AT&T

**UNIX® System V Release 3.2**

Source Code Provision
Release Notes

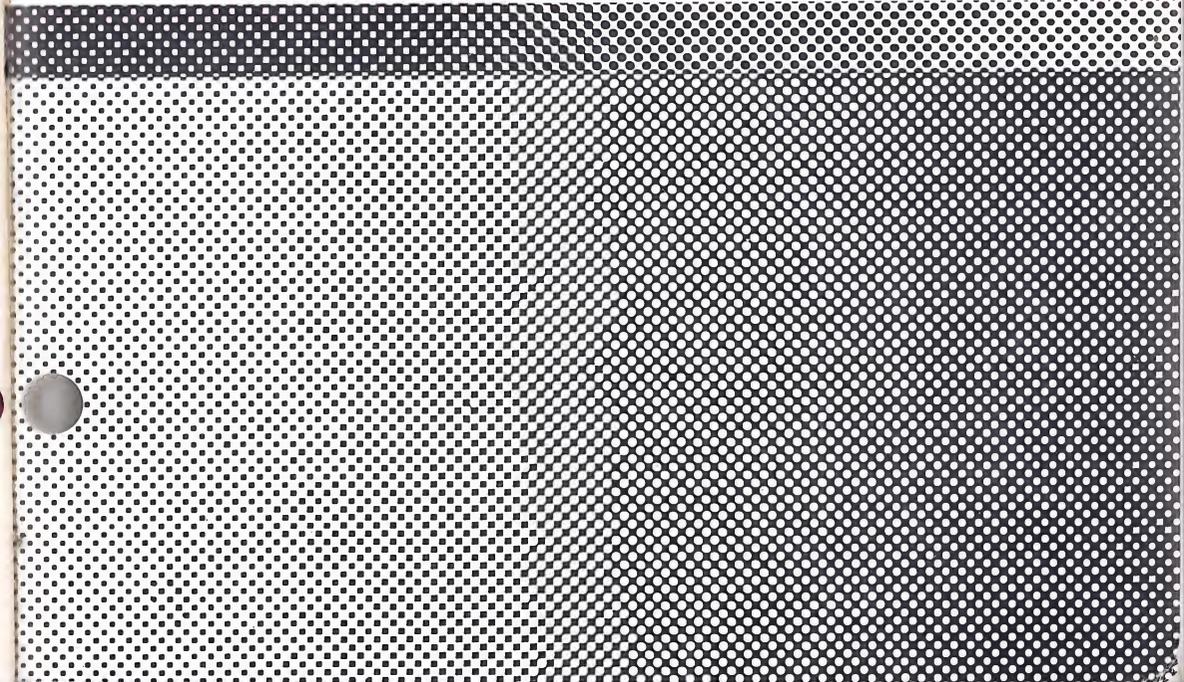305-659

**AT&T**

# UNIX® System V Release 3.2

## Source Code Provision
## Release Notes

# Source Code Provision

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# Introduction

The Source Code Provision contains

- The source code for the utilities that make up the UNIX System V Release 3.2 binary product for the 3B2 Computer. These utilities are listed under "Contents of the Distribution Tape."

- The source code for several additional utilities that are not part of the UNIX System V Release 3.2 binary product. These are listed under "Additional Utilities."

- Binary diskettes for the C Programming Language Utilities Issue 4.1 and Advanced Programming Utilities Issue 1.1 that are needed to build a UNIX System V Release 3.2 system from the Source Code Provision.

NOTE  As CPLU and APU utilities have not changed since Release 3.1, these binary diskettes are not included with System V Release 3.2 Source Code Provision.

- A complete set of UNIX System V Release 3.2 binary diskettes that should be used to upgrade the 3B2 Computer on which you are building the Source Code Provision to UNIX System V Release 3.2.

The *AT&T UNIX System V Release 3.2 Source Code Provision Release Notes* describe how to install and build a UNIX System V Release 3.2 system on a 3B2 Computer and on non-3B2 Computer systems. In addition to installation and build procedures, the *Release Notes* include a list of new features, a description of what is included in the Source Code Provision distribution, notes on hardware and software dependencies, a section of software notes, and a description of the documentation provided with the Source Code Provision. The *Release Notes* also include a listing of all source files on the distribution tape in the order in that they are written on the tape and a remove list. The remove list contains all files that were a part of the UNIX Release 3.1 system but which are not in Release 3.2.
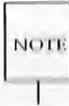
| NOTE | A System V Release 3.2 system is defined as a Release 3.1 system with the appropriate additions and deletions that make it into a Release 3.2 system. This product cannot be used to upgrade the machine on which you are currently running, to UNIX System V Release 3.2. To upgrade the machine on which you are running, you must use the UNIX System V Release 3.2 binary product and the release upgrade option described in the *Release Notes*. |
|---|---|

# Conventions Used in this Manual

In this document the following typesetting conventions are followed when command names, command line format, files, and directory names are described.

- You must type words that are in **bold** font exactly as they appear.

- *Italicized* words are variables; substitute the appropriate values.

- CRT or terminal output and examples of source code are shown in constant-width font.

- An Ellipse (...) show that you can repeat a word or an option.

- A command name followed by a number in parentheses is a reference to that command's manual page. The number in parentheses refers to the section of the manual. Manual pages appear in the *UNIX System V Release 3 Programmer's Reference Manual* unless otherwise noted. For example, **ls**(1) refers to the manual page for the **ls** command, which is in Section 1 of the *Programmer's Reference Manual*.

- \<CR> indicates a continuation of the same line.

## New Features

The UNIX System V Release 3.2 Source Code Provision includes several new features. They are described in detail in the *UNIX System V Release 3.2 Binary Release Notes*. In reading the descriptions, keep in mind that several of the utilities that are optional for binary UNIX System V Release 3.2 customers are included with the Source Code Provision.

## The Source Code Provision

The Source Code Provision can be ordered on either a cartridge tape or a nine-track magnetic tape. If your 3B2 Computer has a cartridge tape controller, you can load the Source Code Provision directly from a cartridge tape. If your 3B2 Computer has only a diskette drive, see "Dependency Notes, Hardware Options for Installation," below.

The Source Code Provision includes source code that corresponds to the binary UNIX System V Release 3.2 for the 3B2 Computer. Process Accounting Utilities Release 1.1, Networking Support Utilities Release 1.2, and Remote File Sharing Utilities Release 1.2.

The Source Code Provision also includes binary diskettes for the C Programming Language Utilities Issue 4.1 and Advanced Programming Utilities Issue 1.1, and a complete set of UNIX System V Release 3.2 binary diskettes.

NOTE  As CPLU and APU utilities have not changed since Release 3.1, these binary diskettes are not included with System V Release 3.2 Source Code Provision.

When the Source Code Provision is loaded onto a 3B2 Computer and compiled with the accompanying executable versions of the C Programming Language Utilities Issue 4.1 and Advanced Programming Utilities Issue 1.1, it generates executable code for utilities that may be divided into two groups: those that, taken together, make up an operating system that is functionally equivalent to the binary UNIX System V Release 3.2, and those that represent AT&T utilities that are not part of the binary UNIX System V Release 3.2. Some of these additional utilities may be purchased separately by binary customers. Process Accounting Utilities are available only as part of the Source Code Provision.

Appendix A lists existing files that are obsolete in this new release. The source files on the distribution tape are listed in Appendix B.

The Source Code Provision does not include all 3B2 Computer hardware-specific code such as firmware or pumpcode.

## Contents of the Distribution Tape

The distribution tape contains source code for portions of the following utilities. Only the files that have changed since Release 3.1 are included on this tape. These are the utilities that make up the UNIX System V Release 3.2 binary product.

- AT&T Windowing Utilities
- Basic Networking Utilities
- Directory and File Management Utilities
- Editing Utilities
- Essential Utilities
- Inter-Process Communication Utilities
- System Administration Utilities
- System Header Files
- Terminal Information Utilities
- User Environment Utilities

## Additional Utilities

The Source Code Provision includes source code for the following utilities that are not part of the UNIX System V Release 3.2 binary product.

- Remote File Sharing Utilities 1.2
- Networking Support Utilities 1.2
- Process Accounting Utilities 1.1
- Framed Access Command Environment (FACE)/Form and Menu Language Interpreter (FMLI)
- 2KB File System
- enhanced **lp** package
- System Performance Analysis Utilities 1.1 (SPAU)

## Binary Diskettes

The Source Code Provision includes binary diskettes for the C Programming Language Utilities Issue 4.1 and the Advanced Programming Utilities Issue 1.1.

| NOTE | As CPLU and APU utilities have not changed since Release 3.1, these binary diskettes are not included with System V Release 3.2 Source Code Provision. |

A set of Release 3.2 update binary diskettes is included with the Source Code Provision. UNIX System V Release 3.2 Source Code Provision builds are only supported for Release 3.0, 3.1, and 3.2 Binary Products. Release 3.2 Source Code Provision builds are not supported for any binary products predating Release 3.0. Therefore, it is a requirement that the UNIX System V Release 3.0, 3.1, or 3.2 Binary Product be installed on the machine on which the Source Code Provision is to be built. Should the Release 3.2 Source Code Provision be built on a Binary Product earlier than Release 3.0, a native build will yield unpredictable results that will not be supported by AT&T. If you want to build on a release earlier than 3.0 the Cross Environment procedures should be used.

# Dependency Notes

Only object code generated by building the Source Code Provision on an AT&T 3B2 Computer running UNIX System V Release 3.0, 3.1, and 3.2 and the C Programming Language Utilities Issue 4.1 with the Advanced Programming Utilities Issue 1.1 is supported.

## Hardware Dependencies

### Hardware Options for Installation

If your computer is an AT&T 3B2/300 or 3B2/310 Computer, it may not have a cartridge tape drive. The following three installation alternatives are available to you. Since the medium on which you receive the Source Code Provision is dependent on which alternative you choose, you will probably have made this choice before you ordered the product.

- Upgrade your 3B2/300 or 3B2/310 Computer using an expansion module (3B2 Computer XM) with a cartridge tape controller.

  If you have upgraded your 3B2 Computer, you should have ordered the Source Code Provision on cartridge tape.

- If the Basic Networking Utilities have been installed on your 3B2 Computer, arrange for access to a 3B2 Computer that has both the Basic Networking Utilities and a cartridge tape controller. You can read the cartridge tape onto this 3B2 Computer and transfer its contents to your 3B2 Computer using the Basic Networking Utilities. (See Chapter 9 Procedure 9 of the *System Administrator's Guide*.)

  In this case, you should have ordered the Source Code Provision on cartridge tape.

- If your 3B2 Computer has the Basic Networking Utilities or another utility that will allow it to communicate with a non-3B2 Computer, arrange for access to a non-3B2 Computer (a 3B20 Computer, for example), read the Source Code Provision tape onto the non-3B2 Computer, and transfer the files to your 3B2 Computer.

  If you have access to a non-3B2 Computer that can communicate with your 3B2 Computer, you should have ordered the Source Code Provision on nine-track magnetic tape.

- Change root builds may require a second hard disk.

### Space Requirements

To build the full Source Code Provision on your 3B2 Computer you must have at least one 72-megabyte disk.

The space requirements tables (Figure 1) show the free space needed for UNIX System V Release 3.1 and 3.2 Source Code Provision installation. Installation space is the free space needed for reading the Source Code Provision tape onto your system. Setup space is the space needed for creating the changed root and cross environments in which you will be building the Source Code Provision, and it includes the space required for installing the full system. Build space is the free space needed for building the Source Code Provision.

| Install | Release 3.1 /usr | | Install | Release 3.2 /usr | |
|---|---|---|---|---|---|
| | blocks | inodes | | blocks | inodes |
| full system | 43,000 | 5,150 | full system | 54,000 | 6,400 |

Figure 1: Space Requirements for Installing the System V Release 3.1 and 3.2 Source Code Provision

Figure 2 shows the additional **root** (/) and **/usr** space requirements for preliminary procedures (setup) and for the build. A computer with a file system that has a larger logical block size than 512 bytes—the logical block size of the 3B2 Computer—may require more space to install the Source Code Provision.

