



Customer Service Support System

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QL 4222 Manual

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QL 3222/QL 4222 Chapter 1 - Introduction

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QL Product Architecture

QL Series products provide a platform for application processing on Novell NetWare networks. QL processor boards function as NetWare DOS, Microsoft Windows, or OS/2 workstations. These products are 80386 or 80486 based PC boards. Each standard sized board provides two complete 80386 workstations. The products are as follows:

- . **QL 4222** - Two 80486 based NetWare workstations on a single board
- . **QL 3222** - Two 80386 (or 486SLC) based NetWare workstations on a single board

* The software documented in this manual will also support earlier models of these products. Contact for a list of supported board models.

QL boards are designed to be installed in the backplane of a PC functioning as a NetWare file server or router. This embedded processor design reduces space requirements and eliminates much of the hardware required by regular workstations, including the PC enclosure, the power supply, and the network interface controller (NIC). Although a monitor, keyboard, and mouse may be attached to a QL processor, QLs are typically used in applications where these devices are not required, including the following:

- . Remote communications (modem) - a remote user may dial into a QL and use the QL as the host processor for the remote session. To support this application, the QL boards have been designed with the following features:

- Reset on Loss of Carrier - When enabled, this feature will cause the QL to reset when the remote user terminates a dial-in session, thus automatically initializing itself for the next caller.
- Line Busy - This feature prevents the QL from answering an incoming call while the processor is resetting and therefore unable to host a remote session. Instead of answering the call, the line will appear busy and the PBX will proceed to the next available line.

. Remote communications (LAN) - the user of a workstation on a LAN may connect to a QL and run applications on the QL processor, increasing the processing power available to the user.

. Batch processing - the QL processors may be used to run background or batch processes.

QL boards are equipped with a hard disk drive controller. However, the QL processors are usually configured as diskless DOS or MS-Windows workstations and boot from a file on a NetWare file server. If the QL processor is configured as an OS/2 workstation, a hard disk is required. A floppy drive controller is provided only on the QL 4222 products.

Because QL boards are installed in a NetWare file server or router, they use the bus to transfer network packets to/from the server/router. Since this functionality is integrated into the QL architecture, the QL processors do not require a dedicated external network interface controller (NIC). If it is necessary for a QL to communicate with a device on the LAN, the QL sends the packet via the bus to the NetWare server/router, which routes the packet through its NIC and onto the network.

Cubix has designed the QL products so that NetWare recognizes the QL processor as a standard workstation. The fact that the QL workstations use the bus as their media for network communications is transparent to NetWare. Cubix provides standard NetWare ODI drivers to handle these functions. Each QL workstation must load a workstation driver. This is analogous to a standard workstation loading a driver to handle packet transfers over a NIC. The server/router containing the QL boards must load a server driver, just as a server must load a driver for each NIC installed.

QL Management

Cubix provides several levels of management for the QL products as explained below:

. **QLVision** - included with the QL software, QLVision is a DOS based workstation application that provides basic monitoring and supervisory control functions for QL products.

. **CMS (Cubix Management System)** - an optional Windows based workstation application that provides alarming, monitoring, control, and reporting functions for all Cubix products installed on the network.

. **SNMP** (Simple Network Management Protocol) - QL products are instrumented for SNMP, the industry standard for network management. This allows QL processors to be managed by a SNMP-compliant network management system.

More information on managing QL products may be found in *Chapter 4 - QL Management*.

Version 5.0 Enhancements

The following enhancements have been incorporated into version 5.0 of the QL software.

CMS Support

Support for the Cubix Management System (CMS) is included in version 5.0 of the QL software. CMS is a complete Windows based application that manages all Cubix devices on a Novell network. CMS uses the industry standard SNMP management protocol for all network communications.

* To configure a QL workstation to run in a CMS environment, follow the instructions in the *Cubix Management System Installation Guide*.

Incorporating CMS support into the QL product required the following changes.

. The default image file configures the QL workstation for the NetWare DOS Requester (VLM) environment rather than the NetWare Workstation Shell (NETX) environment.

. The NetWare Workstation Shell files are not shipped with the QL software.

QLVision Enhancements

The following enhancements have been added to QLVision. The new functions are also supported by CMS.

. The deadman functionality has been replaced by the Cubix Processor Recovery (CPR) function. CPR can be enabled and disabled on individual boards. If CPR is enabled:

- The QL processor will be interrogated on a regular interval. This **poll interval** is user configurable.
- If the QL processor fails to respond to the poll, it will be reset (the amount of time that the processor is given to respond to a poll is also the value specified as the **poll interval**).
- Once a processor is reset, it is given a certain amount of time to boot. After this time elapses, the polling of the processor will commence and the process above repeats. The amount of time that the QL is given to reset is the **reboot timeout**. This **reboot timeout** is user configurable.

. The QLVision edit screen has been modified. The deadman parameters have been replaced with **poll interval** and **reboot timeout** configuration.

. The ability to place a QL processor offline and online has been added.

. The ability to place a QL processor into a *pending offline (POL)* state has been added. When POL is enabled, a processor will continue to function normally until it is reset. Once a reset occurs, the processor will automatically be placed offline.

. QLVision will report the number of times that a processor has been reset. Resets are tracked in three categories:

- Normal resets - a reset that is generated by the processor itself, as occurs when the user presses <CTRL><ALT>.
- CPR resets - a reset caused by the CPR function.
- Manual resets - a reset caused by user request via QLVision or CMS.

. The QLVision node screen has been modified. <F3> brings down a menu list, and <F5> toggles mark. The menu list contains the following options:

- Reset Node(s)
- Force Node(s) Online
- Force Node(s) Offline
- Enable POL
- Disable POL
- Enable CPR
- Disable CPR
- Reset Slave Counters

. The new functions can be performed from the QLVision command line. Refer to the ***QL Management*** chapter for an explanation of command line parameters. The new functions are invoked as follows:

- -on *server net node* places node online
- -off *server net node* takes node offline
- -cpr+ *server net node* enables CPR on node
- -cpr- *server net node* disables CPR on node
- -pol+ *server net node* enables POL on node
- -pol- *server net node* disables POL on node

. The custom diagnostics have been removed from the Diagnostics screen.

. New QL 3.INI and QL 4.INI files have been created to support the new QLVision functions. These files will be placed in the SYS:\ETC directory on the device containing the QL processors by the QL 3_SUPR.NLM or

QL 4_SUPR.NLM application..

Other Modifications

. Support for NetWare 2.x has been discontinued.

. The QL 3_SRVR.NLM has been renamed to QL 3_SUPR.NLM, and the QL 4_SRVR.NLM has been renamed to QL 4_SUPR.NLM. These NLMs advertise as QL 3_<net>_ON_<server name> or QL 4_<net>_ON_<server name> (the second net address has been removed). The identification number of the advertisement has also been changed.

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Customer Service Support System

QL 3222/QL 4222 Chapter 2 - Installation

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Preparation

Before the QL hardware and/or software may be installed, the following information **must** be determined. **Installation cannot be completed without the answers to the questions below.**

1. What is the name of the Designated Server?

The designated server is the server on which the QL files will be installed. In diskless installations, the designated server is the file server from which the QL workstations boot. **The designated server is written into the driver file by the QL Installation Utility.** Therefore, if the designated server is changed after installation, **the Installation Utility must be run again** and the new server specified. Refer to **Chapter 5 - Configuration Changes** for more information.

Enter the name of the designated server in the space provided and proceed to the next question. If a more detailed description of the designated server is desired, one is provided below.

Designated Server:

Designated Server

If the QL boards are installed in a file server, this file server is usually specified as the designated server. However, if the boards are installed in a router, a file server on the LAN should be selected as the designated server.

In installations where QL workstations are not configured to boot from a local disk drive, but instead will perform a "remote boot", the designated server assumes an additional function.

To perform a remote boot, QL workstations boot from a file on a file server. This file contains an image of a DOS bootable diskette, and is called the "image file". QL workstations boot from the image file exactly as

they would from a floppy diskette drive.

During installation, the user must select a designated server. The QL drivers are configured to search the designated server for the image file. Therefore, if a need arises to change the server from which the QL workstations boot after the initial installation is performed, the drivers must be reconfigured for the new designated server.

2. What is the net address?

The QL network address defines the unique network segment used by the QL workstations and bound to the protocol stack. **The QL Net Address is written into the driver file by the QL Installation Utility.** Therefore, if the QL Net Address is changed after installation, **the Installation Utility must be run again** and the new address specified. Refer to *Chapter 5 - Configuration Changes* for more information.

If both QL 3222 and QL 4222 types of boards are being installed, two network addresses must be assigned (one for each board type). Enter the net addresses in the space provided and proceed to the next question. If a more detailed description of the net address is desired, one is provided below.

QL 3000 Series Net Address:

QL 4000 Series Net Address:

QL Net Address

Nodes (workstations and file servers) on NetWare networks are identified by a net number and a node number, or address. QL workstations residing within a single server or router function as nodes on their own network segment with their own unique network address. These network segments are typically referred to as LAN A, LAN B, etc. using Novell terminology. Each QL workstation is assigned a unique node address on the network segment. Node numbers are assigned to QL workstations using DIP switches on the boards as explained during the installation instructions. The net address will be the same number specified when the Cubix driver is bound to the protocol (e.g. IPX). Refer to [Figure 2-1](#) for an illustration of network addressing.

For example, the following commands load the QL 4000 Series server driver:

```
load QL 4000
```

```
bind ipx to QL 4000 net = xx
```

where **xx** is the QL Network Address

If multiple QL boards belonging to the same QL Series are installed in a server or router, they will share one net address. However, if both QL 3000 and QL 4000 Series workstations are installed in the same server/router, two network addresses are required: one for the QL 3000 network and one for the QL 4000 network.

3. What are the IRQ assignments?

The QL boards require an interrupt (IRQ) on the file server or router in which the boards are installed. The interrupt is specified on the command line when the QL driver is loaded on the server or router; **no hardware configuration is required.** Interrupts 7, A, B, and F hexadecimal (7, 10, 11, and 15 decimal) are supported (IRQ A is the default). If more than one QL board of the same type (QL 3222 or QL 4222) is installed, the boards will share the same interrupt. However, if both QL 3222 and QL 4222 boards are installed in the same server or router, each type of board requires its own interrupt assignment.

Enter the interrupt assignments in the spaces provided and proceed to the next question. A more detailed explanation of the IRQ assignments is included below.

QL 3000 Series IRQ Assignment:

(7, A, B, or F hexadecimal; Default = A)

QL 4000 Series IRQ Assignment:

(7, A, B, or F hexadecimal; Default = A)

IRQ Assignment

The interrupt configuration described above refers to an interrupt on the CPU of the file server or router. This allows the QL to interrupt the server or router when bus communications are required. An interrupt on the QL CPU is also required to allow the server or router to interrupt the QL. This interrupt is not configurable (refer to the *Hardware Reference* for a complete list of QL interrupt assignments).

4. What are the I/O Addresses?

The server or router uses a block of I/O addresses to communicate with the QL workstations. The block is configured by setting the first, or base, I/O address using a DIP switch on the QL board as explained during the installation instructions. The same address must also be specified when the QL driver is loaded on the server or router. If more than one QL board of the same type (QL 3222 or QL 4222) is installed, the boards will share the same I/O address block; however, if both QL 3222 and QL 4222 boards are installed, two I/O address blocks must be allocated (one for each QL type).

The QL 3222 requires eight consecutive I/O addresses starting at hexadecimal 220, 230, 320, or 330 (220 is the default base address). The QL 4222 requires thirty-two consecutive addresses starting at hexadecimal 200, 220, 300, or 320 (200 is the default).

Enter the base I/O address assignments below.

QL 3000 Series Base I/O Address:

(220, 230, 320, or 330 hexadecimal; Default = 220)

QL 4000 Series Base I/O Address:

(200, 220, 300, or 320 hexadecimal; Default = 200)

5. What is the shared memory window?

The QL 3222 boards require a 16 Kbyte shared memory window in the memory of the file server or router. The shared memory window consists of dual port RAM that resides on the QL board, but is directly accessible to the server or router. The memory addresses used are specified when the QL 3222 driver is loaded on the server or router; **no hardware configuration is required**. The shared memory window may start at hexadecimal address C000, C400, C800, CC00, D000, D400, D800, or DC00 (the default is CC00).

If multiple QL 3222 boards are installed, they will share the same memory window. The QL 4222 boards do not require a shared memory window. Enter the starting address for the shared memory window in the space provided below.

16 Kbyte Shared Memory Window:

(C000, C400, C800, CC00, D000, D400, D800, or DC00; Default = CC00)

6. Will the Reset on DCD/DSR feature be enabled?

* This question must be answered only if a QL board is being installed. If a software update is being performed, and no QL boards are being installed, skip this question and proceed to the installation instructions.

The QL Series workstations are typically connected via the COM1 port to a modem performing remote communications over a telephone line. The COM1 port monitors the state of the Data Carrier Detect (DCD) or Data Set Ready (DSR) signals coming from the modem. The QL workstations can be configured to perform an automatic hardware reset if DCD or DSR is dropped.

Enter the state of the Reset on DCD/DSR function in the space provided. For a more detailed description of this function, refer to the discussion below.

State of Reset on Loss of DCD/DSR:

(Enabled or Disabled)

Reset on Loss of DCD/DSR

One practical usage of this feature is to force the QL workstation to reset between remote sessions. This ensures users that they are connecting to a newly initialized system. It also verifies that users are properly disconnected from the network when their session terminates (i.e., a user will not remain logged into a NetWare after "hanging up" the phone).

Depending upon the system configuration, the state of DCD, DSR, or a combination of both signals will indicate that the telephone signal connection is established and that the modem is ready. Most configurations support DCD. However, if a multiplexor is installed between the QL COM1 port and the modem, it may be necessary to monitor DSR instead.

Installation Overview

This chapter describes the proper installation procedures for the QL software in each of following scenarios:

. QL Hardware and Software Installation

A full installation must be performed when QL boards are to be installed in a system.

. Driver Update

A driver update is performed to install new QL drivers on boards already installed in a system.

* As network configurations change, it is sometimes necessary to modify the configuration specified during the QL installation (Designated Server and/or Network Address) without performing a complete installation of all QL files. Refer to ***Chapter 5 - Configuration Changes*** for instructions of changing these configuration parameters.

Both installation scenarios require running the Cubix installation utility, INSTALL.EXE, on the *QL Series Installation Diskette*. This utility prompts the user for the installation parameters and informs the user as the software installation progresses. For advanced users, the installation utility can be invoked with command line parameters that override the user interface. Refer to the ***Advanced Installation Features*** section at the end of this chapter for command line options.

NOTICE!

Installing QL boards requires that the SNMP.NLM (file date 4/6/93 or later) be installed and loaded on the NetWare device which will contain QL boards. This file is contained in the Novell SNMP Agent Update,

which may be downloaded from the Cubix BBS.

Installation Instructions

Requirements

- . Answers to the questions in the preceding *Preparation* section.
- . The *QL Series Installation Diskette*.
- . One formatted diskette for a backup of the *QL Series Installation Diskette*.
- . A workstation on the LAN equipped with a floppy drive (A or B).
- . The password to the NetWare SUPERVISOR account on the designated server.
- . Novell's SNMP.NLM (dated 4/6/93 or later).

Installation Steps

* Throughout the installation instructions, "QLx" refers to QL 3 or QL 4, depending upon the type of QL product being installed.

If a driver update is being performed, and no QL boards are being installed, proceed to step 4.

1. Refer to the answers to questions 4 and 6 in the *Preparation* section to set the Mode Switch (DIP Switch Block SW2) on each QL board being installed. [Figure 2-2](#) and [Table 2-1](#) illustrate the switch location and settings on QL 3222 boards. [Figure 2-3](#) and [Table 2-2](#) illustrate the switch location and settings on QL 4222 boards.

2. Configure the node number of each QL workstation. This is accomplished using DIP Switch Block SW1 (refer to [Figure 2-2](#) for QL 3222 switch locations, and [Figure 2-3](#) for QL 4222 switch locations). **The address for each workstation installed must be unique** on the network segment. Therefore, if more than one board of the same type (i.e. QL 3222 or QL 4222) is being installed into one file server or router, SW1 **must** be configured to set the unique address for each QL.

* For an explanation of net and node addressing on a NetWare network, refer to the *QL Net Address* description in the *Preparation* section of this chapter.

Since each QL board contains two workstations, or nodes, the seven switches on SW1 determine the seven high order bits of the address for each node. The low order bit for the Processor A node is assumed to be 0, while it is assumed to be 1 for the Processor B node. The default node addresses are 2 (Processor A) and 3 (Processor B). Number the nodes on one network segment consecutively, starting with node number 2.

