

Netlog user Guide

Users guide to
Netlog
the call logging buffer with an IP number.



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- Addendum for using Netlog as a call logging buffer connected to a PABX.
 - Addendum for using the Netlog and HitchHiker DOS based management tool.
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and more...

Quick start - for the impatient.

A) Netlog hardware product.

1. The unit may be shipped with the 12v sealed lead acid battery in separate packing due to its weight. If so, remove the outer case from the unit by unscrewing six rear panel screws - two on the extreme left and right and two in the middle. Fit the battery into its housing and connect the battery leads, red for positive, black for negative. Note polarity, the battery contains a lot of energy!
2. Power up each unit and see the led indications are correct. Replace the outer cover and fit the battery isolating link.
3. Connect the unit to a thin-net network segment or UTP hub. Connect another Netlog or HitchHiker to the same segment or hub.
4. Connect a PC serial port or a terminal, set for 9600 baud, 8, N, 1 to serial port 2, the right hand of the two D9 male connectors. The serial ports are configured as DTE so a crossover serial cable is required when configuring with a PC. Note - it may also be required if replacing a "DCE" type Netlog, however new installations are recommended to use a new cable. See port setting notes below.
5. Type ++++ for the root menu.
6. Use the menu selection 'Display units on line' and ensure you have an entry for each connected unit; one local unit and one or more remote units listed below it. Notice that the firmware version number is displayed for all the units. Netlogs are V2.xx and HitchHikers are V1.xx. It is best if all units of the same type have the same firmware version - contact your distributor in case of query. Press SPACE or RETURN to return to the main menu.
7. Enter the 'Configure Unit' menu and rename the local unit. The factory default password is 'pass' and the unit name was shown in step 6 (the units ignore case). You should also enter IP addresses for the unit and the default gateway, and the subnet mask. (you do not need to do this if you are not wide area connected and have no routers). Enter IP numbers as dotted quads e.g. 1.2.3.4
8. Save the changes. Press any key to return to the main menu.
9. Connect to each unit and repeat steps 4 to 8. Once you have given each unit its own IP numbers and name you can configure it remotely.
10. Make a link between any pair of units that are connected to the same network segment. When prompted for Source and Destination unit names, enter their IP numbers. Save the link. Exit command mode by pressing Escape. Try passing data across the logical link you have made.
11. A good first try is to link port 2 on the local unit to port 2 on another unit. Make two wire links on the chosen remote units serial port 2 - D9 pin 2 to 3 (data loop back) and D9 pin 7 to 8 (CTS to RTS). With your PC/terminal connected to local port 2, exit command mode (Esc), and see typed characters echoed, having been looped back by the remote unit.

B) DOS software product.

In this form, software suitable to run under DOS, is provided. To use the software-

- Copy the software to the PC containing the NIC it is coded to.
- Run a Clarkson (otherwise known as Crnwyr) packet driver suitable for the network card fitted to your PC. These drivers can be obtained by anonymous FTP or via a Web browser, from various sites - DRIVERS.ZIP contains the executables, DRIVERSS.ZIP contains sources too. Instructions for use are included within these zip files.

For example, a batch file shown here runs an NE2000 driver for a card set for IRQ 10 and base address 320h (0x on the front of a number means it is a hexadecimal number)-

```
rem Run the Clarkson packet driver for an NE2000 card.
rem Parameters are - software int, hardware IRQ, I/O base.
rem The software interrupt is normally OK at 0x7e but the next 2 parameters
rem must be changed to suit the way your network card is set up.
rem For example, an NE2000 card set for IRQ 10 and address 320h -
```

```
ne2000 0x7e 10 0x320
```

- Once the packet driver is loaded, then run the program called PT.EXE, and see-

```
COLD start - creating files... Complete. NETLOG running.
```

```
Press G to toggle data generator
Press Q to toggle speaker wadogs
Press SPACE key twice to enter Menu mode
Press ESC to end program.
```

Important notes - 1) The software turns the PC into a 'black box' like a HitchHiker, and takes over the PC completely, it is not suitable for use under Windows etc.

2) It is only suitable for use on the PC fitted with the NIC it is coded to.

3) You cannot send characters from the PC keyboard to another HitchHiker (real or software), nor receive characters from another HitchHiker onto the PC screen - the data streams go to COM1 and 2.

You *can* use the keyboard and screen to manage other HitchHikers.

Introduction

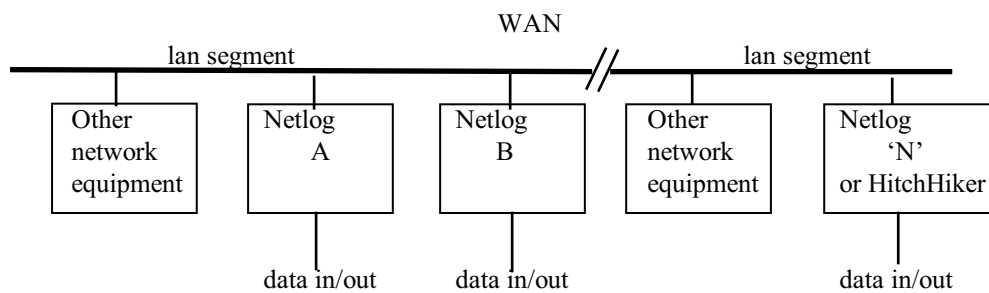
Netlog is a call logging buffer with an IP number. It sends call records across standard Ethernet networks from a PABX site to a central reporting system. It provides up to 32Mb of non-volatile buffer in case of network failure. Netlog is 802.3 compliant and uses protocols from the TCP/IP suite to ensure that it is fully routable.

Rugged protocol - Netlog provides error corrected, self repairing logical links. Every network packet is error checked and sequence numbered to ensure that data is delivered error free. Should the network or power fail, Netlogs will continue to accept and store call records and then automatically re-link when the problem is resolved.

Low network loading - Netlogs only use network capacity when carrying data, so they have little effect on network loading.

