

SONY

*Release 2*

# *NET WORK STATION*

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*ROM Monitor User's Guide*

# NEWS

# Notice to Users

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# Document and Command Conventions

In this manual, command formats use the following symbols:

**Courier Bold** is used within examples to show command lines and options that should be typed verbatim on the screen.

*Courier* is used within the body of the text to show:  
☐ Command lines or options that should be typed verbatim on the screen.

is used within examples to show:  
☐ Computer-generated output.  
☐ The contents of files.

[Ctrl+A] Press the Control key along with another specified key, in this case A.

*Italic* is used to show:  
☐ Command or device names  
☐ Parameters which you enter according to your particular needs, or system messages which vary depending on your system configuration.

*man(#)* The number included in parentheses following a command name indicates the On-Line Manual's section number.

Example:  
*disklabel(8)* indicates that you can find more information regarding the *disklabel* command in the On-Line Manual's section number 8.

# Introduction

This guide explains ROM Monitor software (version 2.x) for certain models of NEWS Series workstations which incorporate the Motorola MC68030 or MIPS R3000 CPU. Since slight operational differences exist between workstation models and their CPU types, relevant differences are addressed as necessary. Refer also to the hardware manual supplied with your workstation.

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## System Setting

Before beginning to use the ROM Monitor, make sure peripheral devices are connected and all DIP switches are set.

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### Activating the ROM Monitor

Turn on the power to your workstation. The ROM Monitor is automatically activated.

After performing a simple hardware test, the ROM Monitor enters one of the following two modes according to the DIP switch settings:

☐ **Monitor mode**

The ROM Monitor enters monitor mode when the autoboot bit of the DIP switch has been set to OFF. The prompt NEWS> appears on the screen and the system is ready to accept commands. Specific commands which can be used in monitor mode are explained on the following pages.

☐ **Autoboot mode**

The ROM Monitor enters autoboot mode when the autoboot bit of the DIP switch has been set to ON. In this mode, NEWS-OS automatically boots when the power is turned on.

# Using the Command Line

You can enter commands when the prompt `NEWS>` displays on the screen.

Press the "P" and the Ctrl key simultaneously to display the latest command line input. The cursor moves to the right of the last character. With the command line displayed, you can use the Backspace key to delete characters.

## Edit Mode

Press the Esc key to enter edit mode. You can now move the cursor, delete characters, and insert characters in a manner similar to the *vi* editor. Table 1 shows the command keys and their functions available in the edit mode:

Table 1. Command Keys for Edit Mode

Key	Function
<b>h (bs)</b>	Moves the cursor one character to the left. (bs: Backspace)
<b>l</b>	Moves the cursor one character to the right.
<b>x</b>	Deletes the current character.*
<b>o</b>	Moves the cursor to the beginning of the current line.
<b>\$</b>	Moves the cursor to the end of the current line.
<b>D</b>	Deletes from the cursor position to the right of the screen.
<b>a</b>	Adds text after the cursor position automatically enters insert mode.
<b>i</b>	Inserts text before the cursor position.
<b>A</b>	Appends text to the current line.
<b>r</b>	Replaces the current character.

\* The "current character" is the character the cursor is on.

After you enter insert mode by pressing the "a", "i" or "A" key, any characters typed from that point on will be inserted at the cursor position. You can exit insert mode and return to edit mode by pressing the Esc key.

Whichever mode you are in, pressing the Return key immediately executes the current command line.



# ROM Monitor Commands

ROM monitor command formats are explained in this section. Table 2 lists format conventions for the commands.

Table 2. ROM Monitor Command Conventions

Convention	Meaning
[ ]	An argument which can be omitted. When omitted, the default value of the argument is used.
{a b}	"a" or "b" may be specified.
---	A multiple number of arguments may be specified.
<addr>	Address (Hex)
<ofs>	Offset memory address (Hex)
<bootsw>	Boot switch (Hex)
<cnt>	Number of counts (Hex)
<value>	Numerical data (Hex)
<c>	Controller number
<u>	Unit number
<p>	Partition number
<b>	Bus number
<i>	Initiator number
<str>	String
<pathname>	Path name on a file system
<devspec>	Device specification

All numbers indicating addresses and counts are assumed to be hexadecimal values. In order to specify decimal numbers you must attach # in front of each value. When % is attached to a value, it indicates a disk block number in decimal notation, such as %1 = #512 = 200.

