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May 1995

## **Dear Paragon™ Supercomputer Customer:**

This package contains your Paragon™ System DIAG2.0 software. With this software installed on your Paragon™ Supercomputer, you can use the Paragon™ system diagnostics on the diagnostic station. Please read through the documentation and distribute it to those intending to use the system diagnostics.

### **Before using your Paragon™ System:**

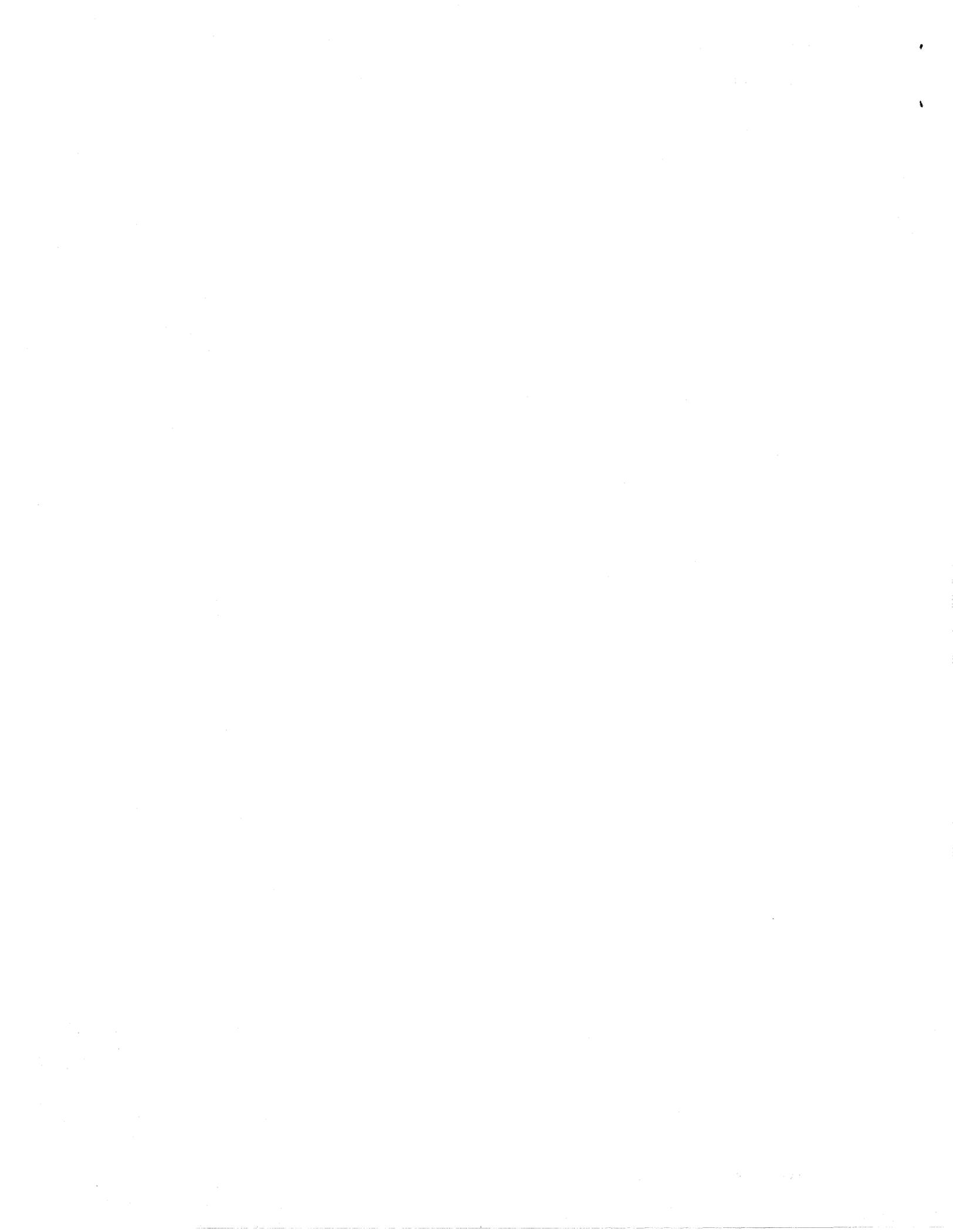
- **Read this letter completely.**
- **Verify the contents of this package.**
- **Read the *Paragon™ System Diagnostic DIAG2.0 Release Notes*.**

## **Package Contents**

Your Paragon™ System diagnostic software is provided as a separate shrinkwrapped package. Please verify that it includes the items listed in Table 1 (Installation Media) and Table 2 (Documentation). If any items are missing, or if you have any questions, please contact Intel Scalable Systems Division as described in the "Comments and Assistance" section.

## **What is in This Release?**

This release contains Paragon™ System Diagnostics DIAG2.0, Release 3.0.0 of the SCO Open Desktop, the *Paragon™ System Diagnostic Reference Manual*, the *Paragon™ System Diagnostic Troubleshooting Guide* and the *Paragon™ System Diagnostic DIAG2.0 Release Notes*.



**Table 1. Installation Media**

<b>Description</b>	<b>Order Number</b>
Cartridge tape labeled "Paragon™ Diagnostics Mass Install Release 3.0.0"	312978-001 ✓
Cartridge tape labeled "Paragon™ System Diagnostic Software Release 2.0"	633972-002 ✓
SCO® OPEN DESKTOP® R3.0.0 for the Paragon™ Diagnostic Workstation N1 Boot Disk	312974-001 ✓
SCO® OPEN DESKTOP® R3.0.0 for the Paragon™ Diagnostic Workstation N2 File System Disk	312975-001 ✓
SCO® OPEN DESKTOP® R3.0.0 for the Paragon™ Diagnostic Workstation M01 Master Install Disk	312976-001 ✓
Paragon™ System Diagnostic Workstation Tests Release 1.0 Disk	312787-001 ✓

**Table 2. Documentation**

<b>Description</b>	<b>Order Number</b>
<i>Paragon™ System Diagnostic DIAG2.0 Release Notes</i>	633971-002 ✓
<i>Paragon™ System Diagnostic Reference Manual</i>	312702-004 ✓
<i>Paragon™ System Diagnostic Troubleshooting Guide</i>	313001-003 ✓ 004 ✓

## Restrictions and Limitations of DIAG2.0

Every effort has been taken to ensure the quality of this release, but at the time of shipment we are aware of some limitations. Please refer to the *Paragon™ System Diagnostic DIAG2.0 Release Notes* for known limitations and available workarounds.

