UNICOS® Installation Guide for CRAY J90™ Series

SG–5271 9.0.2

Cray Research, Inc.

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Cray Research Software Documentation Map

The information on the following pages highlights the major body of documentation available for Cray Research customers. The manuals are organized into categories by product designation:

Product	Description
Programming environments	Cray Research programming environments provide an integrated development environment by combining compilers with development tools and libraries.
UNICOS operating system	The UNICOS operating system provides basic system control and management functions. It provides services, including basic batch and interactive system access for users, operating system interfaces for programmers, networking facilities, and sophisticated resource management for administrators.
	UNICOS MAX, in conjunction with UNICOS on the host system, provides operating system functionality on CRAY T3D systems.
Networking products	Cray Research networking products provide media connections, network programming access, and batch and interactive access for users across a heterogeneous network of computers.
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To use the map, find the product designation closest to your specific needs or role as a Cray Research system user. Documents listed under other categories also may be of interest to you; documents are listed only once, underneath the product to which they most directly apply. The date on the bottom of the page tells you when the information was last revised.

For more information

In addition to the map, you can use the following publications to find documentation specific to your needs:

- *Software Documentation Ready Reference,* publication SQ–2122, serves as a general index to the Cray Research documentation set. The booklet lists documents and man pages according to topic.

- *Software Overview for Users,* publication SG–2052, provides an overview of Cray Research software, including operating systems, programming environments, libraries, tools, applications, and so on. It directs you to documentation that contains user-level information.

- *User Publications Catalog,* publication CP–0099, briefly describes all Cray Research manuals available to you, including some not shown on the map. Cray Research customers who subscribe to the Cray Inform (CRInform) program can access this information on CRInform.

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Cray Assembly Language (CAL) for Cray PVP Systems Ready Reference (SQ–3110)

Cray Assembly Language (CAL) for Cray PVP Systems Reference Manual (SR–3108)[†]

Fortran Compilers

CF90 Ready Reference (SQ–3900)

CF90 Commands and Directives Reference Manual (SR–3901)[†]

CF90 Fortran Language Reference Manual, Vol. 1 (SR–3902)[†]

CF90 Fortran Language Reference Manual, Vol. 2 (SR–3903)[†]

CF90 Fortran Language Reference Manual, Vol. 3 (SR–3905)[†]

CF90 SPARC Ready Reference (SQ–3904)

Introducing the CF90 SPARC Programming Environment (IN–2155)[†]

Cray MPP Fortran Reference Manual (SR–2504)[†]

CF77 Fortran Language Reference Manual (SR–3772)

Cray Standard C Compiler

Cray Standard C Reference Manual (SR–2074)[†]

Cray Standard C Ready Reference (SQ–2076)

Cray Standard C Reference Manual for MPP (SR–2506)[†]

C++ Compiler

Cray C/C++ Reference Manual (SR–2179)[†]

Cray C/C++ Ready Reference (SQ–2180)

CrayLibs

Application Programmer's I/O Guide (SG–2168)[†]

Application Programmer's Library Reference Manual (SR–2165)[*]

Introducing CrayLibs (IN–2167)[†]

Math Library Reference Manual (SR–2138)[*]

Parallel Virtual Machine (PVM) Reference Card (SQ–2512)

PVM and HeNCE Programmer's Manual (SR–2501)[†]

Scientific Libraries Reference Manual (SR–2081)[*]

CrayTools

Compiler Information File (CIF) Reference Manual (SR–2401)[†]

Cray TotalView Debugger Reference Card (SQ–2519)

Guide to Parallel Vector Applications (SG–2182)[†]

Introducing the Cray TotalView Debugger (IN–2502)[†]

Introducing the MPP Apprentice Tool (IN–2511)[†]

Introducing the Program Browser (IN–2140)[†]

UNICOS CDBX Symbolic Debugger Reference Card (SQ–2110)

UNICOS CDBX Symbolic Debugger Reference Manual (SR–2091)[†]

UNICOS CDBX Debugger User's Guide (SG–2094)[†]

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Cray Research MPP Software Guide (SG–2508)[†]

CRAY T3D Emulator User's Guide (SG–2500)[†]

Installing Programming Environment Products (SG–5191)

Migrating to the CRAY T90 Series IEEE Floating Point (SN–2194)[†]

Optimizing Code on Cray PVP Systems (SG–2192)[†]

Programming Environment Installation Guide (SG–5217)

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MPT: PVM Programmer's Manual (SR–2196)[†]

MPT: MPI Programmer's Manual (SR–2197)[†]

UNICOS Operating System

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Software Documentation Ready Reference (SQ–2122)

Software Overview for Users (SG–2052)[†]

User's Guide to Online Information (SG–2143)[†]

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UNICOS Environment Variables Ready Reference (SQ–2117)

UNICOS File Formats and Special Files Reference Manual (SR–2014)[*]

UNICOS Standard Shell Reference Card (SQ–2115)

UNICOS User Commands Ready Reference (SQ–2056)[*]

UNICOS User Commands Reference Manual (SR–2011)[*]

UNICOS vi Reference Card (SQ–2054)

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FTA User and Administrator Manual (SG–2144)[†]

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Kerberos User's Guide (SG–2409)[†]

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ONC+ Technology for the UNICOS Operating System (SG–2169)[†]

Remote Procedure Call (RPC) Reference Manual (SR–2089)[†]

TCP/IP Network User's Guide (SG–2009)[†]

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UNICOS NQS and NQE Administrator's Guide (SG–2305)[†]

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Cray MPP Simulator User's Guide (SG–2503)[†]

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CRAY EL Series IOS Commands Reference Manual (SR–2408)[*]

CRAY EL Series IOS Messages (SQ–2402)

CRAY IOS-V Commands Reference Manual (SR–2170)[*]

CRAY IOS-V Messages (SQ–2172)[†]

General UNICOS System Administration (SG–2301)[†]

nmake Reference Card (SQ–2146)

OLNET Online Diagnostic Network Communications Program Maintenance Manual for UNICOS (SD–1021)[†]

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UNICOS Basic Administration Guide for CRAY J90 Series and CRAY EL Series (SG–2416)[†]

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UNICOS Installation Guide for the CRAY EL Series (SG–5201)

UNICOS Installation Guide for the CRAY J90 Series (SG–5271)

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UNICOS Installation/Configuration Menu System User's Guide (SG–2412)[†]

UNICOS Resource Administration (SG–2302)[†]

UNICOS Shared File System (SFS) Administrator's Guide (SG–2114)[†]

UNICOS Feature Use and Administration

UNICOS Administrator Commands Reference Manual (SR–2022)[*]

UNICOS Administrator Commands Ready Reference (SQ–2413)[*]

UNICOS Message System Programmer's Guide (SG–2121)[†]

UNICOS Multilevel Security (MLS) Feature User's Guide (SG–2111)[†]

UNICOS System Security Overview for Administrators (SG–2141)[†]

UNICOS Tape Subsystem Administrator's Guide (SG–2307)[†]

UNICOS Tape Subsystem User's Guide (SG–2051)[†]

UNICOS under UNICOS Administrator's Guide (SG–2156)[†]

[†] Available with CrayDoc
[*] Man pages available with the man command

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UNICOS Operating System (continued)

Programming Support

Segment Loader (SEGLDR) and ld Reference Manual (SR-0066)†

SEGLDR Reference Card (SQ-0303)

UNICOS System Libraries Ready Reference (SQ-2147)*

UNICOS System Libraries Reference Manual (SR-2080)*

Programming Support (continued)

UNICOS Macros and Opdefs Reference Manual (SR-2403)*

UNICOS System Calls Reference Manual (SR-2012)*

UNICOS X Window System Reference Manual (SR-2101)†

X Window System Resources Ready Reference (SQ-2123)

Networking Products

ATM

Asynchronous Transfer Mode (ATM) Administrator's Guide (SG-2193)†

Fiber Distributed Data Interface (FDDI)

Fiber Distributed Data Interface (FDDI) Administrator's Guide (SG-3091)

fy Driver

fy Driver Administrator's Guide (SG-2132)

HIPPI

HIPPI Channel Administrator's Guide (SG-2159)

Network Queuing Environment (NQE)

NQE User's Guide (SG-2148)†

NQE Ready Reference (SG-2149)

NQE Administration (SG-2150)†

Introducing NQE (IN-2153)†

RQS MVS

RQS User's Guide for IBM MVS Systems (SG-2405)

RQS Administrator's Guide for IBM MVS Systems (SG-2406)

RQS VMS

RQS/NQC User's Guide for DEC OpenVMS/VAX and AXP Systems (SV-3151)

RQS/NQC Administrator's Guide for DEC OpenVMS/VAX and AXP Systems (SV-3152)

SUPERLINK VM

SUPERLINK VM User's Guide: RQS Component (SI-0170)

SUPERLINK VM Administrator's Guide: RQS Component (SI-0171)

SUPERLINK VMS

SUPERLINK Administrator's Guide for DEC VAX/VMS Systems (SV-3154)

SUPERLINK User's Guide for DEC VAX/VMS Systems (SV-3153)

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Cray/REELlibrarian (CRL)

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Cray/REELlibrarian (CRL) User's Guide (SG-2126)

SMARTE

System Maintenance and Remote Testing Environment (SMARTE) Guide (SD-1017)†

Data Migration Facility (DMF)

Cray Data Migration Facility (DMF) Administrator's Guide (SG-2135)†*

Cray Data Migration (DMF) MSP Writer's Guide (SN-2098)†

OWS

Support System Reference Manual (SR-3077)*

Support System Operator's Guide (SG-3078)†

Support System Administrator's Guide (SG-3079)†

Support System Ready Reference (SQ-3080)

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† Available with CrayDoc
* Man pages available with the man command

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Record of Revision

The date of printing or software version number is indicated in the footer. Changes are noted by revision bars along the margin of the page.

Version	Description
8.0.3.2J	March 1995 – Original. This document describes the CRAY J90 software installation procedures for the UNICOS 8.0.3.2J release.
8.0.4A	June 1995 – This document describes the CRAY J90 software installation procedures for the UNICOS 8.0.4A release.
8.0.4B	July 1995 – This document describes the CRAY J90 software installation procedures for the UNICOS 8.0.4B release.
8.0.4.1	September 1995 – This document describes the CRAY J90 software installation procedures for the UNICOS 8.0.4.1 release.
8.0.4.2	November 1995 – This document describes the CRAY J90 software installation procedures for the UNICOS 8.0.4.2 release.
9.0.2	April 1996 – This document describes the CRAY J90 software installation procedures for the UNICOS 9.0.2 release.

Preface

This publication is for system administrators and operators of CRAY J90 Series systems. It provides the procedures that are necessary for installing your CRAY J90 console software and the UNICOS operating system.

Related publications

Because CRAY J90 Series systems run the UNICOS operating system, you will find the entire UNICOS manual set to be helpful. However, because some differences exist that are especially important to system administrators and operators, the following Cray Research, Inc. (CRI) publications help you run UNICOS successfully on CRAY J90 Series systems:

- *UNICOS Release Overview*, publication RO–5000

- *UNICOS Basic Administration Guide for CRAY J90 and CRAY EL Series*, publication SG–2416

- *UNICOS User Commands Reference Manual*, publication SR–2011

- *CRAY IOS-V Commands Reference Manual*, publication SR–2170

- *CRAY IOS-V Messages,* publication SQ–2172

- *UNICOS Administrator Commands Reference Manual*, publication SR–2022

- *Software Overview for Users,* publication SG–2052

- *UNICOS General System Administration*, publication SG–2301

Conventions

This manual uses the following typographical conventions:

Convention	Meaning
`typewriter font`	Denotes literal items such as command names, file names, routines, directory names, path names, signals, messages, and programming language structures.
italic font	Denotes variable entries and words or concepts being defined.
bold typewriter font	In screen drawings of interactive sessions, denotes literal items entered by the user. Output is shown in nonbold typewriter font.
[ ]	Brackets enclose optional parts of a command line.
< >	Angle brackets indicate that you must use at least one of the enclosed options.

In this publication, *Cray Research*, *CRI*, and *Cray* refer to Cray Research, Inc. and/or its products. To avoid redundancy or awkwardness, *Cray Research* may occasionally be shortened to *Cray* (for example, *Cray disk* or *Cray job*).

Ordering publications

The *User Publications Catalog*, publication CP–0099, lists all Cray Research hardware and software manuals that are available to users.

To order a manual, either call the Distribution Center in Mendota Heights, Minnesota, at (612) 681–5907 or send a facsimile of your request to fax number (612) 681–5920. Cray Research employees may choose to send electronic mail to `order.desk` (UNIX system users) or `order desk` (HPDesk users).

Reader comments

If you have comments about the technical accuracy, content, or organization of this manual, please tell us. You can contact us in any of the following ways:

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    `publications@timbuk.cray.com` (general comments)

- Contact your Cray Research representative and ask that a Software Problem Report (SPR) be filed. Use `PUBLICATIONS` for the group name, `PUBS` for the command, and `NO-LICENSE` for the release name.

- Call our Software Information Services department in Eagan, Minnesota, through the Technical Support Center, using either of the following numbers:

    (800) 950–2729 (toll free from the United States and Canada)

    (612) 683–5600

- Send a facsimile of your comments to the attention of "Software Information Services" in Eagan, Minnesota, at fax number (612) 683–5599.

We value your comments and will respond to them promptly.

Contents

This document is for system administrators and operators of CRAY J90 Series computer systems. It explains the procedures for installing the CRAY J90 console software and the UNICOS operating system.

Introduction
1.1

With the introduction of the Sun SPARCstation™ as a system console on the CRAY J90 series, software installation has improved dramatically from other CRAY platforms. You can now use the windowing capabilities of the Solaris™ operating system on the CRAY J90 console to simplify and streamline the installation process. Also, by using the embedded hard drive on the console and the connections to the I/O subsystems via a private Ethernet, there is a single point of control for system installations and upgrades.

This guide is divided into six sections, each focusing on a specific type of operation you may be performing:

- Overview of the CRAY J90 system and the software installation process

- Installing CRAY J90 system console software

- *Cray Install Utility* general instructions

- Installing CRAY J90 software

- Customizing UNICOS

- J90 UNICOS 9.0.2 Release Information

Related Information
1.2

Before you begin any of the procedures outlined in this guide, you should read through the entire section that relates to the procedure you intend to perform.

You should have the following documentation available:

- *UNICOS Basic Administration Guide for CRAY J90 and CRAY EL Series*, publication SG–2416

- *CRAY IOS-V Commands Reference Manual,* publication SR–2170

- *CRAY IOS-V Messages Reference,* publication SQ–2172

- *UNICOS Administrator Commands Reference Manual,* publication SR–2022

Note

Read the *Read Me First for CRAY J90 System Installation* document shipped with your system before proceeding with these instructions.

Hardware Components
1.3

The minimum hardware configuration of each CRAY J90 series system includes a CRAY J90 console, an IOS, and a CRAY J90 mainframe.

