



NetROM™

Drivers & Utilities User's Guide

P/N 924-07000-00



Applied Microsystems Corporation



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P/N 924-07000-00

December 1995

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Preface

This guide lists the contents of the Drivers & Utilities diskette, gives general information about the four host utility programs, and explains how to install and use NetROM for Windows. The target-side driver source code is described in Chapter 7 of the *NetROM User's Manual*.

Documentation overview

This guide is organized into the following chapters:

Chapter 1, "Diskette Contents," lists the files on the Drivers & Utilities diskette for both UNIX and PC.

Chapter 2, "Host-system Utility Programs," is a guide to the four host utility programs: *upload*, *download*, *rompack*, and *ieeeparse*.

Chapter 3, "NetROM for Windows," is a guide to installing and using NetROM with Microsoft Windows.

Documentation conventions

This manual uses the following conventions:

- Book titles, emphasized words, command names, and keywords are in *italics*.
- Command parameters are in **boldface**.
- Computer programs are in constant-spaced font.
- Environment variable names are in “quotation marks.”
- Items that are optional are enclosed in [square braces].
- Items that are mutually exclusive are separated by a vertical bar |.
- Mutually exclusive items, one of which is mandatory, are enclosed in {braces}.

Warnings, cautions, notes

Warning



Warning messages appear before procedures and alert you to the danger of personal injury which may result unless certain precautions are observed.

Caution



Caution messages appear before procedures and indicate that damage may be done to the emulator or to your target system unless certain steps are observed.

Note



Notes indicate important information for the proper operation and installation of your emulator.

Support Services

Applied Microsystems provides a full range of support services. New software is covered by a 90-day warranty that includes full applications phone support. Additional support agreements are available to extend the initial warranty and to provide additional services.

If you have trouble installing or using your software, consult your manuals to verify that you are following the correct procedures.

If the problem persists, call Customer Support. Customers outside the United States should contact their sales representative or local Applied Microsystems office. When you contact Customer Support, have your serial number available.

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Chapter 1

Diskette Contents

The NetROM Drivers & Utilities diskette is organized into two top-level directories: *unix/* and *pc/*. These directories are further organized into *target* and *host* subdirectories. The source files in the *unix/target* and the *unix/host* subdirectories are identical to the *pc/target* and *pc/host* subdirectories except that each follows their respective UNIX or PC text-file conventions. The *pc/* directory contains a third subdirectory, *nrwin/*, which contains the NetROM for Windows files.

The utilities supplied in this distribution have been tested successfully in several environments. The utilities are unsupported software, however, and Applied Microsystems will log bug reports and make fixes as time allows.

This chapter lists the files in each directory and subdirectory on the diskette.

UNIX directory structure and files

<i>unix/</i>		UNIX files
	<i>target/</i>	Target code for dualport protocols
		<i>dptarget.c</i>
		<i>dptarget.h</i>
		<i>dualport.h</i>
		<i>dpconfig.h</i>
	<i>host/</i>	Source code for host utilities
		<i>download.c</i>
		<i>upload.c</i>
		<i>rompack.c</i>
		<i>ieeeparse.c</i>

PC directory structure and files

<i>pc/</i>		DOS and Windows files
	<i>target/</i>	Target code for dualport protocols
		<i>dptarget.c</i>
		<i>dptarget.h</i>
		<i>dualport.h</i>
		<i>dpconfig.h</i>
	<i>host/</i>	Source code for host utilities
		<i>download.c</i>
		<i>upload.c</i>
		<i>rompack.c</i>
		<i>ieeeparse.c</i>
	<i>nrwin/</i>	NetROM for Windows
		<i>nrfiles/</i>
		<i>download.ex_</i> Download utility
		<i>notify.ex_</i> Notify daemon
		<i>nrcom.drv</i> Com driver
		<i>nrdiag.ex</i> Test program
		<i>bc402rtl.dl_</i>
		<i>bids402.dl_</i>
		<i>nrconf.ex_</i>
		<i>owl202.ex_</i>
		<i>netromw.in_</i>
		<i>netromw.mst</i>
		<i>msshlstf.dll</i>
		<i>testdrv.hlp</i>
		<i>setupapi.inc</i>
		<i>netromw.inf</i>
		<i>setup.exe</i>
		<i>setup.lst</i>
		<i>msuilstf.dll</i>
		<i>msshared.inc</i>
		<i>msregdb.inc</i>
		<i>msinsstf.dll</i>