3. Install the QL workstations in one of the following:

- NetWare file server, version 3.11, 3.12, 4.0, or higher
- NetWare MultiProtocol router (MPR), version 3.11, 3.12, 4.0, or higher

To install the boards:

- . Perform an orderly shutdown of the server or router.
- . Gain access to the backplane. Typically, this requires removing the cover from the enclosure.
- . Power down the server or router (if the QL is being installed in a Cubix Fault Tolerant subsystem, only the group that will contain the QL needs to be powered down).

. Seat the QL board into a 16-bit slot in the server or router and secure it with a screw. Repeat for each QL board to be installed.

. Reassemble the system as necessary.

* Depending upon the enclosure in which the QL board is installed, additional hardware installation may be required for disk drives, the line busy feature, etc. Instructions to perform these installation procedures are included in *Chapter 9 - Hardware Reference*. Instructions for connecting I/O to the QL workstations are also included in the *Hardware Reference*.

. Apply power to the server or router.

. Boot the file server or router.

4. Load the SNMP.NLM (dated 4/6/93 or later).

5. Make a working copy of the *QL Series Installation Diskette* using the DOS DISKCOPY command and place the original diskette in a safe place. Do not use the original diskette for the rest of the installation process.

6. If this is a driver update, and new drivers are being installed on the same designated server as existing QL drivers, rename the SYS:cubix\QL 3000 or SYS:cubix\QL 4000 directory. Be aware that a new image file will be installed so any custom changes that have been made to the old image file will need to be applied to the new image file after the update is complete.

7. From a workstation equipped with a floppy drive (A or B), log onto the network and login to the designated server as SUPERVISOR.

8. Execute the Cubix installation utility to copy and configure the necessary QL files onto the designated server.

At the DOS prompt, insert the *QL Series Installation Diskette* into the floppy drive. Change to that floppy drive, and type:

```
INSTALL <ENTER>
```

* For initial installations it is important that INSTALL be run from the A: or B: floppy drive. INSTALL should only be run from a file server or hard drive to change configuration parameters. A full installation is not performed unless INSTALL is run from the A: or B: drive.

Upon executing INSTALL, a screen similar to [Figure 2-4](#) will be displayed.

9. Specify the Designated Server (refer to question 1 of the preceding *Preparation* section). Press <ENTER> and a list of currently connected file servers is displayed on a screen similar to [Figure 2-5](#).

Use the arrow keys to highlight the designated server and press <ENTER>. To login to a server not listed, or to establish supervisory privileges on a server, press <INSERT> and select the desired server from the list displayed. If there are too many existing connections for this workstation to login to another server, an existing connection may be removed by highlighting the server no longer required and pressing the <DELETE> key.

* The connection to the default server may not be deleted, nor may a connection established by the Novell Directory Services.

10. Specify the QL Network Address. Enter in hexadecimal the unique network address selected in response to question 2 in the preceding *Preparation* section and press <ENTER>.

11. Complete the installation utility. INSTALL performs the following functions:

\$ INSTALL copies the QL files to the designated server and configures them with the parameters specified in steps 8 and 9. **Note that *INSTALL must be run again if either the designated server or QL net address is changed.*** These parameters are written into the QL driver files. The files are placed in a SYS:cubix\QL 3000 or SYS:cubix\QL 4000 directory on the designated server. A directory tree of the files installed is included in the *QL Files* chapter.

* INSTALL places a default image file on the designated server. This image file may be used to boot diskless QL workstations. The location of the image file is listed below:

* SYS:cubix\QL 3000\LOGIN\QL 32_DOS.LOD (for QL 3222 installations)

* SYS:cubix\QL 4000\LOGIN\QL 4_DOS.LOD (for QL 4222 installations)

This image file is configured to use the NetWare DOS Requester (VLM) rather than the NetWare Workstation Shell (NETX) environment. An explanation of the default image file is included in the *Boot Process* chapter, and the files included in the image file are listed in the *QL Files* chapter. This image file may be modified for specific application requirements as described in the *Custom Image Files* chapter.

NOTICE!

The INSTALL utility will install an image file on the designated server. It is the installer's responsibility to ensure that a DOS license is acquired for each QL processor that will boot from this image file.

* INSTALL creates an object in the bindery of the designated server. This bindery object is required by the QLVision management utility.

As INSTALL progresses through the installation, it builds a log file documenting its activities and functions. This log file, INSTALL.LOG, is written to the cubix\QL 3000 or cubix\QL 4000 directory of the designated server. This file is useful for troubleshooting purposes if problems occur during installation.

When INSTALL completes copying and configuring the QL files, it will optionally display or print a README file explaining the remaining steps which must be performed to complete the installation process. The instructions below are the same as the instructions in the file. The file is only provided as an added convenience.

12. If drivers are being updated in an existing QL installation, follow the steps below; otherwise, proceed to step 13.

* Verify that the QL workstations that are to be updated are not in use.

* If the QL workstations that are to be updated are equipped with hard disk drives, follow the instructions below.

Disk Drive Updates for DOS

To update disk drives formatted for DOS:

* Verify that the Novell utility WSUPDATE.EXE resides in the SYS:/PUBLIC or SYS:/SYSTEM directory of the designated server.

* On each QL workstation to be updated, change to the SYS:/cubix\QLx000\HDDRV directory on the designated server. If there is not a monitor and keyboard attached to the QL workstation, QLVision or a remote communications application may be used to establish a remote control link with the workstation.

* Invoke the update application by typing QL 3_UPDT or QL 4_UPDT and answer the prompts as they are displayed.

Disk Drive Updates for OS/2

To update disk drives formatted for OS/2:

* On each QL workstation to be updated, change to the SYS:/cubix\QLx000/OS2 directory on the designated server. If there is not a monitor and keyboard attached to the QL workstation, QLVision or a remote communications application may be used to establish a remote control link with the workstation.

* Copy the QL OS/2 workstation driver file (QLx_OS2.SYS) from the designated server to the QL local drive in the C:\NETWARE directory.

* Copy the OS/2 mouse driver, CBXMOUSE.SYS, from the designated server to the QL local drive in the C:\OS2 directory.

* Modify the CONFIG.SYS file to include:

device=c:\os2\cbxmouse.sys

* Modify the NET.CFG file to include:

Link Support Buffers 14 4210

where 14 is the number of communication buffers the OS/2 Requester can use, and 4210 provides support for a maximum packet size of 4 Kbytes.

* Unload QLx_SRVR on the file server or router containing the QL workstations. If the version of software already installed and being updated with the new software is v5.0 or higher, the file to unload is QLx_SUPR rather than QLx_SRVR.

* Unload the QLx000 driver on the file server or router containing the QL workstations.

13. On the designated server, copy all files from the SYS:/cubix\QLx000/LOGIN directory to SYS:/LOGIN on the same server.

14. Install the drivers and supporting software on the device containing the QL boards. The appropriate files to install depend upon the version of NetWare running on the device as follows:

* If the boards are installed in a NetWare 4.x file server or MPR, copy all of the files in the SYS:/cubix\QLx000/DEVICE/NW4XX directory to the SYSTEM directory on the 4.x device.

* If the boards are installed in a NetWare 3.12 file server or MPR, copy all of the files in the SYS:/cubix\QLx000/DEVICE/NW312 directory to the SYSTEM directory on the 3.12 device.

* If the boards are installed in a NetWare 3.11 file server or MPR, copy all of the files in the SYS:/cubix\QLx000/DEVICE/NW311 directory to the SYSTEM directory on the 3.11 device.

* If the boards are installed in a MPR with no volume mounted, copy the files to the MPR boot diskette (wherever SERVER.EXE is located).

15. Modify the AUTOEXEC.NCF file on the server or MPR containing the QL boards. Invoke the QLx_EXEC.NCF file by adding one of the following commands to the AUTOEXEC.NCF file:

QL 3_EXEC (if QL 3000 Series processors are installed in the device)

or

QL 4_EXEC (if QL 4000 Series processors are installed in the device)

16. Modify STARTUP.NCF on the device containing the QL boards. Invoke the QLxSTART.NCF file by adding one of the following commands to the STARTUP.NCF file:

QL 3START (if QL 3000 Series processors are installed in the device)

or

QL 4START (if QL 4000 Series processors are installed in the device)

17. **Reboot the server or MPR containing the QL boards.** This allows the changes made to the AUTOEXEC.NCF and STARTUP.NCF files to take effect.

18. **Create a user group named QLVISION on the designated server.** Using the Novell utility SYSCON, add the names of all users who should be allowed to run the QLVision management utility to this group. Refer to *Chapter 4 - QL Management* for more information on QLVision security.

19. **If the QL workstations are not equipped with disk drives, edit the QLUSER.BAT file in the /LOGIN directory of the designated server.** Add the commands necessary to invoke the appropriate application software. For more information on the QLUSER.BAT file, refer to the *QL Files* chapter.

20. **If diskless QL workstations will run Windows in enhanced mode, modify the [386enh] section of the SYSTEM.INI file used by this workstation to exclude the memory used by the dual port RAM.**

`emmexclude=ee00-ffff` (for QL 3222 workstations), or

`emmexclude=cc00-cfff` (for QL 4222 workstations)

21. **Run the QLVision utility to ensure that all of the QL Series workstations are functioning properly.** QLVision resides on the designated server as SYS:/cubix\QLx000/UTILITY/QLVISION.EXE. If problems arise, refer to *Chapter 3 - Troubleshooting*.

22. **Use QLVision to configure the Cubix Processor Recover (CPR) function as desired.** CPR monitors QL workstations and automatically resets a non-responsive QL processor. Instructions for using QLVision may be found in *Chapter 4 - QL Management*.

23. **If the Cubix Management System (CMS) is installed, follow the instructions in the subsequent CMS Support section.**

At this point, the installation is complete.

It may be necessary to make changes to the configuration files (such as CONFIG.SYS, AUTOEXEC.BAT, NET.CFG, etc.) on the QL workstations. If the QL workstations are equipped with disk drives, attach a monitor and keyboard to the workstation (as described in the *Hardware Reference* chapter) or use a remote communication application to connect to the workstation via the LAN. Then make the changes to the configuration files as required.

If the QL workstations are diskless, changing the configuration files requires changing the image file. Refer to *Chapter 6 - Custom Image Files* for instructions to create a custom image file. Before creating a custom image file, verify that the QL workstations function using the default image file shipped with the QL software (SYS:cubix\QL 3000/LOGIN/QL 32_DOS.LOD or SYS:cubix\QL 4000/LOGIN/QL 4_DOS.LOD). **Do not change the default image file.**

CMS Support

Follow the instructions below to configure the QL workstations for Cubix Management System (CMS) support.

Instructions

1. The installation utility places the following file on the designated server:

SYS:cubix\QLx000/LOGIN/CMSNET.CFG

For CMS to manage the QL workstation, the CMSNET.CFG file must be modified to include the IPX address of the CMS console as the *trap target*. The CMS console refers to the workstation running the Windows-base

CMS application. Note that the semicolon (";") preceding this statement must be deleted. To determine the address of the CMS console, log into the network from the CMS console and enter the command:

userlist /a

The current users and the network address of the workstation from which each user is logged in will be displayed. An asterisk will indicate the line describing the CMS console.

* The network address must be specified in the format

xx:yyyyyyyyyyyyyy, where

xx is an eight digit hexadecimal net number and yyyyyyyyyyyy is a twelve digit hexadecimal node number.

2. If the QL boards are installed in the backplane of the designated server, no changes to the NET.CFG file used by the QL workstations are required (the installation utility will have made the change below automatically). Otherwise, the NET.CFG file must be modified as described below. If the QL is diskless, this requires creating a custom image file as described in *Chapter 6 - Custom Image Files*. Before changing the NET.CFG file, determine the network address of the QL Supervisor (QLx_SUPR.NLM) loaded on the device containing the QL boards. On the NetWare console of this device, enter the following command:

config

The value displayed as the "IPX Internal Network Number" represents the net address of the QL Supervisor. The node address is one. Construct the complete address in the format

xx:000000000001, where

xx is the eight digit hexadecimal net number displayed on the console and 000000000001 is twelve digit representation of the node number. Insert this complete address into the *Cubix Node Agent* section of the NET.CFG file as the **SupervisorAddress**:

Cubix Node Agent

TrapInterval = 30

SupervisorAddress =*put address here*

DeviceType = QL

3. On the file server or router containing the QL boards, edit the following file (if the file does not exist, create it):

SYS:ETC/TRAPTARG.CFG

In the ProtocolIPX section of this file, add the same trap target address determined in step 1 and placed in the CMSNET.CFG file.

Complete CMS configuration instructions may be found in the *Cubix Management System Installation Guide*.

Advanced Installation Features

The user may specify the installation parameters on the INSTALL command line. Invoking this feature allows experienced users to bypass the user interface while performing an installation. INSTALL will not request or display any information if command line parameters are specified unless an error is encountered, in which case an error message is displayed and the installation is aborted.

Command Line Parameters

Option Description

-h, -help, and -? Displays command line parameter help

-s=*server* where *server* specifies the designated server name

-n=*net address* where *net address* specifies the hexadecimal QL network address

@*options file* where *options file* specifies the name of a file containing the installation parameters

* Refer to the **Installation** chapter for a description of these parameters.

Usage

INSTALL [-s=*server*] [-n=*net address*] [@*options file*]

Options File Format

The installation parameters may be read from an options file by specifying the name of the file preceded by "@" on the INSTALL command line. The options file must be an ASCII file beginning with an "[Installation]" identifier. One or more installation parameters may follow this identifier.

Format:

[Installation]

DesignatedServer=*server*

QLNetAddress=*net address*

where *server* specifies the name of the designated server and *net address* is the hexadecimal QL network address.

Rules

! The Help command line parameter overrides all others.

! The *net address* must be specified in hexadecimal.

! No command line parameters are case sensitive.

! If any command line parameters are specified, all installation parameters must be specified via the command line.

! Command line parameters are read from left to right, with the right-most parameters overriding options to the left.

Examples

1. INSTALL -s=SERVER_ONE -n=26

This will install the QL software on network address 26 hexadecimal using SERVER_ONE as the designated server.

2. INSTALL @INSTALL.TXT

where INSTALL.TXT contains the following text:

[Installation]

DesignatedServer=SERVER_TWO

QLNetworkAddress=2C

This will install the QL software on network address 2C hexadecimal using SERVER_TWO as the designated server.

3. INSTALL -s=SERVER_ONE -n=2C @INSTALL.TXT

where INSTALL.TXT contains the following text:

[Installation]

DesignatedServer=SERVER_TWO

This will install the QL software on network address 2C hexadecimal using SERVER_TWO as the designated server.

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Customer Service Support System

QL 3222/QL 4222 Chapter 4 - QL Management

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Management Architecture

Cubix provides a multi-tiered approach to QL management:

. Standard QL Utilities

QLVision is a DOS based application providing monitoring and supervisory control of QL processors as described in the *QLVision* section of this chapter. QLVision is included as part of the standard QL software. Also included in the standard utilities is QLVer, described in the *QLVer* section of this chapter.

. Cubix Management System (CMS)

For installations with more stringent management requirements, Cubix offers CMS, the Windows based Cubix Management System. CMS provides alarming, monitoring, control, and reporting for all Cubix devices on the network. More information on this management option is included in the *CMS* section of this chapter.

. SNMP

The QL products are instrumented for SNMP, allowing management of these products to be performed via any SNMP-compliant management package. More information on SNMP integration may be found in the *SNMP* section of this chapter.

QLVision

QLVision makes monitoring and control of the QL Series processors available to the system administrator or authorized user. The functions provided by QLVision include:

- . Configuring Cubix Processor Recovery (CPR)
- . Configuring Pending Offline (POL)
- . Monitoring QL Status
- . Resetting QL nodes
- . Placing QL nodes online/offline
- . Remotely Controlling a QL Node
- . Monitoring Diagnostics
- . Historical Log Reporting

To manage QL processors, QLVision requires that a QLVision Supervisor software application be loaded with the QL server driver on the device containing the QL processors. The QLVision Supervisor resides in the QL 3_SUPR.NLM (for QL 3000 Series products) or QL 4_SUPR.NLM (for QL 4000 Series products). This NLM should be loaded after the QL 3000.LAN or QL 4000.LAN server driver as part of the installation process.

The QLVision Supervisor provides QLVision with management information about the QL nodes installed on a single QL network. Refer to the ***QL Network Address*** section in ***Chapter 2 - Installation*** for an explanation of QL networks. One QLVision Supervisor is associated with each QL network.

Security

To restrict unauthorized users from accessing the QLVision functions, the system administrator is required to create a bindery object on each designated server to be managed by QLVision (for an explanation of the designated server, refer to ***Chapter 2 - Installation***). This bindery object must be created using the Novell SYSCON utility. The directory services NETADMIN utility should not be used.

The bindery object must be created with the name QLVISION. It must be a group, and should contain the name(s) of all users authorized to manage the QL processors associated with this designated server. Only single users should be specified as members of the QLVISION group; the inclusion of other groups is not supported.

SNMP security is based on standard SNMP Communities. Refer to the ***SNMP*** section later in this chapter.