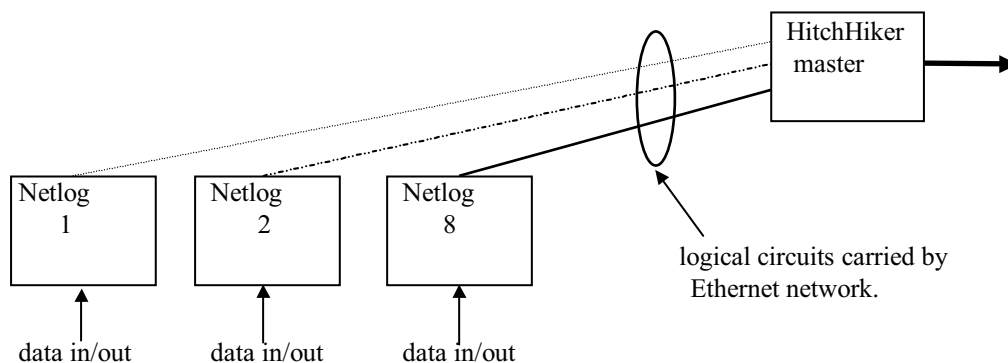
Central management - the TFTP file transfer protocol allows remote Netlog units to be upgraded with new versions of operating software. It also allows data files stored in remote units to be retrieved. Command mode allows management of any unit from any other unit on the network.

HitchHiker, a companion product to Netlog, allows data from two serial ports and a parallel port to be transported across Ethernet networks. HitchHiker and Netlog are protocol compatible to allow logical links to be made between them. To minimise central site equipment and ports, up to eight simultaneous Netlog data streams can be linked to a single HitchHiker port.



Each Netlog has two RS232C ports and a network port. You may connect as many units as you wish to the network and establish logical connections between units with complete flexibility.

Netlog allows its ports to be individually linked to any port of any other Netlog or its companion product, HitchHiker. You can connect as many units as you wish to your network, obeying normal Ethernet rules of course, and set up connections between units with complete freedom. For example, set one unit to accept data from several other units -



These, and many other configurations can be easily set up, monitored and changed at will from any unit on the network. The command mode menu allows you to make and break logical links between units, examine and change configurations, unit names, IP numbers etc. of any Netlog on the network. Security is provided by unit password.

Battery installation.

The unit may be shipped with the 12v sealed lead acid battery in separate packing due to its weight. Remove the outer case from the unit by unscrewing six rear panel screws - two on the extreme left and right and two in the middle and sliding the outer case off backwards. The battery housing can be seen at the front right. Unscrew the four screws holding the retaining cover, insert the battery with its terminals toward the middle of the case and replace the cover and screws. Connect the battery leads, red for positive, black for negative - *take great care with polarity.*

Power up check that the front panel leds indicate correctly i.e. -5Vdc off, -12Vdc on, +12Vdc on, Mains on, Battery low off and +5Vdc on. If these are correct, unplug the mains power, replace the outer cover and reapply mains power. The battery isolating link, packed with the battery, may now be inserted into the two terminals in the rear panel, adjacent to the mains socket.

Pre-connect configuration.

You must make a few minor configuration changes to each unit before you connect them to your network. The most important thing is to give each unit a unique IP number and optionally a name. If you do not do this you cannot make links from one unit to another! Each unit saves user configurations in non-volatile memory. These configurations are reloaded each time the unit is powered up. Power up the unit.

Netlog is configured by an RS232 terminal, or PC running a terminal emulation program, connected to serial port two, the right hand of the two D9 male connectors. The serial ports are configured as DTE so a crossover serial cable may be required if replacing a "DCE" type Netlog, however new installations are recommended to use a new cable. See port setting notes below.

To enter the Command menu mode type ++++ . The 'Netlog root menu' will appear. A menu tree is included at the end of this manual. A new or cold started unit will ask you to enter its IP address, the IP address of the default gateway and the subnet mask now. Use numbers provided by your network manager. If all the units are going to be on the same lan segment with no routers (gateways) in the system you can invent IP numbers, for example - IP no. of units - 1.1.1.10 through to 1.1.1.99, default gateway - 1.1.1.100 and sub-net mask 255.255.255.0.

At this stage you may rename each unit to suit your site. You may also change passwords, port names, port settings, IP number, default gateway IP number and subnet mask from this menu. All these settings are changed using selections in the 'Configure Unit', menu -

- At the prompt 'Enter name of unit to configure', and enter the factory default 'Netlog'.
- Answer the prompt 'Enter password for unit', with the factory default 'pass' in upper or lower case. Characters are echoed as asterisks.
- Enter IP addresses for the unit and default gateway and the subnet mask.
- If desired change the name of the unit and password.

If you wish to change the port names enter the 'Configure port' menus for each port. The factory default port names are; serial port 1 = 'port1'; serial port 2 = 'port2'.

Notes -

- To configure or make links to units on remote subnets, you must enter an IP number when prompted for the unit name.
- The network 'map' given by menu option 3 only shows units on the local subnet (unless your routers pass multicasts).
- Remember to *Save* your changes before escaping from command mode.

Connecting to the network.

Now you can connect your units to the network. Enter the Command mode on any unit and use the 'Display units on line' menu selection to get a report of all the Netlogs connected to the local LAN segment. You will not see units on other subnets. This menu option is a good test of the units ability to communicate correctly on the network.

Making links.

You can now form links between units. A 'link' is a data route starting at a source port on one unit and ending at a destination port on any another unit.

Use the 'Set up link' menu selection' and get the prompt 'Enter name of Source Unit'. You may enter its name - the unit will search the local sub-net for a unit of the given name, and if it is found you will be prompted to enter its password. Alternatively you may enter its IP number - if this is on the local subnet (as defined by the subnet mask) it will be searched for locally. If it is not on the local subnet the request is passed to the default gateway. When the unit is found you will be asked to identify the source port number, 1 or 2. You will now be prompted for the name of the Destination unit (or to enter 'none' or 'MULTI', more below). You may enter a name or IP number as before, and it will be searched for. When it is found you will be prompted to identify the destination port number on that unit. Lastly you will be prompted for an output port time-out. This time value is passed to the destination output port, which will not allow any other user to connect to it until it has been empty and idle for the chosen time. Choose from 2 sec, 20 sec, 2 min or 'never'. Having made the link, Save it (Esc to exit without changes).

Wide Area Network Routers.

