ConvexOS and Utilities V10.0 Local Initial Installation Procedures

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Before you start 1

This document contains instructions for upgrading to ConvexOS and Utilities V10.0 on a system that is currently running ConvexOS and Utilities V9.0 or V9.1 and that has a local tape drive. This chapter contains information that you will need to perform the installation correctly and expediently.

Please read this chapter completely before attempting installation of ConvexOS and Utilities.

Types of installations

There are four different methods of installing ConvexOS and Utilities, only one of which is appropriate for your site. If you are currently running an earlier version of ConvexOS, you will be performing an *upgrade*. If this is the first installation of ConvexOS on your machine, you will be performing an *initial installation*.

If your machine has a tape drive, you will be doing a *local* installation; if you will be using the tape drive on another machine, you will be doing a *remote* installation.

Optional products may also be installed locally or remotely.

Table 1 lists the documents that describe these installations.

Table 1 Types of ConvexOS and Utilities installations

Installation Type	Document
Local upgrade	*ConvexOS and Utilities V10.0 Local Upgrade Installation Procedures*
Remote upgrade	*ConvexOS and Utilities V10.0 Remote Upgrade Installation Procedures*
Local initial installation	*ConvexOS and Utilities V10.0 Local Initial Installation Procedures*
Remote initial installation	*ConvexOS and Utilities V10.0 Remote Initial Installation Procedures*

Verifying your installation kit

Installation kits for local upgrades should contain the following:

- A tape labelled "ConvexOS V10.0". This tape may be in one of four formats depending on the type of machine, the type of installation, and the format of your SPU tape drive. This tape may be:
  - —a ct-format cartridge, for a full-height SPU tape drive. This tape has a white label.
  - —an mt-format cartridge, for a half-height SPU tape drive. This tape has a yellow label.
  - —a DAT-format cassette, for a SPU equipped with a digital audio tape drive.
  - —a round magnetic tape, which is only appropriate for sites that will be doing an upgrade.
- If you received a cartridge tape, be certain that it is appropriate for the drive on your SPU.
- A magnetic tape labelled "ConvexOS Utilities V10.0". Check the packing slip to be certain that this tape also contains
  - —CONVEX C V4.0 or V4.1
  - —CONVEX ALL V10.0

If the ConvexOS V10.0 Utilities tape does not contain these products, you should have received these products on two separate round magnetic tapes.

- A single sheet of paper that contains installation activation keys that are specific for your machine.
- A copy of the *ConvexOS and Utilities V10.0 Release Notice.*
- These installation procedures.
- Release notices for optional products for which you hold licenses.

If you are missing any of these items, contact the CONVEX Technical Assistance Center (TAC) or a CONVEX field representative.

Local initial installation 2

This chapter contains information that you need to know to perform a local initial installation correctly and expediently.

Please read this chapter completely before attempting installation of ConvexOS and Utilities.

Prerequisites

This installation requires that the following conditions be met:

- You must have V4.0 or later of the CONVEX C Compiler available for installation. This may be included on the "ConvexOS V10.0 Utilities" tape or may be on a separate tape.
- Your system must have CONVEX ALL (Assembler, Loader, and Libraries) V1.0 available for installation. This may be included on the "ConvexOS V10.0 Utilities" tape or may be on a separate tape.
- Your system must have the versions of SPU OS, System Diagnostics, and the Diagnostic Database listed in Table 2.

Table 2 SPU OS, System Diagnostics, and Diagnostic Database dependencies

CONVEX System	SPU OS	System Diagnostics	Diagnostic Database
C120	V5.2	V6.6 or later	V2.7 or later
C2x0, C32x0	V5.2	V3.5 or later	V3.7 or later
C34x0	V6.0	X1.0 or later	X1.0 or later
C38x0	X0.5.0.0	X0.5.0.0 or later	X0.5.0.0 or later

Figure 1 shows the commands to use to determine which versions you are running. Relevant information is highlighted; commands you enter are in bold type.

Figure 1 Determining versions of SPU OS, System Diagnostics, and Diagnostic Database

```
(spu)> cat /UNIX_REV
!<installsw>
Copyright 1990 CONVEX Computer Corp.
All rights are reserved.
CREATED ON Fri Jan 12 14:36:22 1990
Product:        SPU UNIX, Version: V5.2
Release date:   Jan 8, 1990
Installation date:              Mon Jan 22 11:57:56 CST 1990
(spu)> cat /mnt/DIAG_REV
!<installsw>
Copyright 1990 CONVEX Computer Corp.
All rights are reserved.
CREATED ON Mon Nov 19 15:38:37 1990
Product:        System Diagnostics, Version: V3.5.0.2
Release date:   Oct 15, 1990
Directories:    /mnt/bin, /mnt/test, /mnt/man
(spu)> cat /mnt/DIAG_DB_REV
!<installsw>
Copyright 1990 CONVEX Computer Corp.
All rights are reserved.
CREATED ON Mon Nov 19 15:55:52 1990
Product:        Diagnostics Data Base, Version: V3.7
Release date:   Oct 19, 1990
Directories:    /mnt/usr, /hw/cputest, /hw/field
```

Required information

The installation script requires you to provide several pieces of information, many of which you may not know offhand.

You can avoid having to abort the installation procedure by reading this section before you begin.

You should know:

- The name of your time zone and your daylight savings rule.
- The type of disk device that contains your root partition. Figure 2 shows the command used to display this device. The root disk device is highlighted.

Figure 2 Determining root disk device

```
(spu)> cat /ioconfig
iop 6
  mbus 0
    ctlr DKC-001 csr 0x3f8 int 3
      unit 0 type DKD-005
      unit 1 type DKD-005
    ctlr ACM-001 csr 0x3c8 int 6
      unit 0 type TTY
      unit 1 type TTY
      unit 2 type TTY
                          (additional output not shown)
```

Table 8 shows how to determine the device type from this output.

Table 3 Root disk device types

Device Name	Device Type
mbus	Multibus
ipi	IDC
vme	VMEbus

According to Table 8, the root disk device in Figure 2 is a Multibus.

- The type of device unit 0 on the root disk device is. In Figure 3, this device is highlighted.

Figure 3 Determining root device unit

```
(spu)> cat /ioconfig
iop 6
  mbus 0
    ctlr DKC-001 csr 0x3f8 int 3
      unit 0 type DKD-005
      unit 1 type DKD-005
    ctlr ACM-001 csr 0x3c8 int 6
      unit 0 type TTY
      unit 1 type TTY
      unit 2 type TTY
                              (additional output not shown)
```

- Whether or not you have a /mnt/os/bootcmd.local file on the SPU, and whether or not you wish to continue to use it after the installation.
- Which partitions you have designated as swap space. The installation script will look in /mnt/os/bootcmd.local for this information and you will be asked to confirm it.

