Motorola Firmware for PowerPC™ User's Guide

Release 3.05

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Preface

The *Motorola Firmware for PowerPC User's Guide* is designed to complement Motorola Firmware's user-friendly interface by describing each task and providing details on circumstances under which particular tasks are necessary. This guide also provides information on the Motorola Firmware utilities, and lists supported peripheral devices.

This manual includes the following chapters:

Chapter 1 provides an overview of Motorola Firmware.

Chapter 2 provides an overview of the Motorola Firmware user interface and shows functional group organization.

Chapter 3 describes user-accessible functionality, such as booting an operating system and setting the boot password.

Chapter 4 discusses how to administer the system using Motorola Firmware. The procedures described in this section should only be used by system administrators or similarly qualified personnel.

Chapter 5, describes the Motorola Firmware FDOS utility and lists commands.

Chapter 6 provides system administrators with firmware installation instructions.

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Introduction to Motorola PowerPC Firmware 1

Overview

Firmware, as the term suggests, has attributes of both hardware and software. As a hardware component, firmware is the part installed in each hardware platform that identifies and checks system board components to ensure that the manufactured system is functional and ready for use. In its software role, firmware provides a method for describing the hardware platform to an operating system (OS) so that the OS can make full use of each hardware component and feature.

Motorola Firmware allows you to perform a variety of tasks on your PowerPC system. These tasks range from performing system setup and additional hardware installation before booting an operating system to booting one of the three currently supported operating systems.

Supported Standards

Hardware and software standards are supported in Motorola Firmware as a response to innovations in systems, add-on cards, and operating system software. Motorola Firmware supports the following major hardware and software specifications:

- PowerPC Reference Platform (PR*P) Specification

  The PR*P specification, introduced by the Apple-IBM-Motorola (AIM) Alliance, describes the standards for PowerPC hardware platforms. Operating systems currently adhering to the PR*P specification include IBM AIX®.

- Windows NT Portable Boot Loader Specification

  The Windows NT Portable Boot Loader specification describes the requirements for booting the Microsoft

Windows NT operating system on all RISC computing platforms.

Motorola Firmware Features

Motorola Firmware provides a wide range of features from hardware and peripheral support to unique utilities and OS-specific installation assistance. Specific features include:

- Support for PowerPC 603, 603e,603ev, 604 and 604e microprocessors
- 486 real-mode emulation for video option ROM (int10 support)
- Core logic, library and porting source, including chipset, port and platform modules
- Power On Self-Tests (POST)
- 60% ROM image compression
- FDOS command interpreter shell utility
- Convenient window-based user interface
- Full implementation of the Windows NT Portable Boot Loader Specification
- Full implementation of PR*P v1.1 conventional firmware, including residual data, nonvolatile random access memory (NVRAM), and OS booting
- Installation support to create and format FAT (File Allocation Table) partitions, and to create and populate PR*P partitions
- Windows NT boot and installation
- Windows NT setup user interface
- IBM AIX boot and installation

Supported Operating Systems

Motorola Firmware currently supports and boots the following operating systems:

- Microsoft Windows NT
- IBM AIX

Supported Computer Systems

Motorola Firmware is supported on the following PowerStackII products:

- PowerStackII Pro4000/166 and 4000/200
- PowerStackII Net4000/166 and 4000/200
- PowerStackII Pro2000/200 and 3000/200
- Series E and Series EX
- RISC PC and RISC PC+

Supported Peripherals

Motorola Firmware supports the following peripherals:

Peripheral	Description and Capacity
Hard Drives	2Gb, 4Gb, 9Gb
CD-ROM	600 Mb
Floppy Drive	1.44 Mb 3.5” AT

Conventions

Unless otherwise noted, command syntax and code examples use the following.

Case	Commands and reserved words typically appear in uppercase letters. Unless the manual states otherwise, you can enter these items using uppercase, lowercase, or both. For example, you can type MYPROG, myprog, or MYprog.
variable	Words appearing in italics are variables that you must replace with appropriate values, as in *filename*.
`output`	Words appearing in the courier font represent output.
input	Words formatted as bold represent commands to be input.
[ ]	Square brackets enclose optional information, as in [*option*]. If information is not enclosed in square brackets, it is required.
|	A vertical bar indicates an “either-or” choice of information to enter, as in the command: `echo [[.]|[on]|[off]|[message]]`

User Interface Diagram and Key Usage Definitions

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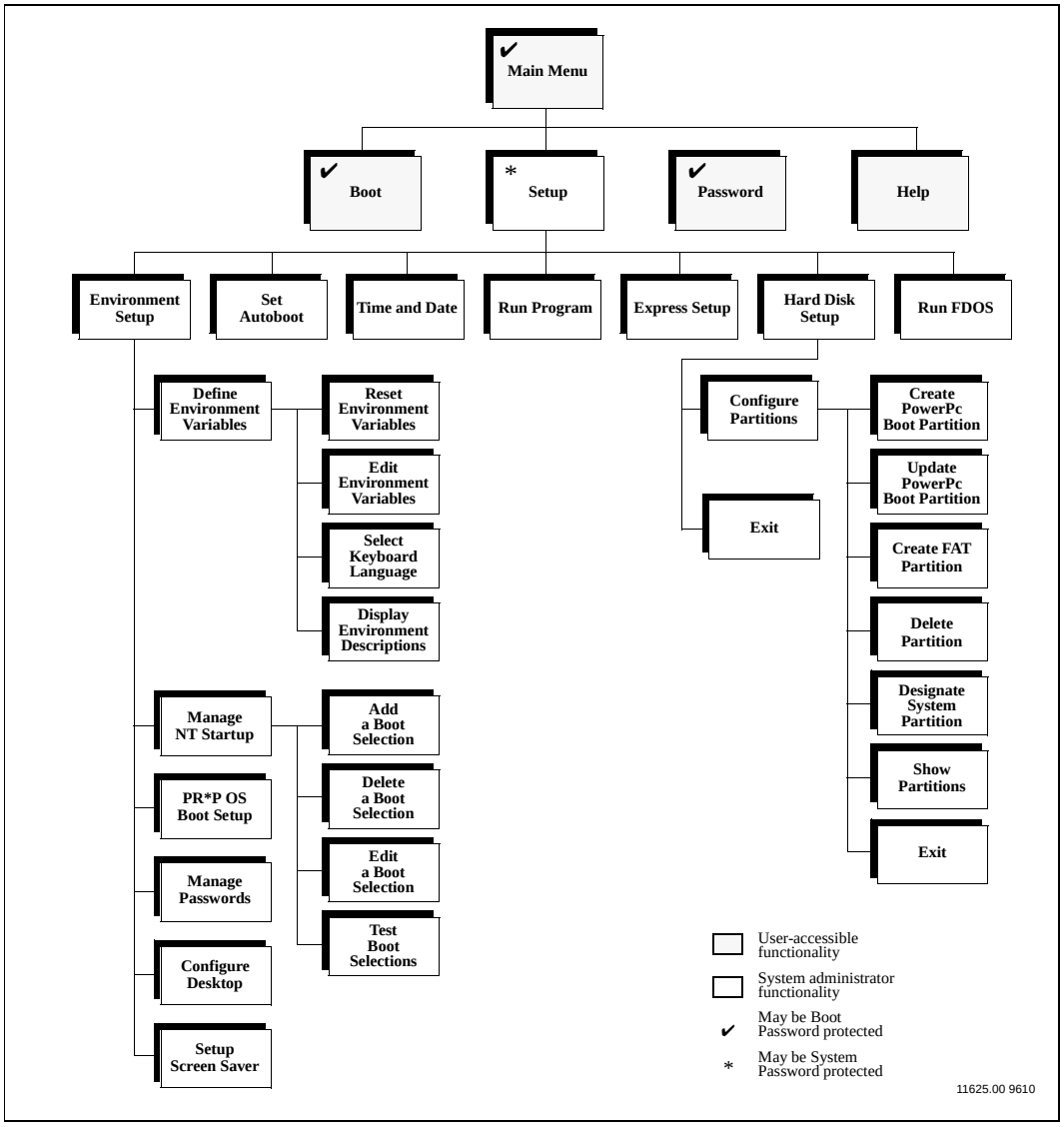

Figure 2-1. User Interface Hierarchy

Table 2-1 describes key usage definitions as they relate to user-interface navigation and data entry. The mouse can also be used to select the active region within a dialog box or select an item within a list box.

Table 2-1. Command Line Keystrokes

Key	Usage
<ENTER>	In Menus: Invokes the selected menu or action. In Data Entry: Saves and terminates data entry from the keyboard.
<ESC>	Escape from the current menu to the parent menu
Backspace	In Menus: Not applicable. In Data Entry: Deletes the character before the current cursor position.
Delete	In Menus: Not applicable. In Data Entry: Deletes the character at the current cursor position.
Insert	In Menus: Not applicable. In Data Entry: Toggles insert mode. Insert mode is indicated by a black cursor. Overtype mode is indicated by a white cursor.
Up Arrow	In Menus: Rotates the highlighted menu selection up one position; if the current menu item is on the top and **`Up Arrow`** is pressed, the bottom menu item will be highlighted. In Data Entry: Moves the cursor to the beginning of the current field. If the cursor is already at the beginning of the field, pressing the **`Up Arrow`** moves the cursor to the previous field.

Key	Usage
Down Arrow	In Menus: Rotates the highlighted menu selection down one position; if the current menu item is on the bottom and **Down Arrow** is pressed, the top menu item will be highlighted. In Data Entry: Moves the cursor to the end of the current field. If the cursor is already at the end of the field, pressing the **Down Arrow** moves the cursor to the next field.
Left Arrow	In Menus: Collapses submenus. In Data Entry: Used to nondestructively move the cursor one position to the left during data entry.
Right Arrow	In Menus: Expands submenus. In Data Entry: Used to nondestructively move the cursor one position to the right during data entry.
Tab	In Menus: Not applicable. In Data Entry: Not applicable. In Dialog Boxes: Move to the next field in the box.

Mouse Operation

Moving the mouse over a menu or submenu item causes the menu highlight bar to change position. Movement of the mouse occasionally interferes with keyboard input. For example, if the mouse is in motion while the keyboard is being used for menu navigation, submenus may not be displayed correctly.

Action	Description
Right Click	No action.
Left Click	Invokes the selected menu item or action.
Middle Click	No action.

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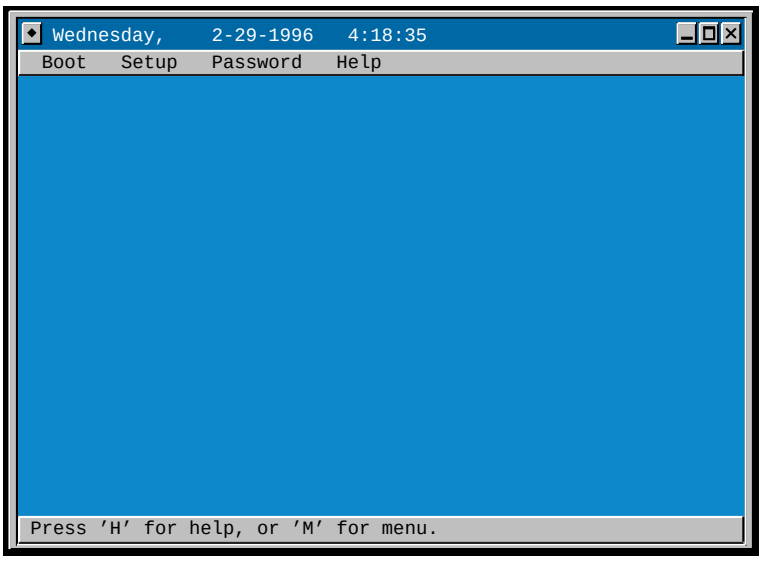
Using Motorola Firmware 3

When you power on your PowerPC system, the firmware initializes the hardware and performs Power-On Self Test (POST) routines. The POST routine failures are displayed in the DEBUG window. When the POST routines have completed, the DEBUG window is automatically minimized and the Motorola Firmware window is restored.



The following sections describe the menu choices **Boot**, **Password**, and **Help**. The **Setup** menu should be accessible *only* to the System Administrator or similarly qualified personnel. For more information on system administration functionality, see *System Setup* on page 4-1.

Booting an Operating System

Motorola Firmware allows you to choose a specific operating system each time you start your computer. To boot any operating system that is currently installed on the system:

1. In the Motorola Firmware window, pull down the **Boot** menu to display a list of properly installed operating systems.
2. Click on the operating system you wish to boot.

Motorola Firmware also allows you to boot PR*P-compatible operating systems from floppy or CD-ROM drives. To do so, select the appropriate device from the **Boot** menu.

To install an operating system on the system, contact your system administrator.

Managing Boot Passwords

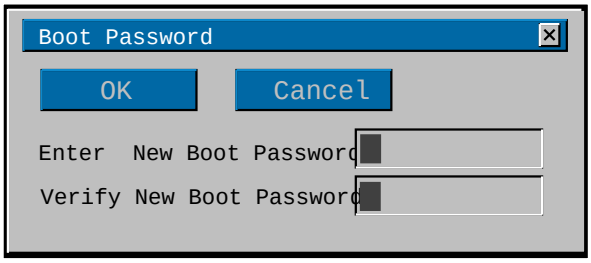
Motorola Firmware provides password protection to secure your system against unauthorized access and tampering. Two levels of password protection allow customized security:

- *Boot Password protection* prevents unauthorized access to your system by requiring a password to boot an operating system. The Boot Password must be enabled by the system administrator. The password is set by the user or the system administrator.
- *System Password protection* prevents unauthorized access to your system configuration through the firmware. The System Password is set by the system administrator. For information on setting a System Password, see *Managing Boot and System Passwords* on page 4-17.

