Plexus Sys5 UNIX S/M1.4.2 Release Notice

98-40199.3 Ver A   September, 1986

IMPORTANT NOTICE

A problem exists in the Sys5 UNIX 1.4.2 software release that occasionally causes standalone drivers to detect an error when an attempt is made to access the last sector of a minor device. This problem is rare; you most likely will not see it, and not need to take any action.

You might experience a failure while using standalone **mkfs**. For example, if you are using the standalone **mkfs** command:

```
mkfs /dev/dsk/0s1 34000 7 660
```

an error might be detected within block 33999 when the minor device is 68000 sectors (34000 blocks). To work around this problem, change the cylinder size to one less than the previously specified value so that **mkfs** will not attempt to access the last block of the sector. For example, in the command described above change the cylinder size to 659.

This problem exists only in the standalone disk driver; it does not exist in the UNIX kernel. Execution of **mkfs** under UNIX functions correctly.

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98-40199.3 Ver A   September, 1986

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INTRODUCTION

This release, Plexus Sys5 UNIX[1] S/M1.4.2, is an implementation of the AT&T System V Version 2.0 operating system by Plexus Computers for the P/35, P/55, P/60, and P/75 computer systems. This document, which accompanies this release of *Sys5*, is a collection of information about *Sys5 Release S/M1.4.2*.

☞ NOTE ☜

- If you are simultaneously upgrading from *Sys3* to *Sys5* AND upgrading from the MC68000 to the MC68020, you must first satisfy the hardware requirements listed in the *68020 CPU Installation Manual* (part number 98-40184.1).

- If you have a previous version of *Sys5* already installed and are upgrading to the MC68020 CPU board, perform the hardware upgrade when instructed to do so in this document.

- Before beginning the upgrade of your system, make sure that your console terminal is set to 9600 baud.

- If you are upgrading from *Sys5 UNIX Release S/M1.4* to *Sys5 UNIX Release S/M1.4.2* ignore the first part of this release notice; go directly to Chapter 7, *Installation* and follow the instructions for installing the update.

Within this document, *System V* refers to the stock software provided by AT&T. *Sys5* and *Sys5 Revision S/M1.4.2* refer to Plexus' implementation of this software.

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1   UNIX is a trademark of AT&T Bell Laboratories. Inc.
2   MC68000 and MC68020 are trademarks of Motorola, Inc.

1.1 Purpose

This release notice describes the following:

- How to upgrade your system to *Sys5 Release S/M1.4.2*.

- How to reload *Sys5 Release S/M1.4.2*.

- How to perform other procedures needed to complete this *Sys5 Release S/M1.4.2* installation.

- Additional information about *Sys5 Release S/M1.4.2*.

- New features added to *Sys5 Release S/M1.4.2*.

Use this release notice as a supplement to the User's Manual and Installation Guide that was shipped with your Plexus system.

1.2 How To Use This Manual

If you have received a new Plexus P/35, P/55, P/60, or P/75 system, *Sys5 Release S/M1.4.2* was installed by Plexus at the factory. Keep this release notice as a reference.

As part of the software installation, a *System Format and Load* listing is generated and sent with your system. This listing is a hardcopy of the procedures that installed your software. SAVE THIS LIST; it contains information you might need if you experience a catastrophic system failure. Refer to your system User's Manual for start up and shut down procedures.

This document contains eight chapters:

- Chapter 1 is an introduction.

- Chapter 2 describes how to prepare your system to be upgraded.

- Chapter 3 lists the procedures to reload *Sys5* onto your system.

- Chapter 4 provides optional and additional procedures for your system.

- Chapter 5 gives additional general information.

- Chapter 6 describes new features of this release of *Sys5*.

- Chapter 7 provides instructions for installing this update.

- Chapter 8 provides instructions for relinking the system and rebooting the old system.

1.3 Conventions

This document observes the following conventions for consistency and accuracy of communication.

- *Sys5* and UNIX commands, utilities, programs, files, etc. are identified by boldface type (e.g., **getty**).

- Operator entry instructions are set off from the rest of the text and are in bold face. The RETURN key is to be pressed after each command line unless instructed otherwise.

- Numbers in parentheses after a command name -- such as **dnld**(1) -- indicate the section of the *Plexus Sys5 UNIX Reference Manual* where that command is documented.

1.4 Release Sys5 Overview

Plexus Sys5 UNIX S/M1.4.2 consists of:

- A release tape (one cartridge version, two cartridge version, or 9-track).

- This release document (part number 98-40183.2 Ver. A).

The 9-track and single cartridge release tape comprises 24 files (see Table 1-1 and Table 1-2).

TABLE 1-1. Description of Release Tape

File Number(s)	Position to Start	Bytes per Block	Format	Description
0-19	n/a	1024	binary	Standalone programs (see Table 1-2)*
20	20	10240	dump	Bootstrap minimum file system release for *Sys5*
21	21	5120	cpio	Files comprising the full release except /usr/man
22	22	5120	cpio	Files comprising /usr/man
23	23	5120	cpio	Scripts to backup files added to the root file system
24	24	5120	cpio	Updates to software

n/a = not applicable

File numbers 0 - 19 are for backup and emergency purposes in case the disk copies of the standalones become inaccessible and you need to run the standalone programs from a tape.

For the two-cartridge version, files 0 through 21 are on the first tape. The second tape lists files 0 through 23, however, only files 22, 23, and 24 contain information.

Table 1-2 lists the standalone files (file numbers 0-19) of the *Sys5* Release Tape in order.

TABLE 1-2. Standalone Files of the Sys5 Release Tape

File #	Programs	File #	Programs
0	help	1	dummy
2	unix	3	dformat
4	mkfs	5	restor
6	fsck	7	dd
8	fbackup	9	od
10	dconfig	11	dummy
12	fsdb	13	du
14	ls	15	cat
16	dummy	17	dummy
18	dummy	19	dummy

1.5 Plexus Software Support Policy

Plexus Computers offers two levels of software support for this product at an additional cost. The two software support plans available are the Software Subscription Service (SSS) and Comprehensive Software Support Service (CSS). Services provided under each plan are listed below. The Software Subscription Service provides:

- Automatic updates to software products.

- Procedure to report software problems.

- Software Product Support Newsletter.

In addition to the above three services, Comprehensive Software Support provides the following:

- Toll-free access to the Plexus Software Support Center.

- Access to the Plexus on-line software bug report/fix bulletin board.

- *Tips and Techniques* newsletter which periodically summarizes software problems, work-arounds, and fixes.

UPGRADING TO SYS5 S/M1.4.2

☞ CAUTION ☜

You must perform the procedures in this chapter before reloading *Sys5*.

Please read this chapter all the way through before reloading your system.

Upgrading to *Sys5 Release S/M1.4.2* should be relatively easy. The checklist below lists the steps that are required. Each step in this list is described at greater length in one of the subsections that follow.

1. _____ Run **fsck**.

2. _____ Make a full backup of ALL file systems.

3. _____ Save files from the root file system.

4. _____ Use **dconfig** to change the primary boot prompt name (if *Sys3*) and increase the size of the root file system to a minimum of 34000 blocks (44000 blocks if you intend to load the **man** pages in root).

5. _____ Install appropriate hardware.

☞ NOTE ☜

Plexus assumes no responsibility for modifications you may have made to the kernel or any object files delivered with *Sys5*. If you have changed these files, you are responsible for ensuring that your changes are transferred to the new system.

DO NOT use /etc/**dump**(1) from systems previous to *Sys3* 3.12, because large, sparse files will fail. Instead, use **cpio**(1).

2.1 Running fsck

Plexus Computers recommends that you run **fsck**. To do this, shut the system down and reboot single-user mode. Note that systems with auto boot enabled must have auto boot disabled in order to boot single-user mode. Use the procedure below to shutdown your system and unmount file systems. For additional information, see Chapter 2 of your User's Manual.

1. Log in as **root** on the system console.

2. At the prompt, enter:

    /etc/shutdown *n*

    Where *n* = the number of seconds until shutdown (default is 60 seconds).

3. The **shutdown** program sends a series of messages to all active terminals warning that the system will shut down in *n* seconds. All users except the system administrator should log off of the system. This program takes several minutes to execute. During this time the system administrator is prompted for yes or no responses.