A "full system" is a 3B2 Computer on which the binary equivalent of UNIX System V Release 3.2 is already resident (see "Source Code Provision, Contents of the Distribution Tape" for a list of the utilities that make up the binary product), as well as a binary version of the C Programming Language Utilities Issue 4.1 and the Advanced Programming Utilities Issue 1.1. Additional utilities, excluding Remote File Sharing, Networking Support Utilities, and Process Accounting, is also included.

The system configuration used to obtain the measurements for the UNIX System V Release 3.2 **chroot** build of the Source Code Provision was the same as that for the full system, above.

Space measurements for building the Source Code Provision in a cross environment on non-3B2 Computers are implementation and machine dependent. The space requirements for such builds listed in Figure 2 are derived from building the Source Code Provision on an Amdahl Computer running UNIX System V Release 5.2.5 580. The logical block size on an Amdahl[10] is 4k bytes.

| Running System | Type of Build | Stage of Build | / (root) space | | /usr space | |
|---|---|---|---|---|---|---|
| | | | blocks | inodes | blocks | inodes |
| System VR3.2, native build, | full system | setup | 11,960 | 620 | 20,250 | 1320 |
| | | build | 1050 | 30 | 21,000 | 1200 |
| System VR3.2, chroot | full system | setup | 11,936 | 601 | 45,916 | 2,884 |
| | | build | 0 | 0 | 24,000 | 1,450 |
| non—3B2, cross environment* | full system | setup | 0 | 0 | 1985 | 355 |
| | | build | 0 | 0 | 8814 | 3184 |

\*  If you are installing and building the Source Code Provision on a non—3B2 Computer, it is not necessary to use the /usr directory. They represent the space requirements for the file system you use. The numbers in the /usr and /root columns are NA (Not Available), at the time of this printing.

Figure 2: Setup and Build Space Requirements

## Software Dependencies

### Operating System Requirements

If you are building the system on an AT&T 3B2 Computer running UNIX System V Release 3.0, 3.1, or 3.2, at least the Essential Utilities, Directory Management Utilities, and File Management Utilities must be resident on your system.

### Cross-Compiler Requirements

Note that a cross-compiler is not part of the Source Code Provision and that code generated in a cross environment on any configuration other than an AT&T 3B2 Computer running UNIX System V Release 3.0, 3.1, or 3.2 is not supported.

The instructions provided in this document for building on machines other than the AT&T 3B2 Computer are based on the assumption that you have a cross-compiler in place on the machine on which you intend to build UNIX System V Release 3.2, and that your cross-compiler is capable of generating code for the machine on which you intend to run Release 3.2.

The Source Code Provision should build on a non-3B2 Computer only if your cross-compiler is functionally equivalent to the C Programming Language Utilities Issue 4.1. An important feature of the C Programming Language Utilities Issue 4.1 is shared libraries (see the *C Programming Language Utilities Issue 4.1 Release Notes*). To build the commands listed below, you will need the Network Services Library. This library is supplied only as a shared library. If your cross-compiler does not support shared libraries, the build of at least these seven commands will fail.

> etc/mount
> usr/bin/ct
> usr/bin/cu
> usr/lib/uucp/uucico
> usr/net/nls/listen
> usr/net/servers/rfs/rfsetup
> usr/nserve/nserve

The following cross-compile functions must be available on your cross-compiler. They correspond to the UNIX system commands **as, cc, ld, lorder**, and **strip**.

- common assembler
- C compiler
- link editor
- library orderer
- object file stripper

### Flexname Capability

If you are not using the C Programming Language Utilities Issue 4.1 as your C Compilation System, be sure the C compiler you are using supports a flexname capability. Some structure element names and **#define** names used in Source Code Provision Release 3.2 code are not unique because only the first seven characters of the name are significant. Trying to build System V Release 3.2 with a non-flexname C compiler will result in a fatal error.

### Rebuilding lpsched

If the existing line printer scheduler **lpsched** is running while you are building a new verion of the **lpsched** command, the build of the new **lpsched** will fail since the existing version of **lpsched** is not backed up while the new version is being built.

If the build of th new version of **lpsched** fails, kill the process running the existing version of **lpsched** and rebuild the **lp** command (see "Building Selected Parts of the Source Code Provision").

### Release 3.0 Downward Incompatibilities

When the Source Code Provision is built on any UNIX system release other than UNIX System V Release 3.0, 3.1, or 3.2, the resulting object code for some of the commands will not execute on Release 3.2. The reason these commands will fail is related to new system calls that were introduced in UNIX System V Release 3.0. See "Compatibility Notes" in *AT&T 3B2 Computer UNIX System V Release 3.0 Release Notes*.

### Driver Requirements

The files in **/etc/master.d** (the **master.d** files for the existing binary system) and the files in **/usr/src/uts/3b2/master.d** (the **master.d** files installed as part of the Source Code Provision) are not the same. Only the **master.d** files that are part of an existing Release 3.2 binary system should be used to create drivers.

Procedures for saving and copying the appropriate **master.d** files are included in the installation and build instructions. These procedures will create the drivers whose binaries were previously installed on the system. If a driver was not previously installed on the running system, that driver may not work properly on the system built from the Source Code Provision, and the corresponding device will not be made.

### Rebuilding layers and sa

If you are building the Source Code Provision on a computer other than an AT&T 3B2 Computer running UNIX System V Release 3.0, 3.1, or 3.2, a shell syntax error may occur while you are building **layers** and **sa**. If this occurs, you will have to rebuild these two commands. Instructions for rebuilding **layers** and **sa** are given in the appropriate installation and build sections of this document.

### Permissions Requirements

Unless you are building the Source Code Provision in a native environment on a 3B2 Computer, it is strongly recommended that you not be logged in as **root** while you are building the system. If you are logged in as **root**, slight, and even inadvertent, deviations from the procedures outlined in this document can significantly damage the currently running system.

You should be aware that building the Source Code Provision will produce binaries whose permissions will not match the permissions of their Release 3.2 binary product counterparts. This will occur even if you are building the Source Code Provision without **root** permissions.

### Rebuilding /etc/inittab Entries

If you are building the full system in the standard root directory and you want **/etc/ports** to rebuild the **/etc/inittab** entries, you must remove the **/dev/tty??** special device files, then bring the system down and reboot it. If you do not do this, **/etc/ports** will not rebuild the **/etc/inittab** entries or create the **/dev/tty??** device files correctly.

# Installation and Build Procedures

This section tells you how to install and build the Source Code Provision

- in the standard root directory on an AT&T 3B2 Computer running UNIX System V Release 3.0, 3.1, or 3.2

- in a root directory other than the standard root directory on an AT&T 3B2 Computer running UNIX System V Release 3.0, 3.1, or 3.2

- on a non-3B2 Computer running UNIX System V, in a cross environment

If there is not enough free space in the root file system on a 3B2 Computer running Release 3.2, you can build the Source Code Provision using a root directory other than the standard root directory. This ensures that the code generated is executable on Release 3.2. A second hard disk maybe needed.

On non-3B2 Computers, you must build the Source Code Provision using a cross-compiler capable of generating code for the machine on which you intend to run the system (the target machine). A cross-compiler is not included as part of the Source Code Provision. The instructions for building on a non-3B2 Computer are based on the assumption that you have a cross-compiler resident on the machine on which you are building the Source Code Provision (the host machine). See the "Dependency Notes" for a list of the cross-compiler commands needed.

Instructions for building on a non-3B2 Computer are provided to build Release 3.2 for target machines other than the AT&T 3B2 Computer.

### Preinstallation Procedures

Before you install the Source Code Provision, you will have to do several things.

Step 1: First, read the "Dependency Notes" above. Do not attempt to install the Source Code Provision before you have read the "Dependency Notes." In particular, you will need to consult the table of space requirements in that section to be sure you have enough space to install and build the Source Code Provision.

Step 2: The installation and build procedures assume that you are installing the Source Code Provision from a cartridge tape. If your 3B2 Computer does not have a cartridge tape controller, see the "Dependency Notes" for a description of your options.

Step 3: To make sure you can restore the UNIX system as it now exists on your 3B2 Computer, make a backup of the entire system. The *System Administrator's Guide*, "File System Administration Procedures," describes how to back up a system.

Step 4: You must determine the appropriate procedure for installing and building the system. Determining the correct installation and build procedure depends on two pieces of information.

- ☐ If you are installing and building System V Release 3.2 Source Code Provision on a 3B2 Computer, you must know the UNIX System V binary release currently running on your 3B2 Computer. The procedure you follow depends on the release. The options are UNIX System V Release 3.0, 3.1, or 3.2.

- ☐ Second, when you are building on an existing UNIX System V Release 3.0, 3.1, or 3.2, you must decide whether to install and build the system in the standard root directory or in another directory. If you build the Source Code Provision in the standard root directory, you will overwrite the binary System V Release 3.0, 3.1, or 3.2 system. You may not want to do this. Another factor in making this decision will be the space available on your root file system.

Consult the table below to find out which of the procedures in this section you must follow. In each case, go to the section named in the table and follow only the procedure detailed in that section. Ignore the other installation procedures.

| 3B2 UNIX Release, or non-3B2 Host | Environment | Full System | Go To |
|---|---|---|---|
| Release 3.0/3.1/3.2 | native (/) environment | full system | Section 1 |
| Release 3.0/3.1/3.2 | **chroot** environment | full system | Section 2 |
| Non-3B2 Computer | cross environment | full system | Section 3 |

Figure 3: Finding the Correct Installation and Build Procedure

NOTE: Some of the shell commands in these sections are long. Typing them without any errors may be difficult. We recommend copying the longer command lines into your own shell scripts and running the script instead of typing the command each time.

## Section 1: System V Release 3.2 Full System Build and Install in Standard Root Directory on a Release 3.0, 3.1, or 3.2 System

You will be installing the system from a cartridge tape. If you do not have a cartridge tape controller, see the "Dependency Notes."

Step 1: Log in as superuser if you have not already done so.

Step 2: Change directory to the standard root (/) directory.

    **cd /**

Step 3:

    cp /etc/passwd /etc/passwd.old

> **NOTE** If you currently have System V Release 3.0 and 3.1 source code on your system, you may skip Steps 4 through 12. You may continue with Step 13. If you have Release 3.0, skip to step 6.

Step 4:   Place the System V Release 3.0 Source Code Provision cartridge tape in to tape drive #1.

Step 5:   To install the entire System V Release 3.0 Source Code Provision, enter the following command.

    ctccpio −idumvT /dev/rSA/ctape1

Step 6:   Place the System V Release 3.1 Source Code Provision cartridge tape in to tape drive #1.

> **NOTE** If you want to save your Release 3.0 source code, continue with steps 7 through 9. Otherwise, go to step 10. You may decide to back up your original Release 3.0 Source in the event you want to return to the Release 3.0 System you previously had in place.

Step 7:   Verify there is adequate space in /usr. See Figure 1.

    df /usr

Step 8:   Create a directory to save the Release 3.0 Source Code.

    mkdir /usr/old/3.0

Step 9:   Move the Release 3.0 source code to the created directory.

    find /usr/src −print | cpio −pdlu /usr/old/3.0

> **WARNING** The following Steps will remove the files referenced in Steps 10 through 12 from your system. If you want to save these files you must go back to Step 7 before continuing with Step 10 if you have not done so already.

