

Software Release Notice



Onyx Systems, Incorporated

SOFTWARE RELEASE NOTICE

FOR

"UNIX~ 3.0.3"

FOR THE

"C8002 - D1020"

"C8002M - D1019"

"C8002A, C5002A, and SUNDANCE 16 - D1028"

SYSTEMS

RELEASE NOTICE HISTORY

INITIAL RELEASE MAY 1983

TRADEMARK INFORMATION

~ UNIX is a trademark of Bell Laboratories.

Software Order Number (C8002) - S1020.

Software Order Number (C8002M) - S1019.

Software Order Number (C8002A/C5002A/SUNDANCE 16) - S1028.

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RELEASE DESCRIPTION

OVERVIEW

This Software Release Notice describes Version 3.0.3 of "UNIX"; UNIX 3.0.3 is ONYX's latest version of UNIX System III. Version 3.0.3 is the first version of UNIX System III released to run on the following ONYX computer systems:

C8002A, C5002A and SUNDANCE 16.

UNIX 3.0.3 supports an inboard 10, 20 or 40 Mbyte 8 inch Winchester disk drive, and up to 3 outboard disk drives, intermixed from the above sizes, on the C8002, C8002M and C8002A.

UNIX 3.0.3 supports an inboard 14 or 21 Mbyte 5 1/4 inch Winchester disk drive, and up to 3 outboard disk drives, intermixed from the above sizes, on the C5002A and SUNDANCE 16.

The customer can configure a small version of the system to run a 7 Mbyte 5-1/4 inch Winchester disk. Support is provided via the disk map "RP_SML" and the "rcmfg" utility (a modified recreate) on the Initialization Tape.

ENVIRONMENT

Prerequisites

UNIX 3.0.3 is available on the following computer systems: C8002, C8002M, C8002A, C5002A, SUNDANCE 16.

Hardware/PROM Dependencies

UNIX 3.0.3 works only with the disk format standards introduced in late 1981. This gives the following dependencies:

- 1) For controller disk drive configurations (i.e. C8002M systems), the drives must all support software-settable interlace factors which means that:
 - a) For 8 inch controller drives, PROMs part numbers 330094 and 330095 must be at revision level C1 or later.

The Z8001 boot PROMs must be 926/927-C for 4 Mhz systems and 1538/1539-D or later for 6 Mhz systems. The Z8001 PCB must have the EC to correct the memory map timing fault (ECO

#117), and also the EC that eliminates filter switch/bounce noise out of the reset switch line (ECO #116). The Z8002 boot PROMs must be at revision E or later, 466/467-E (possibly 883/884-E). The Z8002 PCB must be at revision 3 with ECs XX9, X10, X13 or later. The Z80 PROMs must be the following or later:

- a) Logic II I/O controller needs 455-2, 456-2 or later.
- b) Z80 SU I/O controller needs 455-2, 456-2 or later.
- c) Z80 MU I/O controller needs 459-3, 460-3 or later.

Updates for systems with the original spare sector tables will lose all record of their spare sectors, so a written record of the old spare table should be made and these sectors should be spared again after upgrading.

Supported Hardware

This release supports the following:

- 1) The following printers are supported:
 - a) Serial printers. Any RS-232C compatible printer such as

- Epson
 - NEC Spinwriter~
 - Printronix
 - Diablo
 - Qume
 - C.Itoh/TEC Starwriter

The pin assignments and port number for the serial port may be found in the appropriate one of the following manuals:

- i) C8002 User Guide.
- ii) C5002A, C8002A SUNDANCE 16 User Guide.

- b) Parallel printers: (requires ordering a special cable). Any printer compatible with the "Centronics" interface may be connected. Some examples are as follows:

- Epson
 - NEC Spinwriter~
 - Printronix

The pin assignments and port number for the parallel port may be found in the appropriate

~Spinwriter is a trademark of NEC

one of the following manuals:

- i) C8002 User Guide.
- ii) C5002A, C8002A Microcomputer Systems User Guide.

As delivered UNIX 3.0.3 is configured for a serial printer. To configure a parallel printer for use with lpr.

```
rm /dev/lp
ln /dev/plp /dev/lp
```

and (in the /etc/rc) comment out the invocation of openup and stty on /dev/slp. Add a line at the same place to invoke splp with the required options.

As an alternative, the parallel printer could be configured with a second spooler.

```
ln /dev/plp /dev/pp
ln /usr/bin/lpr /bin/ppr
ln /usr/lib/lpd /usr/lib/ppd
mkdir /usr/spool/ppd
chmod 777 /usr/spool/ppd
```

Duplicate the lines "rm /usr/spool/lpd/lock" and the invocation of lpd in the /etc/rc file for ppd. Finally add a line in /etc/rc where openup is invoked to invoke splp.

Supported Software

The following software products are available from ONYX for use with UNIX version 3.0.3.

- 1) CBASIC16, order number S3011.
- 2) RM/COBOL, order number S3010.
- 3) SCCS, order number S7004.
- 4) FORTRAN 77, order number S3018.

Memory Requirements

UNIX 3.0.3 requires 110 Kbytes of main memory. User programs may occupy either one address space of up to 64 Kbytes for code and data, or two address spaces, which consist of up to 64 Kbytes for code and up to 64 Kbytes for data.

Users

This release supports 1 to 8 users on the C8002 or C8002M. This may be expanded to 16 users by the addition of a PEM-C. This release supports 1 to 5 users on the C8002A, C5002A or SUNDANCE 16.

Disk Requirements

As delivered from ONYX the disks are partitioned into a number of logical disks identified as /dev/rp0, /dev/rp1, and /dev/rp2 which describe a 10 Mbyte disk. If more than one drive is connected or the inboard drive is larger than 10 Mbytes then the user has to set up the remaining logical disks (see the "INSTALLATION" section). The sizes of the various logical disks vary between systems. When this release is compared to the earlier releases of UNIX (which were compatible with UNIX version 7), the sizes have been changed. See the "WARNING" section.

The distributed version of UNIX 3.0.3 leaves almost 2 Mbytes of space on the root file system, and occupies no space on the mounted file systems. The graphics sub-system in /usr/bin/graf and /usr/lib/graf occupy almost 1 Mbyte of disk space and may be removed if not required.

The file systems described by the diskmap incorporated in the distributed Kernel may have the following sizes. The sectors are 512 bytes long.

UNIX 3.0.3 supports inboard 5-1/4" disk drives of 14 or 21 Mbytes, or inboard 8" drives of 10, 20, or 40 Mbytes, plus up to three outboard drives. The three outboard drives may

have intermixed capacities, but must match the format (5-1/4" or 8") of the inboard drive.

In the following disk configuration tables, "M" refers to the interlace factor of the disk drive (i.e., the number of data blocks on the disk that rotate past the head between CPU read- or write-to-disk cycles).

C8002M/C8002A CONFIGURATIONS - controller disk drives.
8 inch Winchester disks, (10c, 20c, 40c).

TYPE(M)	SECTORS per TRACK	CYLINDERS	SECTORS (N) per CYLINDER	SECTORS per DISK
10 Mb(3)	20	353	60	21180
20 Mb(3)	20	387	100	38700
40 Mb(3)	20	775	100	77500

4 Mhz disk drives have an M of 4, instead of 3.

Drive 0 - in board.

DISK	Base sector	Base cyl:sec	Size	Size Mbytes
			10 Mb - 10c0	
rp0	0	0:00	570	0.28
/ rp1	570	9:30	16000	7.81
rp2	16570	276:10	2536	1.24
/u rp3	19106	318:26	2074	1.01

DISK	Base sector	Base cyl:sec	Size	Size Mbytes
			20 Mb - 20c0	
rp0	0	0:00	570	0.28
/ rp1	570	5:70	16000	7.81
rp2	16570	165:70	2536	1.24
/u rp3	19106	191:06	19594	9.57

DISK	Base sector	Base cyl:sec	Size	Size Mbytes
			40 Mb - 40c0	
rp0	0	0:00	570	0.28
/ rp1	570	5:70	16000	7.81
rp2	16570	165:70	2536	1.24
/u rp3	19106	191:06	19594	9.57
/v rp4	38700	387:00	38800	18.95

OR

Drive 0 - in board.

DISK	Base sector	Base cyl:sec	Size	Size Mbytes
			40 Mb - 40c0b	
rp0	0	0:00	570	0.28
/ rp1	570	5:70	16000	7.81
rp2	16570	165:70	2536	1.24
/u rp3	19106	191:06	58394	28.51

C8002M/C8002A CONFIGURATIONS - controller disk drives.
8 inch Winchester disks, (10c, 20c, 40c).

Drive 1 - out board.

DISK	Base sector	10 Mb Base cyl:sec	- 10c1 Size	Size Mbytes
rp5	0	0:00	570	0.28
/w rp6	570	9:30	16000	7.81
/x rp7	16570	276:10	2536	1.24
/y rp8	19106	318:26	2074	1.01

DISK	Base sector	20 Mb Base cyl:sec	- 20c1 Size	Size Mbytes
rp5	0	0:00	570	0.28
/w rp6	570	5:70	16000	7.81
/x rp7	16570	165:70	2536	1.24
/y rp8	19106	191:06	19594	9.57

DISK	Base sector	40 Mb Base cyl:sec	- 40c1 Size	Size Mbytes
rp5	0	0:00	570	0.28
/w rp6	570	5:70	16000	7.81
/x rp7	16570	165:70	2536	1.24
/y rp8	19106	191:06	19594	9.57
/z rp9	38700	387:00	38800	18.95

OR

Drive 1 - out board.

DISK	Base sector	10 Mb Base cyl:sec	- 10cla Size	Size Mbytes
rp5	0	0:00	570	0.28
/w rpa	570	9:30	20610	10.06

DISK	Base sector	20 Mb Base cyl:sec	- 20cla Size	Size Mbytes
rp5	0	0:00	570	0.28
/w rpa	570	5:70	38130	18.62

DISK	Base sector	40 Mb Base cyl:sec	- 40cla Size	Size Mbytes
rp5	0	0:00	570	0.28
/w rpa	570	5:70	76930	37.56

OR

Drive 1 - out board.

	40 Mb	- 40c1b	
DISK	Base sector	Base cyl:sec	Size Mbytes
rp5	0	0:00	570 0.28
/w rp6	570	5:70	16000 7.81
/x rp7	16570	165:70	2536 1.24
/y rp8	19106	191:06	58394 28.51

C8002M/C8002A CONFIGURATIONS - controller disk drives.
8 inch Winchester disks, (10c, 20c, 40c).

Drive 2 - out board.

	10 Mb	- 10c2	
DISK	Base sector	Base cyl:sec	Size Mbytes
rpb	0	0:00	570 0.28
/s rp10	570	9:30	20610 10.06

	20 Mb	- 20c2	
DISK	Base sector	Base cyl:sec	Size Mbytes
rpb	0	0:00	570 0.28
/s rp10	570	5:70	38130 18.62

	40 Mb	- 40c2	
DISK	Base sector	Base cyl:sec	Size Mbytes
rpb	0	0:00	570 0.28
/s rp10	570	5:70	76930 37.56

Drive 3 - out board.

	10 Mb	- 10c3	
DISK	Base sector	Base cyl:sec	Size Mbytes
rp11	0	0:00	570 0.28
/t rp12	570	9:30	20610 10.06

	20 Mb	- 20c3	
DISK	Base sector	Base cyl:sec	Size Mbytes
rp11	0	0:00	570 0.28
/t rp12	570	5:70	38130 18.62

	40 Mb	- 40c3	
DISK	Base sector	Base cyl:sec	Size Mbytes
rp11	0	0:00	570 0.28
/t rp12	570	5:70	76930 37.56

C8002 CONFIGURATIONS - standard disk drives.
8 inch Winchester disks, (10s, 20s, 40s).

TYPE(M)	SECTORS per TRACK	CYLINDERS	SECTORS (N) per CYLINDER	SECTORS per DISK
10 Mb(3)	18	354	54	19116
20 Mb(3)	18	388	90	34920
40 Mb(3)	18	776	90	69840

482 Z80 I/O controllers have an M of 4, instead of 3.

Drive 0 - in board.

