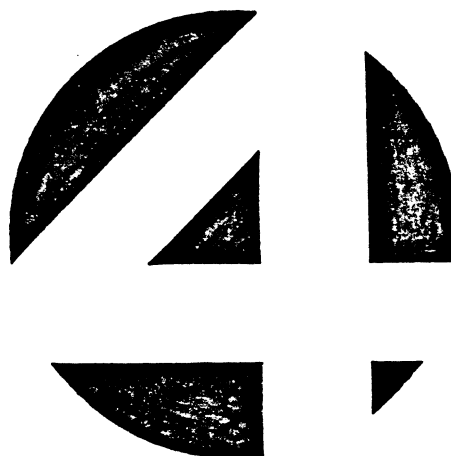# RISC/os

SOFTWARE BINARY
RELEASE NOTES
4.51 MANUAL

Revision A

NOTICE

Every attempt has been made to make this manual complete, accurate and up-to-date. However, all information herein is subject to change due to updates. All inquiries concerning this manual should be directed to POINT 4 Data Corporation.

Document Order Number: JTP0047

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REVISION RECORD

PUBLICATION NUMBER: SM-250-0047

Revision	Description	Date
A	Initial customer release	12/10/90

LIST OF EFFECTIVE PAGES

Changes, additions, and deletions to information in this manual are indicated by vertical bars in the margins or by a dot near the page number if the entire page is affected. A vertical bar by the page number indicates pagination rather than content has changed. The effective revision for each page is shown below.

Page	Rev	Page	Rev	Page	Rev
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Comment Sheet	A				
Mailer	-				
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--------------------------------- Contents   ---------------------------------

1. Introduction

This document contains the information required to install and run RISC/os 4.51 on a POINT 4 system. RISC/os 4.51 is a follow-on release to RISC/os 4.50, providing fixes for bugs that were found too late to be included in the 4.50 release.

These Release Notes are meant to be a supplement to the RISC/os 4.50 Release Notes. Please read through both Release Notes carefully before attempting to install release 4.51. There are significant changes in the installation process and in the administrative files from prior releases. You will need to read all of the release information and follow the procedures carefully to guarantee a smooth update.

1.1 Release Identification Information

Software Version
        RISC/os 4.51
Release Date
        November 16, 1990
POINT 4 Marketing Identification:
        QPR2000 RISC/os 4.51
        UTP2008 RISC/os 4.51 Release Notes

1.2 Release Requirements

The RISC/os System Requirements are:

Package	Approximate Disk Space	Inodes
root	8.49Mb	395
r2400	5.44Mb	815
r3030	5.57Mb	713
usr	41.90Mb	2727
cmplrs	6.28Mb	369
cmplrs-bsd43	1.36Mb	88
man	6.51Mb	2272
compat	14.93Mb	1069
bsd43	14.15Mb	606
reconfig	12.47Mb	352
emacs	8.26Mb	446
posix	2.39Mb	72
uucp	2.16Mb	56
sccs	.14Mb	3
news_readers	.62Mb	21
games	2.98Mb	39
mh	14.02Mb	63
Total for /usr packages	128.17Mb	8183

An update install requires approximately .5 megabyte of additional space on the root filesystem for an update install, and if all subpackages are installed, approximately 35 additional megabytes on the /usr filesystem.

1.3 Compatibility of Software Products

MIPS software is tested by MIPS for compatibility of specific releases. For best results with this release, you must use the following releases of other MIPS software:

Package	Release
C RISCompiler	2.11 (included with RISC/os)
FORTRAN RISCompiler	2.11
Pascal RISCompiler	2.11
PL/I RISCompiler	2.11
COBOL RISCompiler	2.11
RISCwindows	3.21
FrameMaker	1.31 or 2.1
MicroFocus COBOL	1.0
C++	2.0
UniVerse	5.3 or 5.4
Systems Programmer's Package	5.02

The following packages are not compatible with release 4.51. Systems

requiring them should be maintained at their current (pre-4.50) release level.

Package	Release
Ada RISCompiler	2.10
ASAPP	2.10
RISComm-DN	4.0

(Beta test versions of the next release of the above products are currently available and are compatible with RISC/os 4.51. The versions under test are: Ada/ASAPP 3.0 and RISComm-DN 4.10. Contact your Regional Sales Manager for information about applying for beta test status for these versions.)

The following packages have been tested by MIPS in the Compatibility Package, but may work outside of it:

Package	Release
Ingress	5.06a
Oracle	5.1.22
Informix	O3K

For third party applications and development software, contact your supplier for information about compatibility with release 4.51. As a general guide-line, applications which run as executable programs will run with no problems, and packages which are dependent on libraries or header files may require rebuilding or use of the Compatibility Package.

Packages which are compatible with 4.50 are compatible with 4.51, though they may not reflect some of the fixes listed in these Release Notes.

1.4 RISC/os Distribution Media

POINT 4 systems software is organized as a set of packages which comprise
several subpackages. The RISC/os operating system software package includes
the following subpackages distributed on two QIC-120 tapes:

Tape 1 of 2

File	Name	Contents
0	id:	tape identification
1	instd:	packaging information and tools
2	tapevol.std:	a bootable tape header and the stand-alone utilities, including the stand-alone shell (sash.std) and the disk formatter (format.std)
3	miniroot:	a minimal file system used to complete installation of the new os
4	unix.r2400_std.boot	MARK 2000/2500 tape bootable kernel
5	unix.r3030_std.boot	MARK 1500 tape bootable kernel
6	archive1:	root filesystem tar archive
7	archive2:	MARK 2000/2500 device and kernel files tar archive
8	archive3:	MARK 1500 device and kernel files tar archive
9	archive4:	standard usr filesystem tar archive

Tape 2 of 2

File	Name	Contents
0	id:	tape identification number
1	archive1:	base compiler system tar archive
2	archive2:	4.3 BSD compilation environment (libraries and compiler include files) tar archive
3	archive3:	on-line manuals tar archive
4	archive4:	RISC/os 4.00 compatibility tar archive
5	archive5:	4.3 BSD commands tar archive
6	archive6:	binary kernel reconfiguration files tar archive
7	archive7:	emacs tar archive
8	archive8:	POSIX libraries tar archive
9	archive9:	uucp tar archive
10	archive10:	sccs tar archive
11	archive11:	netnews reading programs tar archive
12	archive12:	games tar archive
13	archive13:	mh tar archive

2. RISC/os 4.51

This section describes new features, problems resolved, and known problems with RISC/os 4.51.

2.1 New Features

2.1.1 New Assembler

RISC/os 4.51 provides a new assembler with slightly different instruction scheduling.

2.1.2 New Cartridge Tape Drive Usage

In the past, cartridge tape drives have always been operated in ``default''
mode. For a read operation, the drive automatically determines the format
written on the tape. For a write operation, the drive writes the highest den-
sity supported by the tape cartridge. The following table shows what format
is written by each drive type and cartridge type by default: (The DC 600 XTD
is equivalent to the DC 6150 tapes)

Drive	Cartridge	Tape Format
150	DC 600 XTD	QIC-150
150	DC 600 A	QIC-120
150	DC 300 XLP	illegal
125	DC 600 XTD	QIC-120
125	DC 600 A	QIC-120
125	DC 300 XLP	illegal
60	DC 600 XTD	QIC-24
60	DC 600 A	QIC-24
60	DC 300 XLP	QIC-24

Please note that POINT 4 does not support QIC-150 format, but we have made it
possible to use the combination of DC 600 XTD cartridges with a QIC-150 drive
and override the default to write QIC-120 format tapes. In RISC/os 4.51, the
driver allows specification of tape format based on minor device number. To
maintain backward compatibility, the default mode may also be selected. The
minor device number encodes the tape format as follows:

    t t t t 0 d d n

where

<u>tttt</u> = target id number
<u>dd</u>   = density code
                00 = default density (current style)
                01 = QIC-24 format
                10 = QIC-120 format
                11 = QIC-150 format
<u>n</u>   = no rewind

The following table lists the device names and minor device numbers for the cartridge tape as device 6.

ctape0	96	default - rewind
ctape4	97	default - no rewind
Q24-0	98	QIC-24 - rewind
Q24n-0	99	QIC-24 - no rewind
Q120-0	100	QIC-120 - rewind
Q120n-0	101	QIC-120 - no rewind
Q150-0	102	QIC-150 - rewind
Q150n-0	103	QIC-150 - no rewind

With the new driver, if you specify device Q24-0 you can **only** read/write QIC-24 format. If you attempt to read a tape written in another format you will get an error. If you try to write a tape in another format, you will get an error. Use the correct device file for whatever format tape you have.

In order to use the new features of the cartridge tape driver, the following commands must be executed to set up the device files that allow you to override the default on MARK 2000 and MARK 2500 systems:

```
# cd /dev/rmt
# rm Q*
# mknod Q24-0 c 16 98
# mknod Q24n-0 c 16 99
# mknod Q120-0 c 16 100
# mknod Q120n-0 c 16 101
# mknod Q150-0 c 16 102
# mknod Q150n-0 c 16 103
# chmod 666 Q*
```

For the MARK 1500 system, use the following commands to set up the device files to override the default:

```
# cd /dev/rmt
# rm Q*
# mknod Q24-0 c 33 98
# mknod Q24n-0 c 33 99
# mknod Q120-0 c 33 100
# mknod Q120n-0 c 33 101
# mknod Q150-0 c 33 102
# mknod Q150n-0 c 33 103
# chmod 666 Q*
```

2.1.3 New timed Option

The -a flag was added to the **timed** command. For a **timed** master, it specifies
that the local clock is accurate, and should not be adjusted by the **timed** pro-
tocol. This flag may be used when another protocol or method assures the
accuracy of the local clock, and one wishes to use the time daemon as a dis-
tribution mechanism for this accurate time.

2.1.4 Sendmail

Three new versions of sendmail are provided with RISC/os 4.51 for compatibil-
ity with different configurations of host and alias files, NIS services, and
the Domain Name Server. The system administrator should select one version
which best suits the network environment and link or copy that version to
/usr/lib/sendmail. The three versions are:

- /usr/lib/sendmail.named
  This version is by default linked to /usr/lib/sendmail, and is the same
  version as the one shipped with previous releases of RISC/os.
  sendmail.named is compiled to query a running nameserver, and will work
  only if one of the following is true:

  1. The system can correctly resolve hostnames using the Domain Name
      Service either locally using /etc/named or remotely using
      /etc/resolv.conf and /etc/vis.conf is configured to use ``dns'' to
      resolve hostnames.