Step 10:   Retrieve the update and remove lists from the tape.

    ctccpio −idmuvT /dev/rSA/ctape1 etc/rlist etc/updlist

> **NOTE** After the two filenames are printed on the screen, the command will continue to search. Hit the **<BREAK>** key to stop.

Step 11:   Sever the links between **/usr/src** and **/usr/old/3.0**, leaving the original 3.0 data in **/usr/old/3.0**.

    xargs rm −rf < /etc/rlist
    xargs rm −rf < /etc/updlist

Step 12:   To install the entire System V Release 3.1 Source Code Provision, enter the following command.

    ctccpio −idumvT /dev/rSA/ctape1

Step 13:   Place the System V Release 3.2 Source Code Provision cartridge tape in to tape drive #1.

> **NOTE** If you want to save your Release 3.1 source code, continue with Steps 14 through 16. Otherwise go to Step 17. You may decide to back up your original Release 3.1 source in the event you want to return to the Release 3.1 system you previously had in place.

Step 14:   Verify there is adequate space in /usr. See Figure 1.

    df /usr

Step 15:    Create a directory to save the Release 3.1 Source Code.

    **mkdir /usr/old/3.1**

Step 16:    Move the Release 3.1 source code to the created directory.

    **find /usr/src −print | cpio −pdlu /usr/old/3.1**

⬡ WARNING

The following Steps will remove the files referenced in Steps 17 through 19 from your system.  If you want to save these files you must go back to Step 14 before continuing with Step 17 if you have not done so already.

Step 17:    Retrieve the update and remove lists from the tape.

    **ctccpio −idmuvT /dev/rSA/ctape1 etc/rlist etc/updlist**

▢ NOTE

After the two filenames are printed on the screen, the command will continue to search.  Hit the **<BREAK>** key to stop.

Step 18:    Sever the links between **/usr/src** and **/usr/old/3.1**, leaving the original Release 3.1 data in **/usr/old/3.1**.

    **xargs rm −rf < /etc/rlist**
    **xargs rm −rf < /etc/updlist**

Step 19:    To install the entire System V Release 3.2 Source Code Provision, enter the following command.

    **ctccpio −idumvT /dev/rSA/ctape1**

▢ NOTE

During the build of the Source Code Provision, the following files are replaced.

    **/etc/system**
    **/etc/fstab**
    **/etc/checklist**
    **/etc/inittab**
    **/etc/profile**
    **/dgn/edt_data**

If you want to keep the old versions of these files, copy them to **old.***filename* before you begin to build the Source Code Provision.

Step 20:    Install the binary C Programming Language Utilities Issue 4.1, System Header Files, and the Advanced Programming Utilities Issue 1.1.

    **sysadm installpkg**

▢ NOTE
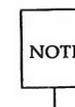
In general, the CC package in C Language Programming Utilities Issue 4.1 requires the System Header Utilities package for the release that is currently running on your machine.

When running UNIX System V Release 3.0 or 3.1 binary product, you will install the CC package and then you will be asked to install the System Header Utilities Package for Release 3.0 or 3.1.  At this point, install the System Headers for Release 3.2.  After this is done, you will again be asked to install the System Headers for Release 3.0 or 3.1. You must hit break to get out of this part of the installation.

Step 21:    To preserve the **master.d** files installed as part of the Source Code Provision and create drivers that correspond to the drivers on the running system, execute the following commands.

    **cd /usr/src/uts/3b2**
    **mkdir omaster.d**
    **cp master.d/∗ omaster.d**
    **cp /etc/master.d/∗ master.d**

NOTE
If you are running Release 3.1, you must retain the Release 3.2 **master.d** source files. To do this, execute the following:

```
cp omaster.d/kernel master.d/kernel
cp omaster.d/ports master.d/ports
cp omaster.d/stubs master.d/stubs
```

**Step 22:** The remainder of this section must be done from the single-user mode. To go to single-user mode, execute:

```
cd /
shutdown −is −y
```

**Step 23:** Remount the file systems.

```
mountall
```

**Step 24:** Set and export the shell variable **TMPDIR**.

```
TMPDIR=/usr/tmp
export   TMPDIR
```

**Step 25:** Create the following directories:

```
mkdir /usr/net /usr/net/nls
```

**Step 26:** Change directory to **/usr/src**.

```
cd /usr/src
```

NOTE
To build the entire system, allow at least 27 hours for the process to complete. You may want to use **nohup**(1) with Steps 27 through 30, and 32, 34, 36, 38, and 40. If the User Environment package has not been installed, execute the following:

```
./:mkcmd nohup
```

**Step 27:** Build and install **cpset** in **/usr/bin**. This command is used in a number of source makefiles to install commands in appropriate directories.

```
./:mkcmd cpset
```

NOTE
If you have more than 8000 blocks in your root file system, you may want to substitute the following command for Steps 28 through 40.

```
./:mk
```

You may also use **nohup** with this command. Do not run two commands under **nohup** at the same time. You must wait for the first one to finish before issuing the second **nohup** command.

**Step 28:** Install the user system header files by executing:

```
./:mkhead
```

**Step 29:** Install the kernel system header files in the **/usr/include/sys** directory.

```
./:mksyshead
```

**Step 30:** Make the libraries by executing:

```
./:mklib \*
```

**Step 31:** Reduce the space required for the library archives by stripping comment sections. Execute

```
find /lib −type f −print | xargs file \<CR>
| grep archive | cut −f1 −d: | while read i
```

Enter the next five lines in response to the secondary shell prompt.

```
do
echo ++++$i
mcs −d $i
ar ts $i
done
```

**Step 32:** Build and install the first group of commands by executing:

```
./:mkcmd \[0−e\]\*
```

**Step 33:** Reduce the space required for commands in the root (/) directory by stripping comment sections. Execute

```
find /etc /bin −type f −print | xargs file \<CR>
| grep executable | cut −f1 −d: | while read i
```

Enter the next four lines in response to the secondary shell prompt.

```
do
echo ++++$i
mcs -d $i
done
```

Step 34:   Build and install the second group of commands by executing:

```
./:mkcmd \[f-n\]\*
```

Step 35:   Reduce the space required for commands in the root (/) directory by stripping comment sections.  Execute

```
find /etc /bin -type f -print | xargs file \<CR>
| grep executable | cut -f1 -d: | while read i
```

Enter the next four lines in response to the secondary shell prompt.

```
do
echo ++++$i
mcs -d $i
done
```

Step 36:   Build and install the third group of commands by executing:

```
./:mkcmd \[o-s\]\*
```

Step 37:   Reduce the space required for commands in the root (/) directory by stripping comment sections.  Execute

```
find /etc /bin -type f -print | xargs file \<CR>
| grep executable | cut -f1 -d: | while read i
```

Enter the next four lines in response to the secondary shell prompt.

```
do
echo ++++$i
mcs -d $i
done
```

Step 38:   Build and install the last group of commands by executing:

```
./:mkcmd \[t-z\]\*
```

Step 39:   Reduce the space required for commands in the root (/) directory by stripping comment sections.  Execute

```
find /etc /bin -type f -print | xargs file \<CR>
| grep executable | cut -f1 -d: | while read i
```

Enter the next four lines in response to the secondary shell prompt.

```
do
echo ++++$i
mcs -d $i
done
```

Step 40:   Build and install the kernel and drivers by executing:

```
./:mkuts
```

If you want to incorporate the kernel of the system you have just built, see "Incorporating the New Kernel into a System V Release 3.0, 3.1, or 3.2 Operating System," which follows Section 3.

## Section 2:  System V Release 3.2 Full System Build in a Directory Other Than the Standard Root Directory on a Release 3.0, 3.1, or 3.2 System

You will be installing the system from a cartridge tape.  If you do not have a cartridge tape controller, see the "Dependency Notes."

Step 1:   Log in as superuser if you have not already done so.

Step 2:   Change directory to the **root** (/) directory.

```
cd /
```

Step 3:   Create a directory to be used as the new root directory for the installation and build of the Source Code Provision.  This directory can be created in any file system that satisfies the setup and build requirements outlined in the Installation and Build section except the standard **root** file system of your machine.

mkdir *new_root*

**Step 4:** Copy the following directories from the standard root directory to the new **root** by executing:

**find /dev /lib /bin /etc /usr/lib /shlib \\<CR>**
**/usr/bin /install /usr/admin /usr/lbin \\<CR>**
**/usr/options −print | cpio −pudm** *new_root*

**Step 5:** Change directory to the new root directory.

**cd** *new_root*

**Step 6:** Change root to the new root name by executing:

**chroot . bin/sh**

**Step 7:** Create the following subdirectories in the new root directory by executing:

**mkdir /tmp /usr/tmp /usr/src /usr/spool**
**mkdir /usr/net /usr/net/nls**

**Step 8:** Install the binary C Programming Language Utilities Issue 4.1, System Header Files, and the Advanced Programming Utilities Issue 1.1.

**sysadm installpkg**

NOTE | In general, the CC package in C Language Programming Utilities Issue 4.1 requires the System Header package for the release that is currently running on your machine.

When running UNIX System V Release 3.0 or 3.1 Binary Product, you will install the CC package and then you will be asked to install the System Header Package for Release 3.0 or 3.1. At this point, install the System Headers for Release 3.2. After this is done, you will again be asked to install the System Headers for Release 3.0 or 3.1. You must hit break to get out of this part of the installation.

If you currently have System V Release 3.0 and 3.1 source code on your system, you may skip Steps 9 through 17 and continue with Step 18. If you have System V Release 3.0 source code on your system, you may continue with Step 11.

**Step 9:** Place the System V Release 3.0 Source Code Provision cartridge tape in to tape drive #1.

**Step 10:** Install the Source Code Provision by executing:

**ctccpio −idumvT /dev/rSA/ctape1**

**Step 11:** Place the System V Release 3.1 Source Code Provision cartridge tape in to tape drive #1.

NOTE | If you want to save your Release 3.0 source code, continue with Steps 12 through 14. Otherwise, go to Step 15. You may decide to back up your original Release 3.0 source in the event you want to return to the Release 3.0 system you previously had in place.

**Step 12:** Verify there is adequate space in **/usr**. See Figure 1.

**df /usr**

**Step 13:** Create a directory to save the Release 3.0 Source Code.

**mkdir /usr/old/3.0**

**Step 14:** Move the Release 3.0 source code to the created directory.

**find /usr/src −print | cpio −pdlu /usr/old/3.0**

WARNING | The following Steps will remove the contents of files referenced in Steps 15 through 17 from your system. If you want to save these files, you must go back to Step 12 before continuing with Step 15, if you have not done so already.

**Step 15:** Retrieve the update and remove lists from the tape.

**ctccpio −idmuvT /dev/rSA/ctape1 etc/rlist etc/updlist**

NOTE
After the two filenames are printed on the screen, the command will continue to search. Hit the <BREAK> key to stop.

Step 16: Sever the links between /usr/src and /usr/old/3.0 leaving the original 3.0 data in /usr/old/3.0.

```
xargs rm -rf < /etc/rlist
xargs rm -rf < /etc/updlist
```

Step 17: To install the entire System V Release 3.1 Source Code Provision, enter the following command.

```
ctccpio -idumvT /dev/rSA/ctape1
```

Step 18: Place the System V Release 3.2 Source Code Provision cartridge tape in to tape drive #1.

NOTE
If you want to save your Release 3.1 source code, continue with Steps 19 through 21. Otherwise, go to Step 22. You may decide to back up your original Release 3.1 source in the event you want to return to the Release 3.1 system you previously had in place.

Step 19: Verify there is adequate space in your changed root environment in /usr. See Figure 1.

```
df /usr
```

Step 20: Create a directory in your changed root environment to save the Release 3.1 Source Code.

```
mkdir /usr/old/3.1
```

Step 21: Move the Release 3.1 source code to the new directory.

```
find /usr/src -print | cpio -pdlu /usr/old/3.1
```

WARNING
The following steps will remove the contents of files referenced in Steps 22 through 24 from your system. If you want to save these files, you must go back to Step 19 before continuing with Step 22 if you have not done so already.