Space requirements

This section describes space requirements for ConvexOS and Utilities V10.0. You should be sure to have adequate space available before you begin the installation.

You can avoid having to abort the installation procedure by reading this section before you begin.

Table 4 contains space requirements for the root upgrade. Table 5 contains space requirements for the /usr upgrade.

Table 6 contains space requirement for Domestic Tools installation, which may only be done at sites within the United States and Canada.

Please note that these values are correct for initial installations only.

Table 4 Root upgrade space requirements

Directory	Kilobytes Required
/tmp	8100
/bin	5200
/dev	20
/etc	2800
/lib	5
/mnt	1
/sys	1
/usr	1

Table 5 /usr upgrade space requirements

Directory	Kilobytes Required
/tmp	5400
/usr/adm	300
/usr/bin	6400
/usr/convex	9000
/usr/dict	400
/usr/doc	10
/usr/etc	5000
/usr/include	400
/usr/infosys	700
/usr/lib	16000
/usr/man	4200
/usr/msgs	5
/usr/skel	10
/usr/spool	2000
/usr/src	1
/usr/sys	2500
/usr/tmp	1
/usr/ucb	6700

Table 6 Domestic Tools space requirements

Directory	Kilobytes Required
/tmp	3000
/usr/68k	3000
/usr/lib	1

If you will be installing optional products, you should also consult the section titled "Space requirements" on page 43 to determine additional space requirements.

Installing SPU software

Follow the instructions in this section to upgrade the SPU software. It should take about ten minutes to complete this section.

Step 1: Remove the directory /mnt/old_os with the command shown in Figure 4.

Figure 4 Removing /mnt/old_os

```
(spu)> rm -rf /mnt/old_os
(spu)>
```

Step 2: Verify that there is a sufficient amount of free space in /mnt on the SPU disk. Table 7 lists space requirements by machine type.

Table 7 SPU space requirements

System	Kilobytes Required
C1x0	3120
C2x0, C32x0	3490
C34x0	3320
C38x0, HP SPU	4490
C38x0, Opus SPU	3960

Use the `df` command to determine the available space, as shown in Figure 5.

Figure 5 Determining available space on SPU disk

```
(spu)> df /mnt
Filesystem  Mounted on  kbytes    used    free  % used
/dev/dk0d   /mnt         81174   75999    5175    93%
```

In this example, there are 5175 kilobytes free, which is adequate for this installation.

If you do not have enough available space, refer to Appendix A for a list of SPU files that may be deleted.

Step 3: Locate the tape labeled "ConvexOS V10.0" and insert it in the SPU tape drive.

Step 4: Terminate unnecessary SPU processes with the command shown in Figure 6.

Figure 6 Removing unnecessary SPU processes

```
(spu)> osclean
(spu)>
```

Ignore messages such as

```
osclean:SIGSEV signal
```

if they appear.

Step 5: Load ConvexOS onto the SPU.

Execute the commands in Figure 7. Note that you should only enter the `mt rew` command if you have an mt-format cartridge tape with a yellow label.

Figure 7 Invoking `installsw`

```
(spu)> cd /
(spu)> mt rew              (mt-format only)
(spu)> /etc/installsw -i -d device-name
```

Replace *device-name* with the name of the SPU tape device, usually /dev/rmt0.

Step 6: `installsw` displays a menu of time zones, as shown in Figure 8. At the prompt, enter either the number corresponding to your time zone, or one of the abbreviations in the second column.

Figure 8 Time zone menu

```
--- Time zone settings
         0      ast/adt          US: Atlantic
         1      est/edt          US: Eastern
         2      cst/cdt          US: Central
         3      mst/mdt          US: Mountain
         4      pst/pdt          US: Pacific
         5      eet/eetdst       Eastern European
         6      met/metdst       Middle European
         7      wet/wetdst       Western European
         8      aest/aedt        Australia: Eastern
         9      acst/acdt        Australia: Central
        10      awst/awdt        Australia: Western
--- What is your local time zone?
```

Step 7: Enter your daylight savings rule at the prompt, as shown in Figure 9.

Figure 9 Daylight savings rule menu

```
--- Daylight Savings rule
         0      none             No DST rule
         1      us               United States
         2      aus              Australia
         3      wet              Western European
         4      met              Middle European
         5      eet              Eastern European
         6      can              Canada
--- Which daylight savings rule do you use?
```

Step 8: At the prompt, enter the type of device your root file system is on, as shown in Figure 10.

Figure 10 Root device prompt

```
-- Is your root file system on a VME, Multibus, or IDC device? [v/m/i]
```

Step 9: If you have a bootcmd.local file, you are asked if you want to continue to use it. Answer y if you do, n if you do not.

Figure 11 bootcmd.local prompt

```
--- You have your own boot commands file "bootcmd.local"
--- Do you wish to use it for this release also? [yn]
```

Step 10: If you have a bootcmd.local file and have specified additional swap partitions in this file, this information is displayed. You are asked to confirm this information, as shown in Figure 12.

Figure 12 Swap space confirmation

```
--- You have specified the following swap paritions
in /mnt/os/bootcmd.local

swap on         da5c

--- Is this information correct? [yn]
```

`installsw` loads the release contents and moves the SPU directory /mnt/os to /mnt/old_os. If the installation fails, the old files are returned to /mnt/os.

Step 11: Supply the ConvexOS password at the prompt shown in Figure 13.

Figure 13 Installation password prompt

```
--- Extracting X10.0.0.3 release from /dev/rmt12 into /mnt/os.

--- /mnt/os already exists.  Moving to /mnt/old_os.

--- Loading /mnt/os from /dev/rmt0

--- Please enter your ConvexOS password:
```

If you have supplied a valid password, the installation continues.

The installation of SPU software is complete when the `(spu)>` prompt returns

Extracting the mini-root file system

The ConvexOS mini-root file system is used to boot ConvexOS and restore the contents of the installation tape.

If your tape cartridge has a white label, follow the instructions in the section titled "Extracting mini-root from a ct-format tape".

If your tape cartridge has a yellow label, follow the instructions in the section titled "Extracting mini-root from an mt-format tape".

If your SPU drive is a DAT drive, follow the instructions in the section titled "Extracting mini-root from a DAT tape".

Extracting mini-root from a ct-format tape

Complete the following steps:

Step 1: Enter the commands shown in Figure 14.