  2. /etc/resolv.conf exists with the correct domain information and the
      file /etc/hosts contains fully qualified hostnames (ie.
      service.point4.com)

- /usr/lib/sendmail.nonamed
  This version uses the gethostbyname system call and should be used when
  there is no operating nameserver on the user's network.

  /etc/vis.conf should be configured to use ``files'' to resolve hostnames,
  and the /etc/hosts file contains the list of hosts to which **sendmail** can
  communicate directly with via the network.

- **/usr/lib/sendmail.nis**
  This version of **sendmail** should be used when NIS services (Yellow Pages)
  are being used to resolve hostnames and system wide mail aliases.

  /etc/vis.conf should be configured to use ``nis'' to resolve hostnames,
  aliases will be resolved using /usr/lib/aliases, and using NIS for Yellow
  Pages aliases.

here are some examples:

1. Using sendmail.named with a remote nameserver:

    ```
    % cat /etc/vis.conf
    host:  files dns
    % cat /etc/resolv.conf
    domain mips.com
    nameserver 130.62.14.10
    ```

2. Using sendmail.named with no nameserver:

    ```
    % cat /etc/vis.conf
    host:  files
    % cat /etc/resolv.conf
    domain mips.com
    % cat /etc/hosts
    127.1                localhost loghost
    130.62.65.5          myhost myhost.mips.com
    130.62.49.11         yourhost yourhost.mips.com
    ```

3. Using sendmail.nonamed:

    ```
    % cat /etc/vis.conf
    host:  files
    % cat /etc/hosts
    127.1                localhost loghost
    130.62.65.5          myhost
    130.62.49.11         yourhost
    ```

4. Using sendmail.nis:

    ```
    % cat /etc/vis.conf
    host:  files nis
    % cat /etc/hosts
    127.1                localhost loghost
    130.62.65.5          myhost
    ```

Technical Hints:

1. The order of the entries in /etc/vis.conf determine which service, NIS,
    Domain Name Service (dns), or file lookup in /etc/hosts (files), should
    be tried to resolve hostnames.

2. **sendmail** is terribly dependent on the **sendmail** configuration file, /usr/lib/sendmail.cf. Be sure you have read the Systems Administration Guide on **sendmail** before you begin installation.

3. If you use a central host as a gateway for outbound mail, you might consider using sendmail.nis, because with proper configuration of the /etc/vis.conf file, one could resolve hostnames via nis, dns, and files, and it supports alias lookups via nis.

Refer to the Systems Administrator's Guide for more information on:

    Setting up the Nameserver:
    Setting up NIS:
    Setting up Sendmail:
    Setting up RISCos VIS:

Sendmail Guru's only:

/usr/lib/sendmail.named always attempts to get an MX record via the nameserver, as opposed to the other **sendmails** which use gethostbyname and are affected by the ordering of vis.conf. Therefore, to send mail to hosts which your system is connected to but which are not directly on the internet without explicit routing, taking advantage of MX records, you must use sendmail.named.

2.1.5 trpt

The **trpt** command was ported to RISC/os 4.51. **trpt** interrogates the buffer of TCP trace records created when a socket is marked for ``debugging'' (see setsockopt(2)), and prints a readable description of these records. See the trpt(1M) man page for information.

2.1.6 vi/ex Support For Eight Bit Display

vi and **ex** have been enhanced to optionally pass all eight bits on output when the variable ``8bitdisplay'' is set using the ``:set'' command. To preserve the prior behavior in which characters with the eighth bit set were displayed using the \xxx notation, this variable defaults to off, ``no8bitdisplay''.

2.1.7 Additional System Groups

Four additional entries have been made to the default group data base (/etc/group) to supply names for all the groups mentioned in the default /etc/passwd. On update installations, you may wish to add these entries into your group file. The new entries are for the following groups:

5	uucp	uucp as a user account, owner of uucp programs
10	nuucp	uucp transfer account, uucico as login shell
14	nobody	group for a currently unused daemon account
18	xrje	group for the user rje, which is currently unused

Adding these entries will also reduce the number of complaints from pwck about bad groups. The impact of these requested changes is largely cosmetic, and is not critical for system operations.

2.2 Problems Resolved in RISC/os 4.51

The following sections describe problems resolved in RISC/os 4.51.

2.2.1 Binary Kernel Reconfiguration

To the best of our knowledge, the RISC/os 4.51 kernel does not need any binary reconfiguration for Universe/Pick sites. All master.d/msg, master.d/sem and master.d/shm constants are now adequate.

2.2.2 Shared Memory Fixes

Two fixes were made for shared memory:

- While locking a shared memory segment, the system was not reserving any real memory and allowed the caller to lock an unlimited number of shared memory segments in-core.

- A system panic sometimes resulted when shared memory was freed without first being unlocked.

2.2.3 TLB Entries

A bug was discovered in RISC/os 4.50 which occurs only when someone detaches and then reattaches a shared memory segment or shrinks the data region by less then 7 pages and crosses the 2 Mbyte boundary. This is a rare occurrence, but could result in a core dump or other unpredictable results. This bug is fixed in RISC/os 4.51.

2.2.4 Exabyte

The following fixes were made for Exabyte tape drives:

- Previous versions of RISC/os contained a bug in which the system would crash if a tape operation was started before the Exabyte drive was ready.

● RISC/os 4.50 did not properly recognize and attach the Exabyte SCSI drive
  during system initialization due to a timing problem caused by multiple
  drives in the system. Specifically, this could happen on systems with an
  Exabyte and more than one disk.

2.2.5 Asynchronous Writes

A change was made to the kernel to make block writes resulting from appending
to a disk file be done delayed (bsdwrite), instead of asynchronously
(bawrite). Doing the write asynchronously slowed down appending, because it
made the disk busy when the application attempted to allocate the next disk
block for the next write, which required a synchronous write to the disk to
record the allocation.

2.2.6 vn_rele Panic

Linking a file on an NFS mounted filesystem in RISC/os 4.50 sometimes crashed
the server with either an ``iinactive'' or ``vn_rele'' panic. This problem is
fixed in RISC/os 4.51.

2.2.7 Serial I/O

RISC/os 4.51 includes enhanced error checking to properly handle extraneous
interrupts and data on closed tty ports. This eliminates one source of panics
on the system.

2.2.8 Network Information Service (NIS)

The Network Information Service (NIS, formerly known as Yellow Pages) was not
fully functional in prior releases. These problems have been largely resolved
in this release. The following known constraints exist:

● The hosts.equiv file does not recognize the NIS escapes sequences for
  netgroups. You must explicitly list the appropriate hosts in this file.

● Conversion of the local passwd file to or from using the shadow password
  mechanisms must be done with NIS services for this file disabled, and the
  NIS escapes deleted. That is, prior to running pwconv or pwunconv, the
  conversion programs, you must disable NIS service for passwd by editing
  /etc/vis.conf to delete the nis entry for passwd:, and delete the lines
  beginning with ``+'' or ``-'' from /etc/passwd. These lines must be
  added back to the passwd file after conversion, and then re-enable NIS
  service for passwd by revising /etc/vis.conf to include nis for passwd.

Included in these NIS changes are changes to the /bin/passwd and
/bsd43/bin/passwd programs so that these programs alter only the local passwd
file. NIS passwords are not changed by these programs. Instead, the program

yppasswd must be used.

As with other systems running NIS, your RISC/os system must have some information in its local files to allow it to be booted and to bring up the TCP/IP networking software necessary to communicate with the NIS server. Specifically:

• your /etc/passwd file must have an entry for **root**

• you must have an /etc/group file, but it can contain only the ``+:'' entry

• your /etc/hosts file must contain entries for the local system by name and for the special name ``localhost''.

Since NIS is an option, neither the client nor the server software is started by default. If you wish to run NIS, you must modify the the /etc/init.d/netdaemons as described in the System Administrators Guide. RISC/os supports both NIS client and server operation.

Also included in these changes to better support NIS is a different **sendmail** program, **sendmail.nis**, which follows the semantics of SunOS versions of the mail subsystem with respect to alias use. These semantics include automatic use of NIS for retrieval of information about aliases. **sendmail** is discussed in more detail elsewhere in this document.

2.2.9 Starting NIS

The system does not automatically start the NIS daemons (neither **ypserv** nor ypbind). If you wish to use NIS on your system it will be necessary to start the appropriate daemons with a locally provided script.

NIS must be started before the automounter, and after the portmapper. This suggests that the proper place is a file called /etc/rc2.d/S38nis local. The S38 prefix says this is a startup script and these scripts are processed in numeric order. S38xxx would be processed after S37netdaemons, where the portmapper is started, and before S40nfs which is where the automounter is started if it has been configured. The rest of the name is not important.

The contents of this file should be something like:

```
#
#  Startup file for NIS
#
#   start up the YP server  (Required only if there is to be a server on
#   this system)  This assumes that you have previously set up the server
#   for this system using ypinit.
echo starting ypserv
/usr/etc/yp/ypserv

#   start the ypbind program.  This is required on all systems using NIS.
#   The nohup is required to operate this command from this startup script.
echo starting ypbind
nohup /etc/ypbind

#   the first yp client access causes the binding to the server.  This
#   does one ypwhich to force this.  This will come back and say
#   something like   Domain mips.com not bound  which is OK
/usr/bin/ypwhich
```

2.2.10 NIS and Shadow Passwords

RISC/os 4.50 provided support for both NIS (Yellow Pages) and Shadow Pass-
words. In some sense, utilization of NIS defeats the protection of the passwd
data base afforded by use of Shadow Passwords, as a programmer could obtain
the encrypted NIS passwords with normal system calls. Shadow Passwords do
protect the local passwords, and the two features can be used together, sub-
ject to the constraints on conversion to and from the Shadow Password mechan-
ism (via pwconv and pwunconv) discussed above.

2.2.11 nice Processes and High CPU Usage

A change was made to the kernel to allow nice'd processes' CPU usage to be
aged even when the load average is high, and when updating a parent process's
resource totals.

2.2.12 systat

The -vmstat option now counts only USER_PROCESS entries, similar to what
uptime does.