4. When the console displays the following:

    ```
    Busy out (push down) the appropriate phone lines for
    the system.
    Do you want to continue (enter y or n).
    ```

    Hang up any modems and enter:

    y

    The system responds with the following:

    ```
    All currently running processes will now by killed.
    Wait for 'INIT SINGLE USER MODE' before halting.
    #
    INIT: New run level s
    INIT: SINGLE USER MODE
    #
    ```

5. At the # prompt, enter:

    sync; sync

6. Run **fsck** for each file system with the root file system being last. Enter:

    fsck

    Follow the directions given by the program. If you want **fsck** to check file systems other than the root file system, you must enter the file system as an argument for **fsck**, or enter the drive names in **/etc/checklist**. (See FSCK(1M) in the *Administrator's Reference Manual*.) When the prompt returns, **fsck** is done. If changes were made to any file system, run **fsck** again, or until it passes through without change. Refer to Chapter 6, *File System Checking*, in the *Plexus Sys5 UNIX Administrator's Guide*, or contact the Plexus Software Support Center for assistance if needed.

7. If auto boot does not need to be disabled, go to step 8. If auto boot needs to be disabled, refer to Chapter 4, *Auto Boot*.

8. Press RESET. The system will go through a self test. At the PROM prompt (:), press <**cr**> to load the kernel. When the operating system is booted, the system comes up single-user mode. You see the login prompt if auto boot is enabled. At the `Console Login:` prompt, log in as **root**. If auto boot is disabled, after loading the kernel you will see a prompt.

2.2 Backing Up All File Systems

☛ WARNING ☚

Installing this release tape destroys any customizing that you have done to your operating system.

The following back up procedures save your current operating system, as well as any customized files you might have.

1. All devices containing logical file systems need to be identified. Refer to **mount** commands in the **/etc/rc** file to see what is normally mounted. A command to do this is:

    grep mount /etc/rc

    Use the file system device name in the **dump** commands in step 2.

2. Make a complete (level 0) dump of ALL your file systems. If you have a release prior to 3.12 on *Sys3*, use **cpio** instead of **/etc/dump**. Note that files cannot easily be accessed singly from the dump tape. Although inconvenient, **restor** can retrieve individual files from the dump tape. An example of the command to run a dump of your file systems for *Sys5* looks like the following:

    /etc/dump 0uf /dev/*XXXX* /dev/dsk/?s?

    Where *XXXX* = **rpt/0m** for cartridge tape,
    and where *XXXX* = **rrm/0m** for 9-track tape.

An example of the command to run a dump of your file systems for *Sys3* follows:

    /etc/dump 0uf /dev/rmt0 /dev/dk?

If you have logical disks containing data bases on raw file systems, use the data base backup utility supplied with your database software, or **dd**.

☛ NOTE ☚
Load a new tape before each dump is taken or you will overwrite each previous dump.

2.3 Saving Files From the Root File System

The following procedure is designed to extract those files you added to your root file system and install them in your upgraded root file system. The procedure is designed to identify files added to a standard root file system so that:

- the system administrator can back up and restore only the files (s)he wishes to retain from the existing root file system.

- the new release can be loaded onto an empty file system to maximize the contiguous allocation of system files.

- the time necessary to reload user files on the root file system is minimized.

☞ NOTE ☜

This procedure will not identify all files which you, or other users, have changed, and which have the same name as a file provided on the standard release tape. If you have changed any standard files not listed below you must rename them before running the script.

The following files will be automatically included in a list to be backed up:

/usr/lib/uucp/L.sys	/usr/lib/uucp/USERFILE
/etc/passwd	/etc/group
/etc/ttytype	/.profile
/etc/checklist	/etc/cshprofile
/etc/ddate	

The script in step 4 will automatically retain a copy of the following files.

File Name	Retained As
/etc/profile	/etc/profile-old
/etc/rc	/etc/rc-old
/etc/inittab	/etc/inittab-old
/etc/motd	/etc/motd-old
/usr/lib/uucp/L-devices	/usr/lib/uucp/L-devices-old

If you have modified any files in the root file system other than those mentioned above, copy these modified files to **filename-old** before continuing (see step 6).

File number 23 on the release tape contains the files and scripts that will save files from the root file system. Make sure that you have at least 500 blocks available in your root file system (use the **df** command).

Use the following procedure to load and backup the root file system.

1. Insert the *Sys5* release tape into the drive.

   — If you have a *Plexus Sys5* cartridge tape system, enter:

      cd /
      /usr/plx/tape -f /dev/rpt/0mn srcheof 23
      cpio -iBvu < /dev/rpt/0m

   — If you have a *Plexus Sys5* 9-track tape system, enter:

      cd /
      /usr/plx/tape -f /dev/rrm/0mn srcheof 23
      cpio -iBvu < /dev/rrm/0m

2. Remove the *Sys5* release tape from the tape drive.

3. Insert the release tape used to load your root file system into the drive.

4. Execute only one of the following scripts, depending upon the level of your release tape:

Revision	Issue the command
Sys3 3.0+	/usr/plx/plx-ssc/keep.files.dk1 rmt0
Sys3 3.1+	/usr/plx/plx-ssc/keep.files.dk1 rmt0
Sys3 3.2+	/usr/plx/plx-ssc/keep.from.dk1 rmt0
Sys3 3.3+	/usr/plx/plx-ssc/keep.from.dk1 rmt0
Sys5 1.0+ cart	/usr/plx/plx-ssc/keep.from-dk1 rpt/0m
Sys5 1.0+ 9-track	/usr/plx/plx-ssc/keep.from-dk1 rrm/0m
Sys5 1.2+ cart	/usr/plx/plx-ssc/keep.from-dk1 rpt/0m
Sys5 1.2+ 9-track	/usr/plx/plx-ssc/keep.from-dk1 rrm/0m
Sys5 1.3+ cart	/usr/plx/plx-ssc/keep.from-dk1 rpt/0m
Sys5 1.3+ 9-track	/usr/plx/plx-ssc/keep.from-dk1 rrm/0m

    Where + includes any update level for the revision.

5. When the selected command executes, the system returns a status message or the word DONE. The status may be used to identify the reason for a tape problem. The word DONE indicates that the command completed and is continuing to run. If any errors are displayed, identify the reason for the errors, correct the errors, and execute the procedure again. The procedure will be completed when the shell returns the command prompt.

6. The file **/keep-tmp** is automatically created. It contains a list of files you have added to the root file system and files which are listed in the file **keep-files-dk1**. Review the file **/keep-tmp** and edit it to include or exclude any files which you wish to keep or discard. If files are added, their names must be in the same format as the other files listed in /keep-tmp.

7. Remove the old release tape from the drive.

8. Insert a tape and back up your files. For a *Plexus Sys5* cartridge tape system, enter:

    cat /keep-tmp | cpio -ovB > /dev/rpt/0m

    If you have a *Plexus Sys5* 9-track tape system, enter:

    cat /keep-tmp | cpio -ovB > /dev/rrm/0m

    If you have a *Plexus Sys3* system, enter:

    cat /keep-tmp | cpio -ovB > /dev/rmt0

9. Note the number of blocks written to tape so that you know how much disk space the files require. (**cpio** reports blocks in 512-byte blocks.)

10. Verify that the tape can be read successfully and that the files you want to back up are on the tape by listing the tape's contents. For a *Plexus Sys5* cartridge tape system, enter:

    cpio -itvB < /dev/rpt/0m

    If you have a *Plexus Sys5* 9-track tape system, enter:

    cpio -itvB < /dev/rrm/0m

    If you have a *Plexus Sys3* system, enter:

    cpio -itvB < /dev/rmt0

11. Remove the tape from the drive and write protect it. It will be used to restore files after the new software release is loaded into the root file system.

2.4 Using dconfig

If you are upgrading from *Sys3*, you need to change the primary boot name to **/unix**. Follow steps 1, 2 and 4. If your root file system contains less than 34,000 blocks (444,000 blocks if you plan to load the **man** pages in the root file system), you must increase the size of your root file system. Follow steps 1, 3 and 4. If you need to change the primary boot name **and** increase the size of the root file system follow all the steps below. If you have *Sys5* **and** your root file system is large enough, proceed to Section 2.5.