Figure 14 Extracting mini-root from a ct-format tape

```
(spu)> initall
(spu)> cd /mnt/os
(spu)> scn_util -b > /mnt/boot_db
(spu)> pqutil -I
(spu)> cpfs ct0d vv0b 12288
```

Replace *vv* with the appropriate letters for your root disk device, as shown in Table 8.

Table 8 Root disk device types

Root Device Type	Replace *vv* with
VME	dd
Multibus	da
IDC	du

Step 2: When asked to confirm the copy, answer y.

"^" characters appear to indicate that the copy is proceeding. The procedure is complete when the `(spu)>` prompt returns.

Extracting mini-root from an mt-format tape

Complete the following steps:

Step 1: Enter the commands shown in Figure 15.

Figure 15 Extracting mini-root from an mt-format tape

```
(spu)> initall
(spu)> cd /mnt/os
(spu)> scn_util -b > /mnt/boot_db
(spu)> pqutil -I
(spu)> mt rew
(spu)> mt fsf 3
(spu)> cpfs mt0 vv0b 12288
```

Replace *vv* with the appropriate letters for your root disk device, as shown in Table 9.

Table 9 Root disk device types

Root Device Type	Replace *vv* with
VME	dd
Multibus	da
IDC	du

Step 2: When asked to confirm the copy, answer y.

A block countdown will appear to indicate that the copy is proceeding. The procedure is complete when the `(spu)>` prompt returns.

Extracting mini-root from a DAT tape

Complete the following steps:

Step 1: Enter the commands shown in Figure 16.

Figure 16 Extracting mini-root from a DAT tape

```
(spu)> initall
(spu)> cd /mnt/os
(spu)> scn_util -b > /mnt/boot_db
(spu)> pqutil -I
(spu)> mnt rew
(spu)> mt fsf 4
(spu)> cpfs mt0 vv0b 12288
```

Replace *vv* with the appropriate letters for your root disk device, as shown in Table 10.

Table 10 Root disk device types

Root Device Type	Replace *vv* with
VME	dd
Multibus	da
IDC	du

Step 2: When asked to confirm the copy, answer y.

A block countdown will appear to indicate that the copy is proceeding. The procedure is complete when the `(spu)>` prompt returns.

Booting ConvexOS

You must reboot ConvexOS to single-user mode to load the newly-installed software.

Reboot ConvexOS to single user mode using the command shown in Figure 17.

Figure 17 Rebooting ConvexOS

```
(spu)> boot mini
```

Information about the boot process is displayed. After approximately five minutes, the system prompt is displayed, as shown in Figure 18.

Ignore warning messages about changing the date and time if they appear.

Figure 18 System prompt

```
#erase ^H, kill ^U, intr ^C
#
```

Setting up the root file system

To create the root (/) file system, complete the steps in this section.

Step 1: Mount the tape labeled "ConvexOS Utilities V10.0".

Step 2: If you are using a DAT tape, create the DAT device by entering the command shown in Figure 19.

If you are not using a DAT tape, skip this step.

Figure 19 Creating a DAT device

```
# cd /dev
# MAKEDEV dat0
```

Step 3: Create the root file system by entering the commands shown in Figure 20.

Figure 20 Creating the root file system

```
# cd /
# /etc/newfs -v /dev/rvv0a unit-type
```

Replace *vv* with the appropriate letters for your root disk device, as shown in Table 11.

Table 11 Root disk device types

Root Device Type	Replace *vv* with
VME	dd
Multibus	da
IDC	du

Replace *unit-type* with the unit type for unit 0, for example, DKD-005 or DKD-001. Refer to Figure 3 on page 16 if you do not know the unit type.

Step 4: Verify the integrity of the new file system by executing the command in Figure 21.

Figure 21 Running `fsck`

```
# /etc/fsck -f -p /dev/rvv0a
/dev/rvv0a:277 files,8517 used,11428 free(36 frags,1424 blocks)(8k/1k)
/dev/rvv0a: File system marked clean
```

Replace *vv* with the appropriate characters, as shown in Table 11.

Output similar to Figure 21 will be displayed.

Step 5: Mount the file system by entering the commands in Figure 22.

Figure 22 Mounting the root file system

```
# /bin/mt -f device-name rew
# /etc/mount /dev/vv0a /root
# cd /root
# /bin/mt -f device-name fsf 5
# /etc/restore xGf device-name
```

Continue to replace *vv* with the appropriate characters, as shown in Table 11.

Replace *device-name* with the name of the SPU tape device, usually /dev/rmt0.

Ignore all warning messages if they appear.

Step 6: When prompted for a volume number, enter **1**.

Step 7: When prompted to change the owner and mode of the current directory, enter **y**.

Step 8: When the system prompt returns, bring the system to SPU level by executing the commands shown in Figure 23.

Figure 23 Returning to SPU level

```
# /bin/sync
# /etc/halt
```

Output is printed to the screen and the system returns to the `(spu)>` prompt.

Step 9: Boot to single-user mode by entering the commands shown in Figure 24.

Figure 24 Booting to single-user mode

```
(spu)> osclean
(spu)> boot single

#erase ^H, kill ^U, intr ^C
#
```

Ignore messages such as

```
osclean:SIGSEV signal
```

if they appear.

Step 10: Verify the integrity of the new file system a second time by executing the command in Figure 25.

Figure 25 Running `fsck`

```
# /etc/fsck -f -p /dev/rvv0a
/dev/rvv0a:277 files,8517 used,11428 free(36 frags,1424 blocks)(8k/1k)
/dev/rvv0a: File system marked clean
```

Replace *vv* with the appropriate characters, as shown in Table 11.

Output similar to Figure 25 will be displayed.

If any errors occur, contact the Technical Assistance Center (TAC).

Step 11: If you have VME or IDC devices on your system, you must edit the /etc/fstab file using the /bin/ed editor. All of the device names in the default /etc/fstab specify Multibus devices in the form of:

```
/dev/daxx
```

where *xx* defines the file partition. For VME devices, change this to:

```
/dev/ddxx
```

and for IDC devices:

```
/dev/duxx
```

Step 12: Create an entry for the root file system in the /etc/mtab file by entering the commands in Figure 26.

Figure 26 Creating an entry in /etc/mtab

```
# cp /dev/null /etc/mtab
# /etc/mount -f /
```

Setting up the /usr file system

To set up the /usr file system, follow the steps in this section.

Step 1: Create the /usr file system by entering the commands shown in Figure 20.

Figure 27 Creating the /usr file system

```
# cd /
# /etc/newfs -v /dev/rvv0e unit-type
```

Replace *vv* with the appropriate letters for your root disk device, as shown in Table 12.