		10 Mb		- 10s0	
DISK	Base sector	Base cyl:sec	Size	Size	Mbytes
rp0	0	0:00	570		0.28
/ rp1	570	10:30	16000		7.81
rp2	16570	306:46	2536		1.24

		20 Mb		- 20s0	
DISK	Base sector	Base cyl:sec	Size	Size	Mbytes
rp0	0	0:00	570		0.28
/ rp1	570	6:30	16000		7.81
rp2	16570	184:10	2536		1.24
/u rp3	19106	212:26	15814		7.72

		40 Mb		- 40s0	
DISK	Base sector	Base cyl:sec	Size	Size	Mbytes
rp0	0	0:00	570		0.28
/ rp1	570	6:30	16000		7.81
rp2	16570	184:10	2536		1.24
/u rp3	19106	212:26	19594		9.57
/v rp4	38700	430:00	31140		15.21

OR

Drive 0 - in board.

		40 Mb		- 40s0b	
DISK	Base sector	Base cyl:sec	Size	Size	Mbytes
rp0	0	0:00	570		0.28
/ rp1	570	6:30	16000		7.81
rp2	16570	184:10	2536		1.24
/u rp3	19106	212:26	50734		24.77

C8002 CONFIGURATIONS - standard disk drives.
8 inch Winchester disks, (10s, 20s, 40s).

Drive 1 - out board.

		10 Mb		- 10s1	
DISK	Base sector	Base cyl:sec	Size	Size	Mbytes
rp5	0	0:00	570		0.28
/w rp6	570	10:30	16000		7.81
/x rp7	16570	306:46	2536		1.24

		20 Mb		- 20s1	
DISK	Base sector	Base cyl:sec	Size	Size	Mbytes
rp5	0	0:00	570		0.28
/w rp6	570	6:30	16000		7.81
/x rp7	16570	184:10	2536		1.24
/y rp8	19106	212:26	15814		7.72

		40 Mb		- 40s1	
DISK	Base sector	Base cyl:sec	Size	Size	Mbytes
rp5	0	0:00	570		0.28
/w rp6	570	6:30	16000		7.81
/x rp7	16570	184:10	2536		1.24
/y rp8	19106	212:26	19594		9.57
/z rp9	38700	430:00	31140		15.21

OR

Drive 1 - out board.

		10 Mb		- 10sla	
DISK	Base sector	Base cyl:sec	Size	Size	Mbytes
rp5	0	0:00	570		0.28
/w rpa	570	10:30	18546		9.06

		20 Mb		- 20sla	
DISK	Base sector	Base cyl:sec	Size	Size	Mbytes
rp5	0	0:00	570		0.28
/w rpa	570	6:30	34350		16.77

		40 Mb		- 40sla	
DISK	Base sector	Base cyl:sec	Size	Size	Mbytes
rp5	0	0:00	570		0.28
/w rpa	570	6:30	69270		33.82

OR

Drive 1 - out board.

DISK	Base sector	40 Mb Base cyl:sec	- 40s1b Size	Size Mbytes
rp5	0	0:00	570	0.28
/w rp6	570	6:30	16000	7.81
/x rp7	16570	184:10	2536	1.24
/y rp8	19106	212:26	50734	24.77

C8002 CONFIGURATIONS - standard disk drives.
8 inch Winchester disks, (10s, 20s, 40s).

Drive 2 - out board.

DISK	Base sector	10 Mb Base cyl:sec	- 10s2 Size	Size Mbytes
rpb	0	0:00	570	0.28
/s rp10	570	10:30	18546	9.06

DISK	Base sector	20 Mb Base cyl:sec	- 20s2 Size	Size Mbytes
rpb	0	0:00	570	0.28
/s rp10	570	6:30	34350	16.77

DISK	Base sector	40 Mb Base cyl:sec	- 40s2 Size	Size Mbytes
rpb	0	0:00	570	0.28
/s rp10	570	6:30	69270	33.82

Drive 3 - out board.

DISK	Base sector	10 Mb Base cyl:sec	- 10s3 Size	Size Mbytes
rp11	0	0:00	570	0.28
/t rp12	570	10:30	18546	9.06

DISK	Base sector	20 Mb Base cyl:sec	- 20s3 Size	Size Mbytes
rp11	0	0:00	570	0.28
/t rp12	570	6:30	34350	16.77

DISK	Base sector	40 Mb Base cyl:sec	- 40s3 Size	Size Mbytes
rp11	0	0:00	570	0.28
/t rp12	570	6:30	69270	33.82

C5002A/SUNDANCE 16 CONFIGURATIONS - controller disk drives.
5 1/4 inch Winchester disks (7c, 14c, 21c).

TYPE(M)	SECTORS per TRACK	CYLINDERS	SECTORS (N) per CYLINDER	SECTORS per DISK
07 Mb(3)	20	305	40	12200
14 Mb(3)	20	305	80	24400
21 Mb(3)	20	305	120	36600

Drive 0 - in board.

DISK	Base sector	14 Mb Base cyl:sec	- 14c0 Size	Size Mbytes
rp0	0	0:00	570	0.28
/ rp1	570	7:10	16000	7.81
rp2	16570	207:10	2536	1.24
/u rp3	19106	238:66	5294	2.58

DISK	Base sector	21 Mb Base cyl:sec	- 21c0 Size	Size Mbytes
rp0	0	0:00	570	0.28
/ rp1	570	4:90	16000	7.81
rp2	16570	138:10	2536	1.24
/u rp3	19106	159:26	17494	8.54

C5002A/SUNDANCE 16 CONFIGURATIONS - controller disk drives.
5 1/4 inch Winchester disks (7c, 14c, 21c).

Drive 2 - out board.

DISK	Base sector	14 Mb	- 14c2	Size
		Base cyl:sec	Size	Mbytes
rpb	0	0:00	570	0.28
/w rpc	570	7:10	16000	7.81
/x rpd	16570	207:10	2536	1.24
/y rpe	19106	238:66	5294	2.58

DISK	Base sector	21 Mb	- 21c2	Size
		Base cyl:sec	Size	Mbytes
rpb	0	0:00	570	0.28
/w rpc	570	4:90	16000	7.81
/x rpd	16570	138:10	2536	1.24
/y rpe	19106	159:26	17494	8.54

OR

Drive 2 - out board.

DISK	Base sector	14 Mb	- 14c2a	Size
		Base cyl:sec	Size	Mbytes
rpb	0	0:00	570	0.28
/w rp10	570	7:10	23830	11.64

DISK	Base sector	21 Mb	- 21c2a	Size
		Base cyl:sec	Size	Mbytes
rpb	0	0:00	570	0.28
/w rp10	570	4:90	36030	17.59

C5002A/SUNDANCE 16 CONFIGURATIONS - controller disk drives.
5 1/4 inch Winchester disks (7c, 14c, 21c).

Drive 4 - out board.

DISK	Base sector	14 Mb Base cyl:sec	- 14c4 Size	Size Mbytes
rp13	0	0:00	570	0.28
/s rp14	570	7:10	23830	11.64

DISK	Base sector	21 Mb Base cyl:sec	- 21c4 Size	Size Mbytes
rp13	0	0:00	570	0.28
/s rp14	570	4:90	36030	17.59

Drive 6 - out board.

DISK	Base sector	14 Mb Base cyl:sec	- 14c6 Size	Size Mbytes
rp15	0	0:00	570	0.28
/t rp16	570	7:10	23830	11.64

DISK	Base sector	21 Mb Base cyl:sec	- 21c6 Size	Size Mbytes
rp15	0	0:00	570	0.28
/t rp16	570	4:90	36030	17.59

CONTENTS OF RELEASE

Media

UNIX 3.0.3 is distributed as three tapes as follows:

- 1) The INITIALIZATION Tape.
This tape contains the system dependent software that is used to prepare the system for use. There are three versions, labeled as follows:

INITIALIZATION TAPE
UNIX VER 3.0.3
C8002
05/02/83 S/N:-----
LICENSED USE ONLY

INITIALIZATION TAPE
UNIX VER 3.0.3
C8002M
05/02/83 S/N:-----
LICENSED USE ONLY

INITIALIZATION TAPE
UNIX VER 3.0.3
C8002A, C5002A, SUNDANCE 16
05/02/83 S/N:-----
LICENSED USE ONLY

- 2) The ROOT FILE SYSTEM tape.
This tape contains the UNIX Kernel, system files and utilities. There are two versions, labeled as follows:

ROOT FILE SYSTEM TAPE
UNIX VER 3.0.3
C8002, C8002M
05/02/83 S/N:-----
LICENSED USE ONLY

ROOT FILE SYSTEM TAPE
UNIX VER 3.0.3
C8002A, C5002A, SUNDANCE 16
05/02/83 S/N:-----
LICENSED USE ONLY

- 3) The MANUAL PAGE tape.
This tape contains the UNIX manual pages. It is
labeled as follows:

MANUAL PAGE TAPE
UNIX VER 3.0.3
C8002, C8002M, C8002A, C5002A, SUNDANCE 16
05/02/83 S/N:-----
LICENSED USE ONLY

Documentation

The following documents are included with the release.

- 1) UNIX Software Release Notice, Version 3.0.3.
This document. File in the front of the "System Administrator's Guide".
- 2) User Guide Volume 1.
This contains descriptions of communications, graphics, and system maintenance commands, as well as general purpose information.
- 3) User Guide Volume 2.
This contains a description of system calls, library subroutines, special files, file formats, miscellaneous facilities and system maintenance procedures.
- 4) Programmer's Reference Manual.
Technical papers pertinent to the software development environment of System III.
- 5) Document Preparation Manual.
This describes how to prepare and format documents.
- 6) General Reference Manual.
Ancillary technical papers pertinent to the UNIX environment.
- 7) System Administrator's Guide.
Papers and instructions necessary for the setup, configuration and maintenance of a UNIX system. This software release notice should be filed in this manual.
- 8) C8002 User's Guide or C5002A, C8002A SUNDANCE 16 User's Guide.
This is distributed with the system.

Software

The files contained on the Root File System Tape are listed in ATTACHMENT B, "Contents of UNIX 3.0.3 ROOT FILE SYSTEM". If you ordered UNIX with your system these files are also contained in /dev/rpl on the inboard disk drive.

CHANGES TO PREVIOUS RELEASE

This is the first release of UNIX System III for the C8002A, C5002A and SUNDANCE 16. The following are changes since release 3.0.2 for C8002 and C8002M systems.

Corrections

The following problem reports have been corrected:

The following problems were corrected in release 3.0.2 but not declared as such in the Software Release Notice.

SCR 00288: INSTALL: When user had write permission on the install directory but not on the old copy of the program, INSTALL would fail.

SCR 00419: 300, 300S, 4014, 450, bcopy, calprog, checkeq, checkcw, clri, crypt, csplit and cw were compiled with an old version (before 3.0.1) of ioctl, stty and gtty, which produced unpredictable effects..

SCR 00565: PEM-C driver: The "BREAK" key interpretation was incorrect. In a "stat packet" the wrong bit was examined when looking for break (smxrint).

SCR 00566: PEM-C driver: To be supplied.

SCR 00567: PEM-C driver: "lock/waiting" code locked out "terminal control packets".

SCR 00664: KERNEL: Record locking did not work all the time.

The following problems have been corrected in 3.0.3:

SCR 00104: DUMPDIR: Dumpdir created the file rst* but did not remove it after use. The rst* file still is not removed if the dumpdir is killed with a signal.

SCR 00186: TAR: When using 'tar xOv' to copy in old files from another system, it gave files with the current date instead of that of the original file.

SCR 00220: MORE: More did not work in init state 1. It displayed the first page of text and then exited.

SCR 00238: NROFF: The half-motion commands in nroff had no effect. The problem could be created by typing: nroff -T450 l od -c <CR>

<CR>
This is a /u super/d script <CR>
CNTL-D

SCR 00239: Vertical lines drawn by nroff were incomplete at the top.

SCR 00259: XOFF: UNIX was slow to respond to XOFF from terminal. It sometimes sent more than 100 characters stopping, causing problems for some CRTs and communications.

SCR 00265: The code sequence (in a function returning a double):

```
double xys,xyvar;  
return (xys/(xyvar?xyvar:1));
```

produced `compiler error:no table entry for opREG`.