Requirements

- . QLVision must be run on a NetWare workstation with a minimum of 640K RAM. QLVision should not be run on a non-dedicated server or router.
- . The NetWare version must be 3.11 or higher.
- . The QLRCV.COM TSR version 3.1 or higher must be installed on each QL node monitored by QLVision. QLRCV is placed in the SYS:cubix\QLx000/UTILITY directory of the designated server during installation (a copy is also placed in SYS:cubix\QLx000/LOGIN)..
- . The QL nodes must be installed with QL drivers version 5.0 or higher.
- . If the QL node is running OS/2, the NetWare Workstation for OS/2 v2.01 or higher must be installed on each QL node monitored by QLVision.
- . The QLVision Supervisor NLM (QL 3_SUPR.NLM or QL 4_SUPR.NLM) must be loaded on the device containing the QL boards. Note that this requires Novell's SNMP.NLM (dated 4/6/93 or later) be installed on this device also.

. A QLVISION bindery object must exist on the designated server and must contain the name of the user running QLVision.

. Bindery emulation must be enabled on any designated server installed with NetWare 4.x.

Operation

QLVision consists of the following three files placed in the SYS:cubix\QLx000/UTILITY directory of the designated server during installation:

QLVISION.EXE

QLVISION.HLP

QLVISION.CWA

To invoke QLVision, log onto the designated server(s) associated with the QL processors to be managed, and type:

```
QLVISION <ENTER>
```

The Main Menu will display the following options:

. **QLVision Supervisor Functions** - This option must be selected before the Node, Diagnostics, or Scan functions can be performed. It determines which QL network is to be managed.

. **Node Functions** - Monitors the status of the nodes and allows the user to perform supervisory control functions on the nodes. Also provides configuration of CPR and POL functions.

. **Diagnostics** - Provides diagnostics of the QL server driver.

. **Historical Log Functions** - Provides historical reporting of user login/logout information.

. **Scan QL Nodes** - Scans a QL network for added, removed, and/or replaced nodes.

. **Help** - Provides online help.

. **Exit to DOS** - Terminates the QLVision application.

Each option is described below. Note that it is also possible to perform some of the QLVision functions directly from the DOS command line. This feature is described under *Advanced QLVision Features* later in this section.

QLVision Supervisor Functions

One QLVision Supervisor is associated with each QL network. The Main Menu options **Node Functions**, **Diagnostics**, and **Scan QL Nodes** operate on the QL nodes on a single QL network. Therefore, the network must be selected before these functions may be performed. This is accomplished by choosing the QLVision Supervisor associated with the QL network.

Upon selecting **QLVision Supervisor Functions** from the Main Menu, a list of available QLVision Supervisors will be displayed. For a QLVision Supervisor to be included on the list of available supervisors, the user must be logged into the designated server associated with the QLVision Supervisor, and the user must be a member of the QLVISION group on this designated server.

Use the arrow keys to traverse the list, and press <ENTER> to select the currently highlighted QLVision Supervisor.

There are two reasons why a QLVision Supervisor may not be included on the list:

. The QLVision user is not logged into the designated server associated with the QLVision Supervisor. To correct this problem, press <INSERT>. A list of all QLVision Supervisors installed on the network will be displayed. Select the desired QLVision Supervisor from this list. QLVision will prompt the user for a login name and password, and will log the user into the designated server. QLVision will also verify that the user is a member of the QLVISION group on this designated server.

. The QLVision user is not a member of the QLVISION group on the designated server. To correct this problem, the system administrator must create a QLVISION group object with the name of the QLVision user specified as a member of the QLVISION group. Refer to the discussion on Security earlier in this section. Once the group membership is established, return to the QLVision Main Menu and select the **QLVision Supervisor Functions** option again.

Once a QLVision Supervisor is selected, the following functions are available:

. **Specify Description** - Enter a description for the QLVision Supervisor.

. **Configure Communication Parameters** - Specify the timeout values used by QLVision in network communications.

Node Functions

This selection provides monitoring and control of each of the QL nodes installed with the selected QLVision Supervisor.

Monitoring

The **status** and **reset counters** are monitored for each node as described below.

Status:

. TxHold - the processor has been reset, but the network shell has not been loaded.

. Present - the processor is physically present, but the QL drivers are not loaded.

. Download - the processor is downloading its image file.

. Active - the processor has booted and passed its memory test.

. Reset - the processor has been marked for reset.

. Timeout - a transmission timeout error has occurred.

. CPR - the processor activity is being verified.

. Not Present - the processor is no longer physically present.

* The "Not Present" status is only displayed for nodes that become absent after the **Node Functions** option is selected from the main menu.

Reset Counters:

. CPR Reset Counter - the number of times that the node has been reset by the CPR function.

. Manual Reset Counter - the number of times that the node has been reset by QLVision, CMS, or a SNMP management application.

. Normal Reset Counter - the number of times that the node has been reset by the user (<CTRL><ALT>) or by the reset on loss of DSR/DCD option (refer to the *Hardware Reference* chapter for more information on this option).

Control

The control functions available for each node are explained below.

Reset Performs a hard reset of the specified QL node. Note that this is not a soft reset as occurs when <CTRL><ALT> is pressed, but is a hard reset as occurs when power to the processor is cycled.

Online Places a QL node online on demand..

Offline Places a QL node offline on demand. Note that placing a node offline will immediately terminate any active session on the node. To wait for the current session to end before placing the node offline, use the POL function.

Connect This function allows the monitor and keyboard on the workstation running QLVision to function as if they were attached to the specified QL node. While the connection is active, the message "Session is being Monitored" will blink at the top of the screen. To terminate the connection, simultaneously press the left SHIFT and left CTRL keys.

The remote connect feature only supports DOS text-based applications. An error will be displayed if an attempt is made to connect to a QL workstation running graphics.

In an OS/2 environment, the remote connect feature only supports connection to DOS sessions on the QL workstation running OS/2. An attempt to connect to an OS/2 workstation that does not have a DOS session running will result in an error. Note that the QLRCV.TSR must be loaded in the DOS session.

Configuration

POL (Pending Offline) - If POL is enabled on a node, that node will be placed offline the next time that it goes into reset. When used in conjunction with the reset on loss of DCD/DSR, the POL function provides a mechanism for an orderly maintenance shutdown of QL processors used for remote communications. For example, if both the reset on loss of DCD/DSR and the POL functions are enabled for all of the QL processors installed in a system hosting dial in users, as each session terminates the QL hosting that session will be placed offline. When all of the QL processors are offline, the system may be shutdown without interrupting any active sessions.

CPR (Cubix Processor Recovery) - Enabling CPR instructs the QL Supervisor to automatically reset any QL node that goes inactive.

Diagnostics

This selection displays the QLVision Supervisor communication information.

Historical Log Functions

This selection describes QL node activity over time. A log may be run on any NetWare file server that has NetWare's accounting services enabled. Supervisor rights to the file server are required.

Scan QL Nodes

This option is intended for use with the Cubix Expansion Subsystem. Some revisions of the Expansion Subsystem may be powered on and off without affecting the file server or router to which they are attached. If QL boards are installed in an Expansion Subsystem, it is possible for the QL boards go online and offline dynamically. The **Scan QL Nodes** feature causes the selected QLVision Supervisor to scan for QL processors that have been inserted, replaced, or removed.

* Not all revisions of the Cubix Expansion Subsystem support this "hot swap" feature. Do **not** attempt to power an Expansion Subsystem on or off while it is attached to an active file server/ router until verifying that the subsystem supports this feature. If the Expansion interface card installed in the server/router has switches on the top edge of the board, it supports the "hot swap" feature; otherwise, it does not.

The **Scan QL Nodes** function should be invoked under the following circumstances:

- . An Expansion Subsystem is offline and contains QL processors.
- . A file server or router is running with the QL server driver loaded.
- . The Expansion Subsystem is placed online on the file server or router.

Under any of the conditions listed above, the QL processors in the Expansion Subsystem are present but not initialized. The **Scan QL Nodes** must be invoked to initialize the QL processors and put them into an active state.

* While the QLVision supervisor is performing the scan function, SNMP support is suspended. This support is resumed upon completion of the scan.

Help

This selection provides detailed information on all QLVision functions.

Exit to DOS

This function terminates the QLVision session.

Helpful Hints

- . At any time during the QLVision session, press <F1> for help with the current function. All QLVision help screens are context-sensitive.
- . Remember to select a QLVision Supervisor before trying to perform any node, diagnostic, or scan functions.
- . If the QLVision Supervisor installed on file server or router does not appear on the **QLVision Supervisor** screen, verify that it has software version 5.0 or higher Cubix drivers installed. Verify that the Cubix QLVision Supervisor (QL 3_SUPR.NLM or QL 4_SUPR.NLM) is loaded.
- . To remote connect to a QL workstation running DOS, the QLRCV TSR must be loaded. To remote connect to a QL workstation running OS/2, a DOS session must be running and QLRCV must be loaded.

Advanced QLVision Features

Some QLVision functions may be invoked directly from the DOS prompt by specifying certain parameters on the QLVision command line. This feature allows experienced users to bypass the user interface while performing management functions. QLVision will not request or display any information if command line parameters are specified unless an error is encountered, in which case an error message is displayed and the function is aborted.

* QLVision security requirements are enforced whether or not command line parameters are specified. Therefore, to invoke any QLVision function, the user must be logged into the designated server associated with the QL processors to be managed and must be a member of the QLVISION group on that server.

Command Line Parameters

Option Description

- ? Displays command line parameter help
- r *server net node* Resets a QL processor
- on *server net node* Places a QL processor online
- off *server net node* Places a QL processor offline

- cpr+ *server net node* Enables CPR on a QL processor
 - cpr- *server net node* Disables CPR on a QL processor
 - pol+ *server net node* Enables pending offline on a QL processor
 - pol- *server net node* Disables pending offline on a QL processor
 - c *server net node* Remote Connects to a QL processor, redirecting screen and keyboard I/O over the LAN
 - s *server net* Scans the QL network for QL processors that have been inserted, removed, and/or replaced
- where: *server* specifies the designated server name,
net represents the hexadecimal QL net address, and
node represents the hexadecimal QL node address

Usage

QLVISION [-r *server net node*]

QLVISION [-on *server net node*]

QLVISION [-off *server net node*]

QLVISION [-cpr+ *server net node*]

QLVISION [-cpr- *server net node*]

QLVISION [-pol+ *server net node*]

QLVISION [-pol- *server net node*]

QLVISION [-c *server net node*]

QLVISION [-s *server net*]

Examples

1. QLVISION -r SERVER_ONE 26 3

Successful execution of this command requires that a QL installation was performed with SERVER_ONE specified as the designated server and 26 (hexadecimal) specified as the QL network address. There must also be a QL processor installed on this QL net with a node number of 3. If these conditions are true, this command will perform a hardware reset of this QL processor.

2. QLVISION -c SERVER_ONE 2C F

Successful execution of this command requires that a QL installation was performed with SERVER_ONE specified as the designated server and 2C (hexadecimal) specified as the QL network address. There must also be a QL processor installed on this QL net with a node number of F (hexadecimal). If these conditions are true, this command will establish a remote connection with this QL processor.

3. QLVISION -s SERVER_TWO 2C

Successful execution of this command requires that a QL installation was performed with SERVER_TWO specified as the designated server and 2C (hexadecimal) specified as the QL network address. If these conditions are true, this command will scan the QL network to determine which QL processors are present.

QLVer

The Cubix Version Utility (QLVer) is useful in determining and displaying information about a file, including the specific version of a file. For any given file, the Cubix Version Utility will display:

! the file name

! the file size

! the date and time

! the file checksum

! the file version and copyright information for files which contain such information

! internal information stored in NLMs and NetWare driver files.

For example, the Cubix Version Utility can display the following information about itself:

Filename QLVER.EXE

Date/Time 10/08/92 01:07 pm

File Size 33250 (32.47K)

Version Cubix Version Utility v2.00.05 (930623)

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Command Line Parameters

The **QLVER** command can include one or more of the following options (the order of these options is irrelevant):

Option Description

-c or **-checksum** Calculates and displays a checksum value for each file found. This value is displayed as a hexadecimal digit.

-h or **-help** or **-?** Displays the command format and list of available options with a brief description of each, then exits. This parameter overrides any other parameter, regardless of order.

-n or **-nonversion** Disables searching for version and copyright strings within files. Searching through large files for these strings may be time-consuming. Specifying **-N** instructs the Cubix Version Utility to display only file information for each file: name, date/time, size, and (optionally) checksum information.

-s or **-subdirectories** Instructs the Cubix Version Utility to search also through any subdirectories found in the same directory as a file specification.

file specification Specifies the file or file pattern for which information is to be listed.

Usage

QLVER [*options*] *file specification* [*file specification...*]

Output from the **QLVER** command may be redirected to a device or file using standard DOS redirection techniques. Refer to the DOS documentation for more information on output redirection.

File Specification Parameter(s)

The **QLVER** command's *file specification* parameter determines which file(s) QLVer will examine for version information. The parameter may be a specific filename (e.g. MYFILE.TXT), or may be a file pattern using DOS wildcard characters (e.g. MYFILE.*). Wildcard characters are used as part of a name to represent any single character (?) or any combination of characters (*). Refer to the DOS documentation for more information on wildcard characters.

Additionally, Novell NetWare server and volume name combinations may be used in any combination (e.g. SERVER_1/SYS:SYSTEM/*.*).

At least one file specification must be included with the **QLVER** command. Multiple specifications may be used. In that case, the specifications are processed in the order entered.

Examples

! The following example presents information for all files located in SYS:CUBIX and its subdirectories on the default server:

```
QLVER SYS:cubix\*.* -S
```

! The following example presents information for all batch files located in the root directory of C:.

```
QLVER C:\*.*.BAT
```

! The following example presents information for all files on the SYS volume of the ADMIN server including all subdirectories, calculating a checksum value for each file and ignoring version and copyright information, redirecting pertinent file information to the file C:\FILEINFO.TXT.

```
QLVER ADMIN/SYS:*.* -S -C -N>C:\FILEINFO.TXT
```

Error Message

The QLVER utility may generate the following error message.

Warning V1001: ignoring unrecognized command line option: 'option'

The Cubix Version Utility encountered a command line option which is not defined. The option will be ignored.

Use **QLVER -H** to show the available command line options.

CMS

The Cubix Management System (CMS) is a complete system for Cubix device management. CMS provides monitoring, alarming, supervisory control, and usage reporting of all Cubix devices on a NetWare network from a central management console. CMS performs all network communications using SNMP encapsulated in IPX packets.

CMS supports all of the functions previously described for QLVision. In addition to the QLVision functions, CMS provides the functions listed below in a graphical, Windows based environment:

- . Alarming - CMS reports alarms as they occur and also stores the alarms in an alarm database for historical reporting purposes.
- . Usage Reporting - CMS generates reports describing how the QL nodes are used over time.

. Component Information - information describing the hardware and software components installed on each QL node are displayed (e.g. amount of memory installed, memory management configuration, etc.).

In addition, if Cubix devices other than QL products are installed on the network, CMS manages them as well. This allows all Cubix devices to be managed from a single management console.

Installation

Installing CMS support requires changing files on the QL processor and on the server or router in which the QL boards are installed. Specific instructions for installing CMS support may be found in the *Cubix Management System Installation Guide*. **NOTICE!**

CMS will not recognize the QL Supervisor or the QL processors unless the installation instructions in the *Cubix Management System Installation Guide* are followed.

SNMP

The QL Series processors have been instrumented for SNMP via the QLVision Supervisor (QL 3_SUPR.NLM or QL 4_SUPR.NLM). The information available is defined in a Management Information Base (MIB) text file (CBXQL 3S.MIB or CBXQL 4S.MIB).

In addition, a standard SNMP trap is generated whenever a QL processor is reset by the CPR function.

If the QL processors are to be monitored by a SNMP management application other than CMS, it will be necessary to configure the management application to ignore certain SNMP traps. This is because some of the traps contain status information intended only for CMS and do not indicate an alarm condition.

The traps to be ignored are identified as follows:

QL 3 Supervisor Status

QL 4 Supervisor Status

Cubix Trap

Security

Security is based on SNMP Community strings which are optional command line parameters entered when SNMP.NLM is loaded on the device containing the QL processors. The command and its parameters may be placed in the AUTOEXEC.NCF file. The QL Supervisor does not impose any additional security. There are three community strings:

Monitor Community - (read) allows GET and GET NEXT operations, the default is "public"

Control Community - (read/write) allows SET operations, the default is disabled

Trap Community - default is "public"

To configure the community access privileges, specify the appropriate community names when loading SNMP.NLM:

load snmp [options] <enter>

where **options** are specified as:

MonitorCommunity = {community name}

ControlCommunity = {community name}

TrapCommunity = {community name}

The option name followed by = only (no community name specified) allows access by any community. The option name alone (followed by nothing) disables access by all communities.