1. To load **dconfig** at the # prompt, enter:

    /etc/dconfig

    At the `Disk?` prompt, enter:

    /dev/dk0

    At the `disk id?` `[xx]` prompt, enter:

    <cr>

2. Change the primary boot name. Press <**cr**> until the `Primary bootname?` prompt appears. Enter:

    /unix

3. Increase the size of the root file system. The following instructions assume that file systems 1 and 2 together occupy the first 100000 sectors on the disk. The instructions also assume that you will use the second file system as the swap area.

☞ NOTE ☜

These instructions are an example only and may not be appropriate for your system configuration.

If you have data or programs on file system 2 you will need to back it up. Use **tar** or **cpio**. The file system must be mounted in order to perform the backup. This backup will need to be restored at a later time.

☞ WARNING ☜

The backup must be performed before executing the following instructions.

You must use **tar** or **cpio** to back up any file system that will be reduced in size. If you are uncertain regarding the procedures or options for your specific system, call the Plexus Software Support Center.

Press <**cr**> until the following question appears:

    `Change the default unix device mapping?` `[y/n]`:

Enter:

    y.

Enter the **boldface** responses to the following questions:

```
Rootdev? [0x0]:    1
Pipedev? [0x0]:    1
Dumpdev? [0x0]:    2
Swapdev? [0x0]:    2
Swaplo? [0x0]:     0
Nswap? [?????]:    32000
```

Change the file system disk configuration? [y/n]: **y**

```
dsk/?s0    [  x,   y  ]:   0, ~
dsk/?s1    [  x,   y  ]:   0,68000
dsk/?s2    [  x,   y  ]:   68000,32000
dsk/?s3    [  x,   y  ]:   100000, ~
dsk/?s4    [  x,   y  ]:   140000, ~
dsk/?s5    [  x,   y  ]:   180000, ~
dsk/?s6    [  x,   y  ]:   220000, ~
dsk/?s7    [  x,   y  ]:   260000, ~
dsk/?s8    [  x,   y  ]:   300000, ~
dsk/?s9    [  x,   y  ]:   400000, ~
dsk/?s10   [  x,   y  ]:   500000, ~
dsk/?s11   [  x,   y  ]:   600000, ~
dsk/?s12   [  x,   y  ]:   700000, ~
dsk/?s13   [  x,   y  ]:   800000, ~
dsk/?s14   [  x,   y  ]:   900000, ~
dsk/?s15   [  x,   y  ]:   1000000, ~
```

Where *x* is sector start and *y* is sector count for each logical disk.

After restoring the root file system in Chapter 3, restore the backup tape of the former file system 2 into a file system that has sufficient space. It is important to determine which file system(s) you wish to remove or shrink in size so that all of your information is properly backed up and can be reloaded successfully.

4. To exit **dconfig** press <cr> until the following two questions appear:

    Is the above information correct [y/n]:

Enter:

    y

    Are you sure you want to rewrite block 0 [y/n]:

Enter:

    y

2.5 Installing Hardware

This hardware upgrade procedure must be completed before your new *Sys5* UNIX *S/M1.4.2* software is loaded. If you are upgrading from *Sys3* to *Sys5*, you must upgrade your hardware at this time. If you are upgrading to an MC68020 processor, see the 68020 CPU upgrade manual for assistance.

Please call the Plexus Software Support Center for help if you think you need a hardware upgrade.

Depending on your current level of hardware equipment, you might be required to install PROM's and/or new boards. This software update also requires that jumpers be changed on the Excelan board if your system is running NOS. Instructions for these jumper changes follow. For additional information, see the *NOS Installation Manual*.

2.5.1 Excelan Board Jumper Changes

1. Power down the system.

2. Remove the Excelan board.

3. Make the following jumper changes:

    a. Take the jumper off of J51 and put it on J50.

    b. Put a Berg-type jumper on J15.

    If these jumper changes are not made, the system will get Multibus timeout errors on the Excelan wakeup address (AA = COFF11).

4. Insert the Excelan board into the card cage making sure it is seated correctly.

5. Install the update that was loaded in steps 4 and 5. See Section 7, steps 4 and 5.

6. See Chapter 3, *Reloading Sys5*, for instructions on how to install *Sys5* on your root file system.

This chapter describes how to reload *Sys5*. Follow these procedures only if:

• your system is being upgraded (see Chapter 2 first)

• your system has a new primary disk and system software must all be reloaded

• your system has experienced a major failure such that the system software is lost and you do not have a dump backup of your operating system.

This checklist lists the procedure to reload *Sys5*. Each step in this checklist is described in a separate subsection below.

1. _____ Run **mkfs**.

2. _____ Install the full release.

3. _____ Install the update as described in Chapter 7.

3.1 Running mkfs

Follow these directions before you load the system software onto a new disk.

☛ WARNING ☚

---

mkfs destroys the data on the designated file system!

---

1. Turn on system power or press the RESET button.

2. Wait for the following message:

        PLEXUS SELFTEST REV X.X COMPLETE

   The system informs you about the disk and tape driver names in use on your system, the various boards, and the memory size. Then the following boot message appears followed by the PROM prompt (:):

        PLEXUS PRIMARY BOOT REV X.X
        :

☞ NOTE ☜

The disks have been formatted at the factory. In the event of a major catastrophe, you will need to reformat the disks. See your User's Manual for instructions.

---

3. Insert the release tape into the drive.

4. Make a file system on the disk with the standalone program **mkfs**. The file system size is given in 1024-byte blocks.

   - At the PROM prompt (:), enter:

     mkfs

   - The system returns the following:

     $$ mkfs

   - Respond with the following:

     /dev/dsk/0s1 *34000 m n*

     Where *34000* = file system size in blocks,
     where *m* = interlace factor,
     and where *n* = blocks per cylinder (see Tables 3-1 and 3-2).

5. When **mkfs** is finished, the system returns the following:

     Exit O

   and returns you to the PROM prompt.

TABLE 3-1. Interlace Factor for the IMSP Controller Board

Controller Board	Interlace Factor	Blocks/Cylinder
IMSP	1	500
EMSP	see Table 3-1	see Table 3-2

TABLE 3-2. Interlace Factors for the EMSP Controller Board

Drive Type	Interlace Factor	Blocks/Cylinder
Fujitsu 71Mb (8-inch)	7	112
NEC 142Mb (8-inch)	7	128
NEC 443Mb (9-inch)	7	551
Fujitsu 586Mb (10.5-inch)	7	660
Fujitsu 72Mb (14-inch)	7	82.5
Fujitsu 145Mb (14-inch)	7	165
Fujitsu 285Mb (14-inch)	7	264
Fujitsu 570Mb (14-inch)	12	528

IMPORTANT NOTICE

A problem exists in the Sys5 UNIX 1.4.2 software release that causes standalone drivers to detect an error when an attempt is made to access the last sector of a minor device.

For example, if you are using the standalone **mkfs** command:

```
mkfs /dev/dsk/0s1 34000 7 660
```

an error might be detected within block 33999 when the minor device is 68000 sectors (34000 blocks). To work around this problem, change the cylinder size to one less than the previously specified value so that **mkfs** will not attempt to access the last block of the sector. For example, in the command described above change the cylinder size to 659.

3.2 Installing the Release Tape

☞ NOTE ☜

To abort the following process at any time, press the RESET button.

---

1. Restore the bootstrap and minimum file system onto the disk, using the standalone program **restor** from the Release Tape. The files loaded are listed below and are the minimum files necessary to boot **/unix**.