## Installation

### NOTE

Adding or removing any boards or components from your Paragon™ system can damage the system and may invalidate your warranty. Please contact Intel Scalable Systems Division Customer Support for assistance in answering your questions.

For directions on how to install the Paragon™ System Diagnostic software, refer to Chapter 4 in the *Paragon™ System Diagnostic DIAG2.0 Release Notes*.



## Comments and Assistance

Intel Scalable Systems Division is eager to hear of your experiences with our products. Please call us if you need assistance, have questions, or otherwise want to comment on your Paragon system.

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Sincerely,



Peter Wolochow

Product Marketing Manager  
Intel Scalable Systems Division

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May 1995

Order Number: 633971-002

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**Paragon™ System  
Diagnostic DIAG2.0 Release Notes**

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## **WARNING**

Some of the circuitry inside this system operates at hazardous energy and electric shock voltage levels. To avoid the risk of personal injury due to contact with an energy hazard, or risk of electric shock, do not enter any portion of this system unless it is intended to be accessible without the use of a tool. The areas that are considered accessible are the outer enclosure and the area just inside the front door when all of the front panels are installed, and the front of the diagnostic station. There are no user serviceable areas inside the system. Refer any need for such access only to technical personnel that have been qualified by Intel Corporation.

## **CAUTION**

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

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# Preface

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This document describes the DIAG2.0 release of the Paragon™ System Diagnostic package.

In this manual, “operating system” refers to the operating system that runs on the nodes of the Paragon™ supercomputer.

## Organization

- |            |   |
|------------|---|
| Chapter 1  | This chapter describes the features of this release of the Paragon™ system diagnostics.   |
| Chapter 2  | Describes resolved limitations for this release.  |
| Chapter 3  | This chapter describes the compatibility, limitations and workarounds for the Paragon™ system diagnostics.  |
| Chapter 4  | This chapter describes how to install the Paragon™ system diagnostic software.  |
| Chapter 5  | This chapter describes how to update Paragon™ system firmware.  |
| Appendix A | This appendix describes how to install the Diagnostic Station SCO ODT operating system software.  |
| Appendix B | This appendix contains instructions for creating an emergency boot diskette set, for use if a fault prevents normal logins to the diagnostic station. |

## Notational Conventions

This manual uses the following notational conventions:

**Bold** Identifies command names and switches, system call names, reserved words, and other items that must be used exactly as shown.

*Italic* Identifies variables, filenames, directories, processes, user names, and writer annotations in examples. Italic type style is also occasionally used to emphasize a word or phrase.

### Plain-Monospace

Identifies computer output (prompts and messages), examples, and values of variables. Some examples contain annotations that describe specific parts of the example. These annotations (which are not part of the example code or session) appear in *italic* type style and flush with the right margin.

### ***Bold-Italic-Monospace***

Identifies user input (what you enter in response to some prompt).

### **Bold-Monospace**

Identifies the names of keyboard keys (which are also enclosed in angle brackets). A dash indicates that the key preceding the dash is to be held down *while* the key following the dash is pressed. For example:

`<Break>`      `<s>`      `<Ctrl-Alt-Del>`

[ ] (Brackets) Surround optional items.

... (Ellipsis dots) Indicate that the preceding item may be repeated.

| (Bar) Separates two or more items of which you may select only one.

{ } (Braces) Surround two or more items of which you must select one.

## Applicable Documents

For more information, refer to the *Paragon™ System Diagnostic Reference Manual* and the *Paragon™ System Diagnostic Troubleshooting Guide*.

## Comments and Assistance

Intel Scalable Systems Division is eager to hear of your experiences with our products. Please call us if you need assistance, have questions, or otherwise want to comment on your Paragon system.

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# Product Features

1

## Features of This Release

This release of the Paragon™ system diagnostics include the following additional features and enhancements added since the DIAG1.2.3 version:

- The **config** utility has been added, which combines the functions of the **scantest**, **hwcfg**, **cfgpar**, and **mergecfg** utilities into one tool. Refer to the description of the **config** utility in the *Paragon™ System Diagnostic Reference Manual* or the online manual page for the **config** utility.
- A new module of tests has been added to support the SCSI-16 subsystem. See Chapter 12 of the *Paragon™ System Diagnostic Reference Manual* for complete information.
- The menu of tests that **psd** displays is now dynamic and displays only tests that support installed hardware.
- Several operational faults that were reported from system users have been fixed. They are listed in Chapter 2 of this manual.
- Support for Exabyte 5005 tape drives has been added.
- Support for Seagate ST15230 disk drives has been added.



# Resolved Limitations

2

The following problem reports are fixed in this release. The number in brackets following each description is the problem report number.

- Current production diagnostic stations no longer exhibit 32MB SIMM memory errors when running MTA tests for extended periods. [6127]
- The **nwho** (network who) command has been added to show someone logged in. [3976]
- The Paragon system clock does not stop when the diagnostic station reboots. [9117]
- The **psd** program now detects MCP failures. [10319]
- The **cnv** utility handles condo configurations. [11152]
- The **psd** message length default is set to 1792 bytes instead of 64 Kbytes. [11255]
- The **margin** utility works on large machines. [11417]
- The LTU All Modify Test is now available in PSD. [11615]
- The **flashutil** utility reports how many MDCs are expected when reporting firmware versions. [12144]
- The **flashutil** utility displays version information for MP Flex Flash EPROM on MP node boards with MIOs attached. [12455]
- The SCSI Operator Functions request confirmation before proceeding with a device format. [12735]



# Limitations and Workarounds

3

This chapter contains known limitations and workarounds in this release of the Paragon™ system diagnostics (PSD). Please read this chapter before you use the diagnostic software.

## NOTE

The Paragon system diagnostics should not be running when the Paragon system operating system is to be booted.

## Hard Reset Error Recovery

If you use the reset button on a diagnostic station to do a hard reset, or cycle the power on the diagnostic station of any system, you will make an “ungraceful” exit from Paragon System Diagnostics.