Requirements

Novell's SNMP.NLM (file dated 4/6/93 or later) must be installed and loaded on the file server in which the QLVision Supervisor NLM is installed. SNMP.NLM is contained on the Novell SNMP Agent Update diskette v2.1. Installation instructions are contained on the diskette. The contents of this diskette may be downloaded from the Cubix BBS.

Novell NMS

The QL product provides support for the NMS browser. *No other NMS support is currently included.* To use the NMS browser, perform the following steps:

. Compile the following QL MIB with the NMS MIB compiler:

```
SYS:cubix\QLx000/SNMP/CBXQLxS.MIB
```

. Use the NMS browser to monitor and control the QL processors.

. For the NMS management console to receive QL traps via SNMP, the address of the NMS management console must be placed in the SYS:ETC/TRAPTARG.CFG file on the server or MPR containing the QL boards.

HP OpenView

To manage the QL Series products via HP's OpenView management system, follow the steps below:

. Compile the MIB using the Manage Database option on the OpenView Control menu. The MIB (CBXQLxS.MIB) is located in the SYS:cubix\QLx000/SNMP directory, where x represents the QL product type.

. Use the OpenView browser to monitor and control the QL processors.

. OpenView does not directly support SNMP traps. However, OpenView does include a method of reporting alarms. A third party package is available to convert SNMP traps into OpenView alarms. Contact HP for further information on this product.



Customer Service Support System

QL 3222/QL 4222 Chapter 5 - Configuration Changes

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Reasons for Change

If the configuration parameters (designated server and QL network address) change, it is necessary to reconfigure the QL drivers with the new parameter information. The installation utility provided with the QL software writes this information into the driver file. Therefore, if the configuration changes, the installation utility **must** be run again so that the QL driver is updated.

Changing the Designated Server

It is necessary to update the designated server information stored in the QL driver under any of the following reasons:

- . The QL processors need to boot from a different file server.
- . The name of the file server specified as the designated server is changed.
- . The internal IPX address of the designated server is changed.

Changing the QL Net Address

If the address specified when the QL driver is bound to the protocol on the server or router containing the QL boards, the QL Net Address **must** be reconfigured using the installation utility. For more information on QL network addressing, refer to *Chapter 2 - Installation*.

Configuration Steps

1. Login to the designated server as SUPERVISOR.

* This refers to the server designated during the initial installation. Even if the intent is to change the designated server, log into the original server (where the QL files are located).

2. Run the installation utility. Change to the SYS:cubix\QL 3000 or SYS:cubix\QL 4000 directory (depending upon the type of QL product being configured). Type:

INSTALL <ENTER>

* For configuration changes it is important that INSTALL be run from the SYS:cubix\QLx000 directory of the current designated server. If INSTALL is run from a floppy drive (A: or B:), it will attempt to perform a full installation and overwrite existing QL driver files.

A screen similar to [Figure 5-1](#) is displayed.

3. Specify the Designated Server. Press <ENTER> and a list of currently connected file servers is displayed on a screen similar to [Figure 5-2](#).

Use the arrow keys to highlight the designated server and press <ENTER>. To login to a server not listed, or to establish supervisory privileges on a server, press <INSERT> and select the desired server from the list displayed. If there are too many existing connections for this workstation to login to another server, an existing connection may be removed by highlighting the server no longer required and pressing the <DELETE> key.

F The connection to the default server may not be deleted, nor may a connection established by the Novell Directory Services.

4. Enter in hexadecimal the new unique network address and press <ENTER>.

5. Complete the installation utility. INSTALL will configure the QL files on the current file server with the parameters specified in steps 3 and 4. However, even if a new designated server was specified, INSTALL will not move these files to the new designated server. This must be done by the user as explained in step 6.

INSTALL will also create the object in the bindery of the new designated server required by the QLVision management utility.

As INSTALL progresses through the installation, it builds a log file documenting its activities and functions. This log file, INSTALL.LOG, is written to the cubix\QL 3000 or cubix\QL 4000 directory of the current file server. This file is useful for troubleshooting purposes if problems occur during the configuration.

When INSTALL completes configuring the QL files, it will optionally display or print a README file explaining the remaining steps which must be performed to complete the installation process. The instructions below are the same as the instructions in the file. The file is only provided as an added convenience.

6. On the file server originally specified as the designated server, copy all files from the SYS:/cubix\QLx000/LOGIN directory to SYS:/LOGIN on the new designated server.

F If the designated server is being changed, copy the files from the cubix\QLx000/LOGIN on the old designated server to the LOGIN directory on the new designated server. Otherwise, copy the file from the cubix\QLx000/LOGIN on the designated server to the LOGIN directory on that same server.

7. Install the drivers and supporting software on the device containing the QL boards. The appropriate files to install depend upon the version of NetWare running on the device as follows:

- If the boards are installed in a NetWare 4.x file server or MPR, copy all of the files in the SYS:/cubix\QLx000/DEVICE/NW4XX directory to the SYSTEM directory on the 4.x device.

- If the boards are installed in a NetWare 3.12 file server or MPR, copy all of the files in the SYS:/cubix\QLx000/DEVICE/NW312 directory to the SYSTEM directory on the 3.12 device.

- If the boards are installed in a NetWare 3.11 file server or MPR, copy all of the files in the SYS:/cubix\QLx000/DEVICE/NW311 directory to the SYSTEM directory on the 3.11 device.

* If the boards are installed in a MPR with no volume mounted, copy the files to the MPR boot diskette (wherever SERVER.EXE is located).

8. Verify that QLx_EXEC.NCF is invoked from the AUTOEXEC.NCF file on the device containing the QL boards.

9. Verify that QLxSTART.NCF is invoked from the STARTUP.NCF file on the device containing the QL boards.

10. Reboot the server or MPR containing the QL boards. This allows the changes made to the AUTOEXEC.NCF and STARTUP.NCF files to take effect.

11. Run the QLVision utility. Ensure that all of the QL Series workstations are functioning properly. QLVision is located on the designated server as SYS:cubix\QLx000/UTILITY/QLVISION.EXE. If problems arise, refer to *Chapter 3 - Troubleshooting*.

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Customer Service Support System

QL 3222/QL 4222 Chapter 6 - Custom Image Files

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QL Image File

The QL Series processors can be configured to boot DOS from an image file on a designated NetWare file server. This chapter explains how to make changes to this image file, and does not apply to installations in which QL processors boot from a local hard drive.

To perform a remote boot, the QL processors boot from a file on a file server. This file contains an image of a DOS bootable diskette (thus the name "image file"). The QL processors boot from the image file exactly as they would from a floppy diskette drive.

The QL installation utility places a default image file on the designated server as follows:

. SYS:cubix\QL 3000/LOGIN/QL 32_DOS.LOD (for QL 3222 workstations)

. SYS:cubix\QL 4000/LOGIN/QL 4_DOS.LOD (for QL 4001 and QL 4222 workstations)

* A default image file for the older style QL 3001 and QL 3002 processors is also placed on the designated server: SYS:cubix\QL 3000/LOGIN/QL 3_DOS.LOD.

A listing of the files included in the default image files is included in the *QL Files* chapter.

Executing an Application

When a QL processor boots from the default image file, it reads DOS, CONFIG.SYS, and AUTOEXEC.BAT from the file. The last thing that the default image file does is to execute the QLUSER.BAT file (refer to the *Boot Process* chapter for more information).

The QLUSER.BAT file is run from the file server; it is not part of the image file. Any application that should be initiated upon QL system boot should be invoked from the QLUSER.BAT file. This can easily be accomplished by modifying the QLUSER.BAT file in the SYS:LOGIN directory of the designated file server. **No changes to the image file are required.**

Configuration File Changes

There are certain functions which must be performed via CONFIG.SYS, AUTOEXEC.BAT, or NET.CFG. For example, DOS device drivers must be installed by CONFIG.SYS. Since these files are part of the image file, modifying them requires creating a custom image file.

Creating Image Files

The image file is created by building a bootable diskette that contains all of the files required to boot the QL processor. This *Workstation Boot Diskette* should be constructed just as if the QL processor were going to boot from the diskette rather than from an image file. Therefore, the *Workstation Boot Diskette* must be DOS bootable (i.e. formatted with the /s option), and must contain the appropriate CONFIG.SYS, AUTOEXEC.BAT, and NET.CFG files for the QL processor. The QL workstation driver and other QL specific files must also be included. Once the *Workstation Boot Diskette* has been created, the Novell DOSGEN utility is run to create an image of the diskette and store the image in an image file.

The default image file configures the QL processor for a NetWare DOS Requester (VLM) environment. In addition to the image file itself, the installation utility places all of the files required to build the image file on the designated server in the directories below:

- . SYS:cubix\QL 3000/IMAGE32/VLM (for QL 3222 workstations)
- . SYS:cubix\QL 4000/IMAGE/VLM (for QL 4001 and QL 4222 workstations)
- . SYS:cubix\QL 3000/IMAGE30/VLM (for QL 3001 and QL 3002 workstations)

In the discussion that follows, these directories will be referenced as the SYS:cubix\QLx000/IMAGE directory.

Instructions to Create an Image File

1. Format a DOS bootable diskette (using the /s option). This is the *Workstation Boot Diskette* (WBD). Label the diskette to indicate that it is a WBD.
2. Copy all of the files in the SYS:cubix\QLx000/IMAGE/VLM directory to the WBD.
3. If memory management is desired, copy the following DOS files onto the WBD (the DOS version of these files should match the version of DOS used to format the WBD):

- HIMEM.SYS

- EMM386.SYS

If Microsoft Windows support is required, copy this same EMM386.SYS file to the SYS:LOGIN directory of the designated server.

4. If **ansi.sys** support is desired, copy the ANSI.SYS file onto the WBD.
5. Create a new directory under the SYS:cubix\QLx000/IMAGE directory on the designated server. Name this directory CUSTOM or some other appropriate name that describes the image file being created.
6. Follow the *Guidelines* section later in this chapter to modify the files in this new directory as required on the WBD.

7. Copy all of the files on the WBD to the new directory.

8. Run the DOSGEN utility to create an image file from the WBD. DOSGEN is a Novell utility and should be in the SYS:SYSTEM directory of the file server.

DOSGEN A:<image file name>

where <image file name> is replaced with QL 32_DOS.LOD (if the image file is to boot a QL 3222 workstation), QL 4_DOS.LOD (if the image file is to boot a QL 4001 or QL 4222 workstation), or QL 3_DOS.LOD (if the image file is to boot a QL 3001 or QL 3002 workstation).

Place the new image file in the directory created in step 5. Write the name of the image file, including the path, on the label of the WBD.

* The WBD is not needed for the remainder of this process. Place the WBD in a safe location. It may be helpful if troubleshooting is required at a later time.

NOTICE!

A different image file name may be specified. However, this name must be placed in the BOOTCONF.SYS file. Refer to the section *Naming the Image File* later in this chapter for more information.

9. Copy the new image file to the SYS:LOGIN directory on the designated server.

10. If the new image file has a different name from the default image file, modify the BOOTCONF.SYS file as described later in this chapter.

11. Use QLVision to reset the QL processor.

12. Once QLVision reports the processor status as **Active**, remote connect to the processor and verify that the changes in the new image file are effective.

Guidelines

These guidelines are intended to provide details helpful in performing Step 6 of the instructions to create an image file in the preceding section.

Modifications to files on the *Workstation Boot Diskette* (WBD) may be made using any standard ASCII text editor.

Changing CONFIG.SYS

When changing CONFIG.SYS, leave the line below as the first line in the file:

device=qlsetup.sys -t

Windows Memory Management

The default image file contains the following statement:

device=emm386.exe /y=f:\login\emm386.exe . . . noems

where ". . ." defines memory inclusions and exclusions, which vary with the type of QL workstation. The "/y" is a Microsoft Windows switch. If the "/y" switch is not specified, Windows will load in standard mode. **The "/y" switch must be specified if Windows is to run in enhanced mode on the QL processor.**

If Windows will not be run on the QL workstation, the "/y" switch can be left on the emm386 command line (it will not cause any problems).

A copy of emm386.sys must exist in the path specified by the "/y" switch (f:\login in the default image file).

Adding Device Drivers

- . Modify CONFIG.SYS on the WBD to load the required device drivers.
- . Copy the device drivers to the WBD.
- . Return to Step 7 of the Instructions to Create an Image File.

Increasing DOS Environment Space

- . Add a SHELL command to the CONFIG.SYS file on the WBD as needed. For example:

shell = command.com /p /e:512

*** Do not use a drive designation in the command.**

- . Return to Step 7 of the Instructions to Create an Image File.

Defaulting to a Drive Other Than F:

These instructions apply to QL workstations functioning in a NetWare Workstation Shell (NETX) environment only. To change the default drive in a NetWare DOS Requester environment, refer to the following section *Changing NET.CFG*.

- . Modify the LASTDRIVE parameter in the CONFIG.SYS file on the WBD. LASTDRIVE should be one less than the desired drive letter of the first network drive. The QL processor defaults to the first network drive at boot time. This is accomplished in the QLxBOOT.BAT file, which will use the LASTDRIVE drive designation plus one for the network drive letter.
- . Return to Step 7 of the Instructions to Create an Image File.

* In NetWare DOS Requester environments, LASTDRIVE should be set to z.

Changing AUTOEXEC.BAT

Do not make any changes to this file except to add a program that must be executed before the NetWare environment is loaded.

- . Insert the required command to invoke the program before the QL 3BOOT.BAT or QL 4BOOT.BAT file is executed.
- . Copy the program to the WBD.
- . Return to Step 7 of the Instructions to Create an Image File.

Changing NET.CFG

To change the default drive from F: in a NetWare DOS Requester (VLM) environment, use the "Default Network Drive" parameter in the NET.CFG file. Refer to the Novell NetWare Manuals for information on NET.CFG options and parameters.

- . When changing the NET.CFG file, do not modify the instructions placed in this file by the QL installation utility, as they are imperative for proper functioning of the QL software (refer to the *QL Files* chapter for a listing of these instructions).
- . Return to Step 7 of the Instructions to Create an Image File.

Changing QL 3BOOT.BAT or QL 4BOOT.BAT

It is critical that these files match the QLxBOOT.BAT file in the /LOGIN directory of the designated server **exactly**. The **only** reason to change these files is if the NetWare Workstation Shell (NETX) environment is required rather than the NetWare DOS Requester (VLM) environment on the QL workstation. A listing of these files is in the *QL Files* chapter.

To configure the QL workstation for the NetWare Workstation Shell environment:

. Edit the QLxBOOT.BAT file in the new directory (created in Step 5 of the Instructions to Create an Image File) as required.

. Copy the modified QLxBOOT.BAT file to the /LOGIN directory of the designated server, replacing the QLxBOOT.BAT file already there.

. Return to Step 7 of the Instructions to Create an Image File.

Other Changes

No other files on the WBD should be modified. Make all other boot sequence modifications to the batch files (QLUSRxxx.BAT or QLUSER.BAT) in the /LOGIN directory of the designated server. Refer to the *QL Files* chapter for a listing of these batch files.

Naming the Image File

In installations of multiple QL nodes, it is possible to assign to each node its own image file. This allows the boot sequence for each node to be configured on an individual basis. To use a unique filename for each image file, create a BOOTCONF.SYS file in the \LOGIN subdirectory of the SYS volume on the designated server.

Using an ASCII editor, create a BOOTCONF.SYS file in the SYS: \LOGIN subdirectory. The file should be made shareable to allow simultaneous access by multiple workstations.

Each line of the BOOTCONF.SYS file must start with "0x" (or "0X") followed by a hexadecimal network address up to 8 digits long. The network address is followed by a comma. After the comma, a hexadecimal node address (up to 12 digits long) must be specified. The network and node addresses together specify a particular QL workstation. An equal sign separates the node address from the name of the image file from which the specified workstation will boot. The white space characters **Tab** (09H), **Space** (20H), **Carriage Return** (0DH), and **Line Feed** (0AH) will be ignored.

The wildcard characters "?" and "*" may be used in the network and node addresses to specify groups of QL workstations; a group of QL workstations can be made to boot from a single image file using wildcards. The "?" wildcard replaces any single digit within the address. The "*" wildcard expands to fill up the address to its maximum length (the network address is a maximum of 8 digits, the node address is a maximum of 12 digits). For example "*"1" as a network address would expand to "???????1", "1*" would expand to "1???????", and "1*1" would expand to "1?????1".

For example, consider the following BOOTCONF.SYS file:

0x100, 1=ql_dos.001

0x200 , 44=anyfile.nam

0x0003*4, ??5=image.fil

0x*, *=default.img

In line 1 of the example above, a QL workstation with network address 100 (hexadecimal) and node address 1 (hexadecimal) would boot from an image file of name QL_DOS.001.

In line 2 of the example above, a QL workstation with network address 200 (hexadecimal) and node address 44 (hexadecimal) would boot from an image file of name ANYFILE.NAM.