/bin	/bin/cat
/bin/cpio	/bin/date
/bin/dd	/bin/du
/bin/echo	/bin/ed
/bin/env	/bin/login
/bin/ls	/bin/mkdir
/bin/mv	/bin/od
/bin/ps	/bin/pwd
/bin/rm	/bin/rmdir
/bin/sh	/bin/stty
/bin/su	/bin/sum
/bin/sync	/bin/uname
/dev	/dev/console
/dev/dsk	/dev/dsk/0s0
/dev/dsk/0s1	/dev/dsk/0s2
/dev/error	/dev/kmem
/dev/mem	/dev/rdsk
/dev/rdsk/0s0	/dev/rdsk/0s1
/dev/rdsk/0s2	/dev/rfp
/dev/rfp/0s0	/dev/rmt
/dev/rpt	/dev/rpt/0m
/dev/rpt/0mn	/dev/rrm
/dev/rrm/0hm	/dev/rrm/0hmn
/dev/rrm/0m	/dev/rrm/0mn
/dev/swap	/dev/syscon
/dev/systty	/dev/tty
/etc	/etc/crash
/etc/fsck	/etc/fsdb
/etc/getty	/etc/grpck
/etc/init	/etc/inittab
/etc/mirutil	/etc/mkfs
/etc/mknod	/etc/mount
/etc/passwd	/etc/rc
/etc/restor	/etc/umount
/etc/termcap	/tmp
/unix	/usr
/usr/bin	/usr/bin/tar
/usr/bin/vi	/usr/plx
/usr/plx/mconv	/usr/plx/tape

2. At the PROM prompt (:) enter:

    restor

    The system returns:

    `$$ restor`

    For a *Sys5* cartridge tape system enter:

    rf /dev/rpt/0m /dev/dsk/0s1 +20

    For a *Sys5* 9-track tape system enter:

    rf /dev/rrm/0m /dev/dsk/0s1 +20

    The system returns:

    `Spacing forward 20 files on tape`

    The final response from the **restor** program before it commences to restore the file system is:

    `Last chance before scribbling on /dev/dsk/0s1.`

    Respond with a <**cr**> when you are ready to begin the **restor**.

☞ NOTE ☜

The **restor** is not done. Do not remove the tape or reset the machine until you see the message `Exit 0`.

---

3. At the PROM prompt (:), press <**cr**> to boot /**unix**.

3.2.1 Startup and Installation

1. You now need to install the rest of your operating system by loading the following files from the release tape:

    *   file number 21 (the full file system)

    *   file number 24 (update files to be added to the root file system)

2. For a *Sys5* cartridge tape system, enter:

    /usr/plx/tape -f /dev/rpt/0mn srcheof 21

    For a *Sys5* 9-track tape system, enter:

    /usr/plx/tape -f /dev/rrm/0mn srcheof 21

    The system returns a message.

3. For a *Sys5* cartridge tape, enter:

    cpio -idumvB < /dev/rpt/0m

    For *Sys5* 9-track tape, enter:

    cpio -idumvB < /dev/rrm/0m

    The system displays each file as it is loaded. This procedure will take about 20 minutes for a 9-track tape and more than an hour for a cartridge tape.

4. At the # prompt, enter:

   sync;sync

5. If you wish to load the **man** pages to your system, see the NOTE below and continue with the next step. If you do not wish to load the **man** pages, go to step 9.

☞ NOTE ☜

10Mb of disk space is required to load the **/usr/man** pages. If you intend to load the **man** pages into the root file system, the root file system should have 32Mb. If you have a two cartridge release, file 22 is on the second tape. Be sure that the correct cartridge is loaded.

---

6. If you have a 20Mb *Sys5* cartridge tape system insert the second volume. For both 20Mb and 45Mb cartridge systems, enter:

   cd /usr/man
   /usr/plx/tape -f /dev/rpt/0mn srcheof 22

   If you have a *Sys5* 9-track tape system, enter:

   cd /usr/man
   /usr/plx/tape -f /dev/rrm/0mn srcheof 22

   The system returns a message indicating it is finished.

7. If you have a *Sys5* cartridge tape system, enter:

   cpio -idumvB < /dev/rpt/0m

   If you have a *Sys5* 9-track tape system, enter:

   cpio -idumvB < /dev/rrm/0m

   The system displays each file as it is loaded. This procedure takes about 20 minutes for a 9-track tape, and more than an hour for a cartridge tape.

8. At the # prompt, enter:

   sync; sync

9. Install the files currently in use (**/bin/sh, bin/cpio,** and **/etc/init**). Run the shell procedure **/tmp/release/fixup**. Enter:

   /tmp/release/fixup
   <CTRL d> (press the *CTRL* and the *d* keys simultaneously)
   sync; sync

10. Reboot according to the instructions in your User's Manual. After the system returns to the single-user state, enter:

    rm -rf /tmp/release
    sync

11. Perform update installation as described in Chapter 7, section 7.3.2, *Installation.*

12. Proceed to Chapter 4 to perform site-dependent operations which allow you to enter **init** state 2 (multi-user mode).

Chapter 4

OTHER PROCEDURES

This chapter describes site-dependent and other procedures that might be needed to complete the installation of *Sys5 S/M1.4.2*. The checklist below is a step-by-step procedure to follow in this chapter. See your User's Manual for other procedures (shutdown, adding line printers, etc.).

1. _____ Reload user installed files saved from root.

2. _____ Modify /etc/inittab.

3. _____ Enter init s.

4. _____ Modifying /etc/rc.

5. _____ Using /dev/swap.

6. _____ File Systems Created Prior to Sys5.2 Version 1.4.

4.1 Reloading User Installed Files Saved From Root

1. Using the **cpio** tape made in Chapter 2, reload all user files which were previously on the root file system. Make sure you have enough file space (34Mb) before reloading the files. For *Sys5* cartridge tape, enter:

> **cd /**
> **cpio -idumB** </dev/rpt/0m

For *Sys5* 9-track tape, enter:

> **cd /**
> **cpio -idumB** </dev/rrm/0m

The system displays each file as it loads. This procedure will take about 20 minutes for 9-track tapes, and more than hour for cartridge tapes.

2. At the # prompt, enter:

> **sync; sync**

3. Referring to your old files, update the files that are provided with this release to incorporate additions that you have made. These files can not be used in their original format in most cases because file contents have changed or file formats have changed. The files you must update are:

> /etc/profile-old
> /etc/rc-old
> /etc/inittab-old
> /etc/motd-old
> /usr/lib/uucp/L-devices-old

4. For *Sys5* and *Sys3*, edit the username **lp** line in **/etc/passwd**. Following is a sample entry:

lp::71:2:0000-lp(0000):/usr/spool/lp:

When all the files are installed, reboot the system (see your User's Manual). When booting the system, the normal response to the primary boot prompt is <**cr**> (which selects the default primary boot name).

4.2 Modifying /etc/inittab

If you are updating your system with this software release or adding an ACP, edit the **/etc/inittab** file for changes (see the *ACP Installation Manual* for additional information). If you are installing this release on a new system, go to Section 4.2.3, *Create /etc/inittab*. In all cases read the Sections *Special Instructions for 16 or 32 User Systems* and *Special Instructions for 8 or 24 User Systems*.

☞ CAUTION ☜

When updating with this software release, do not wipe out the installation information in your previous **/etc/inittab** file. Do not run **ttyconf**. Instead, using *vi* or *ed*, edit by hand your **/etc/inittab** file and add the appropriate information for this release to your **/etc/inittab** file.

4.2.1 Special Instructions for 16 or 32 User Systems

Plexus has disabled the highest port number as a default (port 31 for a 32-user system). If you want to disable a different login port, choose the port to be disabled and change its line in the **/etc/inittab** file. To do this, substitute the word **off** for the word **respawn** in the third field.

For example, to disable logins on tty7, the following line:

```
07:2:respawn:/etc/getty /dev/tty7 9600
```

would be changed as follows:

```
07:2:off:/etc/getty /dev/tty7 9600
```

To re-enable logins, change the **off** back to **respawn**.

This change takes effect when you enter **init** state 2 from **init** state s (usually after rebooting) or when **init** is asked to re-examine the **/etc/inittab** by the command **telinit q**.

4.2.2 Special Instructions for 8 or 24 User Systems

Plexus Computers delivers 16-, 32-, or 64-user release tapes. If you have an 8- or 24-user system, you need to modify the file **/etc/inittab**. If you have an 8-user system, **inittab** will contain lines that execute continuous gettys for ports 8-15, (for 24-user systems, ports 24-31); these gettys are unnecessary. The modification to **inittab** suggested here decreases CPU load associated with these gettys. It also helps limit the growth of the file **/usr/adm/wtmp**.