When **psd** begins its initialization, it saves a copy of the *SYSCONFIG.BIN* file into *SYSBIN.ORIG*. If the diagnostic station reports:

```
Cannot save the binary configuration file: /u/paragon/diag/SYSBIN.ORIG already exists
```

Remove this file to run **psd** without error.

## FRU Hardware Compatibility

The following tables show the combinations of hardware and firmware that are supported by DIAG1.2.x and DIAG2.0.x (including all diagnostic updates).

### NOTE

Blank fields—except for comments—indicate that compatibility for a combination is unknown or unverified.

## GP Node Compatibility

The following table shows which GP Node hardware components and firmware versions are compatible with Paragon System Diagnostics.

**Table 3-1. GP Node Compatibility With DIAG1.2+ and DIAG2.0+**

Component	Revision	Comments	Compatible OS Revisions
Node Board	Fab7-011 and up		
Flash EPROM	V3.1	Base version. 32-MB support. Expansion-board NCT failure now a fatal error.	1.2.x, 1.3.x
	V3.2	Fixed reset-hang problem.	1.2.x, 1.3.x
	V3.3	Contains the correct address to check for the existence of an MDC.	1.2.x, 1.3.x
NIC ASIC	A step		
	B step		

## MP Node Compatibility

The following table shows which MP Node hardware components and firmware versions are compatible with Paragon System Diagnostics.

**Table 3-2. MP Node Compatibility With DIAG1.2+ and DIAG2.0+**

Component	Revision	Comments	Compatible OS Revisions
Node Board	Fab 2.1		
NCT Flash EPROM	V2.0	Base version. CS8-mode test menu, ability to run extended NCTs via scan.	1.3.x
	V2.1	Local bus test, bug fixes in monitor, CS8-mode looping.	1.3.x
	V2.2	Added check of the daughtercard NCT return status. Changed addresses for SCSI-16 Flash EPROM locations.	1.3.x
MP Flex Flash EPROM	V1.1	Initial release.	1.3.x
	V1.2	Base version. Fixes NIC status register reads. Adds HIPPI daughtercard.	1.3.x
	V1.3	Fixes NIC underrun problem. Improves HIPPI bandwidth. Improves BRDY timing, LTU arbitration, and expansion arbitration.	1.3.x
	V1.4	Changed CORR timing to match MDC.	1.3.x
NIC ASIC	B step		

## Memory Daughtercard Compatibility

The following table shows which MDC hardware components and firmware versions are compatible with Paragon System Diagnostics and with which node boards.

**Table 3-3. MDC Board Compatibility With DIAG1.2+ and DIAG2.0+**

Component	Revision	Comments	Compatible OS Revisions
Node Board	As per GP	GP Nodes must have V3.3 firmware to support an MDC.	
MDC Board	Fab 3	16- and 32-Mbyte versions are available as Fab 3.	
Flash EPROM	V1.2	Base version.	1.2.4-1.2.7, 1.3.x
	V1.4	Bug fixes.	1.2.4-1.2.7, 1.3.x
	V1.5	Fixes hard ECC errors.	1.2.4-1.2.7, 1.3.x

## MIO Daughtercard Compatibility

The following table shows which MIO hardware components and firmware versions are compatible with Paragon System Diagnostics and with which node boards.

**Table 3-4. MIO Board Compatibility With DIAG1.2+ and DIAG2.0+**

Component	Revision	Comments	Compatible OS Revisions
Node Board(s)	As per GP and MP	MP requires "fast" NIC-B.	
Daughtercard	Fab2		
	Fab3		
Flash EPROM	tftp - 1.13 MIO - 1.0	Base version.	1.2.x, 1.3.x
	tftp - 1.13 MIO - 1.1	Adds Ethernet tests and fixes SCSI and asynchronous bugs.	1.2.x, 1.3.x
	tftp - 1.13 MIO - 1.2	Adds Ethernet tests and fixes SCSI and asynchronous bugs.	1.2.x, 1.3.x
	tftp - 1.13 MIO - 1.3	Fixes Ethernet tests.	1.2.x, 1.3.x

## HIPPI Daughtercard Compatibility

The following table shows which HIPPI hardware components and firmware versions are compatible with Paragon System Diagnostics, and with which node boards.

**Table 3-5. HIPPI Board Compatibility With DIAG1.2+ and DIAG2.0+**

Component	Revision	Comments	Compatible OS Revisions
Node Board(s)	GP Node - Fab8		
	MP Node - Fab 2.1	Requires V1.5 or later Flash. MP requires "fast" NIC-B.	
Daughtercard	Fab3		
Flash EPROM	V1.2	Base version.	1.2.x
	V1.5	IPI-3 support.	1.3.x

## SCSI-16 Daughtercard Compatibility

The following table shows which SCSI-16 hardware components and firmware versions are compatible with Paragon System Diagnostics, and with which node boards.

**Table 3-6. SCSI-16 Board Compatibility With DIAG1.2+ and DIAG2.0+**

Component	Revision	Comments	Compatible OS Revisions
Node Board(s)	MP Node - Fab 2.1	SCSI-16 is only supported on MP Node boards.	
Daughtercard			
NCT Flash EPROM	V1.0	Base version.	1.3.x
Flex Flash EPROM	V1.0	Base version.	1.3.x

## RAID Controller Compatibility

The following table shows which RAID hardware components and firmware versions are compatible with Paragon System Diagnostics.

**Table 3-7. RAID Controller Compatibility With DIAG1.2+ and DIAG2.0+**

Component	Revision	Comments	Compatible OS Revisions
Controller Board	92/01	Provides RAID OS 3.06.	1.2.x, 1.3.x

## Disk Drive Compatibility

The following table shows which disk drive hardware components and firmware versions are compatible with Paragon System Diagnostics.

**Table 3-8. Disk Drive Compatibility With DIAG1.2+ and DIAG2.0+**

Manufacturer	Model	Comments	Compatible OS Revisions
Maxtor	MXT-1240	Intel P/N 317961-001	1.2.x, 1.3.x
Seagate	ST31200N	Intel P/N 340573-001	1.2.x, 1.3.x
	ST15230	Intel P/N 341404-001	1.2.x, 1.3.x

## Tape Drive Compatibility

The following table shows which tape drive hardware components and firmware versions are compatible with Paragon System Diagnostics.