In line 3 of the example above, a QL workstation with network address 3xxx4 (hexadecimal) and node address xx5, where x is any hexadecimal digit, would boot from an image file of name IMAGE.FIL.

Line 4 in the example above serves as a catch-all for all QL workstations not covered in the previous lines. All workstations not matching the previous addresses would boot from DEFAULT.IMG.

If the BOOTCONF.SYS file format is invalid, the QL processor attempting to boot will display an error and will ignore the rest of the file.

Without the BOOTCONF.SYS file, all QL Series processors will load and execute the default image file. The default image file for the QL 3222 workstations is QL 32_DOS.LOD; the default image file for the QL 4001 and QL 4222 workstations is QL 4_DOS.LOD; and the default image file for the QL 3001 and QL 3002 workstations is QL 3_DOS.LOD.

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Customer Service Support System

QL 3222/QL 4222 Chapter 7 - Boot Process

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Remote DOS Boot

The following information is provided to explain the QL workstation remote boot sequence when booting DOS from a NetWare file server. Remote boot of the OS/2 operating system is not supported.

1. The file server or router boots, and NetWare loads the Cubix LAN Drivers.
2. The QL Series processors find and load their image file (QLx_DOS.LOD) from the \LOGIN subdirectory of the file server designated during QL installation or from the "nearest server" if the designated server is unavailable. The image file loads and executes the following:

COMMAND.COM

CONFIG.SYS

AUTOEXEC.BAT

QL 4BOOT.BAT (for QL 4000 Series processors) or

QL 3BOOT.BAT (for QL 3000 Series processors)

3. The QLxBOOT.BAT file executes the following:

LSL.COM

QL 4_DOS.COM (for QL 4000 Series processors) or

QL 3_DOS.COM (for QL 3000 Series processors)

IPXODI.COM

QLNODE.EXE (Sets NODE number as QLNODE environment variable)

VLM.EXE

* Several of these files will access the **NET.CFG** file for configuration information.

4. After VLM.EXE, execution of the QLxBOOT.BAT file transfers from the image file to the file server's drive and continues to execute QLxBOOT.BAT from \LOGIN. Therefore, an **exact** copy of the QLxBOOT.BAT in the image file **must** be placed in the LOGIN directory on the designated server.

5. QLxBOOT.BAT then executes:

STPIPX.COM

STPIPX.COM reads SNMP trap target information from the CMSNET.CFG file on the designated server. This file is necessary only if CMS (or another SNMP-based management application) will manage the QL processors.

6. Finally, QLxBOOT.BAT executes:

QLUSRxxx.BAT (where xxx = node number), if found, or executes **QLUSER.BAT**

7. If the QLUSER.BAT file (default QL batch file) is invoked by QLxBOOT.BAT, it will execute the following:

QLRCV.COM (QL utility support)

LOGIN (Novell's Login command)

Local DOS Boot

The following information is provided to explain the QL workstation boot sequence when booting DOS from a local hard drive.

1. File server or router boots, and NetWare loads the Cubix LAN drivers.

2. The QL processor detects the presence of the C: drive and displays the message:

Do you want to boot from the network? (Y/N)

* Note that a local monitor and keyboard are required to respond to this prompt. If no response is entered, a local boot is performed.

3. The QL processor waits up to two seconds for a response. If the user enters "Y" within this time period, the QL processor performs the remote boot procedure previously described. Otherwise, the QL processor attempts to load and execute the following files from the local drive:

COMMAND.COM

CONFIG.SYS

AUTOEXEC.BAT

QL 4000.BAT (for QL 4000 Series processors) or

QL 3000.BAT (for QL 3000 Series processors)

4. The QLx000.BAT file executes the following files from the local drive:

LSL.COM

QL 4_DOS.COM (for QL 4000 Series processors) or

QL 3_DOS.COM (for QL 3000 Series processors)

IPXODI.COM

QLNODE.EXE (Sets NODE number as QLNODE environment variable)

VLM.EXE

STPIPX.COM

QLRCV.COM (QL utility support)

* Several of these files will access the **NET.CFG** file for configuration information.

5. After loading **QLRCV.COM**, the **QLx000.BAT** file changes from the local drive to the **\LOGIN** directory of the network drive, then executes:

LOGIN (Novell's Login command)

Local OS/2 Boot

The following information is provided to explain the QL workstation boot sequence when booting OS/2 from a local hard drive.

1. File server or router boots, and NetWare loads the Cubix LAN drivers.
2. The QL processor detects the presence of the C: drive and displays the message:

Do you want to boot from the network? (Y/N)

* Note that a local monitor and keyboard are required to respond to this prompt. If no response is entered, a local boot is performed. Remote boot functionality is not supported in an OS/2 environment.

3. The QL processor waits up to two seconds for a response. If the user enters "Y" within this time period, the QL processor will attempt to remote boot DOS from a NetWare file server. Otherwise, the QL processor attempts to load and execute OS/2 from the local disk drive.
 4. OS/2 loads and executes the **CONFIG.SYS** file, which loads the drivers required by the QL system, including the NetWare environment and QL driver files.
 5. It is left to the person installing the QL processor to develop the necessary **STARTUP.CMD** file to autoloading any application software required.
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Customer Service Support System

QL 3222/QL 4222 Chapter 8 - QL Files

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Directory Tree

The QL installation utility installs many files on the designated file server. A directory tree of these files is included below (separate trees are provided for the QL 3000 Series and the QL 4000 Series products). A brief description of files requiring explanation is provided. A listing of the key configuration files is included later in this chapter.

QL 3000 Series Tree

SYS:cubix\QL 3000 QL 3000 FILES

INSTALL.LOG	Results of the installation procedure
INSTALL.EXE	QL installation utility
INSTALL.CWA	Support file
INSTALL.HLP	Support file
INSTALL.INI	Support file
README.TXT	Installation steps
+LOGIN	FILES FOR THE LOGIN DIRECTORY
QLRCV.COM	Provides QLVision support
CMSNET.CFG	Contains the CMS console address

QL 3BOOT.BAT	Loads the QL drivers and VLMS
QLUSER.BAT	Loads user applications
QLNODE.EXE	Initializes environment variables
QL 3_DOS.LOD	Default image file (QL 3001/QL 3002)
EMM386.EXE	DOS memory management driver
STPIPX.COM	Novell file
STPUDP.COM	Novell file
QL 32_DOS.LOD	Default image file (QL 3222)

+UTILITY	QL UTILITY FILES
QLVISION.EXE	QLVision application
QLVISION.HLP	Support file
QLVISION.CWA	Support file
QLVER.EXE	QLVer utility
QLRCV.COM	Provides QLVision support
QLCLIENT.EXE	Customer Service file
QLCLIENT.HLP	Support file
QLCLIENT.CWA	Support file

+OS2	OS/2 FILES
QL 3_OS2.SYS	QL driver
CBXMOUSE.SYS	Mouse driver
NET.QL 3	NET.CFG file

+WIN	WINDOWS FILES
VHOTFIX.386	Mouse support file

+IMAGE30	FILES IN QL 3000/3001 IMAGE
----------	-----------------------------

\VLM	
AUTOEXEC.BAT	
CONFIG.SYS	
NET.CFG	
QL 3BOOT.BAT	
QLSETUP.SYS	
QL 3_DOS.COM	QL driver
IPXODI.COM	
LSL.COM	
QLNODE.EXE	
CBXNODE.VLM	CMS agent
VLM.EXE	
CONN.VLM	
IPXNCP.VLM	
TRAN.VLM	
SECURITY.VLM	
NDS.VLM	
BIND.VLM	
NWP.VLM	
FIO.VLM	
PRINT.VLM	
GENERAL.VLM	
REDIR.VLM	
NETX.VLM	
RSA.VLM	
AUTO.VLM	
WSSNMP.VLM	
WSTRAP.VLM	
WSREG.VLM	
WSASN1.VLM	
MIB2IF.VLM	

+IMAGE32	FILES IN QL 3222 IMAGE
----------	------------------------

\VLM	
AUTOEXEC.BAT	
CONFIG.SYS	
NET.CFG	
QL 3BOOT.BAT	
QLSETUP.SYS	
QL 3_DOS.COM	QL driver
IPXODI.COM	

```

| LSL.COM
| QLNODE.EXE
| CBXNODE.VLM          CMS agent
| VLM.EXE
| CONN.VLM
| IPXNCP.VLM
| TRAN.VLM
| SECURITY.VLM
| NDS.VLM
| BIND.VLM
| NWP.VLM
| FIO.VLM
| PRINT.VLM
| GENERAL.VLM
| REDIR.VLM
| NETX.VLM
| RSA.VLM
| AUTO.VLM
| WSSNMP.VLM
| WSTRAP.VLM
| WSREG.VLM
| WSASN1.VLM
| MIB2IF.VLM
|
+DEVICE          FILES FOR DEVICES CONTAINING QLS
|
| +NW311          FILES FOR 3.11 DEVICES
| | QL 3000.LAN   QL server driver
| | QL 3_SUPR.NLM  QL Supervisor
| | MONITOR.NLM
| | TOKENTSM.NLM
| | LSLENH.NLM
| | PATCHMAN.NLM
| | MSM31X.NLM
| | QL 3START.NCF  Add to the STARTUP.NCF
| | QL 3_EXEC.NCF  Add to the AUTOEXEC.NCF
| |
| | +NW312          FILES FOR 3.12 DEVICES
| | | QL 3START.NCF  Add to the STARTUP.NCF
| | | QL 3_EXEC.NCF  Add to the AUTOEXEC.NCF
| | | QL 3000.LAN   QL server driver
| | | QL 3_SUPR.NLM  QL Supervisor
| | | TOKENTSM.NLM
| | | MSM31X.NLM
| |
| | \NW4XX          FILES FOR 4.X DEVICES
| | | QL 3START.NCF  Add to STARTUP.NCF
| | | QL 3_EXEC.NCF  Add to AUTOEXEC.NCF
| | | MSM.NLM
| | | QL 3000.LAN   QL server driver
| | | QL 3_SUPR.NLM  QL Supervisor
| | | TOKENTSM.NLM
| |
| +HDDRV          FILES FOR A QL HARD DRIVE
| | QL 3_UPDT.BAT   File update utility
| | AUTOEXEC.HD     AUTOEXEC.BAT
| | CNFGVLM.HD      CONFIG.SYS (for VLM environment)
| | NET.HD NET.CFG
| | QL 3000.HD      QL driver
| | README.HD
| | VERSION.HD
| | ASK.EXE
| |
| \SNMP          SNMP MIB FILES
| CBXQL 3S.MIB     QL Supervisor SNMP MIB
| CBXNODE.MIB     QL Workstation SNMP MIB

```

QL 4000 Series Tree

SYS:cubix\QL 4000 QL 4000 FILES

	INSTALL.LOG	Results of the installation procedure
	INSTALL.EXE	QL installation utility
	INSTALL.CWA	Support file
	INSTALL.HLP	Support file
	INSTALL.INI	Support file
	README.TXT	Installation steps
+LOGIN		FILES FOR THE LOGIN DIRECTORY
	QLRCV.COM	Provides QLVision support
	CMSNET.CFG	Contains the CMS console address
	QL 4BOOT.BAT	Loads the QL drivers and VLMs
	QLUSER.BAT	Loads user applications
	QLNODE.EXE	Initializes environment variables
	QL 4_DOS.LOD	Default image file
	EMM386.EXE	DOS memory management driver
	STPIPX.COM	Novell file
	STPUDP.COM	Novell file
+UTILITY		QL UTILITY FILES
	QLVISION.EXE	QLVision application
	QLVISION.HLP	Support file
	QLVISION.CWA	Support file
	QLVER.EXE	QLVer utility
	QLRCV.COM	Provides QLVision support
	QLCLIENT.EXE	Customer Service file
	QLCLIENT.HLP	Support file
	QLCLIENT.CWA	Support file
+OS2		OS/2 FILES
	QL 4_OS2.SYS	QL driver
	CBXMOUSE.SYS	Mouse driver
	NET.QL 4	NET.CFG file
+WIN		WINDOWS FILES
	VHOTFIX.386	Mouse support file
+IMAGE		FILES IN QL 4222 IMAGE
	\VLM	
	AUTOEXEC.BAT	
	CONFIG.SYS	
	NET.CFG	
	QL 4BOOT.BAT	
	QLSETUP.SYS	
	QL 4_DOS.COM	QL driver
	IPXODI.COM	
	LSL.COM	
	QLNODE.EXE	
	CBXNODE.VLM	CMS agent
	VLM.EXE	
	CONN.VLM	
	IPXNCP.VLM	
	TRAN.VLM	
	SECURITY.VLM	
	NDS.VLM	
	BIND.VLM	
	NWP.VLM	
	FIO.VLM	
	PRINT.VLM	
	GENERAL.VLM	
	REDIR.VLM	
	NETX.VLM	
	RSA.VLM	
	AUTO.VLM	
	WSSNMP.VLM	

```

| WSTRAP.VLM
| WSREG.VLM
| WSASN1.VLM
| MIB2IF.VLM
|
+DEVICE          FILES FOR DEVICES CONTAINING QLS
| +NW311          FILES FOR 3.11 DEVICES
| | QL 4000.LAN   QL server driver
| | QL 4_SUPR.NLM  QL Supervisor
| | MONITOR.NLM
| | TOKENSM.NLM
| | LSLENH.NLM
| | PATCHMAN.NLM
| | MSM31X.NLM
| | QL 4START.NCF  Add to the STARTUP.NCF
| | QL 4_EXEC.NCF  Add to the AUTOEXEC.NCF
| |
| +NW312          FILES FOR 3.12 DEVICES
| | QL 4START.NCF  Add to the STARTUP.NCF
| | QL 4_EXEC.NCF  Add to the AUTOEXEC.NCF
| | QL 4000.LAN   QL server driver
| | QL 4_SUPR.NLM  QL Supervisor
| | TOKENSM.NLM
| | MSM31X.NLM
| |
| \NW4XX          FILES FOR 4.X DEVICES
| | MSM.NLM
| | QL 4START.NCF  Add to STARTUP.NCF
| | QL 4_EXEC.NCF  Add to AUTOEXEC.NCF
| | QL 4000.LAN   QL server driver
| | QL 4_SUPR.NLM  QL Supervisor
| | TOKENSM.NLM
| |
+HDDRV           FILES FOR A QL HARD DRIVE
| QL 4_UPDT.BAT   File update utility
| AUTOEXEC.HD     AUTOEXEC.BAT
| CNFGVLM.HD      CONFIG.SYS (for VLM environment)
| NET.HD          NET.CFG
| QL 4000.HD      QL driver
| README.HD
| VERSION.HD
| ASK.EXE
|
\SNMP            SNMP MIB FILES
CBXQL 4S.MIB     QL Supervisor SNMP MIB
CBXNODE.MIB      QL Workstation SNMP MIB

```

QL 3000 Series Remote Boot Files

CONFIG.SYS

File: SYS:cubix\QL 3000\IMAGE32\VLM\CONFIG.SYS

device=qlsetup.sys t

device=himem.sys /testmem:off

device=emm386.exe /y=f:\login\emm386.exe I=b000b7ff I=cc00edff I=f000f7ff x=c000cbff x=ee00efff
noems

shell=command.com /p /e:500

devicehigh=ansi.sys

dos=umb

```
dos=high
stacks=9,256
files=60
fcbs=4,0
buffers=15,0
lastdrive=z
```

* For the QL 3001 and QL 3002, the command **/m:6** must be appended to the command to load himem.sys as follows:

device=himem.sys /testmem:off /m:6

The line is correct in the in the SYS:cubix\QL 3000/IMAGE30/VLM/CONFIG.SYS file. The file above represents the CONFIG.SYS file in the SYS:/cubix\QL 3000/IMAGE32/VLM directory.

* The "/y" switch on the **emm386** command is a Microsoft Windows switch. If Windows is run on the QL workstation and the "/y" switch is not specified, Windows will load in standard mode. **The "/y" switch must be specified is Windows is to run in enhanced mode on the QL workstation.** If Windows will not be run on the QL workstation, the "/y" switch can be left on the emm386 command line (it will not cause any problems).

A copy of emm386.sys must exist in the path specified by the "/y" switch (f:\login in the file listed above).

