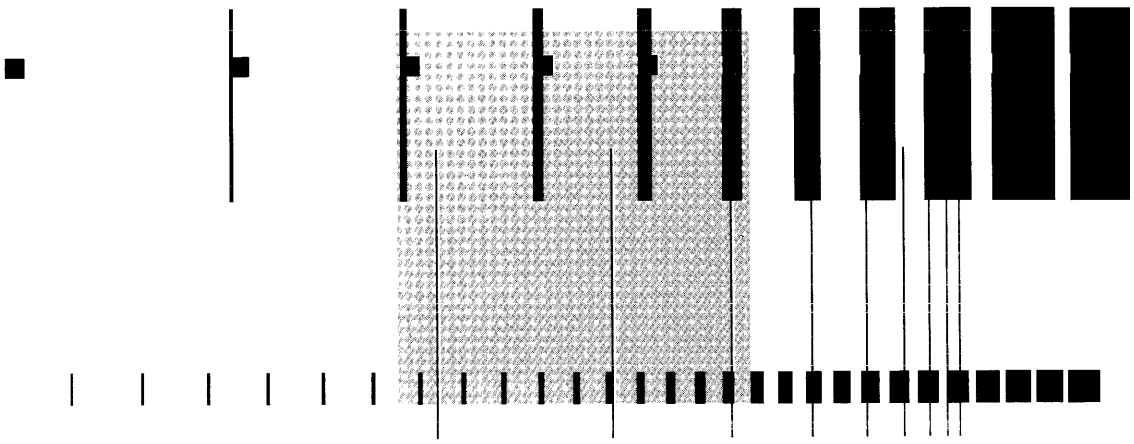
MIPS

Software Binary Release Notes
RISCos 4.51 Release

75-00145-001 (A)



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The power of RISC is in the system.

MIPS

Software Binary Release Notes

RISCos 4.51 Release

75-00145-001 (A)

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Order Number 75-00145-001 (A)

August 30, 1990

1. Introduction

This document contains the information required to install and run RISC/os 4.51 on a MIPS system. RISC/os 4.51 is a follow-on release to RISC/os 4.50, adding support for the RC6260, RC6280, and the new RB3125 product, in addition to 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 those release notes for more information.

The basic RB3125 CPU board adds ethernet and SCSI connectivity to the MIPS RC3260 systems. Wherever RB3125 is referred to, it is equivalent to an RC3260 with integral SCSI and Ethernet. A "4210 Jaguar SCSI" is the original RC3260. For further information on the system, see the *RC3360 Technical Reference Manual.*

1.1 Release Identification Information

Software Version
RISC/os 4.51
Release Date
August 30, 1990
MIPS Part Numbers:
01-00145-001 RISC/os 4.51
75-00145-001 RISC/os 4.51 Release Notes

1.2 Release Requirements

The RISC/os System Requirements are:

Package	Approximate Disk Space	Inodes
root	8.23Mb	409
r2030	5.26Mb	757
r2300	5.49Mb	436
r2400	5.47Mb	776
r3200	5.57Mb	748
r3260	5.57Mb	748
r3030	5.59Mb	773
r6000	5.54Mb	10
r6260	0Mb	738
r6280	0Mb	738
rb3125	5.69Mb	10
rb3125.ijc	0Mb	1302
rb3125.ipc	0Mb	1012
rb3125.sdc	0Mb	944

Note that the packages that require 0Mb of disk space contain device files only, and thus use no disk space but do use inodes.

Package	Approximate Disk Space	Inodes
usr	41.92Mb	2727
cmplrs	6.28Mb	369
cmplrs-bsd43	1.36Mb	88
man	6.51Mb	2272
compat	14.93Mb	1069
bsd43	14.15Mb	606
reconfig	23.72Mb	599
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	139.44	8430