If you connect units on different subnets of a WAN system you must refer to units by their IP numbers and you must define default gateways and subnet masks for every unit. Your network administrator can provide this information. If you connect all units to one subnet, IP numbers can be ignored or invented.

Valid responses to the prompt for a 'unit name' -

Whenever you are prompted to enter a unit name you can enter either -

1. An IP number. This can be used to refer to units situated on remote subnets.
2. The name of a Netlog connected to the local network. A multicast enquiry is sent to look for a unit of this name. Warning - most routers do not forward multicasts.
3. The word 'none' - simply a way of clearing a previously set link.
4. The word 'MULTI' - used to set up data broadcast from one unit to many units. See below.

Data broadcast.

Data broadcast may be selected as a link option on any input port by using the special word 'MULTI' (which stands for multicast) instead of the name of a destination unit. This option allows data to be broadcast to all other units on the same subnet. Data arriving at the broadcasting source port is sent to all other Netlogs connected to the local network (not units on other subnets), and output by them on the port you selected as the destination port.

Serial port configurations - handshake (flow control).

Whenever you make links between units, one unit will be connected to a source of data. i.e. a piece of equipment sending data, and the other unit will re-output this data to some receiving equipment. You must configure the serial port handshakes correctly. To do this enter 'Configure Hardware ports', specifying the unit name, password and port number, and then enter the 'Handshake' menu selection. Netlog can generate handshakes, to stop/start a data source, in two ways -

1. By either raising and lowering its CTS output - select 'Hardware' handshake
2. By sending Xon and Xoff characters - select 'Input generating Xon/Xoff handshake

Netlog can respond to handshakes from equipment trying to stop/start the data coming out of a destination port in two ways -

1. By monitoring the incoming RTS signal - select 'Hardware' handshake
2. By looking for incoming Xon Xoff characters - select 'Output responding to Xon/Xoff'

Other serial port settings.

Whilst in the Configure Hardware ports menu, you may also need to change the factory default settings. Choose baud rates in the range 110 to 38K4, data bits may be 7 or 8, parity can be none, odd or even and stop bits may be 1 or 2.

Notes -

1. The factory default is 9600 baud, 8 data bits, No parity 1 stop bit. 'Output responding to Xon/Xoff'.
2. Remember to save the changes before you exit.
3. Incorrectly set handshakes result in data loss.

Serial port pin connections - factory DTE configuration.

| <u>Signal name</u> | <u>Pin</u> |
|--------------------|------------|
| Data into unit | 2 |
| Data out of unit | 3 |
| DTR out of unit | 4 |
| Signal ground | 5 |
| DSR into unit | 6 |
| RTS out of unit | 7 |
| CTS into unit | 8 |
| n/c | 1 |
| n/c | 9 |

Serial cables.

The SBC/104 COM ports are set to DTE. Earlier units were configured as DCEs so a crossover cable may be needed on the serial port 2 connector -

| <u>DTE socket into Netlog</u> | | <u>DCE plug into PABX</u> |
|-------------------------------|---|---------------------------|
| <u>D9F</u> | | <u>D9M</u> |
| 1,9 | - | n/c |
| 2 | - | 3 |
| 3 | - | 2 |
| 4 | - | 6 |
| 5 | - | 5 |
| 6 | - | 4 |
| 7 | - | 8 |
| 8 | - | 7 |

'When to send packet' parameters.

It is possible to adjust various parameters relating to when a packet is sent.

1. The idle time in the incoming data stream. Each time a character is received, the idle time value for the port is reset. If no data arrives at an input port for the chosen idle time, characters waiting to be sent are formed into a packet and sent. Valid choices for this value are 0 = never time out, 1 = 10ms, up to 255 = 25.5sec. The default is 100ms.
2. The full packet count.. When the chosen number of bytes are waiting, they are formed into a packet and sent. Valid choices for this value are from 1 to 256 bytes. The default is 256.
3. Special termination character. If the chosen character appears, waiting characters are formed into a packet and sent. The last byte of the packet is the special character itself and packets are never

longer than 256 bytes, so if the character does not appear by then a 256 byte packet is sent. The default is no special character.

A value of 254 is used for ISDX records. This type of record starts with EE hex FF hex and it is this header that Netlog looks for. Valid records are 22 bytes long, all others are discarded.

A value of 255 is used to mean 'no special header or termination character in use'.

4. Add packet header - toggle. This option adds a five character header to the beginning of every packet to inform receiving equipment of the source of the data. The default for this option is off.
5. This sub-menu allows the 5 byte packet header to be entered and saved.
6. If ISDX records are used a special 4 byte header of FE hex EF hex nn 00 is automatically added (the user entered packet header is not used), where nn is an ISDX PABX number. This sub-menu allows the PABX number to be entered and saved.

Note - the selected values apply to all the input ports. However each input port is independent and uses its own copies of the parameters.

File types, file upload and download using TFTP and remote restart.

Netlog requires a number of files important to its operation. These are-

AUTOEXEC.BAT - controls the boot process.

PTTFTP.EXE - the operating software.

PT.EXE - a backup copy of the operating software.

PTCSUM.EXE - a utility that does a checksum of PTTFTP.EXE before running it.

PT.DAT - the configuration file containing user settings. If this file does not exist Netlog creates it and sets all the configurable parameters to the default settings.

BUF.00 - BUF.59 - sixty files that may contain unsent user data if it becomes impossible to deliver it across the network. The sixty data files are normally empty, but if Netlog cannot deliver incoming data it writes to the data files in order, allowing up to 256k of data in each. The file FILETAB.DAT is used internally to hold status information about the sixty data files.

If Netlog is unable to deliver data across the network it performs network retries every few seconds until data can once again be delivered. It is then forwarded, in the order received, until all the unsent data files are sent. Note - in the event that a large amount of data is held in the data files, a considerable period may elapse before the unit is once again delivering current data.

Upgrading a unit using TFTP

Netlog supports the IP file transfer protocol TFTP, using the optional checksum to give a reliable data transfer. TFTP allows the user to download unsent data files and upload new versions of the operating software. To upgrade, using TFTP send the new version of PTTFTP.EXE to drive D: on the IP number of the unit being upgraded. The unit must then be restarted in order to run the new version, this can be done remotely using menu option 2.

Restoring factory defaults.