AUTOEXEC.BAT

File: SYS:cubix\QL 3000/IMAGE32/VLM/AUTOEXEC.BAT@echo off

```
rem *****
rem * AUTOEXEC.BAT
rem * rem * Cubix Corporation rem * 2800 Lockheed Way, Carson City, NV 89706 rem
rem * *****
rem *
rem * Invoke the Cubix QL 3BOOT.BAT file with the
rem * DOS 'loadhigh' option.
QL 3boot.bat loadhigh
```

QL 3BOOT.BAT

File: SYS:cubix\QL 3000/IMAGE32/VLM/QL 3BOOT.BAT

```
@echo off
cls
rem *****
rem * QL 3BOOT.BAT rem * rem * Cubix Corporation rem * 2800 Lockheed Way, Carson City, NV 89706
rem * *****
rem * Begin the normal IPX boot Process for ODI.
rem *
rem * Load the NetWare Link Support Layer driver.
```

```
rem * If a command line parameter was specified
rem * when QL 3BOOT.BAT was run (e.g. QL 3BOOT.BAT
rem * LH), use that parameter here.
%1 ls1.com
rem *
rem * Load the Cubix QL 3000 Series Workstation
rem * Driver for ODI. If a command line parameter
rem * was specified when QL 3BOOT.BAT was run (e.g.
rem * QL 3BOOT.BAT LH), use that parameter here.
%1 QL 3_dos.com
rem *
rem * Load the NetWare IPXODI.COM driver.
rem * Loading IPXODI.COM high can cause problems
rem * with SPX communications, so IPXODI.COM will
rem * be loaded in low memory here.
ipxodi.com
rem *
rem * Execute QLNODE.EXE which initializes the DOS
rem * environment variables as follows:
rem * QLNODE QL processor node number
rem * QLLDRV DOS last drive
qlnode
set comspec=y:command.com
rem *
rem * Load the NetWare DOS Requester (VLMs).
rem *
vlm.exe /Mx
rem *
rem * Load the NetWare SNMP/IPX transport provider
stpipx.com /c=f:cmsnet.cfg
rem *
rem * Change to the drive specified by the
rem * environment variable QLLDRV
rem * (set by the program QLNODE above).
```

%QLLDRV%:

```
rem *
rem * Clear the environment variable QLLDRV to save
rem * space.
set QLLDRV=
rem *
rem * If a custom QL user batch file exists for
rem * this node number, execute it.
if exist qlusr%QLNODE%.bat qlusr%QLNODE%.bat %1
rem *
rem * If no custom QL user batch file exists for
rem * this node number, execute the default
rem * QLUSER.BAT file.
if exist qluser.bat qluser.bat %1
```

NET.CFG

File: SYS:cubix\QL 3000/IMAGE32/VLM/NET.CFG

```
preferred server = designated server
link driver QL 3_dos
frame TokenRing
protocol IPX E0 TokenRing
NetWare DOS Requester
checksum = 0
first network drive = f
cache buffer size = 2484
VLM = wssnmp.vlm
VLM = wstrap.vlm
VLM = wsreg.vlm
VLM = wsasn1.vlm
VLM = mib2if.vlm
vlm = cbxnode.vlm
Cubix Node Agent
TrapInterval = 30
SupervisorAddress = QL Supervisor IPX Address
DeviceType = ql
```

Protocol IPX

spx connections 35

* *designated server* will be replaced by the name of the designated server specified during QL installation.

* If the Cubix Management System (CMS) is to manage the QL workstation, the **TrapInterval** specifies the number of seconds between status messages generated by the QL workstation. Do not modify this setting without first consulting the CMS documentation.

* The installation utility will set the *QL Supervisor IPX Address* to the address of the QL Supervisor NLM if the QL boards are installed in the backplane of the designated server. If the QL boards are installed in another device, set this field to the IPX address of the QL Supervisor NLM installed on the server or MPR containing the QL processor. Instructions for setting this field are included in *Chapter 2 - Installation*.

CMSNET.CFG

Transport Provider IPX

```
; trap target = 00000000:000000000000
```

* If the Cubix Management System (or another SNMP compliant management system) is to manage the QL workstation, the **trap target** must be set to the IPX address of the management console. Also remove the semicolon (";") from the beginning of the line.

QL 4000 Series Remote Boot Files

CONFIG.SYS

File: SYS:cubix\QL 4000\IMAGE\VLM\CONFIG.SYS

```
device=qlsetup.sys t
```

```
device=himem.sys /testmem:off
```

```
device=emm386.exe /y=f:\login\emm386.exe I=b000b7ff I=d000f7ff x=C000CFFF noems
```

```
buffers=15,0
```

```
files=60
```

```
dos=umb
```

```
lastdrive=z
```

```
fcbs=4,0
```

```
devicehigh=ansi.sys
```

```
shell=command.com /p /e:500
```

```
dos=high
```

```
stacks=9,256
```

* The "/y" switch on the **emm386** command is a Microsoft Windows switch. If Windows is run on the QL workstation and the "/y" switch is not specified, Windows will load in standard mode. **The "/y" switch must be specified if Windows is to run in enhanced mode on the QL workstation.** If Windows will not be run on the QL workstation, the "/y" switch can be left on the emm386 command line (it will not cause any problems).

A copy of emm386.sys must exist in the path specified by the "/y" switch (f:\login in the file listed above).

AUTOEXEC.BAT

File: SYS:cubix\QL 4000/IMAGE/VLM/AUTOEXEC.BAT

@echo off

rem *****

rem * AUTOEXEC.BAT *

rem * *

rem * Cubix Corporation *

rem * 2800 Lockheed Way, Carson City, NV 89706 *

rem *****

rem *

rem *

rem * Invoke the Cubix QL 4BOOT.BAT file with the DOS 'loadhigh' option.

QL 4boot.bat loadhigh

QL 4BOOT.BAT

File: SYS:cubix\QL 4000/IMAGE/VLM/QL 4BOOT.BAT

@echo off

rem *****

rem * QL 4BOOT.BAT *

rem * *

rem * Cubix Corporation *

rem * 2800 Lockheed Way, Carson City, NV 89706 *

rem *****

rem *

rem * Begin the normal IPX boot Process for ODI.

rem *

rem * Load the NetWare Link Support Layer driver. rem * If a command line parameter was specified

rem * when QL 4BOOT.BAT was run (e.g. QL 4BOOT.BAT rem * LH), use that parameter here.

%1 lsl.com

rem *

rem * Load the Cubix QL 4000 Series Workstation

rem * Driver for ODI. If a command line parameter

rem * was specified when QL 4BOOT.BAT was run (e.g.

```
rem * QL 4BOOT.BAT LH), use that parameter here.
%1 QL 4_dos.com
rem *
rem * Load the NetWare IPXODI.COM driver.
rem * Loading IPXODI.COM high can cause problems
rem * with SPX communications, so IPXODI.COM will
rem * be loaded in low memory here.
ipxodi.com
rem *
rem * Execute QLNODE.EXE which initializes the DOS
rem * environment variables as follows:
rem * QLNODE QL processor node number
rem * QLLDRV DOS last drive
qlnode
set comspec=y:command.com
rem *
rem * Load the NetWare DOS Requester (VLMs).
vlm.exe /Mx
rem *
rem * Load the NetWare SNMP/IPX transport provider
stpipx.com /c=f:cmsnet.cfg
rem *
rem * Change to the drive specified by the
rem * environment variable QLLDRV
rem * (set by the program QLNODE above).
%QLLDRV%:
rem *
rem * Clear the environment variable QLLDRV to save
rem * space.
set QLLDRV=
rem *
rem * If a custom QL user batch file exists for
rem * this node number, execute it.
if exist qlusr%QLNODE%.bat qlusr%QLNODE%.bat %1
```

```
rem *
rem * If no custom QL user batch file exists for
rem * this node number, execute the default
rem * QLUSER.BAT file.
if exist qluser.bat qluser.bat %1
```

NET.CFG

File: SYS:cubix\QL 4000/IMAGE/VLM/NET.CFG

```
preferred server = designated server
link driver QL 4_dos
frame TokenRing
protocol IPX E0 TokenRing
NetWare DOS Requester
checksum = 0
first network drive = f
cache buffer size = 3084
VLM = wssnmp.vlm
VLM = wstrap.vlm
VLM = wsreg.vlm
VLM = wsasn1.vlm
VLM = mib2if.vlm
vlm = cbxnode.vlm
Cubix Node Agent
TrapInterval = 30
SupervisorAddress = QL Supervisor IPX Address
DeviceType = ql
Protocol IPX
spx connections 35
```

* *designated server* will be replaced by the name of the designated server specified during QL installation.

* If the Cubix Management System (CMS) is to manage the QL workstation, the **TrapInterval** specifies the number of seconds between status messages generated by the QL workstation. Do not modify this setting without first consulting the CMS documentation.

* The installation utility will set the *QL Supervisor IPX Address* to the address of the QL Supervisor NLM if the QL boards are installed in the backplane of the designated server. If the QL boards are installed in another device, set this field to the IPX address of the QL Supervisor NLM installed on the server or MPR containing the QL processor. Instructions for setting this field are included in **Chapter 2 - Installation**.

CMSNET.CFG

File: SYS:cubix\QL 4000/LOGIN/CMSNET.CFG

Transport Provider IPX

```
; trap target = 00000000:000000000000
```

* If the Cubix Management System (or another SNMP compliant management system) is to manage the QL workstation, the **trap target** must be set to the IPX address of the management console. Also remove the semicolon (";") from the beginning of the line.

QLUSER.BAT or QLUSRxxx File

In addition to the CONFIG.SYS, AUTOEXEC, QLxBOOT.BAT, and NET.CFG files, the QL user file (QLUSER.BAT or QLUSRxxx.BAT) is also part of the remote boot process. Unlike the other files, the QL user file is not included in the image file. The last thing that the image file will do is to execute the QL user file, which must be located in the LOGIN directory on the designated server.

The purpose of the QL user file is to provide an easy way for the system installer to invoke applications from a QL workstation without having to modify the image file. This is accomplished by invoking the application from the QL user file.

If all QL processors booting from this designated server will invoke the same application at boot time, they can share a single QL user file (QLUSER.BAT). However, in certain installations some QL nodes may need to invoke different applications than other QL nodes. This is accomplished by using the QLUSRxxx.BAT file, where **xxx** represents the QL node number.

* To determine the node number, run QLVision, select the appropriate QL Supervisor, and then run the QL Node Functions option from the Main Menu. The node numbers will be displayed.

When a QL processor boots, it executes the QL 3BOOT.BAT or QL 4BOOT.BAT file, which will search the LOGIN directory for a QLUSRxxx.BAT file with **xxx** set to the node number of the booting processor. If a match is found, the QLUSRxxx.BAT file is executed; otherwise, QLUSER.BAT is executed.

For example, if the LOGIN directory on the designated server contains both a QLUSR001.BAT file and a QLUSER.BAT file, the QL processor configured as node 1 will execute QLUSR001.BAT at boot time, while all other QL processors booting from this file server will execute QLUSER.BAT.

The QLUSRxxx.BAT file should be created by copying the default QLUSER.BAT file and then modifying QLUSRxxx as necessary.

QLUSER.BAT

File: SYS:cubix\QLx000/LOGIN/QLUSER.BAT

```
@echo off
```

```
rem *****
```

```
rem * QLUSER.BAT rem * rem * Cubix Corporation rem * 2800 Lockheed Way, Carson City, NV 89706 rem  
*****
```

```
rem *
```

```
rem * Display full path at DOS prompt
```

```
prompt $p$g
```

```
rem *
```

rem * Load the Cubix QLRCV TSR. This cannot be

rem * loaded in high memory.

qlrcv

rem *

rem * Perform NetWare LOGIN.

login

QL 3000 DOS Local Boot Files

CONFIG.SYS

The CONFIG.SYS file installed on the hard drive is the same as the SYS:cubix\QL 3000/HDDRV/CNFGVLM.HD file on the designated server.

device=qlsetup.sys t

device=c:\dos\himem.sys /testmem:off

device=c:\dos\emm386.exe I=cc00edff I=b000-b7ff I=f000f7ff x=c000cbff x=ee00efff NOEMS

shell=command.com /p /e:500

devicehigh=ansi.sys

dos=umb

dos=high

stacks=9,256

files=60

fcbs=4,0

buffers=15,0

lastdrive=z

AUTOEXEC.BAT

The AUTOEXEC.BAT file installed on the hard drive is the same as the SYS:cubix\QL 3000/HDDRV/AUTOEXEC.HD file on the designated server.

@echo off

rem *****

rem * AUTOEXEC.BAT for Microsoft DOS 6.22 (or

rem * compatible) and for use with Cubix QL 3222

rem * Series workstation hard drives.

rem * rem * Cubix Corporation rem * 2800 Lockheed Way, Carson City, NV 89706 rem

rem *

rem * Set up a path to DOS.

```
path c:\;c:\dos
rem *
rem * Set up the prompt.
prompt $p$g
rem *
rem * Invoke the Cubix QL 3000.BAT file with the DOS
rem * 'loadhigh' option.
cd \QL 3000
QL 3000.bat loadhigh
```

NET.CFG

The NET.CFG file installed on the hard drive is the same as the SYS:cubix\QL 3000/HDDRV/NET.HD file on the designated server.

```
preferred server = designated server
link driver QL 3_dos
frame TokenRing
protocol IPX E0 TokenRing
NetWare DOS Requester
checksum = 0
first network drive = f
cache buffer size = 2484
VLM = wssnmp.vlm
VLM = wstrap.vlm
VLM = wsreg.vlm
VLM = wsasn1.vlm
VLM = mib2if.vlm
vlm = cbxnode.vlm
Cubix Node Agent
TrapInterval = 30
SupervisorAddress = QL Supervisor IPX Address
DeviceType = ql
Transport Provider IPX
trap target = 00000000:000000000000
Protocol IPX
spx connections 35
```

* *designated server* will be replaced by the name of the designated server specified during QL installation.

* If the Cubix Management System (CMS) is to manage the QL workstation, the **TrapInterval** specifies the number of seconds between status messages generated by the QL workstation. Do not modify this setting without first consulting the CMS documentation.

* The installation utility will set the *QL Supervisor IPX Address* to the address of the QL Supervisor NLM if the QL boards are installed in the backplane of the designated server. If the QL boards are installed in another device, set this field to the IPX address of the QL Supervisor NLM installed on the server or MPR containing the QL processor. Instructions for setting this field are included in **Chapter 2 - Installation**.

* If the Cubix Management System (or another SNMP compliant management system) is to manage the QL workstation, the **trap target** must be set to the IPX address of the management console.

QL 3000.BAT

The QL 3000.BAT file installed on the hard drive is the same as the SYS:cubix\QL 3000\HDDRV\QL 3000.HD file on the designated server.

```
@echo off
```

```
rem *****
```

```
rem * QL 3000.BAT rem * rem * Cubix Corporation rem * 2800 Lockheed Way, Carson City, NV 89706 rem  
rem *****
```

```
rem *
```

```
rem * Clear the screen.
```

```
cls
```

```
rem *
```

```
rem * Print the message "Novell NetWare System
```

```
rem * Login".
```

```
echo Novell NetWare System Login
```

```
rem *
```

```
rem * Begin the normal IPX boot Process for ODI.
```

```
rem *
```

```
rem * Load the NetWare Link Support Layer driver.
```

```
rem * If a command line parameter was specified
```

```
rem * when QL 3000.BAT was run (e.g. QL 3000.BAT LH),
```

```
rem * use that parameter here.
```

```
%1 lsl.com
```

```
rem *
```

```
rem * Load the Cubix QL 3000 Series Workstation
```

```
rem * Driver for ODI. If a command line parameter
```

```
rem * was specified when QL 3000.BAT was run (e.g.
```

```
rem * QL 3000.BAT LH), use that parameter here.
```

```
%1 QL 3_dos.com

rem *

rem * Load the NetWare IPXODI.COM driver.

ipxodi.com

rem *

rem * Execute QLNODE.EXE which initializes the DOS

rem * environment variables as follows:

rem * QLNODE QL processor node number

rem * QLLDRV DOS last drive

qlnode

rem *

:DOSREQ

rem *

rem * Set the variable QLLDRV to F. (VLM.EXE will

rem * leave the user in the root of the working

rem * directory and this must be the first

rem * network drive in order to perform login.)

set QLLDRV=f

rem * Load the NetWare DOS Requester Software

rem * (.VLM's).

vlm.exe

rem *

rem * Load the NetWare SNMP\IPX transport provider

rem *

stpipx.com /c=c:\QL 3000\cmsnet.cfg

rem *

:LDQLRCV

rem *

rem * Load the Cubix QLRCV TSR. This cannot be

rem * loaded in high memory.

qlrcv

rem *

rem * Change to the drive specified by the

rem * environment variable QLLDRV (set by the
```

```
rem * program QLNODE above).
%QLLDRV%:
rem *
rem * Clear the environment variable QLLDRV to save
rem * space.
set QLLDRV=
rem *
rem * Perform NetWare LOGIN.
login
```

QL 4000 DOS Local Boot Files

CONFIG.SYS

The CONFIG.SYS file installed on the hard drive is the same as the SYS:cubix\QL 4000/HDDRV/CNFGVLM.HD file on the designated server.

```
device=qlsetup.sys t
device=c:\dos\himem.sys /testmem:off
device=c:\dos\emm386.exe I=b000b7ff I=d000f7ff x=C000CFFF NOEMS
buffers=15,0
files=60
dos=umb
lastdrive=z
fcbs=4,0
devicehigh=ansi.sys
shell=command.com /p /e:500
dos=high
stacks=9,256
```

AUTOEXEC.BAT

The AUTOEXEC.BAT file installed on the hard drive is the same as the SYS:cubix\QL 4000/HDDRV/AUTOEXEC.HD file on the designated server.

```
@echo off
rem *****
rem * AUTOEXEC.BAT for Microsoft DOS 6.22 (or
rem * compatible) and for use with Cubix QL 4000
rem * Series workstation hard drives.
```

```
rem * rem * Cubix Corporation rem * 2800 Lockheed Way, Carson City, NV 89706 rem
*****
```

```
rem *
```

```
rem * Set up a path to DOS.
```

```
path c:\;c:\dos
```

```
rem *
```

```
rem * Set up the prompt.
```

```
prompt $p$g
```

```
rem *
```

```
rem * Invoke the Cubix QL 4000.BAT file with the DOS 'loadhigh' option.
```

```
cd \QL 4000
```

```
QL 4000.bat loadhigh
```

NET.CFG

The NET.CFG file installed on the hard drive is the same as the SYS:cubix\QL 4000/HDDRV/NET.HD file on the designated server.

```
preferred server = designated server
```

```
link driver QL 4_dos
```

```
frame TokenRing
```

```
protocol IPX E0 TokenRing
```

```
NetWare DOS Requester
```

```
checksum = 0
```

```
first network drive = f
```

```
cache buffer size = 3084
```

```
VLM = wssnmp.vlm
```

```
VLM = wstrap.vlm
```

```
VLM = wsreg.vlm
```

```
VLM = wsasn1.vlm
```

```
VLM = mib2if.vlm
```

```
vlm = cbxnode.vlm
```

```
Cubix Node Agent
```

```
TrapInterval = 30
```

```
SupervisorAddress = QL Supervisor IPX Address
```

```
DeviceType = ql
```

```
Transport Provider IPX
```

```
trap target = 00000000:000000000000
```

Protocol IPX

spx connections 35

* *designated server* will be replaced by the name of the designated server specified during QL installation.