**Table 3-9. Tape Drive Compatibility With DIAG1.2+ and DIAG2.0+**

Manufacturer	Model	Comments	Compatible OS Revisions
HP	35470A	Intel P/N 316897-001	1.3.x
HP	C1533A	Intel P/N 340744-001	1.2.x, 1.3.x
Exabyte	8505	Intel P/N 341640-001	1.3.x

## Diagnostic Component Sources

The following table shows which Diagnostic release contains specific firmware and software revisions. The firmware checksum is shown with the first appearance of a new revision. Later instances of the same revision have the same checksum.

### CAUTION

Unreleased packages may be changed or removed without warning.

Table 3-10. Diagnostic Component Sources

Diagnostic Release		Included Firmware								
Version	Status (Date)	Scan Driver	GP Node	MP Node	MP Flex	MDC	HIPPI	MIO	SIO	SIO Flex
1.2	Yes (Mar 94)	0.8	3.3 0x5ffd	-	-	1.2 0xebf7	1.2 0x92e3	1.3 0x0996	-	-
1.2.1	Yes (Jun 94)	0.8	3.3	X0.1 0xf05d	X0.1 0x5da7	1.2	1.2	1.3	-	-
1.2.2	Yes (Sep 94)	1.0	3.3	2.0 0xc086	1.2 0x2c2a	1.4 0xf59e	1.2	1.3	-	-
1.2.2.1	Yes (Dec 94)	1.0	3.3	2.0	1.2	1.4	1.2	1.3	-	-
1.2.2.2	Yes (Mar 95)	1.0	3.3	2.0	1.4 0x3086	1.5 0xf61e	1.2	1.3	-	-
2.0	Yes (Apr 95)	1.0	3.3	2.2 0x77ad	1.4	1.5	1.5 0xd92f	1.3	1.0 0xc1ba	1.0 0x662f

## Operating System and Diagnostics Compatibility

The following table shows which operating system and diagnostic revisions are compatible with each other.

**Table 3-11. Paragon™ System OS and Diagnostic Compatibility**

Operating System		Diagnostics		OS Features
Rev	OS Compatible Scan Driver	Rev	PSD Compatible Scan Driver	
1.2 1.2.1 1.2.2 1.2.3	0.8 1.0	1.2.x 2.0.x	0.8 <sup>1</sup> 1.0	Base OS Release
1.2.4 to 1.2.7	0.8 1.0	1.2.2.2 2.0.x	0.8 <sup>1</sup> 1.0	MDC Support
1.3.x	1.0	2.0.x	0.8 <sup>1</sup> 1.0	

1. The 0.8 scan driver does not support the **scantest** utility.

## FRU Identification

### GP Node Identification

The codes in Table 3-12. identify the FRU (Field Replaceable Unit) numbers for the different GP Node boards that might be in a system.

**Table 3-12. GP Node FRU Identification (1 of 2)**

FRU Number	Description
AIxx	All Pre-1.2-compatible GP Nodes (except 32 MB Fab 8 boards)—MCP <i>OFF</i>
AJxx	Pre-1.2-compatible 32 MB Fab 8 GP Nodes—MCP <i>OFF</i>
AKxx	1.2-compatible Fab 7 GP Nodes—MCP <i>ON</i>
ALxx	Not used

**Table 3-12. GP Node FRU Identification (2 of 2)**

FRU Number	Description
AMxx	1.2-compatible Fab 8 (16 MB) GP Nodes—MCP <i>ON</i>
ANxx	1.2-compatible Fab 8 (32 MB) GP Nodes—MCP <i>ON</i>

The codes are shown in the *SYSCONFIG.TXT* file, as in the following example line. The “AK” entry in this example identifies a 1.2-compatible Fab 7 unit with the Message Coprocessor (MCP) turned on:

```
S 0 GPNODE AK00 16 MIO B02
```

Refer to Appendix D of the *Paragon™ System Diagnostic Reference Manual* for more information.

## MP Node Identification

The codes in Table 3-13. identify the FRU (Field Replaceable Unit) numbers for the different MP Node boards that might be in a system.

**Table 3-13. MP Node FRU Identification**

FRU Number	Description
AHxx	Fab 2.1 (128 Mbyte)
AGxx	Fab 2.1 (64 Mbyte)
AFxx	Fab 2.1 (32 Mbyte)
AExx	Fab 2.1 (16 Mbyte)

The codes are shown in the *SYSCONFIG.TXT* file. Refer to Appendix D of the *Paragon™ System Diagnostic Reference Manual* for more information.

## Memory Daughtercard (MDC) Identification

The FRU (Field Replaceable Unit) numbers for the memory daughtercards are not shown in the configuration files.

## MIO Daughtercard Identification

The FRU identification for MIO boards in *SYSCONFIG.TXT* is a placeholder and does not contain type or revision information.

## HIPPI Daughtercard Identification

The FRU identification for HIPPI boards in *SYSCONFIG.TXT* is a placeholder and does not contain type or revision information.

## SCSI-16 Daughtercard Identification

The FRU identification for SCSI-16 boards in *SYSCONFIG.TXT* is a placeholder and does not contain type or revision information.

## Power Controller Identification

The following versions of Power Controllers are used—all of which are compatible with the current release of Diagnostics:

PC AU00  
PC AU01  
PC AU02

## LED Controller Identification

The only version of the LED Controller is identified as follows:

LED AM00

## Backplane Identification

A variety of backplane versions are used—all of which are compatible. The following is an example:

BP A AC00

# Installation Instructions

4

This chapter describes the steps necessary to install the Paragon™ System Diagnostic Software.

## NOTE

To install the Paragon System Diagnostic Software, you must have completed the installation of the SCO OPEN DESKTOP Release 3.0.0. (This is the same release used with the previous version of Diagnostic Software.) If the operating system is not in place, follow the procedure shown in Appendix A to install it before installing the diagnostic software.

To check the version of the operating system on the diagnostic station, type the following command at the OS prompt:

```
uname -X
```

If it does not report "Release = 3.2v4.2", you must install a new operating system.