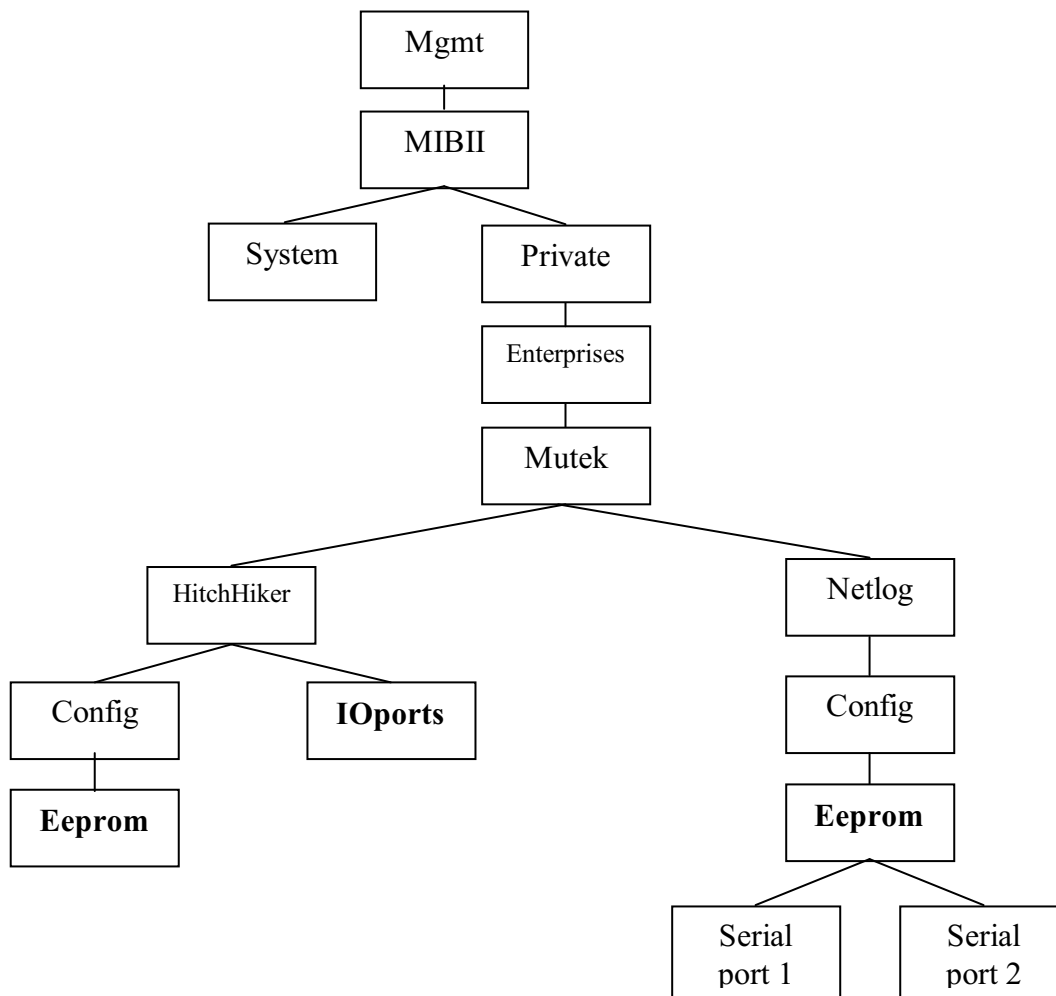
Two methods are provided to restore factory settings -

1. Use the menu system and enter 'Configure Hardware ports', specifying the unit name (or IP number), password and port number, and then use the 'Restore factory defaults' menu selection.
2. Delete the master configuration file 'PT.DAT' and restart the unit.

SNMP support.

Netlog V214 (and onwards) offers support for the Simple Network Management Protocol, one of the members of the TCP/IP suite of protocols. Using an SNMP client, for example HP Open View, the user can examine and modify the operating parameters of the unit. Additionally, Netlog may be configured to send SNMP traps for various reasons.

The client software must be configured with the Management Information Base (MIB) supported by the SNMP agent software running in Netlog. The MIB is provided on a DOS diskette in simple ASCII text form ready to be loaded into the management station, and results in a new tree being added under the 'private.enterprises' section of the MIB named 'Mutek'. The portions of the MIB supported by Netlog are shown pictorially below -



Setting up to use Netlog with SNMP.

1. Whenever using Netlog, it is first essential to connect a terminal set to 9600 baud, 8, N, 1, to serial port 2 and use the menu system to enter a unit name and IP numbers. This is explained in the opening section 'Quick start for the impatient'. Type ++++ to enter command mode. Use main menu 2 to enter your chosen unit name, IP number, the IP number of the default router, and the sub-net mask and Save these settings.
2. Using your SNMP client, set the IP number of the workstations that the unit must send its Traps to. MIB items 'TrapIP1 to 4' below.

The Mutek enterprise MIB.

The Mutek MIB includes two SNMP managed products, Netlog and its partner product HitchHiker. The HitchHiker product is fully explained in its own user guide. The Netlog MIB comprises;

The 'System' part of the MIB shows the seven standard read only variables defined in MIBII.

The 'Eeprom' part of the Mutek MIB allows the user to manage the objects shown below.
Objects relating to the main unit functions -

NL-Macnumber - read-only, the value of the 'burned in' Ethernet number in the unit.

NL-Name - the unit name

NL-Password - the unit password (community)

NL-IPnumber - unit IP number

NL-RouterIP - the IP number of the default router

MaskIP - the unit sub-net mask

NL-SPtrigger - unused

NL-Sptime, - three values to do with when to send packets. Please see section below.

NL-Spchar,

NL-SPcount.

[NL-SerialPort1] - settings for serial port 1, see more below.

[NL-SerialPort2] - settings for serial port 2, see more below.

NL-TrapIP1 - the IP number of the first management station that trap messages are sent to.

NL-TrapIP2 - the IP number of the 2nd management station that trap messages are sent to.

NL-TrapIP3 - the IP number of the 3rd management station that trap messages are sent to.

NL-TrapIP4 - the IP number of the 4th management station that trap messages are sent to.

Syshours - System time hours.

Sysmins - System time minutes.

Reshours - The hour that the system will auto-restart. Feature off if set to 00:00.