2.2.13 SCSI Disk Software-Controller Power-Up

Bug fixes have been made to the SCSI drivers to properly ``motor=start'' disk drives for those hardware configurations that require sequenced power-up.

2.2.14 glossary

The **glossary** command now works.

2.2.15 /bsd43/bin/install

The **install -s** option now works.

2.2.16 /usr/bsd43/bin/ps

The RISC/os 4.51 version of /usr/bsd43/bin/ps has a fix for the output of the WCPU field when using the -a option.

2.2.17 more

When used with the -p option, **more** no longer clears the screen after the error message is printed, making it impossible to know what the error message was.

2.2.18 /bsd43/bin/spell

The /bsd43/bin/spell program was never installed in previous releases because of conflicts with System V **spell** file locations. /bsd43/bin/spell is now installed correctly.

2.2.19 tftpd

A bug described in the RISC/os 4.50 Release Notes concerning **tftpd** being invoked with the -s (secure) option has been fixed. **tftpd** will now correctly follow symbolic links if the -s option is not used.

2.2.20 uucp

In RISC/os 4.50, uucp over TCP was broken, but now works in RISC/os 4.51.

2.2.21 Installation Tool Changes

The following changes were made to the installation tools for RISC/os 4.51:

- The space check now checks for disk fragmentation if more than 90% of the disk will be used; it lists the exact percentage of the disk that will be used if it uses more than 90%; and the check is more conservative than previously when giving credit for current files.

- The **diskmap** program no longer lists occupied partitions as ``available''.

- The installation tools now allow up to three retries after encountering a tar read error.

- Subpackage selection speed is improved over that in RISC/os 4.50.

2.3 Known Problems and Limitations

The following is a list of known problems with the RISC/os 4.51 release, and any work around solutions known.

2.3.1 format

If you are going to format a SCSI disk, as opposed to just writing a new volume header or scanning, you must verify that the drive parameters are correct before actually formatting. When the program asks:

dump device parameters (y if yes)?

respond with a **y**.

Ensure that the ``tracks per zone'' is 1, the ``alternate sectors per zone'' is 1 and the ``alternate tracks per volume'' is 2 times the ``number heads''. If required, you may modify these parameters by responding **y** to the ``modify device parameters'' question.

If the drive was formatted with an earlier version of **format** you should also respond **y** to the question:

use default device parameters (y if yes)?

This will ensure that the disk utilization is optimal. When you run **newfs.ffs**, use the number of sectors reported by **prtvtoc** if they are different from the values in /etc/disktab.

2.3.2 /bsd43/bin/passwd Does Not Honor Password Aging

The program /bsd43/bin/passwd does not follow the constraints on password change imposed by the optional invocation of password aging. Thus, if you wish to make use of password aging, you should disable /bsd43/bin/passwd by removing execute permissions or deleting it. Users can change their passwords before the minimum time interval with /bsd43/bin/passwd, which is not permitted by /bin/passwd.

2.3.3 Binary Identification Strings

When the what or ident commands are used on any of the standard package RISC/os 4.51 binaries, the reported revision is ``RISC?os'' instead of ``RISC/os''.

2.3.4 Automounter Messages

If you configure the automounter and are not using NIS, you will see the following messages through syslog:

        automount[160]: YP bind failed: can't communicate with ypbind
        automount[160]: auto.master: can't communicate with ypbind

These should not effect the automounter's function.

2.3.5 Startup Scripts on Systems Without the bsd43 Subpackage

Some of the startup scripts in /etc/init.d use the head command which is in the optionally installable bsd43 subpackage. Systems re-installed without the bsd43 subpackage may fail to start system services properly. You may correct this either by installing the bsd43 subpackage, or by changing all references in the scripts sysetup, netdaemons, and nfs from:

        head (or bsd43/bin/head or /usr/ucb/head) -1 filename

to:

        sed -n -e 1p filename

which will avoid using the command.

2.3.6 Manual Updating Required for Startup Scripts

Many startup scripts in the /etc/init.d directory have been changed; the new versions will be loaded as <script>:4.51+. Be sure to compare these scripts to any scripts you may have modified, and put the merged script, or the original script if no localization is needed, under the name <script>. (For

example, if there are no local changes to the NFS startup script, move
/etc/init.d/nfs:4.51+ to /etc/init.d/nfs.)

2.3.7 Binary Configuration

The files needed to rebuild the RISC/os kernel (according to the ``Binary
Reconfiguration'' directions in the RISC/os Systems Administrator's Guide)
have been broken out into a seperate subpackage called reconfig on the release
4.51 tapes. This subpackage is normally pre-installed on systems shipped by
POINT 4. If you re-install software from scratch, you must be careful to
select the reconfig subpackage (or, of course, all subpackages) if you wish to
reconfigure kernel parameters or add device drivers.

Also, because it contains header files which are used within the kernel, you
must install the bsd43 suopackage if you wish to perform binary configuration.

2.3.8 indent Core Dumps

indent core dumps when used. This will be corrected in the next release of
RISC/os.
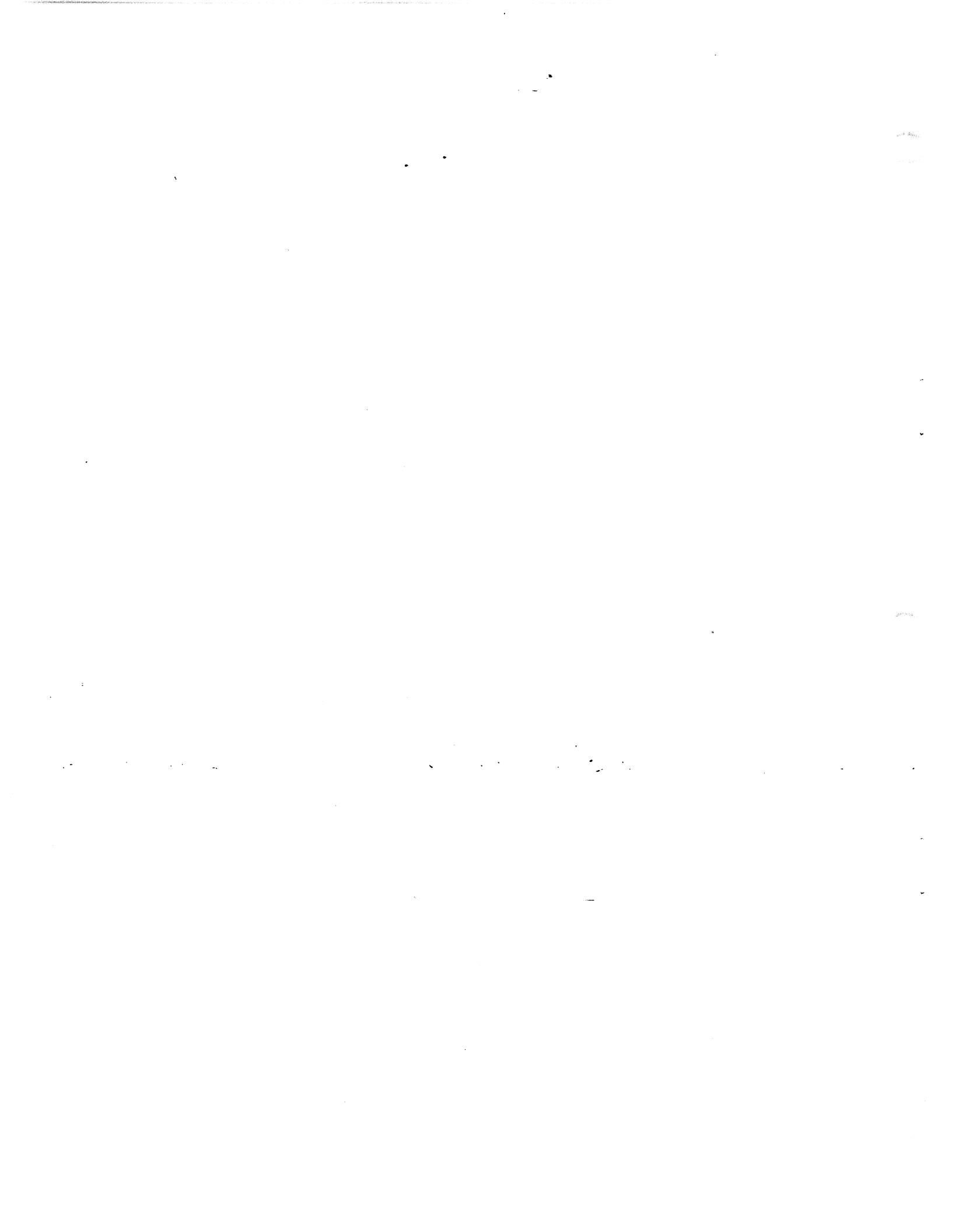
3. Installation Notes

This section illustrates the installation of the RISC/os 4.51 binary release onto a POINT 4 system. In the procedure examples given in this section, different fonts are used to show output from the system and user responses. System output is shown in the standard font; user responses are shown in the **bold** font; comments about the procedure are shown in <u>underlines</u>. All user responses should be typed as shown and entered with a return.

Prompts from the installation scripts are always in the form:

  prompt (choice1 choice2 ...) [default]?

or, simply:

  prompt [default]?

where ``(choice1 choice2 ...)'', if present gives the range of legal responses, and ``[default]'' gives the default choice; pressing return by itself will always select the default choice.

Each series of a machine type supported by POINT 4 requires slightly different installation commands. In the scripts below, we include all versions of the command with a comment in parenthesis identifying which command to use for which system type. The installation messages will also vary depending on system type.

3.1 Installing RISC/os 4.51 as an Update

This section describes the procedure for performing an update install. If you have received this release of RISC/os as a software update, you will need to perform this procedure to install it on your system running an earlier release. Please read the **Known Problems and Limitations** section of both these release notes and the <u>RISC/os 4.50 Release Notes</u> before attempting the installation.

A sample update installation is shown below. The procedure is the same for all other systems; some of the particulars of the messages shown below will also vary slightly from machine to machine, but the procedure will be essentially the same as shown for all system types.

Installation of the RISC/os 4.51 <u>usr</u> filesystem requires approximately 35 megabytes of free space. To save yourself some time, it is best to ensure this space is available before beginning the update procedure.