2. RB3125 Systems

When power is first applied to the system, one should see the following display:

```
Running Power-On Diagnostics...
Low Memory Test... PASSED
Cache Test1... PASSED
Cache Test2... PASSED
Data Cache MATS+ Test... PASSED
Instruction Cache MATS+ Test... PASSED
Data Cache Block Refill Test... PASSED
Instruction Cache Block Refill Test... PASSED
ID PROM Test... PASSED
Write Buffer Test... PASSED
Memory Test... PASSED
TLB Test... PASSED
Exception Test... PASSED
VME Test... PASSED
ECC Test... PASSED
Battery Check Test... PASSED
NVRAM Test... PASSED
8254 Timer Test... PASSED
Time-of-Day Clock Test... PASSED
FP Test1... PASSED
FP Test2... PASSED

m2000-25 MIPS Monitor: Version 5.50 MIPS OPT Wed Jun 20 10:59:30 PDT 1990 root
Memory size: 33554432 (0x2000000) bytes, 32 MB
Icache size: 65536 (0x10000) bytes
Dcache size: 65536 (0x10000) bytes
>> printenv use this command for more information about the system
netaddr=130.62.9.22
lbaud=9600
rbaud=9600
bootfile=dksd(0,0,8)sash
bootmode=m
console=l
cpuid=0
resetepc=0xbfc018a4
resetra=0xbfc0181c
version=5.50
magic=RISCPROM
vendor=MIPS
model=m2000-25
rootname=0
```

Further information on the PROM monitor, and setting the netaddr for a networked system may be found in the *RC3360 Technical Reference Manual*.

Usually one boots the system by typing **auto**. This will cause the stand alone shell to load the RISC/os kernel from the internal SCSI disk. Additional information on configuring UNIX for your operating environment is contained in *RISC/os 4.50 Release Notes*.

2.1 RISC/os Distribution Media

MIPS 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:

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 for non-2030 systems, including the stand-alone shell (**sash.std**) and the disk formatter (**format.std**).
3	**tapevol.2030:**	a bootable tape header and the stand-alone utilities for Rx2030 systems, including the stand-alone shell (**sash.2030**) and the disk formatter (**format.2030**).
4	**miniroot:**	a minimal file system used to complete installation of the new os.
5	**unix.r2300_std.boot**	M/500, 800, 1000 tape bootable kernel
6	**unix.r2400_std.boot**	M/120, RC3240 tape bootable kernel
7	**unix.r3200_std.boot**	M/2000 SMD tape bootable kernel
8	**unix.i2000_std.boot**	Rx2030 tape bootable kernel
9	**unix.r3200_ijc.boot**	M/2000 SCSI, RC3260 tape bootable kernel
10	**unix.r6000_std.boot**	RC6260 and RC6280 tape bootable kernel
11	**unix.r3030_std.boot**	Rx3230 tape bootable kernel
12	**unix.r3125_std.boot**	RB3125 tape bootable kernel
13-19	**7 space holders**	
20	**archive1:**	**tar** archive of root filesystem
21	**archive2:**	**tar** archive of M/500, 800, 1000 device and kernel files
22	**archive3:**	**tar** archive of M/2000 device and kernel files
23	**archive4:**	**tar** archive of RC3260 device and kernel files
24	**archive5:**	**tar** archive of M/120 and RC3240 device and kernel files
25	**archive6:**	**tar** archive of Rx2030 device and kernel files
26	**archive7:**	**tar** archive of RC6260 and RC6280 kernel files
27	**archive8:**	**tar** archive of RC6280 device files
28	**archive9:**	**tar** archive of RC6260 device files
29	**archive10:**	**tar** archive of Rx3230 device and kernel files
30	**archive11:**	**tar** archive of m2000-25 device and kernel files
31	**archive12:**	**tar** archive of m2000-25ipc and kernel files
32	**archive13:**	**tar** archive of m2000-25ijc and kernel files
33	**archive14:**	**tar** archive of m2000-25sdc and kernel files
34	**archive15:**	standard *usr* filesystem **tar** archive

Tape 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**:	**tar** archive of files used for binary kernel reconfiguration
7	**archive7**:	**emacs tar** archive
8	**archive8**:	POSIX libraries **tar** archive.
9	**archive9**:	**uucp tar** archive
10	**archive10**:	**sccs tar** archive
11	**archive11**:	**tar** archive of netnews reading programs
12	**archive12**:	games **tar** archive
13	**archive13**:	**mh tar** archive

Note that if you have an older MIPS' system with a QIC-24 tape drive, you will need to special request a QIC-24 set of release tapes because the QIC-120 tapes cannot be read on your tape drive. Contact the MIPS' CRC (in the USA and Canada) or your local support office.