CRAY J90 Console
1.3.1

The CRAY J90 console is Sun SPARCstation™ workstation running the Solaris operating system. This workstation serves as the system console for each IOS and the CRAY J90 mainframe. This console is connected via a private Ethernet connection to each IOS. It is shipped with a CD-ROM drive as the only media device. It also contains disk space that is used to run the Solaris operating system, to store all the necessary IOS files, and to run the *Cray J90 Install Utility.*
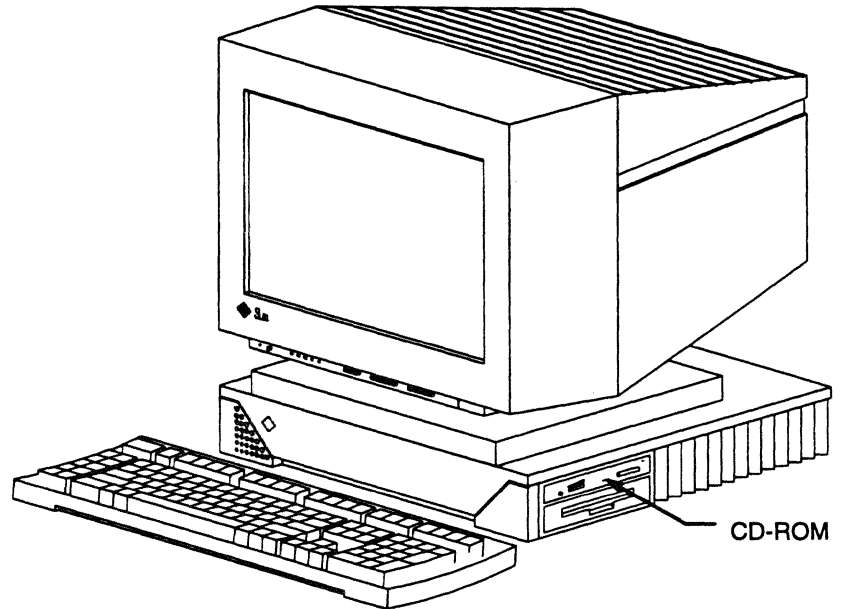
Figure 1. CRAY J90 console

**Input-Output Subsystem
(IOS)**
1.3.2

This diskless I/O Subsystem (shown Figure 2) runs the Vxworks™ operating system with CRAY device drivers installed. The entire software that runs on the IOS is also referred to as IOS-V software. Each IOS is connected to the mainframe via Y1 channels. The I/O Subsystem is shipped with a Digital Audio Tape (DAT) device on IOS-0 serving as the primary media device for software installations and backups.
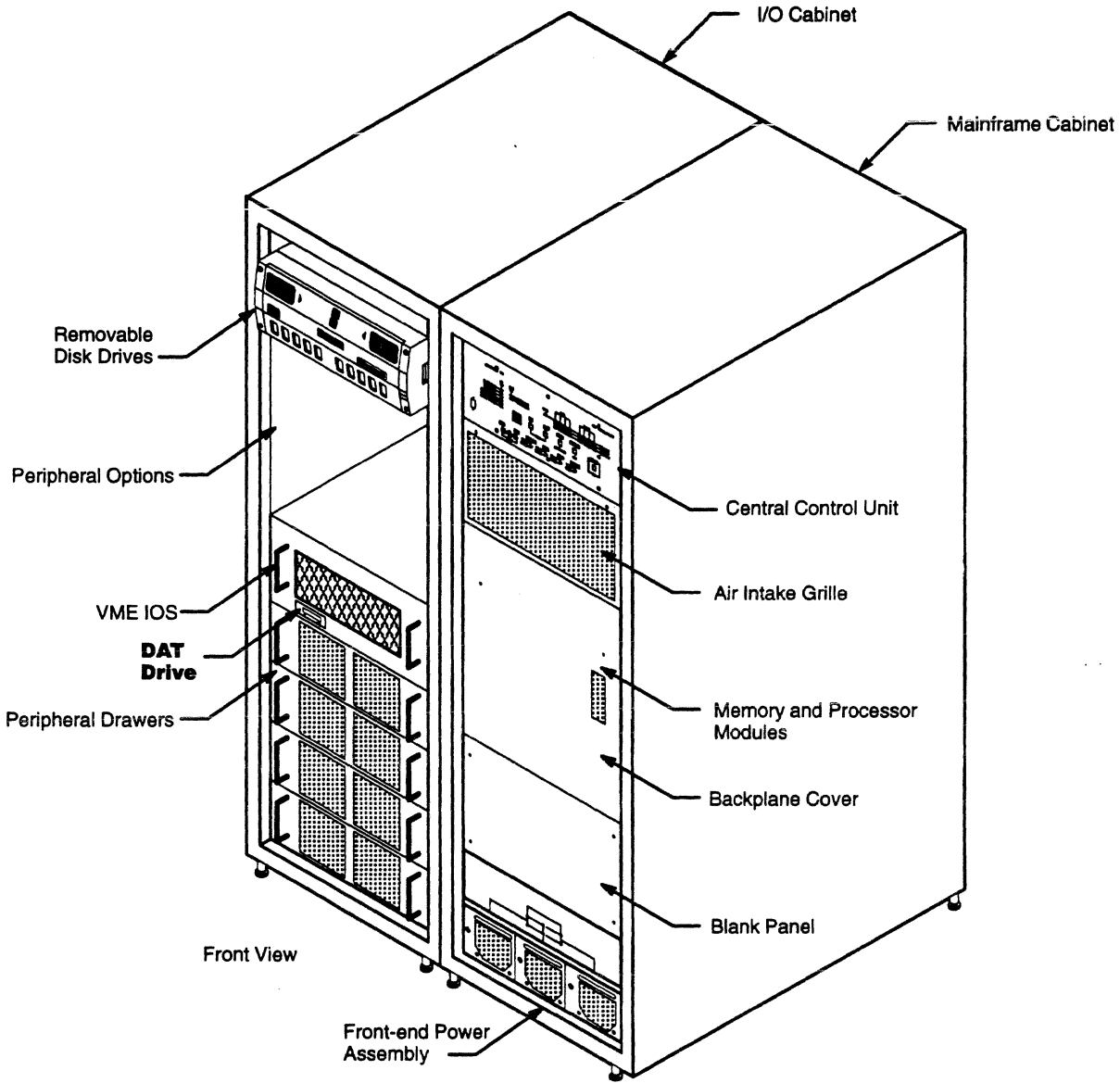
Figure 2. CRAY J916 I/O Cabinet and Mainframe Cabinet Components

If you need to power-cycle the machine, you must press the CPU reset button first followed by the VME reset button on the control panel. Failure to press the reset buttons in this order will cause the power-up diagnostic tests to fail.

CRAY J90 Mainframe
1.3.3

The CRAY J90 mainframe (also shown in Figure 2) runs the UNICOS operating system. The allowable backplane types are 1x1, 2x2, 4x4, and 8x8. There can be up to 8 processor modules with each module containing 4 CPUs. There can be up to 8 memory modules with a combined range of 0.25 to 4 Gbytes.

Software Components
1.4

CRAY J90 series systems include the components described in this subsection.

Note

All of the software necessary to run your system will be initially installed by Cray Research. Your console, IOSs, and CRAY J90 mainframe will be a working system when you receive it.

Sun SPARCstation Installation Materials
1.4.1

A Solaris CD contains the Solaris Operating system with on-line documentation and installation instructions. This CD will only be necessary if you have to reinstall the Solaris operating system.

CRAY J90 CD
1.4.2

This CD contains a one-time setup procedure for enabling the Sun SPARCstation to serve as a system console to the IOS and CRAY J90 mainframe. This includes setting up a console environment that uses a Graphical User Interface (GUI) for all subsequent installations (called the *J90 Install Utility*). The intention is to release this CD only once for initial machine deliveries.

J90 UNICOS Release Tape
1.4.3

The CRAY J90 UNICOS release tape contains all the software required to operate the J90 console, the IOSs, and the J90 mainframe. Included on this tape are five files:

• IOS tar file

• Install tar file

- Generic UNICOS file system

- Generic system files

- UNICOS binaries

This section describes the steps necessary for installing your CRAY J90 console software.

Solaris Installation
2.1

The Solaris operating system must first be installed on the Sun terminal prior to running CRAY J90 installation procedures. Please refer to the Solaris installation manuals delivered with the Sun SPARCstation.

Note

All of your essential software has been installed Cray Research prior to the delivery of your CRAY J90 system. The procedures in the following section will only be necessary if you have to reinstall your CRAY J90 console software.

Cray Research is not responsible for the use of this console for any other purpose than for explicitly operating CRAY J90 systems.

To ensure adequate disk space for the CRAY J90 installation, allocate all remaining disk space to the /opt file system partition. This partition will be used to store the installation and IOS-related files.

CRAY J90 Console Software

2.2

The CRAY J90 console software is initially delivered to you on a single CD which is read by the CD-ROM drive on your console hardware. Subsequent updates to the CRAY J90 console software will be included on J90 UNICOS release tapes.
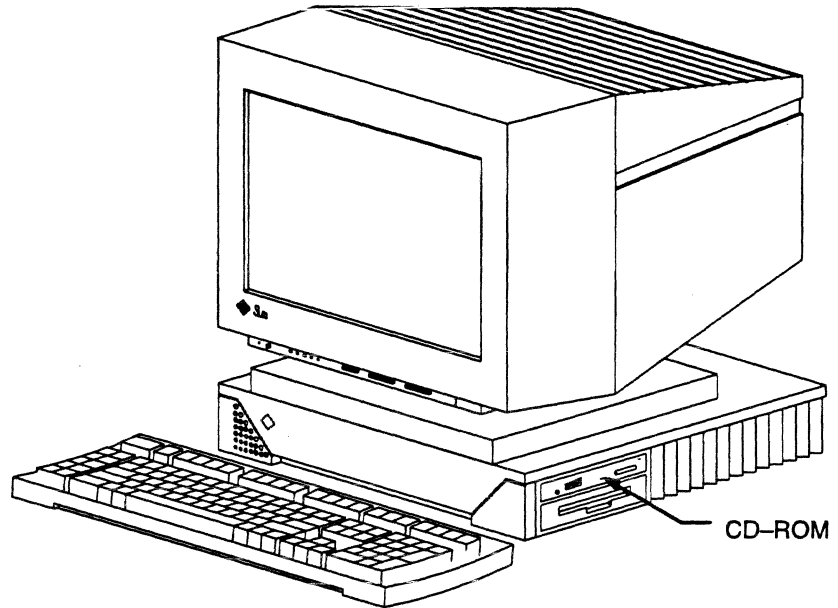
Figure 3. CRAY J90 console

To install the initial CRAY J90 console software, perform the following tasks:

1. Ensure that the Solaris operating system is installed on your CRAY J90 console. Refer to the *Solaris Basic Installation Guide* delivered with your Sun SPARCstation.

   You should allocate all disk space not used by the Solaris operating system to the /opt file system partition.

2. Insert the *CRAY J90* CD into the CD–ROM drive.

3. Log in as root and change directories to the mount point for the CD-ROM device as follows:

   ```
   # cd /cdrom/cdrom0
   ```

4. Read in the files from the CD.

   # ./setup

   Enter the serial number of your system when you receive the following prompt:

   `Please enter J90 serial number:` **xxxx**

   This is a one-time only procedure that will perform the following tasks:

   * Sets up the `crayadm` account

   * Sets up the `crayadm` home environment

   * Sets up the `ios` group account

   * Loads the `opt.tar` file from the CD into `/opt/install`, `/opt/local`, and `/opt/packages`

   * Establishes the J90 Console script (`jcon`) script for the master IOS

   * Sets up the `BOOTPD` daemon

   * Updates the following Solaris network files in `/etc`: `inetd.conf`, `services`, `hostname.le1`, `netmasks`, `hosts`, `nsswitch.conf`

   * Loads the CD-ROM version of the *J90 Install Utility*

5. Eject the CD.

   ```
   # cd /
   # eject cdrom
   # reboot
   ```

6. Log in with the `crayadm` account using the password of `initial0`.

IOS–V Man Pages

2.3

CRAY IOS-V man pages now reside on the Sun SPARCstation. You can view them by using the Solaris man(1) command in any window (not from the console window at the IOS prompt).
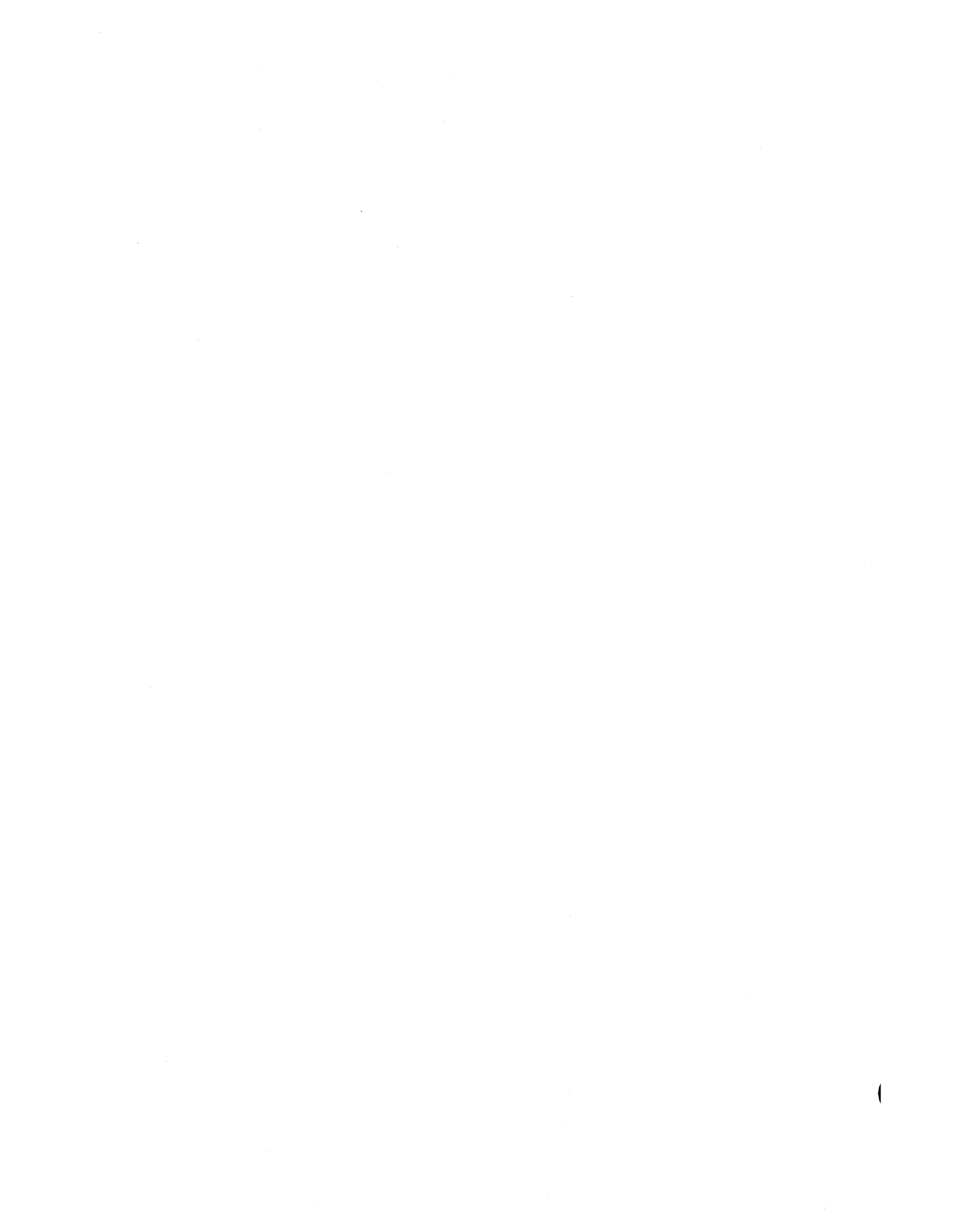
The *Cray Install Utility* is a graphical user interface used to install software on IOS-V I/O subsystems and CRAY mainframes. Currently, this utility is only supported on the CRAY J90 system. This utility runs in OpenWindows under the Solaris operating system on the CRAY J90 console.

Each CRAY J90 installation screen is designed to be a single-focused task in the installation process, consistent and easy-to-use. This first section on look-and-feel rules display the general windowing rules followed in the *Cray Install Utility*. The next section on window layouts define the CRAY-specific implementation of the look-and-feel rules.

Look and Feel Rules
3.1

To keep the user interactions simple, only single left-button mouse clicks are required for selections and actions. The only exceptions are when *left-click and drag* is required and pull down menus. The following section describes the general windowing look-and-feel rules utilized in the *CRAY J90 Installation Utility* windows.

- Action buttons

  These are raised rectangular boxes that initiate an action when selected.
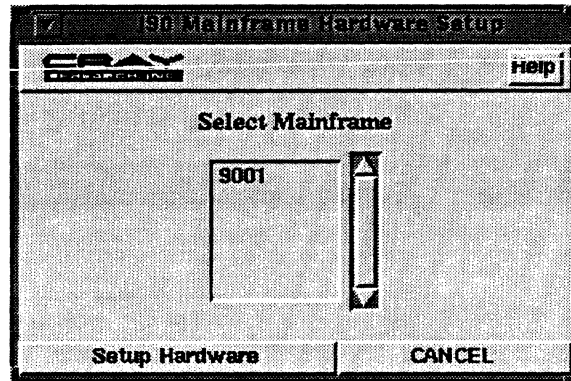
- Radio buttons

  These are raised rectangular boxes with a preceding triangle. Clicking a radio button causes it to be exclusively selected among all the buttons in its group. A selected radio button is displayed in dark red.
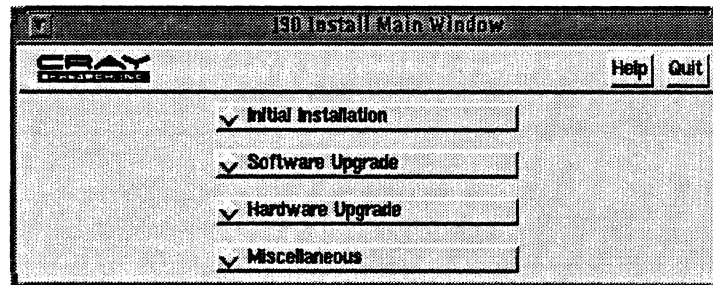
- Check boxes

  These are raised rectangular boxes with a preceding square. Clicking a check button toggles the button selection state. Multiple check boxes may be selected in a group. A selected checkbutton is displayed in dark red.
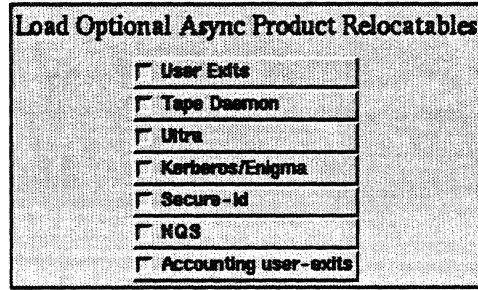
- List boxes

  These are used to display a multiple selections that span more
  than one window. You can scan the list either by using the
  scrollbar clicking or by dragging list box. To select an
  individual item in the list box, simply click on the selection.