Passwords are limited to 8 characters. Valid characters include all alpha-numeric characters, !, @, #, $, %, ^, &, *, (,), -, +, _, =, {, }, [,], \, :, ;, ″, ′, and SPACE. Characters entered for the password are displayed on screen as a string of asterisks (for example, ********).

From the Motorola Firmware menu, you can set or change a boot password as follows:

1. Select **Password** from the menu bar in the Motorola Firmware window. The following dialog box is displayed:



2. In the **Boot Password** dialog box, enter and confirm the new boot password.
3. Click **OK** when you are finished, or **Cancel** to dismiss the dialog box without changing the boot password.

Note The boot password must be enabled by the system administrator as described in *Managing Boot and System Passwords* on page 4-17.

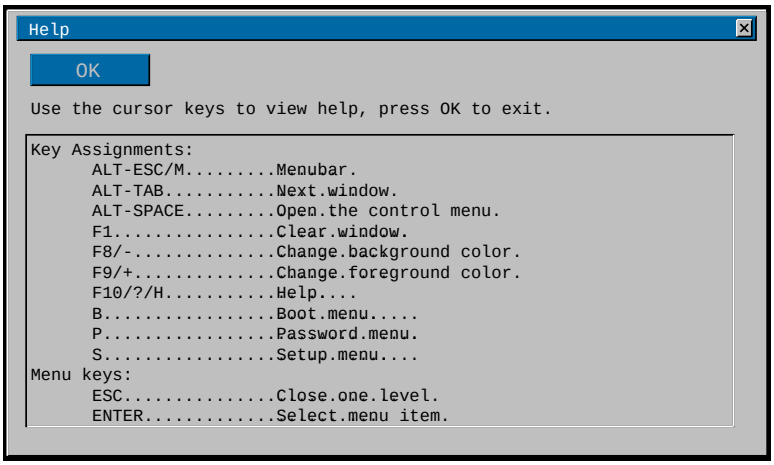
Getting Help

The **Help** menu allows you to access information about keyboard shortcuts and environment variable default values.

Keyboard Shortcuts

A list of keyboard shortcuts is provided in the Motorola Firmware **Help** dialog box. To access the **Help** dialog box:

1. From the **Help** menu in the Motorola Firmware window, select **Keyboard**. Motorola Firmware brings up the following dialog box:



2. Use the arrow keys to scroll through the help menu.
3. Click **OK** when you are finished.

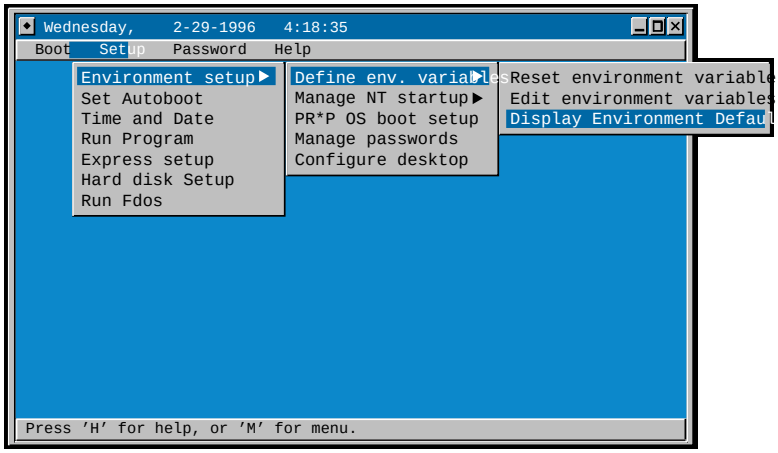
Environment Variable Defaults

The **Display Environment Defaults** dialog box provides a brief description of each environment variable and indicates how it is treated when it is reset.

To access the **Display Environment Defaults** dialog box:

1. From the **Help** menu in the Motorola Firmware window, select **Display Environment Defaults**.

   Motorola Firmware brings up the following dialog box:



2. Use the arrow keys or mouse to select an environment variable category from the categories list box.
3. Use the arrow keys or mouse to select an environment variable.
4. Click **OK** when you are finished.

The **Reset Action** field of the dialog box indicates how the selected environment variable is treated when it is reset to its default value. Possible values for this field are:

Normal	If the environment variable exists, reset it to its default value. If it does not exist, do not create it.
Default	If the environment variable exists, reset it to its default value. If it does not exist, create it and set it to its default value.

Some combinations of environment variables may prevent the system from booting. If there is a fatal error during system boot, the firmware tries to recover by resetting some environment variables to their default values. The **Last Boot Fail Action** field of the dialog box indicates how the selected environment variable is treated following a boot failure.

Possible values for this field are:

None	Do not change the environment variable.
Default Value	Reset the environment variable to its default value.
Delete	If the environment variable exists, delete it.

The reset action and last boot fail action are both stored ROM. They cannot be changed through the firmware.

EDO Memory Configuration

For the Pro2000/200 and Pro3000/200 systems supporting EDO, Motorola Firmware must be configured to use the timing values for EDO memory. The default state of the **EDODRAM** environment variable is set to *true*.

To verify or set the EDODRAM environment variable:

1. From the **Environment Setup** menu, select **Define env. Variables,** then select **Edit Environment Variables**.

   Motorola Firmware displays a dialog box.

2. Click on the **Add** button.

3. Use the TAB key or mouse to select the name field, type in **EDODRAM**.
4. Use the TAB key or mouse to select the value field, set the value to **Y** (*true*) or **N** (*false*).
5. Click on the **Save** button.
6. Click on the **Exit** button.
7. Reset the system to use the new value.

If nonEDO memory is added, refer to the *System Installation Guide.*

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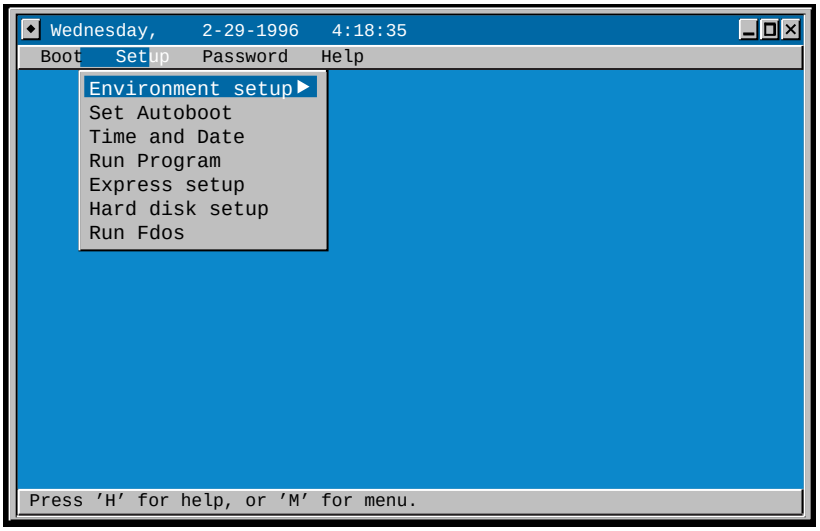
System Setup 4

Motorola Firmware allows you to perform a variety of administrative tasks before booting an operating system. System Setup functionality should be reserved for use *only* by system administrators or similarly qualified personnel.

Warning

Improper use of these system administrator functions can render the system unusable.

These system administrator functions are grouped under the **Setup** menu.



When you select **Setup**, Motorola Firmware prompts you for a System Password if one has been set for the system. If no System Password has been set, you may set one using the **Manage Passwords** function under the **Environment Setup** submenu. For details, see *Managing Boot and System Passwords* on page 4-17.

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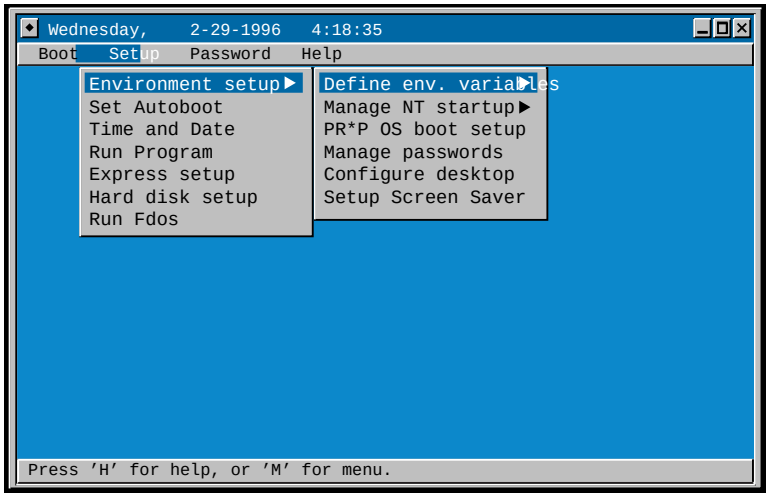
Environment Setup

If you have not already installed an operating system on your computer, or if you wish to install another operating system, you can use Motorola Firmware to properly set up the environment for each operating system. The functionality for setting up the environment is grouped under the **Environment Setup** menu, shown below.



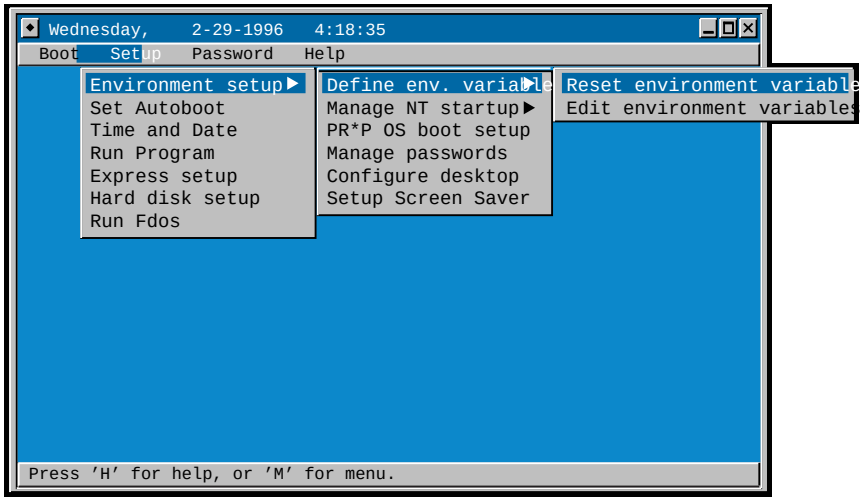
The following sections describe how to:

- Set and change environment variables
- Manage Windows NT startup and boot selections

- Manage boot selections for PR*P-compliant operating systems
- Manage password protection
- Configure the desktop
- Set up the screen saver

Environment Variables

The following sections describe how to use Motorola Firmware to reset environment variables to their default values, edit existing environment variables, and create new ones. The functionality required for these actions is grouped under the **Define env. Variables** menu option shown below.



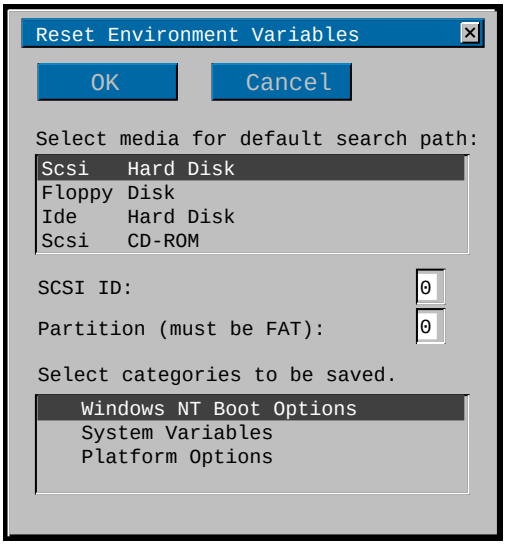
Resetting the Default Environment

Note The **Reset Environment Variables** menu option clears all current environment variables, not just the variables that you redefine.

To reset environment variables to their default values:

1. From the **Environment Setup** menu, select **Define env. Variables**, then **Reset Environment Variables**.
2. Motorola Firmware prompts you for information to initialize the default search path used for loading and executing firmware utility programs.

   The following dialog box is displayed. Use the mouse or the arrow keys to select a device from the list presented.



Depending on the device selected, you will be prompted for one of the following sets of information:

```
SCSI Hard Disk
       SCSI ID:
       Partition (must be FAT):

Floppy Disk
       Drive (0/1):

IDE Hard Disk
       Drive (pri. = 0/1, sec. = 2/3):

       Partition (must be FAT):

SCSI CD-ROM
       SCSI ID:

ATAPI CD-ROM
       Drive (pri. = 0/1, sec. = 2/3):
```

3. Enter the correct information for the device selected.
4. Motorola Firmware gives you the option of saving sets of environment variables. To save a set of environment variables, click on its name in the category list box. A check mark appears next to the name of each set which will be saved. To determine which variables comprise each set, see *Environment Variable Defaults* on page 3-5.
5. Click **OK** when you are finished.

Editing and Creating Environment Variables

If you wish to edit or add to the system environment variables without completely resetting all variables, use the **Edit Environment Variables** menu option as described in the next two sections.