Resmins - the minutes of the auto-reset.

Office-hours-start - Alarms will only be generated during office hours.

Office-hours-end.

Inactivity-time - idle data for this time will generate an alarm. Feature off if set to 0.

Reset-unit - allows remote restart of unit.

Monitor-data - allows port 2 data to be routed into port1 buffer, for separate routing.

Port1-Rxd - no. of characters received by port 1

Port1-Txd - no of characters transmitted by port 1

Port2-Rxd - no. of characters received by port 2

Port2-Txd - no of characters transmitted by port 2

Rptd-data - no of data packets that timed out and were retransmitted

Rptd-startlinks - no of Startlink requests that timed out and were retried.

Rptd-arps - no of Arp requests that timed out and were retried.

Unacked-arps - no of Arp requests that timed out and were retried.

Data-pkt-Txd - no of data packets transmitted

Data-pkt-Rxd - no of data packets received

Arps-Txd - no of Arps requests transmitted

Arps-Rxd - no of Arps requests received

Pings-Rxd - no of Pings received

Startlink-Txd - no of Startlink requests transmitted

Unsent-files – no of files containing unsent data
Unsent-files-Kb – the total amount of unsent data in kilobytes
Reset-stats – set all the stats to 0 (Save the initialised stats with the ‘Save-button’ below)

NL-Save-button - saves user changes into flash memory.

Serial ports 1 & 2 support the following MIB items -

NL-Name - port name.
NL-LinkMac - Mac number of the unit this port is linked to. FF = none, 7F = ARP refresh
NL-LinkPort - Port number on the unit that this port is linked to.
NL-LinkIP - IP number of the unit that this port is linked to
NL-TO - idle time out of the above link
NL-LinkName - text string description of the destination unit that this port is linked to.
NL-Baud - Baud rate of this port. (serial ports only)
NL-Format - Number of data bits, stop bits and parity of this port. (serial ports only)
NL-Flow - flow control method of this port. (serial ports only). PABX filters are here.
NL-Multiin - whether this port accepts one link or eight data links. (serial ports only)
and on port 2 only -
NL-UserPABX – user defined dialled digit stripping. 1 for Meridian switches, 0 for others.
NL-UserSTART – start position of dialled digits field in the record.
NL-UserLENGTH – length of the dialled digit field.

Traps

Netlog generates Alarms or information messages when certain events occur as described below. These alarms or messages are sent in the form of SNMP Traps, and they can be sent to up to four workstations whose IP numbers entered into the mib 4 variables ‘TrapIP1’ to ‘TrapIP4’. The traps are -

- The unit is powered up with no configuration file present = System Trap ‘Cold start’
- The unit is powered up and adopts previously saved settings = System Trap ‘Warm Start’
- No RS232 data arrived into serial port 2 during Inactivity-time period = Enterprise Trap 1
- No data delivered to destination HitchHiker during Inactivity-time period = Enterprise Trap 2

END of MIB.

Examples of using the items in the Netlog MIB using HP OpenView.

Open the map showing the managed items on your network. (This map may be created by hand or by automatic polling). To create a query highlight a device and select Control – SNMP manager – Define query. Use the up and down tabs to move through the MIB to Private/Enterprises/Mutek/NetlogNL-Config/NL-Eeprom/ and use the add button to choose the items you want to be in your query. A typically list of items would be those in needed to make a link, as shown below in the example below. Save the query giving it a useful name. These items may now be read, modified and saved; OpenView calls these actions GET and SET.

To use the query highlight a device and select Control – SNMP manager – Select query and select one of your saved queries and press the Perform button. The highlighted device is queried and the values of the query items are returned. Items which are not shown as read only, may be modified and stored back to the device. Select the item, enter a new value by typing or pull down, press the tick button or hit return and press the SET button to store the value. Finally use the NL-Save-button to make the changes permanent in the Netlog. (the Save-button shows a value of ‘Waiting’, pull down to see ‘Save’, select it and use SET as above.

Making links from a Netlog port to a HitchHiker port.

The user must set values in the source port of the source unit. For example, suppose you wish to link port 2 on a certain unit to port 2 on a HitchHiker having IP number 1.2.3.4 .

Set SerialPort2 values on the source unit as follows –

```
NL-LinkMac = 7F xx xx xx xx xx // xx= any value. 7F causes ARP cache refresh (or wait)
NL-LinkPort = port2 // destination port number
NL-LinkIP = 1.2.3.4 // IP number of the destination HitchHiker.
NL-TO = 2 min // your chosen idle time out to release the destination unit.
NL-LinkName = 1.2.3.4 // (for menu display purposes only)
NL-Save-button = Save // This sets up the link and commits it to flash memory.
```

Note - the proposed destination port must not itself have a link set.

OpenView alarms (traps).

The two Enterprise traps ‘No RS232 data arrived into serial port 2’ and ‘No data delivered to destination HitchHiker’ allow alarms to be generated and are controlled by the Mib items,

Office-hours-start – Alarms will only be generated during office hours.

Office-hours-end.

Inactivity-time – idle data for this time will generate an alarm. Feature off if set to 0.

Set the office hours as required (24 hour clock, hours only) e.g. if the office is open from 9am to 5pm set Office-hours-start to 9 and Office-hours-end to 17. Set Inactivity-time to the number of minutes of data inactivity allowable before an alarm is raised. Data inactivity is only checked during the specified office hours, and if data fails to arrive from the switch for the specified number of minutes Trap 1 is sent. If data cannot be delivered to the destination HitchHiker for the specified time Trap 2 is sent.

The two System traps ‘Cold start’ and ‘Warm Start’ are generated when the program PTTFTP.EXE runs. The Cold start trap is sent if the program cannot find the configuration file PT.DAT and the Warm start trap is sent if it does find it and adopts the saved settings. These alarms could indicate power failure (and failure of the internal UPS), a scheduled daily restart, or an unscheduled restart. If the Cold start alarm is seen the unit may need to be reconfigured with the settings required at that location.

Notes on using Netlog with bridges and routers.

Routers do not pass 'all ones' broadcasts and rarely pass multicasts, so units on a wide area network will not be seen by menu option 3. The Netlog protocol is fully TCP/IP compliant, and allows any unit on the WAN to be -

1. Pinged.
2. Linked to any other unit.
3. Have its configuration examined and modified.
4. Uploaded and downloaded using TFTP.