Table 12 Root disk device types

Root Device Type	Replace *vv* with
VME	dd
Multibus	da
IDC	du

Replace *unit-type* with the unit type for unit 0, for example, DKD-005 or DKD-001. Refer to Figure 3 on page 16 if you do not know the unit type.

Step 2: Verify the integrity of the new file system by executing the command in Figure 28.

Figure 28 Running `fsck`

```
# /etc/fsck -f -p /dev/rvv0e
/dev/rvv0e:277 files,8517 used,11428 free(36 frags,1424 blocks)(8k/1k)
/dev/rvv0e: File system marked clean
```

Replace *vv* with the appropriate characters, as shown in Table 11.

Output similar to Figure 28 will be displayed.

Step 3: Mount the file system by entering the commands in Figure 22.

Figure 29 Mounting the /usr file system

```
# /bin/mt -f device-name rew
# /etc/mount/dev/vvea /usr
# cd /usr
# /bin/mt -f device-name fsf 8
# /etc/restore xGf device-name
```

Continue to replace *vv* with the appropriate characters, as shown in Table 12.

Replace *device-name* with the name of the SPU tape device, usually /dev/rmt0.

Ignore all warning messages if they appear.

Step 4: When prompted for a volume number, enter 1.

Step 5: When prompted to change the owner and mode of the current directory, enter y.

Step 6: Change the access modes for the root (/), /usr and /tmp file systems by entering the commands in Figure 30.

Figure 30 Changing modes on root (/), /usr and /tmp file systems

```
# cd /
# /bin/chmod 755 / /usr
# /bin/chmod 777 /tmp
```

Step 7: Unmount the /usr file system by entering the command in Figure 31.

Figure 31 Unmounting /usr

```
# /etc/umount /usr
```

Step 8: Verify the integrity of the new file system a second time by executing the command in Figure 32.

Figure 32 Running `fsck`

```
# /etc/fsck -f -p /dev/rvv0e
/dev/rvv0e:277 files,8517 used,11428 free(36 frags,1424 blocks)(8k/1k)
/dev/rvv0e: File system marked clean
```

Replace *vv* with the appropriate characters, as shown in Table 12.

Output similar to Figure 32 will be displayed.

If any errors occur, contact the Technical Assistance Center (TAC).

Step 9: Mount the /usr file system by entering the command in Figure 31.

Figure 33 Mounting /usr

```
# /etc/mount /usr
```

Extracting the /sys directory

This section describes how to extract the /sys directory from the ConvexOS V10.0 cartridge tape.

Step 1: Ensure that the ConvexOS V10.0 cartridge tape is in the SPU drive.

Step 2: If you are using a ct-format tape with a white label, read the subsection titled "Extracting /sys from a ct-format tape".

If you are using an mt-format tape with a yellow label, read the subsection titled "Extracting /sys from an mt-format tape".

If you are using a DAT tape, read the subsection titled "Extracting /sys from a DAT tape".

Extracting /sys from a ct-format tape

Execute the commands in Figure 34 to extract /sys from a ct-format tape.

Figure 34 Extracting /sys (ct-format only)

```
# cd /tmp
# /usr/convex/ctar xvpf /dev/rct0b extract_script
# ./extract_script
```

Extracting /sys from an mt-format tape

Execute the commands in Figure 35 to extract /sys from an mt-format tape.

Figure 35 Extracting /sys (mt-format only)

```
# cd /tmp
# /usr/convex/spucmd mt rew
# /usr/convex/spucmd mt fsf 2
# /usr/convex/ctar xvpf /dev/rmt0 extract_script
# ./extract_script
```

Extracting /sys from a DAT tape

Execute the commands in Figure 36 to extract /sys from a DAT tape.

Figure 36 Extracting /sys (DAT only)

```
# cd /tmp
# /usr/convex/spucmd mt rew
# /usr/convex spucmd mt fsf 3
# /usr/convex/ctar xvpf /dev/rmt0 extract_script
# ./extract_script
```

Copying the ConvexOS system image

Follow the instructions in this section to copy the ConvexOS system image from the SPU.

Step 1: Copy the ConvexOS system image from the SPU disk to the root file system by entering the command shown in Figure 37.

Figure 37 Copying a new system image from the SPU

```
# /usr/convex/spu -r /mnt/os/vmunix | /bin/gut > /vmunix
#
```

Setting up a file system for user directories

Follow the instructions in this section to create a file system for user directories.

Step 1: Select the disk partition to use for the /mnt partition.

If you have only one disk, you should consider using the h partition. If you have two or more disks, you should consider using the g partition of disk unit 1.

If you will be using disk unit 1, you must invoke the commands in Figure 38 to create a new device entry.

Figure 38 Creating a device for disk unit 1

```
# cd /dev
# MAKEDEV vv1
```

Replace *vv* with

- da for Multibus devices
- dd for VME devices
- du for IDC devices

Step 2: If you have VME or IDC devices on your system, you must edit the /etc/fstab file using either /bin/ed or /usr/ucb/vi. All of the device names in the default /etc/fstab specify Multibus devices in the form of:

/dev/da*xx*

where *xx* defines the file partition. For VME devices, change this to:

/dev/dd*xx*

and for IDC devices:

/dev/du*xx*

For example, Figure 39 shows an example of /etc/fstab for VME devices.

Figure 39 /etc/fstab file for VME devices

```
/dev/dd0a      /         4.2     rw 1 1
/dev/dd0e      /usr      4.2     rw 1 1
/dev/dd0h      /mnt      4.2     rw 1 1
```

Step 3: Create the /mnt file system with the command in Figure 40.

Figure 40 Creating the /mnt file system

```
# /etc/newfs -v /dev/rvvpp unit-type
```

Replace *vv* with the appropriate letters for the device type, DKD-001 or DKD-005, for example.

Replace *pp* with the partition you have chosen to use, `0g` or `1h`, for example.

Replace *unit-type* with the unit type for unit 0, for example, DKD-005 or DKD-001. Refer to Figure 3 on page 16 if you do not know the unit type.

Step 4: Verify the integrity of the new file system by running fsck, as shown in Figure 41.

Figure 41 Running `fsck`

```
# /etc/fsck -f -p /dev/rvvpp
/dev/rvvpp:277 files,8517 used,11428 free(36 frags,1424 blocks)(8k/1k)
/dev/rvvpp: File system marked clean
```

Replace *vv* with the appropriate letters for the device type, DKD-001 or DKD-005, for example.

Replace *pp* with the partition you have chosen to use, `0g` or `1h`, for example.

Step 5: Mount the file system and set its access mode using the commands in Figure 42.