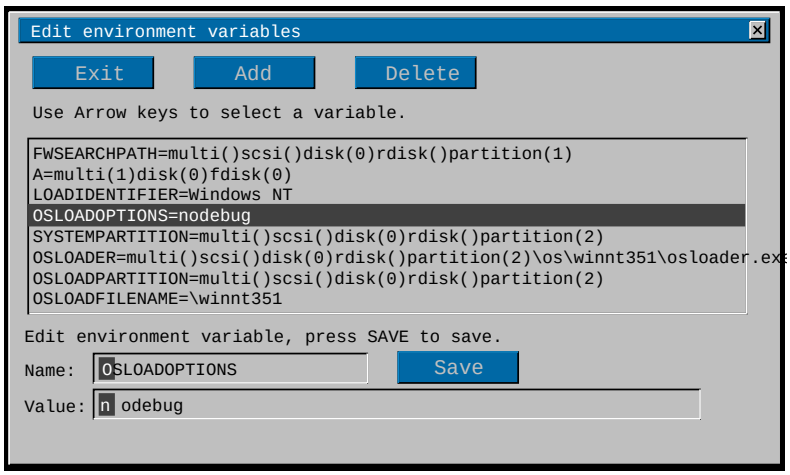
The **Edit Environment Variables** dialog box cannot be used to edit environment variables with values greater than 255 characters in length. When several Windows NT boot selections are present on the same machine, for example five boot selections, the firmware automatically appends information to the OSLOADER environment variable until it exceeds this length.

If you are working with many Windows NT boot selections, use the **Edit a Boot Selection** dialog box to edit Windows NT boot variables.

Editing Environment Variables

To edit your system environment variables:

1. From the **Environment Setup** menu, select **Define env. Variables**, then **Edit Environment Variables**.
2. Motorola Firmware displays the following dialog box:



3. Use the TAB key or the mouse to select the active field in the dialog box. Use the arrow keys to select the environment variable to be edited, then modify the value field and click on **Save**. Proceed to the next environment variable to be edited.
4. Click **Exit** when you are finished.

Uses of the Arrow keys and the Delete, Tab, and Backspace keys are listed in Table 2-1 on page 2-2.

Creating Environment Variables

To create a new environment variable:

1. From the **Environment Setup** menu, select **Define env. Variables**, then **Edit Environment Variables**.

2. Motorola Firmware displays the same dialog box shown in *Editing Environment Variables* on page 4-6
3. Click **Add** to clear the name and value fields.
4. Enter a name and value for the new environment variable and click on **Save**. Motorola Firmware adds the name and value of the new environment variable to the list of current variables.
5. Click **Exit** when you are finished.

Deleting Environment Variables

To delete an environment variable:

1. From the **Environment Setup** menu, select **Define env. Variables**, then **Edit Environment Variables**.
2. Motorola Firmware displays the same dialog box shown in *Editing Environment Variables* on page 4-6.
3. Use the arrow keys to select an environment variable from the list.
4. Click **Delete**.
5. Click **OK** when you are finished.

International Keyboard Selection

Motorola Firmware provides support for the United States, Kanji, and some European style keyboards.

To modify the international keyboard:

1. From the **Setup menu**, select **Environment Setup**, then **Define env. Variables**.
2. Choose **Select keyboard language**.
   Motorola Firmware displays a list of available languages.
3. Use the arrow key or mouse to select the desired language.

4. Click on **OK.**
5. You are then prompted to reset the system so the new variable takes effect. Click on **Yes**.

The system automatically resets and that country's keyboard is immediately activated. It remains as the set variable whenever the system is powered up.

Display Environment Descriptions

To view an environment variable description:

1. From the **Environment Setup** menu, select **Define env. Variables**, then **Display Environment Description**.

   Motorola Firmware displays a list of the following categories: **Windows NT Boot Options, System Variables**, and **Platform Options**.

2. Use the arrow key or mouse to select the appropriate category.

   The lower window displays a list of the environment variables and descriptions for that selection.

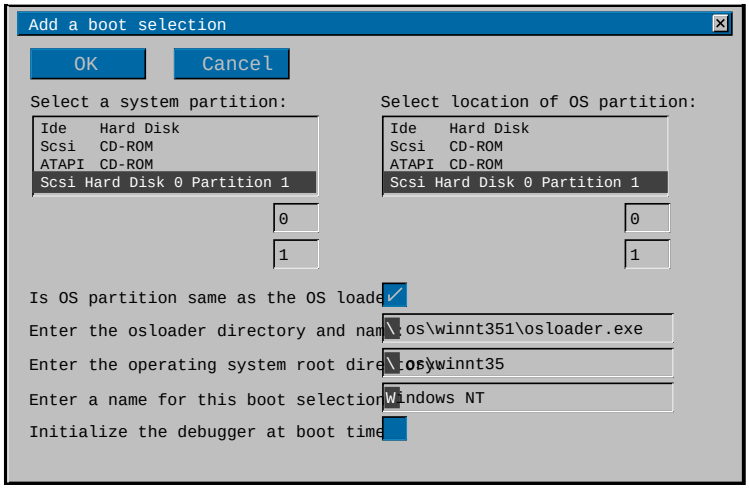
3. Click **OK** when you are finished.

Managing Boot Selections

Warning

Improper use of these system administrator functions can render the system unusable.

The following sections describe how to manage boot selection using Motorola Firmware. The functionality required to manage Windows NT boot selections is grouped under the **Manage NT Startup** menu option. The functionality required to manage PR*P OS boot selections is grouped under the **PR*P OS Boot Setup** menu option.



Windows NT Boot Selections

The Windows NT boot selection is set by Windows NT during the installation process. Each installation of Windows NT requires its own boot selection. Under normal circumstances, you should not need to modify the boot selection except in cases in which the system configuration has been changed, for example:

- When the SCSI ID of the current Windows NT installation has been changed
- In cases of NVRAM failure and loss of information

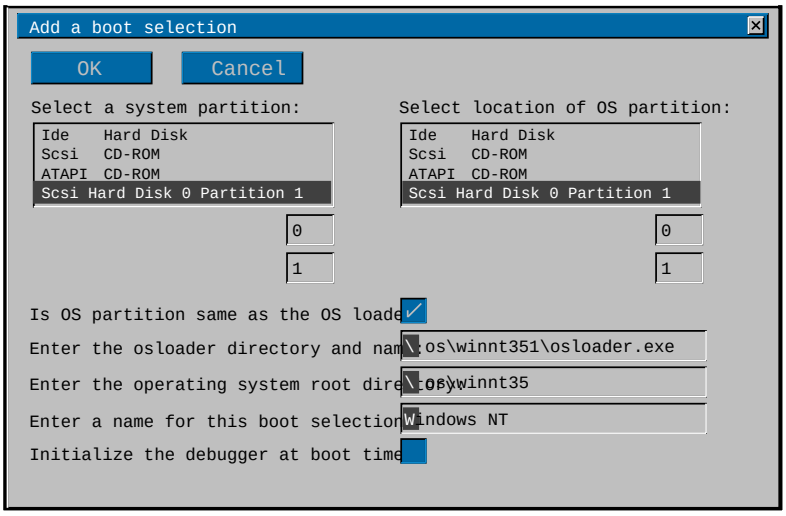
To add, delete, edit, or check a Windows NT boot selection, first select **Setup** (enter a System Password, if required), select **Environment Setup**, then **Manage NT Startup**. Follow the instructions listed in the following sections for each operation.

Adding a Boot Selection

In cases of NVRAM loss or changes to the system configuration, you may wish to add a Windows NT boot selection.

To add a Windows NT boot selection:

1. From the **Manage NT Startup** menu, select **Add a Boot Selection**. Motorola Firmware brings up the following dialog box:



2. Use the arrow keys to select a system partition and an operating system (OS) partition. Using the list presented, you may select from existing partitions or define a new partition.

   The list of existing partitions is generated using the *FWSEARCHPATH* and *SYSTEMPARTITION* environment variables.

3. To define a new partition select a device from the list. Motorola Firmware uses the input areas below the list boxes to prompt you for any further information that is needed to completely specify the partition.

4. To choose an OS partition other than the system partition, find the prompt which reads:

   ```
   Is OS partition same as OS loader?
   ```

   Deselect the corresponding button (the check mark disappears).

Motorola Firmware prompts for the path and name of the Windows NT OS loader:

```
Enter the osloader directory and name:
\os\winnt351\osloader.exe
```

5. Keep the default pathname or enter a different pathname for the Windows NT Boot Loader.

   Motorola Firmware prompts for the OS root directory:

   ```
   Enter the operating system root directory: \winnt351
   ```

   If you installed Windows NT using default settings keep the default value, `\winnt351`. Otherwise, enter the base directory for Windows NT.

   Motorola Firmware prompts you to name the OS boot selection:

   ```
   Enter a name for this boot selection: WINDOWS NT
   ```

   The firmware uses the pathname to boot the operating system, not the name of the boot selection, so you may name the boot selection to describe the specific installation. If you have installed multiple versions of Windows NT, you may choose to customize the boot selection names.

   Motorola Firmware asks if it should initialize the Windows NT internal debugger whenever it boots the operating system:

   ```
   Do you want to initialize the debugger at boot time:
   ```

6. Select the corresponding button (a check mark appears) to initialize the debugger at boot time.

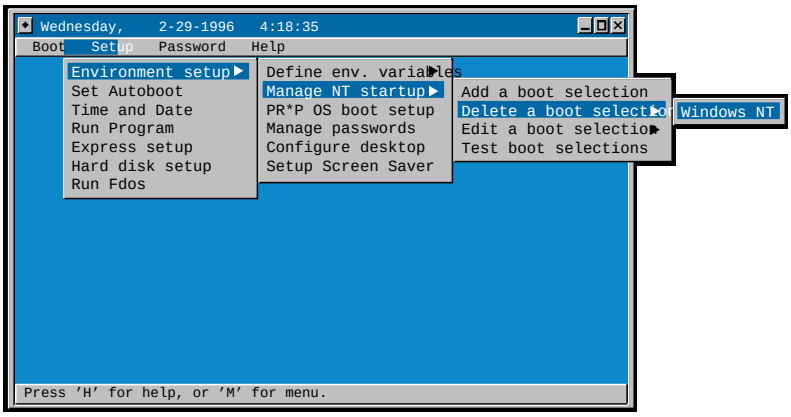
Note For user-level systems, system administrators typically should not initialize the Windows NT internal debugger at boot time. The internal debugger should only be used for troubleshooting system problems and should *only* be used by system administrators or other qualified personnel.

7. Click **OK** when you are finished.

Deleting a Boot Selection

To delete a Windows NT boot selection:

1. From the **Manage NT Startup** menu, select **Delete a Boot Selection**.



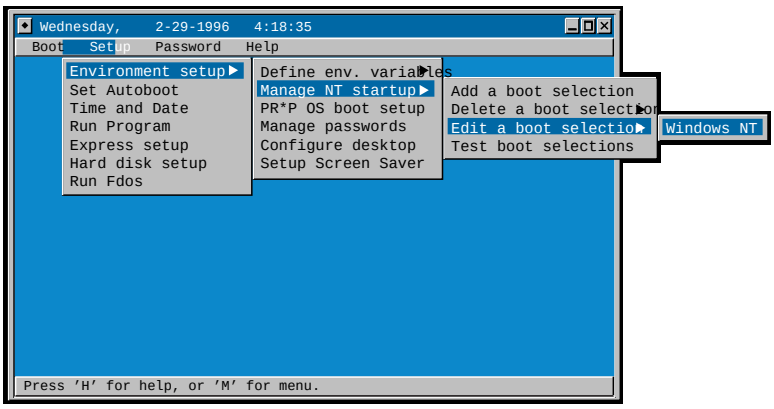
Motorola Firmware presents a list of existing boot selections.

2. Click on the boot selection to be deleted. A dialog box pops up asking you to confirm your choice. To delete the boot selection click **OK**. Otherwise click **Cancel**.

Editing a Boot Selection

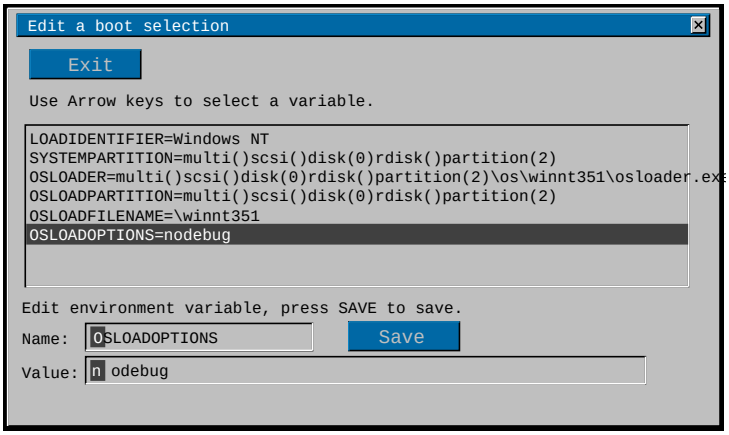
To edit a Windows NT boot selection:

1. From the **Manage NT Startup** menu, select **Edit a Boot Selection**.



Motorola Firmware presents a list of existing boot selections.