SCR 00278: C Compiler: The supplied code at line 45 worked, but the code at line 72 did not. The bug was constant rather than varying with np->value.

SCR 00302: A simple C program containing an arithmetic statement, involving floating point but no printf, was loading printf anyway, making it 6K larger than it was on V7.

SCR 00306: The C optimizer generated incorrect code for the supplied C code.

SCR 00322: When GETTY was run with a single argument of `!' to update the /etc/utmp file and exit, it also placed a dummy record in /usr/adm/wtmp which later caused system accounting to fail.

SCR 00415: ADB: ADB contained a string identifying itself as `PLEXUS V7`. This has been changed to read `SIII`.

SCR 00416: MKFS: The Manual Page entry did not document that tabs could be used as "white space" in a proto file.

SCR 00417: FILE: "FILE /usr/lib/macros/cmp.n.d.an" reported the file type as "ascii text" when it was actually "data".

SCR 00418: /ETC/RC: Certain programs started in State 2 should have been killed when entering State 1 such as UPDATE and CRON. A reboot in the middle of UPDATE doing a SYNC formerly could destroy the file system.

- SCR 00420: RESTOR: RESTOR(1), documenting the "X" option, item 4, did not issue a prompt to type in the full path name of the raw tape device for the desired volume. i.e., "/dev/rmt0" for the first volume, as opposed to "0" or "2"
- SCR 00427: SH: The conditional 'if [-x /dev/rpl]', where x was true for 'd',
- SCR 00428: SHUTDOWN: SHUTDOWN executed "etc/wall" in two places; the leading slash was missing. SHUTDOWN first does a "cd /" so the program operates, but it was fixed anyway.
- SCR 00434: ADB: Expressions of the form 'abcd' were interpreted as 'badc'. Example: ?W 'abcd' modified the file to 'badc'.
- SCR 00442: MORE: MORE looked for VI in /usr/bin only, not /bin.
- SCR 00443: Curses Library: GETSTR function disregarded all input until newline, but was supposed to collect characters up to and including newline.
NOTE: As an enhancement, -getstr now accepts "RETURN" or "NEW LINE" as terminator.
- SCR 00444: CPIO: The complaint that the portable option on -o did not appear to work has been determined to be an operator error.
- SCR 00445: MORE: When a user responded to the prompt, "MORE", the system did not erase the prompt immediately; it remained on display until the next output.
- SCR 00467: CC: CC option -c did not work when used with -p, and "hung" when used with -E.
- SCR 00484: NROFF: NROFF and support utilities: 1) NROFF ignored the ".nx" directive. This item is the same as SCR 00297 (above).
2) Use of TAB450 data file caused improper output from NROFF:
- a) ".BD" and the "FTB" directives did not result in bold print.
 - b) The command line argument, "-e", resulted in the loss of right margin adjustment.
 - c) Preprocessing with TBL or NEQN resulted in improper vertical motions. "\n" was added to output that should have contained only "\r".

- SCR 00487: STTY: The STTY min function formerly input the min argument in the wrong format. STTY min 1 input the ascii character 1 instead of the value 1.
- SCR 00491: TAR: The "-o" flag had no effect on directories.
- SCR 00504: LPR/LPD: To do invoicing in a multi-user environment, one has to go through the spooler. The print spooler always output a blank header page, which prevented RM/COBOL programs from invoicing properly.
- SCR 00506: SHUTDOWN: Shutdown specifies unit 0 when it does a tension. Consequently, tracks 1,2, and 3 do not get tensioned. This SCR has been determined to be due to operator error.
- SCR 00514: The dialout support for ventel 212 + failed. The match subroutine did not recognize the Ventel's responses although the Ventel 212 + worked properly with CU.
- SCR 00517: TC: `tc` terminated with `Memory Fault - core dumped`. Input for tc came from `troff -t` on the condition that the input file was one line of text with no troff commands. More complex input resulted in a core dump.
- SCR 00518: /ETC/RC: RC in /ETC/RC did not function with "init 2" after running SHUTDOWN. Nor did it start up multi-user, start CRON, initialize printers, etc.
- SCR 00520: When printing to a parallel printer, if the printed line length exceeded 100 characters, the printer would hang. To continue operation the printer had to be reset. The problem had been noted on both TI (810) and Data Products printers running at higher speeds (e.g. 300 lpm, 600 lpm). Pins 1-8, 10-15, not 16 or 17, + logic ground. This was logged against version 3.0.1. See also SCR 00575, below.
- SCR 00553: UUXQT: UUXQT executed only 3 commands in /usr/lib/uucp/uuxqtcmds.
- SCR 00558: UUXQT: This SCR logged the same complaint as SCR 00553.
- SCR 00561: UUCP: uucp queues up a file copy but uucico must be invoked manually to execute the actual transfer. ONYX does not consider this feature to be a "bug."

- SCR 00569: TAR: Tar did not always detect write errors.
- SCR 00572: TAR: TAR opened special (character, block, pipe) files before deciding not to dump them. After opening them it did not close them.
- SCR 00573: TAR: When extracting files from a tape that took up more than one track, TAR aborted when reading the second track if the tape was write-protected ("SAFE").
- SCR 00574: TAR: When selectively extracting a file from tape, TAR, when switching tape tracks, would delete a disk file with the same name as the one at the end of the previous tape track.
- SCR 00575: This SCR described the same problem as SCR 00520, but was recorded in regard to version 3.0.2.
- SCR 00598: LIBCURSES: The "noraw" function in libcurses.a erroneously turned on parity checking.
- SCR 00599: ACCT/CKPACCT: A manufacturing error prevented this routine from functioning.
- SCR 00600: LPR: A -d option has been added to lpr to print files directly from a mounted file system without copying them into rpl. NOTE: This is an enhancement, not a bug fix.
- SCR 00601: LPR: A multiple printer queuing capability has been added to lpr. NOTE: This is an enhancement, not a bug fix.
- SCR 00603: CC: Use of a structure or union in an "if" condition sometimes caused a memory fault.
- SCR 00605: TAR: The documentation stated that 20 was the maximum blocking factor. It has been corrected to delineate a maximum of 16 for the cartridge tape and 20 for the 9-track tape.
- SCR 00606: TAR: (same as 00574) TAR used to erroneously remove a file copied in, if the message "removed. Incomplete file" was output.
- SCR 00607: TAR: A multi-track session could not be ended by the DELETE key.
- SCR 00608: TAR: (same as 00572) TAR used to "hang" if asked to copy out a named pipe (fifo).
- SCR 00609: TAR: The use of the -r option on blocked tapes produced the message, "tar: cannot update blocked tapes (yet)". The "yet" has been removed.

- SCR 00610: TAR: The message output at the end of a track has been changed to be less confusing.
- SCR 00611: TAR: The message "cannot make directory" was displayed erroneously.
- SCR 00612: KERNEL: Tensioning tapes did not work on the C8002A/C5002A.
- SCR 00616: TAR: Same as SCR 00609.
- SCR 00617: TAR: Same as SCR 00573.
- SCR 00636: KERNEL: The Kernel could not access past 32 Mbytes in any one file system. The message "Iaddress > 2²⁴" would appear and the file system would be corrupted. The problem has been corrected and the message changed to a panic.
- SCR 00663: GRAF: The graphics programs GD, GED, GTOP, HPD, LABEL, TD and TITLE were mis-compiled as a result of SCR 278. This has been corrected.
- SCR 00665: CC: The compiler debug message "stuck starg" was output by the compiler. This has been corrected.

Enhancements

The following new programs have been incorporated:

- 1) Unixgetspare and unixgetstat have been provided in /sa.
- 2) /etc/crash is provided to aid fault diagnosis.
- 3) The ability to make "memdump" tapes has been added, which can take complete memory dumps for examination by crash.
- 4) Software now supports the I.D.T 1050 9 track magnetic tape (800/1600 bpi), connected via the parallel port.
- 5) A new line switch (stty line 2) has been added to the serial driver to provide the CTS/DCD handshake for printers.
- 6) /usr/bin/pf is provided as a filter for FORTRAN style printer controls.
- 7) Software now supports the PEM-C to enable the addition of 8 extra serial ports to a C8002 or C8002M.

Compatibility

- 1) ONYX advises that any programs compiled under UNIX Version 7 (running on ONYX hardware), should be recompiled to run under UNIX 3.0.3. A close look should be taken at the use of system calls that have changed between V7 and UNIX 3.0.1, particularly ioctl (even though a V7 compatibility mode is provided).
- 2) UNIX 3.0.3 Initialization Tapes must be used to recreate a system on which 3.0.3 runs with the appropriate PROMs.

DOCUMENTATION CHANGES

Corrections

See the new man pages.

Addenda

None.

ADDITIONAL INFORMATION

There are differences between UNIX Version 7 and UNIX System III. These differences are listed in ATTACHMENT C, "Differences Between UNIX version 7 and UNIX SYSTEM III".

WARNINGS

- 1) The diskmap incorporated in the distributed Kernel differs from that supplied with Version 7 releases. You should perform a level 0 dump on all file systems prior to installation.
- 2) UNIX 3.0.3 uses the DTR line (pin 20) for terminals. If this is not connected for the console, then the system will not boot. This is discernible by the lack of a "Single User" prompt after displaying the real and available memory during the boot procedure (see "Loading UNIX into memory").
- 3) The issued version of /usr/lib/crontab invokes the following items:
 - a) At 1 A.M on Mondays, Wednesdays and Fridays, all five-day-old files with the following names are removed:
a.out, core, nohup.out, ed.hup, dead.letter, adv.susp.
 - b) At 1 A.M on Mondays, Wednesdays and Fridays, all ten-day-old files in /usr/tmp are removed.
 - c) At 3 A.M on Sundays, the file /usr/lib/cronlog is copied to /usr/lib/ocronlog and cronlog is made zero length.
 - d) Atrun is invoked every 15 minutes.

You may want to remove or modify these functions as provided and add functions of your own, such as the running of calendar, the truncation of the wtmp file, etc.
- 4) As issued the system is configured for a serial printer running at 9600 baud, using protocol "line 1" i.e. DTR. This is controlled by the rc file and by the link of /dev/lp to /dev/slp. On the C8002A, C5002A and the SUNDANCE 16, tty02 is configured as slp. If a parallel printer is used then tty02 may be used as a login port, with appropriate changes to /etc/inittab and /etc/rc.
- 5) The default maximum file size is 1 Mbyte. A utility has been provided to change this default for a process tree (see ulimit(1)).

- 6) Background processes invoked from sh will be killed when the shell is logged out unless nohup was used. Background processes invoked from the csh are automatically nohupped.
- 7) Since the csh does not automatically execute the equivalent of /etc/profile, it is recommended that the first line of the .login file is:

```
source /etc/cprofile
```

Which is a csh equivalent of /etc/profile.

- 8) uucp uses the node name of the Kernel as the system name. The distributed Kernel has a node name of "rel". To change it, you should login as root and perform the following:

```
Type "cd /usr/sys/cf" followed by "RETURN". Type
"make NODE=nodename VER=nn.mm" followed by
"RETURN". Where nodename is the nodename of this
Kernel. Where nn is the version number of the
distributed Kernel and mm is your version number.
This should be incremented by one each time the
Kernel is made.
```

- 9) (Was SCR 0-0093-E). When script is terminated by exit, a stray process remains. Script should be terminated by CNTRL D.
- 10) (Was SCR 0-0105-F). Only four mounted file systems are allowed in the distributed Kernel. If you have outboard disks it is probably necessary to remake the Kernel with a larger number of mounts and sabufs.
- 11) Line 1 and line 2 protocols for serial ports are output modes only. They are intended for use with printers.
- 12) (Was SCR 0-0234-H). The '-inum' operator of FIND is not documented (but is implemented) in either the printed or on-line manual.
- 13) The graphics subsystem is provided in /usr/bin/graf and /usr/lib/graf, though it has not been fully tested. This is invoked by /usr/bin/graphics. This subsystem occupies almost 1 Mbyte on rpl. Consider removing it if you do not have the appropriate terminals, or will not be using it.
- 14) If your system is equipped with a 5-1/4 inch disk drive, it is necessary to lock the disks before physically moving the system. It is also advisable to do so before powering-off. To lock the disks, use the following procedure:

- a) Press "RESET" or power-on.
 - b) To get the "<" prompt from the PROM, type the letter, "l", followed by "RETURN". This locks the disks.
 - c) Power-off the system before doing anything else, as the disks may be unlocked at the next attempt to access them. The disks are unlocked automatically the next time you power-up.
- 15) Updates for systems with the original spare sector tables will lose all record of their spare sectors, so a written record of the old spare table should be made and these sectors should be spared again after upgrading.

