of modems in a single session. To use RackLoad, you must have a Rack controller.

Before Using Load or Rack Load

If the management module being used for Rackload has a firmware version before v274b then Rackload v1.21 must be used. For management modules with firmware v2.74b or higher rackload v1.24 must be used. Please note however that using Rackload v1.21 or v1.23 is not recommended. Upgrade the management module firmware to the latest revision using the standalone modem Load proram and then proceed with Rackload v1.24. The rackload version can be read by running Rackload without any command line parameters.

It is important to set the maxModemNumber parameter to the actual number of modems in the rack system before running rackload. This can be set by issuing the commands AT#V0

followed by ATI208 using the RS232 port on the management module or alternatively by setting the system MaxModemNumber MIB variable using SNMP.

☞ Failure to set this value correctly can seriously effect the performance of the systemas a whole not just when running rackload.

Before running Rackload ensure that all modems are properly inserted into the slots in the frame. All modems should be on-hook in the idle state. When Rackload first displays the graphic of the modems in the system, ensure that all modems which are being upgraded are displaying the "+" symbol indicating that they will be upgraded, any modems which aren't being upgraded should preferably be removed from the rack.

☞ Never run the standalone Load program on the modem in a rack in which other modems are being upgraded using Rackload.

☞ Never use Rackload with modems which are on-line or receiving calls.

☞ Never insert or remove a modem from any slot in the system while a rackload is in progress.

☞ Never stop Rackview during programming. When the program has completed, if any errors have occured DO NOT switch off the power or remove the faulty modems from the rack. Remove the successfully programmed modems from the rack and run Rackload again.

If any modems in the system are suspected of being faulty or malfunctioning, remove the suspect modems from the system before running Rackload.

Load Program

The Load program is designed to be used for downloading firmware file from DOS based systems to NetComm's family of rack modems. It is used for upgrading firmware to a newer version. It is used to upgrade a single modem at a time. You will have to repeat this procedure for each modem if you do not have a Rack Controller card.

☞ After the load program, your modem must be re-configured to your settings.

How to use the Load

1. Connect the serial port on the back of the frame to your PC with a standard modem cable.
2. Make sure the modem is powered on.
3. Run Load with the parameters as specified below.

   To get help on parameters required by Load:

   • Type 'LOAD' without any parameters followed by a carriage return.

   Load will display the following information:

   • NetComm Load and EEPROM Programmer v (current version number)

   • Format - load /f=FullFileName [/p=CommPort / c=CommPortParams]

   • To run downloader the following must be specified:

   File name with /f=.... (no default)

   Optionally you can specify:

   comm port with /p=x

   where x=COM1

   x=COM2

   x=COM3

x=COM4

(default x=COM1)

comm port parameters with /c=x

where x=9600

x=19200

x=38400

x=57600

(default x=38400)

☞ Port is set to no parity, 8 data bits, 1 stop bit

WARNING

Loader will check the file specified. Make sure before running the Loader that the file is the right one.

Do not, under any circumstances, interrupt the Loader.

During downloading and reprogramming operation, Loader displays progress status. It can be interrupted at any stage, but once the erasing has started it cannot be interrupted or the firmware will NOT be properly loaded.

Possible problems

If the Loader cannot communicate with the modem make sure that:

1. The modem is "ON" .
2. Is properly connected to the PC.
3. Right communication port is specified.
4. Modem is in Autobauding state (issue ATR0).

Rackload Program

The Rackload program is designed for downloading the firmware file from DOS based systems to NetComm's Rack modems. It is designed to upgrade firmware in a group of modems simultaneously

How to Use Rackload:

1. Connect the serial port of the Management Module at the rear of the rack frame to a PC with a standard modem cable.
2. Make sure the controller is in autobauding mode (issue ATRO command to enable this) and not in SLIP mode, flip switch 3 to OFF position (RIGHT).
3. Before running Rackload, upgrade the controller card with the latest version of firmware using LOAD.EXE.
4. Run Rackload with the specified parameters.