For R3000 CPU models, any memory address specification is assumed to indicate a logical address. In other words, the head of main memory is 80000000 (hex) in a cached memory space [KSEG0 (Kernel, Unmapped, Cached)], and a0000000 (hex) in an uncached memory space [KSEG1 (Kernel, Unmapped, Uncached)]. However, when a value between 00000000 and 7fffffff is given to a command argument to indicate a memory address, it is automatically converted into an uncached memory address and the command is executed accordingly.

## bf

### (Block of memory fill)

#### Format

bf[. {b|f|l}]<addr1>{<addr2>|:<cnt>}<value>

#### Description

The *bf* command fills a range of memory with data designated by <value>. The memory range is specified by the start address <addr1> and end address <addr2> (or <cnt> number of fields from <addr1>).

The length of one field is specified by blwl, which indicates byte (b), word (w) and long word (l), respectively. The default value of this argument is a word.

#### Note

In the R3000 CPU conventions, 32-bit data is called "word" and 16-bit data is called "half-word". To avoid any confusion, this manual calls them "long word" and "word," respectively, as in the 68030 CPU conventions.

Data designated by <value> is set justified to the field right regardless of field length. When this exceeds specified field length, upper bits are ignored and the remainder is set to the field.

When the number of bytes in the designated memory range is not a multiple of field length, the number of data to fill the range will be the maximum integer which does not exceed  $(\text{memory range})/(\text{field length})$ .

## bm

### (Block of memory move)

#### Format

bm <addr1>{<addr2>|:<cnt>}<addr3>

#### Description

The *bm* command copies a range of memory specified by the start address <addr1> and end address <addr2> (or <cnt> number of fields from <addr1>) to another place in memory as designated by <addr3>.

A count <cnt> argument specifies the number of bytes to be copied.

## bo

### (Boot)

#### Format

`bo [/<value>] [<devspec> [<pathname>]]`

#### Description

The *bo* command boots NEWS-OS from the device <devspec> according to the boot switch specified by <value>. For details on <devspec> and <value>, refer to Table 3 and the "Specifying a Device" section later in this guide.

The default <devspec> is the device specified by the global variable *bootdev*. For details on environmental variables, refer to the set command later in this guide.

The boot file name <pathname> designates a NEWS-OS boot program. The <pathname> default is */boot*.

#### Note

Do not place any separator such as a space between <devspec> and <pathname>.

The boot switch <value> specifies the booting method for system start up. This switch is expressed as 32-bit data. The significance of each bit value is shown in Table 3.

Table 3 Boot Method Specification Bits

Bit	Meaning
0	CPU program specification bit 0: Executes /vmunix on the boot device. 1: Prompts for the name of a CPU initial program and executes it.
1	Mode specification bit 0: Multi-user mode 1: Single-user mode
2-3	Always 0
4	System init program specification bit 0: Executes /etc/init. 1: Prompts for the name of a system init program, and executes it.
5	Root device specification bit 0: Specifies the device which booted /vmunix as the root device. 1: Uses the device which was specified when /vmunix was compiled.
6	IOP program specification bit (Available only on models equipped with an I/O processor) 0: Executes /mrx on the boot device. 1: Prompts for the name of the I/O processor's initial program name and executes it.
7-31	Always 0

#### Example

When you want to start the system in the single-user mode, enter the following:

```
NEWS> bo /2
```

If your workstation is equipped with an I/O processor and you want to specify the I/O processor's initial program when starting the system, enter the following:

```
NEWS> bo /40
```

When <value> is omitted, 0 is assumed to be the boot switch.

## **cls** (Clear terminal screen)

**Format** `cls`

**Description** The *cls* command clears the console screen and moves the cursor to its home position.

## **cp** (Copy)

**Format** `cp<devspec1><ofs1>{<ofs2>|:<cnt>}<devspec2><ofs2>`

**Description** The *cp* command copies the designated range of data from a device specified by <devspec1> to another specified by <devspec2>.

For details on the source device <devspec1> and the destination device <devspec2>, refer to the "Specifying a Device" section later in this guide.

The range of data to be copied is between the offset head address <ofs1> and the end address <ofs2>, or <cnt> number of bytes from the offset head address <ofs1>. The data position in a device is specified by the number of bytes from the device head, but all values including <cnt> must be an integer multiple of 0x200 (Hex).