The following fault reports are still open:

SCR 00102: LINT: Lint complains about local variables of more than 2048 bytes. The compiler works; lint will be corrected to incorporate the compiler changes.

SCR 00166: LPD: Lpd running for root destroys the spool queue. To recreate the problem, turn off the printer, login as root and use lpr to queue a file. Login under csh as a user and use lpr to queue a file. Examine /usr/spool/lpd and everything will appear OK. Turn on the printer and the file from root will be printed, but not the user file. Examination of the spool queue shows the second file to have been renamed so it will never be printed.

SCR 00168: TOUT: TOUT does not inform the user that a file has not been dumped. E.g. If one replies 'Y' to the dump prompt instead of 'y' everything appears to to have dumped, even though nothing has been. The user is notified if files are dumped.

SCR 00169: In csh the implementation of || and && are reversed from that stated in the documentation. The manual states that || causes execution of the second part of the pipeline if the 1st fails and && causes execution if the 1st succeeds. The second part is always executed.

SCR 00170: TDISP displays only the first eight characters of the ten-character tape serial number.

SCR 00173: TOUT does not correctly format the directory entry block that precedes file data. TOUT puts in 'FN NN' at the start of the block where NN is the 2 most significant digits of the file number. This

should allow for 4 digits. OASIS TIN will not be able to copy in files written to the tape if the file number is > 99.

SCR 00185: CB: cb filename causes 'SEGMENTATION VIOLATION - Core dumped' on the provided file.

SCR 00195: LINT: Lint complains "Structure too large," but code compiles and executes correctly.

SCR 00196: Source (involving SSCANF) produces a core dump when run.

SCR 00203: MAN: Man's 't' option doesn't work. Use man.s3 instead.

SCR 00216: Writing to a "SAFE" tape produces a misleading message. If the tape is on "SAFE" and running 'dump', i.e.,
dump u0 /dev/rrpl

The error reported is,
dump: cannot create /dev/rmt0

SCR 00233: Line discipline #1, DTR 'tandem' protocol, doesn't work. UNIX won't make either DSR or CTS (or any other line) FALSE when its input buffer is nearly full.

SCR 00246: CSPLIT splits in erratic and random places when a regular expression is specified. It worked correctly when splitting the same file on specified line numbers. This file was a named pipe which may have confused it. It sometimes split in the middle of lines.

SCR 00247: CSPLIT catches interrupts and aborts even when the shell (CSH) says to ignore interrupts as in background.

SCR 00250: Same as reported in SCR 00216.

SCR 00282: In vi the sequence /~ (search for unescaped tilde) "hangs" with no diagnostic message. Only an interrupt (RUBOUT) will "unhang."

SCR 00283: The Bourne shell doesn't expand variables prior to parsing. Thus the following:

```
N=`exit 0;`; $N (pr *.c|lpr)
```

generates the message: sh:syntax error at line 1: '('unexpected

SCR 00287: When two users run the 'c' compiler concurrently with at least one being root, the compiler lock files are defeated and the two programs

use the same temporary file names, causing incorrect compiles. Apparently this bug also exists in the Bell Version 7 UNIX.

SCR 00289: MAN GET doesn't work properly. Apparently the GET document uses TBL commands and MAN doesn't run them through TBL.

SCR 00295: MAN (Berkeley version) doesn't process filter requests that some manual entries (e.g. GET(1)) require. MAN . S3 does handle them correctly. Manual needs to document this too. See MAN.S3(I)

SCR 00297: nx filename option does not include the specified file. The current file is considered ended but the input is not switched to 'filename'. The so filename does work but is not the best substitute. The nx option did work under Version 7.

SCR 00304: ADB: When trying to single-step through some code in TYPOPROG that contained floating point instructions, the intermediate instructions appeared to be skipped, partially. It seemed to single-step between the floating point instructions.

SCR 00307: BCAT: When redirecting output to disk via bcat, write errors are not always detected.

SCR 00313: The manual does not document the fact that TEST is a built-in of the Bourne shell and thus isn't available to csh.

SCR 00327: After installation on a 256K byte system, a boot of the Kernel (from disk) using the boot from tape produced the panic 'Kernel page fault' at pc=2. The same Kernel booted by boot from disk works.

SCR 00330: CTAGS: CTAGS generates the wrong search pattern for a function if the preceding line contains a 'type' specification (such as "int") followed by a tab

SCR 00331: ACCTG.1: The manual does not document that to use the accounting system one must first execute acctcom to include /usr/lib/acct in your search path.

SCR 00332: VI: VI may core dump when the user sends an interrupt during a 'g/<something>/p'.

SCR 00340: "awk" does not properly "add" numbers.

cause following line to be treated as a comment also!

SCR 00469: Termcap library: The listing given for the optimized twinkle is incomplete and illegible as well. I have attached a listing of a complete and tested version.

SCR 00481: AWK: AWK is rounding long and float variables greater than 32767.

SCR 00483: LPD: LPD Printing process to /dev/plp hangs when outputting columns greater than 80. SPLP used to set width to 132. LPD will allow output of 1 line each time a "KILL - 2 XXX" generated signal is sent to the LPD process. Hang up is not consistent: appears to happen more with long files or files containing tab characters. All other printing is normal with the exception of problems noted in SRN D1020.

SCR 00540: CC: The line "cc -c prog.s" doesn't return an error if a fatal error occurs during assembly.

SCR 00552: Segmentation violation: See full description.

SCR 00557: C8002S built with a 482 Z80 I/O controller doesn't reset.

SCR 00559: "basename /tmp/foo" .db command produces a null string.

SCR 00560: expr 3500 > 32767 in the c shell produces a true condition.

SCR 00562: VI: VI does not support the arrow keys for cursor movement.

SCR 00563: uux should have an option to inhibit the sending of mail when uux is complete.

SCR 00564: NM: Should have a -d option to display in decimal. This is particularly useful with -s to give the size of each symbol.

SCR 00568: Panic Kernel page fault. The problem was invoked by a segmentation violation in a user program in a busy machine (lots of interrupts). The Z8002 gives the segmentation violation interrupt (dumps 3 words on the system stack (correctly), then immediately interrupts at the first instruction of the interrupt routine (which cannot be in error) and the panic results because system mode is now set.

SCR 00570: CC: The function char&char causes a fatal compiler error.

SCR 00576: The uucp documentation implies that the line," /" in the USERFILE will allow anyone to access any directory. In fact the only combination that seems to work is when the exact path is specified as in root, /usr/goodstuff.

SCR 00577: When Line 2 protocol is specified for a modem port, -clocal does not work correctly. It should force a login whenever DTR is dropped, but presently does not.

INSTALLATION NOTES

If you are using an ONYX supplied DT/80 or DT/132 terminal with your system, follow the procedure in ATTACHMENT A to configure your terminal before proceeding with the software installation. If you received UNIX with your system /dev/rp0 (the reserved area), /dev/rpl (the Root File System), and /dev/rp2 (the swap area) were set up as part of the system checkout procedures before shipping. You do not need to perform the Loading Procedure to transfer the files from the Initialization Tape and the Root File System Tape. You will need to perform all procedures for outboard disks, however, and the makefs procedure for all mountable file systems. Additionally you will have to decide what to do about the manual pages.

If you received the release separately or are upgrading from V7, you will need to follow the loading procedure to transfer the files from the Initialization Tape and the Root File System Tape to the disk.

LOADING PROCEDURE

The Initialization Tape (INIT) provides a means of loading a disk with a set of files distributed by ONYX that will allow booting an operating system (UNIX) from disk. The Root File System Tape (RFST) is a dump tape containing the operating system, its utilities and system files. Although the system is shipped from ONYX with the files already loaded on disk, these tapes will allow the disk to be recreated in case of a "crash", they should be stored in a safe place. New releases are also distributed on a new RFST. This section describes the loading procedure with the UNIX 3.0.3 release.

Loading UNIX Onto Disk

Since the sizes and position of the logical disks have been changed (from V7), it is necessary for customers installing a new release of UNIX on an existing system, to back up all the file systems prior to this installation. NOTE: This release of UNIX is based on UNIX System III, hence the root file system is substantially different and will be completely overwritten by the loading procedure. Any user files and configuration files on the Root File System (/dev/rpl) should be backed up using tar, so that they may be reloaded easily after installing UNIX 3.0.3. See the WARNING section of this Software Release Notice.

An Initialization Tape (INIT) is a bootable tape that allows rebuilding of a system. When the system disk is rebuilt, the reserved area and Root File System (/dev/rpl) will be the same as when it was first made. UNIX may then be booted

from disk.

In the following section user input will be indicated by the phrase

type "input" followed by "RETURN".

The characters within the quotes should be typed and then the "RETURN" key should be pressed.

To boot from tape use the following procedure:

- 1) If this is a new installation, it is necessary to connect the terminals. Connect a terminal to the serial RS232 port labeled "CONSOLE" on the back of the system. The console port is configured for 9600 baud, parity disabled, 8 bits per character (eighth bit should be space) and 1 stop bit; the terminal should be configured to match this (or vice versa; see the C8002 or C8002A User Manual). Secure this connection by tightening the two small screws on the data line plug. Plug both the terminal and the system into an electrical outlet. In the same fashion, connect other terminals to the ports labeled "TERM X".
NOTE - UNIX 3.0.3 checks for the "Data Terminal Ready" (DTR) signal from a terminal, hence pin 20 must be connected.
- 2) As shipped from the factory, the console port is configured for 9600 baud with parity disabled. Ensure the console terminal is configured correctly, and that the autoboot function is disabled (see the C8002 User's Guide).
- 3) If you are using a DT/80 or DT/132 terminal then configure them as described in ATTACHMENT A. Ensure that DT/132 terminals have the RTS/CTS mode disabled.
- 4) Turn on the console terminal.
- 5) Turn on the system by inserting the key into the lock on the front of the system and then turn the key clockwise. Take the key out to avoid accidentally turning the system off.
- 6) After powering up the system the console should display the following:

```
C8002 V1.5 SELF TEST COMPLETED  
<
```

OR

Z8000 V1.2 SELF TEST COMPLETED
<

If the system was RESET by pressing the RESET button (the red button on the back of the machine), the system should respond as follows:

C8002 V1.5 SELF TEST COMPLETED
DUMPING MEMORY
<

OR

Z8000 V1.3 SELF TEST COMPLETED
DUMPING MEMORY
<

- 7) The "<" is a place marker for prompts or input lines. If no place marker appears or a diagnostic is displayed on the console, then you may have a hardware problem. Try resetting the machine again by pushing the RESET button on the back of the system. If this fails, check the terminal connection and if this fails then try powering the machine off and then back on. If the self test fails repeatedly, then have the machine serviced.
- 8) Ensure the Initialization Tape is "SAFE" and insert the Initialization Tape into the tape slot in the front of the machine. The tape will be labeled as follows:

INITIALIZATION TAPE
UNIX VER 3.0.3
C8002
05/02/83 S/N:-----
LICENSED USE ONLY

OR

INITIALIZATION TAPE
UNIX VER 3.0.3
C8002M
05/02/83 S/N:-----
LICENSED USE ONLY

OR

INITIALIZATION TAPE
UNIX VER 3.0.3
C8002A, C5002A, SUNDANCE 16
05/02/83 S/N:-----
LICENSED USE ONLY

- 9) When the "<" prompt from the self-test PROM (PROM monitor) appears type "T" (in upper or lower case) followed by "RETURN". The following message will be displayed:

Boot v3.3
:

If the tape does not load and you are using a DT/80 or DT/132, verify that you have established the correct terminal characteristics, see ATTACHMENT A. Then return to step 1).