Step 22: Retrieve the update and remove lists from the tape.

```
ctccpio -idmuvT /dev/rSA/ctape1 etc/rlist etc/updlist
```

NOTE
After the two filenames are printed on the screen, the command will continue to search. Hit the <BREAK> key to stop.

Step 23: Sever the links between /usr/src and /usr/old/3.1 leaving the original Release 3.1 data in /usr/old.

```
xargs rm -rf < /etc/rlist
xargs rm -rf < /etc/updlist
```

Step 24: Install the Source Code Provision by executing:

```
ctccpio -idumvT /dev/rSA/ctape1
```

Step 25 To preserve the master.d files installed as part of the Source Code Provision and create drivers that correspond to the drivers on the running system, execute the following commands.

```
cd /usr/src/uts/3b2
mkdir omaster.d
cp master.d/* omaster.d
cp /etc/master.d/* master.d
```

NOTE
If you are running Release 3.1, you must retain the Release 3.2 master.d source files. To do this, execute the following:

```
cp omaster.d/kernel master.d/kernel
cp omaster.d/ports master.d/ports
cp omaster.d/stubs master.d/stubs
```

Step 26:    Change directory to /usr/src.

            cd /usr/src

Step 27:    Build and install cpset in *new_root*/usr/bin.

            ./:mkcmd cpset

            This command is used in several source makefiles to install com-
            mands in appropriate directories.

┌──────┐
│ NOTE │   To build the entire operating system, allow at least 27 hours for the pro-
└──────┘   cess to complete. You may want to use nohup(1) with the :mk command
           in the next step. If nohup has not been installed, execute the following:

            ./:mkcmd nohup

Step 28:    Build the remainder of the system (header files, C Library, C
            Compilation System, all libraries, all commands, and the kernel).

            ./:mk

Step 29:    Type ctrl-d once to leave the chroot (changed root) environment
            and return to the native environment.

If you want to incorporate the kernel of the system you have just built,
see "Incorporating the New Kernel into a System V Release 3.0, or 3.1, or 3.2
Operating System," which follows Section 3.

# Section 3:  Cross Environment  System V Release 3.2 Full System Build on a Computer Other Than AT&T 3B2 Computer

In what follows, the directory that contains the C compilation utilities
(the cross-compiler equivalents of the commands as, cc, ld, nm, lorder, and
strip) will be referred to as *cross_bin*. The directory where the cross-compile
commands expect to find the libraries will be referred to as *cross_lib*. The
directory where the cross-compile commands expect to find the header files
will be referred to as *cross_inc*. In commands where these directories are

referred to, substitute the actual pathnames on the computer on which you
are building the Source Code Provision.

It is strongly recommended that you are not logged in as root while
building the Source Code Provision using this procedure.

Step 1:     If your cross-compiler satisfies the requirements listed in the
            "Cross Compiler Requirements" section of the "Dependency
            Notes" and you are building the Source Code Provision with
            shared library support, go to Step 2. If not, set the shell variable
            LDLIBS to null and export it.

            LDLIBS=" "
            export LDLIBS

            The value of LDLIBS is used to tell the system whether or not to
            include shared libraries. Setting LDLIBS to null tells the system
            not to include shared libraries.

┌──────┐
│ NOTE │   Some commands will not build in the absence of the Network Services
└──────┘   Library, which is supplied only as a shared library. See "Dependency
           Notes, Software Dependencies, Cross-Compiler Requirements" for a list
           of these commands.

Step 2:     Set the shell variable CH to # and export CH.

            CH='#'
            export CH

            Unless you have root permissions, certain makefile commands
            cannot or should not be executed. Setting the shell variable CH
            to # will force these commands to be commented out.

            Since # is typically the default erase character on UNIX systems,
            you may have to escape this character to set the variable CH.

Step 3:     Create a cross-environment root directory to be used as the root
            directory for the cross-environment build.

            mkdir *cross_root*

| NOTE | In choosing a location for the cross-environment root directory, make sure the file system being used meets the space requirements listed in the section headed "Dependency Notes." |

Step 4:  Set the shell variable **ROOT** to the path of the cross-environment root directory. Set the shell variable **SRC** to **$ROOT/usr/src**. Export **ROOT** and **SRC**.

> **ROOT=**_cross_root_
> **SRC=$ROOT/usr/src**
> **export ROOT SRC**

Step 5:  Change directory to the cross-environment root directory.

> **cd $ROOT**

Step 6:  Create the following subdirectories by executing:

> **mkdir usr bin usr/bin usr/lbin etc lib usr/lib**
> **mkdir tmp usr/tmp shlib usr/admin usr/include**
> **mkdir usr/include/sys usr/lib/terminfo usr/lib/tabset**
> **mkdir usr/lib/libp usr/lib/cron usr/spool**
> **mkdir usr/spool/cron usr/spool/cron/crontabs etc/init.d**
> **mkdir etc/rc0.d etc/rc2.d lib/libp usr/net usr/net/nls**

| NOTE | If you currently have System V Release 3.0 and 3.1 source code on your system, you may skip Steps 7 through 15 and continue with Step 16. If you have System V Release 3.0 source code on your system, go to Step 9. |

Step 7:  Load the 9-track magnetic tape on which the System V Release 3.0 Source Code Provision was delivered into drive 0 of the host machine.

Step 8:  Install the source by executing:

> **cpio −icduvmB < /dev/rmt/0m**

Step 9:  Load the 9-track magnetic tape on which the System V Release 3.1 Source Code Provision was delivered into drive 0 of the host machine.

| NOTE | If you want to save old source code, i.e. Release 3.0, continue with step 10. Otherwise, go to Step 13. You may decide to back up your original 3.0 source in the event you want to return to the 3.0 system you previously had in place. |

Step 10:  Verify there is adequate space in **$ROOT/usr**. See Figure 1.

> **df $ROOT/usr**

Step 11:  Create a directory to save the Release 3.0 Source Code.

> **mkdir $ROOT/usr/old/3.0**

Step 12:  Move the Release 3.0 source code to the new directory.

> **find $ROOT/usr/src −print | cpio −pdlu $ROOT/usr/old/3.0**

| WARNING | The following steps will remove the contents of files referenced in Steps 13 through 15 from your system. If you want to save these files you must go back to Step 10 before continuing with Step 13 if you have not done so already. |

Step 13:  Retrieve the update and remove lists from the tape.

> **cpio −idmuvB /dev/rmt/0m etc/rlist etc/updlist**

| NOTE | After the two filenames are printed on the screen, the command will continue to search. Hit the **<BREAK>** key to stop. |

Step 14: Sever the links between **$ROOT/usr/src** and **$ROOT/usr/old/3.0** leaving the original 3.0 data in **$ROOT/usr/old/3.0**.

> **xargs rm −rf < $ROOT/etc/rlist**
> **xargs rm −rf < $ROOT/etc/updlist**

Step 15: Install the source by executing:

> **cpio −icduvmB < /dev/rmt/0m**

Step 16: Load the 9-track magnetic tape on which the System V Release 3.2 Source Code Provision was delivered into drive 0 of the host machine.

> **NOTE** If you want to save your old 3.1 source code, continue with Steps 17 through 19. Otherwise go to Step 20. You may decide to back up your original 3.1 source in the event you want to return to the 3.1 system you previously had in place.

Step 17: Verify there is adequate space in **$ROOT/usr**. See Figure 1.

> **df $ROOT/usr**

Step 18: Create a directory to save the Release 3.1 Source Code.

> **mkdir $ROOT/usr/old/3.1**

Step 19: Move the Release 3.1 source code to the new directory.

> **find $ROOT/usr/src −print | cpio −pdlu $ROOT/usr/old/3.1**

> **WARNING** The following steps will remove the contents of files referenced in Steps 20 through 22 from your system. If you want to save these files you must go back to Step 17 before continuing with Step 20 if you have not done so already.

---

Step 20: Retrieve the update and remove lists from the tape.

> **cpio −idmuvB /dev/rmt/0m etc/rlist etc/updlist**
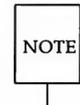
> **NOTE** After the two filenames are printed on the screen, the command will continue to search. Hit the **<BREAK>** key to stop.

Step 21: Sever the links between **$ROOT/usr/src** and **$ROOT/usr/old/3.1** leaving the original 3.1 data in **$ROOT/usr/old/3.1**.

> **xargs rm −rf < $ROOT/etc/rlist**
> **xargs rm −rf < $ROOT/etc/updlist**

Step 22: Install the source by executing:

> **cpio −icduvmB < /dev/rmt/0m**

Step 23: Reset the shell variable **PATH** to include the path of the cross-compile **bin** directory where the cross-compile commands are located.

> **PATH=*cross_bin*:$PATH**
> **export PATH**

Step 24: Build the **cpset** command by executing:

> **cd $ROOT/usr/src/cmd**
> **/bin/make cpset**
> **cp cpset *cross_bin***

Step 25: Build the **tic** command by executing:

> **cd ../lib/libcurses**
> **/bin/make −f libcurses.mk clobber**
> **cd screen**
> **/bin/make curses.h unctrl.h curshdr.h \<CR>**
> **term.h uparm.h tic**
> **cp curses.h term.h unctrl.h *cross_inc***
> **cp tic *cross_bin***
> **cd ..**
> **/bin/make −f libcurses.mk clobber**

Step 26: Set the target machine in the *cross_bin* directory. Set **u3b2** to **true**. Set **u3b5, u3b15, u3b, pdp11**, and **vax** to **false**.

    cpset /bin/true *cross_bin*/**u3b2**
    cpset /bin/false *cross_bin*/**u3b5**
    cpset /bin/false *cross_bin*/**u3b15**
    cpset /bin/false *cross_bin*/**u3b**
    cpset /bin/false *cross_bin*/**pdp11**
    cpset /bin/false *cross_bin*/**vax**

Step 27: Install the header files in **$ROOT/usr/include** and **$ROOT/usr/include/sys**.

    **cd $SRC**
    **./:mkhead**

Step 28: Install the kernel system header files in the **/usr/include/sys** directory.

    **./:mksyshead**

Step 29: Build **mkboot** and copy it into the **bin** directory for your cross-compilation commands by executing the following group of commands.

    **cd $ROOT/usr/src/cmd/mkboot**
    **/bin/make −f mkboot.mk CH= CC=cc \<CR>**
    **CFLAGS="−I/usr/include −I$ROOT/usr/include"**
    **cp mkboot** *cross_bin*
    **/bin/make −f mkboot.mk clobber**

> **NOTE** The order of the options to which the **CFLAGS** variable is set in Step 29 is compiler-implementation dependent. The recommended setting for **CFLAGS** is shown in Step 29. If this results in compilation errors, reverse the sense of the arguments to
>
>     **CFLAGS="−I$ROOT/usr/include −I/usr/include"**

Step 30: Build **scpmake** and **make**, and copy them into the **bin** directory for your cross-compilation commands by executing the following groups of commands.

    **cd $ROOT/usr/src/cmd/make**
    **/bin/make −f make.mk**

    **cp make** *cross_bin*/**scpmake**
    **/bin/make −f make.mk clobber**

    **cp $ROOT/usr/src/MAKE** *cross_bin*/**make**
    **chmod 777** *cross_bin*/**make**

> **NOTE** Note that **make** is copied to *cross_bin*/**scpmake**, not to *cross_bin*/**make**, and that MAKE is copied to *cross_bin*/**make**.

Step 31: Generate the temporary files **make** and **sh** in the directory **$ROOT/bin**.