   To get HELP on parameters required by the Rackload type 'RACKLOAD' without any parameters, then CR. The following information will then be displayed:

   NetComm EEPROM Programmer for racks v (current version number)

   format - load/f=FullFileName [/p=CommsPort / c=CommsPortParams/fs=FirstSlave/ ls=LastSlave]

   To run RackLoad, the following must be specified:

   - File Name with /f=....(no default)

     Optionally you can specify:

   - Comm port with /p=x

     Where x=COM1

     x=COM2

     x=COM3

     x=COM4 (default x=COM1)

Comm port parameters with /c=x

Where x=9600

x=19200

x=38400

x=57600

(default x=38400)

- First slave card to program /FS=.. (default = 1)
- Last slave to program /LS=.. (default = 255)

☞ It is important to set the first and lasst slave correctly (i.e. do not use the defaults)

Port is set to no parity, 8 data bits, 1 stop bit

First slave and last slave specify the slot number of the first modem in a group of modems to be upgraded. The last modem specifies the slot of the last modem in the group respectively. It is not necessary to have modems in all specified slots, Rackload will check the presence of modems in the specified group and indicate what is found.

☞ Rackload does not perform checking on the file specified, so before running the Rackload, ensure the file is the right one.

5. After entering required parameters, the Rackload performs checking of the rack. It displays information about its status in the form of an array of characters.

Their meaning is as follows:

'x'	Could not find modem in this slot
'-'	Cannot be programmed
'+'	Can program
'L'	In loader mode, will be programmed
'O'	Online!, will be put onhook
'C'	Controller card, will not be programmed

☞ If you respond OK to start programming, all modems that were offhook will be disconnected before proceeding.

WARNING

Never insert or remove a modem from any slot in the system or interrupt while a rackload is in progress.

- Rackload displays progress status.

☞ You can interrupt at any stage, but once the erasing has started, you should not interrupt because the firmware will not be correctly loaded.

- After programming is complete, the Rackload will display the status of the modems again, indicating whether the operation was successful.

The following codes are used to indicate the outcome:

'x'	No modem in this slot
'-'	Could not be programmed
'+'	Programming successful
'E'	Error during programming
'C'	Controller card, NOT programmed

Possible problems

Some possible problems which may occur if Rackload cannot communicate with the modem:

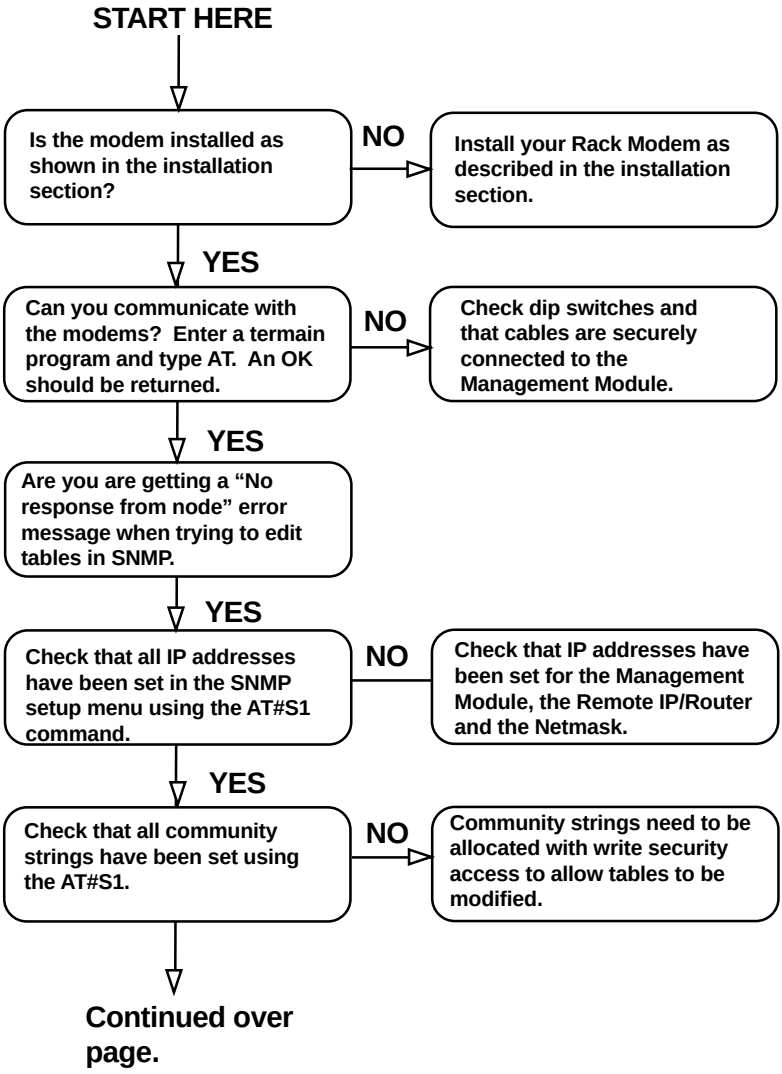
1. Check the modem is on.
2. Check the modem is properly connected to the PC.
3. Check the right communication port is specified.
4. Check the modem is in autobauding state (issue ATR=0).
5. Try setting the AT#V0 command on the Rack controller and then on the modems.