- 10) The ":" is a prompt from the bootstrap which was loaded from track 0 of the tape. The bootstrap "knows" the names of several stand alone programs that are held on track 1 of the Initialization Tape. One of these is "recreate" which will run a series of stand alone programs from track 1 of the Initialization Tape, and copy the bootstrap and reserved area from track 2 of the tape to the reserved area of the inboard disk drive.
NOTE - The user must watch the screen output during the execution of the "recreate" function, to check that the return codes are always "(0)"; otherwise errors may go undetected. To initiate "recreate", type "recreate" followed by "RETURN". The following messages will be displayed:

Standalone recreate v3.2
do you really want to recreate the system?

- 11) Answer by typing "y" (upper or lower case) followed by "RETURN". This will recreate the reserved area and the Root File System, thus producing a bootable system, and then return to the bootstrap. A "n" in response to the above question will abort this operation and return to step 9). If the answer was "y" the following messages will be displayed.

```
(0) returned by exit
Boot v3.3
: format
Standalone format v3.2
Physical disk drive number: 0
Do you wish to recreate spare information? n
Do you really wish to format disk drive 0? y
formatting disk drive number 0
Alternate sector location: 1
Total alternate sectors are used: 0
```

```
(0) returned by exit
Boot v3.3
```

- 12) If the number of alternate sectors is not zero, then that number of sectors have been "spared". These sectors should be noted down and stored in the "Systems Administrator's Manual". The recreation process will continue automatically, displaying the following messages:

```
: mkfs
Standalone mkfs v3.3
file system size: 16000
file system: rp(1,0)
Drive type: 20corDrive type: 20s
isize = 5120
m/n = 3 100orm/n = 3 90
file system name:
volume name:
```

```
(0) returned by exit
Boot v3.3
```

- 13) The size of the Root File System is standard across all machines and disk sizes; however the "Drive type" will reflect that of your system, as shown below.

C8002- may be 10s, 20s or 40s. The s stands for "standard disk drives".

C8002M- may be 10c, 20c or 40c. The c stands for "controller disk drives".

C8002A- may be 10c, 20c or 40c. The c stands for "controller disk drives".

C5002A- may be 14c or 21c. The c stands for "controller disk drives". This also applies to the SUNDANCE 16.

The disk type may be prefixed by "F" (for fast). With C8002M/C8002A if the Z80 in the disk is running at 4 Mhz. With C8002 systems if the Z80 I/O controller is a 482 board.

The restoration process will proceed to set up the reserved area and will display the following messages:

```
: cpres
Standalone cpres v3.2
Do you really want to copy the reserved area: y

Blocks in 570.
Blocks out 570

(0) returned by exit
Boot v3.3
```

- 14) The automatic process will continue. The drive statistics are cleared. This process will display the following messages:

```
: clrstat
Standalone clrstat v3.2
Physical drive number: 0
Do you really want to clear the statistics on drive 0?

(0) returned by exit
Boot v3.3
```

- 15) The next program to be run will display information describing your hardware configuration. This information should be noted down and stored in the "Systems Administrator's Guide". It will be needed later when configuring the system.

The following messages will be displayed for a C8002M or a C8002:

```
: setup
Standalone Hardware Setup v3.3

Z8000 Board Type: REV3 C8002
Z8000 PROM Date Code: 06 29
Disk Number 0 Type: 20cor Disk Number 0 Type: 20s
Disk Operating at 4 MHz
z80 Board Number: 412or z80 Board Number: 246
Memory Size: 512 kb

(0) returned by exit
Boot v3.3
```

The following messages will be displayed for a C8002A, C5002A or SUNDANCE 16:

```
: setup
Standalone Hardware Setup v3.3

Board Type: Z8001
Disk Number 0 Type: 20cor Disk Number 0 Type: 21c
Disk Operating at 4 MHz
Z8000 PROM Date Code: 11 22 82
PROM Type: Z8000 V1.0
Memory Size: 512 kb

(0) returned by exit
Boot v3.3
```

16) For the C8002 and C8002M.

The Z8000 board type may be REV2 or REV3. Only the REV3 is supported, if yours is a REV2 the processor card will need to be replaced. The Z8000 PROM date code consists of the month and the day of the release of that PROM. The Z80 board number message indicates the type of I/O controller in the system. For a C8002 this should be only a type 246 or 482. For a C8002M this should only be a type 412.

For the C8002A, C5002A and SUNDANCE 16.

The Z8000 board type should be Z8001. The Z8000 PROM date code consists of the month, day and year of the release of that PROM. The PROM Type is the PROM release level, which is displayed on power up or reset.

The disk number message is output for each physical drive that the system will access. If there are fewer messages than you expect, then the missing drive or drives may have the wrong address. The number indicates the physical address; the value after the: may be as follows:

C8002.
10s, 20s or 40s to indicate a 10, 20 or 40 Mbyte standard disk drive.

C8002M.
10c, 20c or 40c to indicate a 10, 20 or 40 Mbyte controller disk drive.

C8002A
10c, 20c or 40c to indicate a 10, 20 or 40
Mbyte controller disk drive.

C5002A or SUNDANCE 16.
14c or 21c to indicate a 14 or 21 Mbyte 5-1/4
inch controller disk drive.

After each disk number message (for a controller
disk) there may be a message (disk operating at 4
MHz) which indicates the speed of the Z80 con-
troller in the disk drive. The memory size mes-
sage indicates the size of main memory.

The initialization process will continue, display-
ing the following messages:

```
: restor
Standalone restor v3.2
Change tape. Start restor from mt(0,0) ?
file system: rp(1,0) ?
```

- 17) At this point, remove the Initialization Tape,
ensure it is "SAFE", restore it to its case, and
store it in a safe place. Load the Root File Sys-
tem Tape into the Cartridge tape unit. The tape
will be labeled as follows:

```
ROOT FILE SYSTEM TAPE
UNIX          VER 3.0.3
C8002, C8002M
05/02/83      S/N:-----
*LICENSED USE ONLY*
```

OR

```
ROOT FILE SYSTEM TAPE
UNIX          VER 3.0.3
C8002A, C5002A, SUNDANCE 16
05/02/83      S/N:-----
*LICENSED USE ONLY*
```

- 18) To restore the Root File System on stand alone
logical disk 1, offset 0 blocks, press "RETURN".
If the Root File System is successfully restored
then the following messages will be displayed:

```
reading from mt(1,0)
reading from mt(2,0)
end of tape
```

```
(0) returned by exit
Boot v3.3
```

:

After the Root File System Tape rewinds, remove the Root File System Tape, ensure it is "SAFE", restore it to its case, and store it in a safe place, together with the Initialization Tape. If during the restore of the RFST, the system displays diagnostic messages of the form:

```
tape error: rc = 41
tape read error: inode 123
resynced at inode 124
```

Then a tape error has been encountered. The "inode" is a unique number associated with each file. If you saw one or more of these diagnostics, then wait for the tape to rewind and run "restor" again. This may be done by replacing the Initialization Tape in the drive and typing "restor" followed by "RETURN" in response to the ":" prompt from boot. This will take you back to step 16). The restore may work the second time. If it does not; then contact the ONYX Support Organization so that a new Root File System Tape may be dispatched or a service technician can check your tape drive.

19) A bootable system has been established at this stage. The next step is to format any outboard disk drives. If you have only one disk drive then proceed directly to step 27). In steps 20) to 26) N refers to the physical disk drive number. Steps 20) to 26) should be repeated for each non zero disk number reported by "setup". NOTE - during these steps, the return codes must be observed carefully. The programs "format" and "clrstat" should be run as follows:

20) In response to the ":" prompt from boot; type "rp(1,0)sa/format" followed by "RETURN". This will display the following messages:

```
Standalone format v3.2
Physical disk drive number:
```

21) Type "N" (e.g. 1) followed by "RETURN". This will display the following messages:

```
Do you wish to recreate the spare information?
```

22) Type "n" followed by "RETURN". This will display the following message (where N is the disk drive number specified in section 21)):

```
Do you really wish to format disk drive N?
```

- 23) Type "y" followed by "RETURN". This will display the following messages (where N is the disk drive number specified in section 21)):

```
formatting disk drive number N
Alternate sector location: 1
Total alternate sectors used: 0
```

```
(0) returned by exit
Boot v3.3
:
```

- 24) To clear the drive statistics, type "rp(1,0)sa/clrstat" followed by "RETURN". This process will display the following messages:

```
: clrstat
Standalone clrstat v3.2
Physical drive number:
```

- 25) Type "N" (e.g. 1) followed by "RETURN". This will display the following messages (where N is the disk drive number specified in section 21)):

```
Do you really want to clear the statistics on drive N?
```

- 26) Type "y" followed by "RETURN". This will display the following messages:

```
(0) returned by exit
Boot v3.3
:
```

Repeat steps 20) through 26) for each remaining, non zero disk drive. Then proceed to step 27).

- 27) The file systems will be initialized by running mkfs when the system is booted. So, follow the instructions for booting the system, up to the stage where you receive the "Single User!" prompt (see "Loading UNIX into Memory").

NOTE: the default "erase" and "kill" characters are "#" and "@" respectively. Hence the "BACKSPACE" key is just another character. If you use "BACKSPACE" in typing in a command; then the error message will look as if you typed in the correct message. You may be advised to use stty to set your "erase" character to

"BACKSPACE".

Input today's date by typing "date mddhhmmyy" followed by "RETURN".

NOTE: this is a different format to UNIX V7.

Then perform the following instructions.

- 28) Type "/etc/fsck /dev/rpl" followed by "RETURN". This will check that the root file system has been installed correctly. The following messages will be displayed:

```
/dev/rpl
File System:      Volume:

** Phase 1 - Check Blocks and sizes
** Phase 2 - Check Pathnames
** Phase 3 - Check Connectivity
** Phase 4 - Check Reference Counts
** Phase 5 - Check Free List
622 files 9122 blocks 6236 free
```

- 29) To create and initialize the necessary file systems for your system, you should run makefs on each disk drive reported by "setup" in section 15). This is done by typing "makefs XY XY XY XY" followed by "RETURN", where X is the drive type identified by "setup" and Y is the drive number identified by "setup". In the case where Y is "1" (for 8 inch disks) or "2" (for 5-1/4 inch disks); the drive will be partitioned with a number of file systems. An alternative is provided where Y may be specified as "1a" (or "2a"); this will configure drive 1 (or 2) as one file system. An additional option is provided 0b or 1b (see disk configurations). If there are less than four drives, omit the extra parameters.

An example of configuring a C8002 system with two 20s drives and one 40s drive is as follows:

```
makefs 20s0 20sla 40s2
```

An example of configuring a C8002M or C8002A system with two 20c drives and one 40c drive is as follows:

```
makefs 20c0 20cla 40c2
```

An example of configuring a C5002A or SUNDANCE 16 system with two 21c drives and one 14c drive is as follows:

```
makefs 21c0 21c2a 14c4
```

For each mountable file system that is created, a directory will be created and where necessary the devices in /dev. Two files will be created (/etc/mountable and /etc/unmountable); these contain the necessary mount/umount commands for the directories and file systems that have been created. These files will be executed by your /etc/rc file. Additionally the file (/etc/checklist) will be set up for "fsck".

30) Now run fsck on all the file systems. First type in "sync;sync" followed by "RETURN" to insure that the disk is updated in single user mode. Next type in "/etc/fsck" followed by "RETURN". This will check that all the file systems have been established correctly.

31) To bring the system up multi user type "init 2" followed by "RETURN". This will display the following messages:

```
#Multi-User. State 2  
onix rel 3.0.3 10  
cron started  
openup started  
lpd started  
update started
```

login:

32) Type "root" followed by "RETURN". The root account (as supplied) has no password; put one on before going much further. If you are not on Pacific time, change the global TZ in /etc/inittab and /etc/rc to reflect your time zone. (See ctime(3) for an explanation of the format).

33) The manual pages require approximately 2.6 Mbytes of disk space (1.7 Mbytes for /usr/man/docs and 0.9 Mbytes for man pages) and there is not really enough room for all the manual pages in the Root File System. Hence they are provided on a separate tape. There are three options:

a) Do not load the manual pages onto the disk.