### *Note*

The same device name cannot be specified both as <devspec1> and <devspec2>.

## **di** (List disk information)

**Format** `di [<devspec>]`

**Description** The *di* command displays the partition information written in a device specified by <devspec>. For details on the <devspec> specification, refer to the "Specifying a Device" section later in this guide.

When <devspec> is omitted, the *di* command displays the partition information of a device specified by the environment variable *bootdev*.

## **eject** (Eject floppydisk)

**Format** `eject`

**Description** The *eject* command is used to eject a 3.5-inch micro floppydisk from the drive.

## **format** (Format floppydisk)

**Format** `format {fd|fh}`

**Description** The *format* command is used to initialize a 3.5-inch micro floppydisk. Specify *fd* when formatting a 1M byte floppydisk (2DD), and *fh* for a 2M byte floppydisk (2HD).

## **he** (Help)

**Format** `he`

**Description** The *he* command calls up the monitor mode help function. All command formats which can be used in monitor mode are displayed together with simple explanations.

## **ld** (Load from device)

**Format** `ld<devspec><ofs1>{<ofs2>|:<cnt>}<addr>`

**Description** The *ld* command reads a range of data on a device specified by <devspec> into the memory address specified by <addr>. The range of data to be read is between the offset start address <ofs1> and end address <ofs2>, or <cnt> number of bytes from <ofs1>. The data position in a device is specified by the number of bytes from the device head, but all values including <cnt> must be integer multiples of 0x200 (Hex).

## md

### (Memory display)

#### Format

```
md[. {b|w|l}] [<addr1>[<addr2>|:<cnt>]]
```

#### Description

The *md* command displays the memory contents within a range specified by the start address <addr1> and the end address <addr2>, or the count number of field <cnt>. The memory contents are divided into blocks of specific field lengths and displayed in hexadecimal.

The *md* command accepts either byte (b), word (w) or long word (l) data. The default data type is a word.

A count <cnt> argument specifies the number of data fields to be displayed. The default value is 8 when the power is turned on. Once *md* is executed with <cnt> specified, the value of <cnt> becomes the default until the command is executed with a different <cnt> value.

After executing *md*, the command can be repeated by pressing the Return key at the NEWS> prompt. A number of data fields equal to the default count number are displayed from the address following the address last displayed.

## ms

### (Memory set)

#### Format

```
ms[. {b|w|l}] [<addr>[<value>]]
```

#### Description

The *ms* command is used to write <value> to the memory address specified by <addr>.

The length of one field is specified by blwl, which indicates byte (b), word (w) and long word (l), respectively. The default is a word. Input data is stored right justified in the field regardless of field length: byte, word and long word.

When this exceeds the specified field length, upper bits are ignored and the remainder is set to the field.

If both <addr> and <data> are specified, data is written in address, and control returns to the ROM monitor.

If <addr> is specified and <value> omitted, the specified field length of memory content is read from the specified address and output to the console together with the address. The desired data can be entered here. When the Return key is pressed following data entry, memory content will be replaced by newly entered data and data of the next address will be displayed. If the Return key is pressed without entering new data, memory content will remain as is, and data for the next address will be displayed.

If the Return key is pressed without entering new data, memory content will remain as is, and data for the next address will be displayed.

Entering ^ or - causes the address to go back one address before; entering "." returns control to the ROM Monitor.

When *ms* is executed without <addr>, data is written to the default address 00000000, or to an address next to the last accessed address (if *ms* has previously been executed).

## **off**

### **(Power off)**

#### **Format**

`off`

#### **Description**

The *off* command is used to turn off the power to the workstation.

#### *Note*

When a floppydisk is in the drive, it will be ejected before the power is turned off.

## **revarp**

### **(Reverse ARP)**

#### **Format**

`revarp`

#### **Description**

The *revarp* command broadcasts a Reverse Address Resolution Protocol (Reverse ARP) request packet on the Ethernet network, and checks and displays the workstation's own Internet address. To use this command, at least one server that knows the workstation's Ethernet/Internet address and is able to respond to its reverse ARP request must be functioning on the network.



## set

### (Set environment variable)

#### Format

```
set [<var>|=<str>]]
```

#### Description

The *set* command assigns a value to an environment variable which is used by the ROM Monitor.

##### *Note*

This command is only effective on environmental variables of the ROM monitor. It has nothing to do with those on the NEWS-OS.