The procedures in this chapter use the conventions described in the Preface. You should also be aware of the following conventions:

- The instruction "Enter *character(s)*" means type the indicated character(s), and then press the <Enter> key. For example, "Enter *y*" means type the letter "y", and then press the <Enter> key.
- In prompts, square brackets surround a default value. Pressing <Enter> selects the indicated default value.
- Some steps in these procedures cause a great deal of information to be displayed. However, the step as described here may show only the last message displayed. Also, do not be concerned if the indicated message does not appear immediately. Some steps take several minutes to complete.

## Installing the Paragon™ System Diagnostic Software

---

<b>Installation Time:</b>	Approximately 10 minutes.
<b>Installation Media:</b>	One cartridge tape labeled "Paragon™ System Diagnostic Software DIAG2.0" (633972-002).
<b>Information you need:</b>	<p><i>root</i> password.            IP address of the Paragon System boot node.            IP address of the diagnostic station.            The total number of cabinets in the Paragon system.</p>

---

### Requirements for Installation

You will need certain data on hand for use during the installation. Use this form to gather and record the required data.

Data Needed	Enter data in this column
Total number of Paragon system cabinets.	1
The <i>root</i> password for the diagnostic station.	<i>Protect system passwords in a secure place.</i>
The IP Address of the Paragon system Boot Node.	169
The IP Address of the diagnostic station.	170

### CAUTION

If you installing over an existing installation of the diagnostic software, save any files in the directory `/u/paragon/diag` that you don't want to be overwritten (such as `.psd.mac`).

## Installing the Diagnostic Software

1. Shut down the operating system on the Paragon system with the following steps:

- A. On the Paragon System, change to the root directory:

```
cd /
```

- B. Sync the memory:

```
sync;sync
```

- C. Close down the operating system:

```
shutdown now
```

- D. Unmount all file systems:

```
umount -A
```

- E. Stop the processor:

```
halt
```

- F. Return to the diagnostic station prompt:

```
~.
```

2. Verify that the correct version of the SCO Open Desktop® operating system is installed on the diagnostic station:

- A. Login as *root* on the diagnostic station.

- B. Issue the following command to find out what version of the operating system is installed:

```
DS#uname -X
```

Eleven lines of information will be printed on the display. The *Release...* line should read:

```
Release = 3.2v4.2 ✓
```

If it does not, you must install a new version of the operating system onto the diagnostic station, using the procedure in Appendix A, before continuing with this procedure.

3. Change to the root directory:

```
DS#cd /
```

4. Change the **umask** for directory creation:

✓ DS#**umask 022**

5. If a diagnostic daemon is running, stop it with the following command:

✓ DS#**dcdc stop**

## NOTE

Ignore any of the following messages: **dcdc: Command not found** or **DSD shutdown: DSD is not running** or **DSD shutdown: [DSD shutdown complete]** and continue with the installation.

The daemon will either be restarted automatically when the diagnostic station is rebooted, or restarted manually at the end of this procedure.

6. Insert the Paragon™ System Diagnostic Software tape in the tape drive.

7. Extract the files from the tape:

(This step takes a few minutes.)

✓ DS#**tar xvpf /dev/rct0**

8. If this is the first installation of this release, go to step 9. If you are unsure, check to see whether the Diaboard driver is current with the following command:

0.8 ← DS#**strings /unix | grep Dia**

If the version is 1.0, go to Step 16. Otherwise, continue to Step 9.

9. The scan utilities directory has now been created. Change to that directory:

✓ DS#**cd /etc/conf/pack.d/scan**

10. Install the Driver:

✓ DS#**./buildscan**

If the OS has previously been installed, you may be prompted about whether you want to rebuild the kernel. Answer **yes (y)**.

The system now builds */unix*.

(This step takes a few minutes.)

## NOTE

The following messages are normal; ignore them:

```
device driver for scan does not exist configuring
scan driver into kernel
```

```
/dev/scan does not exist, building into kernel
```

- 11. When asked if you want this kernel to boot by default, enter **y** (for yes).
- 12. When asked if you want the kernel environment to be rebuilt, enter **y** (for yes).
- 13. Shutdown the diagnostics station:

```
DS#shutdown -y -g0
```

- 14. When prompted to reboot, press **<Enter>**.

- 15. Login as *root* on the diagnostics station.

- 16. Do one of the following:

- Check that *DIAG\_ALIAS* and *PARA\_ALIAS* are defined in the */etc/hosts* file. The alias variables should be included on the lines that contain the Paragon System and Diagnostic Station IP numbers. (This is the recommended way to define system IP addresses.)

```
xxx.xx.xx.xx DS_name DIAG_ALIAS DS_name.def.com
xxx.xx.xx.xx Paragon_name PARA_ALIAS
```

- Modify the */u/paragon/diag/psdenv* file to include the IP definition lines as follows: (This is the old way of defining system IP addresses for PSD.)

```
OUR_IP_ADDR=Paragon Boot Node IP Address
DS_IP_ADDR=Diagnostic Station IP Address
```

17. Change directory to */usr/paragon/boot*:

DS# *cd /usr/paragon/boot*

- ✓ Find out if *DEVCONF.TXT* and *MAGIC.MASTER* files exist. If they are not found in */usr/paragon/boot*, then do the next step. If the files are present, skip the next step. ✓

18. Do one of the following:

- ✓
- Restore the *DEVCONF.TXT* and *MAGIC.MASTER* files now if you saved them prior to installation of SCO ODT 3.0.0.
  - Create *DEVCONF.TXT* and *MAGIC.MASTER* files. You can alter the samples found in */u/paragon/diag/sample*. Refer to the *Paragon System Diagnostics Reference Manual* for a detailed description of these files.
- rest of the hard copy.*

19. Change directory to */u/paragon/diag*:

✓ DS# *cd /u/paragon/diag*

20. Use the **config** utility to generate the diagnostic configuration files:

✓ ✓ DS# *./config*

- ✓ 21. Use **flashutil** to update the Paragon System Flash EPROM contents in your system. See Chapter 5 of these release notes on how to update the Flash EPROMs.

- ✓ 22. If you did not do Steps 11 through 15 to build a new scan driver and did not reboot the diagnostic station, restart the diagnostic daemon manually:

DS# *dcdc start*

## NOTE

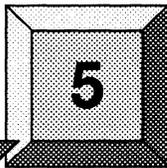
The message *DSD started* is normal.