3. Problems Resolved and Changes Included in RISC/os 4.51

The following describes fixes included in the RISC/os 4.51 release.

3.1 RC6280 Kernel

Three changes have been made to the RC6280 kernel:

- A hardware bug that caused some kernels to hang during booting has been fixed.
- The *unix.r6000_std* kernel is now compiled **-mips2** for slight performance improvement.
- The *unix.r6000_std* kernel is now much more frugal in using physical memory for the disk cache and page maps.

3.2 /etc/hwconf

The **/etc/hwconf** program provides the revision and serial number of the RC6280 CPU board if readable.

3.3 /usr/new/top

The **top** command now works on RC6280 systems.

3.4 New Assembler

RISC/os 4.51 provides a new assembler with slightly different instruction scheduling. This improves R6000 performance in certain cases.

3.5 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.

3.6 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.

3.7 SMD Drive Hangs

The **dkip** driver for SMD drives has been fixed to eliminate drive hangs that occurred under certain rare circumstances for drives formatted with 83 sectors per track.

3.8 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 motherboard-SCSI systems (M/120, RC3240) with an Exabyte in an expansion cabinet, and more than one disk.

3.9 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.

3.10 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.

3.11 Variable-Length Tape Problems

Some fixes were made to the **dkvj** driver, the 4210 VME-SCSI driver for M/2000, RC3260, and RC6280 systems. These fixes clear up problems reported with variable-length tape.

3.12 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.

3.13 dkip Driver

The **dkip** driver now resets the controller before initializing the structures stored in controller memory. This may have been the cause of unexplained crashes.

A change was made the the standalone **dkip** driver that allows **format** to correctly read the manufacturing defects off the disk.

3.14 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.

3.15 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
```

3.16 NIS and Shadow Passwords

RISC/os 4.50 provided support for both NIS (Yellow Pages) and Shadow Passwords. 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, subject to the constraints on conversion to and from the Shadow Password mechanism (via **pwconv** and **pwunconv**) discussed above.

3.17 Sendmail

Three new versions of sendmail are provided with RISC/os 4.51. 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.mips.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.

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 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 **sendmail**s 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*.

3.18 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.

3.19 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 density 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 MIPS 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

ttt = target id number
dd = density code
00 = default density (current style)
01 = QIC-24 format
10 = QIC-120 format
11 = QIC-150 format
n = 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 M/120 and RC3240 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 RC3230 and Magnum 3000 systems, 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*
```

For M/2000 and RC3260 systems, use the following commands to set up the device files to override the default:

```
# cd /dev/rmt
# rm Q*
# mknod Q24-0 c 22 98
# mknod Q24n-0 c 22 99
# mknod Q120-0 c 22 100
# mknod Q120n-0 c 22 101
# mknod Q150-0 c 22 102
# mknod Q150n-0 c 22 103
# chmod 666 Q*
```

3.20 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** protocol. 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 distribution mechanism for this accurate time.

3.21 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.

3.22 systat

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

3.23 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.

3.24 glossary

The **glossary** command now works.

3.25 /bsd43/bin/install

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

3.26 /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.

3.27 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.

3.28 /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.

3.29 tftpd

A bug described in the errata sheet for 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.

3.30 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.

3.31 uucp

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

3.32 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 *xx* notation, this variable defaults to off, "no8bitdisplay".

3.33 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.

3.34 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.

3.35 RC3230 Fixes

The following items were fixed in the RISC/os 4.50B patch for the RC3230 system, and are included in RISC/os 4.51:

- A new revision of the DigiBoard connector for the RC3230.
- SCC driver fixed so that modem controls do not switch so fast that they hang the mouse. Modem control is now included in the kernel.
- Processes with large data space (54 Mbyte) would work incorrectly when a color or mono board was installed in the system. This now works correctly.

4. Known Problems

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

4.1 sash and RC6280

Sometimes it appears as though **sash** does not work on an RC6280 system. You may see an error message:

```
NO IOA INITIALIZATION PERFORMED!  RESET ioa-param TO RE-ENABLE
```

There is a new NVRAM variable called *ioa_param*. If **sash** appears to work incorrectly, make sure *ioa_param* is set to zero. Non-zero values are used only for diagnostic purposes and cause **sash** to appear broken. To set this variable, issue the following command from the prom monitor:

```
>> setenv ioa_param 0
```

4.2 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*.