msdetect.inc
_mstest.exe
msdetstf.dll
mscuistf.dll
mscomstf.dll

Chapter 2

Host-system Utility Programs

The utility programs *upload*, *download*, *rompack*, and *ieeeparse* simplify interfacing to NetROM for some users. The *upload* and *download* programs are file transfer utilities that open a TCP connection to the NetROM. The *rompack* and *ieeeparse* programs are file-format conversion utilities. These programs, supplied as C source files on the distribution diskette, are written for UNIX systems and have been compiled and run on Sun workstations.

The utility programs are unsupported software; that is, porting these files to new platforms is the user's responsibility.

Program functions

Function	Description
<i>upload</i>	Opens a TCP connection on the NetROM unit and uploads the contents of emulation memory to a file on the host machine.
<i>download</i>	Opens a TCP connection on the NetROM unit and sends a file from the host machine to emulation memory.
<i>rompack</i>	Converts S-record or Intelhex files to binary. This allows NetROM users to convert large hex record files into smaller binary files. Binary files can be downloaded more quickly than hex files, both because they are smaller and because they require less per-record processing by the NetROM unit.

Function	Description
ieeeparse	<p>Converts IEEE 695 object format files to binary. If your cross-development tools generate only IEEE 695 files, you will need to convert to binary before downloading to NetROM. This program has only been used with the Microtec linker's output. The invocation line for this program is similar to that for <i>rompack</i>.</p> <p>Note: <i>upload</i> and <i>download</i> have been modified to print the status of data transfers from the control socket. When invoked without arguments, all of these programs provide a help summary that describes how to use them. Note that the <i>base</i> and <i>offset</i> arguments required by <i>rompack</i> are the same as those specified with the <i>newimage</i> command on the NetROM; consult your <i>NetROM User's Manual</i> for details.</p>

Chapter 3

NetROM for Windows

NetROM for Windows allows you to convert and use any of the Windows serial communications (COM) ports for a network connection to NetROM, when running a Windows-compliant TCP/IP protocol stack. This makes it possible for developers in PC environments to have their debuggers network-connected to NetROM, a capability not generally available for PCs.

NetROM for Windows also includes a utility that downloads code into NetROM for users who either have no TFTP server or who need a faster download speed.

NetROM for Windows does not include the *rompack* utility for converting S-record or Intelhex files to binary nor the *ieeeparse* utility to convert IEEE 695 object format files to binary. PC users who need these utilities must port the C source code to DOS or Windows.

NetROM for Windows is unsupported software. The utilities have been tested successfully in several environments, and Applied Microsystems will log bug reports and make fixes as time allows.

Installing NetROM for Windows

Requirements

Your PC environment must have the following system requirements to run NetROM for Windows:

- ❑ MS-Windows 3.1 running 386 Enhanced Mode.
- ❑ 2.3 MB of hard disk space with 1 MB for use as scratch space during installation.
- ❑ Version 1.1 of Windows Sockets.
- ❑ Ethernet adapter card.
- ❑ Windows-compliant TCP/IP protocol stack.

Files

All the files necessary to implement NetROM for Windows are on the Drivers & Utilities distribution diskette you received with your NetROM product. They are located in the directory `pc/nrwin/`. The filenames are listed in Chapter 1, "Diskette Contents."