3.1.1 Prior to Beginning the Update

Before beginning the update procedure, there are a few cautionary items to note:

- The update procedure requires that all of the system's filesystems be ``clean'' (i.e., unmounted when the system is brought down before loading the miniroot). If for some reason they are not, the install will note that they cannot be mounted, and halt. If this happens, use /etc/fsck.ffs from the miniroot to clean the filesystem(s) before redoing the install.

- Any directories in the root or usr filesystems that may have been linked to a separate filesystem in order not to fill up the root or usr filesystems should be added to the preserve list before giving the inst command. If any of these special directories are not added to the preserve lists, the links (and thus the files in the directories) will be lost during installation. Take a good look at the $Pkg/lib/root.preserves and usr.preserves files, and add any appropriate entries (mount /usr on /mnt if you prefer an editor other than ed).

- If any directories (RISC/os' filesystems, such as /usr, /usr/man, or any other directories where RISC/os software is installed) are links to filesystems across the net through NFS, the installation procedure will fail with a message similar to this:

  space: error: fstabind(): couldn't find device file for dev = 0x1436
  space: fatal: pathname: ./usr/man/catman/u_man/man1/pc.1

  To work around this problem, delete the link to the remote filesystem, create the directory on the target system and proceed with the installation. Once the installation is complete, the filesystem (or directory) can be removed and the link recreated.

  For example, if /usr/man is a link, type:

  ```
  # ls -l /usr/man
  l--------- 1 bin bin 15 May 13 15:33 /usr/man@ -> /n/system2/usr/man
  # mv /usr/man /usr/man.temp
  # mkdir /usr/man
  ```

  and the manual pages will not be installed.

- The /etc/fstab file must be in correct format. In particular, no blank lines are allowed. Use ``#'' for a blank comment line.

- And finally, if it looks like anything at all went wrong during the installation procedure, the upgrade should be redone to ensure no bizarre behavior results.

3.1.2 Shutting Down the System

To begin the update installation, you must first shutdown the system. To shut down a POINT 4 system running RISC/os, perform the following steps from the console device:

```
    login: root
    Password:

    # cd /
    # /etc/telinit 0
```

Before pressing reset or turning off the power, the system administrator should wait for the console message:

    The system is down.

Under normal circumstances the system will then drop into the monitor and the console will display the monitor prompt:

```
M/120 MIPS Monitor Version 5.10 MIPS OPT Tue Nov 28 21:06:25 PST 1989 root
Memory size: 16777216 (0x1000000) bytes, 16MB
Icache size: 65536 (0x10000) bytes
Dcache size: 65536 (0x10000) bytes
>>
```

3.1.3 Installing and Booting the miniroot

Put tape 1 into the tape drive and proceed as follows:

```
>> boot -f tqsd(,6,2)sash.std    (for MARK 1500)
>> boot -f tqis(,,2)sash.std     (for MARK 2000/2500)
209760+58672+229232 entry: 0xa0300000
Standalone Shell: Version 5.02 OPT Tue Aug 21 02:16:35 PDT 1990 root
sash: cp -b 16k tqsd(0,6,3) dksd(,,1)    (MARK 1500)
sash: cp -b 16k tqis(,,3) dkis(,,1)      (for MARK 2000/2500)

13824000 (0xd2f000) bytes copied


enter one of the following commands, depending on your system type:

sash: boot -f tqis(,,4)unix.r2400_std root=isc0d0s1    (for MARK 2000/2500)
sash: boot -f tqsd(0,6,5)unix.r3030_std root=sdc0d0s1  (for MARK 1500)
840528+109248+870464 entry: 0x80021000
CPU: MIPS R3000 Processor Chip Revision: 2.0
FPU: MIPS R3010 VLSI Floating Point Chip Revision: 2.0

RISC/os Release 4_51 mips Version UMIPS
Total real memory  = 16777216
Available memory   = 14581760
Root on dev 0x1001, Swap on dev 0x1001
Root fstype ffs
New swplo: 26992  swap size: 6244K bytes
Available memory  = 12967936


Miniroot run level 1

Making miniroot device files for m120-5 system...
erase=^H, kill=^U, interrupt=^C
```

3.1.4 Updating the System Software

At this point, the miniroot file system has been copied to the swap partition and is running the Bourne shell, sh. To begin the update, proceed as follows from the miniroot prompt:

```
# From=Q120
# Install=update
# inst
```

Software package installation

Installation Information:

This is an update install.
Packages will be read in from the local Q120 tape device.
Machine type: m120-5

Is the information above correct? (y n) [y]?

Note: It is not necessary to install a kernel on the miniroot
      The process will take a few minutes.
Would you like to install the kernel to the miniroot (y n) [n]? n

========== checking subpackages ==========

The following subpackages may be installed:

root   -- RISC/os Standard Root Filesystem
m120   -- RISC/os MARK 2000/2500 Kernel and Devices
usr   -- RISC/os Standard /usr Filesystem
cmplrs   -- MIPS-C Compiler
cmplrs-bsd43   -- MIPS-C 4.3 BSD Include Files and Libraries
man   -- RISC/os Manual Pages
compat   -- RISC/os 4.00 Compatibility Libraries
bsd43   -- RISC/os 4.3 BSD Utilities, Include Files and Libraries
reconfig   -- Kernel Binary Reconfiguration Components
emacs   -- emacs
posix   -- RISC/os POSIX P1003.1 Include Files, Commands and Libraries
uucp   -- UUCP
sccs   -- SCCS
news_readers   -- News Readers
games   -- Games
mh   -- mh

========== selecting subpackages ==========

You may select all of the above subpackages by answering "y" to the
following question. If you answer "n" then you will be asked to
select the optional subpackages you would like to have installed.

Install ALL subpackages (y n) [n]? y

========== setting system clock/calendar ==========

The current value of the clock is: Thu Aug 23 16:15:40 PDT 1990
Is the clock correct (y n) [y]?

========== verifying single-user mode ==========

The system is in a single-user run level.

Please answer "y" to.the following question unless you really understand
the consequences.

Do you want to install sash to the volume header (y n) [y]?

========== installing sash to the volume header ==========

========== mounting filesystems ==========

/dev/root mounted on /mnt
/dev/usr mounted on /mnt/usr

Partition   Megs   Mounted File System or Partition Usage
----
0   /dev/dsk/isc0d0s0   20   /dev/root
1   /dev/dsk/isc0d0s1   20   /
6   /dev/dsk/isc0d0s6   569   /dev/usr
7   /dev/dsk/isc0d0s7   25   -#### Available Partition ####-

Disk Device   /dev/dsk/isc0d0s2   632   Megabytes Total Size

Do you wish to change swap partition configuration (y n) [n]?

========== preserving local files ==========

Running preserve -s for subpackage root... 56 files preserved.
No preserve list or findmods list for m120-5 preserve not executed.
Running preserve -s for subpackage usr... 25 files preserved.
No preserve list or findmods list for cmplrs- preserve not executed.
No preserve list or.findmods list for_cmplrs-bsd43- preserve not.executed.
No preserve list or findmods list for man- preserve not executed.
No preserve list or findmods list for compat- preserve not executed.
No preserve list or findmods list for bsd43- preserve not executed.
No preserve list or findmods list for reconfig- preserve not executed.
No preserve list or findmods list for emacs- preserve not executed.
No preserve list or findmods list for posix- preserve not executed.
No preserve list or findmods list for uucp- preserve not executed.
No preserve list or findmods list for sccs- preserve not executed.
No preserve list or findmods list for news_readers- preserve not executed.
No preserve list or findmods list for games- preserve not executed.
No preserve list or findmods list for mh- preserve not executed.

========== verifying disk space ==========

Do you want to check for space (please do so unless you really
understand the consequences) (y n) [y]?
The system will now be checked to verify that there is enough disk

space with the current configuration to successfully install the package
(and any selected optional subpackages). For large packages (especially
operating system packages), this can be time consuming...

You will see one of the following responses from the system:

device	bfree	ifree	breq	ireq	bcred	icred
/dev/root	5032	8827	13081	396	11344	348
/dev/usr	19607	102942	87942	4744	72948	4574

WARNING! This package will fit on the disk,
but it will cause more than 90% of the disk to be used.
This may cause problems for non-root users.
It is recommended that you abort the installation now.

Abort the installation? (y n) [y]? n

or:

There is enough space.

========== stripping old links ==========

Stripping links for subpackage root...
Stripping links for subpackage m120-5...
Stripping links for subpackage usr...
Stripping links for subpackage cmplrs...
Stripping links for subpackage cmplrs-bsd43...
Stripping links for subpackage man...
Stripping links for subpackage compat...
Stripping links for subpackage bsd43...
Stripping links for subpackage reconfig...
Stripping links for subpackage emacs...
Stripping links for subpackage posix...
Stripping links for subpackage uucp...
Stripping links for subpackage sccs...
Stripping links for subpackage news_readers...
Stripping links for subpackage games...
Stripping links for subpackage mh...

========== extracting files from subpackage archives ==========

rewinding the tape...

Verifying tape id... ok
Forward spacing the tape...

Loading subpackage: root...
Forward spacing the tape...
Forward spacing the tape...
Loading subpackage: m120-5...

Forward spacing the tape...
Forward spacing the tape...
Loading subpackage: usr...
Forward spacing the tape...
rewinding the tape...

Please mount umips tape number 2 and press return:
rewinding the tape...
Verifying tape id... ok
Forward spacing the tape...

Loading subpackage: cmplrs...
Forward spacing the tape...
Loading subpackage: cmplrs-bsd43...
Forward spacing the tape...
Loading subpackage: man...
Forward spacing the tape...
Loading subpackage: compat...
Forward spacing the tape...
Loading subpackage: bsd43.
Forward spacing the tape...
Loading subpackage: reconfig...
Forward spacing the tape...
Loading subpackage: emacs...
Forward spacing the tape...
Loading subpackage: posix...
Forward spacing the tape...
Loading subpackage: uucp...
Forward spacing the tape...
Loading subpackage: sccs...
Forward spacing the tape...
Loading subpackage: news_readers...
Forward spacing the tape...
Loading subpackage: games...
Forward spacing the tape...
Loading subpackage: mh...
Forward spacing the tape...
rewinding the tape...

========== making device special files ==========

running MKDEV...
done.