2. Click on the boot selection you wish to edit. Motorola Firmware brings up the following dialog box:



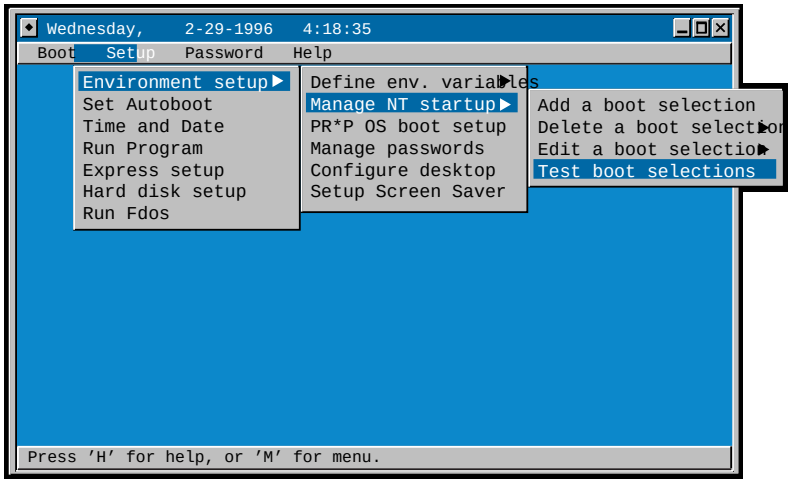
LOADIDENTIFIER	Contains an ASCII string used to associate the values contained in `SYSTEMPARTITION`, `OSLOADER`, `OSLOADPARTITION`, `OSLOADFILENAME`, and `OSLOADOPTIONS`. The value of this variable can be modified to better describe the particular installation of the Windows NT operating system.
SYSTEMPARTITION	Contains the path for the system partition. A system partition is typically located on a hard disk (IDE or SCSI) and must be formatted with the FAT file system.
OSLOADER	Contains the path for `OSLOADER.EXE`.
OSLOADPARTITION	Contains the pathname for the partition containing the operating system.
OSLOADFILENAME	Contains the directory and pathname of the operating system.
OSLOADOPTIONS	Contains any load options defined for the boot selection.

3. Use the arrow keys or the mouse to choose the boot selection environment variable to be edited. Edit the information, click on **Save**, and proceed to the next environment variable to be edited.
4. Click **Exit** when you are finished.

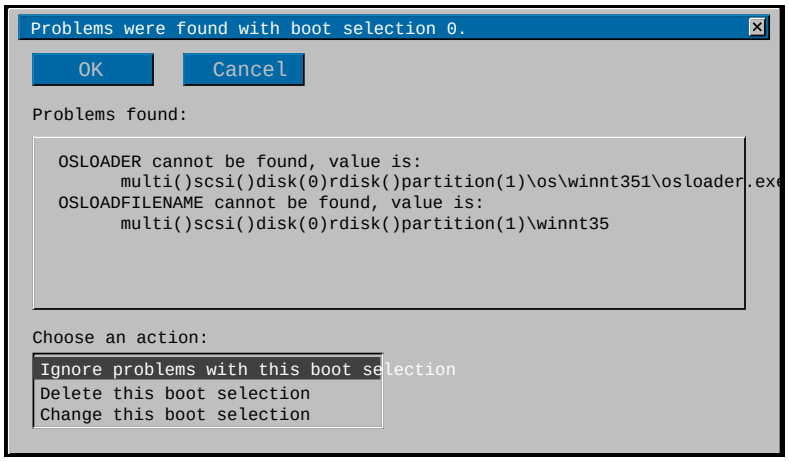
Testing Boot Selections

Motorola Firmware allows you to verify whether the current boot selections for the Windows NT operating system are valid for the current installation. To test the Windows NT boot selections:

1. From the **Manage NT Startup** menu, select **Test Boot Selections**.



Motorola Firmware tests each defined boot selection. Results are displayed in the Motorola Firmware window. If the firmware encounters any problems with a boot selection, it displays the following dialog:



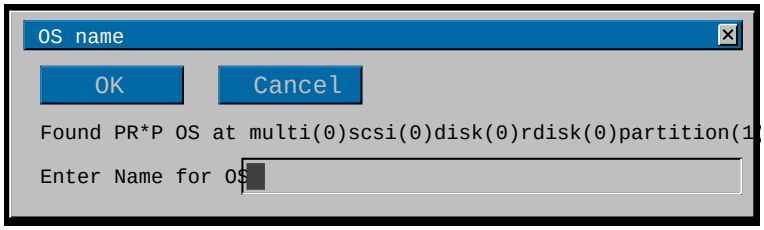
2. Use the arrow keys to select an action from the list at the bottom of the dialog window. If you wish to edit the existing boot selection, select **Change this Boot Selection** and follow the instructions in *Editing a Boot Selection* on page 4-13 to correct the problem. Then, retest the Windows NT boot selections.

PR*P Operating System (OS) Boot Selections

Motorola Firmware boots PR*P-compliant operating systems such as IBM AIX. To add a PR*P-compliant operating system to the **Boot** menu:

1. From the **Environment Setup** menu, select **Manage PR*P OS Boot Selection**.

   If Motorola Firmware finds a PR*P-compliant operating system, it identifies the operating system by its address and displays the following dialog box:



2. Type the name of the boot selection (for example, AIX) and click **OK**.

If no PR*P-compliant operating system can be located, Motorola Firmware takes no action.

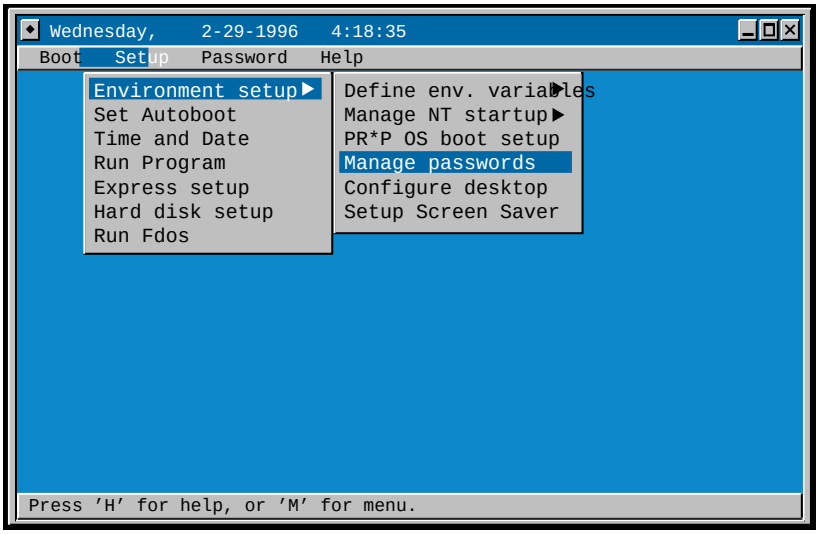
Managing Boot and System Passwords

Motorola Firmware provides password protection to secure your system against unauthorized access and tampering. Two levels of password protection allow you customize security:

- *Boot Password protection* prevents unauthorized access to your system by requiring a password to boot an operating system. The Boot Password must be enabled by the system administrator. The password is set by the user or system administrator. For information on setting a boot password, see *Managing Boot Passwords* on page 3-2.
- *System Password protection* prevents unauthorized access to your system configuration through the firmware. The system password is set by the system administrator.

Passwords are limited to eight characters. Valid characters include all alpha-numeric characters, !, @, #, $, %, ^, &, *, (,), -, +, _, =, {, }, [,], \, :, ;, ″, ′, and SPACE. Characters entered for the password are displayed on screen as a string of asterisks (e.g., ********). Motorola Firmware does not ask you to confirm password settings.

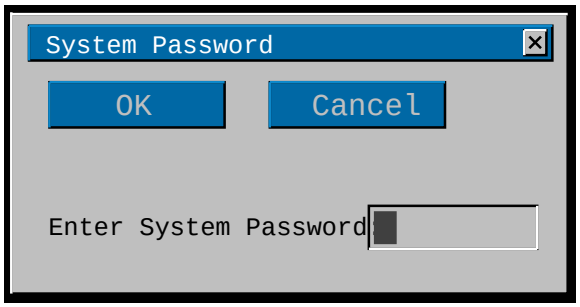
The functionality required for these actions is grouped under the **Manage Passwords** menu option shown below.



Enabling/Disabling Boot and System Passwords

To enable or disable boot passwords and system passwords:

1. From the **Environment Setup** menu, select **Manage Passwords**. The following dialog box is displayed.



2. To enable or disable the system or boot password click on the corresponding button. A check appears if password is enabled.

Setting Boot and System Passwords

To set or change boot passwords and system passwords:

1. From the **Environment Setup** menu, select **Manage Passwords**.

   Motorola Firmware displays the same screen shown in *Enabling/Disabling Boot and System Passwords* on page 4-18.

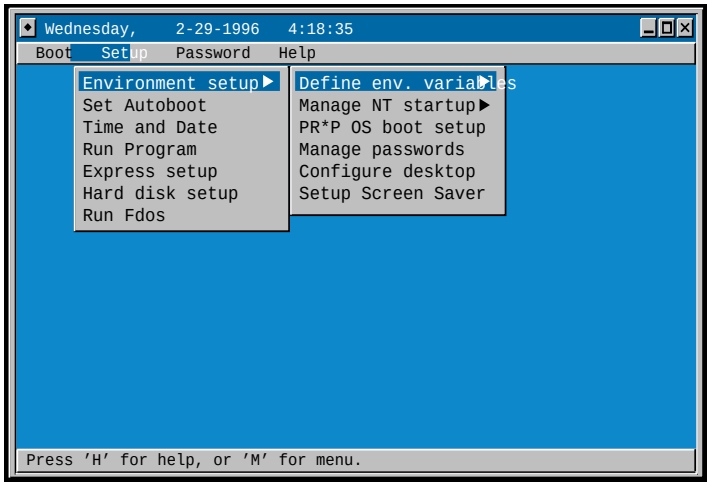
2. Enter and verify the new boot and or system password

3. Click **OK** when you are finished.

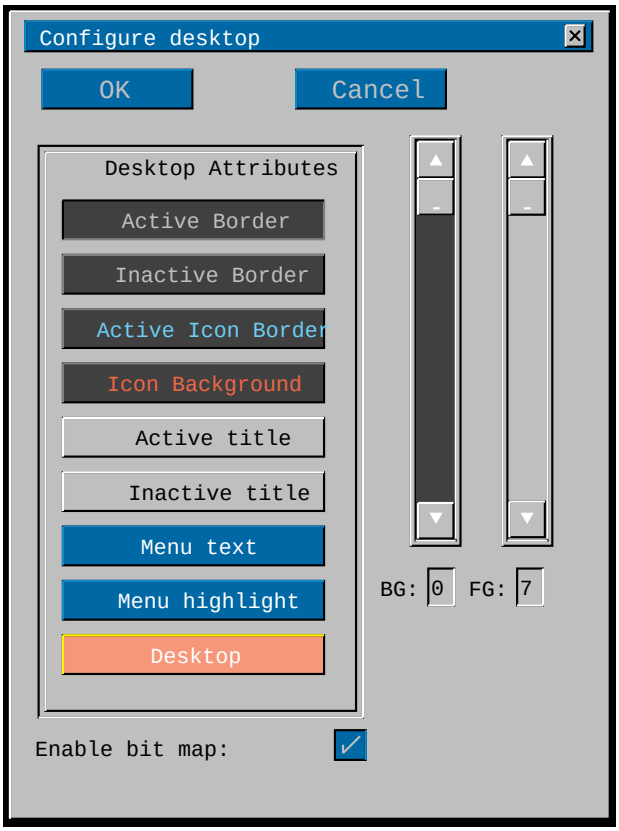
Configuring the Desktop

Motorola Firmware allows you to change the look of the desktop by assigning new colors to existing desktop attributes. To configure the desktop:

1. From the **Environment Setup** menu, select **Configure Desktop**.



Motorola Firmware brings up the following dialog box:



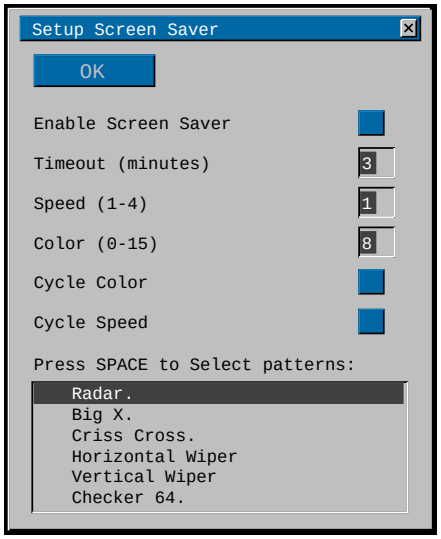
2. Select from the **Desktop Attributes** list, and use the scroll bars at the right to change the colors.
3. Use the **Enable Bit Map** button to display a bitmap as the backdrop.
4. Click **OK** when you are finished.

Setting Up the Screen Saver

Motorola Firmware includes a screen saver to protect your monitor when your system is left in the firmware state. To configure the screen saver:

1. From the **Environment Setup** menu, select **Setup Screen Saver**.

   Motorola Firmware displays the following dialog box:



2. Select one or more screen saver patterns from the list box. A check mark appears next to each pattern which is selected. If more than one pattern is selected, Motorola Firmware cycles through the patterns.

3. Use the **Enable Screen Saver** button to enable or disable the screen saver. The Timeout field indicates how many minutes Motorola Firmware waits before entering screen saver mode. Use the Speed and Color fields to specify the appearance of the screen saver patterns, or use the Cycle Color and Cycle Speed buttons to give a random appearance to the patterns.