- b) Bring in a subset of the manual to the Root File System under /usr/man. A suggested subset is "man/man1" or "man/man1, man/man2 man/man3 man/man4 man/man5 man/man7 man/man8".
- c) Mount a file system on /usr/man and use tar, to bring in the contents of the tape onto that file system (this may require modifying the disk map to avoid wasting too much disk space).
- d) To tar in all the manual pages login as root and type "cd /usr;tar x0" followed by "RETURN". If you receive the prompt "next tape #:" type "1" followed by "RETURN". This prompt occurs after the message "last file incomplete".

Loading UNIX into Memory

For all ONYX computer systems, turning the system on is equivalent to pressing the "reset" button, except that memory is not dumped to disk. If the system is reset, then the message

DUMPING MEMORY

is output after the identification of the self test PROM..

- 1) Press the "reset" button (this is the red button located on the back of the system). The system will test itself to make sure it is working. When it successfully completes the self test (this will take less than a minute), the console will display a message of the form:

```
C8002 V1.5 SELF TEST COMPLETED  
<
```

OR

```
Z8000 V1.2 SELF TEST COMPLETED  
<
```

If you are using a DT/80 or DT/132 and nothing appears on the screen, verify you have established the correct terminal characteristics (see ATTACHMENT A).

The "less than" symbol "<" indicates that the PROM is ready to accept information from the keyboard.

- 2) Press the "RETURN" key. This will load the bootstrap, the following message will be displayed:

```
Boot v3.3
:
```

The ":" is a prompt from the bootstrap. Pressing "RETURN" causes the bootstrap to search for the file /onix.

- 3) Press the "RETURN" key. This will load UNIX and initialize it. The following messages appear on the screen.

```
:rp(1,0) onix

UNIX/3.0.3: onix10
real mem = 524288 bytes
avail mem = 413696 bytes
Single User!
#
```

The amount of memory displayed will depend up on the amount of memory installed in your system. If the "Single User!" message does not appear, a possible reason is that the carrier line (DTR) is not connected for the console.

- 4) To enter multi user mode, type "init 2" followed by "RETURN". This will display the following messages:

```
#Multi-User. State 2
onix rel 3.0.3 10
cron started
openup started
lpd started
update started

login:
```

- 5) When you login you will see the following messages displayed:

```
Welcome to UNIX System III on the ONYX C8002
NODE: rel, VERSION: onix10, RELEASE: 3.0.3 DATE: current date
#
```

There are two basic states: init 1 for single user and init 2 for multi user mode. You can determine the current state by typing "ps -fp 1" followed by "RETURN". This will display the status of the "INIT" process; the number after "INIT" is the current state. An additional state "init 3" is provided, which is identical to "init 2" except that the getty is disabled on the modem port (tty02 for the C8002/C8002M or tty03 for the C8002A/C5002A/SUNDANCE 16). This is to provide an example of how to utilize the modem port with cu or uucp. If you wish to enter state 3 from any state, type "init 3".

CONFIGURING PROCEDURE

- 1) Procedures for each application are given in each product's software release notice.
- 2) Some of the terminal characteristics do not affect its operation with UNIX and you may wish to change them, (see ATTACHMENT A for setting the terminal characteristics of a DT terminal).
- 3) Track 3 of the Initialization Tape was created by tar. It contains files to build a "memdump" tape. This "memdump" tape may be used to take a memory dump in the event of a system crash (e.g. a "panic"). The "memdump" tape may be created by tarring in track 3 e.g "tar x3o". Then a memdump tape may be made by "mkmemdmp C" for a C8002M system, "mkmemdmp S" for a C8002 system or "mkmemdmp A" for a C8002A/C5002A/SUNDANCE 16 system. The files that mkmemdmp needs are provided only for the same system type as the Initialization Tape. After making the "memdump" tape remove the files loaded down (two files and two subsidiary directories containing a number of files).

If the system crashes, press the "RESET" button. In response to the "<" prompt from the PROM, put the "memdump" tape in the cartridge tape drive (ensuring the tape is not SAFE) and type "t" followed by "RETURN". The following will be displayed:

```
Standalone Memory Dump V3.2
```

```
    Dumping the Disk  
    Dumping Memory
```

```
RESET THE SYSTEM
```

Press the "RESET" button and reboot the system. The tape may be sent to ONYX as evidence in a fault report, or the dump may be analyzed with crash. To analyze the dump, login as root and cd to a directory having sufficient room for a file the same size as the physical memory of your machine.

```
dd if=/dev/rmt1 of=dmp bs=2048  
crash dmp /onix
```

If kd29 was displayed as part of a "panic" message, then include that value (prefixed by a % sign) on the crash command line. If the Kernel

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was not /onix then substitute the correct name.

HANDLING PROBLEMS

DIAGNOSTICS

The ONYX computer system is a highly reliable system but occasionally a problem may occur. Each time the system is powered on or reset using the "RESET" button, a series of diagnostic tests exercise the system before allowing the operating system to be loaded. Should an error message occur during these tests, you should have your system serviced.

Additional diagnostics are supplied with the system. Copies of these programs may be loaded from the Initialization Tape or from the disk (if the loading procedure has been completed). See the System's Administrator Guide for details of these diagnostics.

MEMORY PARITY ERRORS

If a memory parity error occurs while running the operating system or an application program, press the "RESET" button to cause the memory test to be performed. If the test is successful, load the operating system into memory by pressing the "RETURN" key. When the system is up, run fsck to check the file system, and then rerun the program which was running when the error occurred. If the error persists, have the system serviced.

ONYX CONFIDENTIAL

ATTACHMENT A
SETTING THE DT TERMINAL CHARACTERISTICS

issue 1.2
May 9, 1983

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1. INTRODUCTION

The DT/80 and DT/132 have been configured at the factory for UNIX. No changes to the parameters are necessary. The following section need be consulted only if you want to alter any of the optional terminal characteristics which do not affect the operating system.

The parameters are set under user control via the "SET-UP" key, located at the upper left side of the keyboard, and under application program control via commands sent to it by the computer. Consult the Terminal Reference Manual for detailed explanations on all the terminal parameters and how to send commands to the terminal from an application program.

Some parameters do not affect the operating system; you may select either value depending on your preferred mode of operation. These parameters are shown with "(optional)" following the value. To alter these parameters you need to use the "SET-UP" mode, described in the following paragraphs.

2. PROCEDURE FOR THE DT/132

2.1. Overview

"SET-UP" mode is entered and exited using the "SET-UP" key.

The DT/132 has three setup modes - A, B, C. When the terminal is in a particular mode, the mode is identified by a message displayed at the top of the screen.

Each mode is entered in turn by using the "5" key.

The parameter values which may be set during a particular mode are displayed in sequence by using the "right arrow" key located at the top of the keyboard. This key moves the cursor right to the next parameter which is shown at the bottom of the screen. To backtrack use the "left arrow" key which moves the cursor left.

Each parameter is displayed together with a choice of values; the current value is underlined. To change the value use the "6" key. This will cause the alternate choice to be underlined, indicating the value has been changed. As soon as you have set the parameters in one mode, you may move to the next mode. You do not have to change any of the values if you don't need to.

Use the "SET-UP" key to enter set-up mode A; "SET-UP A" will be displayed on the screen.

2.2. Mode A

Tab settings may be altered in mode A. Their actual use would depend upon application software. Tab settings are altered with the "1" (set standard tabs 9, 17, 25,) key, the "2" (set or clear a tab) key, and the "3" (clear all tabs) key. Use the "5" key to enter mode B.

2.3. Mode B

"SET-UP B" will be displayed on the screen. Use the "right arrow" key to display the first parameter. The parameters of mode B are listed below; use the "right arrow" key to advance to each succeeding parameter.

PARAMETER	UNIX REQUIRED VALUE (optional)
Scroll Style	Jump
Auto Repeat	On (optional)
Screen Background	Dark (optional)
Cursor	Block (optional)
Margin Bell	Off (optional)
Key-clicks	Silent (optional)
ANSI/VT52	ANSI
Auto XON-XOFF	On
Shift and 3	# (optional)
Auto Wraparound	On
Newline	Off
Interlace	Off
Parity	Odd
Parity	Disable
Bits per Character	8
Screen Frequency	60/50 Hz as needed
Flags	0 (optional)

At any time during mode B the terminal transmit and receive speeds may be set using the "7" and "8" keys, respectively. Using either key causes the speed to advance to the next highest value. The current value of both parameters is displayed at the bottom of the screen (T SPEED for transmit and R SPEED for receive). Both should be set to 9600 baud.

Use the "5" key to exit mode B and enter mode C.

2.4. Mode C

"SET-UP C" is displayed on the screen. The parameters of mode C are shown below.

PARAMETER	UNIX REQUIRED VALUE (optional)
Smooth Scroll Speed	Normal (optional)
Scroll Key Style	VT100
Aux Numeric Keypad	Normal
Form feed	Line feed (optional)
Control Characters	Executed
Incoming XOFF	Disable
Cursor	Visible (optional)
Cursor	Blinking (optional)
Screen Data on 80-132	
Changes	Preserve (optional)
RH of DW lines	Preserve (optional)
Erase Page Extent	Within Margins (optional)
Tab Motion	Direct
CRT Saver	ON (optional)
Half/Full Duplex	Full Duplex
RTS-CTS Handshake	Disable
8th Bit on Transmit	Space
Stop Bits on Transmit	1

If, on a DT/132, you enter Mode D from Mode C using the "5" key, return to mode B and press "CTRL" + "X" (the "CTRL" key held down while pressing "X"). Mode D is not implemented for UNIX systems.

At any time during any of the set-up modes the brightness of the screen may be adjusted. The "up arrow" key is used to make screen characters brighter; the "down arrow" key is used to make them dimmer. At the maximum brightness half-intensity characters are indistinguishable from full-intensity characters. Thus the adjustment should be made so that applications which depend upon the contrast will function properly.

Ensure the "ON LINE" indicator is lit; the "4" key is used to toggle between "ON LINE" and "OFF LINE".

The changes you've made are temporary; the original values will be in effect the next time you turn power on. To save the changes you've made type "CTRL" + "S" (hold the "CTRL" key down while pressing the "S" key). A "WAIT" message will appear on the screen, then a "DONE" message. Now the parameters are stored in the terminal memory permanently. Be sure that the terminal is "ON LINE" before you perform the "SAVE" operation.

Use the "SET-UP" key to exit mode C and the set-up mode.

2.5. Comments

Setting the parameter "CRT Saver" to ON will cause the CRT screen display to go blank after a prolonged period of keyboard inactivity, thus extending the life of the screen. Typing any key will restore the screen display.

There are seven LED display lights on the keyboard, two of which indicate if the terminal is "ON LINE" or "OFF LINE". The terminal will not function in "OFF LINE" mode although characters typed on the keyboard will be displayed on the screen. The terminal is switched between "ON LINE" and "OFF LINE" by entering the "SET-UP" mode and using the "4" key. Once the terminal is "ON LINE", exit the "SET-UP" mode using the "SET-UP" key. After exiting "SET-UP" mode, if the "ON LINE" LED is still blinking instead of constant then the terminal is in "NO SCROLL" mode. This mode tells UNIX to stop sending data to the CRT. Press the "NO SCROLL" button (it toggles the terminal between the two modes) or the "CTRL" button plus the letter "q" This will cause the "ON LINE" LED to light continuously, indicating that UNIX has resumed sending data to the terminal. If the "KBD LOCKED" LED is lit, the keyboard will not transmit characters to the CPU. Pressing the "SET-UP" key twice will restore the keyboard to the "UNLOCKED" condition.

3. PROCEDURE FOR THE DT/80

3.1. Overview

"SET-UP" mode is entered and exited using the "SET-UP" key.

The parameter values which may be set are displayed in sequence by using the "right arrow" key located at the top of the keyboard. This key moves the cursor right to the next parameter which is shown at the bottom of the screen. To backtrack use the "left arrow" key which moves the cursor left.

Each parameter is displayed together with the current value which is shown at the lower left of the screen. To change the value use the "6" key. This will cause the alternate choice to be displayed, indicating the value has been changed.

Use the "SET-UP" key to enter setup mode.