    **cd $ROOT/bin**
    **touch make sh**
    **chmod 666 make sh**

Step 32: Copy the following source file to **$ROOT/usr/lib**.

    **cp $ROOT/usr/src/cmd/lint/llib−lc $ROOT/usr/lib**

Step 33: Set and export the following shell variables.

    **PFX=**_cross_compile_prefix_
    **INC=$ROOT/usr/include**
    **INCSYS=$ROOT/usr/include/sys**
    **AS=${PFX}as**
    **CC=${PFX}cc**
    **LD=${PFX}ld**
    **export PFX INC INCSYS AS CC LD**

> **NOTE** The value of **PFX** is a cross-compiler dependent machine identifier that is prepended to cross-compiler commands.

Step 34: Copy the header files into the directory where your cross-compiler expects to find them.

    **cd $INC**
    **find . −print | cpio −pudm** *cross_inc*

Step 35: Build all libraries, and copy them into the directory where your cross compiler expects to find them.

> **cd $SRC**
> **. /: mklib \\* clobber**
> **cd $ROOT/lib**
> **find . −print | cpio −pudm** *cross_lib*
> **cd $ROOT/usr/lib**
> **find . −print | cpio −pudm** *cross_lib*

Step 36: To build the entire Source Code Provision, execute the following commands.

> **cd $SRC**
> **. /: mk**

Step 37: If you are building the Source Code Provision on a machine other than an AT&T 3B2 Computer running UNIX System V Release 3.0, 3.1, or 3.2, a shell syntax error may occur while you are building **layers** and **sa**. If this error occurs, follow the instructions below to build these two commands.

1. Edit the file **$ROOT/usr/src/cmd/layers/layers.mk**. Delete every occurrence of the string $(CH).

2. Edit the file **$ROOT/usr/src/cmd/layers/wtinit/wtinit.mk**. Delete every occurence of the string $(CH).

3. Create the directory **$ROOT/usr/lib/layersys**.

   > **mkdir $ROOT/usr/lib/layersys**

4. Rebuild **layers** by executing:

   > **cd $ROOT/usr/src**
   > **. /: mkcmd layers**

5. Edit the file **$ROOT/usr/src/cmd/sa/sa.mk**. Delete every occurence of the string $(CH).

6. Create the directory **$ROOT/usr/lib/sa**.

   > **mkdir $ROOT/usr/lib/sa**

7. Create the file **$ROOT/usr/spool/cron/crontabs/sys**.

   > **touch $ROOT/usr/spool/cron/crontabs/sys**

8. Rebuild **sa** by executing:

   > **cd $ROOT/usr/src**
   > **. /: mkcmd sa**

Step 38: When you have finished building the Source Code Provision, you must reinstall the standard **make** in the cross-compile **bin** directory.

> **cd** *cross_bin*
> **mv scpmake make**

Step 39: Reset the shell variable **PATH** to exclude the cross-compile **bin** directory.

> **PATH=`echo $PATH | sed "s,** *cross_bin:,,* **"`**

# Incorporating the New Kernel into a System V Release 3.0, 3.1, or 3.2 Operating System

If you have built the Source Code Provision on a 3B2 Computer running UNIX System V Release 3.0, 3.1, or 3.2, you will need to incorporate the new kernel into the operating system before you can use it. This is true for both root and changed root environments.

> **NOTE**
>
> The locations of files in the commands in this section will vary depending on the root directory used for building the Source Code Provision. If you built in a cross environment, the pathnames are relative to the root directory of your cross environment.

Step 1: Before you begin, save a copy of the existing /unix file. If necessary, you can recover the old kernel by moving /old.unix back to /unix or by entering firmware mode and booting old.unix.

    mv /unix /old.unix

Step 2: If you built the Source Code Provision in a changed root or cross environment, set ROOT to the root directory of the build and export ROOT.

    ROOT=new_root
    export ROOT

If you built the Source Code Provision in the standard root directory, set ROOT to null and export ROOT.

    ROOT=""
    export ROOT

Step 3: Install the new kernel in the boot directory.

    cp $ROOT/usr/src/uts/3b2/KERNEL /boot

Step 4: Change directory to $ROOT/usr/src/uts/3b2/os.

    cd $ROOT/usr/src/uts/3b2/os

Step 5: Copy DISP to /boot.

    cp DISP /boot

Step 6: Change directory to $ROOT/usr/src/uts/3b2/io.

    cd $ROOT/usr/src/uts/3b2/io

Step 7: Copy the following files to /boot.

    cp CLONE GENTTY HDELOG IDISK IPC \<CR>
    IUART LOG MAU MEM MSG PORTS PRF SEM \<CR>
    SHM SP STUBS SXT TIMOD TIRDWR /boot
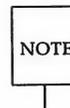
> **NOTE**
>
> If you are building on an empty system, all the files listed may not exist.
>
> If you have an AT&T Teletype®5620 terminal, continue with Steps 8 and 9. If you do not have this type of terminal continue with Step 10.

Step 8: Create a bootable driver and place it in the current directory.

    mkboot −d . −m ../master.d xt.o

Step 9: Copy the loadable image of the xt driver to /boot.

    cp XT /boot

Step 10: Change directory to $ROOT/usr/src/uts/3b2/fs/s5.

    cd ../fs/s5

Step 11: Copy System V driver to /boot.

    cp S5 /boot

Step 12: If you want to include the Remote File Sharing Utilities driver, execute the following four commands.

    cd ../du
    cp DUFST /boot
    cd ../../nudnix
    cp DU /boot

If you are including the Remote File Sharing Utilities driver but the AT&T STARLAN NETWORK Release 1.1 and Networking Support Utilities Release 1.2 packages have not been installed, install them now.

sysadm    installpkg

Step 13:    Change directory to the root directory.

cd  /

Step 14:    Enter firmware mode (see the *System Administrator's Guide*, Pro-
cedure 3.5, "Running Firmware Programs").

**shutdown −i5 −g0 −y**

Step 15:    Your system will now be in firmware mode.  Boot the system
using **/etc/system** as the program to be executed.  This will
bring your 3B2 Computer up under the new kernel and will gen-
erate a new **/unix**.

| | |
|---|---|
| NOTE | If you want to boot the old UNIX system you may do so by typing **/old.unix** while in firmware mode. |

## Installing New Boot Programs

The following commands install the new boot programs.

Step 1:    If you built the Source Code Provision in a changed root or cross
environment, set **ROOT** to the root directory of the build and
export **ROOT**.

**ROOT=***new_root*
**export ROOT**

If you built the Source Code Provision in the standard root direc-
tory, set **ROOT** to null and export **ROOT**.

**ROOT=""**
**export  ROOT**

Step 2:    Change directory to the boot directory.

**cd   $ROOT/usr/src/uts/3b2/boot**

Step 3:    Install the boot programs.

**/etc/newboot olboot/olboot mboot/mboot \<CR>
/dev/rdsk/c1d0s7**

| | |
|---|---|
| NOTE | A **/lib/lboot** has already been installed by :mkuts. |

## Building Selected Parts of the Source Code Provision

The following commands build individual parts of the system. To use them you must change directory to **/usr/src**

./:mklib **libmalloc**

> builds and installs the memory allocation library

./:mklib **libm libmalloc**

> builds and installs the math and memory allocation libraries

**NOTE**
If you have not already built and installed all libraries, you must do so before executing any of the following commands. To build and install all libraries, execute

./:mklib \*

Once this is done, you can continue with the remaining commands.

./:mkcmd \*     build and install all commands found under **/usr/src/cmd**

./:mkcmd **sgs**    build and install the C compilation system from the Source Code Provision

./:mkcmd **who ls**

> build and install the **who** and **ls** commands

./:mkuts       build and install the kernel as **/usr/src/uts/3b2/KERNEL**

## Software Notes

The following notes contain information that may help you avoid problems during installation or that may help you troubleshoot if problems arise while building the system.

## Programmer's Reference Manual

### ctime(3C) 3.0

The type of the argument **clock** in the **ctime, gmtime,** and **localtime** routines has been changed from "pointer to **long**" to "pointer to **time_t**." This change was made to bring System V closer to conformance with the IEEE standard on the UNIX operating system.

No source code changes are required for Release 3.1, but you should start changing source code now to ensure compatibility with future UNIX releases. All previously compiled programs and application packages that use these routines will still work with this release.

### fread(3S) 3.0

The type of the "size" argument to the **fwrite** and **fread** routines and the **strncat, strncpy,** and **strncmp** string manipulation routines, has been changed from **int** to **size_t**. This is another change to bring System V closer to conformance with the IEEE standard on the UNIX operating system. By changing the type to **size_t**, larger buffers or longer strings can be handled by these routines.

No source code changes are required for Release 3.1, but you should start changing source code now to ensure compatibility with future UNIX releases. All previously compiled programs and application packages that use these routines will still work with this release.

### #ident Entries

The #ident entries for the header files are different in the Source Code Provision and in the C Programming Language Utilities Issue 4.1.

All #ident entries are expanded when the source code is built. As a result, when the Source Code Provision is compiled it will produce binary modules that are 10–20% larger than the binaries supplied with the Utilities packages.

You can use mcs(1) either to remove or to compress the #ident entries.

## User's Reference Manual

### getopts Command To Replace getopt

UNIX System V Release 3 is the last release for which the **getopt** command will be supported. The command **getopts**, an enhanced version of **getopt**, will replace it. Shell scripts that use **getopt** may fail under later releases and should be converted. See *AT&T 3B2 Computer UNIX System V Release 3 Product Overview*, "Standardization Activities." Conversion procedures are described in *AT&T 3B2 Computer System V Release 3 Release Notes* and the **getopts**(1) manual page in *UNIX System V Release 3 User's Reference Manual*.

### oawk

In building the Release 3.2 Source Code Provision, **oawk**(1) is equivalent to the Binary Provision **awk**(1). The Release 3.2 Source Code Provision **awk**(1) is equivalent to the Binary Provision **nawk**(1).

## System Administrator's Reference Manual

### mk(8)

The :mkcmd, :mklib, and :mkuts functions of the **mk**(8) command will now check for an environment variable, *CLOBBER*, before executing **make clobber**. If this variable is set to "OFF", then **make clobber** will *not* be performed. If the variable is not set or is set to anything other than "OFF", then **make clobber** *will* be performed.

### idload

When you use the loopback function of RFS, many of the ID mapping features do not function properly in this release. You should use only **global** blocks of information in mapping files (**uid.rules** and **gid.rules** files). Within global blocks only **default transparent** works as intended. Any specific mapping (**map** lines) or attempts to use **host** blocks will result in users and groups being mapped to **60002**.

### Process Accounting

Process accounting must be started by the user. It no longer runs automatically when in multi-user mode. If you want process accounting to run, you must do the following procedure:

Step 1:    Log in as superuser if you have not already done so.

Step 2:    Start Process Accounting with the startup procedure of **acctsh**(1M).

**/usr/lib/acct/startup**
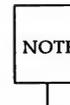
NOTE    To stop Process Accounting use **/usr/lib/acct/shutacct**.

The holiday file used by the Process Accounting Utilities package is not current. You will have to make the appropriate changes in the file **/usr/lib/acct/holidays**.

### listen

After building the **listen** daemon run the following commands:

```
cd  /usr/src/cmd/listen
cp  listen.h  /usr/include
```

### init

After building **init** you must run the following commands to make **telinit** consistent with the documentation.

```
rm  /bin/telinit
ln  /etc/init  /etc/telinit
```

## Miscellaneous

### gettydefs

If you want the newest gettydefs(4) file to be in your on-line system you must copy it from the source tree. To do so, type:

cp $ROOT/usr/src/cmd/.adm/u3b2/gettydefs /etc/gettydefs

### /etc/rc.d

The shell scripts **sysetup**, **autoconfig**, and **disks** in the directory /etc/rc.d are executed more than once during a boot procedure. If you want to reduce the amount of time it takes to boot the system you may remove these files from **/etc/rc.d** by typing:

cd /etc/rc.d
rm sysetup autoconfig disks

### Ignore /usr/src/cmd/sa/README

The file **/usr/src/cmd/sa/README** contains information that is incorrect and misleading. Disregard this file.