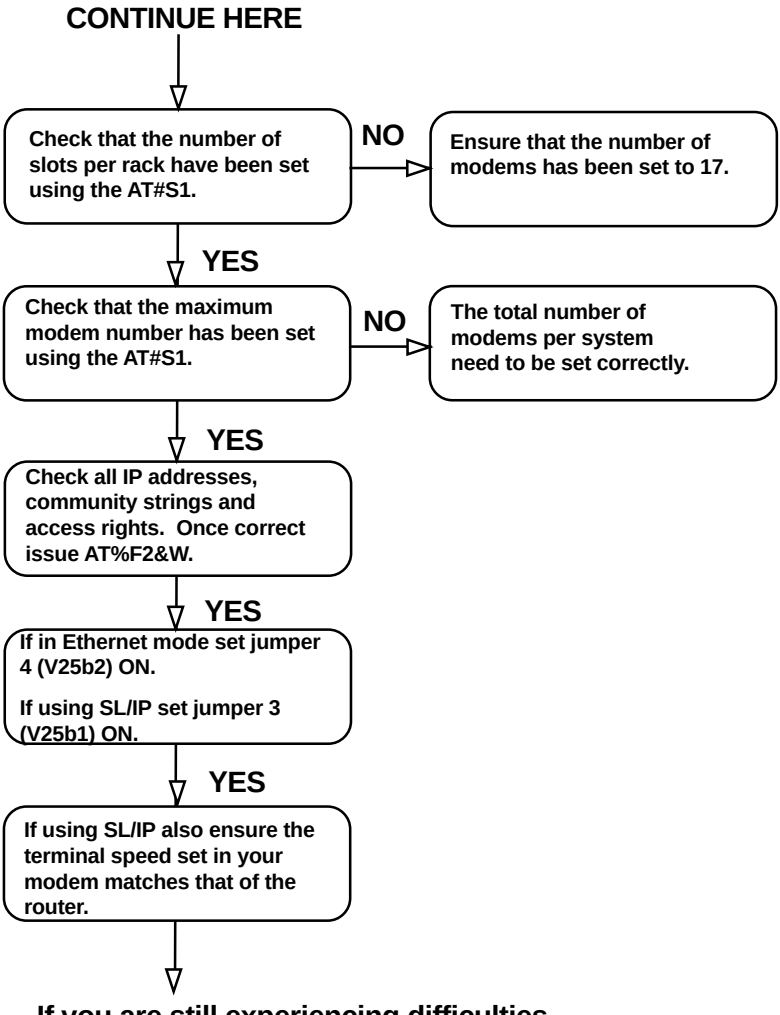
Appendix A: Troubleshooting

This section is provided to help solve problems you may encounter with your modem. Before you call Customer Support, check to see whether your problem is answered in this section.

Having Problems?

The flow chart on the next page is designed to help you work through installation problems. The most common problems encountered by new users relate to the way the modem is installed. If you are having problems with your modem, work through this chart. It will help you solve any simple installation problems.


START HERE
Is the modem installed as shown in the installation section?
NO
Install your Rack Modem as described in the installation section.
YES
Can you communicate with the modems? Enter a termain program and type AT. An OK should be returned.
NO
Check dip switches and that cables are securely connected to the Management Module.
YES
Are you are getting a "No response from node" error message when trying to edit tables in SNMP.
YES
Check that all IP addresses have been set in the SNMP setup menu using the AT#S1 command.
NO
Check that IP addresses have been set for the Management Module, the Remote IP/Router and the Netmask.
YES
Check that all community strings have been set using the AT#S1.
NO
Community strings need to be allocated with write security access to allow tables to be modified.
Continued over page.