3.2. Set-up Mode

PARAMETER	NAME	UNIX REQUIRED VALUE (optional)
Field A	Main Port Speed	9600
Field B	Aux Port Speed	Not supported
Field C		
Position		
1	Main/Aux Parity	Odd
2	RCVR Parity Check	Off
3	Video Attributes	Off (optional)
Field D		
Position		
1	Respond to XON/XOFF	No
2	Generate XON/XOFF	No
3	Duplex	Full
Field E		
Position		
1	Keyboard Auto Repeat	On (optional)
2	Key-click	Off (optional)
3	Shift and 3	# (optional)
4	ANSI Cursor Key	Off
Field F		
Position		
1	Cursor	Block (optional)
2	Cursor	Blinking (optional)
3	Scroll	Jump
4	Background	Dark (optional)
Field G		
Position		
1	Newline	Off
2	Autowrap	On
3	Mode	ANSI
4	Line Freq	60/50 Hz as needed

Ensure the "ON LINE" indicator is lit; the "4" key is used to toggle between "ON LINE" and "OFF LINE". The changes you've made are temporary; the original values will be in effect the next time you turn power on. To save the changes you've made type "CTRL" + "S" (hold the "CTRL" key down while pressing the "S" key). A "WAIT" message will appear on the screen, then a "DONE" message. Now the parameters are stored in the terminal memory permanently. Be sure that the terminal is "ON LINE" before you perform the "SAVE" operation.

Use the "SET-UP" key to exit the setup mode.

3.3. Comments

At any time the brightness of the screen may be adjusted using the "brightness knob" located on the back of the terminal. Turning the knob clockwise will raise the intensity of the screen images. Turning it counter clockwise will lower the intensity. At the maximum brightness half-intensity characters are indistinguishable from full-intensity characters. Thus the adjustment should be made so that applications which depend upon the contrast will function properly.

There are seven LED display lights on the keyboard, two of which indicate if the terminal is "ON LINE" or "OFF LINE". The terminal will not function in "OFF LINE" mode although characters typed on the keyboard will be displayed on the screen. The terminal is switched between "ON LINE" and "OFF LINE" by entering the "SET-UP" mode and using the "4" key. Once the terminal is "ON LINE", exit the "SET-UP" mode using the "SET-UP" key. After exiting "SET-UP" mode, if the "ON LINE" LED is still blinking instead of constant then the terminal is in "NO SCROLL" mode. This mode tells UNIX to stop sending data to the CRT. Press the "NO SCROLL" button (it toggles the terminal between the two modes) or the "CTRL" button plus the letter "q" This will cause the "ON LINE" LED to light continuously, indicating that UNIX has resumed sending data to the terminal. If the "KBD LOCKED" LED is lit, the keyboard will not transmit characters to the CPU. Pressing the "SET-UP" key, the "0" key and then the "SET-UP" key will restore the keyboard to the "UNLOCKED" condition.

ONYX CONFIDENTIAL

ATTACHMENT B
CONTENTS OF THE UNIX 3.0.3 ROOT FILE SYSTEM

issue 1.1
May 9, 1983

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1. INTRODUCTION

The following files are contained on the Root File System Tape. Where version numbers are specified, followed by a "+" symbol, this means that the program is comprised of multiple files, which are predominantly at that version number, but some of the files have a higher version number.

2. DIRECTORIES in /

DIRECTORY	DIRECTORY	DIRECTORY	DIRECTORY	DIRECTORY
bin	dev	etc	lib	lost+found
sa	tmp	user	usr	

2.1. FILES in /

| FILE NAME |
|-----------|-----------|-----------|-----------|-----------|
| .profile | onix | | | |

3. DEVICES in /dev

Device special files.

DEVICE	DEVICE	DEVICE	DEVICE	DEVICE	DEVICE
console	emt0	emt1	emt2	emt3	kmem
lp	mem	mt0	mt1	mt2	mt3
null	plp	pp	rmt0	rmt1	rmt2
rmt3	rp0	rpl	rp3	rp4	rp5
rp6	rp7	rrp0	rrpl	rrp3	rrp4
rrp5	rrp6	rrp7	rs422	slp	swap
tty	tty01	tty02	tty03	tty04	tty05
tty06	tty07	cua0	mt4	mt8	prx
rmt4	rmt8				

Note - On the C8002A, C5002A and SUNDANCE 16 the device tty02 does not exist since it is configured as the slp. Also rs422, tty05, 06 and 07 are absent because there are no corresponding ports.

4. PROGRAMS in /etc

Maintenance programs.

FILE NAME	VERSION	FILE NAME	VERSION	FILE NAME	VERSION
bcopy	1.1	config	1.7	crash	1.5
cron	1.2	devnm	1.1	fsck	1.2
fsdb	1.1	getty	1.1+	grpck	1.1
init	1.1	install	1.3	killall	1.2
labelit	1.1	link	1.1	login	1.2
makefs	1.7	makemfs	1.5	mkfs	1.3
mknod	1.2	mount	1.1	mmdir	1.2
ncheck	1.1	openup	1.1	renice	1.1
setmnt	1.2	shutdown	1.3	sysdef	1.2
sysfix	1.1	umount	1.1	unlink	1.1
update	1.2	wall	1.2	whodo	1.2

4.1. SYSTEM FILES in /etc

System data files.

FILE NAME	COMMENT
TZ	Preserves the system setting of TZ.
checklist	List of file systems processed by fsck.
cprofile	csh equivalent of profile. Source from .login.
ddate	Date of last dump.
group	List of groups.
inittab	Control information for init.
master	Master configuration file.
mnttab	Mounted file system table.
motd	Message of the day.
mountable	A list of mount commands executed by the rc file.
passwd	The password file.
profile	System profile, executed during login, prior to execution of the user's .profile.
rc	Rc file containing control information for init.
termcap	Terminal description file.
ttytype	Terminal ports description for tset.
unmountable	A list of umount commands executed by the rc file.
utmp	Data file of who is currently logged on.

5. PROGRAMS in /bin

Section 1 commands.

FILE NAME	VERSION	FILE NAME	VERSION	FILE NAME	VERSION
acctcom	1.2+	adb	1.1+	ar	1.1
as	1.1+	banner	1.1	basename	1.2
cat	1.1	cc	1.3	chgrp	1.1
chmod	1.1	chown	1.1	chroot	1.1
clri	1.1	cmp	1.1	cp	1.1
cpio	1.2	csd	1.1+	ct	1.1
cu	1.5	cut	1.1	date	1.1
dd	1.1	deroff	1.1	df	1.2
diff	1.1	dirname	1.2	du	1.1
dump	1.1	echo	1.1	ed	1.1
env	1.1	expr	1.1	file	1.2
find	1.1	fmt	1.1	getopt	1.1
grep	1.1	kill	1.1	ld	1.2
line	1.1	ln	1.1	lorder	1.2
ls	1.3	mail	1.1+	mail.s3	1.1?
make	1.1+	mesg	1.1	mkdir	1.1
mv	1.1			newgrp	1.1
nice	1.1	nm	1.3	nohup	1.1
od	1.1	passwd	1.1	paste	1.1
pcc	1.3	pr	1.1	prof	1.2
ps	1.3	pwck	1.1	pwd	1.1
red	1.1	restor	1.2	rm	1.1
rmail	1.1?	rmdir	1.1	rsh	1.1+
sed	1.1	sh	1.1+	size	1.2
sort	1.1	split	1.1	splp	1.1
strip	1.1	stty	1.3	su	1.1
sync	1.1	tail	1.1	tar	1.7
tee	1.1	touch	1.1	tset	1.2
tty	1.1	uname	1.1	wc	1.1
who	1.1	write	1.1		

6. FILES in /sa

Stand alone programs.

FILE NAME	VERSION	FILE NAME	VERSION	FILE NAME	VERSION
boot	3.3	checksec	3.2	clrstat	3.2
cpres	3.2	dd	3.2	diaginit	
diaginit.doc		format	3.2	getspare	3.2
getstat	3.2	mkfs	3.3	recreate	3.2
restor	3.2	secnvt	3.2	setup	3.3
spare	3.2	icheck	3.2	rcmfg	3.2
unixgetspare	1.4	unixgetstat	1.5		

7. FILES in /lib

| FILE NAME |
|-----------|-----------|-----------|-----------|-----------|
| c2 | c2a | cpp | crt0.o | libc.a |
| libm.a | mcrt0.o | | | |

8. DIRECTORIES in /usr

DIRECTORY	DIRECTORY	DIRECTORY	DIRECTORY	DIRECTORY
adm	bin	include	lib	mail
man	news	preserve	pub	spool
src	sys	tmp		

8.1. PROGRAMS in /usr/bin

More commands.

FILE NAME	VERSION	FILE NAME	VERSION	FILE NAME	VERSION
300	1.1	300S	1.1	300s	1.1
4014	1.1	450	1.1	apropos	1.1
at	1.1	awk	1.1	bc	1.1
bcat	1.2	bfs	1.1	bs	1.1
cal	1.1	calendar	1.3	cb	1.1
ccat	1.1	checkcw	1.1	checkeq	1.1
clear	1.1	col	1.1		
comm	1.1	compact	1.1	cref	1.1
crypt	1.1	csplit	1.1	ctags	1.1
cw	1.1	dc	1.2	diff3	1.2
diffmk	1.2	dircmp	1.3	dumpdir	1.2
edit	1.1	egrep	1.1	eqn	1.1
ex	1.1	expand	1.1	false	1.2
fgrep	1.1	graph	1.1	graphics	1.1
greek	1.2	head	1.2	help	1.1+
hp	1.1	hyphen	1.1	id	1.1
join	1.1	lex	1.1+	lint	1.2
logname	1.1	lpr	1.3	m4	1.1
makewhatis	1.2	man	1.2		
man.s3	1.1?	mancv	1.2	mkstr	1.1
mm	1.2	mmchek	1.1	mmt	1.2
more	1.3	mvt	1.2	neqn	1.1
news	1.1	nl	1.1	nroff	1.1+
osdd	1.2	pack	1.2	page	1.3
pcat	1.1	pf	1.1	ptx	1.1
reform	1.1	regcmp	1.1	sag	1.1
script	1.1	sdiff	1.1	sleep	1.1
sno	1.1	spell	1.2	spline	1.1
strings	1.1	sum	1.2	tabs	1.1
tbl	1.1	tc	1.1	tdisp	1.1
tension	1.2	tform	1.1	time	1.2
timex	1.2	tin	1.1	tout	1.1
tplot	1.2				
tr	1.1	troff	1.1+	true	1.2
tshow	1.1	tsort	1.1	ul	1.1
ulimit	1.2	uncompact	1.1	unexpand	1.1
uniq	1.1	units	1.1	unpack	1.1
uucp	1.2+	uulog	1.2	uname	1.1+
uupick	1.1	uustat	1.1+	uuto	1.1
uux	1.2+	vi	1.1	view	1.1
what	1.1+	whereis	1.2	xargs	1.1
xref	1.2	xstr	1.1	yacc	1.1

8.1.1. PROGRAMS in /usr/bin/graf

| FILE NAME |
|-----------|-----------|-----------|-----------|-----------|
| abs | af | bar | bel | bucket |
| ceil | cor | cusum | cvrtopt | dtoc |
| erase | exp | floor | gamma | gas |
| gd | ged | gtop | hardcopy | hilo |
| hist | hpd | label | list | log |
| lreg | mean | mod | pair | pd |
| pie | plot | point | power | prime |
| prod | ptog | qsort | quit | rand |
| rank | remcom | root | round | siline |
| sin | subset | td | tekset | title |
| total | ttoc | var | vtoc | whatis |
| yoo | | | | |

8.2. INCLUDE FILES in /usr/include

Include files for 'C' Compiler.