23. To enter the diagnostic menu, enter:

DS# *psd*

# Updating Paragon™ System Firmware

---



5

The chapter describes how to use **flashutil** to update the firmware in a Paragon™ system.

## CAUTION

This procedure updates all nodes at the same time. There is a very small risk in this method: if a power glitch occurs during the approximately 25 seconds required for updating, it is possible that the contents of every EPROM could be corrupted.

The alternative is to update one node at a time, or a small range of nodes. A power glitch would then disturb the EPROM contents in only a single node or a small set of nodes. However, a 512-node machine, for example, would require several hours to update that way.

If a power glitch occurs while updating the specified node, you may not be able to recover this node. Recovering from a power glitch may require an external EPROM programmer to reprogram a flash EPROM.

**NOTE**

GP  
 3.3 ✓  
 19  
 PA0-AK  
 00 04  
 03 04

You must install the Paragon™ system diagnostic software before you update any firmware.

If your Paragon system has GP node firmware below version V3.1, you need to update those nodes to V3.1 prior to updating to V3.3.

If you receive Response timeout: node... errors, when using **flashutil**, check that the small power connectors (1" x 1", with three wires) in the lower-right corner of the backplanes are seated properly.

1. There are three methods for updating the Paragon system firmware. Choose one of the following methods:

- Update one node at a time:

```
DS#flashutil -s node
```

This is the safest method for protecting against power glitches.

- Update a range of nodes:

```
DS#flashutil -s first_node..last_node
```

You may use the node-range option to do a section of your system at a time. This method localizes the risk to a group of nodes. Updating a cabinet of nodes is possible with this method.

- Update your entire system:

```
DS#flashutil
```

This choice carries the greatest risk, but provides the quickest update. All nodes are updated in parallel.

2.2 ✓  
 09  
 015

MID  
 1.3 ✓  
 03  
 2 04

HIPPI  
 1.5 ✓

2) 09 09  
 015 015

MPFLex  
 1.4 ✓  
 2 09 015

- Choose the target Flash from the menu that **flashutil** displays:

Please select the Flash memory for the update

<p>28 →</p> <p>6P 19 <math>\frac{V}{3.3}</math> ✓</p> <p>MP 2 2.2 ✓</p> <p>MIO 2 1.3 ✓</p> <p>HIPPI 2 1.5 ✓</p> <p>HIPPI 2 1.4 ✓</p> <p>V to 79.</p>	<table border="0"> <tr><td>1 ---&gt;</td><td>Program the GP</td><td>Flash memory</td></tr> <tr><td>2 ---&gt;</td><td>Program the MIO</td><td>Flash memory</td></tr> <tr><td>3 ---&gt;</td><td>Program the HIPPI</td><td>Flash memory</td></tr> <tr><td>4 ---&gt;</td><td>Program the MDC</td><td>Flash memory</td></tr> <tr><td>7 ---&gt;</td><td>Program the SIO</td><td>Flash memory</td></tr> <tr><td>8 ---&gt;</td><td>Program the MP</td><td>Flash memory</td></tr> <tr><td>9 ---&gt;</td><td>Program the MP Flex</td><td>Flash memory</td></tr> <tr><td>10 ---&gt;</td><td>Program the SIO Flex</td><td>Flash memory</td></tr> <tr><td>→ 28 ---&gt;</td><td>ROM version report</td><td></td></tr> <tr><td>→ 29 ---&gt;</td><td>Display fw_all.bin version info</td><td></td></tr> <tr><td>30 ---&gt;</td><td>Exit flashutil no Flash programming</td><td></td></tr> </table> <p>To update GP nodes (for example), enter 1</p>	1 --->	Program the GP	Flash memory	2 --->	Program the MIO	Flash memory	3 --->	Program the HIPPI	Flash memory	4 --->	Program the MDC	Flash memory	7 --->	Program the SIO	Flash memory	8 --->	Program the MP	Flash memory	9 --->	Program the MP Flex	Flash memory	10 --->	Program the SIO Flex	Flash memory	→ 28 --->	ROM version report		→ 29 --->	Display fw_all.bin version info		30 --->	Exit flashutil no Flash programming	
1 --->	Program the GP	Flash memory																																
2 --->	Program the MIO	Flash memory																																
3 --->	Program the HIPPI	Flash memory																																
4 --->	Program the MDC	Flash memory																																
7 --->	Program the SIO	Flash memory																																
8 --->	Program the MP	Flash memory																																
9 --->	Program the MP Flex	Flash memory																																
10 --->	Program the SIO Flex	Flash memory																																
→ 28 --->	ROM version report																																	
→ 29 --->	Display fw_all.bin version info																																	
30 --->	Exit flashutil no Flash programming																																	

### NOTE

The HIPPI selection works on 256 Kbyte firmware. It will not program older 128 Kbyte HIPPI devices (Fab 2).

- The **flashutil** program returns a message asking if you want to reset the Paragon system.

This program will reset the Paragon system. Do you wish to continue? (y/n)

To cancel at this point, enter either a carriage return or **n** (for no).

To update, enter **y** (for yes).

- The program initializes the system, loads the nodes with the code to reprogram the EPROMs, along with the *fw\_all.bin* file, which contains the new firmware for all flash EPROMs, then displays a warning message. You now have one last chance to abandon the update:

Warning! current flash EPROM contents will be erased and replaced.

Proceed? (yes/no)

Enter “no” to abandon the update, or enter “yes” to update.

Any response other than *yes* (fully spelled out) cancels the update.

**flashutil** then sends a command to each node in sequence, causing the node to program the flash EPROM image that now resides in RAM into the selected flash EPROM. **flashutil** displays a “+” for each node on which the target EPROM is programmed, and a “-” for each node on which the target EPROM is not found. For example, if there are five nodes in a system, with the third one including an MIO daughtercard, **flashutil** displays the following series as it goes through the nodes to reprogram MIO flash EPROMs:

--+--

If no error message follows the “+” sign, the node programmed correctly. A “-” sign indicates that the selected target was not found on that node—it does not indicate an error or an empty slot.

## NOTE

A system that contains GP nodes with a mix of old (pre-V3.1) and new firmware (for example when a board is placed in a system that has previously been updated) will need to be operated the same as if all nodes in the system contain the old firmware.