4.3 /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**.

4.4 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".

5. Installing Notes

This section illustrates the installation of the RISC/os 4.51 binary release onto a MIPS RISComputer 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 `typewriter` font; user responses are shown in the **bold** font; comments about the procedure are shown in *Italics*. 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 MIPS 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.

5.1 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 *RISC/os 4.50 Release Notes* 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 *usr* 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.

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 filesystemo 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 (MIPS' filesystems, such as */usr*, */usr/man*, or any other directories where MIPS 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 = 0x143
6
```

```
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.
- **For Rx2030 Installations:**
  Please note that the default partition for */usr* on the Rx2030 systems is now partition 3, in order to allow RISCwindows to fit on a 172 megabyte disk drive. If you are doing an update install and your *usr* partition is not 3, be sure to do one of the following:
  - select only a minimum set of subpackages for the update installation, but note that if you do this and some of the RISC/os 4.10 binaries are left on the system, they may not produce the desired results on RISC/os 4.51.
  - backup all important *usr* filesystem files and do a scratch install
  - backup all important *usr* filesystem files, make partition 3 the */usr* partition, and proceed with the update installation.
- 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.

To begin the update installation, you must first shutdown the system. To shut down a MIPS RISComputer running RISC/os or UMIPS, 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:

```
MIPS Monitor Version 4.00 MIPS OPT Sat May 7 13:12:36 PDT 1988 opsys
Memory size: 8388608 (0x800000) bytes
Icache size: 16384 (0x4000) bytes
Dcache size: 8192 (0x2000) bytes
>>
```

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

```
>> boot -f tqsd(,6,2)sash.std   (for Rx3230, internal SCSI 3260, RC6260, SMD-based RB3125)
>> boot -f tqsd(,6,3)sash.2030  (for Rx2030)
>> boot -f tqis(,,2)sash.std    (for M/120, RC3240)
>> boot -f tpqic(,,2)sash.std   (for M/500, 800, 1000)
>> boot -f tqij(0,6,2)sash.std  (for M/2000, 4210 Jaguar SCSI RC3260, RC6280)
Interphase 4210 Jaguar controller @ (paddr=bd009000)
Jaguar Version (077-30-XAL) Date 03221990 with 126 Kbytes ram.
Work Queue 7 for device 'ARCHIVE -VIPER 125  21006--010'
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(0,6,4) dksd(,,1)  for Rx3230, Rx2030, internal SCSI RC3260, RC6260
sash: cp -b 16k tqsd(0,6,4) dkip(,,1)  for SMD-based RB3125
sash: cp -b 16k tqij(0,6,4) dkij(,,1)  for 4210 Jaguar SCSI RC3260
sash: cp -b 16k tqij(0,6,4) dkip(,,1) for M/2000
sash: cp -b 16k tqis(,,4) dkis(,,1)          for M/120, RC3240
sash: cp -b 16k tpqic(,,4) dkip(,,1)         for M/500, 800, 1000
sash: cp -b 16k tqij(0,6,4) dkip(,,1)        for M/2000 SMD, RC6280
 (paddr=bd009000)
Jaguar Version (077-30-XAL) Date 03221990 with 126 Kbytes ram.
13824000 (0xd2f000) bytes copied
sash: boot -f tpqic(,,5)unix.r2300_std root=ipc0d0s1   for M/500, 800, 1000
sash: boot -f tqis(,,6)unix.r2400_std root=isc0d0s1    for M/120, RC3240
sash: boot -f tqij(,6,7)unix.r3200_std root=ipc0d0s1 for M/2000
sash: boot -f tqsd(0,6,8)unix.i2000_std root=sdc0d0s1 console=g  for RS2030
sash: boot -f tqsd(0,6,8)unix.i2000_std root=sdc0d0s1 console=0  for RC2030 tty 0
sash: boot -f tqsd(0,6,8)unix.i2000_std root=sdc0d0s1 console=1  for RC2030 tty1
sash: boot -f tqij(,6,9)unix.r3200_ijc root=ijc0d0s1 for jaguar 4210 SCSI RC3260
sash: boot -f tqsd(0,6,10)unix.r6000_std root=ijc0d0s1  for RC6260
sash: boot -f tqij(0,6,10)unix.r6000_std root=ipc0d0s1  for RC6280
sash: boot -f tqsd(0,6,11)unix.r3030_std root=sdc0d0s1 for Rx3230
sash: boot -f tqsd(,6,12)unix.rb3125_std root=ipc0d0s1 for SMD-based RB3125
sash: boot -f tqsd(,6,12)unix.rb3125_std root=sdc0d0s1 for internal SCSI RC3260
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  = 100663296
Available memory   = 97513472
Root on dev 0x401, Swap on dev 0x401
Root fstype ffs
New swplo: 26992  swap size: 6376K bytes
Available memory   = 95817728


Miniroot run level 1

Making miniroot device files for m2000-6 system...
erase=^H, kill=^U, interrupt=^C
```