CONTINUE HERE
Check that the number of slots per rack have been set using the AT#S1.
NO
Ensure that the number of modems has been set to 17.
YES
Check that the maximum modem number has been set using the AT#S1.
NO
The total number of modems per system need to be set correctly.
YES
Check all IP addresses, community strings and access rights. Once correct issue AT%F2&W.
YES
If in Ethernet mode set jumper 4 (V25b2) ON.
If using SL/IP set jumper 3 (V25b1) ON.
YES
If using SL/IP also ensure the terminal speed set in your modem matches that of the router.
If you are still experiencing difficulties contact NetComm's Customer Care Centre

The NetComm OnLine Bulletin Board

NetComm provides a bulletin board service that you may dial. This bulletin board gives you free access to useful information about your modem and provides a range of modem drivers which may allow you to use your modem with other communications programs.

Using a data communications program, call the NetComm online BBS: (02) 9878 3755

Restoring the Factory Settings

If you are experiencing problems with your modem, it is best to restore your modems factory settings (or “factory defaults” as they are sometimes known). This will ensure your modem is reliably set up. To do this:

- Run a communications program and enter “local mode” or “terminal mode”
- Type: AT&F and press ENTER
- Type: AT&W and press ENTER
- Exit the communications program

This will restore and save the original settings of your modem.

Before You Call Technical Support

NetComm is committed to continually improving the reliability of its products. We use sophisticated manufacturing techniques to achieve this goal and are confident that each time you use your modem, it will perform reliably and to your satisfaction.

If you do encounter problems, NetComm provides a team of trained technicians. It is their goal to help solve your modem problem as quickly as possible.

Many problems reported to Technical Support are simple installation mistakes — such as not switching on the power at the wall socket — rather than an actual product fault. Before calling Technical Support, please recheck the installation of your modem.

Please have the following information ready when you call

Technical Support:

- The model name and number of your modem
- The identity message of your modem. Use the ATI9 command to obtain the identity message
- The name and version number of the communications program or fax program you are using
- For what application are you using the modem? (For example, “Dial CompuServe”, or “Set up a bulletin board”, or “Attach the modem to a mainframe computer”)
- The speed at which you are trying to use the modem
- Are you using a dial-up connection (normal telephone line) or a leased line connection?
- The brand and model name of modem or fax machine you are dialing (if known)

If it is necessary to return your modem to NetComm, see Appendix F for procedures.

Appendix B: Specifications

Dimensions:	Rack	Power	Management Modem
Height	178mm (7.12 inches)		
Board		144mm (5.76 inches)	144mm (5.76 inches)
Front Panel		173mm (6.92 inches)	173mm (6.92 inches)
Length:	360mm (14.4 inches)	292mm (11.68 inches)	297mm (11.88 inches)
Width:	483mm (19.32 inches)	40.6mm (1.62 inches)	20.3mm (.81 inches)
Weight:	4.1kg (9.06 lbs.)	3.2kg (7.07 lbs)	0.42kg (.93 lbs)

Power:	
Rack:	240V (+10/-15% AC 60Hz, 200VA) maximum via standard IEC socket
Management & Modem:	15V AC (derived from power supply module) typically 3.5W (max 5A) from same source
DTE Interface:	DB25F socket, conforming to CCITT V.24/V.28 Mass Termination RJ11 connectors
Telephone Interface:	6-pin insulation displacement (Krone) connectors
Rack Frame Interface:	6-pin RJ11 connectors
Environmental:	Operating 0^{o} to $+45^{o}$ C
	Non-operating: -10^{o} to $+50^{o}$ C
Humidity:	Operating: 10% to 90% non-condensing
	Non-operating: 5% to 90% non-condensing

Appendix C: Regulatory Statements

Australian Customer Information

Some of the modem default settings have been selected to comply with Austel technical specifications. If you intend to change any default settings you must comply with the following rules:

- The modem must not answer an incoming call less than two seconds after the first ring signal. As a "rule-of-thumb" your modem should be set so it answers incoming calls after the second ring (ATS0=2).
- If Busy signal detection is switched off, the modem must not attempt more than two automatic redials and must wait at least two seconds before redialling.
- If Busy signal detection is switched on, the modem must not attempt more than nine automatic redials and must wait at least two seconds before redialling.
- If, after redialling the maximum number of times, the modem is still unable to establish a connection you must wait 30 minutes before attempting to redial.
- The use of Bell standard 103 and 212A is not permitted in Australia. Use of these modes will cause your modem to lose its permit status.

Changing the default values of the modem, in such a way as to cause your modem to operate in a non-compliant manner when connected to a telecommunications network operated by a carrier, is contrary to the Telecommunications Act 1991 and may result in penalties of $12,000.