Figure 42 Mounting the /mnt file system

```
# /etc/mount /dev/rvvpp /mnt
# chmod 755 /mnt
```

Step 6: Set the hostname of the machine by entering the command in Figure 43.

Figure 43 Setting the hostname

```
# hostname  name
```

Replace *name* with the hostname of the machine.

Step 7: Unmount all file systems by entering the command in Figure 44.

Figure 44 Unmounting file systems

```
# /etc/umount -a
```

Caution

If you are installing optional products, do not boot to multi-user mode at this time.

If you are installing optional products on your system, you *must* upgrade them at this time. Skip to chapter 3, "Local optional product installation" on page 41.

If you are not installing optional products, complete the following steps:

Step 8: Boot to multi-user mode by entering CTRL-D at the system prompt.

The boot procedure is complete when the standard login prompt appears.

Step 9: Complete the installation by following the instructions in the section titled "The upgrade script" on page 59.

Local optional product installation

3

This chapter contains instructions for installing optional CONVEX products on a system with a tape drive. This chapter contains information that you will need to perform the installation correctly and expediently.

Please read this chapter completely before attempting installation of optional products.

Optional products

Table 13 lists the optional products that are bundled with the release of ConvexOS V10.0.

Table 13 Optional products

Part Number	Product
710-010515-002	Share V10.0
710-010415-002	UDD Tools V10.0
710-010315-002	MC68000 Tools V10.0
710-009615-002	NFS (Domestic) V10.0
710-009515-002	NFS (International) V10.0
710-009715-002	Internet Services V10.0
710-010215-002	ConvexOS Optional Sources

Beginning with this release, a new tape production method is being used at CONVEX. Your tape labeled "ConvexOS Utilities V10.0" may not contain products for which you do not hold licenses. Also, additional products (such as compilers) may be included on your tape.

Activation keys

Some optional products require a special password, called an *activation key,* to be supplied during installation. Activation keys are machine specific and are included on a single sheet of paper in your installation kit.

Activation keys are *not* required for:

- MC68000 Tools
- UDD Tools
- ConvexOS Optional Sources

If you will be installing optional products other than these and do not have your activation keys, contact the CONVEX Technical Assistance Center (TAC).

Prerequisites

To install optional products, you must have ConvexOS V10.0 running on your system. If you have not yet installed ConvexOS V10.0, please refer to the chapter titled "Before you start".

All the prerequisites for the ConvexOS and Utilities V10.0 installation also apply to optional products installations.

You should also note that:

- If you have separate installation tapes for CONVEX ALL V1.0 and CONVEX C V4.0 or V4.1, you should install them *before* installing additional optional products. Please refer to the *CONVEX ALL Installation Procedures* and the *CONVEX C Installation Procedures.*
- The Domestic NFS installation will create a new kernel via `sysgen`. If you are installing this product, you should be certain that:

  — you completed the steps in the section titled "Extracting the /sys directory" on page 34, if you installed ConvexOS V10.0 from a cartridge tape

  — you have installed ConvexOS Domestic Tools V10.0.

  Domestic NFS is only available to sites located in the United States and Canada.

- CONVEX Share Scheduler requires that you edit /etc/rc, /etc/rc.std and /etc/rc.local. If you are installing this product, please refer to the *CONVEX Share Scheduler Release Notice* and the *CONVEX Share Scheduler System Manager's Guide* for additional configuration information.

ConvexOS Optional Source

The ConvexOS Optional Source product will install:

- complete source for GNU Emacs and Perl in the /usr/src directory
- C source for the `nu` program in the /usr/src/convex directory
- C source for the `accounting` program in the /usr/src/convex/accounting directory

Space requirements

Table 14 and Table 15 list space requirements for the optional products that are bundled with ConvexOS. Your installation tape may contain additional products; please refer to the installation instructions for those products to determine space requirements.

Refer to the column labeled "Upgrade Install" if you are replacing a previous version of an optional product. If this is the first time you are installing an optional product, refer to the column labeled "Initial Install".

Table 14 Optional products space requirements in kilobytes

Product	Directory	Initial Install
Internet Services	/tmp	6600
	/etc	200
	/usr/convex	5
	/usr/doc	5
	/usr/etc	3800
	/usr/infosys	20
	/usr/lib	50
	/usr/spool	5
	/usr/ucb	2200
Domestic NFS	/bin	680
	/etc	10
	/usr/bin	1500
	/usr/etc/yp	1300
	/usr/etc/install	360
	/usr/lib/verify	20
	/usr/lib	70
	/usr/ucb	310
	/usr/doc	10
	/usr/infosys/optscreens	10
	/usr/infosys/optfscreens	10
	SPU /mnt	3000
International NFS	/bin	70
	/etc	10
	/usr/bin	940
	/usr/etc/yp	1400
	/usr/etc/install	310
	/usr/lib/verify	10
	/usr/lib	50
	/usr/ucb	310
	/usr/doc	10
	/usr/infosys/optscreens	6
	/usr/infosys/optfscreens	6

Table 15 Optional products space requirements in kilobytes (continued)

Product	Directory	Initial Install
Share Scheduler	/tmp	2000
	/usr/convex	1600
	/usr/doc	10
	/usr/etc	100
	/usr/infosys	10
	/usr/lib	40
MC68000	/tmp	3000
	/usr/68k	3000
	/usr/lib	10
UDD	/tmp	500
	/usr/doc	10
	/usr/lib	400
Optional Sources	/tmp	9000
	/usr/lib	1000
	/usr/src	8000

Determining available space

The `df` command displays the amount of used and available space on a disk partition. Figure 45 shows how to display this information for the partition on which the /tmp directory resides.

Figure 45 Determining available space

```
% df /tmp
Filesystem              kbytes    used   avail capacity  Mounted on
/dev/du3a                45978    3550   37830     9%    /tmp
```

In this example, `df` indicates that there are over 37000 kilobytes available, which is more than enough for installation of all of these products.

When an optional product installation completes normally, the files it placed in /tmp are automatically removed. If you

are installing multiple products, you only need enough free space in to satisfy the largest /tmp requirement. In other words, if you are installing Optional Sources and Share, you only need 9000 kilobytes of space in /tmp, not 11000.

If more that one of the directories listed in Table 14 and Table 15 reside on a single partition, you should sum the requirements and verify that the total amount of space is available. The `mount` command can be used to find out how directories are distributed among partitions, as shown in Figure 46.