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: m2000-6
Root disk type: SMD

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
m2000    -- RISC/os m/2000 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
/dev/dsk/ipc0d1s13 mounted on /mnt/usr1b


-------------------------------------------------------------------------
Partition               Megs    Mounted File System or Partition Usage
-------------------------------------------------------------------------
0   /dev/dsk/ipc0d0s0    20     /dev/root
1   /dev/dsk/ipc0d0s1    20     /
6   /dev/dsk/ipc0d0s6   562     /dev/usr
7   /dev/dsk/ipc0d0s7    25      -**** Available Partition ****-
-------------------------------------------------------------------------
Disk Device    /dev/dsk/ipc0d0s2        626      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 m2000- 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     ic
red
        /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 m2000...
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... DKVJ 0:6 unit attention; media change or drive reset

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

Loading subpackage: root...
Forward spacing the tape...
Forward spacing the tape...
Loading subpackage: m2000...
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.m2000 4.50 (y n) [n]? y
Removing leftover files from umips.m2000 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) iles 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 m2000- 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/usr1b: Unmounted
/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.

5.2 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 procedure is essentially the same as

shown for all system types.

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

```
m2000-25 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 Rx3230, internal SCSI 3260, RC6260, SMD-based RB3125)
>> boot -f tqsd(,6,3)sash.2030  (for Rx2030)
>> boot -f tqis(,,2)sash.std  (for M/120, RC3240)
>> boot -f tpqic(,,2)sash.std  (for M/500, 800, 1000)
>> boot -f tqij(0,6,2)sash.std  (for M/2000, 4210 Jaguar SCSI RC3260, RC6280)


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(0,6,4) dksd(,,1)  for Rx3230, Rx2030, internal SCSI RC3260, RC6260
sash: cp -b 16k tqsd(0,6,4) dkip(,,1)  for SMD-based RB3125
sash: cp -b 16k tqij(0,6,4) dkij(,,1)  for 4210 Jaguar SCSI RC3260
sash: cp -b 16k tqij(0,6,4) dkip(,,1) for M/2000
sash: cp -b 16k tqis(,,4) dkis(,,1)          for M/120, RC3240
sash: cp -b 16k tpqic(,,4) dkip(,,1)          for M/500, 800, 1000
sash: cp -b 16k tqij(0,6,4) dkip(,,1)          for M/2000 SMD, RC62 80


Rewinding the tape.....Done

Forward spacing the tape 4 files.....Done
13824000 (0xd2f000) bytes copied

Rewinding the tape.....Done
sash: boot -f tpqic(,,5)unix.r2300_std root=ipc0d0s1   for M/500, 800, 1000
sash: boot -f tqis(,,6)unix.r2400_std root=isc0d0s1   for M/120, RC3240
sash: boot -f tqij(,6,7)unix.r3200_std root=ipc0d0s1 for M/2000
sash: boot -f tqsd(0,6,8)unix.i2000_std root=sdc0d0s1 console=g  for RS2030
sash: boot -f tqsd(0,6,8)unix.i2000_std root=sdc0d0s1 console=0  for RC2030 tty 0
sash: boot -f tqsd(0,6,8)unix.i2000_std root=sdc0d0s1 console=1  for RC2030 tty1
sash: boot -f tqij(,6,9)unix.r3200_ijc root=ijc0d0s1 for jaguar 4210 SCSI RC3260
sash: boot -f tqsd(0,6,10)unix.r6000_std root=ijc0d0s1  for RC6260
sash: boot -f tqij(0,6,10)unix.r6000_std root=ipc0d0s1  for RC6280
sash: boot -f tqsd(0,6,11)unix.r3030_std root=sdc0d0s1 for Rx3230
sash: boot -f tqsd(,6,12)unix.rb3125_std root=ipc0d0s1 for SMD-based RB3125
sash: boot -f tqsd(,6,12)unix.rb3125_std root=sdc0d0s1 for internal SCSI RC3260


1181824+120816+874464 entry: 0x80021000

Rewinding the tape.....Done
```

```
Forward spacing the tape 12 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

dumplo = 0x0 blks, dumpsize = 0x1330 pgs

Miniroot run level 1

Making miniroot device files for m2000-25 system...
erase=^H, kill=^U, interrupt=^C
# 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: m2000-25
Root disk type: SCSI (sdc)

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
m2000-25sdc     -- RISC/os m2000-25 Kernel and stand files
m2000-25sdc_dev -- RISC/os m2000-25 Devices - root on sdc
```