========== running comply ==========

running first comply pass...
running second comply pass...
There were no comply messages from the second pass.

========== cleaning up old versions ==========

An attempt will now be made to clean up any files left over from previous
versions of the software which has just been installed.

Searching for old versions to remove...
Clean up umips.root 4.50 (y n) [n]? y
Removing leftover files from umips.root 4.50...
Clean up umips.m120-5 4.50 (y n) [n]? y
Removing leftover files from umips.m120-5 4.50...
Clean up umips.usr 4.50 (y n) [n]? y
Removing leftover files from umips.usr 4.50...
rm ./usr/dict/build_hlists
rm ./usr/etc/fuser
Clean up umips.cmplrs 4.50 (y n) [n]? y
Removing leftover files from umips.cmplrs 4.50...
Clean up umips.cmplrs-bsd43 4.50 (y n) [n]? y
Removing leftover files from umips.cmplrs-bsd43 4.50...
Clean up umips.man 4.50 (y n) [n]? y
Removing leftover files from umips.man 4.50...
rm ./usr/man/catman/u_man/man1/netstat.1
Clean up umips.compat 4.50 (y n) [n]? y
Removing leftover files from umips.compat 4.50...
Clean up umips.bsd43 4.50 (y n) [n]? y
Removing leftover files from umips.bsd43 4.50...
Clean up umips.reconfig 4.50 (y n) [n]? y
Removing leftover files from umips.reconfig 4.50...
Clean up umips.emacs 4.50 (y n) [n]? y
Removing leftover files from umips.emacs 4.50...
Clean up umips.posix 4.50 (y n) [n]? y
Removing leftover files from umips.posix 4.50...
Clean up umips.uucp 4.50 (y n) y
Removing leftover files from umips.uucp 4.50...
Clean up umips.sccs 4.50 (y n) [n]? y
Removing leftover files from umips.sccs 4.50...
Clean up umips.news_readers 4.50 (y n) [n]? y
Removing leftover files from umips.news_readers 4.50...
Clean up umips.games 4.50 (y n) [n]? y
Removing leftover files from umips.games 4.50...
Clean up umips.mh 4.50 (y n) [n]? y
Removing leftover files from umips.mh 4.50...

========== restoring preserved user files ==========

Running preserve -r for subpackage root...
No preserve list or findmods list for m120-5- no files restored.
Running preserve -r for subpackage usr...
No preserve list or findmods list for cmplrs- no files restored.
No preserve list or findmods list for cmplrs-bsd43- no files restored.
No preserve list or findmods list for man- no files restored.
No preserve list or findmods list for compat- no files restored.
No preserve list or findmods list for bsd43- no files restored.
No preserve list or findmods list for reconfig- no files restored.

No preserve list or findmods list for emacs- no files restored.
No preserve list or findmods list for posix- no files restored.
No preserve list or findmods list for uucp- no files restored.
No preserve list or findmods list for sccs- no files restored.
No preserve list or findmods list for news_readers- no files restored.
No preserve list or findmods list for games- no files restored.
No preserve list or findmods list for mh- no files restored.

========== running conversion scripts ==========

========== root.fstab   Thu Aug 23 17:24:26 PDT 1990 ==========

No ips devices found in /etc/fstab.

To take advantage of the improved parallel fsck, /etc/fstab will now
be modified to allow the root partition to be fsck'd on the first pass.
All other local filesystems will be fsck'd on the second pass.

A copy of /etc/fstab will be saved as /etc/fstab.save.1.

No changes made.

Press return to continue:

========== cleaning up ==========

Copying packaging information directory to /mnt/usr/pkg/lib/umips4.51...
Removing Duplicate File /mnt/.cshrc:4.51+
Removing Duplicate File /mnt/.login:4.51+
Removing Duplicate File /mnt/.profile:4.51+
Removing Duplicate File /mnt/etc/TIMEZONE:4.51+
Removing Duplicate File /mnt/etc/TZ:4.51+
Removing Duplicate File /mnt/etc/bupsched:4.51+
Removing Duplicate File /mnt/etc/cshrc:4.51+
Removing Duplicate File /mnt/etc/coredirs:4.51+
Removing Duplicate File /mnt/etc/dumpdates:4.51+
Removing Duplicate File /mnt/etc/exports:4.51+
Removing Duplicate File /mnt/etc/gettydefs:4.51+
Removing Duplicate File /mnt/etc/inetd.conf:4.51+
Removing Duplicate File /mnt/etc/init.d/ANNOUNCE:4.51+
Removing Duplicate File /mnt/etc/init.d/MOUNTFSYS:4.51+
Removing Duplicate File /mnt/etc/init.d/README:4.51+
Removing Duplicate File /mnt/etc/init.d/RMTMPFILES:4.51+
Removing Duplicate File /mnt/etc/init.d/addswap:4.51+
Removing Duplicate File /mnt/etc/init.d/autoconfig:4.51+
Removing Duplicate File /mnt/etc/init.d/cron:4.51+
Removing Duplicate File /mnt/etc/init.d/disks:4.51+

Removing Duplicate File /mnt/etc/init.d/firstcheck:4.51+
Removing Duplicate File /mnt/etc/init.d/lockfix:4.51+
Removing Duplicate File /mnt/etc/init.d/netdaemons:4.51+
Removing Duplicate File /mnt/etc/init.d/perf:4.51+
Removing Duplicate File /mnt/etc/init.d/savecore:4.51+
Removing Duplicate File /mnt/etc/init.d/set_kopts:4.51+
Removing Duplicate File /mnt/etc/init.d/smtp:4.51+
Removing Duplicate File /mnt/etc/init.d/syslog:4.51+
Removing Duplicate File /mnt/etc/init.d/tzsetup:4.51+
Removing Duplicate File /mnt/etc/init.d/uucp:4.51+
Removing Duplicate File /mnt/etc/inittab:4.51+
Removing Duplicate File /mnt/etc/motd:4.51+
Removing Duplicate File /mnt/etc/profile:4.51+
Removing Duplicate File /mnt/etc/protocols:4.51+
Removing Duplicate File /mnt/etc/remote:4.51+
Removing Duplicate File /mnt/etc/services:4.51+
Removing Duplicate File /mnt/etc/sysdirlist:4.51+
Removing Duplicate File /mnt/etc/syslist:4.51+
Removing Duplicate File /mnt/etc/syslog.conf:4.51+
Removing Duplicate File /mnt/etc/termcap:4.51+
Removing Duplicate File /mnt/etc/timed.conf:4.51+
Removing Duplicate File /mnt/etc/ttytype:4.51+
Removing Duplicate File /mnt/usr/etc/exports:4.51+
Removing Duplicate File /mnt/usr/etc/bootptab:4.51+
Removing Duplicate File /mnt/usr/etc/timed.conf:4.51+
Removing Duplicate File /mnt/usr/lib/aliases:4.51+
Removing Duplicate File /mnt/usr/lib/sendmail.cf:4.51+
Removing Duplicate File /mnt/usr/lib/me/local.me:4.51+
Removing Duplicate File /mnt/usr/lib/uucp/Devconfig:4.51+
Removing Duplicate File /mnt/usr/lib/uucp/Devices:4.51+
Removing Duplicate File /mnt/usr/lib/uucp/Dialcodes:4.51+
Removing Duplicate File /mnt/usr/lib/uucp/Dialers:4.51+
Removing Duplicate File /mnt/usr/lib/uucp/Permissions:4.51+
Removing Duplicate File /mnt/usr/lib/uucp/Poll:4.51+
Removing Duplicate File /mnt/usr/lib/uucp/Sysfiles:4.51+
Removing Duplicate File /mnt/usr/lib/uucp/Systems:4.51+
Removing Duplicate File /mnt/usr/lib/uucp/Uutry:4.51+
Removing Duplicate File /mnt/usr/spool/cron/crontabs/adm:4.51+
Removing Duplicate File /mnt/usr/spool/cron/crontabs/periodic:4.51+
Removing Duplicate File /mnt/usr/spool/cron/crontabs/root:4.51+
Removing Duplicate File /mnt/usr/spool/cron/crontabs/sys:4.51+
Removing Duplicate File /mnt/usr/spool/cron/crontabs/sysadm:4.51+
Removing Duplicate File /mnt/usr/spool/cron/crontabs/uucp:4.51+
Removing Duplicate File /mnt/usr/spool/lp/pstatus:4.51+
Removing Duplicate File /mnt/usr/spool/lp/qstatus:4.51+

Unmounting filesystems...
/mnt/usr: Unmounted
/mnt: Unmounted

========== installation complete ==========
#

Please read the ``Post-Installation System Modifications'' section in the
RISC/os 4.50 Release Notes to make sure everything is correct before shutting
down the miniroot and booting multi-user.

3.2 Installing RISC/os 4.51 From Scratch

This section describes how to install RISC/os onto disk for the first time, or
what to do in the event of an unrecoverable system failure, when the disks
must be reformatted and RISC/os re-installed from scratch. If anything about
the installation appears to be wrong, it is best to redo the install, to
ensure no strange behavior results.

A sample scratch install is illustrated below. Some of particulars of the
messages shown below will vary slightly from machine to machine, but the pro-
cedure is essentially the same as shown for all system types.