5. If you do enter *yes*, the update proceeds. Each node returns a status message to **flashutil** (via the scan bus) when it completes the update.
6. Confirm that all target EPROMs now contain the correct updated firmware. Use the **flashutil** utility with the **-r** and **-t** switches to display the version number that it finds on the node boards:

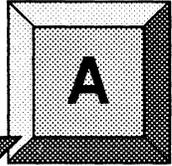
```
DS#flashutil -r -t gp
```

**flashutil** will display a report showing the version numbers of the node flash EPROMs in your system:

```
GP.FLASH - (expected count=4, actual count=4)
Version V3.3 found on the following nodes:
00A00 00A01 00A02 00A03
```

# Installing the SCO Operating System

---



A

This appendix describes the steps necessary to install SCO Open Desktop Release 3.0.0.

The procedures in this appendix use the conventions described in the Preface. You should also be aware of the following conventions:

- The instruction “Enter *character(s)*” means type the indicated character(s), and then press the <Enter> key. For example, “Enter *y*” means type the letter “*y*”, and then press the <Enter> key.
- In prompts, square brackets surround a default value. Pressing <Enter> selects the indicated default value.
- Some steps in these procedures cause a great deal of information to be displayed. However, the step as described here may show only the last message displayed. Also, do not be concerned if the indicated message does not appear immediately. Some steps take several minutes to complete.

# Installing SCO OPEN DESKTOP Release 3.0.0

---

- Installation Time:** Approximately 45 minutes.
- Installation Media:**
- One cartridge tape labeled "SCO OPEN DESKTOP R3.0.0 for the Paragon™ Diagnostic Workstation SCO Mass Install Tape Vol 1 of 1" (312978-001).
  - One disk labeled "SCO OPEN DESKTOP R3.0.0 for the Paragon™ Diagnostic Workstation N1 Boot Disk" (312974-001).
  - One disk labeled "SCO OPEN DESKTOP R3.0.0 for the Paragon™ Diagnostic Workstation N2 File System Disk" (312975-001).
  - One disk labeled "SCO OPEN DESKTOP R3.0.0 for the Paragon™ Diagnostic Workstation M01 Master Install Disk" (312976-001).
- 

## Requirements for Installation

You will need certain data on hand for use during the installation. Use this form to gather and record the required data.

Data Needed	Enter data in this column
→ The SCO Serial Number (located in the SCO OPEN DESKTOP box).	
→ The SCO Activation Key (located in the SCO OPEN DESKTOP box).	
The system name of the diagnostic station.	J A G G E R
The root password of the diagnostic station.	<i>Protect system passwords in a secure place.</i>
The IP address of the diagnostic station.	69.70

Data Needed	Enter data in this column
The domain name of the diagnostic station (use the <b>hostname</b> command to find it).	
The Netmask of the diagnostic station.	
The Broadcast IP address of the diagnostic station.	255
The IP address of the Paragon System Boot Node.	169
The total number of Paragon system cabinets.	1

It is essential to make backup copies of:

- Diagnostic station-specific files */etc/hosts* and */etc/resolv.conf* (if they exist).
- Paragon System diagnostic configuration files */usr/paragon/boot/DEVCONF.TXT*, */usr/paragon/boot/MAGIC.MASTER*, and */usr/paragon/BOOTMAGIC.md* files (if they exist).
- Paragon OSF/1 files which reside on the diagnostic station in the directory trees */usr/local/bin* and */usr/paragon/boo*.

If you haven't done so already, shut down the operating system on the Paragon System with the following steps:

1. On the Paragon System, change to the root directory:

```
cd /
```

2. Sync the memory:

```
sync ; sync
```

3. Close down the operating system:

```
shutdown now
```

4. Unmount all file systems:

```
umount -A
```

5. Stop the processor:

```
halt
```

6. Return to the diagnostic station prompt:

~.

## Reinstalling SCO OPEN DESKTOP

If you are reinstalling SCO OPEN DESKTOP over an existing system, use a utility, such as **fdisk**, to delete the active UNIX partition on the diagnostic station.

1. To find the active partition (see the manual page for **fdisk** to interpret the returned information), enter:

```
fdisk -p
```

2. Delete the active partition. For example, if partition 1 is active, enter:

```
fdisk -d 1
```

## Install SCO OPEN DESKTOP Procedure

### WARNING

These procedures overwrite the Paragon System diagnostic station disk drive. Make a backup of any user file(s) you want to retain.

1. Insert the SCO N1 Boot disk into the disk drive.
2. Boot the diagnostic station by turning the power on.
3. At the boot prompt, press **<Enter>**.
4. When prompted, insert the SCO N2 File System disk and press **<Enter>**.

### NOTE

Ignore the normal message warning: `/dev/ropipe was not in mount table.`

5. When prompted to select the type of tape drive, enter the following:

*scsi*

## NOTE

The prompt in the next step refers to the MIT System Image Vol. 1 tape. Our corresponding product is called the "SCO Mass Installation Toolkit Tape Vol. 1" and is used in place of the MIT tape.

6. When prompted:
  - A. Verify that the SCO M01 Master Install diskette is in the floppy drive.
  - B. Verify that the SCO Mass Installation Toolkit Tape Vol. 1 is in the tape drive.
  - C. Press <Enter>.

(This step takes about 30 minutes.)

## NOTE

Ignore the message `errno 26, Text file busy...`

7. When prompted to set system time, enter *y* (for yes).

If you are not in North America, enter *n* (for no) in response to step 8 and go to step 11.
8. When asked if you are in North America, enter *y* (for yes) or enter *n* (for no).
9. When asked for your time zone, enter your time zone number and press <Enter>.
10. When asked if daylight savings applies to your time zone, enter either *y* (for yes) or *n* (for no).
11. Enter the correct date and time using the format of year, month, day, hour and minute. This example is for a date and time of March 9, 1994 at 6:22 p.m.:

*9403091822*

12. When asked if you want to set the system name, enter *y*.
13. Enter your diagnostic station name and press <Enter>.

14. When asked if the mail system should be a different name, enter *n*.
15. When prompted, press <Enter> to continue.
16. When prompted to serialize the system, respond with *y*.