For each unused line in **/etc/inittab** (**ttys** 8-15 for an 8-user system, and **ttys** 24-31 for a 24-user system) change the third field from **respawn** to **off**. See the example in Section 4.2.1 (preceding).

☞ NOTE ☜

Any port not having a login associated with it should have an **off** in the third field above.

4.2.3 Create /etc/inittab

If you are installing this release on a new system, you must create a real **/etc/inittab** file. This can be done with **/etc/ttyconf** which zeroes out the current **/etc/inittab** and then moves in **/etc/inittab.mstr** to replace it. **ttyconf** then generates the appropriate number of entries based on the number of ICP's and ACP's specified. An abbreviated version is provided to allow booting into single-user state. In the instructions that follow, all arguments must be specified. Use 0 (zero) as an argument place holder.

1. To move the current **/etc/inittab** to a temporary file, enter:

    cp /etc/inittab /etc/inittab.good

2. To enter the appropriate number of ICPs, ACPs, and baud rates, and to create the physical devices for the **inittab** file, type:

    ttyconf *(#ICPs) (#ACPs) (icpbaud) (acpbaud)*

3. To return your previous version of the **/etc/inittab.good** file, enter:

    mv /etc/inittab.good /etc/inittab

For *Sys3* to *Sys5* upgrades, step 3 does not apply. You must manually edit your **/etc/inittab** file.

ttyconf also created the physical devices in the **/dev** directory according to the parameters specified. These devices include the following:

    ic[0-4] ac[0-4] pp[0-4] tty[0-n]

Where *n* is the total number of serial ports, minus one.

The following is an example of the **ttyconf** command for zero ICPs and two ACPs:

    ttyconf 0 2 0 9600

4.2.4 Create /dev Entries

If loading a new system, ensure that you have created **/etc/inittab** (see the previous subsection).

If updating, save the previous device definitions for the following:

    ic[0-4]   pp[0-4]   tty[0-n]

You can use **mknod** to create these if you choose not to use **ttyconf**. The format is:

mknod <devname> c <major> <minor>

Major numbers are as follows:

    ICP = 14
    ICP ttys = 15
    ICP pps = 16

    ACP = 30
    ACP ttys = 31
    ACP pps 32

Minor numbers are the index numbers of the devices.

For example, if you have one ICP and wish to create **ic0**, enter:

mknod /dev/ic0 c 14 0

To create 8 **ttys**, 0 - 7, enter:

mknod /dev/tty0 c 15 0

    .

    .

    .

mknod /dev/tty7 c 15 7

To create a device for the parallel port, enter:

mknod /dev/pp0 c 16 0

4.3 Entering init s

If you are logged in as root on any terminal, you can enter the single user environment with the command **init s**. When this level change is effected, the virtual system teletype, **/dev/syscon**, is changed to the terminal from which the command was executed. This allows the administrator single-user power from a terminal other than the console.

☞ NOTE ☜

If you enter the single-user environment on an ICP port, the console will be reset to the real console the next time the system is rebooted.

4.4 Modifying /etc/rc

To modify your **/etc/rc** file, edit the icp/acp download section of the file. The maximum configuration is 5 ICP/ACPs total. ICP/ACP numbering is 0 through 4. For example:

Example 1: 1 ICP and 2 ACPs

```
/etc/dnld -d -f /usr/lib/dnld/icp -o /dev/ic0 -a 4000
/etc/dnld -L -da 1 2 -f /usr/lib/dnld/acp -a 2000
#comment: 1 is starting ACP # and 2 is # of ACPs
```

Example 2: 3 ICPs and 1 ACP

```
/etc/dnld -d -f /usr/lib/dnld/icp -o /dev/ic0 -a 4000
/etc/dnld -d -f /usr/lib/dnld/icp -o /dev/ic1 -a 4000
/etc/dnld -d -f /usr/lib/dnld/icp -o /dev/ic2 -a 4000
/etc/dnld -L -da 3 1 -f /usr/lib/dnld/acp -a 2000
#comment: 3 is starting ACP # and 1 is # of ACPs
```

Example 3: 0 ICPs and 4 ACPs

```
/etc/dnld -L -da 0 4 -f /usr/lib/dnld/acp -a 2000
#comment: 0 is starting ACP # and 4 is # of ACPs
```

Example 4: 2 ICPs and 0 ACPs

```
/etc/dnld -d -f /usr/lib/dnld/icp -o /dev/ic0 -a 4000
/etc/dnld -d -f /usr/lib/dnld/icp -o /dev/ic1 -a 4000
```

Commands to initiate **lp** spooling must be moved to the bottom of the **/etc/rc** command file to ensure that ICP's and ACP's are operational before output is sent to them.

Move the following lines to precede the last double semicolons:

```
rm -f /usr/spool/lp/SCHEDLOCK
/usr/lib/lpsched
echo "LP scheduler started"
```

4.5 Using /dev/swap

/dev/swap must agree with the logical device number on which you place the swap space. The default logical device file is **/dev/dsk/0s2**. Ensure that **/dev/swap** agrees with the factory default. If **/dev/swap** does not agree with the factory default, at the # prompt enter:

> **rm /dev/swap**
> **mknod /dev/swap b 0 2**

/dev/swap will point to the same physical disk location as **/dev/dsk/0s2**.

If you do not use the factory default for swap space, but use another logical device such as **/dev/dsk/0s5**, at the # prompt enter:

> **mknod /dev/swap b 0 5** (for /dev/dsk/0s5)

4.6 File Systems Created Prior to Sys5.2 Version 1.4

If you have programs that execute the **ncheck** and **clri** commands, you must run **fsdb** for every file system created with **mkfs** prior to *Sys5.2 version 1.4*. There was a bug in **mkfs** which set a variable in the file system super block to indicate the number of physical blocks per logical block on the disk inversely to the way **ncheck**, **clri**, and possibly other programs were written to interpret it. To correct file systems created with **mkfs** prior to *Sys5.2 Version 1.4*, run **fsdb** from the PROM prompt (:).

1. At the PROM prompt (:), enter:

    fsdb

    The system returns:

    `$$ fsdb`

2. Enter the file system. For *Sys5*, enter:

    /dev/dsk/Xsxx

    Where *X* is the major disk number,
    and where *xx* is the minor number (such as 0s1, 1s12, 2s10, etc.).

    The system returns:

    `FSIZE = 34000 ISIZE = xxxx`

3. Next, enter:

    02766 = *x*   (the leading 0 must be entered)

    Where *x* = **1** for disks blocked at 1024 bytes,
    and where *x* = **2** for disks blocked at 512 bytes.

    The system returns the following message:

    `002766:00000x (x)`

    Where *x* = **1** for disks blocked at 1024 bytes,
    and where *x* = **2** for disks blocked at 512 bytes.

4. Enter:

    q

    This returns you to the PROM prompt.

5. At the PROM prompt (:), press <**cr**> to boot **/unix**.

4.7 Miscellaneous Procedures

4.7.1 Booting UNIX From Tape

Sometimes, the operating system on the disk can become damaged in such a way that the system can not be booted from disk. A method to recover from this situation is to boot the system from the master tape that is included in this release. Follow this procedure:

1. Insert the release tape into the drive.

2. Depending upon which version of the PROM devices exist on your CPU board, at the PROM prompt (:), enter one of the following:

    unix

    or

    sys3

    This action loads the operating system.

After booting the system from tape it is possible to selectively **restor** the file system from your latest backup as described in your User's Manual.

4.7.2 Carrier Detect on ACP

The ACP will not allow port access when the port's carrier defect signal is low and the port's **clocal** characterisitc indicates that it is a modem port. To access ports having these characteristics you must do the following:

- Using **cu**, include the **-m** option.
- From a "C" program:

    1. Open the port with O_NDELAY set.
    2. Set **clocal** on with an **ioctl** call.
    3. Close the port.

Both of these techniques make the port a local port which will allow communication with the modem before an external connection is established.

4.7.3 Recording ICP and ACP Dumps

To record ICP and ACP dumps, see your User's Manual and the ACP Installation Manual.

Sys5 GENERAL INFORMATION

This chapter contains general information about *Plexus Sys5*.