3.2.1 Installing and Booting the miniroot

To install RISC/os 4.51, put tape 1 into the tape drive and proceed as fol-
lows:

MIPS Monitor: Version 5.50 MIPS OPT Wed Jun 20 11:14:30 PDT 1990 root
Memory size: 100663296 (0x6000000) bytes, 96 MB
Icache size: 65536 (0x10000) bytes
Dcache size: 65536 (0x10000) bytes
>> boot -f tqsd(,6,2)sash.std   (for MARK 1500)
>> boot -f tqis(,,2)sash.std   (for MARK 2000/2500)

Rewinding the tape.....Done

Forward spacing the tape 2 files.....Done
209760+58672+229232

Rewinding the tape.....Done

 entry: 0xa0300000
Standalone Shell: Version 5.02 OPT Tue Aug 21 02:16:35 PDT 1990 root
sash: **cp -b 16k tqsd(0,6,3) dksd(,,1)**   (<u>for</u> <u>MARK</u> <u>1500</u>)
sash: **cp -b 16k tqis(,,3) dkis(,,1)**   (<u>for</u> <u>MARK</u> <u>2000</u>/<u>2500</u>)

Rewinding the tape.....Done

Forward spacing the tape 4 files.....Done

13824000 (0xd2f000) bytes copied

Rewinding the tape.....Done

sash: **boot -f tqis(,,4)unix.r2400_std root=isc0d0s1**   (<u>for</u> <u>MARK</u> <u>2000</u>/<u>2500</u>)
sash: **boot -f tqsd(0,6,5)unix.r3030_std root=sdc0d0s1** (<u>for</u> <u>MARK</u> <u>1500</u>)

1181824+120816+874464 entry: 0x80021000

Rewinding the tape......Done

Forward spacing the tape 6 files......Done

902640+119712+881024
Rewinding the tape.....Done
 entry: 0x80021000

CPU: MIPS R3000 Processor Chip Revision: 2.0
FPU: MIPS R3010 VLSI Floating Point Chip Revision: 2.0

RISC/os Release 4_51 mips Version UMIPS
Total real memory = 33554432
Available memory = 30687232
Root on dev 0x2101, Swap on dev 0x2101
Root fstype ffs
New swplo: 26992 swap size: 6160K bytes
Available memory = 29134848

Miniroot run level 1

Making miniroot device files for RC3230 system...
erase=^H, kill=^U, interrupt=^C

3.2.2 Installing the System Software

At this point, the miniroot file system has been copied to the swap partition
and is running the Bourne shell, sh. To begin the update, proceed as follows
from the miniroot prompt:

```
# From=Q120
# inst
```

Software package installation

Installation Information:

This is a SCRATCH install. Data on the root and /usr disks will be lost.
Packages will be read in from the local Q120 tape device.
Machine type: RC3230

Is the information above correct? (y n) [y]? y

Note: It is not necessary to install a kernel on the miniroot
      The process will take a few minutes.
Would you like to install the kernel to the miniroot (y n) [n]? n

========== checking subpackages ==========

The following subpackages may be installed:

```
root       -- RISC/os Standard Root Filesystem
RC3230        -- RISC/os MARK 1500 Kernel and stand files
usr        -- RISC/os Standard /usr Filesystem
cmplrs    -- MIPS-C Compiler
cmplrs-bsd43     -- MIPS-C 4.3 BSD Include Files and Libraries
man        -- RISC/os Manual Pages
compat    -- RISC/os 4.00 Compatibility Libraries
bsd43     -- RISC/os 4.3 BSD Utilities, Include Files and Libraries
reconfig        -- Kernel Binary Reconfiguration Components
emacs     -- emacs
posix     -- RISC/os POSIX P1003.1 Include Files, Commands and Libraries
uucp       -- UUCP
sccs      -- SCCS
news_readers      -- News Readers
games     -- Games
mh          -- mh
```

========== selecting subpackages ==========

You may select all of the above subpackages by answering "y" to the
following question. If you answer "n" then you will be asked to
select the optional subpackages you would like to have installed.

Install ALL subpackages (y n) [n]? **y**

========== setting system clock/calendar ==========

The current value of the clock is: Tue Aug 21 18:05:24 PDT 1990
Is the clock correct (y n) [y]?

========== verifying single-user mode ==========

The system is in a single-user run level.

Please answer "y" to the following question unless you really understand
the consequences.

Do you want to install sash to the volume header (y n) [y]?

========== installing sash to the volume header ==========

========== determining /usr partition ==========

Partition   Megs   Mounted File System or Partition Usage
----
3   /dev/dsk/sdc0d0s3   593   -#### Available Partition ####-
4   /dev/dsk/sdc0d0s4   379   -#### Available Partition ####-
5   /dev/dsk/sdc0d0s5   190   -#### Available Partition ####-
6   /dev/dsk/sdc0d0s6   569   -#### Available Partition ####-
----
Disk Device   /dev/dsk/sdc0d0s2   632   Megabytes Total Size

Possible partitions to use are marked by -#### Available Partition ####-
        select either partition 3, 4, 5 or 6
Which partition should /usr be installed on [6]?
/usr partition will be installed on partition 6

========== initializing filesystems ==========

A scratch install of an operating system package is being performed
from the miniroot. Normally in this case the filesystems are
initialized. When a filesystem is initialized, any existing data will
be lost. You will be given a chance to override initialization of
each individual filesystem below.

Initialize filesystems (y n) [y]? **y**
Disk type for controller 0 drive 0 [94171]? **94191**
Initialize filesystem on /dev/root (y n) [y]?
Initialize filesystem on /dev/usr (y n) [y]?

Initializing the filesystem on /dev/root...
/dev/root: 39472 sectors in 47 cylinders of 15 tracks, 56 sectors
        20.2Mb in 3 cyl groups (16 c/g, 6.88Mb/g, 2048 i/g)
super-block backups (for fsck -b#) at:
 32, 13536, 27040,
rotational delay between contiguous blocks changes from 7ms to 0ms

Checking the filesystem on /dev/root...
** /dev/root
** Last Mounted on
** Phase 1 - Check Blocks and Sizes
** Phase 2 - Check Pathnames
** Phase 3 - Check Connectivity
** Phase 4 - Check Reference Counts
** Phase 5 - Check Cyl groups
2 files, 9 used, 18894 free (14 frags, 2360 blocks, 0.1% fragmentation)

Initializing the filesystem on /dev/usr...
Warning: 528 sector(s) in last cylinder unallocated
/dev/usr: 1164240 sectors in 1386 cylinders of 15 tracks, 56 sectors
        596.1Mb in 87 cyl groups (16 c/g, 6.88Mb/g, 2048 i/g)
super-block backups (for fsck -b#) at:
 32, 13536, 27040, 40544, 54048, 67552, 81056, 94560, 108064, 121568,
 135072, 148576, 162080, 175584, 189088, 202592, 215072, 228576, 242080,
 255584,
 269088, 282592, 296096, 309600, 323104, 336608, 350112, 363616, 377120,
390624,
 404128, 417632, 430112, 443616, 457120, 470624, 484128, 497632,
rotational delay between contiguous blocks changes from 7ms to 0ms

Checking the filesystem on /dev/usr...
** /dev/usr
** Last Mounted on
** Phase 1 - Check Blocks and Sizes
** Phase 2 - Check Pathnames
** Phase 3 - Check Connectivity
** Phase 4 - Check Reference Counts
** Phase 5 - Check Cyl groups
2 files, 9 used, 558429 free (13 frags, 69802 blocks, 0.0% fragmentation)

========== mounting filesystems ==========

/dev/root mounted on /mnt
/dev/usr mounted on /mnt/usr

Partition   Megs   Mounted File System or Partition Usage
----
0   /dev/dsk/sdc0d0s0   22   /dev/root
1   /dev/dsk/sdc0d0s1   20   /

```
6    /dev/dsk/sdc0d0s6    569     /dev/usr
7    /dev/dsk/sdc0d0s7    25      -**** Available Partition ****-
```

```
Disk Device    /dev/dsk/sdc0d0s2        632      Megabytes Total Size
```

Do you wish to change swap partition configuration (y n) [n]?

========== verifying disk space ==========

Do you want to check for space (please do so unless you really
understand the consequences) (y n) [y]?
The system will now be checked to verify that there is enough disk
space with the current configuration to successfully install the package
(and any selected optional subpackages). For large packages (especially
operating system packages), this can be time consuming...

There is enough space.

========== extracting files from subpackage archives ==========

rewinding the tape...
Verifying tape id... ok
Forward spacing the tape...

Loading subpackage: root...
Forward spacing the tape...
Forward spacing the tape...
Loading subpackage: RC3230
Forward spacing the tape...
Loading subpackage: usr...
Forward spacing the tape...
rewinding the tape...

Please mount umips tape number 2 and press return:
rewinding the tape...
Verifying tape id... ok
Forward spacing the tape...
Loading subpackage: cmplrs...
Forward spacing the tape...
Loading subpackage: cmplrs-bsd43...
Forward spacing the tape...
Loading subpackage: man...
Forward spacing the tape...
Loading subpackage: compat...
Forward spacing the tape...
Loading subpackage: bsd43...
Forward spacing the tape...
Loading subpackage: reconfig...
Forward spacing the tape...
Loading subpackage: emacs...

Forward spacing the tape...
Loading subpackage: posix...
Forward spacing the tape...
Loading subpackage: uucp...
Forward spacing the tape...
Loading subpackage: sccs...
Forward spacing the tape...
Loading subpackage: news_readers...
Forward spacing the tape...
Loading subpackage: games...
Forward spacing the tape...
Loading subpackage: mh...
Forward spacing the tape...
rewinding the tape...

========== making device special files ==========

running MKDEV...
done.

========== running comply ==========

running first comply pass...
running second comply pass...
There were no comply messages from the second pass.

Do you wish to configure the network (y n) [n]? **y**

========== making special network files ==========

Set hostname [no_hostname]? **point4**
Set netmask [0xffff0000]? **0xffffff00**
Set broadcast address [255.255.255.0]? **130.62.9.255**
Set net address [127.1.0.0]? **130.62.9.88**
Should we create the /etc/local_hostname file (y n) [y]? **y**

point4 130.62.9.88
Should we add the above entry to the /etc/hosts file (y n) [y]? **y**

Set domain name [yourname.com]?
Should we create the /etc/local_domainname file (y n) [y]?

========== cleaning up ==========

Copying packaging information directory to /mnt/usr/pkg/lib/umips4.51...
Copying miniroot fstab to installed system...
Unmounting filesystems...

/mnt/usr: Unmounted
/mnt: Unmounted

========== installation complete ==========

#

The installation is now complete. Refer to the ``Post-Installation Instruc-
tions'' in the <u>RISC/os</u> 4.<u>50</u> <u>Release</u> <u>Notes</u> for further configuration informa-
tion.

3.3 Installing RISC/os 4.51 from Remote Tape

To install RISC/os 4.51 from a remote tape drive over the network, follow the
instructions provided in this section. Note that the network installation
cannot be done through a gateway machine; both machines must be on the same
network. Also note that the remote tape installation is time consuming. If
the network is loaded and/or dirty, the installation time will be increased.

Before beginning, there are a couple of definitions to clarify:

Server Machine:
>   A POINT 4 system with cartridge tape drive.

Target Machine:
>   The POINT 4 machine where the software is to be installed.