- Entry labels

  These are sunken rectangular boxes used to enter text by
  pointing, clicking, and typing. You can delete by selecting and
  typing `Control-d`. `Backspace`, `Control-h`, and `Delete`
  may be typed to erase the character just before the insertion
  point. `Control-W` erases the word just before the insertion
  point, and `Control-u` clears the entry. For entries that are
  too large to fit the window all at once, you can scan through
  the entries by dragging with mouse button 2 pressed.
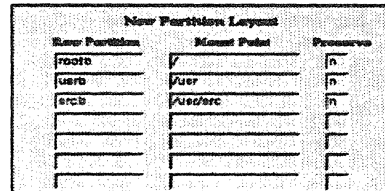
- Scales

  A slide bar and horizontal scales are used to select and display
  values. Simply click and drag the scale to your requested
  value.

- Dialog boxes

  These are used to convey information in a separate window.
  Common uses of dialog boxes are to include an *OK* action
  button to continue processing after the message has been read.
  Other uses are to display ongoing information of a currently
  running process.

- Pull-down menus

  These are used to display multiple selections that are kept hidden behind a single character (V) to prevent cluttering the display. To make a change selection, position the cursor on the pull-down character (V) and hold the right mouse button.

Window Layout
3.2

Each *CRAY J90 Installation Utility* window is designed to be processed top-down from the user's perspective. A title at the top of each window clearly identifies the action to be taken. Each screen is designed to display user-input fields first, followed by action buttons displayed at the bottom. *CRAY J90 Installation Utility* windows employ the following features:

- Status line

  The second line of each window is a status line that displays useful informational and error messages.

- Help button

  The *Help* button is displayed in the upper right-hand corner on the status line. Context-sensitive help and a full display documents are available by selecting this button.
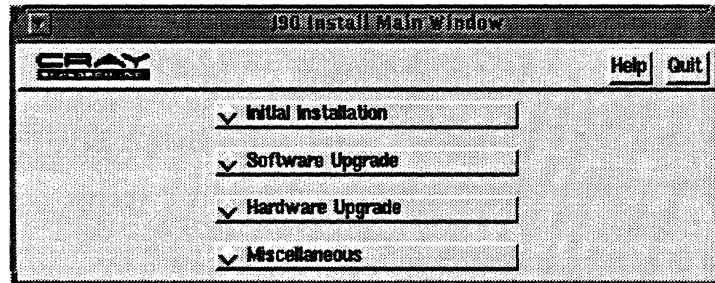
- Quit

  The *CRAY J90 Install Main Window* is the **only** window containing a *Quit* button (located next the *Help* button in the upper right hand corner). Selecting this option is the **only** way to exit the *CRAY J90 Install Utility*.

* Cancel

  With the exception of *OK* dialog boxes, each screen has a *Cancel* action button. This allows you to safely return to the calling window.
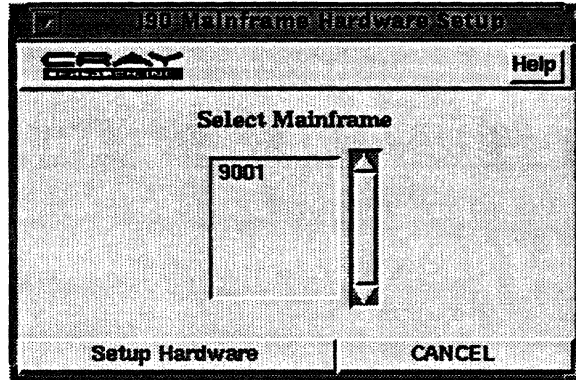
* Speedometers

  When a selected action takes a significant period of time to complete, a speedometer window is displayed to indicate the on-going status of that process. These windows display a *STOP* action button to halt processing. If *STOP* is chosen, an updated Speedometer screen is displayed with allowable actions of *Resume*, *Restart*, and *Cancel*. Completion of processes with Speedometer windows display a completion dialog box.
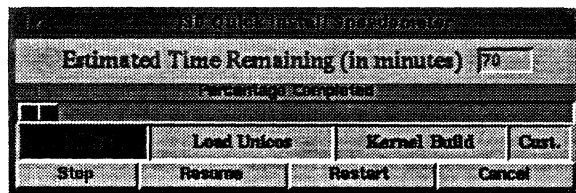
- Error Displays

  Errors are displayed in a separate dialog box. These errors
  are context-sensitive to the action selected. When appropriate,
  a suggestion is offered for assistance.

- Input Validation

  Wherever possible, user validation is performed at the time of
  selection. This reduces the frustration of encountering errors
  when an action button is selected.

- Screen Locking

  When a sub-window is invoked, the focus of that window is
  selected to prevent the user from selecting other *Cray J90
  Install Utility* actions. This ensures single-focused processing
  to eliminate confusion.

This section describes procedures for installing and upgrading CRAY J90 IOS and UNICOS software. Before proceeding, ensure you are logged into your CRAY J90 console with your crayadm account.

Log files are used throughout the *J90 Install Utility* and are located in the /opt/install/log/*xxxx* directory. Viewing these files with standard editors, like vi, cannot handle the long line lengths making output appear incomplete. To properly view these log files, you should use the following command:

```
# fold -80 logfile | more
```

Please note the *J90 Install Utility* requires running in Secure-X mode. Certain X Window System Utilities, (like xhost +), can disable the Secure-X mode. If any of the *J90 Install Utility* programs detect Secure-X mode is disabled, the installer will be instructed to completely log off the Sun SPARCstation and log back in again under the crayadm account. This procedure will re-establish the Secure-X mode.

The *J90 Installation Main Window* is invoked by holding the right button in the OpenWindows root window and selecting the *J90 Install Menu* item.

This selection displays a window labeled *J90 Install Main Window*. The allowable radio-button selections are defined in the following sections.
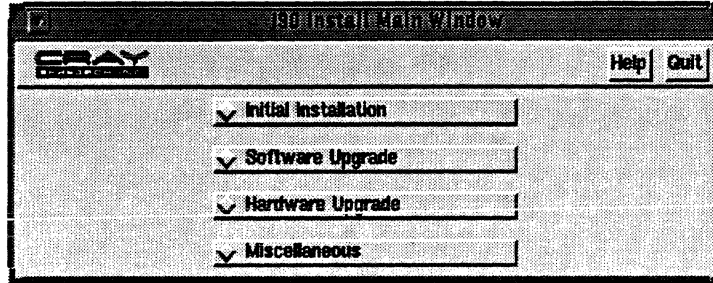
Initial Software Installation

4.1

This section describes the procedures to perform an initial UNICOS and IOS software installation, or to perform a reinstallation of your current UNICOS and IOS software. Initial installations are performed at the factory prior to shipping. Please note that these procedures may destroy any preinstalled CRAY J90 Series system software.

If you currently have UNICOS running, perform a system shutdown by entering the following command from the system console:

CONTROL-a   (toggles to the UNICOS prompt)

 # /etc/shutdown

Then, select *Initial Installation* from the *J90 Install Main Window.*
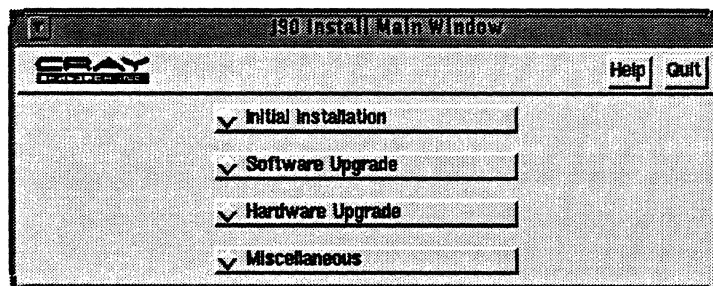
The following menu appears:
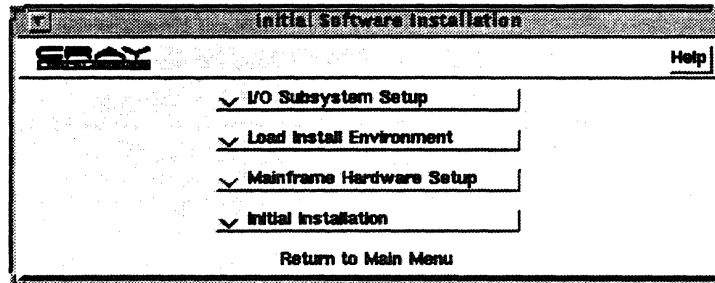
I/O Subsystem Setup
4.1.1

The first step in your software installation is to set up your I/O subsystem. Selecting *I/O Subsystem Setup* allows you to define the Ethernet board addresses and the IP hardware addresses for each IOS. This is required to initiate communication activity between the CRAY J90 console and each IOS.

Selecting this menu displays a *Select Mainframe* window with actions of *Add, Change, Delete*, or *Cancel*.
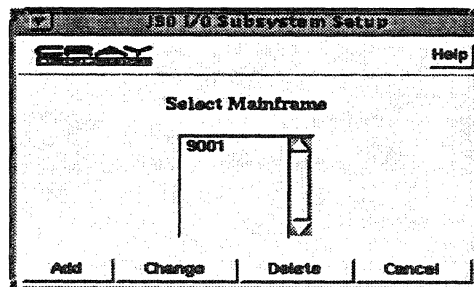
After entries are validated, the action updates the appropriate Solaris system files on the console disk.

I/O Subsystem Add
4.1.1.1

Selecting the *Add* action-button allows you to define a mainframe with Ethernet and IP addresses for up to 16 IOS's. Perform this action to define a new mainframe and associated IOS's.

The Ethernet board addresses are printed on the Themis board. The IP Addresses are automatically generated based on mainframe serial number once the Ethernet address is entered.

I / O Subsystem Change
4.1.1.2

Selecting the *Change* action-button allows you to add, change, or remove Ethernet and IP addresses for specific IOS's on a mainframe.

```
┌─────────────────────────────────────────────┐
│  ▼        J90 I/O Subsystem Change           │
├─────────────────────────────────────────────┤
│  ═╦═╦═╤══                            Help    │
│                                              │
│     Mainframe Serial number 9001             │
│                                              │
│   IOS        Ethernet          IP Address    │
│                                              │
│    0    │00:80:b6:01:b4:40│    │10.1.0.0 │   │
│    1    │                 │    │         │   │
│    2    │                 │    │         │   │
│    3    │                 │    │         │   │
│    4    │                 │    │         │   │
│    5    │                 │    │         │   │
│    6    │                 │    │         │   │
│    7    │                 │    │         │   │
│    8    │                 │    │         │   │
│    9    │                 │    │         │   │
│   10    │                 │    │         │   │
│   11    │                 │    │         │   │
│   12    │                 │    │         │   │
│   13    │                 │    │         │   │
│   14    │                 │    │         │   │
│   15    │                 │    │         │   │
│                                              │
│        Change        │       CANCEL          │
└─────────────────────────────────────────────┘
```

The Ethernet board addresses are printed on the Themis board. The IP Addresses are automatically generated based on mainframe serial number once the Ethernet address is entered.

I / O Subsystem Delete
4.1.1.3

Selecting the *Delete* action-button allows you to delete an entire mainframe definition of Ethernet and IP addresses.
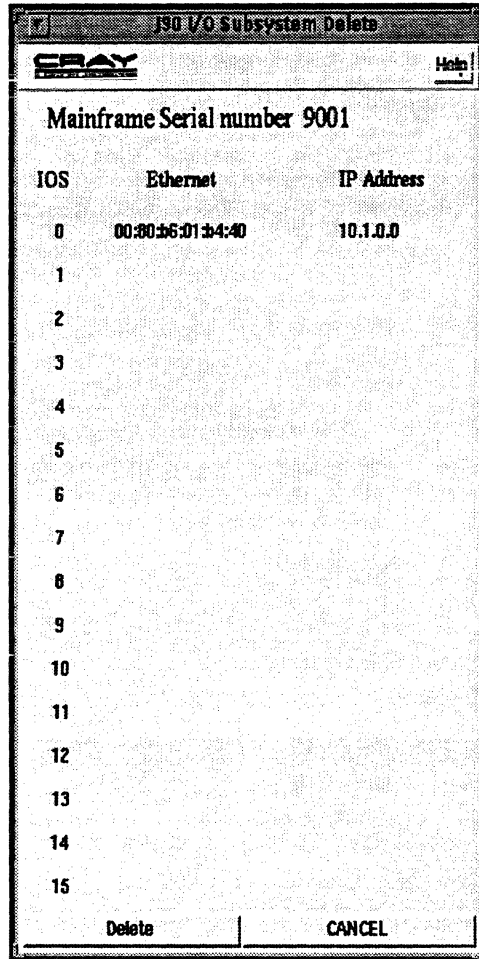
When the *Delete* action-button is selected, the following dialog box appears:
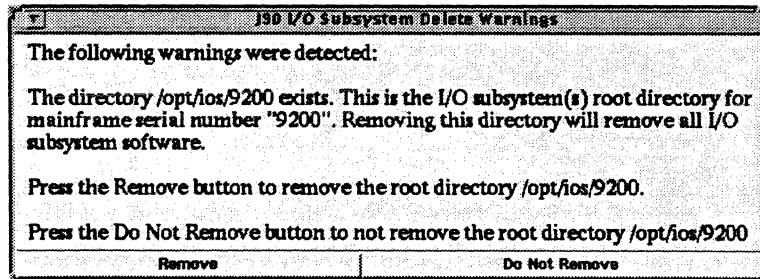
If you select the *Remove* action-button, you must manually perform the following command from an OpenWindows window logged on as root:

unshare /opt/ios/**xxxx**   (*xxxx*) = Serial number of machine

Load Install Environment
4.1.2

The *Load Install Environment* procedure updates the CRAY J90 installation binaries on the console from the J90 UNICOS release DAT tape. Upon completion, additional menu items that were previously graved out from the CRAY J90 CD-ROM installation will be loaded and enabled.

If you are performing an initial install starting from CD-ROM, after running the *Load Binaries* procedure, you must quit the *J90 Install Utility* and restart it before continuing the installation. This avoids an IOS reset problem between the CD-ROM version of *Load Binaries* and the J90 UNICOS 9.0.2 version

Selecting the *Load Install Environment* menu item from the *Initial Software Installation* window displays a *Select Mainframe* window with action-buttons of *Load Binaries* and *Cancel*.
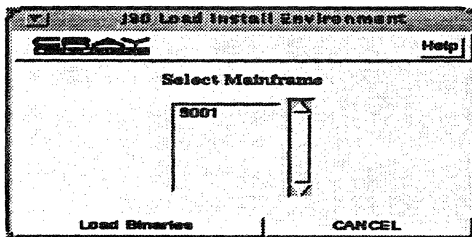
Selecting the *Load Binaries* action-button will display the following dialog box:
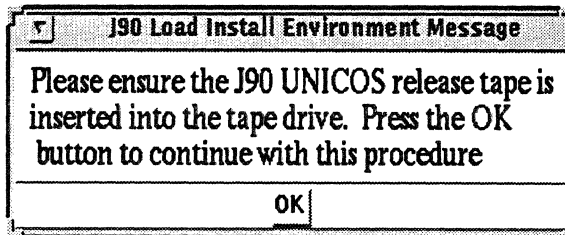
Selecting the *OK* action-button initiates the loading of the installation binaries from tape to the J90 Console. A *Load Binaries Speedometer* is displayed to keep you informed of the progress of the load.

```
┌─────────────────────────────────────────┐
│ ▼    Load Environment Speedometer     │
├─────────────────────────────────────────┤
│ Estimated Time Remaining (in minutes)  4 │
│           Percentage Completed           │
│ ┌───┐                                    │
│ └───┘                                    │
│    Stop    │    Restart   │    Cancel    │
└─────────────────────────────────────────┘
```

Upon completion, the following message is displayed.

```
┌─────────────────────────────────────────┐
│ ▼      Load Environment Speedometer     │
├─────────────────────────────────────────┤
│   Completed loading install binaries from tape. To │
│ activate the J90 Install changes, you must quit the J90 │
│   Install Utility and restart it before continuing the │
│                installation.             │
│                                          │
│  Press the OK button to return to the main install │
│                  window                  │
├─────────────────────────────────────────┤
│                  OK│                     │
└─────────────────────────────────────────┘
```

To activate the *J90 Install* changes, you must quit the *J90 Install Utility* and restart it before continuing the installation. Failure to do so will result in errors with new routines.