Figure 46 Determining directory/partition distribution

```
% mount | grep 4.2
/dev/da0a on / type 4.2 (rw)
/dev/da0g on /mnt type 4.2 (rw)
/dev/dd0b on /export type 4.2 (rw)
/dev/dd1g on /export/Frame type 4.2 (rw)
/dev/dd0g on /usr type 4.2 (rw)
/dev/da1a on /usr/spool type 4.2 (rw)
/dev/da1f on /tmp type 4.2 (rw)
/dev/da2g on /usr/local type 4.2 (rw)
/dev/da2h on /test type 4.2 (rw)
/dev/da3c on /doc type 4.2 (rw)
/dev/dd0a on /usr/adm type 4.2 (rw)
```

In this example, the directories /usr/adm, /usr/spool, and /usr/local are on partitions other than /usr. For example, if you installing an upgrade of Internet Services, /usr must contain 609 kilobytes of free space, which is the sum of the space requirements for all the /usr directories listed in Table 14 *except for* /usr/spool. (/usr/local and /usr/adm do not appear in under "Internet Services" in Table 14.)

Determining available space on the SPU disk

The Domestic NFS installation requires 3000 kilobytes of free space in the /mnt directory on the SPU disk. To check the amount of available space, execute the command in Figure 47.

Figure 47 Determining available space on SPU disk

```
# spucmd df /mnt
+ df /mnt
Filesystem  Mounted on  kbytes    used    free  % used
/dev/dk0d   /mnt         81174   75999    5175     93%
```

In this example, there are 5175 kilobytes free, which is adequate for this installation.

If you do not have enough available space, consult Appendix A for a list of SPU files that may be deleted.

Halting ConvexOS

If you have just completed the upgrade or initial installation of ConvexOS and Utilities V10.0, your system is already in single user mode and you should skip to the section titled "Installing a product" on page 49.

All optional product installations must be done while the system is in single user mode. To do this, complete the following procedure:

Step 1: Log in as root at the system console

Step 2: Put the system in single-user mode by issuing the `shutdown` command, as shown in Figure 48.

Figure 48 Putting the system in single-user mode

```
# /etc/shutdown +5 "to install ConvexOS V10.0"
#
```

Messages warning users of the impending shutdown will be displayed for approximately five minutes. The single-user system prompt appears as in Figure 49.

Figure 49 Single-user mode

```
#erase ^H, kill ^U, intr ^C
#
```

Step 3: Mount the tape labeled "ConvexOS V10.0 Utilities" on tape unit 0.

Step 4: Mount all the 4.2 file systems, as shown in Figure 50.

Figure 50 Mounting 4.2 file systems

```
# /etc/mount -at 4.2
#
```

Installing a product

Follow the instructions in this section to install any of the optional products on the "ConvexOS V10.0 Utilities" tape.

Step 1: Invoke `installsw` as shown in Figure 51.

Figure 51 Invoking `installsw`

```
# /etc/installsw -i -d device-name
```

Step 2: When `installsw` prompts you for the type of installation, enter `local`, as shown in Figure 52.

Figure 52 Installation prompt

```
Choose the type of installation you want to perform:

    LOCAL          --> install on this machine
    REMOTE         --> install on a remote machine
    ABORT          --> abort installation

Enter your selection now --> local
```

Step 3: A menu of ConvexOS Utilities is displayed, as shown in Figure 53. Your tape may contain different products, so the menu you see may not match Figure 53 exactly.

Figure 53 ConvexOS Utilities menu

```
Idx   Part Number     Description                Release      Files

  1   710-009915-000  Root Upgrade               10.0           3
  2   710-010015-000  /usr Upgrade               10.0           3
  3   710-010115-000  Domestic Tools             10.0           3
  4   710-009715-000  Internet Services          10.0           3
  5   710-009615-000  Domestic NFS Utilities     10.0           3
  6   710-010515-000  Share Scheduler            10.0           3
  7   710-010315-000  MC68000 Tools              10.0           3
  8   710-010415-000  UDD Tools                  10.0           3
  9   710-010215-000  Optional Utilities Source 10.0           3

    ^ Items marked with a + will be installed.
      Items marked with a - will be de-installed.

To toggle selection on an item, type its number or part of its
description.  Patches auto-select with their base product.  Use
negative numbers to choose to disinstall.  Use - to toggle
all items.
Use "install"  to quit this menu and do the install.

selection?
```

Step 4: Select the products you wish to install by entering either the index number or the name of the product. In this example, to select Share Scheduler, enter either the number `6` or the word `share`.

"+" signs indicate selected products, as shown in Figure 54.

Caution

Do not install Root Upgrade, /usr Upgrade, or Domestic Tools at this time.

If CONVEX ALL and CONVEX C appear on this menu, be certain to select them.

Figure 54 ConvexOS Utilities menu with items selected

```
Idx   Part Number     Description                Release      Files

  1   710-009915-000  Root Upgrade               10.0           3
  2   710-010015-000  /usr Upgrade               10.0           3
  3   710-010115-000  Domestic Tools             10.0           3
  4 + 710-009715-000  Internet Services          10.0           3
  5 + 710-009615-000  Domestic NFS Utilities     10.0           3
  6 + 710-010515-000  Share Scheduler            10.0           3
  7   710-010315-000  MC68000 Tools              10.0           3
  8   710-010415-000  UDD Tools                  10.0           3
  9   710-010215-000  Optional Utilities Source  10.0           3

    ^ Items marked with a + will be installed.
      Items marked with a - will be de-installed.

To toggle selection on an item, type its number or part of its
description.  Patches auto-select with their base product.  Use
negative numbers to choose to disinstall.  Use - to toggle
all items.
Use "install"  to quit this menu and do the install.

selection? 4 5 6
selection?
```

Step 5: Enter `install` to install the selected products, as shown in Figure 55.

Figure 55 Selection prompt

```
selection?  install
```

Figure 56 contains the output of the Internet Services installation. Figure 57 contains the output of the Domestic NFS Utilities installation. Figure 58 contains the output of the Share Scheduler installation. All of these installation scripts will prompt you for an activation key as well as other information.

The MC68000, UDD, and Optional Utilities Sources installations are shown in Figure 59, Figure 60, and Figure 61. These products do not require activation keys or additional information.

These installation procedures continue with the section titled "Booting multi-user" on page 57.