New Zealand Customer Information

New Zealand Telecom requires you to be aware of these important warnings:

This equipment may not necessarily provide for the effective hand-over of a call to or from a telephone connected to the same line.

The operation of this equipment on the same line as telephones or other equipment with audible warning devices or automatic ring detectors will give rise to bell tinkle or noise and may cause false tripping of the ring detector. Should such problems occur, the user is not to contact Telecom Faults Service.

The telephone associated with the authorised apparatus must be permitted for connection to the New Zealand public telephone network.

The transmit level from this device is set at a fixed level and because of this there may be circumstances where the device does not give its optimum performance. Before reporting such occurrences as faults, please check the line with a standard Telepermitted telephone, and do not report a fault unless the telephone performance is impaired.

If your card frame ever suffers physical damage that causes its internal parts to become exposed, it should be disconnected from the phone lines immediately. The equipment must then be repaired before reconnection to the phone line is permissible.

Should it be necessary to physically move your card frame, disconnect it from the phone lines before disconnecting the power connection. When reconnecting your card frame, reconnect the power before reconnecting it to the phone lines.

Some parameters required for compliance with Telecom's PTC Specifications are dependent on the equipment connected to the RS232 port. The connected equipment shall be set to operate within the following limits for compliance with Telecom Specifications:

1. Equipment connected to the RS232 port shall be certified to meet the requirements of Reg. 18 of the New Zealand Wiring Regulations 1976.

2. When the user manually initiates a call, via equipment connected to the RS232 port, the equipment shall operate within the following restrictions:

a. Not more than 5 call attempts shall be made to the same number within a one hour period.

b. There shall be at least 60 seconds between call attempts.

c. Not more than a total of 10 call attempts shall be made to the same number for any single manual call initiation.

d. Automatic calls to different numbers shall be not less than 5 seconds apart.

FAILURE TO MEET THE ABOVE REQUIREMENTS MAY NEGATE THE USER RIGHTS UNDER THE TELECOM TERMS OF SERVICE.

Setting the S0 register (auto answer) to S0=1 or to values greater than 5 will render this equipment non-compliant with the Telepermit requirements.

When operating in V.22bis or V.22 mode over some older telephone exchanges, it may be necessary to issue the command.

This equipment does not provide a guard tone with the V.22 and V.22bis answer modes. In some circumstances this could cause interference with the telephone network signalling systems, and could result in lost calls. Telecom will not accept responsibility should such problems occur. Such occurrences will be rare.

The preferred method is to use DTMF tones (ATDT...) as this is faster than pulse (decadic) dialling, and is available on most New Zealand telephone exchanges. Where DTMF is not available and decadic must be used, your communications software must be set up to record numbers according to the following translation table as the modem is not directly compatible with the New Zealand (10-N) Reverse dialling standard.

Number to be dialled	Number to program into computer
0	0
1	9
2	8
3	7
4	6
5	5
6	4
7	3
8	2
9	1

Note that where DTMF dialling is used, the numbers should be entered normally. Telecom Faults Service.

FCC Statement

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference.

(2) This device must accept any interference received including interference that may cause undesired operation.

THIS UNIT COMPLIES WITH FCC PART 68 AS OF DATE OF MANUFACTURE.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Re-orient or relocate the receiving antennae.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Note: This unit was tested with shielded cables on the peripheral devices. Shielded cables must be used with the unit to insure compliance.

Note: The manufacturer is not responsible for any radio or TV interference caused by unauthorized modifications to this equipment. Such modifications could void the user's authority to operate the equipment.

Notification to the Telephone Company

Notification to the telephone company is no longer required prior to connecting the registered equipment but upon request from the telephone company the user shall tell the telephone company which line the equipment is connected to as well as the registration number and the ringer equivalence of the registered protective circuitry. In most, but not all areas, the sum of all RENs should be 5.0 or less. The FCC Registration number and Ringer Equivalence number are

printed on the main chip in the center of the internal modem board, or on the underside of the modem.

Malfunction of the Equipment

In the event that the MODEM should fail to operate properly, the customer shall disconnect the equipment from the telephone line to determine if it is the customer's equipment which is not working properly, or if the problem is with the MODEM, the user shall discontinue use until it is repaired. In the event service is needed the user should contact the vendor from whom you purchased the MODEM.