Mainframe Hardware Setup
4.1.3

The *Mainframe Hardware Setup* procedure is required at initial machine setup and each time a processor module or memory module is replaced. This procedure creates the configuration files containing the ASICS chip information that are required to clear the IOS prior to running UNICOS on the CRAY J90 mainframe. These files are accessed on the IOS and are in the following format:

```
/sys/pm0.cfg     # Processor Module configuration
/sys/mem0.cfg    # Memory Module Configuration
```

Selecting the *Mainframe Hardware Setup* menu item from the *Initial Software Installation* window displays a window with action-buttons of *Setup Hardware* and *Cancel*.
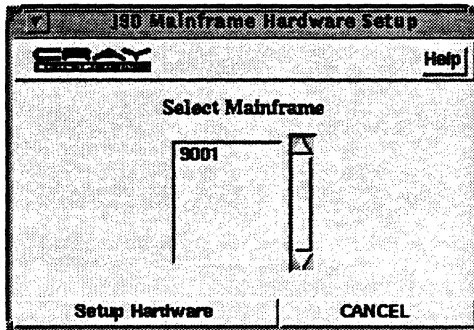
Selecting the *Setup Hardware* action-button displays the following menu to query for information about the processor and memory modules:
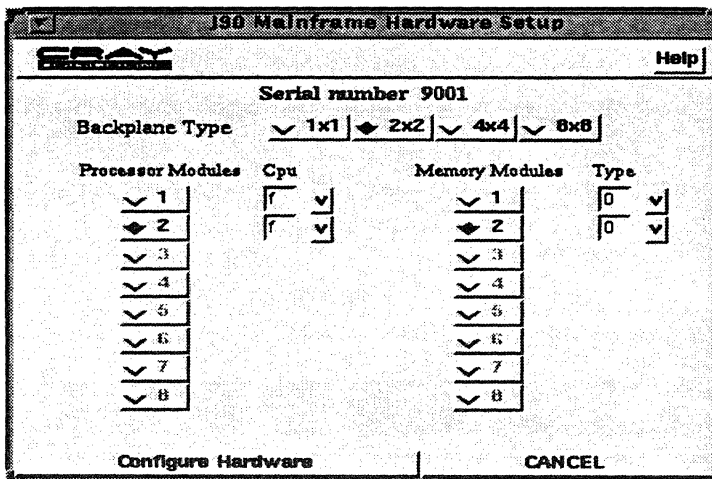
- The *Backplane Type* must be selected. Allowable entries are 1x1, 2x2, 4x4, and 8x8.

- The *Number of Processor Modules* must then be selected. Optionally, you may also specify the bit mask for each processor module to turn off selected CPUs on the *Processor Module*. A pull-down menu is provided displaying all possible settings.

- Select the appropriate number of *Memory Modules* and the *Memory Type* of each module. The memory type is stamped on each memory module board. A pull-down menu is provided displaying all possible settings.

Upon entry into the *Mainframe Hardware Setup* window, the display for the *Memory Type* may be incorrect. If this occurs, simply re-enter the correct *Memory Type* via the pull-down menu before selecting the *Configure Hardware* button.

Selecting the *Configure Hardware* action-button will display the following dialog box:

```
┌──────────────────────────────────────────────────────────────────┐
│ ▼|          J90 Mainframe Hardware Configuration Warnings          │
├──────────────────────────────────────────────────────────────────┤
│  The following warnings were detected:                             │
│                                                                    │
│  The hardware setup process will take the system to PROM. Please   │
│  ensure that the system is running in single user mode and has     │
│  been properly sync'd up. Failure to do so may cause a system      │
│  crash and or data corruption                                      │
│                                                                    │
│  Press the Continue button to ignore warnings and continue with    │
│  the hardware setup.                                               │
│                                                                    │
│  Press the Cancel button to return to the "J90 Mainframe Hardware  │
│  Configuration" window                                             │
├────────────────────────────────┬───────────────────────────────────┤
│            Continue             │              Cancel               │
└────────────────────────────────┴───────────────────────────────────┘
```

Selecting the *Continue* action-button verifies the specify files on the IOS and, if necessary, loads them from the UNICOS release tape. The procedure then performs a quick-load on the IOS, and runs the jconfig command on the IOS. If the jconfig command is successful, the processor module and memory module configuration files will be created. If the jconfig is unsuccessful, you will be instructed to run the jconfig command manually from the IOS console.

A speedometer window is displayed to keep you informed of its progress:

```
┌─────────────────────────────────────────────┐
│ ▼|       Hardware Setup Speedometer          │
├─────────────────────────────────────────────┤
│  Estimated Time Remaining (in minutes)  │10│ │
├─────────────────────────────────────────────┤
│             Percentage Completed            │
│  ▓▓▓▓                                       │
├──────────┬────────────┬─────────────────────┤
│   Stop   │   Restart  │      Cancel         │
└──────────┴────────────┴─────────────────────┘
```

Upon completion, the following dialog box will be displayed:

```
┌─────────────────────────────────────────────┐
│ ▼|       Hardware Setup Speedometer          │
├─────────────────────────────────────────────┤
│          Completed Hardware Setup.          │
│                                             │
│  Press the OK button to return to the main  │
│              install window                 │
├─────────────────────────────────────────────┤
│                    OK|                       │
└─────────────────────────────────────────────┘
```
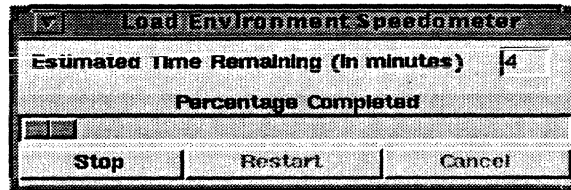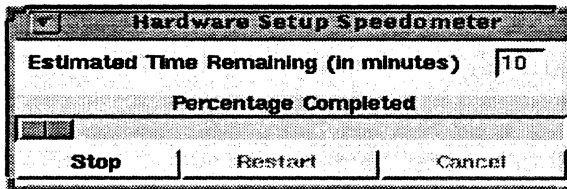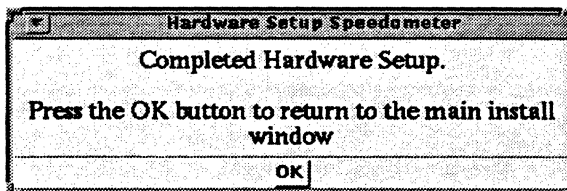
Initial Installation
4.1.4

Selecting the *Initial Installation* menu item from the *Initial Software Installation* menu displays a *Select Mainframe* window with action-buttons of *Quick Install* and *Cancel* (the *Custom* option is not available yet).
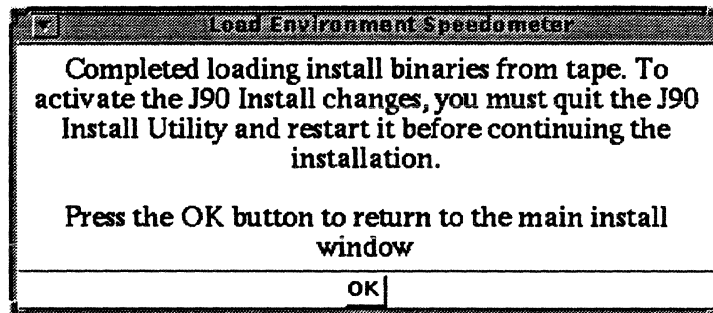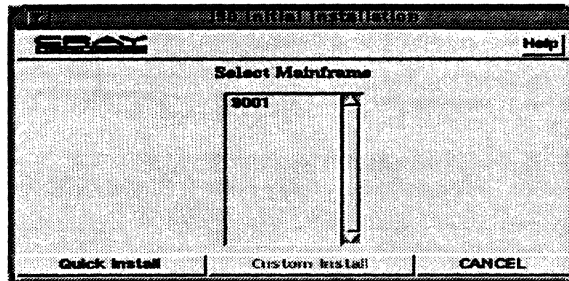

After selecting a mainframe, clicking the *Quick Install* action-button displays a *J90 Quick Install* window with six panels of information described below:

- Hardware Information

    Default settings for the *System Name* and *System Node* are
    filled in. You may change these values by clicking in the
    entry-label-box and editing them.

    ```
    ┌──────────────────────────────────────┐
    │         Hardware Information          │
    │                                       │
    │        Architecture  J90              │
    │        Serial Number 9070             │
    │  System Name │sn9070            │     │
    │  System Node │sn9070            │     │
    └──────────────────────────────────────┘
    ```

- Memory

    The number of memory boards are selected based on the
    probing by the jconfig command (performed in the
    Mainframe Hardware Setup procedure). If this setting is
    incorrect, you will need to run the *Mainframe Hardware Setup*
    procedure. If you wish to run UNICOS with less memory than
    selected, you may decrease the memory setting specified.

    ```
    ┌──────────────────────────────────────┐
    │               Memory                  │
    │  Memory Boards 4                      │
    │                                       │
    │  Memory  ▽ 32mw     │                 │
    │          ◆ 64mw     │                 │
    │                                       │
    └──────────────────────────────────────┘
    ```
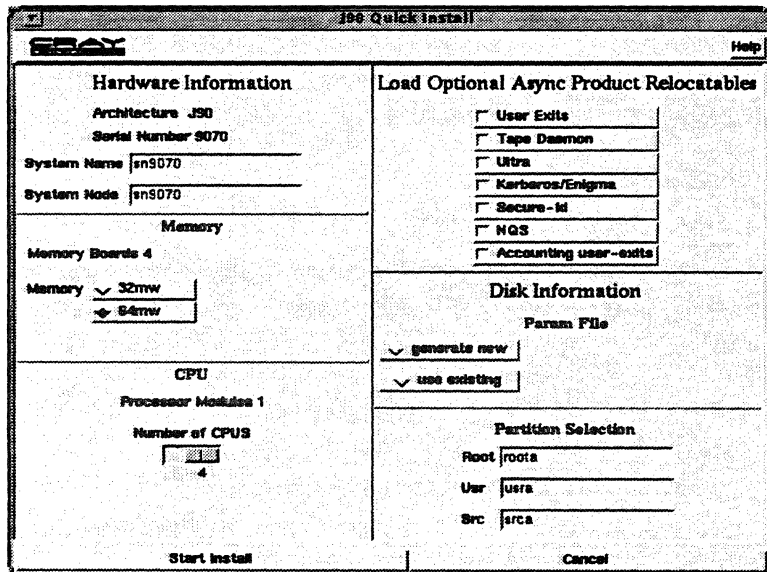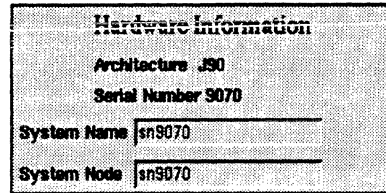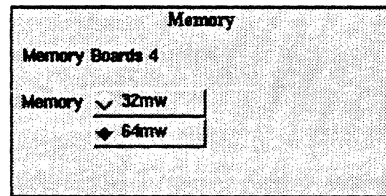
- Processor Modules

    The number of *Processor Module* boards are selected based on
    the probing by the jconfig command (performed in the
    Mainframe Hardware Setup procedure). If this setting is
    incorrect, you will need to run the *Mainframe Hardware Setup*
    procedure. If you wish to run UNICOS with fewer CPUs than
    selected, you may decrease the setting specified.

    ```
    ┌──────────────────────────────────────┐
    │                 CPU                   │
    │         Processor Modules 1           │
    │                                       │
    │           Number of CPUS              │
    │            │   ▓▓▓ │                  │
    │                 4                     │
    └──────────────────────────────────────┘
    ```

- Load Optional Async Product Relocatables

  With the release of UNICOS 9.0, all optional asynchronous relocatables are automatically loaded. Therefore, this panel of input can be ignored.

 | Load Optional Async Product Relocatables |
  |---|
  | ☐ User Exits |
  | ☐ Tape Daemon |
  | ☐ Ultra |
  | ☐ Kerberos/Enigma |
  | ☐ Secure-id |
  | ☐ NQS |
  | ☐ Accounting user-exits |

- Disk Information

  If you wish to have the system parameter file automatically generated, select the *generate new* radio-button. For CRAY J90 Series systems, there is a significant change to the disk space allocation scheme compared to the CRAY EL Series systems. If this option is specified, two sets of production disk partitions are created (named `roota`/`usra`/`srca` and `rootb`/`usrb`/`srcb`). This allows for a subsequent upgrade installations into the alternate set of partitions in multiuser mode without disturbing the running system. In addition, the `bkroot` and `bkusr` disk partitions are automatically created for you. The `bkroot` and `bkusr` file systems should be used for backing up your current production system. The only exception to this is CRAY J90 machines with extremely limited disk space. Specifically, any space beyond 1465536 4K byte blocks will be allocated to the following file systems: `opt`, `bkroot`, `bkusr`, `home`, `disk0` − `diskxx`.

  Starting with UNICOS 9.0, an `/opt` partition is created for asynchronous product installations when the *generate new* option is selected. This new file system is built with a size of 150,000 4K–byte blocks.

  If you plan to use an existing parameter file, select the *use existing* radio-button and you will be prompted for the desired file in an entry-label box. When the *Start Install* action-button is later selected, the rootdev statement in the selected param file will be validated against the root partition and will display an warning dialog-box if they differ.
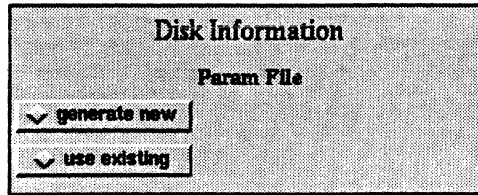
- Partition Selection

  If you wish to select alternate partitions for loading root/usr/src, click in the desired entry-label and edit. If you selected the *generate new* option, a /sys/param file is built for you using roota and rootb.
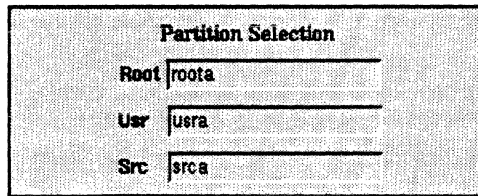
Selecting the *Start Install* action-button from the *J90 Quick Install* menu displays the following dialog box:
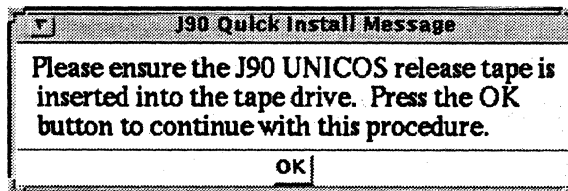
Selecting the *OK* action-button initiates the installation and displays a speedometer window to keep you informed of its progress.

A log file window will then be displayed in the upper right-hand corner capturing the detailed output of the installation.

If you have pressed the *Stop* action button to interrupt the software installation, three additional action buttons are highlighted:

- *Resume*
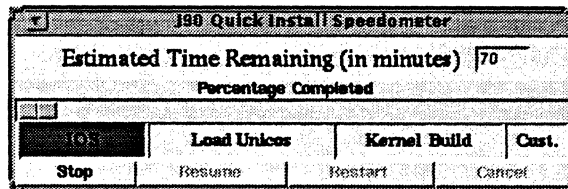
  Selecting *Resume* restarts the software installation from the last checkpointed process (*IOS*, *Load UNICOS*, *Kernel Build*, or *Customization*).

- *Restart*

  Selecting *Restart* completely restarts the software installation.