1. Determine which machine to use as the server. The server must be on the
   same network as the target machine. The server must also have a car-
   tridge tape drive and about 30 or 35 megabytes of free disk space to be
   used during the installation process.

2. Log on to the server as root.

3. A few items must be in place on the installing machine (the server) so
   that it can communicate with the network that is attached to the target
   machine. Specifically, the IP address and name must exist in the
   /<u>etc</u>/<u>hosts</u> file, and the server must have the network of the target in
   the **netstat -r** information. This information shows server daemon is
   running on the server. To check, run the following command:

       ps -e | grep bfsd

   You may see two processes, one for **bfsd** itself and one for the **grep** com-
   mand. If **bfsd** is not running, start it with the following command:

       /etc/bfsd

4. The server's /.<u>rhosts</u> file must include a line:

target_name root

where target_name is the name of the target machine being installed. If the name is not already in the file, the easiest way to do this is with the following command:

echo target_name root >> /.rhosts

5. The target's /etc/hosts file must be updated to include its IP address and name and the server's IP address and name. If necessary, the easiest way to do this is with the following two commands:

echo xx.xx.xx.xx target_name >> /etc/hosts
echo yy.yy.yy.yy server_name >> /etc/hosts

where xx.xx.xx.xx is the IP address assigned to the target, and yy.yy.yy.yy is the IP address of the server machine. All this information is decided by the network administrator at your site.

6. Put tape 1 into the server's tape drive.

7. Load the miniroot, both versions of **sash**, and the kernels onto the server's disk in a directory on a filesystem with at least 35 megabytes (which can be freed up after the installation) of free space (in this example, /usr/netinstall is used), as follows:

Notes:

● Be careful to use the correct device, as listed here, for the next few commands (either Q120-0 or Q120n-0).

● The dd of the miniroot takes several minutes.

```
# cd /usr/netinstall  (or some other directory where there is 35 meg free)
# mt -f /dev/rmt/Q120-0 rewind
# mt -f /dev/rmt/Q120n-0 fsf 2
# dd if=/dev/rmt/Q120n-0 of=sash.std skip=1
1080+0 records in
1080+0 records out
# dd if=/dev/rmt/Q120n-0 of=miniroot bs=5k
2700+0 records in
2700+0 records out
# dd if=/dev/rmt/Q120n-0 of=unix.r2400_std skip=1
4094+0 records in
4094+0 records out
# dd if=/dev/rmt/Q120n-0 of=unix.r3030_std skip=1
4330+0 records in
4330+0 records out
# mt -f /dev/rmt/Q120-0 rewind
```

You are now done issuing commands on the server. The remaining commands

are to be issued on the target machine.

8. Log on to the target machine as root and bring down the target machine:

   # telinit 0

9. Boot **sash** from the server machine (substitute your server's name in place of <u>servername</u> in the following commands):

   ```
   Rx3230 MIPS Monitor Version 5.40 MIPS OPT Tue Aug 29 09:59:10 PDT 1989 root
   Memory size: 8388608 (0x800000) bytes, 8MB
   Icache size: 32768 (0x8000) bytes
   Dcache size: 32768 (0x8000) bytes
   >> boot -f bfs()servername:/usr/netinstall/sash.std
   Obtaining servername:/usr/netinstall/sash.std from server servername

   207632+57504+228704 entry: 0xa0300000
   Standalone Shell: Version 5.0 OPT Wed Jun 6 14:48:44 PDT 1990 root
   ```

10. Copy the miniroot from the server to the target machine:

    ```
    sash: cp -b 16k bfs()servername:/usr/netinstall/miniroot dksd(,,1)
    (for MARK 1500)
    sash: cp -b 16k bfs()servername:/usr/netinstall/miniroot dkis(,,1)
    (for MARK 2000/2500)
    Obtaining servername:/usr/netinstall/miniroot from server servername
    13824000 (0xd2f000) bytes copied
    ```

11. Boot the kernel:

```
sash: boot -f bfs()servername:/usr/netinstall/unix.r3030_std root=sdc0d0s1
(for MARK 1500)
sash: boot -f bfs()servername:/usr/netinstall/unix.r2400_std root=isc0d0s1
(for MARK 2000/2500)
Obtaining servername:/usr/netinstall/unix.r3030_std from servername server
812560+99312+776624 entry: 0x80021000
CPU: MIPS R3000 Processor Chip Revision: 2.0
FPU: MIPS R3010 VLSI Floating Point Chip Revision: 2.0

RISC/os Release 4_51 mips Version UMIPS
Total real memory  = 8388608
Available memory   = 6238208
Root on dev 0x2101, Swap on dev 0x2101
Root fstype ffs
New swplo: 26992  swap size: 6344K bytes
Available memory   = 4661248


UMIPS Miniroot run level 1

Making miniroot device files for RC3230 system...
erase=^H, kill=^U, interrupt=^C
#
```

12. At this point, the miniroot file system has been copied to the swap par-
     tition and is running the Bourne shell, **sh**. Set the EnTapehost variable
     and perform the installation:

```
# set -a
# EnTapehost=servername
# Install=update          for update installs only
# inst
```

     Software package installation

     Remote Tape Installation selected.
     The tape must be mounted on the machine: servername

     ===== initializing the network =====

     Enter the hostname of this machine []? **target**
     Enter the netmask [0xffff0000]? **0xffffff00**
     Enter the broadcast address [97.0.0.0]? **130.62.9.255**

```
hostname:  target
server:    servername
netmask:   0xffffff00
broadcast: 130.62.9.255
```

     Ok (y n) [y]?

Installation Information:

This is a remote tape install.
Packages will be read in from the tape drive on target.
Machine type: RC3230

Is the information above correct? (y n) [y]?

Note: It is not necessary to install a kernel on the miniroot
      The process will take a few minutes.
Would you like to install the kernel to the miniroot (y n) [n]? n

========== checking subpackages ==========

The following subpackages may be installed:

root   -- RISC/os Standard Root Filesystem
RC3230   -- RISC/os MARK 1500 Kernel and Devices
usr   -- RISC/os Standard /usr Filesystem
cmplrs   -- MIPS-C Compiler
cmplrs-bsd43   -- MIPS-C 4.3 BSD Include Files and Libraries
man   -- RISC/os Manual Pages
compat   -- RISC/os 4.00 Compatibility Libraries
bsd43   -- RISC/os 4.3 BSD Utilities, Include Files and Libraries
reconfig   -- Kernel Binary Reconfiguration Components
emacs   -- emacs
posix   -- RISC/os POSIX P1003.1 Include Files, Commands and Libraries
uucp   -- UUCP
sccs   -- SCCS
news_readers   -- News Readers
games   -- Games
mh   -- mh

========== selecting subpackages ==========

You may select all of the above subpackages by answering "y" to the
following question. If you answer "n" then you will be asked to
select the optional subpackages you would like to have installed.

Install ALL subpackages (y n) [n]? y

========== setting system clock/calendar ==========

The current value of the clock is: Thu Aug 23 16:15:40 PDT 1990
Is the clock correct (y n) [y]?

========== verifying single-user mode ==========

The system is in a single-user run level.

Please answer "y" to the following question unless you really understand
the consequences.

Do you want to install sash to the volume header (y n) [y]?

========== installing sash to the volume header ==========

========== mounting filesystems ==========

/dev/root mounted on /mnt
/dev/usr mounted on /mnt/usr

Partition   Megs   Mounted File System or Partition Usage
----
0   /dev/dsk/sdc0d0s0   22   /dev/root
1   /dev/dsk/sdc0d0s1   20   /
6   /dev/dsk/sdc0d0s6   250   /dev/usr
7   /dev/dsk/sdc0d0s7   22   -**** Available Partition ****-

Disk Device   /dev/dsk/sdc0d0s2   312   Megabytes Total Size

Do you wish to change swap partition configuration (y n) [n]?

========== preserving local files ==========

Running preserve -s for subpackage root... 57 files preserved.
No preserve list or findmods list for RC3230 preserve not executed.
Running preserve -s for subpackage usr... 25 files preserved.
No preserve list or findmods list for cmplrs- preserve not executed.
No preserve list or findmods list for cmplrs-bsd43- preserve not executed.
No preserve list or findmods list for man- preserve not executed.
No preserve list or findmods list for compat- preserve not executed.
No preserve list or findmods list for bsd43- preserve not executed.
No preserve list or findmods list for reconfig- preserve not executed.
No preserve list or findmods list for emacs- preserve not executed.
No preserve list or findmods list for posix- preserve not executed.
No preserve list or findmods list for uucp- preserve not executed.
No preserve list or findmods list for sccs- preserve not executed.
No preserve list or findmods list for news_readers- preserve not executed.
No preserve list or findmods list for games- preserve not executed.
No preserve list or findmods list for mh- preserve not executed.

========== verifying disk space ==========

Do you want to check for space (please do so unless you really
understand the consequences) (y n) [y]?

The system will now be checked to verify that there is enough disk
space with the current configuration to successfully install the package
(and any selected optional subpackages). For large packages (especially
operating system packages), this can be time consuming...

You will see one of the following responses from the system:

device	bfree	ifree	breq	ireq	bcred	icred
/dev/root	5032	8827	13081	396	11344	348
/dev/usr	19607	102942	87942	4744	72948	4574

WARNING! This package will fit on the disk,
but it will cause more than 90% of the disk to be used.
This may cause problems for non-root users.
It is recommended that you abort the installation now.

Abort the installation? (y n) [y]? n

or:

There is enough space.

========== stripping old links ==========

Stripping links for subpackage root...
Stripping links for subpackage RC3230
Stripping links for subpackage usr...
Stripping links for subpackage cmplrs...
Stripping links for subpackage cmplrs-bsd43...
Stripping links for subpackage man...
Stripping links for subpackage compat...
Stripping links for subpackage bsd43...
Stripping links for subpackage reconfig...
Stripping links for subpackage emacs...
Stripping links for subpackage posix...
Stripping links for subpackage uucp...
Stripping links for subpackage sccs...
Stripping links for subpackage news_readers...
Stripping links for subpackage games...
Stripping links for subpackage mh...

========== extracting files from subpackage archives ==========

rewinding the tape...

Verifying tape id... ok
Forward spacing the tape...