When both <var> and <str> are specified, <str> is set to the variable <var>. When the argument after "=" is omitted, the <var> variable is erased and any variable setting is canceled. Executing this command without any argument displays information for all relevant variables and their current values.

You can refer to the value set to a variable on the ROM Monitor command line by attaching \$ to the beginning of the variable name. For example, after entering:

```
NEWS>set d=md .b 0:100
```

you can simply enter:

```
NEWS>$d
```

rather than entering:

```
NEWS>md .b 0:100
```

##### *Note*

Do not enter any delimiter such as a space before "=".

As a special environment variable, *bootdev* is provided. Use this variable to specify the default device name which will either be referred to in auto-boot mode, or will be used when no device name is specified in commands such as *bo*. For example, entering the following enables auto-boot from the device *sd(1)*:

```
NEWS>set bootdev=sd(1)
```

When this variable is not set, the system assumes *sd(0,0,0,0,7)* as the default boot device. The *bootdev* variable setting is retained even if you turn off the power to the workstation.

## **SV** (Save to device)

**Format** `sv<addr1>(<addr2>|:<cnt>)<devspec><ofs>`

**Description** The *sv* command writes a range of data between the start address <addr1> and end address <addr2>, or <cnt> number of bytes from <addr1>, at the address <ofs> of a device specified by <devspec>.

For details on the <devspec> specification, refer to the "Specifying a Device" section later in this guide.

## **vers** (Version number)

**Format** `vers`

**Description** The *vers* command displays the ROM Monitor version number together with the workstation's serial number and its Ethernet address.

Use this command to check the Ethernet address of your workstation. Before performing a network boot, you must notify the server machine of the address obtained by this command.

# Specifying a Device

Use the following format to specify a device in <devspec>:

```
<name> ([<c>[, [<u>][, [<p>][, [<b>][, [<i>]]]]]])
```

The arguments are as follows:

Argument	Significance
<name>:	Device type
<c>:	Controller number
<u>:	Unit number
<p>:	Partition number
<b>:	SCSI bus number
<i>:	SCSI initiator number

## Note

These arguments may not be applicable to certain devices. Before specifying a device, refer to its hardware manual to determine the arguments.

Do not enter any delimiter (such as a space) between <name> and the subsequent “(“.

The following devices can be specified as <name>:

Device name	Device
<b>sd</b>	SCSI disk
<b>st</b>	SCSI tape
<b>rd</b>	Remote disk
<b>fd</b>	1M byte floppydisk
<b>fh</b>	2M byte floppydisk
<b>mm</b>	Memory

The <devsw> argument is the device specification switch. Set this switch to one of the following device type groups:

- ☐ SCSI device (sd, st)
- ☐ Remote disk device (rd)
- ☐ Floppydisk, memory device (fd, fh, mm)

## SCSI Device

The SCSI device (sd and st) specification switch assumes the following format:

[<c>[, [<u>][, [<p>][, [<b>][, [<i>]]]]]]

- <c> specifies the controller number which corresponds to the SCSI device channel number.
- <u> specifies the unit number of a drive connected to each controller.
- <p> specifies one of the drive's partitions. The partition numbers 0 through 7 are assigned to partitions a through h. To specify the drive's partition size, use the NEWS-OS *disklabel* command. If the partition size has not been specified using this command, the ROM Monitor accepts only "0" for <p>. You cannot specify any value other than 0 for <p> when using a SCSI device.
- <b> is a valid specification on a machine equipped with multiple SCSI buses. Specify <b> as one of the SCSI bus numbers. For other models with a single SOCI bus, you cannot specify any value other than 0.
- <i> specifies the SCSI device channel number which is assigned to the SCSI controller inside the workstation. Do not specify a SCSI device channel number which has already been assigned to another device.

Valid ranges and default values for each switch are as follows:

Name	Symbol	Valid range	Default
Controller number	<c>	0 to 7	X
Unit number	<u>	0 to 7	0
Partition number	<p>	0 to 7	0
Bus number	<b>	0 to N	0
Initiator number	<i>	0 to 7	7

N = (Number of SCSI bus) - 1

X = 0 (when the device is sd) or 5 (when the device is st)

## Other Devices

Specifications `<c>`, `<u>`, `<p>`, `<b>` and `<i>` are ignored when the target is a non-SCSI device. In that case, enter as follows:

`<name> ( )`

**NEWS**

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Release 2

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ROM Monitor User's Guide