- *Cancel*

  Selecting *Cancel* returns you to the *J90 Initial Installation* menu.
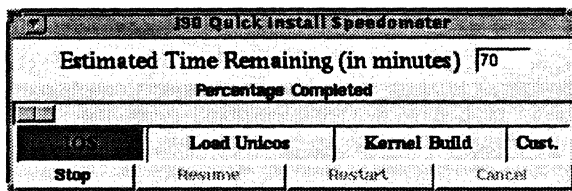
Upon completion, the following completion dialog-box will be displayed:
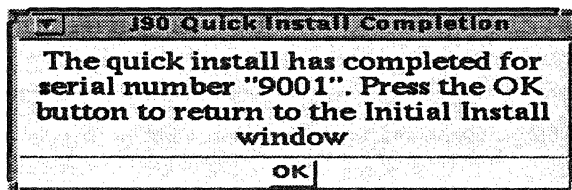
Post Initial Install Procedures
4.1.5

Perform the following procedures after you have completed your initial software installation.

password
4.1.5.1

The root password is `initial`, which you should change using the `passwd`(1) command. For details about the `passwd`(1) command, see the *UNICOS User Commands Reference Manual*, publication SR-2011.

core partition

4.1.5.2

The *J90 Install* procedures do not automatically create (mkfs) the /core partition or initialize the dump partition (via mkdump). This should be done before entering multiuser mode. For more information, refer to the *UNICOS Basic Administration Guide for the CRAY J90 and CRAY EL Series*, publication SG-2416.

ICMS Tool

4.1.5.3

If you want to run the Installation and Configuration Managment System (ICMS), you must first **IMPORT ALL** parameters. Refer to section 6.3.1 for more information. Failure to perform this procedure prior to an **ACTIVATE**, will cause customized parameters to be overwritten by generic values from the release tape.

Initial Installation Procedures Complete

4.1.5.4

The procedures for reinstalling CRAY J90 UNICOS are now complete. Refer to Section 6, *J90 UNICOS 9.0.2 Release*, for general release information and known problems.

For more information on administering your system, refer to the *UNICOS Basic Administration Guide for CRAY J90 and CRAY EL Series*, publication SG-2416, and/or *UNICOS General System Administration*, publication SG-2301.

Software Upgrade Installation

4.2

This section describes the procedures for sites that are currently running CRAY J90 Series system software and are upgrading to a new release level.

Please note that for CRAY J90 Series systems, there are no procedural differences between installing a UNICOS revision and a UNICOS update.

Pre-upgrade procedures

4.2.1

This subsection describes what you need to do to prepare for your upgrade.

State of the system

4.2.1.1

Before starting the Upgrade installation, you must ensure the system is in the following state:

• UNICOS is in multiuser mode

- The J90 Console is logged into UNICOS as `root`

- The UNICOS root prompt must end in one of the following characters: % or # or $

- The J90 Console window has been released (~ . ^C)

File system allocation
4.2.1.2

For CRAY J90 Series systems, there is a significant change to the disk space allocation scheme compared to the CRAY EL Series systems. At initial installation, two sets of production disk partitions are created (named `roota/usra/srca` and `rootb/usrb/srcb`). This allows for an upgrade installation into the alternate set of partitions in multiuser mode without disturbing the running system. The *J90 Install Utility* is designed to perform upgrade installations into the alternate set of partitions (although the installer can specify other partitions if desired).

Disk space requirements
4.2.1.3

The minimum recommended disk space partitions allocation for J90 UNICOS 9.0.2 are as follows (4K byte blocks):

```
root  =    110,000
usr   =    190,000
src   =    120,000
```

Usage of the `src` partition is decreasing since many asynchronous products are installing into the `/opt` partition (i.e. Programming Environment 2.0). Since many sites support existing asynchronous products, we have not changed our recommendation for the `src` partition from UNICOS 8.0. Each site should ensure enough space is allocated for existing asynchronous products.

For additional information on file system size information regarding P.E. 2.0, please refer to *Installing Programming Environment Products 2.0*, publication SG–5191.

Please note on J90 and EL UNICOS initial installations, the `/opt` partition is automatically created for you with a size of 150,000 4-Kbyte blocks.

If you need to modify your disk configuration, refer to the *UNICOS Basic Administration Guide for CRAY J90 and CRAY EL Series*, publication SG-2416.

MLS sites
4.2.1.4

The *J90 Upgrade Installation* process requires the `CONTROL-a` (^A) console feature enabled during multiuser mode. Therefore, MLS sites that have disabled the feature will have to temporarily enable it during the upgrade process.

Software Upgrade
4.2.2

Select *Software Upgrade* from the *J90 Install Main Window*:
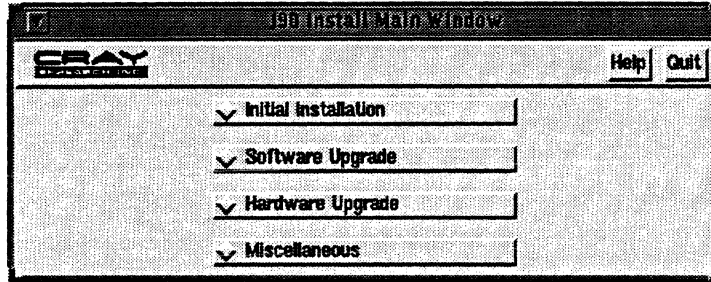
The following menu appears:
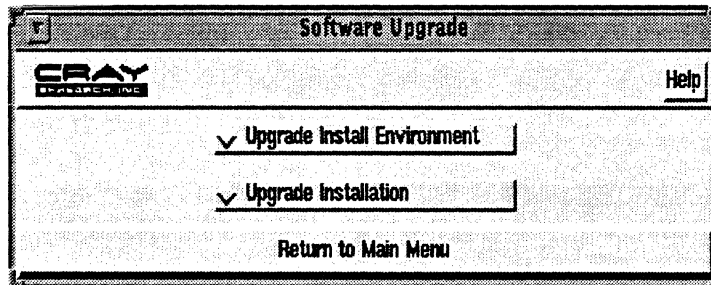
Upgrade Install Environment
4.2.2.1

The *Upgrade Install Environment* should be performed each time a new J90 UNICOS release is installed. This procedure updates the CRAY J90 installation binaries on the console from the UNICOS release DAT tape.

Note

If you are performing an upgrade from J90 UNICOS 8.0.3.2 J or 8.0.3.2K, running the Load Binaries step in the *Upgrade Installation* window will cause the IOS to reset to the BOOT prom causing a running UNICOS system to crash. To avoid this problem, follow the procedures in section 6.2.10 to manually load the binaries. Upon completion of this step, proceed to the Upgrade Installation subsection.

Selecting this menu item displays a *Select Mainframe* window with action-buttons of *Load Binaries* and *Cancel*.
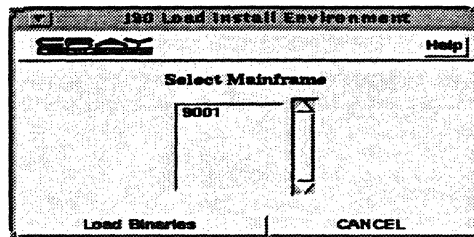
Selecting the *Load Binaries* action-button displays the following dialog box:
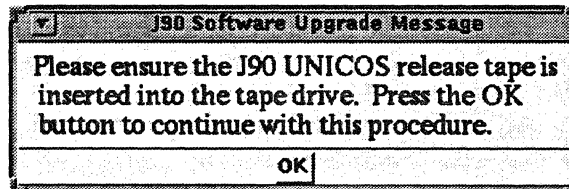
Selecting the *OK* action-button initiates the loading of the installation binaries from tape to the J90 Console. A *Load Binaries Speedometer* is displayed to keep you informed of the progress of the load.
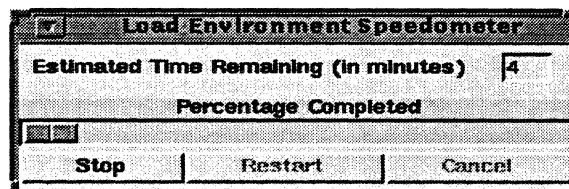
Upon completion, the following message will be displayed.
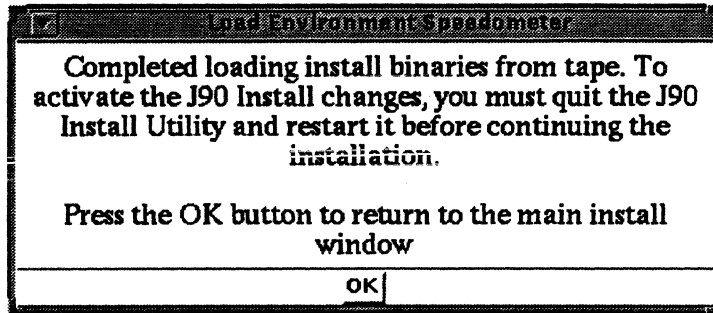
Upgrade installation
4.2.2.2

Selecting *Upgrade Installation* from the *Software Upgrade* menu displays a *Select Mainframe* window with action-buttons of *Upgrade Install* and *Cancel*.
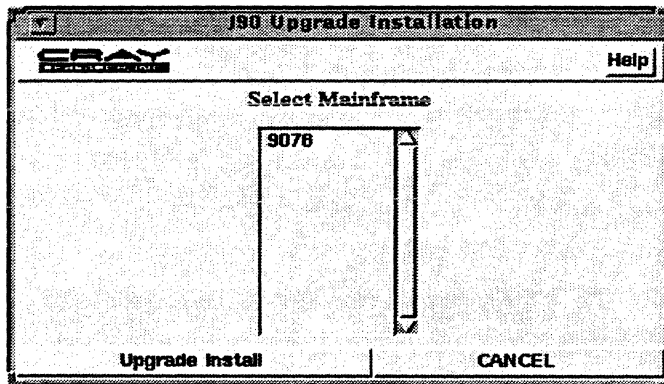
Note

There is a problem with tape device access for this procedure. Please check section 6.2.1 before continuing.

After selecting a mainframe, click the *Upgrade Install* action-button to display a *J90 Upgrade Install* window with six panels of information described as follows:
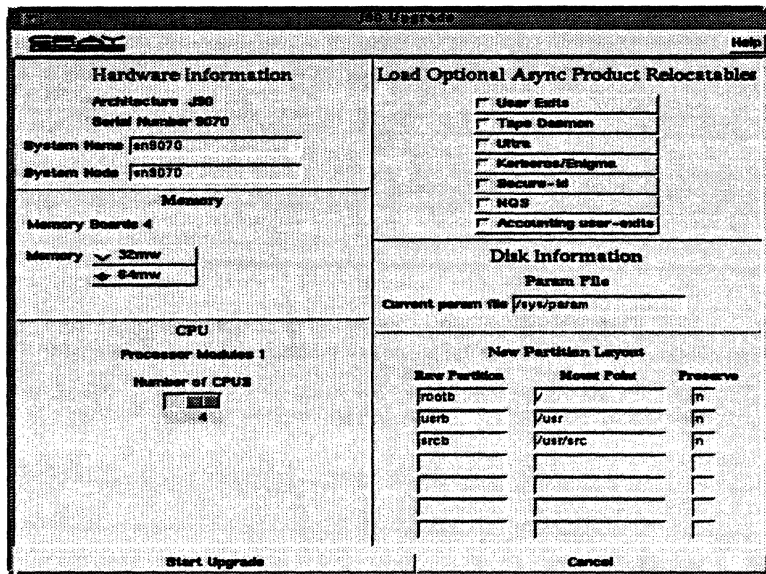
- Hardware Information

  Default settings for the *System Name* and *System Node* are filled in. You may change these values by clicking in the entry-label-box and editing them.

- Memory

  The number of memory boards are selected based on the
  probing by the jconfig command (performed in the
  Mainframe Hardware Setup procedure). If this setting is
  incorrect, you will need to run the *Mainframe Hardware Setup*
  procedure from the *Initial Software Installation* menu. If you
  wish to run UNICOS with less memory than selected, you may
  decrease the memory setting specified.

  ```
                Memory

  Memory Boards 4

  Memory  ∨ 32mw
          ♦ 64mw
  ```

- Processor Modules

  The number of *Processor Module* boards are selected based on
  the probing by the jconfig command (performed in the
  Mainframe Hardware Setup procedure). If this setting is
  incorrect, you will need to run the *Mainframe Hardware Setup*
  procedure from the *Initial Software Installation* menu. If you
  wish to run UNICOS with fewer CPUs than selected, you may
  decrease the setting specified.

  ```
                CPU

         Processor Modules 1

         Number of CPUS

               ███
                4
  ```

- Load Optional Async Product Relocatables

  With the release of UNICOS 9.0, all optional asynchronous
  relocatables are automatically loaded. Therefore, this panel of
  input can be ignored.

Load Optional Async Product Relocatables

- User Exits
- Tape Daemon
- Ultra
- Kerberos/Enigma
- Secure-Id
- NQS
- Accounting user-exits

- **Disk Information**

  You must enter the name of the param file of the currently running UNICOS system. This will be used to determine the available partition selection for the next panel of information.

  Disk Information

  Param File

  Current param file /sys/param
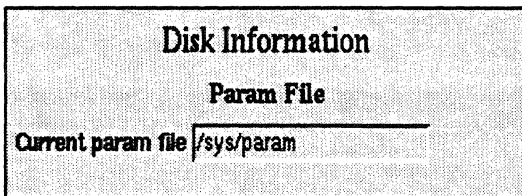
- **New Partition Layout**

  The *J90 UNICOS Upgrade* procedures are designed to install into an alternate set of partitions (i.e. not on into the running partitions like it was on the Cray EL Series machines).

  This panel displays the new partition layout desired for the upgrade installation. If the `rootdev` statement is something other than `roota` or `rootb`, you will need to specify the raw partition that the upgrade process will utilize.

  If the `rootdev` statement on your current param file specified either `roota` or `rootb`, the *New Partition Layout* window will be filled in with the alternate set of partitions to install into.

The set of partitions you are installing into must be at least as large as the partitions you are currently running.

The preserve flags are used by the upgrade process to allow the user to specify whether or not to retain the current file systems you are installing into. When this flag is set to n, the raw (logical) partition will be mkfs'd and fsck'd, labeled, mounted, and restored from the current system (if this is a 9.0.*x* to 9.0.*y* upgrade). When the flag is set to y, only `fsck` and `mount` will be performed on the raw partition.

Selecting the *Start Upgrade* action-button from the *J90 Upgrade* menu will display the following the following dialog box:
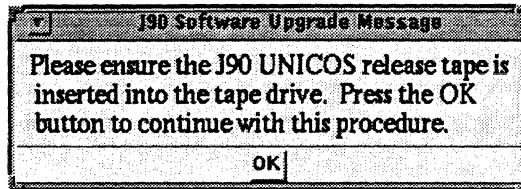
Selecting the *OK* action-button initiates the installation and displays a speedometer window to keep you informed of its progress.

A log file window will then be displayed in the upper right-hand corner capturing the detailed output of the installation.

If you have pressed the *Stop* action button to interrupt the software installation, three additional action buttons are highlighted:

• *Resume*
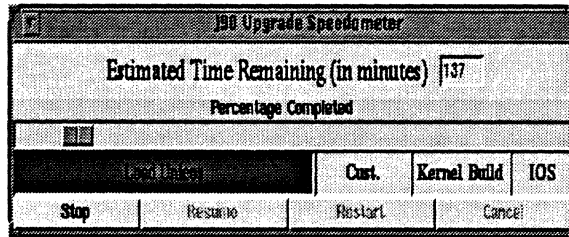
   Selecting *Resume* restarts the software installation from the last checkpointed process (*Load UNICOS, Customization, Kernel Build*, or *IOS*).

• *Restart*

Selecting *Restart* completely restarts the software upgrade installation.

• *Cancel*

Selecting *Cancel* returns you to the *Software Upgrade* menu.

Note

Please note that selecting the *Stop* action-button during the dump/restore portion of the *LOAD Unicos* phase, followed by the user opening the J90 console, may cause the J90 Console to appear hung. If this occurs, wait for a few minutes for the dump/restore process to gracefully shutdown. The system console will return to the UNICOS prompt.
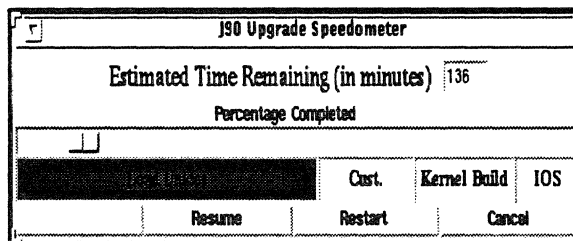
Upon completion, the following dialog–box will be displayed:
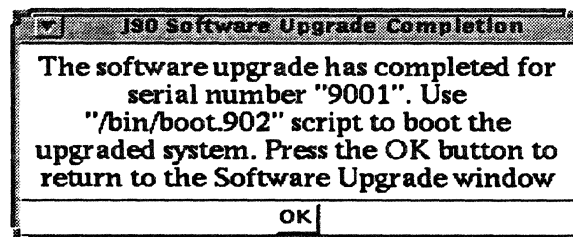
Post Upgrade Procedures
4.2.3

This subsection describes what you need to do **before** you have booted the upgraded system.