4. Click **OK** when you are finished.

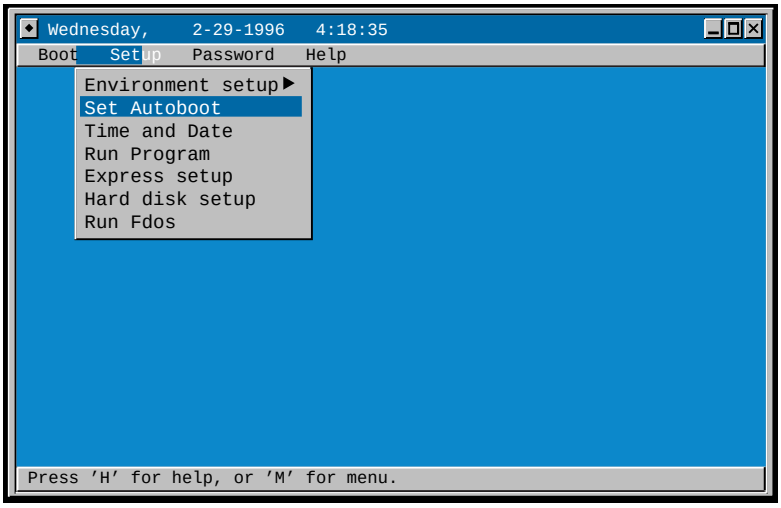
Enabling/Disabling Autoboot

With autobooting enabled, Motorola Firmware automatically boots a preselected operating system after waiting for a predetermined period of time. Users can abort the autoboot function by pressing the **ESC** key.

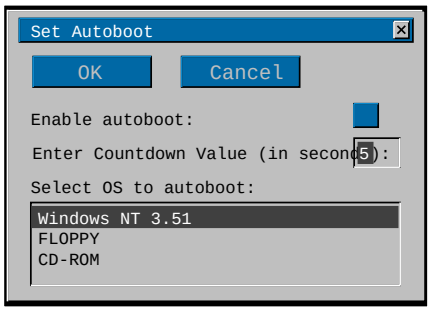
If autobooting is not enabled, when the system is powered on the Motorola Firmware window is displayed. The system waits for you to select which operating system Motorola Firmware will boot.

To enable Motorola Firmware's autoboot feature:

1. From the **System Setup** menu, select **Set Autoboot**.



Motorola Firmware displays the following dialog box:



2. Use the **Enable Autoboot** button to enable or disable autoboot. Autoboot is enabled when the button is selected (a check mark appears in the button).

   Motorola Firmware issues the following prompt:

   ```
   Enter Countdown value (in seconds):5
   ```

3. Use the default value (5 seconds) or type in an appropriate countdown value (for example, 10).

   Motorola Firmware displays a list of installed operating systems.

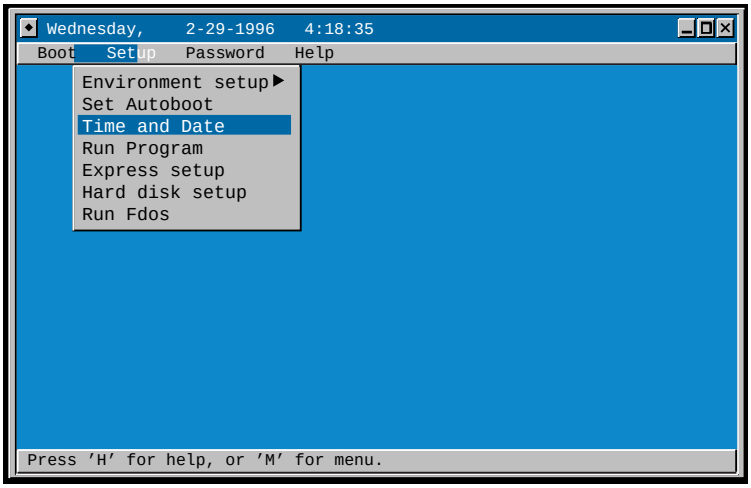
4. Use the arrow keys to select the operating system you wish to autoboot.

5. Click **OK** when you are finished.

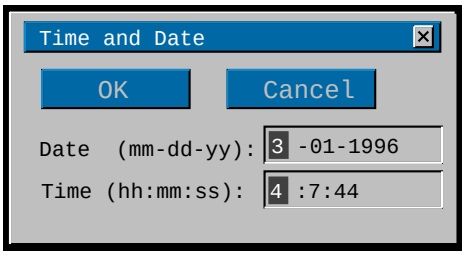
Setting the System Time and Date

To set the system time and date:

1. From the **Setup** menu, select **Set time and date**.



Motorola Firmware displays the following dialog box:



2. Type the new date and the time in 24-hour format (for example, 3:15:45 P.M. would be entered as 15:15:45)
3. Click **OK** when you are finished.

Running Programs

Motorola Firmware allows you to run programs written to the Windows NT Portable Boot Loader Specification.

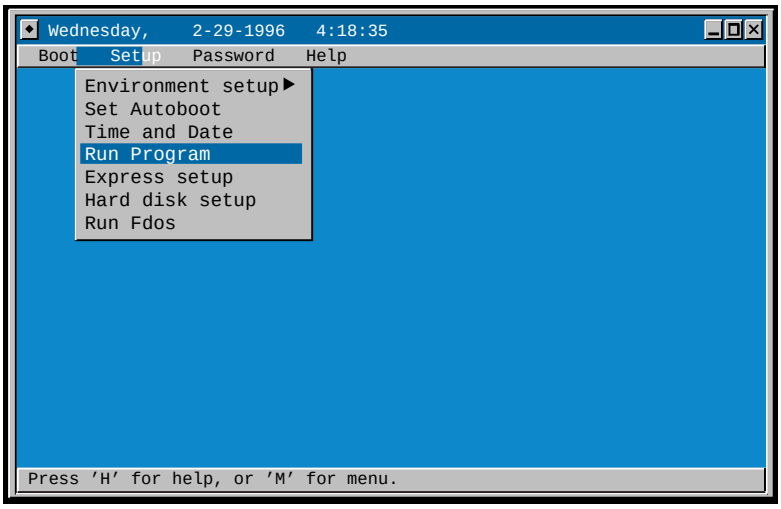
File Extensions

The firmware functions that run programs automatically append **.img** and **.exe** to files that are not found, and retries to use the extended names.

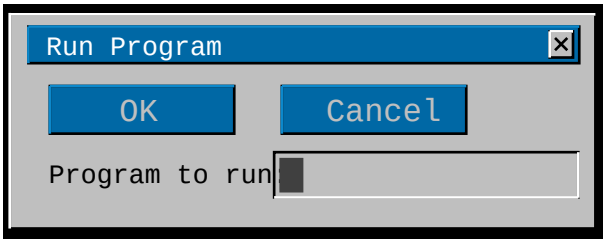
If you enter the file with a type such as **.exe** or **.img** and the file doesn't exist, the message `Name too long` is returned rather than `File not Found`.

To run a program:

1. From the **Setup** menu, select **Run Program**.



Motorola Firmware displays the following dialog box:



2. Enter the name of the program you wish to run.

   Motorola Firmware requires a full path in order to run a program. You can enter this path in one of three ways depending on the value of the *FWSEARCHPATH* and *A* environment variables:

   - **FDOS.EXE**
     Motorola Firmware appends the filename **FDOS.EXE** to the *FWSEARCHPATH* environment variable to obtain the full pathname. If the file, **FDOS**, is not found, **.EXE** is appended to the filename and Motorola Firmware attempts to execute this file.

   - **A:FDOS.EXE**
     Motorola Firmware appends the filename **FDOS.EXE** to the *A* environment variable to obtain the full pathname.

   - **multi(1)disk()fdisk()\FDOS.EXE**
     This is the full pathname to the file **FDOS.EXE** located on a floppy drive. This example is identical to **A:FDOS.EXE** if the A environment variable is set to **multi(1)disk()fdisk()**.

3. Click **OK** when you are finished.

Express Setup

The **Express Setup** feature is the quickest way to get Windows NT running on your system. **Express Setup** searches all installed SCSI and EIDE CD-ROM devices for the Windows NT installation program and attempts to run it.

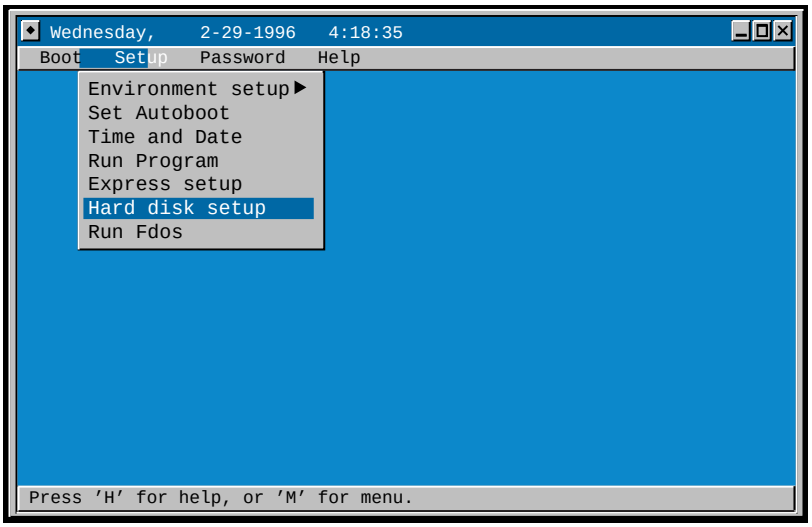
To access **Express Setup**:

1. From the **Setup** menu, select **Express Setup**.

   Motorola Firmware invokes the Windows NT installation program if it is available.

Configuring Hard Disk Partitions

Motorola Firmware allows you to manage hard disk partitions before booting an operating system. The functionality required for these actions is grouped under the **Hard Disk Setup** menu option as shown in the following diagram.



This menu option allows you to:

- Create, update, and delete PowerPC Boot Partitions
- Create and delete FAT Partitions
- Designate System Partitions
- Show Partitions

Warning

Improper use of these system administrator functions can render the system unusable.

PowerPC Partition Support

PowerPC PR*P-compliant operating systems create their own specialized boot partitions during the OS installation procedure. However, for programmers with special needs, Motorola Firmware provides the ability to create, update, and delete these partitions.

Warning

In nearly all cases, there is no need to alter the PR*P boot partition. Improper use of this system administrator function renders the system inoperable. Do not alter PR*P boot partitions unless there is a specific need and you are fully aware of the ramifications of modifying the PR*P boot partition created during the OS installation procedure.

If you have a special need to create or modify a PR*P boot partition, the instructions in the following sections describe how to create, update, and delete the PowerPC boot partitions.

Creating PowerPC Boot Partitions

To create a new PowerPC boot partition:

1. From the **Hard Disk Setup** menu, select **Create PowerPC Boot Partition** and press **ENTER**.

   Motorola Firmware presents a list of devices.

2. Select the device on which you would like to create the new partition and press **ENTER**.

3. Enter the size of the partition to be created in megabytes. Partitions may be any size from 1 Mb to the remaining available disk space.

4. Press **ENTER** to proceed.

   Motorola Firmware then creates and formats the new partition.

Updating PowerPC Boot Partitions

To update an existing PowerPC boot partition:

1. From the **Hard Disk Setup** menu, select **Update PowerPC Boot Partition** and press **ENTER**.

   Motorola Firmware presents a list of devices.

2. Select the device on which the partition resides and press **ENTER**.

   Motorola Firmware presents a list of existing PR*P boot partitions.

3. Select the partition to update and press **ENTER**.

   Motorola Firmware issues the following prompt:

   ```
   The selected partition is going to be updated.
   Are you sure (y/n)?
   ```

4. Type **y** to update the partition or **n** to abort the operation and press **ENTER**.

Motorola Firmware prompts you for the pathname for the PowerPC firmware image.

5. Enter the pathname and press **ENTER**.

Deleting PowerPC Boot Partitions

To delete an existing PowerPC partition:

1. From the **Hard Disk Setup** menu, select **Delete Partition** and press **ENTER**.

   Motorola Firmware presents a list of devices.

2. Select the device on which the partition resides and press **ENTER**.

   Motorola Firmware presents a list of existing partitions.

3. Select the partition to be deleted and press **ENTER**.

   Motorola Firmware issues the following prompt:

   ```
   Are you sure (y/n)?
   ```

4. Type **y** to delete the partition or **n** to abort the operation and press **ENTER**.

   Motorola Firmware then deletes the partition.

File Allocation Table (FAT) Partition Support

The following sections describe how to create and delete FAT partitions.

Creating FAT Partitions

To create a new hard disk partition:

1. From the **Hard Disk Setup** menu, select **Create FAT Partition** and press **ENTER**.

   Motorola Firmware presents a list of devices.

2. Select the device on which you would like to create the new partition and press **ENTER**.

3. Enter the size of the partition to be created in megabytes. Partitions may be any size from 1 Mb to the remaining available disk space.
4. Press **ENTER** to proceed.

   Motorola Firmware then creates and formats the new partition.

Deleting FAT Partitions

To delete an existing FAT partition:

1. From the **Hard Disk Setup** menu, select **Delete Partition** and press **ENTER**.

   Motorola Firmware presents a list of devices.
2. Select the device on which the partition resides and press **ENTER**.

   Motorola Firmware presents a list of existing partitions.
3. Select the partition to be deleted and press **ENTER**.

   Motorola Firmware issues the following prompt:

   ```
   Are you sure (y/n)?
   ```
4. Type **y** to delete the partition or **n** to abort the operation and press **ENTER**.