5.1 Special Device Names

The following subsections lists the names of special devices. *Sys5* uses the following special devices:

/dev/dsk/[0s0-15s15] Disk, blocked I/O
/dev/rdsk/[0s0-15s15] Disk, character I/O

/dev/rmt/0m	Tape, unblocked I/O Magnetic media, unblocked I/O; cartridge or 9-track; this is created by the user using mknod
/dev/rmt/0mn	Magnetic media, unblocked, no rewind; cartridge or 9-track; mknod must be done in order to use this device
/dev/rpt/0m	Magnetic media, unblocked I/O, cartridge only
/dev/rpt/0mn	Magnetic media, unblocked I/O, no rewind; cartridge only
/dev/rrm/[0-3]m	Magnetic media, unblocked I/O; 9-track only
/dev/rrm/[0-3]mn	Magnetic media, unblocked, no rewind; 9-track only
/dev/rfp/0s0	Magnetic media, unblocked I/O; floppy only
/dev/tty[0-39]	Serial ports
/dev/lp	Line printer port
/dev/pp[0-4]	Parallel ports
/dev/console	System console
/dev/ic[0-4]	ICP download ports
/dev/swap	Swap device, used by ps(1) and a few other commands
/dev/mem	Memory
/dev/kmem	Kernel data space within memory
/dev/liomem	Special I/O ports on processor board
/dev/mbmem	System's bus memory address space
/dev/mbiomem	System's bus I/O address space
/dev/null	Bit bucket
/dev/error	Provides access to error records in the kernel
/dev/prf	Provides access to activity information in the kernel
/dev/vpm[0-4]	Provides a software construct for implementation link protocols on the ICP
/dev/modem	Provides access to optional built-in modem (P/75 only)
/dev/ccb	Provides access to common circuits board (P/75 only)
/dev/conslog	Provides access to the messages and errors reported to the console as kept in the kernel.

5.2 Sys5/Sys3 Device Names

Table 5-1 lists cross references between *Sys5* and *Sys3* device names. The format is:

```
device name (major/minor)
```

TABLE 5-1. Cross References Between Sys5 and Sys3

Sys5	Sys3
DISKS	DISKS
Block Devices	
/dev/dsk/0s0 (0/0)	/dev/dk0 (0/0)
/dev/dsk/0s1 (0/1)	/dev/dk1 (0/1)
/dev/dsk/1s0 (0/16)	/dev/dk16 (0/16)
/dev/dsk/2s0 (0/32)	/dev/dk32 (0/32)
Character Devices	
/dev/rdsk/0s0 (3/0)	/dev/rdk0 (3/0)
/dev/rdsk/1s0 (3/16)	/dev/rdk16 (3/16)
TAPES	TAPES
Generic	
user configured	/dev/rmt0 (4/0)
user configured	/dev/nrmt0 (4/4)
9 Track	
/dev/rrm/0m (8/0)	/dev/rrm0 (8/0)
/dev/rrm/0mn (8/4)	/dev/nrrm0 (8/4)
/dev/rrm/0hm (8/8)	/dev/nrrm0 (8/8)
/dev/rrm/0hmn (8/12)	/dev/nrrm0 (8/12)
Cartridge	
/dev/rpt/0m (6/0)	/dev/rpt0 (6/0)
/dev/rpt/0mn (6/4)	/dev/nrpt0 (6/4)

5.3 Some Modifications to System V

Sys5 has the following additions which are not part of *System V*.

/etc/dump	Copies to tape all files changed after a certain date in a given file system.
/etc/restor	Reads tapes dumped with the **/etc/dump** command.
/usr/plx/dumpdir	Lists contents of dump/restor tape.
/usr/plx/tape	Efficient tape manipulation program.
ms	Document preparation macros available in Version 7.
file locking	Allows a file to be locked. See **locking**(2).
date	The clock is battery powered. It must be reset only if the processor board or common circuits board is removed.
trmtab	Makes a new nroff/troff terminal or printer driver table.
/etc/sys	System control and monitoring program.

5.3.1 Not Provided - Not Applicable

The following list defines programs, libraries, and other software that are not provided because they are

- specific to non-Plexus hardware

- replaced by equivalent software.

The following associated manual pages are also not provided:

/bin/kas	/stand/boot2	/usr/lib/lib2A.a
/bin/kasb	/stand/iltd	/usr/lib/lib2B.a
/bin/kun	/stand/rf11boot	/usr/man/man1/kas.1
/bin/kunb	/stand/rk11boot	/usr/mdec
/etc/fscv	/stand/rl11boot	/usr/mdec/copy
/etc/stcntrl	/stand/rp03boot	/usr/mdec/dldr
/etc/stload	/stand/rp04boot	/usr/mdec/iltd
/etc/stproto	/stand/rs04boot	/usr/mdec/list
/etc/vlx	/unixhpht	/usr/mdec/mboot
/lib/as2	/unixhptm	/usr/mdec/rf11booti
/lib/c0	/unixrktm	/usr/mdec/rk11boot
/lib/c1	/unixrlht	/usr/mdec/rkf
/lib/fc0	/unixrltm	/usr/mdec/rp03boot
/lib/fc1	/unixrpht	/usr/mdec/rp04boot
/lib/fcrt0.o	/unixrptm	/usr/mdec/rs04boot
/lib/fmcrt0.o	/usr/bin/sdb	/usr/mdec/tapeboot
/stand/boot1	/usr/include/sys.s	/usr/mdec/tboot
sdb	all graphics programs	

5.3.2 Not Provided - No Source

The following commands are documented in System V but were omitted from the System V source distributed by AT&T to Plexus:

/bin/primes
/bin/vcat
/bin/vpr

5.4 Known Problems

Following are lists of known problems in Release S/M1.4 of the UNIX (*Sys5*) operating system:

- When running **dconfig** from standalone tape or disk, or using the kernel, if you answer yes to the following question, you must also enter a value for NSWAP.

      Change the default unix device mapping? [y/n] : **y**

      NSWAP [32000] : **32000**

  Failure to enter a value for NSWAP can set the NSWAP value written to block 0 to zero. A swap space size of zero can crash the system.

  In addition, if you press return (to retain the current value) NSWAP will be set to zero. You *must* reenter the current value. This has been fixed in this verison of 1.4.2. Note, however, that the standalone release tape version does have this problem.

- In using the mirrored disk utility **mirutil**, when two disks are first mirrored the message "disk idle" is displayed instead of the current status message while the disk copy is taking place. Subsequent status commands will display messages that correctly give the current status.

- The **lp** spooler sometimes loses print files and sometimes has one file step on the end of another. This can occur when running the spooler to a serial device on the ACP.

  The problem is that the ACP has increased buffering. This increased buffering causes the close operation to take longer than previously, since closes flush the output buffer. As a result, the open for the next print file can occur before the close has completed flushing the buffers. This will occur more frequently on slower baud rate peripherals, again because it takes longer to flush buffers to these slower devices.

  To work around this problem,in your spooler model file, add a **sleep** after the outputting of the printer file to the peripheral (typically a **cat** to standard out). For slower peripherals (1200 baud) a **sleep** 10 should guarantee no problem. On higher speed peripherals (9600 baud), a **sleep** of 5 or less should work.

- Modem support on ACP's is provided only on even numbered ports. Odd numbered ports do not recognize transitions in Carrier Detect. This is expected to be corrected soon.

5.4.1 Corrected Kernel Problems

- Incidences of inappropriate core dumps, as seen when entering **vi**, no longer occur.

- Implemented the xon/xoff protocol and high bit stripping in the console drivers. New PROM's will be coming out soon to allow this in standalone mode as well.

- All the assembler files needed to produce **locore.o** are now included in the releases.

- A modification to the memory driver has been made that prevents possible simultaneous accesses to the multibus.

- Improved interrupt handling in the serial interface driver.

5.4.2 Corrected Utility Problems

- **/usr/bin/cu** was not working with autodialers. A modification was made to **dial.o** in **/lib/libc.a** which allows **cu** to work. In addition, it now works properly when you specify both a speed and a line switch.

- A bug in **/usr/bin/tar** was fixed. The bug occasionally caused error messages indicating tape read errors at the end of tape. The bug was harmless, but alarming. In addition, the **tar** default file has been corrected from **/dev/rmt/0m** to **/dev/rrm/0m**.