However, units on different sub-nets of a WAN must be referred to by IP number not name, and valid entries for IP number, default gateway IP number and sub-net mask must be entered into all units. Refer to your network administrator.

Trouble shooting.

If the unit has been left unpowered for a period with the battery link installed, the internal battery will be flat. Disconnect the battery link.

The unit is fitted with a PS/2 keyboard connector and SVGA port. Connect a keyboard and monitor and observe the boot process.

The normal messages are -

- BIOS system checks and messages
- M-system flash disk and flash filing system messages
- Millennium check message
- Starting ROM-DOS
- Start Netlog - (start is automatic after 5 secs)[Y,N] - (*break here to examine the system files*)
- Packet driver load messages
- Messages from PTCSUM as it checksums PTTFTP.EXE
- Netlog messages -
 - WARM start - opening files... Complete. Arcom Netlog running.
 - Press space key twice to enter menu mode
 - Press ESC to close down Netlog.

Should ROM-DOS fail due to corruption of the flash memory, it is necessary to install a floppy drive and use the Arcom utility to re-write it.

Should the Netlog files (described earlier) become corrupted so that Netlog software will not run and TFTP cannot be used, use the floppy drive to re-write the required Netlog files.

Should PTTFTP.EXE become corrupted, the backup file PT.EXE will run. If so, it should be possible to re-write PTTFTP.EXE using TFTP.

If this fails, files may be restored from the self extracting .EXE file on the C: or D: drive. It will be called V2NNx.exe where NNx are the version number.

If all the above is now satisfactory, connect the unit to the local network and enter the Netlog menu system. Press main menu item 3 - *Display units on local subnet*, and check that the expected list of units can be seen. This tests lan traffic in both directions.

Connect a terminal to serial port 2 and observe that menu items appearing on the monitor screen also appear on this terminal, and that the menu system can be operated from the terminal. This tests serial port 2 data in both directions.

Specification.

- Flash file memory sizes of 1Mb to 32Mb provide call logging buffer.
- RS232C ports - speeds up to 38.4k baud, 7 or 8 data, 1 or 2 stops, odd, even or no parity. Presented on D9 male connectors.
- Network port - 10Mbps/s Ethernet presented on either 10baseT, twisted pair, 100m/segment, 10base2 thin net, 185m/segment, or AUI port.
- Network protocols - IEEE 802.3 Ethernet encapsulates IP packets, as defined in RFC 894. IP, ARP, ICMP, TFTP, SNMP and UDP protocols are used.
- Power supply - the units are powered by an internal mains PSU requiring 240VAC, 50Hz @20W. 110Vac, 60 Hz option.
- Indicators - leds are provided for mains and DC power supplies, loss of mains and battery low.
- User Configurations, IP addresses, port settings, logical links etc. are saved in internal non-volatile memory.
- Enclosure - all metal case with electrically bonded panels ensure compliance with EMI/RFI standards. Size - Depth 300 mm, Width to suit 19" rack, Height 135mm (3U). Weight 10Kg. Mounting arrangements - table top and optional rack mounting kit.
- Environmental - 0 to 40 degrees centigrade, 5 to 95% humidity (non-condensing).
- User Interface comprising keyboard and video interface.

Options

- Storage on hard disk (instead of flash file) providing greater buffer capacity.
- Software only version to run on the users chosen DOS based platform.

Netlog / HitchHiker protocol.

Netlog supports a subset of the TCP/IP suit of protocols, namely IP, ARP, ICMP, TFTP and UDP. It also responds to Pings (ICMP). Netlog's own protocol and the user data is carried inside UDP datagrams. The data carried is 1 byte minimum (after time out) and 256 bytes maximum. The Ethernet encapsulation is as defined in RFC 894 and mandated by RFC 1022. The packet format is shown-

Mac Header -

- 6 bytes Destination MAC address
- 6 bytes Source MAC address
- 2 bytes Type - 0800 for IP packets, 0805 for ARP requests and 0806 for ARP replies.

IP header -

- 2 bytes IP Version - 4, header length - 20, TOS - 16 (4510h)
- 2 bytes IP packet length including header
- 2 bytes identifier (packet number, unique over a short period)
- 2 bytes fragmentation - 00
- 2 bytes TTL - 64, protocol - 17 = UDP (4011h)
- 2 bytes header checksum
- 4 bytes Source IP number
- 4 bytes Destination IP number

UDP header -

- 2 bytes Source port - 8500 (2134h)
- 2 bytes Destination port - 8500 (2134h)
- 2 bytes length of UDP portion including header
- 2 bytes optional UDP checksum - set to 00.

Netlog/HitchHiker header -

- 2 bytes spare
- 2 bytes byte 1 - 34h or 0b4h, byte 2 - 32h. Netlog ID code.
- 1 byte Command(1) = 0000cccc where cccc is decoded as -
 - 01 - ACK
 - 02 - Start link
 - 03 - Multicast - who is there?
 - 04 - Multicast reply
 - 05 - Command packet
 - Sequence # bits re-used as -
 - 01 - enquiry; send configuration
 - 02 - reply to enquiry
 - 03 - new configuration data to be adopted
 - 07 - heartbeat (HitchHiker only).
 - 08 - Data packet
- 1 byte Command(2) = ddss0nnn -
 - where dd = destination port # and ss = source port #, range 0 - 2,
 - and where nnn = packet sequence number; range 0 - 7.

User data -

- 1- 256 bytes - May be user data or protocol data, as defined above.

Netlog and HitchHiker menu tree.

Section 1...