Installation procedure

- **To install NetROM for Windows**
 1. Insert the installation disk into a floppy disk drive.
 2. Start up Windows 3.1.
 3. Run the program setup (`b:\pc\nrwin\setup.exe`) from the Run option from the File pulldown menu of the Program Manager.
 4. Follow the setup message windows to complete the installation.

Using the NetROM for Windows Download utility

The NetROM for Windows Download utility has two primary uses:

- ❑ To make downloading files to NetROM speedier by using TCP.
- ❑ To provide a way to download files to NetROM when your Windows TCP/IP software does not include a TFTP server, which is a requirement of the NetROM newimage and batch commands.

Operation

The Download utility opens a TCP connection and sends the file you specify to NetROM. To use the utility, fill in the required fields in the upper part of the window and press the Download button. The program displays the progress of the download in the lower right of the window. A dialog box announces either successful completion or an error in the download. The required fields are as follows:

NetROM IP Address	Enter IP address in dotted-decimal format.
Image File Name	Enter the name of the file to download. The Browse button allows you to search for the proper directory and find the file you want.
Download File Type	Select from the Binary, Srecord or Intelhex radio buttons.

The following fields are optional and normally left blank:

Base	To override the NetROM groupaddr environment variable, enter a hex value here.
Fill pattern	To fill NetROM emulation memory with a particular data value before downloading your file, enter a hex value between 0 and ff. If this field is blank, NetROM does not initialize emulation memory before downloading. If fill pattern is set, there will be a delay at the start of each download.
Offset	To load your file at an offset from the groupaddr or base address, enter a hex value here.
Podgroup	If you have defined multiple podgroups and wish to load to one that is not the default, enter the group number here.

Saving your setup

To save all the values entered, use the Save option under the File pulldown menu. The next time you run the program, use the Open option under the File pulldown menu to load the saved setup.

Configuring the Windows COM ports

To specify how each COM port will be configured either as a serial port or as a port for communicating with a NetROM, use the NetROM for Windows Configuration utility. Each COM port must be configured according to the following procedure:

Note



It is preferable to specify a physically unused COM port.

➤ **To use a COM port as a serial port**

- ❑ Check the Enable Serial check box.

Checking the Enable Serial check box for COM port causes the values for the NetROM IP Address and debugport to be ignored.

➤ **To use a COM port to communicate with a NetROM**

1. Specify the NetROM IP Address and the value of debugport set on the NetROM.
2. Uncheck the Enable Serial check box. (When the Enable Serial check box for COM port is checked, the values for the NetROM IP Address and debugport are ignored.)
3. Check the Restart Windows After Quitting check box to reboot Windows. (You must restart Windows to use a new configuration.)
4. Click OK to save the configuration and reboot Windows.

—Or—

Click CANCEL to exit the utility without saving the configuration.

Diagnosing system setup

The NetROM for Windows Diagnostics utility is used to diagnose problems with your system setup. The Diagnostics utility attempts to open each port you specify. The results of each open are displayed. See “Miscellaneous troubleshooting” on page 3-10 for the meaning of each message and the possible causes of each error.

➤ **To run the Diagnostics utility**

1. Double click on the NetROM for Windows Diagnostics icon.
2. Check the box of each port you want to test.

Only the ports not already selected for serial operation can be selected.

3. Click the Test button when you are ready to test the ports.

The application will now test each port you selected and display the test results. Each passed test means the communications port was opened successfully.

4. Click on the Done button to exit the diagnostics application.

The following table shows the name of each port and possible causes for a failure to open. The mnemonics displayed for the NetROM for Windows product are the same as those used in the Windows 3.1 API and Windows Sockets specification, in addition to extensions made by Applied Microsystems.