Telephone Connection Requirements

Except for telephone company-provided ringers, all connections to the telephone network shall be made through standard plugs and standard telephone company-provided jacks, or equivalent, in such a manner as to allow for easy and immediate disconnection of the terminal equipment. Standard jacks shall also be arranged that, if the plug connected thereto is withdrawn, no interference to the operation of the equipment at the customer's premises which remains connected to the telephone network, shall occur by reason of such withdrawal.

Incidence of Harm

Should terminal equipment or protective circuitry cause harm to the telephone network, the telephone company shall, where practical, notify the customer that temporary discontinuance of service may be required; however, where prior notices are not practical, the telephone company may temporarily discontinue service if such action is deemed reasonable in the circumstances. In the case of such temporary discontinuance, the telephone company shall promptly notify customers and will be given the right to bring a complaint to the FCC if they feel the disconnection is not warranted.

Changes in Telephone Company Equipment or Facilities

The telephone company may make changes in its communications facilities, equipment, operations, or procedures, where such action is reasonably required and proper in its business. Should any such changes render the customer's terminal equipment incompatible with the telephone company facilities, the customer shall be given adequate notice to make modifications to maintain uninterrupted service.

General

The FCC prohibits customer-provided terminal equipment be connected to party lines or to be used in conjunction with coin telephone service.

Installation

The MODEM is equipped with a USOC RJ-11 standard miniature modular jack and is designed to plug directly into a modular jack.

DOC Compliance Statement (Canada)

The Canadian Department of Communications label identifies certified equipment. This certification means that the equipment meets certain telecommunications network protective operational and safety requirements. The Department does not guarantee the equipment will operate to the user's satisfaction.

Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. In some cases, the company's inside wiring associated with a single line individual service may be extended by means of a certified connector assembly (telephone extension cord). The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations.

Repairs to certified equipment should be made by an authorized Canadian maintenance facility designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunction, may give the telecommunications company cause to request the user to disconnect the equipment.

Users should ensure, for their own protection, that the electrical ground connections of the power utility, telephone lines, and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.

CAUTION Users should not attempt to make such connections themselves, but should contact the appropriate electric inspection authority or electrician, as appropriate.

The Load Number (LN) assigned to each terminal device denotes the percentage of the total load to be connected to a telephone loop which is used by the device to prevent overloading. The termination on a loop may consist of any combination of devices subject only to the requirement that the total of the load numbers of all the devices does not exceed 100. The Load number appears on the underside of the NetComm Rack modem..

To be installed in UL-listed and CSA-certified computers with instructions on how to add/remove expansion cards.

Appendix D: Warranty Information

Limited Warranty

NetComm, Inc. (BRI) warrants to the original buyer of this BRI product that the hardware is free of defects in materials and workmanship for a period of five (5) years from the date of purchase from BRI or its authorized dealer. Should the product fail to be in good working order at any time during the five-year period, BRI, will at its option, repair or replace this product as described below. This warranty does not cover defects resulting from misuse, abuse, negligence, accident, repairs, or alterations made by either the customer or another party. NetComm reserves full rights to determine whether a defective product falls into this category.

The entire risk as to the quality and performance of the product rests with the customer. Any written or oral information or advice given by NetComm dealers, distributors, agents, or employees will in no way increase the scope of this warranty. This warranty applies only to the product described in this manual and not to any other value-added software which may be included.

All products will be serviced and returned via UPS-ground at no charge to customers. All customers are required to demonstrate proof of purchase when requesting a Return Merchandise Authorization (RMA). The period of service commences on the date of purchase. A copy of the sales slip must be included with the returned merchandise. Products which require Limited Warranty service during the warranty period should be delivered to BRI at the address in the Appendix (Servicing Your NetComm Product) with proof of purchase and the Return Merchandise Authorization (RMA) number provided by BRI Technical Support. Refer to the Appendix in your manual. Replacement parts or complete products will be furnished on an exchange basis only. Replaced parts and/or products become the property of BRI.

If the returned product is sent by mail, the purchaser agrees to prepay shipping charges, insure the product or assume the risk of loss or damage which may occur in transit, and to use a shipping container equivalent to the original packaging. ALL EXPRESS AND IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS OF PURPOSE FOR THE PRODUCT ARE LIMITED IN DURATION TO THE ABOVE FIVE- AND ONE-YEAR PERIODS, RESPECTIVELY.