- An enlarged version of the "C" compiler was made, called **bigcc**. Because this compiler uses lots of memory it should not be used unless necessary.

- Included a definition of **plexus** for use within the compiler, as was available with *Sys3*.

- Several modifications to **/etc/stty** were made. **Sane** now uses the same conventions as *Sys3*, i.e. **-parenb**, **-parodd** and **cs8**. The **flush** and **icts** directives are included, and you can now select 19200 baud using either **exta** or 19200.

- A *Sys3* version of the **curses** library, called **/usr/lib/libcurses3.a**, is included for people who need the compatibility.

- **Calendar** will now work if you are using the C Shell as it did when using the Bourne Shell.

- In **mkfs**, the default gap and interleave factors have been modified. For P/35s, P/55s, P/60s, and P/75s they are 1 and 500. However, these values are not correct for systems with EMSP controllers. A warning note displays to inform you when you use the EMSP controller, and you can delete out of the program and correct these values if necessary. See the *SysV UNIX Administrators Reference Manual* for a complete explanation of the use of this command.

- The true permissions will now be shown on mounted file systems, rather than the permission of the mount stub.

- The utility **popen** in **/lib/libc.a** has been corrected to handle circumstances properly when **popen** is run with either **stdin** or **stdout** closed.

- **/bin/ps** will now work correctly with the *n* flag, to specify a non-default kernel.

- A properly functioning **termcap** entry for the Wyse 75 has been added to both **/etc/termcap** and **/usr/lib/terminfo/w**.

- The standalone utility **dformat** for EMSP controllers has better error reporting. A bug which caused a second sector spared on a specific cylinder and head to be incorrect was fixed. **dformat** now works with multiple controllers.

- **/usr/plx/restor** now loads cartridge tapes.

- **/etc/errstop** refers to **/unix** rather than **/sys3**.

- **/etc/rc** contains a sleep value to allow forking processes to set up their signal trapping correctly.

- **/bin/su** invokes **sync** at the end to prevent file system corruption when going from state 2 to state s.

- **/usr/bin/tic** makes the terminfo files with the correct permissions. It will ignore unmask values.

- **/etc/ttyconf** now contains the correct parallel port major and minor device numbers.

5.4.3 Corrected Release Tape Problems

- The minimum file system has been increased to include such useful things as **rm, vi, tar**, etc., to help make installing a new operating system easier.

5.4.4 Corrected File Number 24 Problems

- File number 24 is an update file containing the elements necessary for installation of the bug fixes. See Chapter 7, *Installation*, for details.

5.4.5 Corrected ICP Kernel Problems

- The *Sys5* **termio** definition of the VMIN and VTIME parameter usage in raw **tty** mode were implemented incorrectly. *Sys5.2 Release S/M1.4* now includes the *Sys5* **termio** definition of these parameters in the ICP kernel. The following table lists the old and new definitions. Differences are shown in *italics*.

TABLE 5-2. VMIN and VTIME Definitions

Previous Definition	Current (New) Definition
VMIN > 0, VTIME > 0 — In this case, VTIME serves as an I/O call/intercharacter timer and activates as soon as a ready system call is processed. It is reset upon receipt of each character. A read is satisfied as soon as VMIN characters are received or the read time expires. In this case, the read will return with the characters received to that point, if any.	*In this case, VTIME serves as an intercharacter timer and activates after the receipt of the first character. As soon as one character is received, the intercharacter timer is reset.* It is reset upon receipt of each character. A read is satisfied as soon as VMIN characters are received or the read time expires. In this case, the read will return with the characters received to that point *(at least one)*.
VMIN > 0, VTIME = 0 — Since the value of VTIME is zero, the time plays no role and only VMIN is significant. In this case, the read is not satisfied until VMIN characters are received.	Same as Previous Definition
VMIN = 0, VTIME > 0 — In this case, VTIME is ignored (assumed zero) and the system call returns immediately. Any characters present are returned to the user.	*In this case, VTIME serves as an I/O call timer and is activated as soon as the read system call is processed. A read is satisfied as soon as a single character is received or the read time expires. In the latter event, the read will return with zero characters.*
VMIN = 0, VTIME = 0 — In this case, the system call will return immediately. If any characters are present, they will be returned to the user.	Same as Previous Definition

---

☞ NOTE ▓

ACP's are implemented to the *Sys5* **termio** definitions as well. Therefore, ACP's also use the current (new) definitions of VMIN and VTIME.

This chapter explains the use of the new features that have been added to Release 1.4 of Sys5. See your *P/75 User's Manual* for additional information on the following new features.

6.1 Sys Program

The command, **sys**, has been added to the **/etc** directory. This is primarily a system administration command. Use this command only if you have a P/75 system.

6.2 Access to Built-In Modem

There is a standard built-in modem available on P/75 units. This is a 300/1200 baud, auto-dial, auto-answer, direct connect modem. Access to this modem is provided through the **/dev/modem** device entry. The modem may be set up as a dial-up incoming line (outside users can dial up and log in) or an outgoing line (**uucp** can dial out to other computers). Note, however, that the modem cannot be configured for both at the same time.

6.3 Auto Boot

All Plexus systems using this release now have the ability to automatically bring themselves all the way up to **init** state 2 (multi-user state) from a power off condition. This feature is enabled by turning on switch 3 of the switch pack along the front edge of the processor board.

In order to use autoboot to return to the multi-user state, you must edit the file **/etc/bcheckrc**. You will have to alter both lines that read as follows:

```
read reply
```

The first of these is a date verification prompt. Change this to the following:

reply = 6

The second of these is a prompt that indicates whether or not you want to run **fsck**. To guarantee the integrity of your system, change this to the following:

reply = y

Note that if your root file system has sustained damage, your system will not go to the multi-user state, but will require a manual reboot.

6.4 Auto Shutdown

The P/75 has new hardware that allows it to perform 'soft' shutdowns. These shutdowns may be initiated from several sources.

1. Keyswitch off

2. Over temperature

3. UPS interrupt

4. **sys poweroff** command

6.5 Disk Drive References

With this release of *Sys5*, multiple EMSP disk controllers (Xylogics) as well as the IMSP controller are supported which allows for a total of 18 disk units. This is available for the P/75 only.

6.6 Advanced Communication Processor

The Advanced Communication Processor (ACP) is dedicated to managing communications for Plexus models P/35, P/55, P/60, and P/75 computers. ACPs, which use DMA to bypass the CPU, handle data movement between system memory and the following I/O devices: terminals, modems, and parallel printers. By freeing the CPU from handling all I/O interrupts, system performance is increased. Each ACP controls sixteen serial ports (terminals or modems) and one parallel printer port. The ACP is a double-height multibus card equipped with an MC68000 microprocessor.

6.7 Mirrored Disk

The mirrored disk utility, **mirutil**, provides the capability for assigning a pair of identical disk drives as a mirrored pair. Write operations are then performed on both disks in the pair. Disk read operations are from either disk. This utility can be used with Plexus models P/35, P/55, P/60 and P/75 computers. More than one pair of drives can be mirrored. Disk mirroring provides a real-time backup for disk files.

Chapter 7

INSTALLATION

☞ NOTE ▄

Please read this chapter all the way through before you begin installation of 1.4 or an upgrade from 1.4 to 1.4.2.

You will need 3500 free blocks of disk space in order to install this update.

7.1 Contents

New Features

This update, *Sys5 version 1.4.2*, contains the following new features:

- The MC68020 boards will now work with the MC68881 Floating Point Unit. However, the C compiler does not yet support the Floating Point Unit machine code. The kernel modules which have been modified for this feature are **cswitch.s, start.s, strap.s,** and **main.o**.

- The *Sys3* Plexus enhancements to the **lp** spooler have now been ported for *Sys5*. These include the following:

  lpforms   lphold   lprun   topq

The options **lphold, lprun** and **topq** are not documented in the latest Sys5 documentation. Following is a short description of these two options.

— The utility **lphold** postpones the printing of the request whose request identification is *id* until an **lprun** command is received for that request. Conversely, **lprun** enables the printing of the request whose identification number is *id*, which has previously been put on hold by the **lphold** command. The request is placed last in the queue.