Loading subpackage: root...
Forward spacing the tape...
Forward spacing the tape...

```
Loading subpackage: RC3230
Forward spacing the tape...
Loading subpackage: usr...
Forward spacing the tape...
rewinding the tape...

Please mount umips tape number 2 and press return:
rewinding the tape...
Verifying tape id... ok
Forward spacing the tape...

Loading subpackage: cmplrs...
Forward spacing the tape...
Loading subpackage: cmplrs-bsd43...
Forward spacing the tape...
Loading subpackage: man...
Forward spacing the tape...
Loading subpackage: compat...
Forward spacing the tape...
Loading subpackage: bsd43.
Forward spacing the tape...
Loading subpackage: reconfig...
Forward spacing the tape...
Loading subpackage: emacs...
Forward spacing the tape...
Loading subpackage: posix...
Forward spacing the tape...
Loading subpackage: uucp...
Forward spacing the tape...
Loading subpackage: sccs...
Forward spacing the tape...
Loading subpackage: news_readers...
Forward spacing the tape...
Loading subpackage: games...
Forward spacing the tape...
Loading subpackage: mh...
Forward spacing the tape...
rewinding the tape...

========== making device special files ==========

running MKDEV...
done.

========== running comply ==========

running first comply pass...
running second comply pass...
There were no comply messages from the second pass.

========== cleaning up old versions ==========
```

An attempt will now be made to clean up any files left over from previous
versions of the software which has just been installed.

```
Searching for old versions to remove...
Clean up umips.root 4.50 (y n) [n]? y
Removing leftover files from umips.root 4.50...
Clean up umips.RC3230 4.50 (y n) [n]? y
Removing leftover files from umips.RC3230 4.50...
Clean up umips.usr 4.50 (y n) [n]? y
Removing leftover files from umips.usr 4.50...
rm ./usr/dict/build_hlists
rm ./usr/etc/fuser
Clean up umips.cmplrs 4.50 (y n) [n]? y
Removing leftover files from umips.cmplrs 4.50...
Clean up umips.cmplrs-bsd43 4.50 (y n) [n]? y
Removing leftover files from umips.cmplrs-bsd43 4.50...
Clean up umips.man 4.50 (y n) [n]? y
Removing leftover files from umips.man 4.50...
rm ./usr/man/catman/u_man/man1/netstat.1
Clean up umips.compat 4.50 (y n) [n]? y
Removing leftover files from umips.compat 4.50...
Clean up umips.bsd43 4.50 (y n) [n]? y
Removing leftover files from umips.bsd43 4.50...
Clean up umips.reconfig 4.50 (y n) [n]? y
Removing leftover files from umips.reconfig 4.50...
Clean up umips.emacs 4.50 (y n) [n]? y
Removing leftover files from umips.emacs 4.50...
Clean up umips.posix 4.50 (y n) [n]? y
Removing leftover files from umips.posix 4.50...
Clean up umips.uucp 4.50 (y n) y
Removing files from umips.uucp 4.50...
Clean up umips.sccs 4.50 (y n) [n]? y
Removing leftover files from umips.sccs 4.50...
Clean up umips.news_readers 4.50 (y n) [n]? y
Removing leftover files from umips.news_readers 4.50...
Clean up umips.games 4.50 (y n) [n]? y
Removing leftover files from umips.games 4.50...
Clean up umips.mh 4.50 (y n) [n]? y
Removing leftover files from umips.mh 4.50...

========== restoring preserved user files ==========

Running preserve -r for subpackage root...
No preserve list or findmods list for RC3230 no files restored.
Running preserve -r for subpackage usr...
No preserve list or findmods list for cmplrs- no files restored.
No preserve list or findmods list for cmplrs-bsd43- no files restored.
No preserve list or findmods list for man- no files restored.
No preserve list or findmods list for compat- no files restored.
No preserve list or findmods list for bsd43- no files restored.
No preserve list or findmods list for reconfig- no files restored.
```

No preserve list or findmods list for emacs- no files restored.
No preserve list or findmods list for posix- no files restored.
No preserve list or findmods list for uucp- no files restored.
No preserve list or findmods list for sccs- no files restored.
No preserve list or findmods list for news_readers- no files restored.
No preserve list or findmods list for games- no files restored.
No preserve list or findmods list for mh- no files restored.

========== running conversion scripts ==========

========== root.fstab   Thu Aug 23 17:24:26 PDT 1990 ==========

No ips devices found in /etc/fstab.

To take advantage of the improved parallel fsck, /etc/fstab will now
be modified to allow the root partition to be fsck'd on the first pass.
All other local filesystems will be fsck'd on the second pass.

A copy of /etc/fstab will be saved as /etc/fstab.save.1.

No changes made.

Press return to continue:

========== cleaning up ==========

Copying packaging information directory to /mnt/usr/pkg/lib/umips4.51...
Removing Duplicate File /mnt/.cshrc:4.51+
Removing Duplicate File /mnt/.login:4.51+
Remoying Duplicate File /mnt/.profile:4.51+
Removing Duplicate File /mnt/etc/TIMEZONE:4.51+
Removing Duplicate File /mnt/etc/TZ:4.51+
Removing Duplicate File /mnt/etc/bupsched:4.51+
Removing Duplicate File /mnt/etc/cshrc:4.51+
Removing Duplicate File /mnt/etc/coredirs:4.51+
Removing Duplicate File /mnt/etc/dumpdates:4.51+
Removing Duplicate File /mnt/etc/exports:4.51+
Removing Duplicate File /mnt/etc/gettydefs:4.51+
Removing Duplicate File /mnt/etc/inetd.conf:4.51+
Removing Duplicate File /mnt/etc/init.d/ANNOUNCE:4.51+
Removing Duplicate File /mnt/etc/init.d/MOUNTFSYS:4.51+
Removing Duplicate File /mnt/etc/init.d/README:4.51+
Removing Duplicate File /mnt/etc/init.d/RMTMPFILES:4.51+
Removing Duplicate File /mnt/etc/init.d/addswap:4.51+
Removing Duplicate File /mnt/etc/init.d/autoconfig:4.51+
Removing Duplicate File /mnt/etc/init.d/cron:4.51+
Removing Duplicate File /mnt/etc/init.d/disks:4.51+

```
Removing Duplicate File /mnt/etc/init.d/firstcheck:4.51+
Removing Duplicate File /mnt/etc/init.d/lockfix:4.51+
Removing Duplicate File /mnt/etc/init.d/netdaemons:4.51+
Removing Duplicate File /mnt/etc/init.d/perf:4.51+
Removing Duplicate File /mnt/etc/init.d/savecore:4.51+
Removing Duplicate File /mnt/etc/init.d/set_kopts:4.51+
Removing Duplicate File /mnt/etc/init.d/smtp:4.51+
Removing Duplicate File /mnt/etc/init.d/syslog:4.51+
Removing Duplicate File /mnt/etc/init.d/tzsetup:4.51+
Removing Duplicate File /mnt/etc/init.d/uucp:4.51+
Removing Duplicate File /mnt/etc/inittab:4.51+
Removing Duplicate File /mnt/etc/motd:4.51+
Removing Duplicate File /mnt/etc/profile:4.51+
Removing Duplicate File /mnt/etc/protocols:4.51+
Removing Duplicate File /mnt/etc/remote:4.51+
Removing Duplicate File /mnt/etc/services:4.51+
Removing Duplicate File /mnt/etc/sysdirlist:4.51+
Removing Duplicate File /mnt/etc/syslist:4.51+
Removing Duplicate File /mnt/etc/syslog.conf:4.51+
Removing Duplicate File /mnt/etc/termcap:4.51+
Removing Duplicate File /mnt/etc/timed.conf:4.51+
Removing Duplicate File /mnt/etc/ttytype:4.51+
Removing Duplicate File /mnt/usr/etc/exports:4.51+
Removing Duplicate File /mnt/usr/etc/bootptab:4.51+
Removing Duplicate File /mnt/usr/etc/timed.conf:4.51+
Removing Duplicate File /mnt/usr/lib/aliases:4.51+
Removing Duplicate File /mnt/usr/lib/sendmail.cf:4.51+
Removing Duplicate File /mnt/usr/lib/me/local.me:4.51+
Removing Duplicate File /mnt/usr/lib/uucp/Devconfig:4.51+
Removing Duplicate File /mnt/usr/lib/uucp/Devices:4.51+
Removing Duplicate File /mnt/usr/lib/uucp/Dialcodes:4.51+
Removing Duplicate File /mnt/usr/lib/uucp/Dialers:4.51+
Removing Duplicate File /mnt/usr/lib/uucp/Permissions:4.51+
Removing Duplicate File /mnt/usr/lib/uucp/Poll:4.51+
Removing Duplicate File /mnt/usr/lib/uucp/Sysfiles:4.51+
Removing Duplicate File /mnt/usr/lib/uucp/Systems:4.51+
Removing Duplicate File /mnt/usr/lib/uucp/Uutry:4.51+
Removing Duplicate File /mnt/usr/spool/cron/crontabs/adm:4.51+
Removing Duplicate File /mnt/usr/spool/cron/crontabs/periodic:4.51+
Removing Duplicate File /mnt/usr/spool/cron/crontabs/root:4.51+
Removing Duplicate File /mnt/usr/spool/cron/crontabs/sys:4.51+
Removing Duplicate File /mnt/usr/spool/cron/crontabs/sysadm:4.51+
Removing Duplicate File /mnt/usr/spool/cron/crontabs/uucp:4.51+
Removing Duplicate File /mnt/usr/spool/lp/pstatus:4.51+
Removing Duplicate File /mnt/usr/spool/lp/qstatus:4.51+

Unmounting filesystems...
/mnt/usr: Unmounted
/mnt: Unmounted

========== installation complete ==========
```

#

Please read the ``Post-Installation System Modifications'' section in the RISC/os 4.50 Release Notes to make sure everything is correct before shutting down the miniroot and booting multi-user.

COMMENT SHEET

MANUAL TITLE:__RISC/os Software Release Notes 4.51_____

PUBLICATION NO.__SM-250-0047__ REVISION __A__

FROM: NAME/COMPANY:_____

       BUSINESS ADDRESS:_____

       CITY/STATE/ZIP:_____

COMMENTS: Your evaluation of this manual will be appreciated by POINT 4 Data Corporation. Notation of any errors, suggested additions or deletions, or general comments may be made below. Please include page number references where appropriate.

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