UNDER NO CIRCUMSTANCES (WHETHER BASED IN CONTRACT OR TORT) SHALL NETCOMM BE LIABLE FOR INCIDENTAL, CONSEQUENTIAL, INDIRECT, SPECIAL, OR PUNITIVE DAMAGES OF ANY KIND, OR FOR LOSS OF REVENUE, LOSS OF BUSINESS, OR OTHER FINANCIAL LOSS AS A RESULT OF THE SALE, INSTALLATION, MAINTENANCE, USE, PERFORMANCE, FAILURE, OR DISRUPTION OF ITS PRODUCTS.

NetComm reserves the right to make periodic changes or enhancements to any NetComm product without prior notification, but has no obligation to modify or update products once sold.

This warranty gives you specific legal rights, and you have other rights which may vary from state to state. This warranty is valid only in the United States.

Appendix E: Servicing Your NetCommProduct

If your NetComm Rack requires service, first contact the authorized dealer from whom you purchased the modem. If the dealer is unable to assist you, and you must contact NetComm Ltd, please follow the instructions below.

Call NetComm's electronic BBS on (02) 9878 3755, it supports data transmission speeds up to 33.6Kbps with settings of N, 8, 1. Once your modem is functional, the BBS may be helpful (especially during off hours) if you have a question about product settings, or if you wish to download special software or utilities.

If the Troubleshooting section (Appendix A) did not resolve your problem, you may call our technical support staff for assistance. If you haven't referred to the Troubleshooting section, do so now.

NOTE: CALLING TECHNICAL SUPPORT WITHOUT COMPLETE AND ACCURATE INFORMATION CONCERNING YOUR PROBLEM MAY BE BOTH TIME-CONSUMING AND FRUSTRATING FOR YOU.

1. When calling NetComm's Customer care Centre and have the following information available:

   - **Unit name and part number**
   - **Computer manufacturer**
   - **Computer Model**
   - **Peripherals in system**
   - **Operating system and version**

   If you suspect a problem with a specific program or software package, make note of the name, version or release number, and manufacturer of the software.

2. Call NetComm's Customer Care Centre on 1 800 642 067. A trained technician will be available to discuss the problem(s) you are experiencing.

   If factory service is required, you will be given a Return Authorization (RA) number. Please place this number on the outside of the package when you return the item(s) for service and reference it on any correspondence included in the package. NetComm Ltd will return any product which is not accompanied by an RMA number.

3. Refer to the Warranty Statement if the product is covered under the five-year NetComm Ltd, Warranty.

4. Certain parts will not be covered under the NetComm Ltd, Warranty. Dealer installed parts are warranted by the dealer. Parts which you have installed yourself are covered only by the supplier's warranties. In these cases, NetComm Ltd, can identify which parts are defective, but will not replace such parts until specific written authorization is received from you. The cost of parts and labor involved in making such repairs will be billed to you C.O.D.

5. When sending the NetComm Rack to NetComm Ltd, for repairs, please be sure to include:

   - the NetComm Rack (unit only)
   - a copy of the original invoice
   - your return street address (for UPS purposes)
   - phone number
   - the RA number mentioned above

Package the product securely in a container equivalent to the original packaging, and insure the package to protect against loss or damage during transit. Shipping charges must be prepaid; C.O.D. shipments will not be accepted. Please use the address below for all correspondence:

NetComm Ltd

RA # _____

Block A, 25 Paul Street North,

North Ryde NSW 2113

AUSTRALIA

6. If the repairs performed on your modem were covered by the warranty, NetComm Ltd, will return it prepaid.

Contact Information

Please contact NetComm for help, information, sales enquiries or to join the NetComm Info Mailing List:

Customer Care Centre

Updates:	Click on the NetConnect icon, located on the front page, to connect to the internet and receive NetComm's latest product information and updates. *Your computer will need to be configured with an internet connection to use this feature.*
Email:	support@netcomm.com.au
Web Page:	http://www.netcomm.com.au
FTP site:	ftp.netcomm.com.au
Fax:	(02) 9887 4274
Phone:	1 800 642 067or 9878 7473 in the Sydney metropolitan area
BBS:	(02) 9878 3755

TeleMarketing

Fax:	(02) 9805 0254
Phone:	1 800 269 950 or 9878 7333 in the Sydney metropolitan area

Mailing List

For the latest sales and technical information, subscribe to the NetComm Info Mailing List by sending an e-mail to:

mailing-list@netcomm.com.au

In the body of the message enter the word:

subscribe

This will add your e-mail address to the NetComm Information Mailing List and you will be e-mailed news and updates regularly.