— The **topq** command places the request whose identification number is *id* at the top of the print queue, whether or not **lpsched** is running. Only super-user can **topq**.

In addition to these new **lp** options, this update includes new versions of all the spooler programs. These are:

lpadmin	**lpsched**	**lpstat**	**accept**	**reject**	**enable**
disable	**cancel**	**lp**	**lpmove**	**lpshut**	

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Also included are a new version of the **pprx** filter program, a *Sys3* lpr-compatible filter called **lprfilter**, and a sample **printcap** for use with the Plexus interface program.

- Error logging that is sent to the console is saved in the file **/usr/adm/console_log**. A new device, **/dev/conslog** will be made. **/usr/lib/errdemon** has been modified to incorporate this feature, as have **/etc/errstop** and **/etc/errdead**. The kernel modules which have been changed to support this feature are **err.o** and **us.o**. A change will be made to **/usr/spool/cron/crontabs/root** to save the file **/usr/adm/console_log** to **/usr/adm/oconsole_log** every Monday morning. This change will not alter any other lines in the root **crontab** file.

Corrected Problems

This update, *Sys5 version 1.4.2*, contains the following fixes:

Corrected Utility Problems

- A final sync has been added to the **/bin/su** program to prevent minor file system corruption when going from multiuser to single user states. It was common previously to see an unreferenced file after this process.

- A message displayed by **getty** on NOS systems indicating difficulties in opening vltty ports has been removed, as it served no purpose.

- The command **/etc/dconfig** and **/stand/dconfig** will now display more information messages about alternate sectors used for EMSP controlled drives. Also fixed was a bug where NSWAP would be set to zero if not entered. This was fixed in both the standalone and UNIX utility versions.

- The values for ACP downloads given in the **/etc/rc** files have been corrected to "**/etc/dnld -L -da 3 1 -f /usr/lib/dnld/acp -a 2000**". This change will be made in your **/etc/rc** file without removing the modifications you have made.

- Two changes have been made to **uucp**. The timeout for the alarm during login attempts has been increased from 30 seconds to 60 seconds, and the line control values that are set have been fixed to work with ACP direct connections.

- **/usr/plx/dumpdir** now accesses **/dev/rrm/0m** as the default tape drive.

- **/usr/plx/tset** now works.

- **/etc/ttyconf** now generates ICP parallel port (pp) devices with correct major device numbers.

- **/lib/ccom** and **/lib/bigccom** now generates code to access various floating point subroutines with the correct names. The routines which were previously being accessed incorrectly were **afaddf, afsubf, afmulf** and **afdivf**. The leading *a* had been left off of each name.

- **/usr/bin/man** now accesses the manual sections in **/usr/man/catman**, rather than in **/usr/catman**.

- A problem with **/bin/ps** has been fixed. Previously, **ps** did not handle the case where a process was half-swapped, printing old status information, incorrect information, or **lseek** error messages.

- The terminal table file generator **trmtab**, used in conjunction with nroff/troff that was available with *Sys3*, is now implemented on *Sys5 Release S/M1.4.2* and is found in the directory **/usr/src/cmd/term**.

- **/etc/stty** has been altered to allow setting of **stty** parameters on an ACP even though the port has no carrier detect and -CLOCAL is set. **stty** performs an open with O_NDELAY set to bypass the wait for carrier detect.

7.2 Format

This update tape consists of file 24, which is a **cpio** formatted file containing the **keep files** scripts and documentation, and file 25, which is a **cpio** formatted file containing the modules, utilities, and scripts described in Chapter 7.1.4 (preceding).

7.3 Instructions

7.3.1 Notes

If you are installing 1.4 and 1.4.2 as an upgrade from *Sys5* 1.2 use the following instructions.

The **keep files** procedure as described in the 1.4 release notice will not work properly. Before you install 1.4 and 1.4.2, load the **keep files** from the 1.4.2 tape as follows:

- Insert the 1.4.2 tape into your tape drive. Enter:

      cd /
      /usr/plx/tape srcheof 23

  — If you have a 9-track tape, enter:

        cpio -idumBv < /dev/rrm/0m

  — If you have a cartridge tape, enter:

        cpio -idumBv < /dev/rpt/0m

This loads corrected versions of the **keep files** onto your system.

7.3.2 Installation

To install this update, you must be in single-user mode, and you must be in the root directory. This update will relink your kernel. Be sure that your system date is correct. You will not be able to run this update twice as it will overwrite your old kernel with the new version. If you are unable to boot the new kernel, your old kernel will be saved as **/unix.1.4.1**. Type this name in at the (:) prompt, then relink the kernel as directed in Chapter 8, *Miscellaneous Information*.

1. Put the update tape in your tape drive and enter:

       cd /

2. Next, enter:

       /usr/plx/tape srcheof 24

   If the tape drive you are using is not the default tape drive (**/dev/rrm/0mn** or **/dev/rpt/0mn**) use the **-f** option to specify the drive that you are using. See the *Plexus Sys5 User's Reference Manual* for a further explanation of this command.

3. Enter:

       cpio -idumBv < [*your tape drive*]

   For example, using the default 9-track tape drive, enter:

       cpio -idumBv < /dev/rrm/0m

4. Next, enter:

    cd /usr/plx/plx-ssc/[X]1.4.2

    Where *X* = **M** for MC68000-based CPU's,
    where *X* = **S** for MC68020-based CPU's.

    For example, if you have an MC68000 CPU, enter:

    cd /usr/plx/plx-ssc/M1.4.2

5. Finally, enter:

    ./install

    You will see messages as the update is installed, and you will be prompted for yes or no answers. Respond with **y** or **n** as appropriate. All questions are displayed at the beginning of installation, with the exception of the question about the success of the kernel relinking, which displays at the end.

To recover your disk space after successfully installing this update, enter:

rm -rf /usr/plx/plx-ssc/*1.4.2

This will remove all update modules. You can reload these again from the tape if you need them at a later date. You will also need to modify **/etc/rc** as shown in Section 4.4 if you are installing the full release. If you are upgrading from release 1.4 to 1.4.2, your existing **/etc/rc** file will retain the changes you made when you installed the 1.4 release.

When your new kernel boots you may want to remove the old kernel saved as **/unix.1.4.1**.

MISCELLANEOUS INFORMATION

If you have made kernel modifications or the automatic patch relink fails, you will need to relink your operating system kernel manually.

Before relinking your operating system kernel, check the following:

- The system date must be correct.

- The environment variable SHELL must be **/bin/sh**.

8.1 Relinking the Kernel

To boot the new system, follow the instructions below.

1. Shutdown the machine. (See your User's Manual for instructions on how to shutdown gracefully.)

2. Save the current kernel so that if your kernel crashes or will not boot, you will be able to boot using your old kernel. Enter:

      mv /unix /unix.1.4.1

3. Relink the system. Enter:

      cd /usr/src
      sh :mkuts68 -r 1.4.2

   If you have a NOS system add a final **-n**. Enter:

      cd /usr/src
      sh :mkuts68 -r 1.4.2 -n

   The system is then rebuilt as **/usr/src/uts/m68/sys5.2c**XX.

   Where c = **m** on MC68000-based systems, where c = **s** on MC68020-based systems, and where XX is the number of users (16, 32, 64, or 80) that your system is licensed for.

4. Rename your new kernel. Enter:

      mv /usr/src/uts/m68/sys5.2cXX /unix

   This allows you to use the default boot sequence, and makes sure that **ps** works properly.

5. Sync your root file system and reboot. Enter:

> **sync**
> **sync**
>
> [Press reset]
> [Press <**cr**> at the : prompt.

8.2 Rebooting the Old Kernel

If for some reason your new kernel does not boot you must reboot your old kernel. Enter:

> **PLEXUS PRIMARY BOOT REV X.X**
> **: /unix.1.4.1**

PLEXUS COMPUTERS   **Reader Comment Form**

Company Name :

Your Name (Optional) :

Manual Name : **Plexus Sys5 UNIX S/M1.4.2 Release Notice**

Publication Number : **98-40199.3 Ver A**

Please let us know if anything in this manual is unclear, incomplete, or inaccurate.

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