   Motorola Firmware then deletes the partition.

Designating System Partitions

A *system partition* is a partition that has been formatted with the FAT file system whose pathname is contained in the environment variable *SYSTEMPARTITION*. The *SYSTEMPARTITION* environment variable may have multiple values. Each value is associated with a boot selection and is separated by a semicolon.

To designate an existing partition as a system partition:

1. From the **Hard Disk Setup** menu, select **Designate System Partition** and press **ENTER**.

   Motorola Firmware presents a list of devices.

2. Select the device on which the partition resides and press **ENTER**.

   Motorola Firmware presents a list of existing partitions.

3. Select the partition that will be a system partition and press **ENTER**.

   Motorola Firmware sets the *SYSTEMPARTITION* environment variable to the selected partition. If a system partition has already been designated and no boot selections exist, Motorola Firmware issues the following prompt:

   ```
   A system partition has already been defined, overwrite
   (y/n)?
   ```

4. Type **y** to make the selected partition the system partition or type **n** to abort the operation and press **ENTER**.

   If boot selections exist, Motorola Firmware issues the following prompt:

   ```
   Boot selections exist, use the Manage Windows NT Startup
   menu to change the system partition.
   Press any key to continue...
   ```

   The **Manage Windows NT Startup** menu must be used to modify the value or values of the system partition variable.

Show Partitions

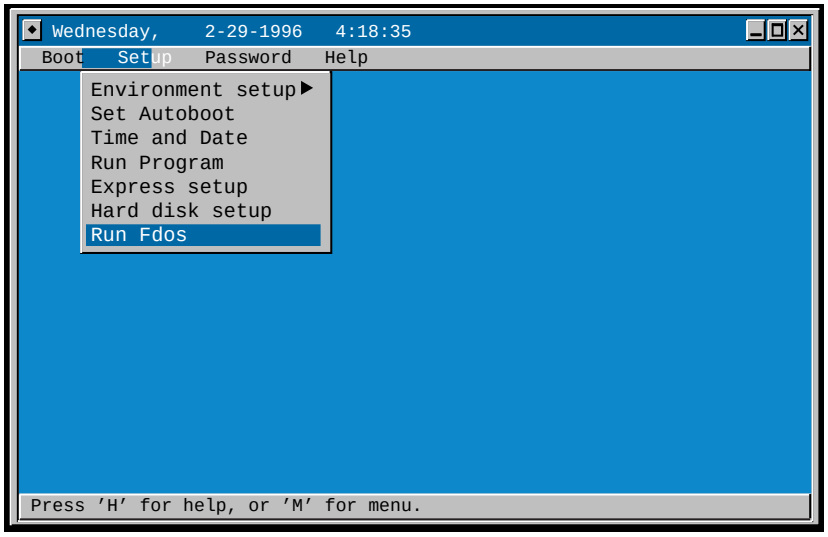
To display all available partitions, including their size, device tree element, and type (PowerPC Boot Partition, FAT, NTFS, and CDFS):

1. From the **Hard Disk Setup**, select **Show Partitions**.

   Motorola Firmware presents a list of partitions.

2. Click **OK** when you are finished.

Running the FDOS Utility



Notes The FDOS utility may not be included in the system ROM, but provided on a diskette instead. If the FDOS utility is provided on a diskette, refer to *Running Programs* on page 4-25. The following discussion assumes that the FDOS utility is embedded in the system ROM.

FDOS returns a "`command not found`" error when a drive letter is included in the path to a batch file. For example,

a:\command\date.cmd

Copy batch files to the local disk before executing them.

To run Motorola Firmware's FDOS utility:

1. Select **Run FDOS** from the **Setup** menu.

The FDOS utility executes and presents a standard command prompt within the ARC window. The Motorola Firmware window is automatically minimized while FDOS is running. FDOS determines the type and number of configured storage devices and assigns drive letters to each device or partition as shown below:

Drive A, B	floppy disk drives
Drive C ... ?	hard disk partitions ... CD-ROM drive

Refer to *FDOS Utility* on page 5-1 or enter **help** or **?** at the FDOS prompt to see a list of all available commands.

2. To exit FDOS, type **exit** at the FDOS prompt and press **ENTER**.

FDOS Utility 5

FDOS Description

The Motorola Firmware FDOS utility is a Windows NT Portable Boot Loader program that allows you to issue selected commands before booting an operating system. FDOS is useful for a wide variety of operations, like accessing the FAT file system on your hard disk, checking system memory usage, rebooting the system, and flashing or writing new firmware images into the system's ROM.

The following sections provide a general discussion of basic FDOS input requirements and navigation techniques.

Command Prompt

The FDOS command prompt always displays the current FAT file system working directory and volume, whether it is a physical or a virtual volume. For a discussion of virtual volumes see *Virtual Volumes* on page 5-3. Command options must be separated by space.

If FDOS cannot find a FAT file system that can be opened it operates in memory mode. You still have access to all FDOS commands that do not require an open file system. In this case the command prompt reads `Memory Mode>`.

Command Editing and Command History Buffers

The command line editor allows you re-execute previous commands without retyping them, to edit the current command line, or to recall and change previous commands. The following keystrokes are available at the command prompt `Memory Mode>`.

Keystroke	Description
ENTER	Use to execute a command from the command prompt.
F3	Use to recall the last command entered.
Backspace	Use to delete character to the left of cursor.
Up Arrow/Down Arrow	Use to cycle through the last 10 commands entered.

Command Aliases

Many commands have one or more aliases listed with each command definition. Entering the alias works like entering the command name. The online help text for each FDOS command also lists its aliases.

Wildcards

Many commands accept the MS-DOS-style wildcards (***** and **?**) in the specified FAT file system filenames. An asterisk (*****) entered after a command acts as a wildcard for any alpha-numeric character or character string. For example, the command,

copy a:*.exe c:\bin

copies all executable (**.exe**) files from A: to the C:\bin. The question mark (**?**) acts as a wildcard for a single character.

Command Options

Many commands accept options. Options entered at the command prompt are case-insensitive. Options that are specified as single characters are preceded by a forward slash (for example, */S*).

Filenames and Pathnames

FAT file system filenames are specified in DOS standard “eight-dot-three” format (up to eight characters before the period which demarcates the beginning of the three character suffix).

FDOS accepts standard MS-DOS-style pathnames, including both absolute and relative pathnames.

Output Redirection

Output redirection is only available when executing batch command files, see *BATCH* on page 5-8. The log file may be opened in create / overwrite or create / append mode. FDOS uses the following redirection symbols:

>	redirect stdout to log file
>>	append stdout to log file
>?	redirect errout to log file
>/	append errout to log file

Virtual Volumes

A virtual volume is a symbolic method of referring to an existing *volume:path* string. They are typically used for brevity on the command line when entering path names.

Help

To access the FDOS online help file:

- Enter **HELP** to display all FDOS internal commands and redirection symbols
- Enter **HELP** followed by a specific command name to display details for that command

- Enter the command name followed by **/?** to display details for that command

The following sections describe each FDOS command.

FDOS Commands

Figure 5-1 lists all FDOS functions and briefly describes each.

Table 5-1. FDOS Commands

Function	Description
ATTRIB	Set file attributes
BATCH	Execute named batch command files
CHDIR	Change to a new working directory
CLS	Clear the screen
CNFG	Displays and allows editing of Board Information Block
COPY	Copy a file
COPYDIR	Copy a directory or directory tree
DATE	Display date and time
DIR	List directory contents
ECHO	Set command echo flag, display message
ERASE	Delete files
EXIT	Quit FDOS
FLASH	Archive/load new firmware image into ROM memory
HELP	Display all commands or syntax for a given command
MEMORY	Display firmware physical memory map
MKDIR	Create a directory
MOUNT	Display firmware component table named nodes
MOVE	Move a file
PART	Show all disk partitions
PAUSE	Cause FDOS to wait for keyboard input
READB	Read one or more bytes from a memory location
READH	Read one or more half-words from a memory location
READW	Read one or more words from a memory location
REGEDIT	Displays and allows editing of processor registers

Table 5-1. FDOS Commands

Function	Description
REM	Mark a line in a batch file as a comment line
RESTART	Reboot or reset system
RMDIR	Delete a directory
SET	Set / display FDOS function / key environment variables
SUBST	Display a volume table or define a virtual user volume
SYSTEM	Display vendor and product IDs
TREE	Display directory tree
TYPE	Display files on screen
VERSION	Display the FDOS version number
WRITEB	Write one or more bytes starting at a specific memory location
WRITEH	Write one or more half-words starting at a specific memory location
WRITEW	Write one or more words starting at a specific memory location
>	Redirect stdout to log file
>>	Append stdout to log file
>?	Redirect errout to log file
>/	Append errout to log file

ATTRIB

Synopsis

attrib [*options*] [*vol*:][*path*][*filename*]

Description

The ATTRIB command displays and/or sets file and directory attributes. The attributes are as noted above under "Options." A group of files may be operated upon by including an appropriate wildcard in *filename*. If no operands are specified, then by default ATTRIB operates upon all files (* . *) in the current working directory.

If no attribute options are specified then by default ATTRIB lists all files (with their attributes) found which match *vol:path\filename*. These default actions of ATTRIB may be used to search an entire subtree for occurrences of a specific file or files. ATTRIB pauses listing when the screen is full of data and wait for a keystroke before continuing.

Alias

None

Wildcards

***** and **?** in the base filename (*filename*)

Options

/S	Process all subtrees found under [`path`]. If no [`path`] is specified begin processing in the current working directory on [*`vol:`*]. If no [*`vol:`*] is specified, begin processing in the current working directory on the current volume.
+R/-R	Set / clear the read-only attribute
+A/-A	Set / clear the archive attribute
+S/-S	Set / clear the system file attribute
+H/-H	Set / clear the hidden file attribute

Examples

1. To remove the read-only attribute from all files in the current dir:

   attrib -r

2. To remove the read-only and system file attributes from all files in the `c:\winnt351` directory:

   attrib -r -s c:\winnt351*.*

Note that the options must be separated by a space.

3. To set the hidden file attribute on all files ending with `.dll` in the `d:\os\winnt351` directory:

   attrib +h d:\os\winnt351*.dll

4. To list the names and attributes of all files in the current directory:

   attrib

5. To list all files ending in `.sys` and their attributes in the subtree beginning with the current directory:

   attrib /s *.sys

6. To find all occurrences of the specified file and list with attributes in the subtree beginning with `c:\winnt351`:

   attrib /s c:\winnt\351\readme.txt

BATCH

Synopsis

batch [*vol:*][*path*]*filename*[*.cmd*] [*option*]

Description

BATCH executes batch command files which have a **.bat** or **.cmd** extension. If no extension is specified in *filename*, BATCH appends **.bat** to the filename and searches for it.

BATCH command files consist of command line commands and associated arguments. Anything that can be typed at the command line can be in a batch command file. Echo may be turned off while executing batch command files (see *ECHO* on page 5-20) and comment lines are provided by typing **rem** at the start of the line (see *REM* on page 5-38).

Batch command files may be nested. If a wildcard is used to specify the batch command file, only the first occurrence matching the wildcard will be executed. Wildcards in logfile are an error.

A batch file can also be executed by entering its name on the command line without the BATCH command.

Alias

call
sh

Wildcards

***** and **?** in the base filename (*filename*)

Options

> logfile	Redirect screen output to the specified *logfile* filename. If the file exists, open it in overwrite mode and begin writing from the start of the file. If the file does not exist, then create it.
>> logfile	Redirect screen output to the specified *logfile* filename. If the file exists, append output to the current contents. If the file does not exist, then create it.

Examples

1. To execute the batch command file DOLOG.BAT:

   batch dolog

2. To execute the batch command file A:\RUNME.CMD:

   batch a:\runme.cmd

3. To execute the batch command file C:\DOLOG.BAT and redirect screen output to the logfile c:\DOLOG.LOG:

   batch c:\dolog > c:\dolog.log

4. To execute the batch command file A:\RUNME.CMD and append output to the logfile c:\LOG\RUNME.LOG:

   batch a:\runme.cmd >> c:\log\runme.log

CHDIR

Synopsis

chdir [*vol:*][*path*]

Description

The CHDIR command changes and displays the current working directory. CHDIR moves the current working directory to the one specified by *vol:path*. If CHDIR is entered with no arguments, then FDOS returns a list of all current working directories sorted by volume.

Alias

cd

Wildcards

None

Options

None

Examples

1. To make C:\WINNT\SYSTEM32 the current working directory:

   cd c:\winnt\system32

2. To list all current working directories by volume:

   cd

CLS

Synopsis

cls

Description

CLS clears the current display and positions the command prompt in the top-left corner of the screen.

Alias

clear

Options

None

Example

To clear the screen:

cls

CNFG

Synopsis

cnfg [*options*]

Description

CNFG displays the contents of the NVRAM Board Information Block and allows it to be edited. With the */I* option, CNFG resets each field of the Board Information Block to its default value. The */M* option allows you to view each field of the Board Information Block individually and change it if necessary. As each field is presented, press **ENTER** to keep the current value or type in a new value at the prompt. Press **ESC** at any time to exit.

Warning

This command should only be used by developers who know that their system has a Board Information Block. If it does not, this command could overwrite a section of NVRAM and render the system unusable.