Figure 56 CONVEX Internet Services installation output

```
[Installing Internet Services v10.0]

------------------------------------------------------------------
--- CONVEX V10.0 Production Internet Services
------------------------------------------------------------------
--- Installation commencing Sat Nov 23 21:03:31 CST 1991.
--- Performing consistency check.
--- Checking disk space requirements.
--- Saving local database files.
--- Extracting CONVEX V10.0 Internet Services from tape.
--- Adding links in /etc for internet utilities
--- Restoring local database files.
--- Setting correct ownership and permissions of restored files.
--- Activation key required.

    Enter Internet Services activation key? activation key

--- Stamping executables
--- Testing activation of Internet Services
--- Updating the version database.
--- Adding message to /etc/motd.
--- Internet Services V10.0 installed.
--- Online release notes in /usr/doc.
--- Installation complete Sat Nov 23 21:05:08 CST 1991.
```

Figure 57 CONVEX Domestic NFS installation output

```
[Installing Domestic NFS Utilities v10.0]

------------------------------------------------------------------
--- CONVEX V10.0 Production Domestic NFS Utilities
------------------------------------------------------------------
--- Installation commencing Sat Nov 23 21:05:12 CST 1991.
--- Performing consistency check.
--- Checking disk space requirements.
--- Checking free space in /sys.
--- Installation of des_soft.o commencing Sat Nov 23 21:05:43 CST
1991.
--- Enter the configuration file to use or ABORT.

    Press return alone to use REL_C2:?

--- Enter the output configuration file name to use or ABORT.

    Press return alone to use REL_C2.SECURE: ?
--- Getting des_soft.o from /usr/lib/libc.a.
--- Loading des_soft.o into /sys/CPU_OBJ/lib_rpc.a.
--- Performing consistancy check.
--- Inserting des_soft.o into system.
--- Performing sysgen (this step will take a few minutes)
--- make: REL_C2.SECURE.
--- make install: REL_C2.SECURE.--- Backing up old system on the
SPU.

--- Moving the new system to the SPU.
--- Remember to spu up /mnt/os/vmunix after you reboot.
--- Installation of des_soft.o complete Sat Nov 23 21:09:38 CST
1991.
--- Extracting CONVEX V10.0 Domestic NFS Utilities from tape.
--- Adding links in /etc for Domestic NFS utilities
--- Turning on the rpc daemons in /etc/inetd.conf

*** >>> START /usr/etc/portmap IN YOUR /etc/rc.local FILE <<< ***

--- Activation key required.

    Enter Domestic NFS Utilities activation key? activation-key

--- Stamping executables
--- Testing activation of Domestic NFS Utilities
--- Updating the version database.
--- Adding message to /etc/motd.
--- Domestic NFS Utilities V10.0 installed.
--- Online release notes in /usr/doc.
--- Installation complete Sat Nov 23 21:11:24 CST 1991.
```

Figure 58 CONVEX Share Scheduler installation output

```
[Installing Share Scheduler v10.0]

------------------------------------------------------------------
--- CONVEX V10.0 Production Share Scheduler
------------------------------------------------------------------
--- Installation commencing Sat Nov 23 21:11:29 CST 1991.
--- Performing consistency check.
--- Checking disk space requirements.
--- Extracting CONVEX V10.0 Share Scheduler from tape.
--- Adding links for share utilities moved from /etc to /usr/etc.
--- Checking share database for shared groups
--- Activation key required.

    Enter Share Scheduler activation key? activation-key

--- Stamping executables
--- Testing activation of Share Scheduler
--- Updating the version database.
--- Adding message to /etc/motd.
--- Share Scheduler V10.0 installed.
--- Online release notes in /usr/doc.
--- Installation complete Sat Nov 23 21:12:06 CST 1991.
```

Figure 59 CONVEX MC68000 installation output

```
[Installing MC68000 Tools v10.0]

------------------------------------------------------------------------
--- CONVEX V10.0 Production MC68000 Tools
------------------------------------------------------------------------
--- Installation commencing Sat Nov 23 21:12:09 CST 1991.
--- Performing consistency check.
--- Checking disk space requirements.
--- Extracting CONVEX V10.0 MC68000 Tools from tape.
--- Updating the version database.
--- Adding message to /etc/motd.
--- MC68000 Tools V10.0 installed.
--- Online release notes in /usr/doc.
--- Installation complete Sat Nov 23 21:12:26 CST 1991.
```

Figure 60 CONVEX UDD installation output

```
[Installing UDD Tools v10.0]

------------------------------------------------------------------------
--- CONVEX V10.0 Production UDD Tools
------------------------------------------------------------------------
--- Installation commencing Sat Nov 23 21:12:29 CST 1991.
--- Performing consistency check.
--- Checking disk space requirements.
--- Extracting CONVEX V10.0 UDD Tools from tape.

--- Updating the version database.
--- Adding message to /etc/motd.
--- UDD Tools V10.0 installed.
--- Online release notes in /usr/doc.
--- Installation complete Sat Nov 23 21:12:32 CST 1991.
```

Figure 61 CONVEX Optional Utilities Source installation output

```
[Installing Optional Utilities Source v10.0]

------------------------------------------------------------------------
--- CONVEX V10.0 Production Optional Utilities Source
------------------------------------------------------------------------
--- Installation commencing Sat Nov 23 21:12:35 CST 1991.
--- Performing consistency check.
--- Checking disk space requirements.
--- Extracting CONVEX V10.0 Optional Utilities Source from tape.
--- Updating the version database.
--- Adding message to /etc/motd.
--- Optional Utilities Source V10.0 installed.
--- Online release notes in /usr/doc.
--- Installation complete Sat Nov 23 21:14:16 CST 1991.
```

Booting multi-user

If you have just installed Domestic NFS, follow the instructions in the section titled "Booting with Domestic NFS". If you have *not* installed Domestic NFS, follow the instructions in "Booting without Domestic NFS".

Booting without Domestic NFS

Step 1: Terminate the init process and unmount the file systems, as shown in Figure 62.

Figure 62 Terminating init and unmounting file systems

```
# kill 1
#erase ^H, kill ^U, intr ^C
# /etc/umount -a
```

Step 2: Press CTRL-D at the system prompt. The boot procedure is complete when the standard login prompt appears.

Booting with Domestic NFS

The Domestic NFS installation modifies the kernel via `sysgen`. To use the new kernel, complete the following steps:

Step 1: Terminate the init process and unmount the file systems, as shown in Figure 63.

Figure 63 Terminating init and unmounting file systems

```
# kill 1
#erase ^H, kill ^U, intr ^C
# /etc/umount -a
```

Step 2: Copy the new system image from the SPU disk with the command shown in Figure 64.

Figure 64 Copying a new system image from the SPU

```
# /usr/convex/spu -r /mnt/os/vmunix | /bin/gut > /vmunix
#
```

Step 3: Bring the system to SPU level by executing the commands shown in Figure 65.

Figure 65 Returning to SPU level

```
# /bin/sync
# /etc/halt
```

Output is printed to the screen and the system returns to the `(spu)>` prompt.

Step 4: Boot multi-user by entering `boot` at the SPU prompt, as shown in Figure 66.