### Floppy Initialization

The directory **/usr/src/cmd/.cmd-3b2** contains files that are used to build the initialization floppies for the AT&T 3B2 Computer. Because these files are not used by a running UNIX System V Release 3.2 system, they are not built by the procedures described in this document.

If you want to create the files needed for floppy initialization, execute the following commands.

cd /usr/src/cmd
mv .cmd-3b2 cmd-3b2
cd ..
./:mkcmd cmd-3b2

This procedure creates the **/mkfs** directory. This directory and the files it contains are not needed by a running 3B2 Computer system and may be removed.

### Commands Whose Binaries Do Not Bit Compare with the Binary Product

Executables for the following commands, when built using the Source Code Provision, do not bit compare with the UNIX System V Release 3.2 binary product. The executables function identically in all cases.

usr/bin/awk
usr/bin/oawk
usr/bin/egrep
usr/lib/libg.a
etc/mkboot

The binaries of packages not reissued for Release 3.2 but built using the Source Code Provision may not compare with the Release 3.2 binary product.

### Freeing Disk Space

Several groups of files and directories may be removed after you build the system if file space is needed. The location of these files may vary depending on the root directory used for the build. If you built the Source Code Provision in a cross environment, all pathnames listed below are relative to the root directory of your cross environment. If you built the Source Code Provision within a changed root, execute **chroot** to get back into the **root** of the build, then remove the files using the pathnames given below.

After building the Source Code Provision, **.o** files will be found in the subdirectories under **/usr/src/uts/3b2**. Since these files are not needed after the build is complete, you may want to remove them to save disk space. To remove the **.o** files, execute the following commands.

cd /usr/src/uts/3b2
make −f unix.mk clean

Files prefixed by the string "OLD" may be removed. These files are created to preserve the existing versions of commands before installing the new versions. They may not exist after the build if a root directory other than the standard **root** directory is used.

/bin/OLDsh
/bin/OLDmake
/etc/OLDinit
/etc/OLDcron

/etc/OLDgetty
/etc/OLDhdelogger
/shlib/OLDlibnsl_s
/usr/bin/OLDshl
/usr/lib/sa/OLDsadc
/usr/net/nls/OLDlisten

These files cannot be deleted until the system has been rebooted and is running the new operating system.

All files with the prefix **libc_s—** that are found in the directory **shlib** under the root directory used for the build may be removed.

rm /shlib/libc_s—*

## Warning Messages

Warning messages may occur while you are building the Source Code Provision. The errors that issue these warnings will not affect the build, and should be ignored. Some messages that may be seen are listed below.

Conversion of double to float is out of range

Illegal pointer combination

Illegal pointer/integer combination

Syntax requires ; at end of struct/union declaration

Mixed signs with unsigned destination can cause erroneous flags

UX tsort: INFORM: cycle in data

*variable_name* previously declared extern, becomes static

Visible .text symbol, *symbol_name*, not included in branch table

*variable_name* unused

*variable_name* set but not used

*variable_name* declared but never used

*variable_name* defined but never used

Template can run out of registers

Line *xx* hides line *yy*

Extra tokens (ignored) after directive

Invariant comparison

Failed to make directory *directory_name*; File exists

Install: —u and —g options available only to root (ignored)

ln: *file1* and *file2* are identical

mcs — couldn't rewrite /etc/init

mcs — couldn't rewrite /etc/telinit

mcs — couldn't rewrite /bin/sh

mcs — couldn't rewrite /bin/rsh

rmdir: Directory not empty (ignored)

No directory found for *filename* /usr/src/lib (when running :**mklib**)

Symbol directory deleted from archive libPW.a (when building **libPW**)

Syntax error at line 276: end of file unexpected (when building **install**)

Messages that are not recognizable as one of these should be carefully scrutinized.

## Random /lib/optim Failure

Some early models of the AT&T 3B2/300 Computer may exhibit random failures while building the Source Code Provision. These failures exhibit themselves as:

```
***Fatal Error in /lib/optim
***Status Code 0213
```

If such a failure occurs, rebuild the failed components. See "Building Selected Parts of the Source Code Provision Product," above.

## Permissions That Must Be Changed

To execute the object code generated by building the Source Code Provision, you must make the following commands executable.

/bin/basename
/bin/dirname
/usr/bin/dircmp
/usr/bin/greek
/etc/install
/etc/mvdir

You can do this by executing:

```
chmod +x /bin/basename /bin/dirname\<CR>
/usr/bin/dircmp /usr/bin/greek /etc/install
chmod o+x /etc/mvdir
```

### RFS: fs_getdents

If the File System Switch code performs **copyout()**s in larger than 1024 byte chunks, the client or server may **PANIC** due to the fact that when **rcopyout()** splits the data into **DATASIZE** size chunks (1024 bytes) for transmission, the data may not be on *struct dirent* boundaries. If the File System Switch code performs **copyout()**s with buffers that contain a partial *struct dirent* entry, the same problem occurs.

This will only be a problem with large **copyout()**s from remote file systems in a heterogeneous environments. Don't do **getdents**(2) requests with a buffer size greater than 1 Kilobyte.

### The Shell

The modifications made to the *sh* command for UNIX System V Release 3.2 may cause compatibility problems. For this reason, two binary versions of the shell are supplied with System V Release 3.2. One version passes the *effective* user permissions to sub-programs as in previous releases, the other version resets the user and group IDs based on certain conditions (**NOPASSIDS** *ifdef* section in the shell component *main.c* will be executed). Both are available as part of the Essential Utilities Package in System V Release 3.2. A mechanism is documented in the UNIX System V Release 3.2 *Binary Release Notes* detailing how a System Administrator installs the version of the shell suitable for their particular environment.

### s5inode.h

The data structure in s5inode.h for the in-core, s5 (and s52k) dependent inode was made bigger by one byte to hold a file generation number needed by NFS. The generation number is maintained by s5 and s52k routines whether or not NFS is installed. At the present time, the crash command does not print this file generation number located in the s5 (and s52k) dependent portion of the inode.

### Disk Inode Structure

The previously unused 40th byte of the disk inode is now being used. The size of the disk inode structure in *ino.h* has not changed; the 40th byte has just been given a label. A file generation number needed by NFS is stored in this byte. This generation number is maintained by s5 and s52k routines whether or not NFS is installed. Customers who may have used this byte for their own purposes may now find that their application breaks.

### libsec functions

Component **libsec** in the 3.2 unix source tree contains library functions **getspent()** and **lckpwdf()** which are used for accessing entries in the shadow passwd file.

## Future Directions

### libPW

We are currently reviewing the contents of the library /lib/libPW.a. It is likely that some of the functions defined in **libPW** will be removed in the next release of this product. If you have any code that relies on **libPW**, we recommend that you reimplement it using existing functions in the standard C library or that you retain copies of the **libPW** functions that you need.

### sys.s

Because **/usr/src/head/sys.***machine* is no longer used by any 3B2 or 3B15 Computer, UNIX System V Source Code, **:mkhead**, will no longer install this file into **usr/include/sys.s**. All code referring to processor specific *sys.machine* will be deleted from the **:mkhead** shell script.

### cpset

In the next major UNIX System Source Code release, **cpset** will no longer be supported. If you have any code that relies on **cpset**, we recommend that you replace all references of **cpset** with the **install** command (refer to manual pages for the appropriate syntax).

### f77

In the next major UNIX System Release, **f77** will no longer be supported.

## Documentation

### How to Order Documents

Additional copies of any document or optional documents can be ordered by calling AT&T Customer Information Center (CIC):

1-800-432-6600 (toll free within the continental United States)

1-317-352-8556 (outside the continental United States)

or by writing to:

AT&T Customer Information Center
Customer Service Representative
P. O. Box 19901
Indianapolis, Indiana 46219

### Document List

The following documents are delivered with the UNIX System V Release 3.2 Source Code Provision. The number in parentheses is the select code. The Select Code uniquely identifies the document and should be used when ordering additional copies.

Several of the documents listed are Release Notes. Release Notes tell you how to install a product and the utilities delivered with it, how to avoid problems both while you are installing a product and while you are using it, and how to upgrade from a previous release.

- *UNIX System V Release 3.1 Source Code Provision Release Notes* (this document) (TBD)

- *UNIX System V Release 3 Programmer's Reference Manual update Pages*

- *AT&T 3B2 Computer UNIX System V Release 3 System Administrator's Reference Manual update pages* (TBD)

- *UNIX System V Release 3 User's Reference Manual update pages*

- *AT&T 3B2 Computer Remote File Sharing Utilities Release 1.2 Release Notes* (TBD)

# A    Source Code Provision

File Update List                                              A-1

# File Update List

etc/rlist
etc/updlist
usr/src/:mk
usr/src/:mkcmd
usr/src/:mklib
usr/src/:mkuts
usr/src/cmd/.adm/.adm.mk
usr/src/cmd/.adm/root
usr/src/cmd/.adm/u3b2/passwd
usr/src/cmd/.adm/u3b2/shadow
usr/src/cmd/.cmd-3b2/cmd-3b2.mk
usr/src/cmd/.cmd-3b2/inst/bin/fstab
usr/src/cmd/.cmd-3b2/inst/bin/movefiles
usr/src/cmd/.cmd-3b2/inst/etc/define
usr/src/cmd/.cmd-3b2/inst/etc/instf
usr/src/cmd/.cmd-3b2/inst/etc/insth
usr/src/cmd/.cmd-3b2/pnewboot.c
usr/src/cmd/bbh/bbh.mk
usr/src/cmd/bbh/hdecmds.h
usr/src/cmd/bbh/hdefix.c
usr/src/cmd/bnu.admin/adddevice
usr/src/cmd/bnu.admin/addsystem
usr/src/cmd/bnu.admin/bnu.admin.mk
usr/src/cmd/chgrp/chgrp.c
usr/src/cmd/chown/chown.c
usr/src/cmd/ckbupscd/ckbupscd.mk
usr/src/cmd/clri/clri.c
usr/src/cmd/cpio/cpio.c
usr/src/cmd/crash/proc.c
usr/src/cmd/crash/stream.c
usr/src/cmd/cron/at.c
usr/src/cmd/cron/cron.c
usr/src/cmd/cron/cron.mk
usr/src/cmd/cron/crontab.c
usr/src/cmd/cron/logchecker.sh
usr/src/cmd/ct/ct.c
usr/src/cmd/ct/ct.mk
usr/src/cmd/cu/cu.c
usr/src/cmd/cu/cu.mk