These messages may be different, depending on system

These messages may be different, depending on system

The above two packages may be different, depending on system type

```
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   271      -**** Available Partition ****-
4   /dev/dsk/sdc0d0s4   167      -**** Available Partition ****-
5   /dev/dsk/sdc0d0s5    84      -**** Available Partition ****-
6   /dev/dsk/sdc0d0s6   250      -**** Available Partition ****-
------------------------------------------------------------------------
Disk Device    /dev/dsk/sdc0d0s2        312      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 [94191]?
Initialize filesystem on /dev/root (y n) [y]?
Initialize filesystem on /dev/usr (y n) [y]?

Initializing the filesystem on /dev/root...
Warning: 24 sector(s) in last cylinder unallocated
/dev/root:      44496 sectors in 53 cylinders of 15 tracks, 56 sectors
        22.8Mb in 4 cyl groups (16 c/g, 6.88Mb/g, 2048 i/g)
super-block backups (for fsck -b#) at:
 32, 13536, 27040, 40544,
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, 21134 free (14 frags, 2640 blocks, 0.1% fragmentation)

Initializing the filesystem on /dev/usr...
Warning: 528 sector(s) in last cylinder unallocated
/dev/usr:       510192 sectors in 608 cylinders of 15 tracks, 56 sectors
        261.2Mb in 38 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, 244734 free (14 frags, 30590 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    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]?

========== 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: m2000-25sdc...
Forward spacing the tape...
Forward spacing the tape...
Loading subpackage: m2000-25sdc_dev...
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]? mips
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

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


Set domain name [mips.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 Instructions" in the *RISC/os 4.50 Release Notes* for further configuration information.

5.3 Installing RISC/os 4.51 from Remote Tape

To install RISC/os 4.51 from a remote tape drive on a RISComputer 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 MIPS system with cartridge tape drive.

Target Machine:
The MIPS 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 cartridge 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 */etc/hosts* file, and the server must have the network of the target in the **netstat -r** information. This information shoue 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** command. If **bfsd** is not running, start it with the following command:

   /etc/bfsd

4. The server's */.rhosts* 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=sash.2030 skip=1
768+0 records in
768+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.r2300_std skip=1
4150+0 records in
4150+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.r3200_std skip=1
4285+0 records in
4285+0 records out
# dd if=/dev/rmt/Q120n-0 of=unix.i2000_std skip=1
4163+0 records in
4163+0 records out
# dd if=/dev/rmt/Q120n-0 of=unix.r3200_ijc skip=1
4285+0 records in
4285+0 records out
# dd if=/dev/rmt/Q120n-0 of=unix.r6000_std skip=1
4360+0 records in
4360+0 records out
# dd if=/dev/rmt/Q120n-0 of=unix.r3030_std skip=1
4330+0 records in
4330+0 records out
```

```
# dd if=/dev/rmt/Q120n-0 of=unix.r3125_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 *servername* in the following commands):