Initialization files
4.2.3.1

There are different requirements for customizing initialization files with different upgrade paths.

UNICOS 8.0 to 9.0 upgrade
4.2.3.1.1

Because some significant changes may have taken place between 8.0 and 9.0 configuration files, the 9.0 configuration files are installed into /mnt. Many of the configuration files will be converted automatically from 8.0 into 9.0, but there are some files which may have been locally modified and aren't converted. To assist in putting local changes back into the configuration files, the running configuration files are placed in /mnt/.OLD. A diff(1) is performed between those files, and the files on your 9.0 system in /mnt, and the output is placed in /mnt/.OLD/file_differences. Look over this file to determine if any of the old changes need to be incorporated into the new files.

Also, note that the UNICOS 8.0 to 9.0 upgrade process does not do a dump and restore of your running system. **If you have some local files which need to be transferred over to /mnt, you should do that now.**

UNICOS 9.0 to 9.0 upgrade
4.2.3.1.2

If you are performing an upgrade from UNICOS 9.0, you should be aware the J90 upgrade process never updates the /etc/brc, /etc/bcheckrc, /etc/rc /etc/nschedv.day and /etc/nschedv.nite files, due to the local customization of initialization scripts. There may be fixes, however, that are applied to these files that may be important to your site.

Instead of applying these default configuration files to your site, they are extracted into /mnt/.NEW. A diff(1) is performed between those files, and the files on your running 9.0 system, and the output is placed in /mnt/.NEW/file_differences. Look over this file to determine if any of the new files need to be applied.

holiday file
4.2.3.1.3

For upgrade installations from UNICOS 8.0 to 9.0, the /mnt/usr/lib/acct/holidays file is not automatically converted. To run accounting successfully, you will need to manually merge the released version of /mnt/usr/lib/acct/holidays with your site's 8.0 configuration files in /usr/lib/acct/holidays.

You can run the diff(1) command to see the new additional parameters you may need to add to your local configuration file.

nfsstart file
4.2.3.1.4

If you are performing an upgrade from J90 UNICOS 8.0 and have locally altered the `/etc/nfsstart` file, you will need to restore these modifications. The format of NFS ID mapping files (created by `nfsmerge`(8) and used by `nfsaddmap`(8)) has changed from UNICOS 8.0 to 9.0. The standard upgrade procedure provides a mechanism to update these map files. This occurs the first time the UNICOS 9.0 system goes to multiuser mode, and is accomplished through the `/etc/nfsstart` script (see `nfsstart`(8)). That script describes the upgrade details. If your site has altered the UNICOS 8.0 `/etc/nfsstart` script (for example, to call local versions of scripts that merge and add ID maps), the same changes must be applied to the UNICOS 9.0 version of the `/etc/nfsstart` file.

Therefore, if you are performing an upgrade from J90 UNICOS 8.0 and have locally altered the `/etc/nfsstart` file, edit the `/mnt/etc/nfsstart` file to include your local UNICOS 8.0 modifications.

Updating production
filesystems
4.2.3.2

If the production system contains a filesystem mounted under `/usr` (for example, the filesystem `/usr/adm`), then this filesystem will not be changed by the J90 upgrade installation utility. If the upgrade affects any files in such a filesystem (for example, `/usr/adm/urm/urmconfig`), then the new version of the affected files will be placed in the alternate `/usr` filesystem during the upgrade (i.e. `/mnt/usr/adm/urm/urmconfig`). The production `/usr/adm` filesystem that is currently being run on will not be automatically changed by the upgrade.

If you have filesystems mounted under the `/usr` production filesystem, you should check the contents of the alternate `/mnt/usr` filesystem after the install has been completed (before booting on the alternate filesystems) to determine if there are any new files from the upgrade that need to be manually copied back into your production filesystem. For example, if you have the filesystem `/usr/adm` mounted in your production system, look in the directory `/mnt/usr/adm` after the install utility has completed. Any files in `/mnt/usr/adm` will have to be manually copied back into their respective locations in `/usr/adm`.

Booting the upgraded
system
4.2.3.3

Before booting the upgraded system, you must first shutdown the running UNICOS, reload the IOS, then run the new boot script as described in the *J90 Software Upgrade Completion* dialog box.

Optional products
4.2.3.4

If you have configured any synchronous or asynchronous products, be sure to relink and/or reinstall these products once the upgrade is complete. Refer to the appropriate users guide for more information regarding configuring and rebuilding these products.

Crash command
4.2.3.5

The crash command now resides on the Sun SPARCstation offering greater flexibility when analyzing system dumps. If you are upgrading from a pre-J90 UNICOS 8.0.4.2 system, please remove the IOS V–based crash command by entering the following command from the J90 UNICOS Console:

```
# snxxxx-ios0> rm /bin/crash
```

ICMS Tool
4.2.3.6

If you want to run the Installation and Configuration Managment System (ICMS), you must first **IMPORT ALL** parameters. Refer to section 6.3.1 for more information. Failure to perform this procedure prior to an **ACTIVATE**, will cause customized parameters to be overwritten by generic values from the release tape.

Upgrade procedures complete
4.2.4

The procedures for the *J90 UNICOS* upgrade installation are now complete. For more information on administering your system, refer to the *CRAY EL Series Basic Administration Guide*, publication SG-2416, and/or *UNICOS General System Administration*, publication SG-2301. Please refer to Section 6, *J90 UNICOS 9.0.2 Release*, for general release information and known problems.

Hardware Upgrade
4.3

To receive information on where to obtain the latest hardware upgrade information, select any of the hardware upgrade buttons to display the following dialog box:

Note: All five buttons produce the same dialog box.

CPU Upgrade

Hardware Upgrade Information

Cray Research J90 Series Systems have various upgrade options available to support an expanding customer user environment. For each of these options, Upgrade Procedure documents are available to support the installation and configuration changes needed to perform the upgrade. These documents are available to the Cray Research Service provider via any of the following methods:

ODIE   Logon to the Cray Technical Network system host named "hydra". Use the On Line Documentation Interface tool by following these steps:

- Enter "data/mayberry/odie/bin/odie" *
- Select "CRAY J90"
- Select "J916 or J932 System Information"
- Select "Upgrade Procedures"
- Select a specific Upgrade Procedure

* Contact online@pandora if this automount point is not configured for your server.

Mosaic   You must have the "ghostview" viewing tool in your path in order to view PostScript documents. If you do not have a copy of "ghostview" on your server, contact your system administrator. You can use the Mosaic command "Options --> Load to Local Disk" to download the PostScript file to a directory of your choice instead of viewing the file with "ghostview". Use Mosaic by following these steps:

- Start Mosaic on a Cray Technical Network server
- Open the following URL:
      http://wwwcf.cray.com/PRIVATE/HPThome/hwdocs.html
- Select "CRAY J90 Series Upgrade Procedures (PostScript) "
- Select a specific Upgrade Procedure

Postscript   Logon to the Cray Technical Network system host named "hydra". Obtain a copy of the PostScript format file that corresponds to the upgrade type which will be installed. The files are found at

/home/hydra/catalog/postscript/"dirname"/file.ps

where dirname is cpu, mem, disk, etc. and file.ps is the actual PostScript file such as 916cpu.ps or 916mem.ps.

E-mail   The Cray Research Service provider can E-mail the request for documentation to online@pandora.cray.com.

OK

Miscellaneous
4.4

The miscellaneous options are *Tape Validation, Backup Console Environment*, and *Restore Console Environment*.

Tape Validation
4.4.1

This automated feature will be available in a future release of CRAY J90 UNICOS. In the interim, we have provided manual steps to verify the release tape.

The following procedure takes about 20 minutes to complete and can be accomplished while the system is running in multi-user mode. Insert the tape labeled *J90 UNICOS 9.0.2* into your tape device and enter the following commands from the J90 Console:

```
snxxx-ios0> cd   /
snxxx-ios0> mt -f rpd03 rewind
snxxx-ios0> tar -xvf rpd03 ./install/scripts.tar ./install/escripts
snxxx-ios0> CONTROL-a  RETURN (toggles to the UNICOS console)
# exdf  -i  install/escripts  |  /bin/sh
# /scripts/verify_tape
```

After some basic prompts, each file on the release tape will then be validated and reported on. If the tape does not pass verification, please contact the Customer Support Call Center (CSCC) at (612) 683–5600 or at the toll–free number 800–950–2729 (800–950–CRAY).

This verification script is also available on CRI's `hydra` computer system via the getfix package `verify_tape.902`.

Backup Console Environment
4.4.2

The *Backup Console Environment* action should be performed after each *Initial Installation*, *Software Upgrade*, or *Hardware Upgrade*. This procedure backs up the Solaris files related to the CRAY J90 installation process and the IOS system software.

Note

There is a problem with tape device access for this procedure. Please check section 6.2.1 before continuing.
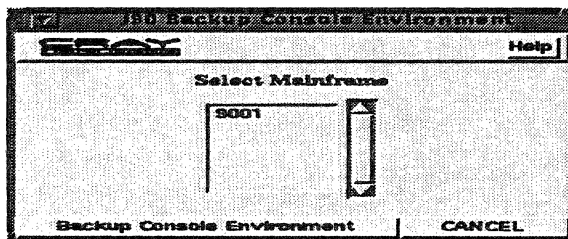
Selecting this menu item displays a *Select Mainframe* window with action-buttons of *Backup Console* and *Cancel*. Selecting *Backup Console* will then display a dialog window informing you about the backup to be performed and to insert a DAT tape in the IOS before continuing.
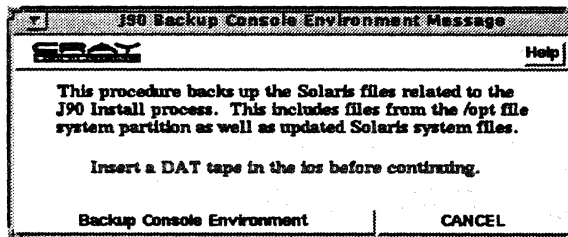
This procedure backs up the following Solaris files related to the CRAY J90 installation process:

- /etc files:

ethers	hosts	services
inetd.conf	passwd	group
shadow	hostname.le0	ethers
bootptab	hosts.equiv	hostname.le1
dfs	hosts	nsswitch.conf

- /opt files

home	install
ios	packages

- /usr/sbin/bootpd

Selecting the *Backup Console Environment* action-button initiates the backup and displays a speedometer window to keep you informed of its progress:

```
┌──────────────────────────────────────┐
│ ▼      Backup Console Speedometer     │
├──────────────────────────────────────┤
│ Estimated Time Remaining (in minutes) │10│
│                                        │
│           Percentage Completed         │
│ ┌────┐                                 │
│ └────┘                                 │
│    Stop    │   Restart  │   Cancel     │
└──────────────────────────────────────┘
```
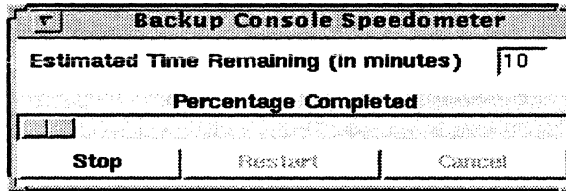
Upon completion, the following dialog box will be displayed:

```
┌──────────────────────────────────────┐
│ ▼      Backup Console Speedometer     │
├──────────────────────────────────────┤
│   Completed Backing Up Console Environment. │
│                                        │
│  Press the OK button to return to the main install │
│                   window               │
│                  │OK│                  │
└──────────────────────────────────────┘
```

Restore Console Environment

4.4.3

The *Restore Console Environment* action should be performed only if has been determined the *CRAY J90 Console Environment* has been corrupted and/or you want to revert to the last saved *Backup Console Environment* DAT tape. This procedure overwrites files from the /opt file system partition as well as Solaris system files.

Note

There is a problem with tape device access for this procedure. Please check section 6.2.1 before continuing.
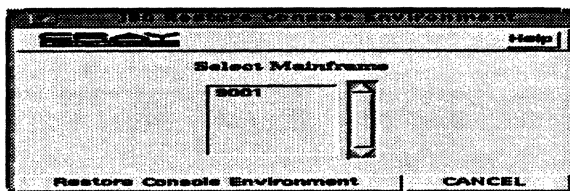
Selecting this menu item displays a *Select Mainframe* window with action-buttons of *Restore Console* and *Cancel*. Selecting *Restore Console* will then display a dialog window to inform you about the restoration to be performed and to tell you to insert the *Console Backup* DAT tape in the IOS before continuing.

This procedure restores the following Solaris files related to the CRAY J90 installation process:

- /etc files:

ethers	hosts	services
inetd.conf	passwd	group
shadow	hostname.le0	ethers
bootptab	hosts.equiv	hostname.le1
dfs	hosts	nsswitch.conf

- /opt files

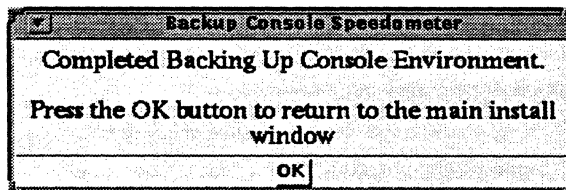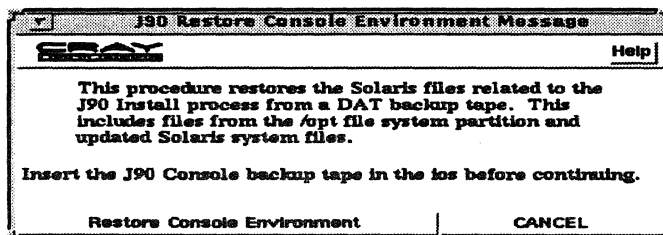 | | |
  |---|---|
  | home | install |
  | ios | packages |

- /usr/sbin/bootpd

Selecting the *Restore Console Environment* action-button
initiates the restore and displays a speedometer window to keep
you informed of its progress:
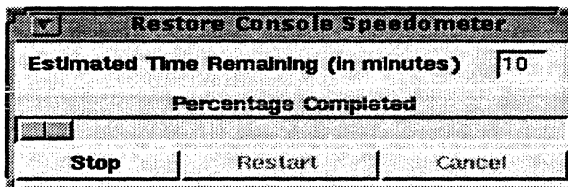
Upon completion, the following dialog box will be displayed:

This section describes the procedures for customizing your installed CRAY J90 Series system software. These procedures assume the following:

- UNICOS is in single-user mode with no file systems mounted

- The current boot script is /bin/boot

- The current param file is /sys/param

- The current root partition is /dev/dsk/roota

- The current usr partition is /dev/dsk/usra

- The current src partition is /dev/dsk/srca

- You will need to adjust the names in the procedures below to match your particular site.
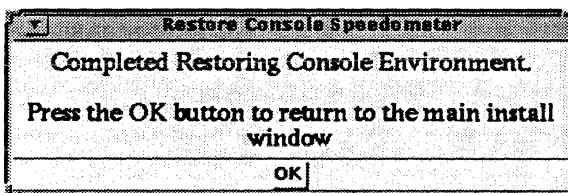
Disk reconfiguration
5.1

To change your system's disk configuration, perform the following procedure:

1. Make a back-up copy of your current param file by entering the following commands:

   # CONTROL-a (toggles to the IOS console)

   snxxx-ios0> **cp /sys/param /sys/param.bak**

2. Transfer the /sys/param file from the IOS to UNICOS by entering the following commands:

   snxxx-ios0> CONTROL-a (toggles back to the
   UNICOS console)

   # **exdf -i sys/param > new_param**

3. Edit the /new_param file by entering the following commands:

```
#  /etc/fsck /dev/dsk/roota
#  /etc/fsck /dev/dsk/usra
#  /etc/mount /dev/dsk/usra /usr
#  TERM=xterm; export TERM
#  vi /new_param
```

For additional information on disk configuration, refer to the *CRAY EL and J90 Series Basic Administration Guide*, publication SG–2416. You can also use the Model E configuration specification language (CSL) information in subsection 3.2 of the *UNICOS System Administration*, publication SG–2113.