Enter ++++ into port 2 at typing speed to enter the Netlog menu system -

NETLOG - ROOT MENU

- 1 - Set up Link
- 2 - Configure Unit
- 3 - Display units on line
- 4 - Print units on line (HitchHiker only)
- 5 - Display statistics (HitchHiker only)
- S - Save settings
- ESC Quit without save

1. Set up Link

- Enter name of Source Unit - IP number
- Enter Password for Unit - Password - **** (default = pass)
- Enter source Port number - 2 (choose 1 or 2)
- Enter name of Destination Unit - IP Number - Checking units on line
- Select Destination Port of Link - 1 (choose 1,2, 'None' to remove link, 'MULTI' to broadcast.)
- Select Time-out for Destination Port of Link - 2 (choose 50ms, 2 sec, 20 sec, 2 min or never.)
- S - Save settings
- ESC Quit without save

2. CONFIGURE UNIT NETLOG. Go to section 2 for sub menus → Section 2

- 1 - Configure serial port 1 - named port1
- 2 - Configure serial port 2 - named port2
- 3 - Configure parallel port - named port3 (HitchHiker only)
- 4 - Configure Digital I/O port (HitchHiker only)
- 5 - Rename Unit
- 6 - Change Password
- 7 - Change IP numbers
- 8 - Change when to send packet parameters
- 9 - Reset to Factory Defaults
- R - System reset (Netlog only)
- S - Save settings
- P - Return to previous menu
- ESC - ROOT MENU

3. List of all units on line

LOCAL Unit name → NETLOG MAC 00201D000428 IP 0.0.0.0 V2.xx
Port name → port1 is a destination port
Port name → port2 is a destination port
Port name → port3 is a destination port
Press space to continue when list is complete

| Unit Name | Ser1 name | Ser2 name | Par name | MAC number | Version |
|------------|-----------|-----------|----------|--------------|---------|
| NETLOG | port1 | port2 | port3 | 0040332D9B2B | 2.xx |
| HITCHHIKER | port1 | port2 | port3 | 00201D000439 | 1.xx |

4. As above, sent to the parallel output port. (HitchHiker only)

5. Statistics - Shows total Packets sent and received, and by packet type - data, ack, link, MULTI, info, query, reply and config.

Section 2...

From section 1 ———> Configure Unit sub menus.

- 1 - Configure serial port 1 - named port1
- 2 - Configure serial port 2 - named port2
- 3 - Configure parallel port - named port3 (HitchHiker only)
- 4 - Configure Digital I/O port (HitchHiker only)
- 5 - Rename Unit
- 6 - Change Password
- 7 - Change IP numbers
- 8 - Change when to send packet parameters
- 9 - Reset to Factory Defaults
- R - System reset (Netlog only)
- S - Save settings ←—— return here to save ←——@
- P - Return to previous menu
- ESC - ROOT MENU

1. and 2. PORT HARDWARE CONFIGURE

Port named port1/2 is set-up for Xon/Xoff controlled input
9600 Baud No Parity 1 Stop bits and 8 Data bits

- 1 - Baud
- 2 - Stop
- 3 - Parity
- 4 - Data bits —————> Selections 1 to 7 sub menus in section 3 —————>
- 5 - Handshake
- 6 - Rename Port
- 7 - 8 channel receiver
- S - Save settings, P - Previous Menu, ESC Root Menu

3. PARALLEL PORT CONFIGURATION (HitchHiker only)

Parallel port named port3 is configured for Centronics Input

- 1 - Set as CENTRONICS OUTPUT
- 2 - Set as CENTRONICS INPUT
- 3 - Set as DATA PRODUCTS INPUT
- 4 - Set as DATA PRODUCTS OUTPUT
- 5 - Rename port
- S - Save settings, P - Previous Menu, ESC Root Menu

4. Configure Digital I/O port - Pin1 Pin2 Pin3 Pin4 (HitchHiker only)

Last recorded state of input lines HIGH HIGH HIGH HIGH
Last recorded state of output pins LOW LOW LOW LOW

- 1 - Set output pin 1
- 2 - Set output pin 2
- 3 - Set output pin 3
- 4 - Set output pin 4
- U - Update unit - save changes and re-read inputs
- P - Previous Menu, ESC Root Menu

5. Enter new unit name - ? —————> return to @ to save

6. Enter new pass word for unit NETLOG
New password - ? —————> return to @ to save

7. Change IP numbers
The units IP number is 0.0.0.0

The default gateway IP number is 0.0.0.0
The subnet mask is 0.0.0.0

- 1 - Change IP number
- 2 - Change Router IP number
- 3 - Change Local Net Mask —————> return to @ to save

8. Change when to send a packet parameters

Current time-out is 10

Current maximum packet size is 256

Current special character is turned off

No user header added to data packets.

1 - Change time-out from last character received - Time-out in 10msec units (0-255)

2 - Change Size of pkt to send - Max. packet size (1-256) - ?

3 - Change special character to terminate each packet - (0 - 255, 255 = none) - ? (Netlog only)

4 - Toggle add packet header. (Netlog only)

5 - Enter packet header. (Netlog only) - ?

6 - Enter ISDX switch number. (Netlog only) - ?

S - Save settings, P - Previous Menu

9. RESET TO FACTORY DEFAULTS

1 - Confirm reset unit NETLOG to Factory defaults (inc. password)

P - Previous Menu, ESC Root Menu —————> return to @ to save

R. System Reset (Netlog only)

System will reset when data is Saved.

Escape to avoid reset.

Section 3...

From section 2 —————> 1 - Configure serial ports 1 and 2, sub-menus -

- 1 - Baud
- 2 - Stop
- 3 - Parity
- 4 - Data bits
- 5 - Handshake
- 6 - Rename Port
- 7 - 8 channel receiver

1. SELECT BAUD RATE

0 - 38k4

1 - 19k2

2 - 9600

3 - 4800

4 - 2400

5 - 1200

6 - 600

7 - 300

8 - 150

9 - 110

2. SELECT STOP BITS

1 - 1 stop bit

2 - 2 stop bits

3. SELECT PARITY

- 1 - NONE
- 2 - 0 Parity
- 3 - ODD
- 4 - EVEN

4. SELECT DATABITS

- 1 - 7 bits
- 2 - 8 bits

5. SELECT HANDSHAKE

- 1 - Hardware
 - 2 - Input generating XonXoff
 - 3 - Output responding to Xon/Xoff
 - 4 - Input connected to a PABX
- option 4 leads to -

Change PABX filter

Current PABX filter is - None

- 1 - No filter
- 2 - Meridian Call Association
- 3 - Meridian Account code
- 4 - Italian digit stripping

6. Current name is port1

New Name - David

7. Port named port2 is set-up for Xon/Xoff controlled input

8 port receiver mode ON.