Alias

none

Options

/I	Initialize the Board Information Block
/R	Display the Board Information Block (default)
/M	Modify the Board Information Block

COPY

Synopsis

copy [*vol:*][*path*]*filename* [*destination*]

Description

COPY copies files or groups of files to the specified location. If no destination is specified, then COPY copies the specified files to the current working directory preserving the file names.

COPY always preserves file attributes (see *ATTRIB* on page 5-6). If a destination file is specified, then COPY copies the source file to the destination under the specified *destination* filename. FDOS returns an error if you attempt to copy a file to itself.

Overwriting of existing files may be suppressed with the **/X** option switch. The **/N** option switch suppresses listing items as they are being copied.

Alias

cp

Wildcards

***** and **?** in the base filename (*filename*)

Options

/N	Do not list copied items
/X	Do not overwrite existing files
destination	A [*vol:*][*path*][*filename*] specifying where the copy is to be placed.

Examples

1. To copy A:\README.TXT to the current working directory on drive C:

   copy a:\readme.txt c:

2. To copy all files in the C:\OS\WINNT351 directory to the D:\BACKUP directory:

   copy c:\os\winnt351*.* d:\backup

3. To copy the file C:\USERS\DEFAULT\AUTOEXEC.CMD to drive A: and rename it AUTOEXEC.BAK in the process:

   copy c:\users\default\autoexec.cmd a:autoexec.bak

COPYDIR

Synopsis

copydir [*options*] [*vol:*][*path*]source [*destination*]

Description

The COPYDIR command copies the directory contents from *source* to *destination*. If *destination* is not specified then the current working directory is assumed. If *destination* exists, then copydir merges the contents of *source* into *destination*, overwriting any existing files in *destination* with files of the same name from *source*. Overwriting of existing files may be suppressed with the */X* option switch. If *destination* does not exist, then it is created and the contents of *source* are copied to it. Only one level of directory is created. If the path to the last directory level of a specified *destination* does not exist, it is an error. The */S* option switch copies the entire subtree structure starting at *source*. The */N* option switch suppresses listing the contents of *source* as they are being copied. It is an error if *source* and *destination* resolve to the same directory.

Alias

dircopy
cpd

Wildcards

None

Options

/S	Copy all subdirectory trees
/N	Do not list copied items
/X	Do not overwrite existing files
destination	A [*vol:*][*path*] specifying the target directory.

Examples

1. To copy the contents of directory A:\TEST to drive C:\TEST (C:\TEST does not exist):

   copydir a:\test c:\test

2. To copy the contents of directory C:\USERS\DEFAULT to C:\USERS\WILMA and suppress listing the entries copied (C:\USERS\WILMA exists):

   copydir /n c:\users\default c:\users\wilma

3. To copy the contents of directory C:\USERS\DEFAULT to C:\USERS\WILMA and prevent overwriting any existing files (C:\USERS\WILMA exists):

   copydir /x c:\users\default c:\users\wilma

4. To copy the entire subtree starting at C:\IMAGES to the current working directory on drive D: and suppress listing the entries copied (D:\IMAGES does not exist):

   copydir /s /n c:\images d:\images

5. To copy the entire contents of the floppy in drive A: into the current working directory:

   copydir /s a:

DATE

Synopsis

date

Description

DATE displays the current date and time stored in the CMOS real-time clock.

Alias

time

Options

None

Example

To output the current system date and time:

date

DIR

Synopsis

dir [*options*] [*vol:*][*path*][*filename*]

Description

The DIR command lists the contents of directories. By default, file sizes are included but this may be suppressed by using the */Z* option (recommended on floppy drive listings). If no directory is specified, then the current working directory is listed. If *filename* is specified, then only matching entries are listed.

All listings include the file attributes (see *ATTRIB* on page 5-6 for an explanation of file attributes).

DIR pauses when the screen is full of data and waits for a keystroke before continuing.

Alias

ls

Wildcards

***** and **?** in the base filename (*filename*)

Options

/Z	Suppresses output of file sizes in the listing (makes some listings go faster)
/S	Lists contents of specified directory and all subdirectories

Examples

1. To list the current working directory:

   dir

2. To list everything on the floppy mounted in drive A:, while suppressing file size listings:

   dir /s /z a:

3. To list all files in directory C:\WINNT\SYSTEM32 that have a .dll extension:

   dir c:\winnt\system32*.dll

ECHO

Synopsis

echo [[.] | [*on*] | [*off*] | [*message*]]

Description

ECHO displays the current setting of the echo flag, changes the setting of the echo flag, or outputs a message to screen output. The echo flag controls whether or not commands, command prompts, and output from command execution are sent to the screen (echo on) or not (echo off). It can also be used with redirection to create batch or text files.

If ECHO is off, the only data output to the screen is messages prefaced with echo. The ECHO command preserves the integrity of blanks preceding and imbedded in the message string. ECHO searches for an ECHO option keyword. If it does not find one, it treats the entire line as a message string.

FDOS requires one blank space between **echo** and **message**. Additional blanks are considered part of the message string.

ECHO is typically used within batch files to make them execute in "quiet" mode (echo off), and to output informative or diagnostic messages from them.

Alias

None

Options

.	Causes a blank line to be output to screen (no space between `echo` and `.`)
on	Sets the command echo flag on (requires a space between `echo` and `on`)
off	Sets the command echo flag off (requires a space between `echo` and `off`)
message	Text to output to screen (requires a space between `echo` and *`message`*)

Examples

1. To check on the current setting of the echo flag:

   echo

2. To turn command echoing off:

   echo off

3. To output a blank line:

   echo.

4. To output the text string "`Error - file not found`!" to the screen:

   echo Error - file not found!

ERASE

Synopsis

erase [*vol:*][*path*]*filename*

Description

ERASE deletes files. If wildcards are used, a group of files may be deleted, or a whole directory may be emptied of its files. If *vol:path* are not specified then ERASE operates on files in the current working directory.

Alias

del

rm

Wildcards

* and ? in the base filename (*filename*)

Options

None

Warning

If you enter ERASE *.*, you are NOT prompted to confirm the deletion.

Examples

1. To delete the file README.TXT in the C:\ directory:

   erase c:\readme.txt

2. To delete all files in the current directory ending with *.bak:

   erase *.bak

3. To erase all files in the C:\USERS\JOHN directory:

   erase c:\users\john*.*

EXIT

Synopsis

exit

Description

EXIT quits the FDOS command shell and returns to the Motorola Firmware Main Menu.

Alias

None

Options

None

Example

To quit FDOS:

exit

FLASH

Synopsis

flash *source archive*

flash /*A archive*

flash /*R source*

Description

FLASH saves (archives) the image currently in ROM into the specified *archive* file, reprograms the flash ROM with the specified *source* image file, or both.

If the source image is larger than the size of the ROM, FLASH issues a warning, pauses, and asks if you really want to continue. In this case, continuing is not recommended as the ROM (and therefore, the system) will most likely be in an unusable state. FLASH also warns if *archive* already exists and will be overwritten.

Alias

None

Wildcards

None

Options

/A	Archive only, save ROM image to file
/R	Flash only, reprogram ROM with specified image
source	Source image filename
archive	Archive filename

Examples

1. To save the contents of flash ROM into the file, ROMFILE.IMG:

   flash /a romfile.img

2. To reprogram flash ROM with the source image, A:\NEWROM.IMG:

   flash /r a:\newrom.img

3. To save the current flash ROM image and reprogram with the new image, A:\NEWROM.IMG:

   flash a:\newrom.img a:\archive.img

HELP

Synopsis

help [*command*]

Description

The HELP command lists all commands and redirection symbols and displays command help

Entered with no operands, HELP displays a list of all FDOS internal commands. Entering HELP with a valid FDOS internal command name as an operand displays help for that command.

Alias

?

Options

command	The name of an FDOS internal command

Examples

1. To list all FDOS internal commands:

   help

2. To display help for the command COPYDIR:

   help copydir

3. To display help for the HELP command:

   help help

MEMORY

Synopsis

memory

Description

KEY prints out a formatted list of the function key bindings. It also includes the bindings for special keys such as the arrow keys.

Alias

None

Options

None

Description

MEMORY displays the current firmware physical memory map.

Example

To display the current firmware memory map:

memory

MKDIR

Synopsis

mkdir [*vol:*][*path*]*directory*

Description

MKDIR creates the specified directory. If no path is specified, the new directory is created in the current working directory. If a path is specified, the new directory is created there. Only one directory level is created. If *path* is specified and it does not exist, FDOS issues an error message and aborts the command.

Alias

md

Wildcards

None

Options

None

Examples

1. To create the directory TEMP in the current working directory:

   mkdir temp

2. To create the directory \TEMP on drive D:

   mkdir d:\temp

MOUNT

Synopsis

mount

Description

MOUNT displays the named nodes (loosely synonymous with mount points) in the firmware component table.

Alias

None

Options

None

Example

To display firmware component table named nodes:

mount

MOVE

Synopsis

move [*vol:*][*path*]*source* [*vol:*][*path*]*target*

Description

MOVE moves a file or files from one directory location to another. The file(s) are copied to the new location and deleted from the old location.

If a wildcard is specified in the *source* filename, then MOVE moves a group of files in the source directory to the target directory. If a source *vol:path* are not specified, then the current working directory is assumed. If a *target vol:path* is not specified, the current working directory is assumed. If a *target* filename is specified, then MOVE moves the file, renaming it in the process.

If the *source* and the *target* both resolve to the same *vol:path\filename,* FDOS returns an error.

Alias

mv

Wildcards

***** and **?** in the source filename if *target* is not specified

Options

None

Warning

If source and target are both files and target exists, FDOS overwrites target without issuing a prompt.

Examples

1. To move the file README.TXT from the current working directory to the A:\DOCS directory:

   move readme.txt a:\docs

2. To move all files in the root directory of drive A: into the current working directory:

   move a:*.*

3. To rename the file LOG.OUT to LOG001.TXT in the current working directory:

   move log.out log001.txt

4. To move all files in the current working directory with a **.sys** extension to the parent directory:

   move *.sys ..

PART

Synopsis

part

Description

The PART command displays all disk partitions for the installed hard disk, CD-ROM drive, and the floppy drive, if found.

Alias

None

Wildcards

None

PAUSE

Synopsis

pause

Description

The PAUSE command halts execution while FDOS waits for keyboard input. Pressing **ESC** at the pause aborts the command sequence. This command is intended primarily for batch command files when processing must stop while the user reads a message which has been issued, and then choose whether to abort by pressing **ESC** or whether to continue by pressing any other key.

Alias

None

Options

None

Example

To pause until a key is pressed:

pause

READB

Synopsis

readb *Address* [*option*]

Alias

rb

Description

READB reads the byte found at *Address* and displays its hexadecimal value on the screen. If */Ln* is specified then *n* consecutive bytes are read starting at *Address*. If */Ln* is not specified then by default READB reads one byte. Bytes are printed to the screen sixteen per line, preceded by the starting address for that line and followed by the printable character for each byte. If a byte's ASCII value is not a printable character then a period (.) is printed. *Address* is assumed to be a virtual hexadecimal address.

Entering a nonmapped address causes an exception to occur.

Options

/L*n*	Length option, the integer *n* following indicates how many consecutive bytes to read

Examples

1. To read the byte found at memory location 8000ADD0:

   rb 8000add0

2. To read the 15 bytes starting at memory location 80008080:

   rb 80008080 /L15

READH

Synopsis

readh *Address* [*option*]

Description

READH reads the half-word found at *Address* and displays its hexadecimal value on the screen. If */Ln* is specified then *n* consecutive half-words are read starting at *Address*. If */Ln* is not specified, then by default READH reads one half-word. Half-words are printed to the screen eight per line, preceded by the starting address for that line. These are in Little-Endian format. *Address* is assumed to be a virtual hexadecimal address.

Entering a nonmapped address causes an exception to occur. READH issues an error message and abort if *Address* is not aligned on a half-word boundary.

Alias

rh

Options

/L*n*	Length option, the integer *n* following indicates how many consecutive half-words to read

Examples

1. To read the half-word found at memory location 8000ADD0:

   rh 8000add0

2. To read the 15 half-words starting at memory location 80008080:

   rh 80008080 /L15

READW

Synopsis

readw *Address* [*option*]

Description

READW reads the word found at *Address* and displays its hexadecimal value on the screen. If */Ln* is specified then *n* consecutive words are read starting at *Address*. If */Ln* is not specified then by default READW reads one word. Words are printed to the screen four per line, preceded by the starting address for that line. These are in Little-Endian format. *Address* is assumed to be a virtual hexadecimal address.

Entering a nonmapped address causes an exception to occur. READW issues an error message and abort if *Address* is not word-aligned.

Alias

rw

Options

/L*n*	Length option, the integer *n* following indicates how many consecutive words to read

Examples

1. To read the word found at memory location 8000ADD0:

   rw 8000add0

2. To read the 15 words starting at memory location 80008080:

   rw 80008080 /L15

REGEDIT

Synopsis

regedit [*options*]

Warning

This command should only be used by developers who know that their system has a Board Information Block. If it does not, this command could overwrite a section of NVRAM and render the system unusable.

Description

REGEDIT displays the contents of the PowerPC processor registers and allows them to be edited. With the */S* option, REGEDIT also displays the contents of the segment registers. The */M* option allows you to view each of the registers individually and change it if necessary. As each field is presented, press **ENTER** to keep the current value or type in a new value at the prompt. Press **ESC** at any time to save your modifications and exit.