4. Check the configuration file for errors by entering the following command:

```
#  /etc/econfig new_param
```

5. If no errors are found, update the /dev/mkdev.sh script and write the sys/param file back to the IOS disk by entering the following commands:

```
#  /etc/econfig -d  new_param > /dev/mkdev.sh
#  chmod 700 /dev/mkdev.sh
#  exdf -ro sys/param <  new_param
```

6. Reload and boot using the new configuration by entering the following commands:

```
#  /etc/umountem
#  sync
#  sync
#  sync

#  CONTROL-a   (toggles back to the IOS console)

snxxxx-ios0>  boot
```

7. Create the device entries by entering the following commands:

```
#  cd /dev
#  rm -f dsk/* ldd/* mdd/* pdd/* sdd/*
#  /dev/mkdev.sh
```

8. Use the mkfs(8) and fsck(8) commands to check new file systems and to recreate file systems that have changed size due to the new configuration. For initial installations, failure to mkfs the /dev/dsk/home file system will cause an error when going to multiuser mode.

9. Backing up the file system is recommended after a change to the disk configuration.

Modifying and relinking the kernel
5.2

To change kernel configuration file and relink the UNICOS kernel, perform the following procedures:

1. Check and mount the disk partitions by entering the following commands:

   ```
   # /etc/fsck    /dev/dsk/roota
   # /etc/fsck    /dev/dsk/usra
   # /etc/fsck    /dev/dsk/srca
   # /etc/mount /dev/dsk/usra /usr
   # /etc/mount /dev/dsk/srca /usr/src
   ```

2. Ensure the following files are in the /usr/src/uts/cf.SN directory: sn.h, conf.h, and config.h. If these files do not exist, recreate them by entering the following commands:

   ```
   # mkdir /usr/src/uts/cf.SN
   # cd /usr/src/uts/cf.SN
   # cp /usr/src/uts/c1/sys/sn.9001 sn.h
   # cp /usr/src/uts/c1/cf/conf.c conf.c
   # cp /usr/src/uts/c1/cf/config.h config.h
   ```

3. Edit the following kernel configuration files to customize to your particular site (SN is your system's serial number):

   ```
   # TERM=xterm; export TERM
   # vi /etc/config/config.mh
   ```

You can edit CONFIG_ID, CONFIG_SN, CONFIG_SYS, and CONFIG_NODE for appropriate values. You can also enable/disable features such as tapes or security. Comments are provided in the file for more specific information on the setting of various parameters.

   ```
   # vi /usr/src/uts/cf.SN/sn.h
   ```

This file contains values for system serial number, number of CPUs, and the size of memory.

 # vi /usr/src/uts/cf.SN/config.h

This file contains kernel parameters used in the kernel relink process.

4. Relink the kernel by entering the following commands:

    # cd /usr/src/uts
    # rm -r cf.SN/lib/*.o
    # rm -f cf.SN/Nmakefile*
    # /usr/bin/nmake rmexe
    # /usr/bin/nmake install

5. Save the old kernel, move the new kernel to the IOS disk, and unmount the file systems by entering the following commands:

    # CONTROL-a (toggles back to the IOS console)

    sn*xxxx*-ios0> **mv /sys/unicos.ymp /sys/unicos.old**
    sn*xxxx*-ios0> CONTROL-a (toggles back to the
                                    UNICOS console)
    # cd /usr/src/uts/cf.SN
    # exdf -ro sys/unicos.ymp < unicos
    # cd /
    # /etc/umountem
    # sync
    # sync
    # sync
    # CONTROL-a (toggles back to the IOS console)

6. Reboot the system by entering the following command:

    sn*xxxx*-ios0> **boot** (boots UNICOS to single-user mode)

This section **replaces** the traditional errata that has been shipped with previous releases. In addition to reading this document, please refer to the current Software Field Notices (located on CRI's CRInform or on CRI's hydra computer system in Eagan, MN) for important, late-breaking information concerning this release.

Note that for J90 UNICOS, all revisions and updates are cumulative within the major release level and contain all fixes and features of prior revisions and updates. Therefore, all problems identified in this document as fixed in a previous revision or update are also fixed in this update.

Please enter 9.0.2 as the version for any SPR you open against this level of UNICOS and IOS software. Future update releases of J90 UNICOS 9.0 will contain fixes for the problems listed below. For additional information, please contact the Customer Support Call Center (CSCC) at (612) 683-5600 or at the toll-free number 800-950-2729 (800-950-CRAY).

This section provides upgrade and compatibility information and lists significant software or documentation problems that are outstanding in J90 UNICOS 9.0.2. The following subsections are presented:

- 6.1   Release Information
- 6.2   Significant Open Problems
- 6.3   Problems with Related Products
- 6.4   J90 SPRs Fixed
- 6.5   J90 SFNs Fixed

6.1 Release Information

6.1.1 Support of EL/J90 specific character special interface has been dropped at UNI-COS 9.0. The interface and drivers will continue to be supplied in UNICOS 9.0 to allow sites to convert to the tape daemon character special interface (/dev/tape/xxxx) or the normal tape daemon interface (tpmnt). Please note at UNICOS 9.2, only the tape daemon and tape daemon character special interfaces will be available.

6.1.2 Physical Disk Device Naming - for CRAY J90 Series systems, there is a significant change to the physical disk device naming scheme compared to the CRAY EL Series systems. The *iopath* is an octal number used both internally in UNI-COS and in several commands and the /sys/param file to describe a disk. The format of the *iopath* is iieeeccc where i = ios, e = eiop, and c = channel. Because the eiop and ios numbers are referred to in decimal in the /sys/param file, you will need to convert the octal values for these identifiers into decimal values to make them correlate to your /sys/param file.

For example: 00036024 would indicate ios 0, eiop 30 (decimal), and channel 024.

Commands that use iopath include pddstat and pddconf. They'll provide information per disk and "name" the disk using the iopath. Please note these commands don't print leading zeroes, so for the above example (00036024) they would print "36024" as the name of the disk.

6.1.3 TCP Channel Numbers on J932 Systems Only

Following an upgrade or initial installation, the J90 UNICOS 9.0.2 parameter file (/sys/param), will contain a line similar to the following, which declares the TCP pseudo channel value:

```
channel 0112 is lowspeed to pseudo TCP;
```

Use of the UNICOS Installation/Configuration Menu System (ICMS) may change this channel value to 78 (0116). Either value is correct.

However on J932 systems, care must be taken to ensure that the Pseudo TCP channel does NOT share a channel physically in use by a Y1 or Memory HiPPI. This is not an issue for J916 systems (as long as either 0112 or 0116 are chosen).

The following rules for choosing a TCP pseudo channel on J932 systems must be satisfied:

- An EVEN number that is not being used by an actual physical channel (Y1 or memory HiPPI)

- The LARGEST value that is less than or equal to 78 (0116) AND greater than or equal to 16 (020)

The ICMS currently does not support altering this param file value; therefore it must be changed manually. For affected J932 sites, the param file should be checked each time a new version of the file is generated by ICMS.

6.1.4 The method of setting up the arguments file for the mfdump command for the CRAY J90 differs significantly from the CRAY EL. The mfdump arguments file defines the location of the dump device and identifies the UNICOS areas to be dumped. For the CRAY EL, this binary file, (/sys/mfdump.arg), had to be modified from within the mfdump command itself with the "-q" option. For the CRAY J90, this ascii file, (/sys/mfdumpa.arg), can be directly modified with the text editor available on the SPARC system console. Therefore, the "-q" option is no longer supported in the mfdump command on CRAY J90 systems.

6.1.5 Documentation

For the UNICOS 9.0 release, there is still an ldproto(8) man page that specifically supports CRAY EL and CRAY J90 systems. The ldproto(8) man page that specifically supports CRAY EL and CRAY J90 systems is provided in online form only for the J90 UNICOS 9.0 release; a printed man page is not provided. If you view the ldproto(8) man page, make sure you look at the second displayed man page marked for *CRAY EL Systems* and not the man page marked for *All Systems*.

6.1.6 Scalar Cache

Since the release J90 UNICOS 8.0.4B, scalar cache is supported and enabled by default. This feature was disabled in the initial software release for the CRAY J90 due to possible data corruption, miscalculations, and/or ORE aborts. The following information describes the fix to the problem as well as what other areas are affected by enabling scalar cache.

The fix to the scalar cache problem is in the following areas:

* scanit(1) command
  This command, when run against an executable, will look for code sequences that create a problem when run with scalar cache enabled. The scanit(1) command will change the code so that the sequence of instructions do not create a problem. The scanit(1) command may be used on other vendor supplied programs if, and only if, agreements with those vendors permit the programs to be modified by the customer.

  This code also sets a bit in the executable's header that lets the UNICOS kernel know that the code has been filtered by scanit(1).

* segldr(1)
  The segldr command in J90 UNICOS 9.0 will have the same module integrated into it as is used by the scanit(1) command. This module will be run when the user's code is linked and the target platform is a CRAY J90 system.

* kernel portion
  The kernel portion of the fix will query the bit in the executable's header to see if scalar cache can be utilized for the program. If it is set, then the kernel code will attempt to use scalar cache, with some exceptions.

  The kernel utilizes a bit in the exchange package to turn on/off scalar cache in the hardware. When the kernel sets this bit, scalar cache is enabled for the process. When this bit is clear, scalar cache is disabled.

The kernel will turn off scalar cache for processes that are part of a multi-tasking group. When the kernel sees that the program is multitasked, scalar cache will be disabled from that point on to the end of program execution. Scalar cache cannot be automatically re-enabled when a program reaches the end of a multitasking region unless the associated tasks explicitly exit.

A way to ensure that your program is executed entirely with scalar cache is by setting the environment variable NPCUS=1 before calling the program to execute. For example:

 # NCPUS=1; export NCPUS
 # ./a.out

It may be that certain programs executed with cache enabled do not see a benefit in terms of decreased run time. This may be due to the piece of the program executing a multitasked library routine that turns off scalar cache until completion of the program. To verify that a program will benefit from scalar cache, perform the following steps:

Step 1. Make sure you are on a CRAY J90 running J90 UNICOS 8.0.4B or later.

Step 2. Run the program without recompiling on a J90 UNICOS 8.0.4B or later system. This ensures that code will not have the scalar cache bit set in the exchange package and will not enable scalar cache for the process. Use the timex command to measure the real, usr, and system times by executing:

 # timex ./a.out

Step 3. Recompile and relink the program on a J90 UNICOS 8.0.4B or later system with CRAY-J90 as the TARGET. If the program cannot be recompiled then run the scanit(1) command against the program executable. This will ensure that the code is enabled for scalar cache execution.

Step 4. Run the program again using the timex command to measure the real, usr, and system times by executing:

 # timex ./a.out

Step 5. Compare the times received from step 2 agains step 4. If the times from step 4 didn't decrease then it may be that the program has executed a multitasked operation. When a multitasked operation is encountered the UNICOS kernel will automatically disable scalar cache for the duration of the process. To check if the program has performed a multitasked operation execute the following:

 # NCPUS=1; export NCPUS
 # timex ./a.out.

Step 6. Compare the times received from the timex command in step 5 against the times in step 4.

If the times of step 5 decreased then the program does have a multi-tasked operation in it but would benefit more with scalar cache. In this case restrict the program to be executed in scalar mode by setting NCPUS to 1 before executing the program.

If the times received from step 5 are larger than step 4 then the program has enough multitasked operations so that it benefits more from a multi-tasked environment. Continue to run code as normal.

J90 Install and jconfig

• Scalar cache is disabled by default in J90 UNICOS 8.0.3.2J and 8.0.3.2K. Any time the *J90 Mainframe Hardware Setup* in the *J90 Install Utility* is run, scalar cache will be disabled. Any time the jconfig command is run, scalar cache will be disabled unless the scalar cache option is specifically enabled.

• Scalar cache is enabled by default in J90 UNICOS 8.0.4B or later. Any time the *J90 Mainframe Hardware Setup* in the *J90 Install Utility* is run, scalar cache will be enabled. Any time the jconfig command is run, scalar cache will be enabled unless the scalar cache option is specifically disabled.

• The jconfig command reads the existing .cfg files and uses these parameters as the system defaults.

Offline Diagnostic Run Manually

The following list of diagnostics use memory as an inter-processor communication port and will fail when ran manually if cache is enabled. Therefore, the -d option (disable scalar cache) must be used in conjunction with the offline(8) command to disable scalar cache during execution (i.e. "offline -d test_name")

jsem, jbsr, jbrt, jaht, jprtc, jsdt, jipt, jejt, jpmt, jcht, jiot

Troubleshooting tip: If using the offline command with cache enabled and an offline diagnostic times-out, it is recommended the diagnostic be run with scalar cache disabled. This will help to distinguish between the possibility of a CPU verses a memory board problem, due to the fact that if it doesn't time-out with cache disabled and that cache resides on a processor module, one can determine the processor module as the probable (FRU) field replaceable unit at fault.

6.2 Significant Open Problems

6.2.1 Tape Device Access Check

Since J90 UNICOS 8.0.4B, the DDAL device driver prevents concurrent access with the Tape Daemon resulting in a significant impact to any *J90 Utility* requiring access the tape device when UNICOS is running. These procedures include *Software Upgrade, Backup*, and *Restore*. Before running these procedures, log in as root at the UNICOS console and follow the steps below to ensure appropriate access to the tape device:

Step 1. Enter the following command:

 # mt -f /dev/tape/rpd03 rewind

If no errors were reported, access to the tape device is ok.

Step 2. If you received an error indicating "No such file or directory", it indicates you are not using the Tape Daemon. Next, enter the following command:

 # mt -f /dev/nrpd03 rewind

If no errors were reported, access to the tape device is ok. If other errors were reported, you need to manually re-create the character special devices, then go back to step 2.

Step 3. If you received an error indicating "Tape open rejected due to device configuration", you first need to configure the device down:

 # tpconfig rpd03 down

If you received an error indicating "Tape Daemon not available", enter the following commands to start the tpdaemon and configure the tape unit up and down:

 # /usr/lib/tp/tpdaemon -cr
 # tpconfig rpd03 up
 # tpconfig rpd03 down

Step 4. Enter the following command:

 # mt -f /dev/tape/rpd03 rew

If no errors were reported, access to the tape device is ok. If other errors were reported, you need to fix the Tape Daemon errors and go back to step 3.

For more information on tapes, refer the *Basic Administration Guide for the CRAY J90 and CRAY EL Series*, publication SG-2416.

6.2.2 Files created on the SPARCstation's /opt/ios/xxxx filesystem by non-crayadm accounts without proper permissions can cause problems with certain IOS-V commands. Files without either group read permission for crayadm or global read permission for crayadm cannot be read by the crayadm account, and thus by the IOS. Some IOS-V commands may not check the status of the open() system call correctly and, therefore, will not print a "Permission Denied" message when encountering this error. In these cases (such as the lu command) the command will exit without printing the proper error message and thus give the impression that the system is hung. If you encounter such a condition, first check to ensure all files are owned by crayadm and have the correct permissions set.

6.2.3 The pddconf(8) command, which is used to control the state of disk drives, requires device nodes in the directory /dev/ddd. Each disk device in the system can have one entry. Sites that use the pddconf command will need to ensure that these devices are created. Otherwise, they are **not** necessary.

A script is provided with each J90 UNICOS 9.0 release to create /dev/ddd devices. Following **any** UNICOS installation or **any** alterations to the "disk" entries in the UNICOS configuration file (/etc/config/param), the following steps should be executed as root on the UNICOS system:

```
# /bin/rm -f /dev/ddd/*
# /bin/exdf -i install/escripts | /bin/sh
# /scripts/dddcreate
```

The /scripts/dddcreate script uses the /etc/config/param file by default. Another configuration file can be specified with the -f option. For example:

```
# /scripts/dddcreate -f paramfilename
```

6.2.4 The tape configuration file does not recognize certain, valid devices that are supported. In /etc/config/tapeconfig, the following DEVICE statement types may not be specified on J90's: "3490" and "3490E". To work around this problem, specify "3480" or "4781".

The associated SPR is 93635.

6.2.5 For machines that have non-sequentially numbered cpus, the cpu-device nodes need to be manually recreated via the MAKE.DEV script. This procedure should be run before entering multi-user mode after an initial or upgrade installation. The cpu argument to the /dev/MAKE.DEV script needs to specify the highest-numbered cpu, rather than the actual number of cpus in the system. For example, if the system has four cpus and the cpu numbers are 0, 1, 2, and 5, you should use 5 (five) as an argument to the /dev/MAKE.DEV script rather than 4 (four), (e.g. MAKE.DEV cpu 5).

Please note the install tool (ICMS) will optionally create the cpu-device nodes if you *activate* the kernel configuration. If you have a machine with non-sequentially numbered cpus, it is recommended that you manually run MAKE.DEV later to properly create the /dev/cpu nodes.