9600 Baud No Parity 1 Stop bits and 8 Data bits

End

Addendum for using Netlog as a call logging buffer connected to a PABX.

The Netlog software can be configured to separate each call record into its own packet and optionally add a five character record header. To configure the Netlog unit in this way use main menu item 2 'Configure a unit' and enter the IP number and password of the unit to be configured. Select menu item 8 'Change Packet send parameters'.

This menu offers the means to enter a five character header and the 'add header' toggle. It also provides the means to enter the special character which will cause the record to be sent. For example, if each call record ends in a line feed character use menu item 3 and enter the decimal value 10 (10 = 0Ah = LF).

If the unit is to be connected to an ISDX switch producing 22 byte binary call records terminated with 0eeh 0ffh, choose the special value of 254. This ensures that each ISDX record is sent separately across the network.

When configuring Netlog to send packets based on seeing call record termination characters, it is best to set the packet send time-outs to a large value, for example a value of 100 counts = 5sec. Also ensure that the full packet count is not set smaller than the call record length.

Special PABX filters.

Port 2 has 'handshakes' to select special to type PABX filters. To select these use the 'Configure serial port 2; handshake; Input connected to a PABX' sub-menu.

Addendum for using the DOS based management tool.

This utility is for use under DOS on a PC platform and allows the configurations of all network attached HitchHikers and Netlogs to be examined and changed, and new links to be set up.

Run a Clarkson (otherwise known as Crnwyr) packet driver suitable for the network card fitted to your PC. These drivers can be obtained by anonymous FTP or via a Web browser, from various sites - DRIVERS.ZIP contains the executables, DRIVERSS.ZIP contains sources too. Instructions for use are included within these zip files.

For example, a batch file shown here runs an NE2000 driver for a card set for IRQ 10 and base address 320h (0x on the front of a number means it is a hexadecimal number)-

```
rem Run the Clarkson packet driver for an NE2000 card.
rem Parameters are - software int, hardware IRQ, I/O base.
rem The software interrupt is normally OK at 0x7e but the next 2 parameters
rem must be changed to suit the way your network card is set up.
rem For example, an NE2000 card set for IRQ 10 and address 320h -
```

```
ne2000 0x7e 10 0x320
```

Once the packet driver is loaded, then run the program management tool called PT.EXE, and see-

```
HitchHiker remote control
```

```
- -
Press SPACE key twice to enter Menu mode
Press ESC to end program.
```

The main menu has three selections -

1. Allows links between units to be made and cleared -

- Enter source unit name and port number and destination unit name and port number as prompted.
- In addition a link from a remote unit to a virtual port 2 on the PC can be made - the data from the remote unit appears on the screen.

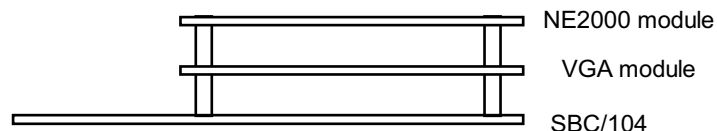
NB: The program does not support the PC serial ports so actual data links to and from the PC cannot be made.

2. Allows user settings, e.g. port speeds, packet send settings etc. to be examined and changed.

3. View all units connected to the same sub-net as the PC running PT.EXE.

Addendum - Setting up an ARCOM SBC/104 based NETLOG.

Make up of the SBC and its PC104 stack -



Setting up the system.

Plug the modules together as shown. Connect a floppy disk (appears as drive B), a keyboard and VGA monitor. Power from a 5V supply.

Use the floppy disk 'Boot disk for Arcom' and set up the flash disk and the NE2000 module.

Setting up the M-Systems Flash module

During power up you should see M-Systems messages as the on-board firmware is picked up by the Bios. The SBC/104 also has an on board flash which appears as drive C:. It contains the Datalight ROM DOS.

1. Run B:\M-SYS\FDSETUP to low level format the flash disk. It should say '1 Flash disk found'. Use the Utilities menu to Format the flash disk - say 'No' to 'Optimise for compression' and Assign the drive letter as D: ('an Additional drive'). The operation takes about 2 minutes.
2. Reboot from the floppy disk and DOS format the flash disk (now occupying the D: drive position) eg. B:FORMAT D:
3. Copy the Netlog files from the floppy to the C: and D; flash disks -
eg. COPY B:\V2NNx.EXE C:\ This is a self extracting exe file and contains -
AUTOEXEC.BAT
NE2000.com - the NE2000 packet driver.
PNPPD.COM - an alternative packet driver.
PTTFTP.EXE - the checksummed version of the Netlog software.
PT.exe - the backup production version of the Netlog software.
PTCSUM.EXE - the checksumming program.
CHOICE.COM - used by Autoexec.bat
4. Use the an editor to create a file called DRIVE_D on the 24Mb D: drive. It can contain anything- eg. 'This is drive D:'

2) Set up the NE2000 network module.

Configure the card using SETUP.EXE which was copied to the C: flash disk. Set it to UTP, I/Obase=300h, Int=10h, Boot Rom = disabled. Save the config.

3) Run the unit as a Netlog.

Power cycle the unit and check that it runs as a Netlog - Check the boot sequence on the display which should conclude with Netlog messages -

COLD start - creating files... Complete. Netlog running.

Press SPACE key twice to enter Menu mode

Press ESC to end program

- Check that it can both see and be seen on the network
- check that port 2 responds to ++++
- check that the reset button works
- Use another HitchHiker or Netlog and set up name, IP numbers and subnet mask. Set a link from the its port 2 to a HitchHiker (V126b if its a unit for HP) using IP numbering. Check that data passes though the link. Do the same for port 1.
- ESC out of the program and check that all the BUF.* files, PT.DAT and FILETAB.DAT were created on drive D:

Serial cables.

Fit the D locking posts to the COM ports. HitchHiker and earlier Netlog serial ports are configured as DCE A crossover cable will be needed on the serial port 2 connector when configuring with a PC.

| D9F | | D9M |
|-----|---|-----|
| 1,9 | - | n/c |
| 2 | - | 3 |
| 3 | - | 2 |
| 4 | - | 6 |
| 5 | - | 5 |
| 6 | - | 4 |
| 7 | - | 8 |
| 8 | - | 7 |

Rear view of completed unit -