Alias

reg

Options

/R	Display the contents of the processor registers (default)
/S	Include the contents of the segment registers
/M	Modify the processor registers

REM

Synopsis

rem [*comment line*]

Description

The REM command marks comment lines in batch command files (see *BATCH* on page 5-8). The optional text string following REM must be separated from it by at least one space. REM does not have to appear in column one of the line, but it must be the first word on the line.

Alias

remark

Options

comment line	text string following REM

Example

To mark a comment line in a batch command file:

rem THIS IS A COMMENT LINE

RESTART

Synopsis

restart *option*

Description

The RESTART command reboots or halts the system. This command requires that you specify one of the options listed above.

Alias

None

Options

powerdown	halt and, if possible, remove power
reboot	power-on boot with previous boot parameters
restart	resume using valid restart block else power on boot of the restart block or autoload environment variable
halt	halt the system

Examples

1. To reboot the system:

   restart reboot

2. To halt the system:

   restart halt

3. To halt the system and powerdown (if powerdown available on this system):

   restart powerdown

RMDIR

Synopsis

rmdir [*vol:*]*path*

Description

RMDIR removes the specified directory if it is empty. If it contains files, use the **ERASE** command to delete the files before removing the directory. See *ERASE* on page 5-22 for a description of the command.

If only a directory name is specified, then RMDIR assumes the specified directory is a child of the current working directory. It is an error to attempt to remove the current directory, the parent directory, or any ancestor directory of the current working directory.

Alias

rd

Wildcards

None

Options

None

Examples

1. To remove the empty directory C:\TEMP:

   rmdir c:\temp

2. To remove the empty directory GROK which is a child of the current working directory:

   rmdir grok

3. To remove the empty directory OBJ which is a child of the parent directory:

   rmdir ..\obj

SET

Synopsis

set

Description

The SET command displays or sets the FDOS keys and environment variables.

Alias:

None

Wildcards

None

Options

<*variable*>	FDOS function key or environment variable
<*value*>	Text string or character value which must be in single quotes
/I	Initialize user-defined variables and function keys to default value

Note If you make any changes using the **set** command, such as shown in example 2, you are asked if you wish to save them in the FDOS.CFG file when you leave the FDOS session. If you respond with **Yes**, the newly-defined FDOS variables are saved in a file called FDOS.CFG.

However, to use those variables in subsequent sessions, you need to delete the environment variable named *FDOSCFG=none* (default). To delete the FDOSCFG environment variable:

1. From the Main menu, select **Setup**, **Environment setup**, **Define env. variables**, then **Edit environment variables**.

2. Using the arrow key or mouse, select *FDOSCFG=None* and then click the **Delete** button.

This enables FDOS to search for the FDOS.CFG file that contains the newly-defined environment variables.

Examples

1. To view all user-defined and system-defined variables:

   set

2. To define a function key to perform a clear screen command:

   set F4='clear line'

3. To reset all user-defined variables and function keys to their original value:

   set /i

SUBST

Synopsis

subst [*drive1*: [*drive2*:]*path*];

subst /D drive1:

Description

The SUBST command creates or deletes symbolic volumes or displays the volume table. If entered with no operands, SUBST lists the assigned entries in the volume table. It is an error if *DRIVE2:* is specified without a path (a \ is a sufficient path declaration). Only virtual volumes can be deleted with the */D* option. It is an error to attempt to assign a volume that is already assigned.

Alias

None

Wildcards

None

Options

drive1:	virtual drive to assign
drive2:path	physical drive/path to assign to the virtual drive
/D	remove a virtual drive

Examples

1. To assign virtual volume M: to C:\TEMP:

   subst m: c:\temp

2. To delete the virtual volume M:

   subst /d m:

3. To list all assigned entries in the volume table:

   subst

SYSTEM

Synopsis

system

Description

The SYSTEM command displays the vendor and product ID strings.

Alias

sys

Options

None

TREE

Synopsis

tree [*option*] [*vol:*][*path*]

Description

The TREE command displays a directory tree structure, and optionally lists the files contained in it. It is a "pseudo-graphical" directory listing showing the parent and child relationships. TREE pauses when the screen is full of data and waits for a keystroke before continuing. If no PATH is specified then TREE displays the structure of the subtree beginning with the current working directory.

Alias

None

Wildcards

None

Options

/F display the names of the files in each directory

Examples

1. To display the entire directory structure on drive C:

   tree c:

2. To display the subdirectory structure and all files beginning with the current working directory:

   tree /f

TYPE

Synopsis

type [*vol:*][*path*]*filename*

Description

The TYPE command prints the contents of text files to the console. If *filename* contains a wildcard then all matching files are printed to the screen in the order in which they are found in the directory.

TYPE pauses when the screen is full of data and waits for a keystroke before continuing.

Alias

cat

more

Wildcards

***** and **?** in the base filename (*filename*)

Options

None

Examples

1. To print the contents of the text file A:\README.TXT to the screen:

   type a:\readme.txt

2. To print out the contents of all text files with a `.txt` extension in the current working directory:

   type *.txt

VERSION

Synopsis

version

Description

The VERSION command displays the FDOS version number.

Alias

ver

Options

None

Example

To display the FDOS version number:

version

WRITEB

Synopsis

writeb *Address databyte* [*databyte*]...

Description

WRITEB writes one or more bytes to the specified virtual memory location (*Address*). At least one `databyte` is required, and more may be optionally listed on the command line separated by a space. *Databyte* values are assumed to be in hexadecimal form. If a *Databyte* value is specified which is larger than a byte, an error message is issued and the write is aborted. *Address* is assumed to be a virtual mapped hexadecimal address. Specifying a nonmapped address is an error and causes an exception to occur.

Alias

wb

Options

databyte	A list of consecutive databytes to be written

Examples

1. To write the byte FF to virtual memory location 8000ADD0:

   wb 8000add0 ff

2. To write three bytes AA BB DD starting at memory location 80008080:

   wb 80008080 aa bb dd

WRITEH

Synopsis

writeh *Address data* [*data*]...

Description

WRITEH writes a half-word or half-words to the specified virtual memory location (*Address*). At least one halfword must be specified, and more may be optionally listed on the command line separated by a space. *Data* values are assumed to be in hexadecimal form. If a *Data* value is specified which is larger than a half-word, an error message is issued and the write is aborted. *Address* is assumed to be a virtual mapped hexadecimal address. If *Address* is not aligned on a half-word boundary then an error message is issued and the write operation is aborted. Specifying a nonmapped address is an error and causes an exception to occur. Remember that this is a Little-Endian environment.

Alias

wh

Options

data A list of consecutive halfwords to be written

Examples

1. To write the half-word FF00 to virtual memory location 8000ADD2:

   wh 8000add2 ff00

2. To write three half-words AAFF BB00 DD11 starting at virtual memory location 80008084:

   wh 80008084 aaff bb00 dd11

WRITEW

Synopsis

writew *Address data* [*data*]...

Description

WRITEW writes one or more words to the specified virtual memory location (*Address*). At least one word of data must be specified, and more may be optionally listed on the command line separated by a space. *Data* values are assumed to be in hexadecimal form. If a *Data* value is specified which is larger than a word, an error message is issued and the write is aborted. *Address* is assumed to be a virtual mapped hexadecimal address. If *Address* is not aligned on a word boundary then an error message is issued and the write is aborted. Specifying a nonmapped address is an error and causes an exception to occur. Remember that this is a Little-Endian environment.

Alias

ww

Options

data A list of consecutive words to be written

Examples

1. To write the word FF00FF00 to virtual memory location 8000ADD4:

   ww 8000add4 ff00ff00

2. To write two words AAFF0000 0000FFFF starting at virtual memory location 80008080:

   ww 80008080 aaff0000 0000ffff

5

Evaluating and Installing Motorola Firmware

6

Use the following instructions to evaluate and install upgrades on systems running previous versions of Motorola Firmware. The instructions in *Evaluating Motorola Firmware Upgrades*, allows you to run Motorola Firmware without overwriting the firmware currently installed on your system. Follow the instructions in:

- *Installing Motorola Firmware Upgrades* on page 6-2 to replace your current firmware.
- *Firmware Recovery* on page 6-3 discusses how to reinstall archived versions of Motorola Firmware.

Evaluating Motorola Firmware Upgrades

To run Motorola Firmware without overwriting your system's existing firmware:

1. Insert the Motorola Firmware diskette in the floppy disk drive.
2. From the Motorola Firmware Main Menu:
   - Select **System Setup** and press **ENTER**
   - Select **Run Program** and press **ENTER**
   - Type: **[*vol:*]*path*\upgrade.img** and press **ENTER**

   where **upgrade.img** is the name of the firmware upgrade to be evaluated.

The system reboots using the new firmware. When you have finished evaluating the firmware upgrade, power down the system and restart.

Installing Motorola Firmware Upgrades

To replace your system's current firmware with a new version of Motorola Firmware:

1. Insert the Motorola Firmware diskette in the floppy disk drive.
2. From the Motorola Firmware Main Menu:
   - Select **System Setup** and press **ENTER.**
   - Select **Run FDOS** and press **ENTER**. For more information on the FDOS utility, see *FDOS Utility*.
3. At the FDOS prompt, type:

   flash [*vol:*]*pathupgrade*.img [*vol:*]*path**archive*.img** and press **ENTER**

   where ***upgrade*** is the prefix of the firmware image file and ***archive*** is the prefix of the firmware archive file. For more information on the FLASH command, see *FLASH* on page 5-24.

Motorola Firmware archives the firmware currently installed in system ROM and then reprograms the system ROM with the firmware upgrade.

Warning

Do not power off the machine during this stage! If power is interrupted, the firmware will be corrupted and the system unusable.

After programming completes successfully, the next time you apply power to the system, it executes the new firmware.

Firmware Recovery

To reinstall an archived version of firmware:

1. From the Motorola Firmware Main Menu:
   - Select **System Setup** and press **ENTER.**
   - Select **Run FDOS** and press **ENTER**. For more information on the FDOS utility, see *FDOS Utility*.
2. After FDOS loads, at the FDOS prompt, type:

   flash /R [*vol*:]*patharchive*.img** and press **ENTER**

   where ***archive*** is the prefix of the archived firmware image file. For more information on the FLASH command, see *FLASH* on page 5-24.

Motorola Firmware restores the archived firmware to the system ROM.

Warning

Do not power off the machine during this stage! If power is interrupted, the firmware will be corrupted and the system unusable.

After programming completes successfully, the next time you apply power to the system, it executes the restored firmware.

6

Video Card Compatibility Chart

A

The following table provides video test compatibilities for Motorola Firmware.

Table A-1. Motorola Firmware 3.05 Video Test Compatibility Matrix

Card	ROM	Silicon	Driver	Bus
MCG Blackhawk onboard video	N/A	Cirrus 5434	Cirrus	OB
STB Horizon	1.1	Cirrus 5429	Cirrus	ISA
Diamond Speedster 64	2.00	Cirrus 5434	Cirrus	ISA
(MCG) Prolink Alpine	N/A	Cirrus 5434	Cirrus	PCI
Diamond Speedstar Pro SE	1.00	Cirrus 5430	Cirrus	PCI
Orchid Kelvin	1.1	Cirrus 5434	Cirrus	PCI
STB Nitro 64	1.0	Cirrus 5436	Cirrus	PCI
Diamond Stealth Video	1.01	S3 868	S3	PCI
Diamond Stealth SE	1.02	S3 732	S3	PCI
Diamond Stealth 64 DRAM	2.02	S3 764	S3	PCI
Diamond Stealth 64 VRAM	1.01	S3 968	S3	PCI
Diamond Stealth 64 VRAM	1.05H	S3 964	S3	PCI
#9 GXE	1.15.20	S3 928	S3	PCI
#9 GXE64 Pro	1.03	S3 964	S3	PCI
#9 GXE64	1.02.09	S3 864	S3	PCI
#9 Motion 531 9FX	2.04.02	S3 868	S3	PCI
Leadtech Winfast S240	N/A	S3 764	S3	PCI
Leadtech Winfast S400	None	S3 964	S3	PCI
Spea Mirage P-64 V	1.00	S3 868	S3	PCI
Spea Mirage P-64 V	1.01	S3 968	S3	PCI
STB Power Graph 64	1.0	S3 764	S3	PCI
Hercules Graphite Terminator 64	N/A	S3 964	S3	PCI
IBM	None	S3 928	S3	PCI
Paradise / Western Digital	N/A	S3 864	S3	PCI

Table A-1. Motorola Firmware 3.05 Video Test Compatibility Matrix

Card	ROM	Silicon	Driver	Bus
S3 Pro Lightening	N/A	S3 864	S3	PCI
Paradise Accelerator 24	N/A	WDC 90C31	N/A	ISA
Diamond Speedstar 24	5.00	Tseng ET4000	N/A	ISA
Hercules Dynamite Pro ISA	N/A	Tseng ET4000	N/A	ISA
ISA Trident 8900	N/A	Trident 8900	N/A	ISA
PCI Trident 9440	A5.1	Trident 9440	N/A	PCI
Hercules Dynamite Power PCI	N/A	Tseng ET4000	N/A	PCI
Diamond Viper Pro	1.05	Weitek 9100	Weitek9	PCI
ATI Gfx Expression	1.02	ATI Mach 64	ATI	PCI
ATI CHRP (FCODE & x86 BIOS)	1.00	ATI Mach 64	ATI	PCI
Matrox MGA Impression Plus	3.6	MGA 64-bit	N/A	PCI
Matrox MGA Millennia	N/A	MGA Storm R2	Matrox	PCI

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