6.2.6 Exabyte Variable Blocking

There is a variable blocking problem with Exabyte tapes that affect CRAY J90 character special devices (via /dev/device) and IOS access to all forms of Exabyte drives. This problem does NOT affect access via the tape daemon or tape daemon character special devices (/dev/tape/device).

The associated SPRS are:

82392 - TAPES WRITTEN WITH TAPE SUB-SYS. COMMANDS CAN'T BE READ BY ELS DEVICES
89119 - IOS PANIC AFTER UNICOS GAVE SET_FIXED: SLEEP ON CTLR 0 SID 2 LUN 0: TIMEOUT

- **The Problem**

  Prior to the J90 UNICOS 8.0.4 release, Exabyte tapes (rseXXX) written via the IOS or the /dev/device for character special access, (referenced as "DDAL"), used a fixed block length of 2048 bytes. This implies each block was broken into 2K chunks when written to the tape. But Exabyte tapes written via the tape daemon or tape daemon character special (/dev/tape/device) used variable blocking. This created the incompatibility referenced in SPR 82392. The design/implementation which switched back and forth between fixed and variable block length modes caused the panic referenced in SPR 89119.

- **The Solution**

  Starting with the J90 UNICOS 8.0.4B release, all SCSI tape devices shall use variable blocking for all forms of access: IOS, DDAL, Tape Daemon, and Tape Daemon Character Special (with the notable exception of QIC devices which have always used a 512 byte fixed length block size for all forms of access). Please be aware that the DDAL interface breaks requests down into 32K bytes maximum. So a block greater than 32K will become multiple blocks on the tape. Additionally, the DDAL interface can only read tapes written with blocks 32K or smaller (Previously this limit was 2K or smaller).

- **Customer Impact (previously written Exabyte tapes)**

  Any Exabyte tape that was written previously via DDAL or the IOS will still be readable as long as the input program reads until EOF (such as the cp or dd commands) rather than aborting when the number of bytes read is less than requested.

  For applications such as the tar command, where the size of the first block is important, a call to the dd command is required. This dd command should specify an input block size of 2048 and output block size equivalent to how the tape was originally intended to be written.

- **Customer Impact (newly generated Exabyte tapes)**

  Any Exabyte tapes created on J90 UNICOS 8.0.4B or later via DDAL or the IOS will not be readable via DDAL or the IOS on releases previous to J90 UNICOS 8.0.4B or on a CRAY YMP/EL.

- **Migration Period (DDAL to Tape Daemon Character Special)**

  Until UNICOS 9.2, there will be two IOS ioctl's available via the mt command (setblklen, getblklen) to set and retrieve block length. These commands are not recommended for normal operations, but can be used when required (assuming only DDAL access is necessary).

6.2.7 Interphase ATM Devices

If you have Interphase ATM cards, in the IOS /config file, you will need to replace the **/dev/atmi** driver with the **/dev/atmv** driver.

6.2.8 Message Catalogs

The message catalogs are not available in single-user mode in J90 UNICOS 9.0. If you need access to them, you must first mount the /usr file system.

6.2.9 The following diagnostic problems are noted below:

The J90 boundary scan test (jbs) uses a configuration file to determine what modules are present in the system and the boundary scan revision for each module. Please note the configuration file is not present the first time the test is executed after software installation. If this configuration file is not present, or has been corrupted, the test displays the following message:

```
JBS ERROR - syscfg.c (407)
     Unable to open configuration file for read.
     File: /sys/config.jbs
     New board configuration settings will be used and
     saved.  Run jbs with "-menu" option to reconfigure
     boards to be tested.
```

After displaying this message, the jbs test generates a new configuration file and tests the hardware according to this new configuration.

There is no way for the jbs application to determine the revision of the memory and processor modules in the system, so this initial configuration file will default all modules to revision A. The user must verify that this is correct for their system. This can be done by verifying the information displayed to the user when the jbs application is run. For example, when jbs is run, the following information will be displayed :

```
JBS Configuration: system=bp8x8
     The following boards are selected for test:
          PROC0 rev A
          PROC1 rev A
          PROC2 rev A
```

Every J90 module contains a label with the boundary scan revision (BSN=A or BSN=B). Verify that this label matches the information displayed. If the modules revisions are not correct, update them by running 'jbs -menu'.

If the system is powered down, and a module with a different revision is added to the system, jbs will fail when run from frstload due to the fact that the module revision number will be incorrect in the jbs configuration files. The user will need to run jbs with the -menu option to reconfigure the board revisions.

If the user is going to add a module with a new revision to the system, then they should run 'jbs -menu' and reconfigure before powering down the system. After reconfiguring, the user can exit jbs, power down the machine and swap modules. After swapping modules, frstload should pass because the new configuration is already saved.

6.2.10 Load Binaries on 8032J or 8032K Upgrades

If you are performing an upgrade from J90 UNICOS 8.0.3.2 J or 8.0.3.2K, running the *Load Binaries* step in the *Upgrade Installation* window will cause the IOS to reset to the BOOT prom causing a running UNICOS system to crash. To avoid this problem, follow these procedures to manually load the install binaries instead of running the *Load Binaries* button on the *Upgrade Installation* window:

- Exit the *J90 Install Utility*

- Insert the *J90 UNICOS 9.0.2* release tape

- Open an *xterm* window by holding the right button in the OpenWindows root window and log into the J90 Console.

    # rlogin snxxx-ios0   (replace xxx with your J90 serial number)

- Load in the `opt.tar` image from tape

    ```
    snxxx-ios0> cd /
    snxxx-ios0> mt -f rpd03 rewind
    snxxx-ios0> mt -f nrpd03 fsf 1
    snxxx-ios0> tar -xvf nrpd03
    ```

- Release the console

    ```
    snxxxx-ios0> ~.
    ```

- Login as `root` on a SPARCstation OpenWindows window

    ```
    % su
    ```

- Load in the opt.tar file from disk

    ```
    # cd /
    # tar -xvf /opt/ios/xxxx/opt.tar
    # rm /opt/ios/xxxx/opt.tar
    # exit
    ```

- Invoke the *J90 Install Utility* via the OpenWindows root menu

- If you wish to run with scalar cache On, you must run the *Mainframe Hardware Setup* procedure in the *Initial Software Installation* menu. This will rebuild the hardware configuration files that turn on scalar cache by default.

- Exit the *Initial Software Installation* window and re-enter the *Software Upgrade* window.

Upon completing this step, proceed to the Upgrade Installation subsection.

6.3 Problems with Related Products

6.3.1 Installation/Configuration Menu System (ICMS)

• When selecting the media types for loading asynchronous products in the *Define Load Device* menu, choose the value **J90_EL**.

```
UNICOS 9.0 Installation / Configuration Menu System
    Release Media Management ==>
        Define Load Device
            Media Type                J90_EL
```

Set the *Remote Cartridge (J90_EL)* device name selection item to be **/dev/tape/rpd03** (or the name selected in the tape daemon configuration file), to use the tape daemon character special device.

• If you wish to run the Installation/Configuration Menu System (ICMS), but have never run it before at your site, **you must first import all parameters** by invoking the following ICMS menus as follows:

```
Utilities ==>
    Import utility ==>
        Import class to run        ALL
        Run the import process ...
```

• During Import All (Utilities Menu), you may see the following errors which should be ignored:

```
== [SECURITY] Importing Spnet.conf
+ spnet.sh -i 9.0 //etc/config/spnet.conf cfdb
Can't find //etc/config/spnet.conf
```

• Upon returning from the import process, you may see the following errors which should be ignored:

```
inmenu Selection value "2" specified by tag field SHMSEG in menu utsshare
for product uts is invalid in the new selection list [0 ].
Selection reset to the first value specified in the new selection list
which is the default.

inmenu Selection value "16" specified by tag field npmaxppd in menu hidden
for product uts is invalid in the new selection list [0 ].
Selection reset to the first value specified in the new selection list
which is the default.

inmenu Selection value "250" specified by tag field NLDMAP in menu hidden
for product uts is invalid in the new selection list [1 ].
Selection reset to the first value specified in the new selection list
which is the default.

inmenu Selection value "250" specified by tag field NMNT in menu hidden
for product uts is invalid in the new selection list [1 ].
Selection reset to the first value specified in the new selection list
which is the default.  (EOF):
```

6.3.2   Applications using Craylibs.

If applications are ported from YMP or YMP/EL series machines, they need to be relinked with Craylibs 1.2.0.3 in order to avoid bidirectional memory errors on the J90.

6.3.3   CRAY Reel Librarian.

There is a problem installing Cray REEL/Librarian on CRAY J90 systems with multi-level security (MLS) feature enabled. In the Cray/REELlibrarian (CRL) Administrator's Guide, publication SG-2127, replace the MLS procedures in Section 3.8 (*Rebuilding spset, spget, and spclr*), with the following:

> On CRAY J90 systems with the multi-level security (MLS) feature enabled, perform the following commands to rebuild and reinstall spset, spget, and spclr:

```
# cd /usr/src/cmd/sp
# nmake  spset  spclr
# cpset  spset  /bin/.  755  bin  bin
# cpset  spclr  /bin/.  755  bin  bin
# rm /bin/spget
# ln /bin/spset  /bin/spget
```

The associated SPR is 76173.

Also please note, that Software Field Notice #1104 recommends those sites that use CRL should upgrade to the CRL 2.0.6 version in conjunction with their UNICOS 8.0.2.2 upgrade and beyond. If you do not upgrade beyond CRL 2.0.5, the UNICOS tape subsystem will be unable to communicate with CRL via the Remote Procedure Call (RPC) protocol interface and SIGABRT (signal 6) TM053 messages will be written to the tape.msg file.

6.3.4   STK Autoloaders

Prior to installing Unicos 9.0, make sure that StorageTek product ACSLS level R5.00 has been installed in your autoloader environment.

The tape daemon source code for the UNICOS 9.0 release was upgraded to work with StorageTek ACSLS R5.00. This StorageTek product is installed on a Sun platform and communicates through TCP/IP with any Cray mainframe to mount and dismount magnetic tapes in an STK4400 tape silo.

If the StorageTek product ACSLS of a level prior to R5.00 is installed with UNICOS 9.0, the connection between the Cray mainframe and the Sun platform that controls the STK4400 silo cannot be established, and the STK4400 autoloader is not usable.

For more information, refer to Software Field Notice #1173.

6.4 J90 SPRs Fixed

6.4.1 SPRs closed in the J90 UNICOS 9.0.2 release filed against J90/EL machines:

ATM
URGENT   94521   NFS JOBS HANG AFTER THE SERVER RECOVERS FROM A REBOOT

DF
MINOR   93494   DF INFO ON /PROC INACCURATE

FILESYSTEMS
CRITICAL   96095   PANIC: ASSERT: FIO.C: 71:(FP->F_COUNT > 0)
CRITICAL   96321   PHASEII FORMED I/O FIX FOR UNICOS/MAX

FTA
URGENT   100444   FTUA GET (IBMBLOCK MODE) FAILING IN FFCLOSE

HDD
URGENT   96396   PANIC : MEMUNLOCK OF UNLOCKED SEMAPHORE

HIPPI
CRITICAL   101031   HIPPIPROBE() BROKEN IN 9.0

INSTALL
URGENT   96313   J90'S AND ELS BUILD WITH THE WRONG TARGET, OR NO TARGET AT ALL
URGENT   96943   INSTALL TOOL DOESN'T INSTALL LIBRARIES OR INCLUDE FILES
MAJOR   100418   IMPORT OF DEVICE NODES SOMETIMES YIELDS INCORRECT RESULTS
DES-HI   96639   INCSLCVT SCRIPT ERRORS ON DD_U DURING 8.0.4.1 INSTALL

LIBC
URGENT   98600   C++ CODE GIVING INCORRECT RESULTS

MDDCP
CRITICAL   97322   MDDCP IS VERY SLOW BUT CAN BE IMPROVED
CRITICAL   100864   MDDCP TAKES ABOUT 16 HOURS TO COPY ONE DD6S DISK TO ANOTHER.
URGENT   98964   MDDCP(8) COMMAND IS EXTRAORDINARILY SLOW
MAJOR   96290   UNACCEPTABLE PERFORMANCE OF MDDCP COMMAND

NFS
MAJOR   95494   SETGID DOES NOT WORK ON NFS FILE SYSTEMS

NSCHEDV
DES-HI   96085   NSCHEDV.DAY SCRIPT CONTAINS DUPLICATE LINE

OLHPA
CRITICAL   98430   OLHPA DOES NOT REPORT CORRECT BANK ON J90 SYSTEMS
URGENT   96771   OLHPA OUTPUT NOT HELPFUL FOR J90 TAPE PROBLEMS
URGENT   99885   OLHPA DOESN'T PROVIDE USEFUL INFORMATION ON SOME TAPE ERRORS
MAJOR   99159   TAPE DRIVE BEING REPORETED INCORRECTLY BY OLHPA ON J90S

PUBS
DES-HI   101893   PLEASE ADD EL AND J90 DISK SPECS TO DISKSPEC(7) MAN PAGE

SAM
MAJOR   99623   CSAM COREDUMPS ON J932 WHEN RUNNING ON SCREEN WITH 52 OR MORE LINES

SCANIT
URGENT   93135   SEGLDR LOOPS WHEN TARGET IS CRAY-J90.
URGENT   97383   GET LDR-351 THIS PROGRAM IS NOT CACHE-SAFE WHEN LINKING CRAY-J90 APPLICATION
URGENT   97388   JT-4 JUMPTRACE: WARNING ERROR OCCURS WHEN USING F90 AND CF77
URGENT   97468   MASSAGER GENERATING BAD CODE

SEGLDR

DES-HI	100890	RELEASE YMP VERSION OF SEGLDR AS J90 CACHE SAFE FOR BETTER LINK TIMES.
DES-MED	100636	ADD AN OPTION TO SEGLDR TO MAKE SCALAR CACHE PROCESSING OPTIONAL

SENDMAIL

URGENT	100982	MAILQ AND NEWALIASES NOT INSTALLED CORRECTLY

SFS

CRITICAL	96392	PANIC: MEMUNLOCK OF UNLOCKED SEMAPHORE
CRITICAL	96433	PANIC: ASSERT: SMP-IPI3.C: 129:((Q->SQ_FLAGS & SMPQ_STARTED)...
URGENT	96492	PANIC: ASSERT: SFSIGET.C: 159:((NC1IP->NC1I_SFSMLS == 1)
URGENT	97477	H-SMP DEVICE CAN SEND RESPONSES BACK TO WRONG IFIELD
URGENT	97633	ASSERT: SMP-IPI3.C: 179:(Q->SQ_FLAGS & SMPQ_QUEUED)
MAJOR	100295	SFS SEMAPHORE COMMANDS FAIL DUE TO TIMING WINDOW

TAPES

CRITICAL	97094	TAPE DAEMON DIES WITH ORE EVERY DAY OR TWO
URGENT	96072	STILL : LDR VOLSERV DOWNED: (079) - DRIVE IN USE
URGENT	98244	TAPE DAEMON PASSES BAD INFORMATION TO USER EXITS
URGENT	98583	TAPE READS AND WRITES HANGS JUST AFTER TAPE MOUNT INTERMITTENTLY
MAJOR	99545	TAPE GETS LOST IN SILO TAPE DRIVE WHEN DRIVE IS DOWNED
MAJOR	99638	TPMNT FAILS WITH "INVALID DEVICE NAME" IF TPMNT ISSUED BEFORE DRIVE IS IDLE

TCP_USER_CMDS

MINOR	87417	RCP RETURNS AN UNHELPFUL ERROR MESSAGE WHEN FILE SYSTEM IS FULL

UNICOS

URGENT	99875	NO LOGIN POSSIBLE (UNICOS STILL RUNNING)

6.5 J90 Software Field Notices Fixed

The following fixed FNs were filed against J90/EL machines.

J90 UNICOS 9.0.2

1173	ACSLS R5.00 needed for the UNICOS 9.0 software
2025a	Users can become root by using the tape command tplist
2047	olhpa error reporting problem
2058	Multitasking accounting incomplete when NCPU greater than 24
2085	Improper Handling of User Uncorrectable Memory Errors
2118b	Problems accessing DAT drive from IOS
2122b	Potential Data Corruption Using UNICOS Tape Daemon
2125	Security Hole In KSHD
2126a	Tape Data Corruption when Upgrading CRAY J90 Series IOS
2127a	New fixes and performance improvements for SEGLDR/SCANIT
2137	Faulty crash(8) binary for J90 at UNICOS 8.0.4.2
2138	Missing X Window System libraries for J90 at UNICOS 8.0.4.2

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