Port	Cause of failure to open
IE_BADID	Windows did not recognize the communications port ID as valid. The probable cause is the symbol MaxCOMPort in the file system.ini does not have the correct value. The value of MaxCOMPort should be 9.
IE_OPEN	Port is already open. It is likely that another application is using the port.
IE_MEMORY	System could not allocate transmit or receive queues. The system may be low on free memory, or the specified size for the transmit or receive queue is too large.
IE_HARDWARE	Communications port under test may be in use; e.g., used for mouse input.
IE_NOPEN	Failed for a reason not specified in the Windows 3.1 API Manual.
NR_LOADDLL_ERROR	Driver could not load winsock.dll. Make sure this file is located in a directory specified in the systems PATH environment variable.
WSAECONNREFUSED	NetROM refused the connection. Another application may have a socket connected on the specified port. Execute the command netstat on the NetROM to report all the connected sockets in the NetROM.
WSAEINPROGRESS	Blocking Windows Sockets call is in progress. Windows Sockets is busy servicing another application. The other application must complete its blocking call before you can use this port.
WSAEISCONN	Socket is already connected.
WSAEMFILE	No more file descriptors are available.

Port	Cause of failure to open
WSAENETDOWN	Network is down. Check the status of your network.
WSAENETUNREACH	Network cannot be reached from this host at this time.
WSAENOBUFS	Not enough buffers are available. There are too many Windows Sockets connections. Close unneeded applications using Windows Sockets to free up buffers needed for NetROM operation.
WSAETIMEDOUT	Connection attempted timed out without establishing a connection. NetROM is not responding. This could be because it is turned off, not on the network, or the Internet Protocol (IP) address specified in the NetROM for Windows configuration is incorrect.
WSAEWOULDBLOCK	Connection cannot be completed immediately. Try again later.
WSAVERNOTSUPPORTED	winsock.dll version on your system is out of date. NetROM for Windows requires version 1.1 of Windows Sockets.

NetROM Notification Daemon

The NetROM Notification Daemon is a program that must be running in the background when an application communicates with a NetROM using the Windows Communications API function `EnableNotifications()`. It does not need to run if the application communicating with the NetROM through a Windows COM port does not use `EnableNotifications()`. If you are not sure, assume your application does not use `EnableNotifications()`. If you have problems, try using it.

To configure COM port use, run the NetROM Configuration utility, then restart Windows before starting the notification daemon. To activate the notification daemon, double click on the NetROM Notification Daemon. You can then minimize the window or change to another application.

- **To run the daemon automatically and minimized upon booting up Windows**
 1. Click on the NetROM Notification Daemon icon in the NetROM for Windows workgroup.
 2. Duplicate the program item using the Copy option from the Program Manager's File pulldown menu.
 3. Move the copied program item to the StartUp workgroup.
 4. Click on the NetROM Notification Daemon icon in the StartUp workgroup.
 5. Execute the Properties option from the Program Manager's File pulldown menu.
 6. Check the Run Minimized check box.
 7. Click OK.

Miscellaneous troubleshooting

The following are some possible operational problems, their symptoms, and solutions:

Error	Solution
The application will not communicate with NetROM.	<p>NetROM is off or the Ethernet cable is not plugged in. Power the NetROM or plug in the Ethernet.</p> <p>The communications driver is not configured properly. Run the NetROM Configuration utility and configure the COM port with the IP address of the NetROM and the debugport of the NetROM. Then restart Windows.</p> <p>The application is not configured properly. Reconfigure the application to use the correct COM port.</p> <p>The application uses EnableNotifications(). Run the NetROM Notification Daemon.</p> <p>When using Distinct TCP/IP software, you may have to PING or start the TFTP server to start the driver before using the NetROM utilities.</p> <p>If the above fails to resolve the problem, run NetROM for Windows Diagnostics on the port. This program will give you more information about the cause of the problems.</p>
Windows displays a message that it cannot load winsock.dll.	Install Windows Sockets on your system and be sure the file winsock.dll is in a directory on your PATH.



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Part No.	Revision History	Date
924-07000-00	Reformatted NetROM documentation to AMC standard.	12/95