```
M/1000 MIPS Monitor Version 4.22 MIPS OPT Tue Aug 29 09:59:10 PDT 1989 root
Memory size: 50331648 (0x3000000) bytes
Icache size: 65536 (0x10000) bytes
Dcache size: 65536 (0x10000) bytes
>> boot -f bfs()servername:/usr/netinstall/sash.std for non-Rx2030
>> boot -f bfs()servername:/usr/netinstall/sash.2030 for Rx2030
Obtaining servername:/usr/netinstall/sash.XXX 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 Rx2030, Rx3230, internal SCSI RC3260, RC6260
sash: cp -b 16k bfs()servername:/usr/netinstall/miniroot dkis(,,1)
for M/120 or RC3240
sash: cp -b 16k bfs()servername:/usr/netinstall/miniroot dkip(,,1)
for M/500, 800, 1000, M/2000 SMD, SMD-based RB3125, or RC6280
sash: cp -b 16k bfs()servername:/usr/netinstall/miniroot dkij(,,1)
for M/2000 SCSI or 4210 Jaguar SCSI RC3260
Obtaining servername:/usr/netinstall/miniroot from server servername
13824000 (0xd2f000) bytes copied
```

11. Boot the kernel:

```
sash: boot -f bfs()servername:/usr/netinstall/unix.i2000_std root=sdc0d0s1 console=g (for RS2030)
sash: boot -f bfs()servername:/usr/netinstall/unix.i2000_std root=sdc0d0s1 console=0 (RC2030 tty 0)
sash: boot -f bfs()servername:/usr/netinstall/unix.i2000_std root=sdc0d0s1 console=1 (RC2030 tty1)
sash: boot -f bfs()servername:/usr/netinstall/unix.r3030_std root=sdc0d0s1 (Rx3230)
sash: boot -f bfs()servername:/usr/netinstall/unix.r2400_std root=isc0d0s1 (M/120, RC3240)
sash: boot -f bfs()servername:/usr/netinstall/unix.r2300_std root=ipc0d0s1 (M/500, 800, 1000)
sash: boot -f bfs()servername:/usr/netinstall/unix.r3200_ijc root=ijc0d0s1 (RC3260 orM/2000 SCSI)
sash: boot -f bfs()servername:/usr/netinstall/unix.r3200_std root=ipc0d0s1 (M/2000 SMD)
sash: boot -f bfs()servername:/usr/netinstall/unix.rb3125_std root=sdc0d0s1 (Jaguar 4210 SCSI RC3260)
sash: boot -f bfs()servername:/usr/netinstall/unix.rb3125_std root=ipc0d0s1 (SMD-based RB3125)
sash: boot -f bfs()servername:/usr/netinstall/unix.r6000_std root=ijc0d0s1 (RC6260)
sash: boot -f bfs()servername:/usr/netinstall/unix.r6000_std root=ipc0d0s1 (RC6280)
Obtaining servername:/usr/netinstall/unix.r2300_std from servername server
812560+99312+776624 entry: 0x80021000
CPU: MIPS R2000 Processor Chip Revision: 5.0
```

```
RISC/os Release 4_51 mips Version UMIPS
Total real memory  = 50331648
Available memory   = 47816704
Root on dev 0x401, Swap on dev 0x401

WARNING: lost battery backup clock

WARNING: CHECK AND RESET THE DATE!
Root fstype ffs
New swplo: 26992  swap size: 6344K bytes
Available memory   = 46522368


UMIPS Miniroot run level 1

Making miniroot device files for m1000 system...
erase=^H, kill=^U, interrupt=^C
#
```

12. At this point, the miniroot file system has been copied to the swap partition 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: m2000-6
Root disk type: SMD

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
m2000    -- RISC/os m/2000 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
/dev/dsk/ipc0d1s13 mounted on /mnt/usr1b


-------------------------------------------------------------------------
Partition                Megs    Mounted File System or Partition Usage
-------------------------------------------------------------------------
0   /dev/dsk/ipc0d0s0     20     /dev/root
1   /dev/dsk/ipc0d0s1     20     /
6   /dev/dsk/ipc0d0s6    562     /dev/usr
7   /dev/dsk/ipc0d0s7     25      -**** Available Partition ****-
-------------------------------------------------------------------------
Disk Device    /dev/dsk/ipc0d0s2        626      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 m2000- 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      ic
red
        /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 m2000...
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... DKVJ 0:6 unit attention; media change or drive reset

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

Loading subpackage: root...
Forward spacing the tape...
Forward spacing the tape...
Loading subpackage: m2000...
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.m2000 4.50 (y n) [n]? y
Removing leftover files from umips.m2000 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) iles 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 m2000- 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/usr1b: Unmounted
/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.