* If the Cubix Management System (CMS) is to manage the QL workstation, the **TrapInterval** specifies the number of seconds between status messages generated by the QL workstation. Do not modify this setting without first consulting the CMS documentation.

* The installation utility will set the *QL Supervisor IPX Address* to the address of the QL Supervisor NLM if the QL boards are installed in the backplane of the designated server. If the QL boards are installed in another device, set this field to the IPX address of the QL Supervisor NLM installed on the server or MPR containing the QL processor. Instructions for setting this field are included in **Chapter 2 - Installation**.

* If the Cubix Management System (or another SNMP compliant management system) is to manage the QL workstation, the **trap target** must be set to the IPX address of the management console.

QL 4000.BAT

The QL 4000.BAT file installed on the hard drive is the same as the SYS:cubix\QL 4000/HDDRV/QL 4000.HD file on the designated server.

```
@echo off
```

```
rem *****
```

```
rem * QL 4000.BAT rem * rem * Cubix Corporation rem * 2800 Lockheed Way, Carson City, NV 89706 rem  
rem * *****
```

```
rem *
```

```
rem * Clear the screen.
```

```
cls
```

```
rem *
```

```
rem * Print the message "Novell NetWare System
```

```
rem * Login".
```

```
echo Novell NetWare System Login
```

```
rem *
```

```
rem * Begin the normal IPX boot Process for ODI.
```

```
rem *
```

```
rem * Load the NetWare Link Support Layer driver.
```

```
rem * If a command line parameter was specified
```

```
rem * when QL 4000.BAT was run (e.g. QL 4000.BAT LH),
```

```
rem * use that parameter here.
```

```
%1 ls1.com
```

```
rem *
```

```
rem * Load the Cubix QL 4000 Series Workstation
```

rem * Driver for ODI. If a command line parameter rem * was specified when QL 4000.BAT was run (e.g.

rem * QL 4000.BAT LH), use that parameter here.

%1 QL 4_dos.com

rem *

rem * Load the NetWare IPXODI.COM driver.

ipxodi.com

rem *

rem * Execute QLNODE.EXE which initializes the DOS

rem * environment variables as follows:

rem * QLNODE QL processor node number

rem * QLLDRV DOS last drive

qlnode

rem *

:DOSREQ

rem *

rem * Set the variable QLLDRV to F. (VLM.EXE will

rem * leave the user in the root of the working

rem * directory and this must be the first network

rem * drive in order to perform NetWare login.)

set QLLDRV=f

rem * Load the NetWare DOS Requester Software

rem * (.VLM's).

rem *

vlm.exe

rem *

rem * Load the NetWare SNMP\IPX transport provider

rem *

stpipx.com /c=c:\QL 4000\cmsnet.cfg

:LDQLRCV

rem *

rem * Load the Cubix QLRCV TSR. This cannot be

rem * loaded in high memory.

qlrcv

```
rem *  
  
rem * Change to the drive specified by the  
rem * environment variable QLLDRV (set by the  
rem * program QLNODE above).  
  
%QLLDRV%:  
  
rem *  
rem * Clear the environment variable QLLDRV to save  
rem * space.  
  
set QLLDRV=  
  
rem *  
rem * Perform NetWare LOGIN.  
  
login
```

QL 3000 OS/2 Local Boot Files

CONFIG.SYS

The CONFIG.SYS file installed on the hard drive is a standard OS/2 CONFIG.SYS file. Only the parts of the file that pertain to the QL driver are listed below.

Appended to LIBPATH should be:

```
C:\NETWARE;
```

Appended to PATH should be:

```
C:\NETWARE;L:\OS2;P:\OS2;
```

Appended to DPATH should be:

```
C:\NETWARE;L:\OS2;P:\OS2;
```

The command to load the MOUSE.SYS device driver should be replaced with the following:

```
DEVICE=C:\OS2\CBXMOUSE.SYS
```

The CONFIG.SYS file should also contain the following lines. Depending upon options selected during the NetWare Workstation for OS/2 installation, some of the lines indicated as commented out (with the **rem** statement) may not be commented out in the actual CONFIG.SYS file on the hard drive.

```
REM --- NetWare Requester statements BEGIN ---
```

```
SET NWLANGUAGE=ENGLISH
```

```
DEVICE=C:\NETWARE\LSL.SYS
```

```
RUN=C:\NETWARE\DDAEMON.EXE
```

```
DEVICE=C:\NETWARE\QL_3_OS2.SYS
```

```
DEVICE=C:\NETWARE\IPX.SYS
```

```
rem DEVICE=C:\NETWARE\SPX.SYS
rem RUN=C:\NETWARE\SPDAEMON.EXE
rem DEVICE=C:\NETWARE\NMPIPE.SYS
rem DEVICE=C:\NETWARE\NPSEVER.SYS
rem RUN=C:\NETWARE\NPDAEMON.EXE
DEVICE=C:\NETWARE\NWREQ.SYS
IFS=C:\NETWARE\NWIFS.IFS
RUN=C:\NETWARE\NWDAEMON.EXE
rem DEVICE=C:\NETWARE\NETBIOS.SYS
rem RUN=C:\NETWARE\NBDAEMON.EXE
DEVICE=C:\NETWARE\VIPX.SYS
DEVICE=C:\NETWARE\VSHELL.SYS GLOBAL
REM --- NetWare Requester statements END ---
```

! The **GLOBAL** declaration on the command to load VSHELL.SYS may be **PRIVATE** in some installations.

NET.CFG

The NET.CFG file installed on the hard drive is the same as the SYS:cubix\QL 3000/OS2/NET.QL 3 file on the designated server.

```
*****
#* NET.CFG
#*
#* Cubix Corporation
#* 2800 Lockheed Way, Carson City, NV 89706
*****
#
# NET.CFG file for QL 3222 OS/2 ODI Workstation
# Driver.
#
Link Support
buffers 20 2154
Protocol Stack SPX
sessions 35
```

QL 4000 OS/2 Local Boot Files

CONFIG.SYS

The CONFIG.SYS file installed on the hard drive is a standard OS/2 CONFIG.SYS file. The QL specific parts of the CONFIG.SYS file for the QL 4000 Series products are the same as previously described for the QL 3000, except that the device driver loaded is QL 4_OS2.SYS instead of QL 3_OS2.SYS.

NET.CFG

The NET.CFG file installed on the hard drive is the same as the SYS:cubix\QL 4000/OS2/NET.QL 4 file on the designated server.

```
#####  
#* NET.CFG  
#*  
#* Cubix Corporation  
#* 2800 Lockheed Way, Carson City, NV 89706  
#####  
#  
# NET.CFG file for QL 4001 OS/2 ODI Workstation  
# Driver.  
#  
Link Support  
buffers 14 4210  
Protocol Stack SPX  
sessions 35
```

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Customer Service Support System

QL 3222/QL 4222 Chapter 10 - Keyboard and Mouse Drivers

Table of Contents

- [QLSETUP.SYS DOS Driver](#)
 - [VHOTFIX.386 Windows Driver](#)
 - [CBXMOUSE.SYS OS/2 Driver](#)
-

QLSETUP.SYS DOS Driver

QLSETUP.SYS is a Cubix DOS device driver that is loaded from CONFIG.SYS. The command to load QLSETUP.SYS must be the first line in CONFIG.SYS for QL processors booting DOS to function properly. QLSETUP.SYS initializes the keyboard type and the Cubix mouse emulator.

Keyboard Options

To initialize the QL processor for a 83/84-key keyboard, add the "-n" option:

device = qlsetup.sys -n

Mouse Options

The Cubix mouse emulator provides support for remote applications requiring a mouse.

Typically applications needing mouse support require that a mouse driver be loaded on the QL processor. The mouse driver will not load unless a mouse is physically attached to the QL board. This causes a problem in remote applications where the mouse is attached to the remote PC and not the QL board.

The Cubix mouse emulator resolves this issue by simulating a PS/2 style mouse on the QL board, thus allowing a mouse driver to load and function properly. Note that the Cubix mouse emulator does not replace the standard mouse driver, but rather enables a PS/2 mouse driver to function properly.

The mouse emulator also enables a mouse to be multiplexed in systems equipped with a Cubix multiplexor.

To use the Cubix mouse emulator:

* Load QLSETUP.SYS in the first line of the CONFIG.SYS file.

* Load the mouse driver so that it will recognize and use a PS/2 style mouse (i.e. do not specify a serial mouse option).

If the Cubix mouse emulator is not required, add the "-m" option to the QLSETUP.SYS command line:

device = qlsetup.sys -m

This disables mouse emulation and frees all memory it would require.

* The "-t" and "-p" options on the QLSETUP.SYS invocation line are used by other QL products. The QL 3000 and 4000 Series processors will ignore these parameters.

VHOTFIX.386 Windows Driver

To support mouse emulation (or the Cubix mouse multiplexor) in a Windows environment, the virtual device driver VHOTFIX.386 must be running inside WINDOWS. This is accomplished by adding this line to the SYSTEM.INI file:

device = VHOTFIX.386

The file VHOTFIX.386 must be copied from the SYS:/QLx000\WIN directory to the directory containing the other Windows virtual device drivers which can be identified by the .386 extension on the filename (usually in the WINDOWS\SYSTEM directory).

In addition, the QLSETUP.SYS DOS driver must also be loaded.

CBXMOUSE.SYS OS/2 Driver

To use the Cubix OS/2 mouse emulation driver:

! Copy the file CBXMOUSE.SYS from SYS:/QLx000\OS2 to the QL processor's hard drive in the C:\OS2 directory.

! Add this line to the CONFIG.SYS file:

device = c:\os2\cbxmouse.sys

! Reboot the QL processor.



Customer Service Support System

QL 3222/QL 4222 Chapter 11 - Communication Applications

Table of Contents

- [Communication Applications](#)
 - [Remote PC to COM Port](#)
 - [Local Terminal to COM Port](#)
 - [Remote Terminal to COM Port](#)
 - [Installing Communication Software](#)
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Communication Applications

The QL Series boards are often used as remote communication processors allowing users to dial into and out of NetWare networks. Cubix provides the hardware and the necessary software to allow the QL processor to function as a NetWare workstation. Third party software must then be utilized to perform the remote communications. These software applications communicate via a COM port on the QL Series processor. Once the communication software is loaded, it has total control of I/O through the COM port.

Remote PC to COM Port

This configuration allows a remote user to dial into the network and use the QL processor as a workstation on the network.

[Figure 11-1](#)

Installation

1. Connect the modem to the QL COM port using the proper cable (refer to the hardware installation guide provided with the QL Series board).
2. Install a communication program, and set its configuration, baud rate, parity, and modem type.
3. Modify or create a batch file for the QL processor so that it loads the communication program on system boot (see the section on *Installing Communication Software* later in this chapter). Then reset the QL processor using QLVision.

4. Use QLVision to connect to the QL processor to ensure that the communication program is loaded and operating correctly.
5. Connect the other modem to the remote PC/AT COM port, turn on the system, and use a communication program to dial the modem connected to the QL board.

Common Questions

How can I tell if the communication program is working or if someone is connected?

Use QLVision to take remote control of the QL processor. This will allow you to use the keyboard and monitor on another workstation as if they were connected directly to the QL processor.

I have installed everything correctly, but it does not work.

Refer to the **Troubleshooting** chapter to find and correct the problem.

Local Terminal to COM Port

The QL Series boards may be connected to terminals by using a communications program that provides terminal drivers, such as ReachOut or pcANYWHERE.

Installation

1. Set the terminal parameters to match those in the communication software.
2. Use the proper cable for the connection between the terminal and the COM port. Refer to the hardware installation guide provided with the QL Series board.

[Figure 11-2](#)

3. Install the communication program, set it up for the proper terminal driver, baud rate and COM1. Modify or create a batch file for the QL processor so that it loads the communication program on system boot (see the section on **Installing Communication Software** later in this chapter).
4. Connect the terminal to the COM port, turn on the terminal, and reset the QL processor if necessary using QLVision.

Common Questions

What parameters do I need to change on my terminal?

Contact the communications software manufacturer's technical support. The communication software has full control of the COM port and its parameters.

I loaded the communication program, but get nothing on the terminal.

Use QLVision to take remote control of the QL processor from another workstation. Make sure your communication program is loaded and set up properly. Check your cable configuration. Try the same configuration on one of your regular workstations. Remember, the communication software controls the COM port and all of its I/O.

When I run an application program, the screen scrambles and the QL processor reboots.

Although the QL Series board can support graphics, most terminal emulations can only support monochrome text mode video. Set up your application software for monochrome text mode.

Remote Terminal to COM Port

A terminal can also be connected via modems to the QL processor.

[Figure 11-3](#)

Installation

1. Set the terminal parameters to match those in the communication software.
2. Use the proper cable for the connection between the remote terminal and its modem. See the terminal and modem manuals for the proper cable configuration.
3. Use the proper cable to connect the QL COM port to its modem.
4. Install the communication program, set it up for the proper terminal driver, baud rate and COM1. Modify or create a batch file for the QL processor so that it loads the communication program on system boot (see the section on *Installing Communication Software* later in this chapter).
5. Connect the QL modem to the COM port, turn on the modem, and reset the QL processor if necessary using QLVision.
6. Connect the remote terminal to its modem.
7. Instruct the terminal's modem to dial the phone number of the QL modem. There are several ways to do this:
 - A. Some modems store a string of characters or hot key sequence. Program the modem to accept an ASCII string, send the dialing string to the modem (such as ATDT 9,7025551212) and then return to Terminal emulation. Execute this function by pressing the proper key sequence on the terminal's keyboard.
 - B. Manually enter the setup program on the terminal and change to an ASCII emulation (Wyse 50, Televideo 925, etc.). Exit the setup program and send the dialing string to the modem (e.g., 9,7025551212). When the modems connect, return to the setup program and enter Terminal mode.
 - C. Connect an autodialer between the phone line and modem. Program the number to dial into the autodialer.
8. When the QL modem answers, the connection is established between the two modems. The communication program will take control of the COM port to provide the remote terminal communications.

Common Questions

What parameters do I need to change on my terminal?

Contact the communications software manufacturer's technical support. The communication software has full control of the COM port and its parameters.

I loaded the communication program, but get nothing on the terminal.

Use QLVision to take remote control of the QL processor from another workstation. Make sure your communication program is loaded and set up properly. Check your cable configuration. Try the same configuration using one of your regular workstations instead of the QL processor. Remember, the communication software controls the COM port and all of its I/O.

When I dial into the modem connected to the QL COM port, the modem will not answer.

Your communication software or modem is set up incorrectly. The communication software is responsible for monitoring the modem and detecting incoming calls. Some programs require you to put the modem into

autoanswer mode, some do it automatically, and others monitor the ring detect line. Check your communication software manual for more information.

Why do I get lower case r's and w's on the remote terminal screen?

Your communication equipment or software is doing ASCII XON/XOFF handshaking instead of PCTERM (XPC) XON/XOFF. The control codes are different for the two versions of XON/XOFF handshaking.