usr/src/cmd/cu/culine.c
usr/src/cmd/dbfconv/dbfconv.mk
usr/src/cmd/dcopy/dcopy.c
usr/src/cmd/dcopy/dcopy.mk
usr/src/cmd/devinfo/devinfo.c
usr/src/cmd/df/df.c
usr/src/cmd/df/df.mk
usr/src/cmd/drvinstal/drvinstal.c
usr/src/cmd/drvinstal/drvinstal.mk
usr/src/cmd/dsconfig/dsconfig.mk
usr/src/cmd/dsconfig/dsconfig.sh
usr/src/cmd/edittbl/editsa
usr/src/cmd/edittbl/edittbl.c
usr/src/cmd/edittbl/edittbl.mk
usr/src/cmd/false/false.mk
usr/src/cmd/false/false.sh
usr/src/cmd/ff/ff.c
usr/src/cmd/file/file.c
usr/src/cmd/finc.c
usr/src/cmd/finc.mk
usr/src/cmd/find/find.c
usr/src/cmd/fltboot/fltboot.c
usr/src/cmd/fmli/fmli.mk
usr/src/cmd/fmli/form/fcheck.c
usr/src/cmd/fmli/form/fclose.c
usr/src/cmd/fmli/form/fctl.c
usr/src/cmd/fmli/form/fcurrent.c
usr/src/cmd/fmli/form/fcustom.c
usr/src/cmd/fmli/form/fdefault.c
usr/src/cmd/fmli/form/form.mk
usr/src/cmd/fmli/form/frefresh.c
usr/src/cmd/fmli/inc/actrec.h
usr/src/cmd/fmli/inc/attrs.h
usr/src/cmd/fmli/inc/but.h
usr/src/cmd/fmli/inc/color_pair.h
usr/src/cmd/fmli/inc/ctl.h
usr/src/cmd/fmli/inc/detabdefs.h
usr/src/cmd/fmli/inc/eval.h
usr/src/cmd/fmli/inc/exception.h
usr/src/cmd/fmli/inc/form.h
usr/src/cmd/fmli/inc/if_menu.h

usr/src/cmd/fmli/inc/ifuncdefs.h
usr/src/cmd/fmli/inc/io.h
usr/src/cmd/fmli/inc/mail.h
usr/src/cmd/fmli/inc/menudefs.h
usr/src/cmd/fmli/inc/menutypes.h
usr/src/cmd/fmli/inc/mess.h
usr/src/cmd/fmli/inc/message.h
usr/src/cmd/fmli/inc/mio.h
usr/src/cmd/fmli/inc/moremacros.h
usr/src/cmd/fmli/inc/obj.h
usr/src/cmd/fmli/inc/optabdefs.h
usr/src/cmd/fmli/inc/parse.h
usr/src/cmd/fmli/inc/partabdefs.h
usr/src/cmd/fmli/inc/procdefs.h
usr/src/cmd/fmli/inc/retcds.h
usr/src/cmd/fmli/inc/retcodes.h
usr/src/cmd/fmli/inc/slk.h
usr/src/cmd/fmli/inc/smdef.h
usr/src/cmd/fmli/inc/status.h
usr/src/cmd/fmli/inc/terror.h
usr/src/cmd/fmli/inc/token.h
usr/src/cmd/fmli/inc/tsys.h
usr/src/cmd/fmli/inc/typetab.h
usr/src/cmd/fmli/inc/var_arrays.h
usr/src/cmd/fmli/inc/vt.h
usr/src/cmd/fmli/inc/vtdefs.h
usr/src/cmd/fmli/inc/windefs.h
usr/src/cmd/fmli/inc/winp.h
usr/src/cmd/fmli/inc/wish.h
usr/src/cmd/fmli/menu/mclose.c
usr/src/cmd/fmli/menu/mctl.c
usr/src/cmd/fmli/menu/mcurrent.c
usr/src/cmd/fmli/menu/mcustom.c
usr/src/cmd/fmli/menu/mdefault.c
usr/src/cmd/fmli/menu/menu.h
usr/src/cmd/fmli/menu/menu.mk
usr/src/cmd/fmli/menu/mreshape.c
usr/src/cmd/fmli/menu/stmenu.c
usr/src/cmd/fmli/oeu/genparse.c
usr/src/cmd/fmli/oeu/oeu.c
usr/src/cmd/fmli/oeu/oeu.mk

usr/src/cmd/fmli/oeu/oeupack.c
usr/src/cmd/fmli/oeu/rm_atob.c
usr/src/cmd/fmli/oh/action.c
usr/src/cmd/fmli/oh/alias.c
usr/src/cmd/fmli/oh/cmd.c
usr/src/cmd/fmli/oh/detab.c
usr/src/cmd/fmli/oh/detect.c
usr/src/cmd/fmli/oh/dispfuncs.c
usr/src/cmd/fmli/oh/evstr.c
usr/src/cmd/fmli/oh/externoot.c
usr/src/cmd/fmli/oh/fm_mn_par.c
usr/src/cmd/fmli/oh/fm_mn_par.h
usr/src/cmd/fmli/oh/getval.c
usr/src/cmd/fmli/oh/helptext.c
usr/src/cmd/fmli/oh/if_ascii.c
usr/src/cmd/fmli/oh/if_dir.c
usr/src/cmd/fmli/oh/if_exec.c
usr/src/cmd/fmli/oh/if_form.c
usr/src/cmd/fmli/oh/if_help.c
usr/src/cmd/fmli/oh/if_init.c
usr/src/cmd/fmli/oh/if_menu.c
usr/src/cmd/fmli/oh/ifuncs.c
usr/src/cmd/fmli/oh/is_objtype.c
usr/src/cmd/fmli/oh/make_obj.c
usr/src/cmd/fmli/oh/misc.c
usr/src/cmd/fmli/oh/namecheck.c
usr/src/cmd/fmli/oh/nextpart.c
usr/src/cmd/fmli/oh/obj_to_opt.c
usr/src/cmd/fmli/oh/obj_to_par.c
usr/src/cmd/fmli/oh/objform.h
usr/src/cmd/fmli/oh/objhelp.h
usr/src/cmd/fmli/oh/objmenu.h
usr/src/cmd/fmli/oh/odftread.c
usr/src/cmd/fmli/oh/odikey.c
usr/src/cmd/fmli/oh/oh.mk
usr/src/cmd/fmli/oh/oh_init.c
usr/src/cmd/fmli/oh/one_menfun.c
usr/src/cmd/fmli/oh/ootpart.c
usr/src/cmd/fmli/oh/ootread.c
usr/src/cmd/fmli/oh/opt_rename.c
usr/src/cmd/fmli/oh/optab.c

usr/src/cmd/fmli/oh/optabfuncs.c
usr/src/cmd/fmli/oh/ott_mv.c
usr/src/cmd/fmli/oh/partab.c
usr/src/cmd/fmli/oh/partabfunc.c
usr/src/cmd/fmli/oh/path_to_vp.c
usr/src/cmd/fmli/oh/pathott.c
usr/src/cmd/fmli/oh/pathtitle.c
usr/src/cmd/fmli/oh/scram.c
usr/src/cmd/fmli/oh/slk.c
usr/src/cmd/fmli/oh/suffuncs.c
usr/src/cmd/fmli/oh/typefuncs.c
usr/src/cmd/fmli/oh/typetab.c
usr/src/cmd/fmli/proc/list.c
usr/src/cmd/fmli/proc/open.c
usr/src/cmd/fmli/proc/pclose.c
usr/src/cmd/fmli/proc/pctl.c
usr/src/cmd/fmli/proc/pcurrent.c
usr/src/cmd/fmli/proc/pdefault.c
usr/src/cmd/fmli/proc/pnoncur.c
usr/src/cmd/fmli/proc/proc.h
usr/src/cmd/fmli/proc/proc.mk
usr/src/cmd/fmli/proc/suspend.c
usr/src/cmd/fmli/qued/arrows.c
usr/src/cmd/fmli/qued/copyfield.c
usr/src/cmd/fmli/qued/editmulti.c
usr/src/cmd/fmli/qued/editsingle.c
usr/src/cmd/fmli/qued/editvirt.c
usr/src/cmd/fmli/qued/fclear.c
usr/src/cmd/fmli/qued/fgo.c
usr/src/cmd/fmli/qued/fmacs.h
usr/src/cmd/fmli/qued/fput.c
usr/src/cmd/fmli/qued/fread.c
usr/src/cmd/fmli/qued/fstream.c
usr/src/cmd/fmli/qued/getfield.c
usr/src/cmd/fmli/qued/initfield.c
usr/src/cmd/fmli/qued/mfuncs.c
usr/src/cmd/fmli/qued/multiline.c
usr/src/cmd/fmli/qued/putfield.c
usr/src/cmd/fmli/qued/qued.mk
usr/src/cmd/fmli/qued/scrollbuf.c
usr/src/cmd/fmli/qued/setfield.c

usr/src/cmd/fmli/qued/sfuncs.c
usr/src/cmd/fmli/qued/singleline.c
usr/src/cmd/fmli/qued/syncfield.c
usr/src/cmd/fmli/qued/vfuncs.c
usr/src/cmd/fmli/qued/wrap.c
usr/src/cmd/fmli/sys/actrec.c
usr/src/cmd/fmli/sys/ar_mfuncs.c
usr/src/cmd/fmli/sys/backslash.c
usr/src/cmd/fmli/sys/chgenv.c
usr/src/cmd/fmli/sys/chgepenv.c
usr/src/cmd/fmli/sys/coproc.c
usr/src/cmd/fmli/sys/copyfile.c
usr/src/cmd/fmli/sys/estrtok.c
usr/src/cmd/fmli/sys/eval.c
usr/src/cmd/fmli/sys/evfuncs.c
usr/src/cmd/fmli/sys/evstr.c
usr/src/cmd/fmli/sys/exit.c
usr/src/cmd/fmli/sys/expand.c
usr/src/cmd/fmli/sys/filename.c
usr/src/cmd/fmli/sys/genfind.c
usr/src/cmd/fmli/sys/getaltenv.c
usr/src/cmd/fmli/sys/getepenv.c
usr/src/cmd/fmli/sys/io.c
usr/src/cmd/fmli/sys/itoa.c
usr/src/cmd/fmli/sys/memshift.c
usr/src/cmd/fmli/sys/mencmds.c
usr/src/cmd/fmli/sys/nstrcat.c
usr/src/cmd/fmli/sys/onexit.c
usr/src/cmd/fmli/sys/parent.c
usr/src/cmd/fmli/sys/putaltenv.c
usr/src/cmd/fmli/sys/readfile.c
usr/src/cmd/fmli/sys/scrclean.c
usr/src/cmd/fmli/sys/spawn.c
usr/src/cmd/fmli/sys/strCcmp.c
usr/src/cmd/fmli/sys/strappend.c
usr/src/cmd/fmli/sys/stream.c
usr/src/cmd/fmli/sys/strsave.c
usr/src/cmd/fmli/sys/sys.mk
usr/src/cmd/fmli/sys/tempfiles.c
usr/src/cmd/fmli/sys/terrmess.c
usr/src/cmd/fmli/sys/terror.c

usr/src/cmd/fmli/sys/testfile
usr/src/cmd/fmli/sys/varappend.c
usr/src/cmd/fmli/sys/varchkapnd.c
usr/src/cmd/fmli/sys/varcreate.c
usr/src/cmd/fmli/sys/vardelete.c
usr/src/cmd/fmli/sys/vargrow.c
usr/src/cmd/fmli/sys/varinsert.c
usr/src/cmd/fmli/sys/varshrink.c
usr/src/cmd/fmli/sys/watch.c
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usr/src/cmd/mkboot/mkboot.y
usr/src/cmd/mkboot/util.c
usr/src/cmd/mkboot/xmkboot.l
usr/src/cmd/mkfs/mkfs.c
usr/src/cmd/mkfs/mkfs.mk

usr/src/cmd/mount/mount.c
usr/src/cmd/mv/mv.c
usr/src/cmd/mv/mv_dir.c
usr/src/cmd/mvdir.sh
usr/src/cmd/ncheck/ncheck.c
usr/src/cmd/newboot/newboot.c
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usr/src/cmd/nlsadmin/main.c
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usr/src/cmd/sa/sys/sysinfo.h
usr/src/cmd/sadmin/admin/Makefile
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usr/src/cmd/sadmin3b2/admin/menu/diskmgmt/harddisk/rmdisk
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usr/src/cmd/true/true.mk

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usr/src/cmd/uucp/Uutry
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usr/src/cmd/vm/proc/suspend.c
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usr/src/scripts/bnu/preinstall
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usr/src/scripts/fmli/UNINSTALL
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usr/src/scripts/fmli/proto.1
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usr/src/scripts/lp/ORDER3
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usr/src/scripts/lp/postinstall