Figure 66 Rebooting ConvexOS

```
(spu)> boot
```

The boot procedure is complete when the standard login prompt appears.

The upgrade script

`/usr/etc/upgrade` is an interactive Perl script that does the following:

- checks your /etc/passwd file to make sure that it contains entries required by ConvexOS V10.0. (See the *ConvexOS V10.0 Release Notice* for more information on required /etc/passwd entries.)
- checks your /etc/groups file to make sure that it contains entries required by ConvexOS V10.0. (See the *ConvexOS V10.0 Release Notice* for more information on required /etc/groups entries.)
- checks your /etc/services file to make sure that it contains entries required by ConvexOS V10.0. (See the *ConvexOS V10.0 Release Notice* for more information on required /etc/services entries.)
- changes the permissions on users'.crontab and .cronrc files to 644. (See the *ConvexOS V10.0 Release Notice* for more information about `cron`.)
- merges new words into your /usr/dict/words file.
- rebuilds the `makewhatis` database. (See the makewhatis(8) man page for more information.)
- builds formatted man pages. (See the catman(8) man page for more information.)
- copies /vmunix from the SPU disk. If you have followed these installation procedures completely, you have already completed this step.
- creates a frozen `sendmail` configuration file

You will be prompted before each step. If you do not want some of these tasks done, simply enter **n** in response to the appropriate prompt.

The upgrade script automatically creates a file of its output, /tmp/upgrade.txt, via the `script` utility.

You should invoke /usr/etc/upgrade while the system is in multi-user mode.

Invoke the `upgrade` script by issuing the command in Figure 67.

Figure 67 Running `/usr/etc/upgrade`

```
# /usr/etc/upgrade
```

SPU files

A

This appendix lists files which may be removed from the SPU disk in order to obtain the required amount of free space for the ConvexOS V10.0 installation.

Do not remove any of the files listed here unless you are unable to create enough free space to install ConvexOS.

IOP systems

The following files may be removed:

- the jptest directory
- /mnt/test/io5000
- /mnt/test /dev5*

This should provide 2.6 megabytes of space.

VIOP systems

The following files may be removed:

- the jptest directory
- /mnt/test/io4000
- /mnt/test/dev4*

This should provide 3.8 megabytes of space.

VIOP and IOP systems

If you system is both VIOP and IOP, contact the Technical Assistance Center (TAC).

Restoring individual utilities

B

This appendix describes how to restore individual products from the ConvexOS Utilities V10.0 tape.

Caution

Some programs in CONVEX Internet Services, CONVEX Share Scheduler, and both international and domestic NFS require activation keys to run. You will be unable to restore working versions of these products using the procedure outlined here. Please follow the procedures in chapter 3, "Local optional product installation" .

Also, you should not restore the root partition using these procedures. If you find it necessary to restore root, contact the CONVEX Technical Assistance Center (TAC).

Positioning the tape

Since your ConvexOS V10.0 Utilities tape may contain many products, the exact location of each product on the tape is variable. However, the first nine files are always in the same position. These are listed in Table 16.

Table 16 ConvexOS Utilities distribution tape contents

Position	File	Format
0	Master header	`cat`
1	Master script	`cat`
2	gip support	`tar`
3	root header	`cat`
4	root script	`cat`
5	root data	`dump`
6	/usr header	`cat`
7	/usr script	`cat`
8	/usr data	`dump`

Optional products begin in position 9. Each optional product consists of three files, which are always in the same order:

- the header, in `cat` format
- the script, in `cat` format
- the data, in `tar` format

To determine the exact position of an optional product on the tape, look at the `installsw` menu, as shown in Figure 68.

Figure 68 ConvexOS Utilities menu

```
Idx   Part Number     Description                Release      Files

  1   710-009915-000  Root Upgrade               10.0           3
  2   710-010015-000  /usr Upgrade               10.0           3
  3   710-010115-000  Domestic Tools             10.0           3
  4   710-009715-000  Internet Services          10.0           3
  5   710-009615-000  Domestic NFS Utilities     10.0           3
  6   710-010515-000  Share Scheduler            10.0           3
  7   710-010315-000  MC68000 Tools              10.0           3
  8   710-010415-000  UDD Tools                  10.0           3
  9   710-010215-000  Optional Utilities Source 10.0           3

    ^ Items marked with a + will be installed.
      Items marked with a - will be de-installed.

To toggle selection on an item, type its number or part of its
description.  Patches auto-select with their base product.  Use
negative numbers to choose to disinstall.  Use - to toggle
all items.
Use "install"  to quit this menu and do the install.

selection?
```

Note that your tape may contain different products, so the menu you see may not match Figure 68 exactly.

Step 1: Determine the position of the product you wish to retrieve. To do this, multiply its index number (shown in the left column of Figure 68) by 3. For example, the MC68000 tools (index number 7) product begins at position 21. The header is at 21, the script is at 22 and the data is at 23.

Step 2: Mount the tape on the tape drive and position it correctly by entering the commands shown in Figure 69.

Figure 69 Mounting the ConvexOS V10.0 Utilities Tape

```
# /bin/mt -f device-name rew
# /bin/mt -f device-name fsf position-number
```

Replace *device-name* with the name of the tape device you are using. (For example, /dev/rmt20 or /dev/rdat0n.) Replace *position-number* with the position of the first file of the optional product.

Restoring a `cat` format utility

The header and script files for an optional product are always in `cat` format. To retrieve these from the tape, execute the command in Figure 70 after you have correctly positioned the tape.

Figure 70 Restoring a `cat` format utility

```
# cat < device-name > filename
```

Replace *filename* with the name of the file to which the utility is restored.

Restoring a dump format utility

The /usr data is in dump format. To restore it, enter the commands in Figure 71, after you have positioned the tape at position 8.

Figure 71 Restoring a dump format utility

```
# /etc/restore xGbf 64 device-name
```

Restoring a tar format utility

To restore a tar format utility, follow the steps in this section after you have correctly positioned the tape.

Step 1: Read the tar image into /tmp, as shown in Figure 72.

Figure 72 Reading a tar image into /tmp

```
# /bin/dd if=device-name of=/tmp/filename ba=64
```

Replace *device-name* with the name of the tape device you are using.

Step 2: List the files in the tar image by entering the command in Figure 73.

Figure 73 Listing the contents of a tar image

```
# cd /tmp
# tar tvf filename
```

Step 3: Extract the desired file from the tar image as shown in Figure 74.

Figure 74 Extracting a file from a `tar` image

```
# cd /tmp
# tar xvf filename
```

Replace *filename* with the name of the file as it appears in the output of the command in Figure 73.

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