PCTerm XON = 65 hex ASCII XON = 11 hex

PCTerm XOFF = 67 hex ASCII XOFF = 13 hex

How do I get multiplexors to work with the QL COM ports?

The same as you would on any PC/ATclass computer. Follow the instructions in your multiplexor's installation manual.

I can connect, but my function keys will not work.

Your communications program handles the interface between the processor and the terminal. Contact the technical support group responsible for the communications software.

Installing Communication Software

Local Disk Drive Configurations

If a local disk drive is attached to the QL Series board, the communications software may be installed on this disk. If there is no floppy disk drive installed on the QL workstation, the software must be copied to the QL disk from a file server. The QL 4222 does support a floppy drive interface specifically for the purpose of installing software onto the QL hard drive. Refer to **Chapter 9 - Hardware Reference** for disk drive installation instructions. Of course, the communication software may be loaded and executed from a network drive as well as the local drive.

Regardless of the location of the communications software, the AUTOEXEC.BAT file on the local drive of the QL Series processor should be modified to load and execute the software.

Diskless Configurations

Communications software should be loaded by a batch file executed by the QL processor; QLUSER.BAT is provided for this purpose. Refer to the **QL Files** chapter for a description of QLUSER.BAT.

Remote Application Access

In order to access application software not stored on the local drive, the user must be logged onto the network. Create a temporary user with assigned rights. This involves a few extra steps in loading the application software:

1. Log in as temporary user (example: TEMPUSER).
2. Change to the subdirectory containing the software.
3. Load the application program.
4. Change back to the \LOGIN subdirectory.
5. Execute the NetWare LOGOUT command.
6. Clear the screen.

loads the communication program (see note below). Refer to the communication software documentation to determine if command line parameters are required.

CD..	Changes to \LOGIN directory
LOGOUT	Executes NetWare LOGOUT command to log out TEMPUSER
CLS	Clears the screen
LOGIN	Executes the NetWare LOGIN command

* At execution time, "%1" is replaced by the **loadhigh** parameter passed to QLUSER.BAT. This parameter is initialized in AUTOEXEC.BAT and passed to QL 4BOOT.BAT, which in turn sends it to QLUSER.BAT.

Finishing and Testing

Run QLVision to reset the QL processor that will load the communication software. The processor will reboot, load the NetWare environment and execute the communications software application. The modem's lights should blink as the modem is initialized. The system is now ready to receive incoming calls.

For More Information

For detailed installation instructions on particular applications in the U.S., check the Cubix Bulletin Board System (702/888-1003). In Europe, the BBS number is 0506 467636 (International +44 506 467636). The BBS contains numerous text files that may provide useful installation information.

For technical support questions on the communication software, contact the manufacturer. Cubix supports the installation of the software in the QL batch files, but not the setup or operation of the communication software.

Once the communication package is installed and running, it has complete control over the COM port on the QL Series board, just as it does on a standalone ATtype system.

For detailed information on the remote boot sequence of the QL processors, refer to ***Chapter 7 - Boot Process***.



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QL 3222/QL 4222 Chapter 9 - Hardware Reference

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- [QL 3222 Specifications](#)
 - [QL 3222 I/O Connections](#)
 - [QL 4222 Specifications](#)
 - [QL 4222 I/O Connections](#)
 - [Optional Connectors](#)
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QL 3222 Specifications

* Communication Processor

Processor type and speed	Cx486SLC 33 MHZ	80386SX 33 MHZ
Number per board	2	
Coprocessor (factory installed, optional)	Cyrix Cx87SLC	
Hardware integer multiplier unit		
Cx486SLC	Internal	
80386SX	None	
Internal cache size		
Cx486SLC	1 Kbyte	
80386SX	None	

Communications Memory Support

Total per processor	4, 8, or 16 Mbytes
Conventional memory	640 Kbytes [00000-9FFFF]
High memory	384 Kbytes [A0000-FFFFFF]
Extended memory	1-15 Mbytes [100000-FFFFFF]
Memory type	PS/2 style, 72-pin SIMMs
Number of SIMM sockets per processor	1
Access time (RAM speed)	70 nanoseconds
System and video BIOS ROM shadowing	Enabled

* Communications Video Support

Video controller	Cirrus GD5428
Video controller location	On-board
Modes supported (vertical x horizontal x color)	
11 Hexadecimal	640x480x2
12 Hexadecimal	640x480x16
13 Hexadecimal	320x200x256
58 Hexadecimal	800x600x16
5C Hexadecimal	800x600x256

5D Hexadecimal
5F Hexadecimal

1024x768x16
640x480x256

* Communications Ports

Serial (per processor)	
Assignment	COM1, COM2
UART type	16C550
Buffering	16 byte, FIFO
Maximum transmission rate	115.2 Kbps
Connector type	
COM1	DB-9 male on rear bracket
COM2	Header to DB-9 male
Parallel (per processor)	
Assignment	LPT1
Connector type	Header to DB-25 female

* Other Input/Output (per processor)

IDE hard disk drive	Header to 44-pin ribbon cable
Mouse	Header to PS/2-style Mini-DIN 6
Video	Header to DB-15 HD
Keyboard	Header to PS/2-style Mini-DIN 6

* Network Characteristics

Network interface	Built-in, ISA bus-based
Burst rate	1 Mbytes/second or 8 Mbps

* Standards Support and Third Party Applications

Novell NetWare® 3.11, 3.12, and 4.0	Yes
Co-exist with Ethernet®, ARCnet® & IBM Token Ring®	YES
MS-DOS® 5.x, 6.x and DR-DOS® 6.x	Yes
IBM OS/2 v 2.x	Yes
Microsoft Windows® 3.x	Yes
Dial-out interrupts 14 and 6B	Yes

* Utilities

QLVision	
Across LAN processor monitoring	Yes
Across LAN processor hard reset	Yes
Across LAN screen/keyboard redirection	
Text based	Yes
Graphics based	No
Historical activity logs	Yes
Connection time and date	Yes
Connection duration	Yes
User identification	Yes
File, screen, and hard copy output	Yes
Diagnostic packet analysis	Yes
CPR monitoring	Yes
Automatic response to lockup	Reset
Interval of checking for lockup	1-15 minutes

* Communications Processor Characteristics

Configurable automatic reset	Upon loss of DCD/DSR
Line busy	Integrated
Diagnostic LEDs	Rear bracket

* Power

Processor type Cx486SLC	
Rating (with coprocessor)	20.4 watts
Rating (without coprocessor)	19.4 watts
Requirements	
+5 VDC (with coprocessor)	3.7 amps maximum
+5 VDC (without coprocessor)	3.5 amps maximum
+12 VDC	0.08 amps maximum

Processor type	-12 VDC 80386SX	0.08 amps maximum
Rating (with coprocessor)		19.9 watts
Rating (without coprocessor)		18.9 watts
Requirements		
	+5 VDC (with coprocessor)	3.6 amps maximum
	+5 VDC (without coprocessor)	3.4 amps maximum
	+12 VDC	0.08 amps maximum
	-12 VDC	0.08 amps maximum

*** Environmental**

Operating temperature	0 - 400 C
Relative humidity	10 - 95% noncondensing
FCC Compliance	Class A

*** Warranty**

Parts and labor return-to-manufacturer	1 year
--	--------

QL 3222 I/O Connections

Connection of the I/O on the QL workstations varies with the enclosure in which the board is installed. The headers and connectors on the QL Series board should be connected to the device indicated for the appropriate enclosure in Table 9 - 1.

Table 9 - 1 QL 3222 I/O Connections

Figure 9-1 for header and connector locations.

Table 9 - 2 QL 3222 Monitor, Keyboard & Mouse Connectors

QL 3222 Installed In:>	J4 & J9 14-pin Header	J5 & J10 26-pin Header
Non-Cubix PC	N/A	Optional monitor, keyboard, and mouse adapter board
Cubix BOS	N/A	Mux or optional monitor, keyboard, and mouse adapter board
Cubix ERS	N/A*	Optional monitor, keyboard, and mouse adapter board
Cubix ERS II	N/A	Mux or optional monitor, keyboard, and mouse adapter board
Cubix ERS/FT	Unused mux monitor, keyboard, and mouse channel	Optional monitor, keyboard, and mouse adapter board
Cubix ERS/FT II	N/A	Mux or optional monitor, keyboard, and

Cubix MultiServ/FT	Unused mux monitor, keyboard, and mouse channel	mouse adapter board	Optional monitor, keyboard, and mouse adapter board
-----------------------	--	------------------------	--

* Do **not** connect the 14-pin J4 or J9 headers to the 14-pin connector on the Cubix ERS subsystem multiplexor.

QL 4222 Specifications

[Figure 9-2](#)

* Communication Processor

Processor type and speed	80486DX4 100 MHZ	80486DX2 50 MHZ
Number per board	2	
Co-processor	Included	
Hardware integer multiplier unit	Internal	
Internal cache size		
80486DX4	16 Kbytes	
80486DX2	8 Kbytes	

* Communications Memory Support

Total per processor	4, 8, 16, 32, or 64 Mbytes
Conventional memory	640 Kbytes [00000-9FFFF]
High memory	384 Kbytes [A0000-FFFFFF]
Extended memory	1-63 Mbytes [100000-3FFFFFFF]
Memory type	PS/2 style, 72-pin SIMMs
Number of SIMM sockets per processor	1
Access time (RAM speed)	70 nanoseconds
System and video BIOS ROM shadowing	Enabled

* Communications Video Support

Video controller	Cirrus GD5428
Video controller location	On-board
Modes supported (vertical x horizontal x color)	
11 Hexadecimal	640x480x2
12 Hexadecimal	640x480x16
13 Hexadecimal	320x200x256
58 Hexadecimal	800x600x16
5C Hexadecimal	800x600x256
5D Hexadecimal	1024x768x16
5F Hexadecimal	640x480x256
60 Hexadecimal	1024x768x256
62 Hexadecimal	640x480x32768
63 Hexadecimal	800x600x32768
64 Hexadecimal	640x480x65536
65 Hexadecimal	800x600x65536
66 Hexadecimal	640x480x32768
67 Hexadecimal	800x600x32768
6C Hexadecimal	1280x1024x16
71 Hexadecimal	640x480x16,800,000

* Communications Ports

Serial (per processor)	
Assignment	COM1, COM2
UART type	16C550
Buffering	16 byte, FIFO
Maximum transmission rate	115.2 Kbps
Connector type	
COM1	DB-9 male on rear bracket
COM2	Header to DB-9 male
Parallel (per processor)	
Assignment	LPT1

Connector type Header to DB-25 female

*** Other Input/Output (per processor)**

IDE hard disk drive	Header to 44-pin ribbon cable
Floppy disk drive	Header to 34-pin ribbon cable
Mouse	Header to PS/2-style Mini-DIN 6
Video	Header to DB-15 HD
Keyboard	Header to PS/2-style Mini-DIN 6

*** Network Characteristics**

Network interface	Built-in, ISA bus-based
Burst rate	4 Mbytes/second or 32 Mbps

*** Standards Support and Third Party Applications**

Novell NetWare® 3.11, 3.12, and 4.0	Yes
Co-exist with Ethernet®, ARCnet® & IBM Token Ring®	Yes
MS-DOS® 5.x, 6.x and DR-DOS® 6.x	Yes
IBM OS/2 v 2.x	Yes
Microsoft Windows® 3.x	Yes
Dial-out interrupts 14 and 6B	Yes

*** Utilities**

QLVision	
Across LAN processor monitoring	Yes
Across LAN processor hard reset	Yes
Across LAN screen/keyboard redirection	
Text based	Yes
Graphics based	No
Historical activity logs	Yes
Connection time and date	Yes
Connection duration	Yes
User identification	Yes
File, screen, and hard copy output	Yes
Diagnostic packet analysis	Yes
CPR monitoring	Yes
Automatic response to lockup	Reset
Interval of checking for lockup	1-15 minutes

*** Communications Processor Characteristics**

Configurable automatic reset	Upon loss of DCD/DSR
Line busy	Integrated
Diagnostic LEDs	Rear bracket

*** Power**

Processor type 80486DX4	
Rating	30.4 watts
Requirements	
+5 VDC	5.7 amps maximum
+12 VDC	0.08 amps maximum
-12 VDC	0.08 amps maximum
Processor type 80486DX2	
Rating	23.4 watts
Requirements	
+5 VDC	4.3 amps maximum
+12 VDC	0.08 amps maximum
-12 VDC	0.08 amps maximum

*** Environmental**

Operating temperature	0 - 400 C
Relative humidity	10 - 95% noncondensing
FCC Compliance	Class A

*** Warranty**

QL 4222 I/O Connections

Connection of the I/O on the QL workstations varies with the enclosure in which the board is installed. The headers and connectors on the QL Series board should be connected to the device indicated for the appropriate enclosure in Table 9 - 3.

Table 9 - 3 QL 4222 I/O Connections

Header/ Connector	Connector Description	Connect to:
*J1 44-pin header	Processor A IDE hard drive	2.5" IDE drive with 2mm pitch pins
J2 20-pin header	Processor A Parallel port (LPT1)	Optional LPT1 adapter board
J3 10-pin header	Processor A Serial port (COM2)	Optional COM2 adapter board
J5 26-pin header	Processor A Monitor, keyboard, and mouse	Refer to Table 9 - 4.
*J6 44-pin header	Processor B IDE hard drive	2.5" IDE drive with 2mm pitch pins
J7 20-pin header	Processor B Parallel port (LPT1)	Optional LPT1 adapter board
J8 10-pin header	Processor B Serial port (COM2)	Optional COM2 adapter board
J10 26-pin header	Processor B Monitor, keyboard, and mouse	Refer to Table 9 - 4
J11 2 RJ-11 connectors	Line busy connectors for both processors	Telephone cable
J12 DB-9 connector	Processor A COM1	Serial device
J15 DB-9 connector	Processor B COM1	Serial device
J16 34-pin header	Processor A Floppy drive	3.5" or 5.25" floppy drive
J17 34-pin header	Processor B Floppy drive	3.5" or 5.25" floppy drive

* Cubix provides an optional 44-pin to 40-pin plus power connector kit to enable the use of 3.5" IDE hard drives. Refer to [Figure 9-2](#) for header and connector locations.

Table 9 - 4 QL 4222 Monitor, Keyboard & Mouse Connectors

QL 3222 Installed In:	J5 & J10 26-pin Header
Non-Cubix PC	Optional monitor, keyboard, and mouse adapter board
Cubix BOS	Mux or optional monitor, keyboard, and mouse adapter board
Cubix ERS	Optional monitor, keyboard, and mouse adapter board
Cubix ERS II	Mux or optional monitor, keyboard, and mouse adapter board
Cubix ERS/FT	Optional monitor, keyboard, and mouse adapter board
Cubix ERS/FT II	Mux or optional monitor, keyboard, and mouse adapter board
Cubix MultiServ/FT	Optional monitor, keyboard, and mouse adapter board

Optional Connectors

In addition to the connectors available from the end bracket of the QL board, additional connectors may be installed for the QL workstations.

Because each QL board contains two complete workstations, and due to the limited space on the end bracket of an AT-style board, Cubix makes these optional connectors available by providing the signals required for each connector via a header on the top of the board. Cubix also supplies breakout kits which convert the signals on these headers to standard connectors. Each breakout kit contains an adapter board with the standard connector on one end and a connector on the other end which attaches via a cable to the header on the QL board. [Figure 9-3](#) illustrates the concept of adding optional parallel printer port connectors (LPT ports) to both workstations on a QL Series board. The available breakout kits include:

. LPT1 Breakout Kit - Adds one parallel printer connector (DB-25) to a QL workstation. Two kits are required per board to add LPT1 to each QL workstation on the board (refer to [Figure 9-3](#)).

. Monitor, Keyboard, and Mouse Breakout Kit - A single adapter board contains the standard connectors required to attach a monitor, keyboard, and mouse to a QL workstation. Two kits are required per board to add support for these devices to each QL workstation on the board.

. COM2 Breakout Kit - Adds one serial connector (DB-9) to a QL workstation. Two kits are required per board to add COM2 to each QL workstation on the board.

. 3.5" IDE Adapter and Cable Kit - Enables 3.5" IDE hard drive support (2.5" mini drive support is integrated in the QL products and requires no breakout kit) on a QL workstation. Each kit converts one 2.5" drive header into a 3.5" drive connector. Two kits are required per board to add 3.5" drive support to each QL workstation on the board.

[Figure 9-3](#)

If there are empty slots in the system containing the QL boards, the standard connector on the adapter board may be installed in the end bracket space for this slot. A bracket is provided for this purpose.

If no slots are available and the QL board is installed in a Cubix subsystem, the standard connector on the adapter board may be installed using an auxiliary junction panel as described in the subsystem documentation.

Regardless of where the adapter board will be located, the installation procedures are the same. Refer to [Figure 9-1](#) and [Figure 9-2](#) to determine the location of the header required to connect any desired optional connectors. Then follow the optional connector installation instructions in the next section.

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