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usr/src/scripts/terminf/proto.2
usr/src/scripts/terminf/setup
usr/src/scripts/vm/INSTALL
usr/src/scripts/vm/ORDER.1
usr/src/scripts/vm/UNINSTALL
usr/src/scripts/vm/proto.1

usr/src/scripts/vm/setup
usr/src/scripts/vm/vm.name
usr/src/uts/3b2/boot/boot.fast.mk
usr/src/uts/3b2/boot/boot.mk
usr/src/uts/3b2/boot/lboot/errortable
usr/src/uts/3b2/boot/lboot/lbld
usr/src/uts/3b2/boot/lboot/lboot.h
usr/src/uts/3b2/boot/lboot/lboot.mk
usr/src/uts/3b2/boot/lboot/loadunix.c
usr/src/uts/3b2/boot/lboot/main.c
usr/src/uts/3b2/boot/lboot/subr.c
usr/src/uts/3b2/boot/mboot/mboot.mk
usr/src/uts/3b2/boot/olboot/olboot.mk
usr/src/uts/3b2/boot/sys/param.h
usr/src/uts/3b2/debug/arg.s
usr/src/uts/3b2/debug/debug.mk
usr/src/uts/3b2/debug/disasm.c
usr/src/uts/3b2/debug/trace.c
usr/src/uts/3b2/fs/du/du.mk
usr/src/uts/3b2/fs/du/dusubr.c
usr/src/uts/3b2/fs/fs.fast.mk
usr/src/uts/3b2/fs/fs.full.mk
usr/src/uts/3b2/fs/fs.mk
usr/src/uts/3b2/fs/s5/s5.mk
usr/src/uts/3b2/fs/s5/s5iget.c
usr/src/uts/3b2/fs/s5/s5nami.c
usr/src/uts/3b2/fs/s5/s5subr.c
usr/src/uts/3b2/fs/s5/s5sys2.c
usr/src/uts/3b2/fs/s5/s5sys3.c
usr/src/uts/3b2/fs/s52k/s52k.mk
usr/src/uts/3b2/fs/s52k/s52kalloc.c
usr/src/uts/3b2/fs/s52k/s52kbio.c
usr/src/uts/3b2/fs/s52k/s52kblklist.c
usr/src/uts/3b2/fs/s52k/s52kiget.c
usr/src/uts/3b2/fs/s52k/s52knami.c
usr/src/uts/3b2/fs/s52k/s52kpipe.c
usr/src/uts/3b2/fs/s52k/s52krdwri.c
usr/src/uts/3b2/fs/s52k/s52ksubr.c
usr/src/uts/3b2/fs/s52k/s52ksys2.c
usr/src/uts/3b2/fs/s52k/s52ksys3.c
usr/src/uts/3b2/io/clone.c

usr/src/uts/3b2/io/drivers.mk
usr/src/uts/3b2/io/id.c
usr/src/uts/3b2/io/if.c
usr/src/uts/3b2/io/io.fast.mk
usr/src/uts/3b2/io/io.full.mk
usr/src/uts/3b2/io/io.mk
usr/src/uts/3b2/io/ldterm.c
usr/src/uts/3b2/io/ldterm.mk
usr/src/uts/3b2/io/lib.io.mk
usr/src/uts/3b2/io/mau.c
usr/src/uts/3b2/io/opts.c
usr/src/uts/3b2/io/ports.mk
usr/src/uts/3b2/io/ppc.c
usr/src/uts/3b2/io/pt.mk
usr/src/uts/3b2/io/ptem.c
usr/src/uts/3b2/io/ptem.mk
usr/src/uts/3b2/io/ptm.c
usr/src/uts/3b2/io/pts.c
usr/src/uts/3b2/io/shm.c
usr/src/uts/3b2/io/sp.c
usr/src/uts/3b2/io/stream.c
usr/src/uts/3b2/io/tirdwr.c
usr/src/uts/3b2/io/xt.mk
usr/src/uts/3b2/master.d/kernel
usr/src/uts/3b2/master.d/ldterm
usr/src/uts/3b2/master.d/opts
usr/src/uts/3b2/master.d/ptem
usr/src/uts/3b2/master.d/ptm
usr/src/uts/3b2/master.d/pts
usr/src/uts/3b2/master.d/s52k
usr/src/uts/3b2/master.d/stubs
usr/src/uts/3b2/ml/misc.s
usr/src/uts/3b2/ml/ml.mk
usr/src/uts/3b2/ml/ttrap.s
usr/src/uts/3b2/nudnix/auth.c
usr/src/uts/3b2/nudnix/canon.c
usr/src/uts/3b2/nudnix/cirmgr.c
usr/src/uts/3b2/nudnix/fileop.c
usr/src/uts/3b2/nudnix/netboot.c
usr/src/uts/3b2/nudnix/nudnix.mk
usr/src/uts/3b2/nudnix/rbio.c

usr/src/uts/3b2/nudnix/remcall.c
usr/src/uts/3b2/nudnix/rfadmin.c
usr/src/uts/3b2/nudnix/rfcanon.c
usr/src/uts/3b2/nudnix/rmount.c
usr/src/uts/3b2/nudnix/rmove.c
usr/src/uts/3b2/nudnix/rnami.c
usr/src/uts/3b2/nudnix/rsc.c
usr/src/uts/3b2/nudnix/serve.c
usr/src/uts/3b2/os/bio.c
usr/src/uts/3b2/os/exec.c
usr/src/uts/3b2/os/fork.c
usr/src/uts/3b2/os/getpages.c
usr/src/uts/3b2/os/grow.c
usr/src/uts/3b2/os/lock.c
usr/src/uts/3b2/os/main.c
usr/src/uts/3b2/os/nami.c
usr/src/uts/3b2/os/os.mk
usr/src/uts/3b2/os/physio.c
usr/src/uts/3b2/os/sig.c
usr/src/uts/3b2/os/startup.c
usr/src/uts/3b2/os/streamio.c
usr/src/uts/3b2/os/subr.c
usr/src/uts/3b2/os/swtch.c
usr/src/uts/3b2/os/sys2.c
usr/src/uts/3b2/os/sys3.c
usr/src/uts/3b2/os/sys3b.c
usr/src/uts/3b2/sys/boothdr.h
usr/src/uts/3b2/sys/buf.h
usr/src/uts/3b2/sys/ct_lla.h
usr/src/uts/3b2/sys/edt.h
usr/src/uts/3b2/sys/extbus.h
usr/src/uts/3b2/sys/fcntl.h
usr/src/uts/3b2/sys/fs/s5filsys.h
usr/src/uts/3b2/sys/fs/s5inode.h
usr/src/uts/3b2/sys/fs/s5macros.h
usr/src/uts/3b2/sys/fs/s5param.h
usr/src/uts/3b2/sys/fsid.h
usr/src/uts/3b2/sys/ino.h
usr/src/uts/3b2/sys/ldterm.h
usr/src/uts/3b2/sys/libxedt.h
usr/src/uts/3b2/sys/nami.h

usr/src/uts/3b2/sys/nisubr.h
usr/src/uts/3b2/sys/nserve.h
usr/src/uts/3b2/sys/nvram.h
usr/src/uts/3b2/sys/omnisubr.h
usr/src/uts/3b2/sys/param.h
usr/src/uts/3b2/sys/ppc.h
usr/src/uts/3b2/sys/proc.h
usr/src/uts/3b2/sys/ptem.h
usr/src/uts/3b2/sys/ptms.h
usr/src/uts/3b2/sys/signal.h
usr/src/uts/3b2/sys/stream.h
usr/src/uts/3b2/sys/sysinfo.h
usr/src/uts/3b2/sys/sysmacros.h
usr/src/uts/3b2/sys/termio.h
usr/src/uts/3b2/sys/vtoc.h
usr/src/uts/3b2/unix.fast.mk
usr/src/uts/3b2/unix.full.mk
usr/src/uts/3b2/unix.mk

# B    Source Code Provision

## File Remove List

# File Remove List

usr/src/cmd/lp/README
usr/src/cmd/lp/accept.c
usr/src/cmd/lp/cancel.c
usr/src/cmd/lp/date.c
usr/src/cmd/lp/dest.c
usr/src/cmd/lp/destlist.c
usr/src/cmd/lp/disable.c
usr/src/cmd/lp/eaccess.c
usr/src/cmd/lp/enable.c
usr/src/cmd/lp/enter.c
usr/src/cmd/lp/fatal.c
usr/src/cmd/lp/fifo.c
usr/src/cmd/lp/filter/filter.mk
usr/src/cmd/lp/findtty.c
usr/src/cmd/lp/fullpath.c
usr/src/cmd/lp/getname.c
usr/src/cmd/lp/gwd.c
usr/src/cmd/lp/isclass.c
usr/src/cmd/lp/isdest.c
usr/src/cmd/lp/isprinter.c
usr/src/cmd/lp/isrequest.c
usr/src/cmd/lp/lock.c
usr/src/cmd/lp/lp.c
usr/src/cmd/lp/lp.h
usr/src/cmd/lp/lpadmin.c
usr/src/cmd/lp/lpmove.c
usr/src/cmd/lp/lpsched.c
usr/src/cmd/lp/lpsched.h
usr/src/cmd/lp/lpshut.c
usr/src/cmd/lp/lpstat.c
usr/src/cmd/lp/model/model.mk
usr/src/cmd/lp/outlist.c
usr/src/cmd/lp/outputq.c
usr/src/cmd/lp/pstatus.c
usr/src/cmd/lp/qstatus.c
usr/src/cmd/lp/reject.c
usr/src/cmd/lp/request.c
usr/src/cmd/lp/sendmail.c
usr/src/cmd/lp/trim.c

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```
usr/src/cmd/lp/wrtmsg.c
usr/src/cmd/sa/sys/vtoc.h
usr/src/cmd/uucp/remote.unknown
usr/src/scripts/lp/proto
usr/src/scripts/lp/setup
usr/src/scripts/lp/setup1
usr/src/scripts/lp/setup2
usr/src/scripts/lp/unsetup
```

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AT&T values your opinion. Please indicate your opinions in each of the following areas. We'd like to know how well this document meets your needs.

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|  | Excellent | Good | Fair | Poor |
|---|---|---|---|---|
| **Accuracy** – Is the information correct? | ☐ | ☐ | ☐ | ☐ |
| **Completeness** – Is information missing? | ☐ | ☐ | ☐ | ☐ |
| **Organization** – Is information easy to find? | ☐ | ☐ | ☐ | ☐ |
| **Clarity** – Do you understand the information? | ☐ | ☐ | ☐ | ☐ |
| **Examples** – Are there enough? | ☐ | ☐ | ☐ | ☐ |
| **Illustrations** – Are there enough? | ☐ | ☐ | ☐ | ☐ |
| **Appearance** – Do you like the page format? | ☐ | ☐ | ☐ | ☐ |
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| **Organization** − Is information easy to find? | ☐ | ☐ | ☐ | ☐ |
| **Clarity** − Do you understand the information? | ☐ | ☐ | ☐ | ☐ |
| **Examples** − Are there enough? | ☐ | ☐ | ☐ | ☐ |
| **Illustrations** − Are there enough? | ☐ | ☐ | ☐ | ☐ |
| **Appearance** − Do you like the page format? | ☐ | ☐ | ☐ | ☐ |
| **Physical binding** − Do you like the cover and binding? | ☐ | ☐ | ☐ | ☐ |

Does the document meet your needs?  Why or why not?

_____

_____

_____

What is the single most important improvement that we could make to this document?

_____

_____

_____

Please complete the following information.

**Name (Optional):** _____

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_____

**Phone (    ) :** _____

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