### NOTE

If you respond "Yes" to the question in step 17, you will be forced to start this procedure over at step 1.

17. When asked if you want to execute floppy-based serialization, respond with *n*.
18. Enter Serial Number and Activation Key codes at the prompts.  
(This step takes about 20 seconds.)
19. When asked if you want to change your answer to any of these questions, respond with *q*.  
The system now builds */unix*. (This step takes a few minutes.)
20. When prompted to reboot the system, remove any remaining floppy disk(s) and/or tape(s) and press <Enter> to reboot.

### NOTE

In the next step you have only 5 seconds to press <Enter> after the boot prompt appears.

21. When the boot prompt appears, enter single-user mode by pressing <Enter> within 5 seconds.
22. Wait for the single-user mode login prompt, then enter the password:  
  
*paragon3*
23. Run the password utility:  
  
*passwd*
24. When prompted to choose your own password, respond with *1*.
25. When prompted, enter your new password.
26. When reprompted, reenter your new password.

## NOTE

Do not restore the password file from a backup. Doing so will compromise the system security and may cause boot problems on the diagnostic station. Use the **passwd** or **sysadmsh** utilities to change the diagnostic station password.

27. Edit the file */etc/default/tcp* by changing the lines in the *tcp* file as shown in Table A-1.

Table A-1. Edit Values in the */etc/default/tcp* File

Current	Change To:
DOMAIN = default.com	DOMAIN = <i>DS system's Domain name</i>
IPADDR = nnn.nnn.nnn.nnn	IPADDR = <i>DS system's IP address</i>
NETMASK = nnn.nnn.nnn.nnn	NETMASK = <i>netmask</i>
BROADCAST = nnn.nnn.nnn.nnn	BROADCAST = <i>broadcast IP address</i>

28. Restore your */etc/hosts* file from your backup copy, if one was created, or modify the existing */etc/hosts* file.

## NOTE

When you restore the */etc/hosts* file, you must also alias the DS domain name to the DS IP number. Use the **hostname** command to find the domain name.

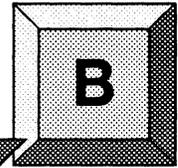
29. Reboot the diagnostic station:

***reboot***

This completes the installation of the basic SCO OPEN DESKTOP Release 3.0.0 software on the diagnostic station.



# Making Emergency Boot Diskettes for the Diagnostic Station



This appendix describes how to create a set of emergency diskettes to use to boot the diagnostic station on the Paragon™ system.

If your diagnostic station develops problems that prevent logins (such as a corrupted *passwd* file or corrupted shared library files, you can boot from the emergency diskettes and then repair the problem.

## NOTE

If you don't create the emergency diskettes ahead of time, the sole remedy is a complete reinstallation of diagnostic station and Paragon system software.

The diskette set can be created without rebooting the Paragon™ System or the diagnostic station. To test your emergency boot diskette set, you will have to reboot the diagnostic station.

## Creating an Emergency Boot Diskette Set

1. Log in to the diagnostic station as a *root* user.
2. Run the system administration shell program:

```
DS# sysadmsh
```

3. Select the "Filesystems" menu.
4. Select the "Floppy" submenu.

5. At the Floppy Disk Filesystem Creation menu, select “135tpi, double sided, 18 sectors” (selection 4).
6. At the floppy filesystem contents menu, select “Bootable only” (selection 2).
7. When prompted, insert a blank diskette and press <Enter>.
8. When prompted to format the floppy, select:

DS#y

The boot diskette is created—you will see messages as files are copied onto the diskette. The filesystem on the diskette will then be checked using **fsck** and you will see some more messages. When the boot diskette has been created you will see the floppy filesystem contents menu again.

9. Remove the diskette, label it with “Boot Diskette”, and write-protect it.
10. At the floppy filesystem contents menu select “Root filesystem only” (selection 3).
11. When prompted, insert a blank diskette and press <Enter>.
12. When prompted to format the floppy, select:

DS#y

The root filesystem diskette is then created—you will see messages as files are copied onto the floppy. The filesystem on the diskette will then be checked using **fsck**, and you will see some more messages.

13. When the Root Filesystem Diskette has been created you will again see the floppy filesystem contents menu. Do not remove the floppy yet, select the following:

DS#g  
DS#<any key>  
DS#<Esc>  
DS#g  
DS#Yes

You should now be at the system prompt.

14. Mount the diskette’s filesystem with the following command:

```
DS#mount /dev/rd0 /mnt  
fdo
```

- Copy the **tar** utility (and others you may want) to the floppy filesystem:

```
DS#cp /usr/bin/tar /mnt/bin
DS#cp /etc/default/tar /mnt/etc/default
```

- Unmount the floppy filesystem:

```
DS#umount /mnt
```

- Remove the root filesystem diskette and label it.

## NOTE

Do not write protect this diskette.

## CAUTION

Store the emergency boot diskette set in a secure location—these diskettes may be used to gain unauthorized access to the system.

## Booting with the Emergency Boot Diskette Set

- Insert the boot diskette and reset the diagnostic station.
- At the 'Boot:' prompt, press <Enter>.
- When prompted, insert the root filesystem diskette and press <Enter>.

When the diagnostic station is booted you will see a system prompt.

- Check the hard disk root filesystem:

```
DS#/etc/fsck /dev/hd0rootOK
hd0root
```

- Mount the hard disk:

```
DS#mount /dev/hd0root /mnt
```

## NOTE

You may see a message saying that the hard disk is already mounted—ignore it.

6. (OPTIONAL) If you need to change the UID of *root* and change the root directory (which is necessary to restore a lost root password), do the following:

```
DS# /mnt/bin/chroot /mnt /bin/sh
DS# su
```

7. At this point, you are able to correct the problem that made it impossible to login, such as restoring a lost root password.

## Testing the Restore Utilities

It is highly recommended that you test the **tar** and **cpio** utilities, because these utilities may be used for restores.

1. To check the **tar** and **cpio** utilities (with the appropriate tapes installed in the tape drive), do the following:

```
DS# cpio -itvCB -I /dev/rStp0
DS# tar tvf /dev/rStp0
```

2. When you need to reboot, enter:

```
DS# /etc/haltsys
```

3. When you see the message to reboot, remove the diskette from the drive and press <Enter>.