FILE NAME	FILE NAME	FILE NAME	FILE NAME	FILE NAME
a.out.h	alarm.h	ar.h	assert.h	core.h
ctype.h	curses.h	dbio.h	dumprestor.h	errno.h
error.h	execargs.h	fatal.h	fcntl.h	grp.h
macros.h	math.h	misc.h	mnttab.h	pwd.h
regexp.h	setjmp.h	sgtty.h	signal.h	stand.h
stdio.h	symbol.h	termio.h	time.h	tp_defs.h
ttycom.h	ustat.h	utmp.h	varargs.h	

8.2.1. INCLUDE FILES in /usr/include/sys

FILE NAME	FILE NAME	FILE NAME	FILE NAME	FILE NAME
acct.h	bps.h	buf.h	callo.h	cio.h
conf.h	ctc.h	dir.h	diskmap.h	elog.h
erec.h	err.h	fblk.h	file.h	filsys.h
fip.h	ino.h	inode.h	io.h	iobuf.h
ioctl.h	it.h	map.h	mount.h	param.h
plp.h	ports.h	proc.h	psl.h	reg.h
scc.h	seg.h	sio.h	sioassoc.h	smx.h
space.h	stat.h	sysdef.h	sysinfo.h	system.h
tape.h	terror.h	text.h	times.h	trap.h
tst.h	tstate.h	ttold.h	tty.h	types.h
user.h	utsname.h	var.h		

8.3. LIBRARY FILES in /usr/lib

FILE NAME	FILE NAME	FILE NAME	FILE NAME
Mail.help	Mail.help~	Mail.rc	atrunc
calprog	ccom	cronlog	crontab
diff3prog	diffh	eign	ex2.14preserve
ex2.14recover	ex2.14strings	getNAME	help/more.help
help/term	help/text	lex/ncform	lex/nrform
lib.b	lib300.a	lib300S.a	lib300s.a
lib4014.a	lib450.a	libPW.a	libcurses.a
libdbm.a	libl.a	libplot.a	libtermcap.a
libterm.lib.a	libvt0.a	liby.a	lint1
lint2	llib-1c	llib-1c.ln	llib-port
llib-port.ln	lpd	makekey	manprog
pplot	suftab	t300	t300S
t300s	t4014	t450	unittab
vplot	whatis	xrefa	xrefb
yaccpar			

8.3.1. LIBRARY FILES in /usr/lib/acct

More 'C' libraries, nroff files, etc.

| FILE NAME |
|-----------|-----------|-----------|-----------|-----------|
| acctcms | acctcon1 | acctcon2 | acctdisk | acctdusg |
| acctmerg | accton | acctprc1 | acctprc2 | acctwtmp |
| chargefee | ckpacct | dodisk | fwtmp | lastlogin |
| monacct | nulladm | prctmp | prdaily | prtacct |
| remove | runacct | sdisk | shutacct | startup |
| turnacct | wtmpfix | holtab | | |

8.3.2. LIBRARY FILES in /usr/lib/cref

| FILE NAME |
|-----------|-----------|-----------|-----------|-----------|
| aign | atab | cign | crpost | ctab |
| eign | etab | upost | | |

8.3.3. LIBRARY FILES in /usr/lib/font

| FILE NAME |
|-----------|-----------|-----------|-----------|-----------|
| ftB | ftBC | ftC | ftCE | ftCI |
| ftCK | ftCS | ftCW | ftFD | ftG |
| ftGI | ftGM | ftGR | ftH | ftHI |
| ftHM | ftI | ftL | ftLI | ftPA |
| ftPB | ftPI | ftR | ftS | ftSB |
| ftSI | ftSM | ftUD | ftXM | |

8.3.4. LIBRARY FILES in /usr/lib/macros

FILE NAME	FILE NAME	FILE NAME	FILE NAME
an	an6	cmp.n.d.an	cmp.n.d.m
cmp.n.t.an	cmp.n.t.m	cmp.t.d.an	cmp.t.d.m
cmp.t.t.an	cmp.t.t.m	mmn	mmt
osdd	ucmp.n.an	ucmp.n.m	ucmp.t.an
ucmp.t.m	vmca		

8.3.5. LIBRARY FILES in /usr/lib/sa

| FILE NAME |
|-----------|-----------|-----------|-----------|-----------|
| sal | sadc | sadd | sar | sarpt |

8.3.6. LIBRARY FILES in /usr/lib/spell

FILE NAME	FILE NAME	FILE NAME	FILE NAME
compress	hlista	hlistb	hstop
spellhist	spellin	spellout	spellprog

8.3.7. LIBRARY FILES in /usr/lib/term

FILE NAME	FILE NAME	FILE NAME	FILE NAME
tab2631	tab2631-c	tab2631-e	tab300
tab300-12	tab300S	tab300S-12	tab300s
tab300s-12	tab37	tab382	tab4000A
tab450	tab450-12	tab832	tabX
tabal	tablp	tabtn300	

8.3.8. LIBRARY FILES in /usr/lib/tmac

FILE NAME	FILE NAME	FILE NAME
tmac.an	tmac.an6	tmac.e
tmac.m	tmac.osd	tmac.s
tmac.scover	tmac.sdisp	tmac.skeep
tmac.srefs	tmac.v	

8.3.9. LIBRARY FILES in /usr/lib/uucp

FILE NAME	FILE NAME	FILE NAME
L-devices	L.sys	L_stat
L_sub	R_stat	R_sub
SEQF	USERFILE	uucico
uuclean	uudemon.wk	uusub
uuxqt	uuxqtcmds	.XQTDIR

8.3.10. INITIALIZATION FILES in /usr/lib/tabset

FILE NAME	FILE NAME	FILE NAME	FILE NAME
3101	beehive	diablo	std
stdcrt	teleray	tvi950	vt100
xerox1720			

8.3.11. HELP FILES in /usr/lib/graf/whatis

| FILE NAME |
|-----------|-----------|-----------|-----------|-----------|
| abs | af | bar | bel | bucket |
| ceil | cor | cusum | cvrtopt | dtoc |
| erase | exp | floor | gamma | gas |
| gd | ged | gtop | hardcopy | hilo |
| hist | hpd | label | list | log |
| lreg | mean | mod | pair | pd |
| pie | plot | point | power | prime |
| prod | ptog | qsort | quit | rand |
| rank | remcom | root | round | siline |
| sin | subset | td | tekset | title |
| total | ttoc | var | vtoc | whatis |
| yoo | | | | |

8.3.12. FILES in /usr/lib/graf/ttoc.d

FILE NAME	FILE NAME	FILE NAME	FILE NAME
ed.notoc	ed.toc	ed.ttoc.t	

8.4. FILES in /usr/spool

FILE NAME	FILE NAME	FILE NAME
at	at/lasttimedone	at/past
lpd	uucp	uucp/AUDIT
uucp/ERRLOG	uucp/LOGFILE	uucppublic
uucppublic/receive		

8.5. FILES in /usr/sys

Distributed sources for the Kernel.

FILE NAME	FILE NAME	FILE NAME	FILE NAME
cf/conf.c	cf/dfile	cf/linesw.c	cf/low.s
cf/makefile	cf/name.c	lib1	lib2
lib3	lib9	mch.o	userio/pio.c
userio/userio.mk			

8.6. DIRECTORIES in /usr/src

Distributed sources for commands.

8.6.1. FILES in /usr/src/getty

FILE NAME	FILE NAME	FILE NAME	FILE NAME
getty.o	gettytab.c	makefile	struct.h

8.6.2. FILES in /usr/src/uucico

FILE NAME	FILE NAME	FILE NAME
cu.o	dialout.c	dialout.h
makefile	uucico.o	uucp.h

8.6.3. FILES in /usr/src/pplot

FILE NAME	FILE NAME	FILE NAME
makefile	pplot.c	prxtab.c

8.7.. FILES in /usr/adm

FILE NAME	FILE NAME	FILE NAME	FILE NAME
.profile	pacct	sulog	wtmp

8.7.1. DIRECTORIES in /usr/adm

DIRECTORY	DIRECTORY	DIRECTORY
acct/fiscal	acct/nite	acct/sum

8.8. FILES in /usr/pub

FILE NAME	FILE NAME	FILE NAME	FILE NAME
ascii	eqnchar	greek	tabs

ONYX CONFIDENTIAL

ATTACHMENT C
DIFFERENCES BETWEEN UNIX SYSTEM-III and V7

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1. INTRODUCTION

There are the following differences between UNIX Version 7 and UNIX System III.

2. COMMANDS

2.1. Changed Commands

arcv: V7 - converts V6.0 archive format to V6.5 (or V7...)
3.0 - converts PDP11 archives to VAX format (not distributed).

at: V7 - used to run a command at a specified time without further "operator" assistance.
3.0 - removed.

bas: V7 - basic dialect (no particular standard).
3.0 - removed. Sort of replaced with the interpretive language bs.

cc: V7 - members of structures can be declared in multiple structures, if the type and offset are identical.
3.0 - each instance of a member declaration is unique and bound to the structure in which it is declared. All pointer references to structures must precisely define the structure either by type cast or in the pointer declaration.

check: V7 - DCHECK and ICHECK programs to check the file system consistency.
3.0 - FSCK program both checks and repairs file systems. DCHECK, ICHECK, and CHECK are not used.

date: V7 - optional year goes first; can give seconds.
3.0 - optional year goes last; can not give seconds. Some format control options added.

init: V7 - executed by the operating system when brought from single- to multi-user. V7 init uses the /etc/ttys file to open up terminals. (Reads the /etc/rc file first.)
3.0 - The init command is used to take system to/from single-/multi- user. It uses the file /etc/inittab for state change instructions (regarding terminal control) Init gets the remainder of its instructions for state changes from /etc/rc. See discussion of boot

the interpreter.

struct:

V7 - program to convert standard FORTRAN source to RATFOR source.
3.0 - removed.

stty:

3.0 - encompasses V7, but has many more options (related to ioctl). For compatibility 3.0 still knows about raw mode, and the system calls, "stty" and "gtty", still exist, but the command does not use them. Rumor has it that stty and gtty don't work and will not remain in the future anyway.

update:

V7 - updates the super block periodically (every 30 seconds).
3.0 - removed. Distributed by ONYX.

2.2. New Commands

accounting:

acct* - programs to summarize accounting information.

communications:

ct - dial a terminal.

uucp - several new monitoring programs (uname, ustat, usub). Also a public copy (uuto, uupick).

filesystem:

chroot - chg root directory.

cpio - yet another tape archive program. A "gift" from PWB.

devnm - get device name (as in labelit) from device.

dircmp - compare two directories.

install - program to install other programs. Used with make.

mkdir - move a tree structure from one place to another. Fast!

graphics:

Several hardware-specific graphics utilities come with 3.0. They have not been validated.

languages:

cref - cross reference program for 'C' or assembler.

efl - yet another FORTRAN preprocessor.

regcmp - regular expression compile.

sno - SNOBOL interpreter.

xref - cross reference program for 'C' programs.

rje:

remote job entry system.

SCCS:

source code control system.

maintenance:

fsdb - file system debugger for fixing things beyond fsck/hope. New error reporting subsystem (not available on Beta...). New system administrator helps - config, crash, uname, sysdef...

textprocessing:

bdiff - "big" diff program for large files, used by SCCS.

bfs - "big" file scanner; read-only editor.

csplit - context split program for text files.

cut - extract specified fields of lines of input.

mm - macros for nroff.

mmchek - check mm macro usage without bother of nroff.

nl - line number filter.

paste - merge files to form columnar
output (parallel.concatenate).

sdiff - side-by-side diff program.

3. SYSTEM CALLS

3.1. Changed System Calls

intro: The include file for the error number definitions changed from errno.h in V7 to error.h in 3.0.

alloc: 3.0 - malloc replaces alloc.

chown: V7 - Only super-user allowed to execute chown.
 3.0 - Either super-user or the owner of a file can execute chown.

dup2: V7 - dup2 was used to make two file descriptors point to the same file.
 3.0 - dup2 does not exist. The same effect can be achieved through the 'fcntl' system call.

ioctl: V7 - ioctl used to set the sgTTY structure.
 3.0 - ioctl used to set the termio structure. The size, function and format of this structure is changed substantially from the sgTTY structure of V7.
 ** This is probably the greatest area of incompatibility. **
 The system is able to interpret V7 style calls from a V7 binary, however, with the caveat that these binaries will not be able to control some of the extra ioctl capabilities.

mknod: V7 - used to create the special device files for the operating system.
 3.0 - added ability to create a fifo special file.

mpx: V7 - routines to manipulate multiplexed files.
 3.0 - removed.

nice: V7 - priorities range from -20 to 20.
 3.0 - priorities range from 0 to 39.

open:
V7 - open modes are 0, 1 and 2 for read, write and read/write.
3.0 - open modes are defined in the <fcntl.h> include file. Open can now do a non-blocking read on a device.

open:
V7 - when given a null string as the file name, open opens the current directory.
3.0 - a null string as an argument returns an error.

phys:
V7 - phys used to access physical memory.
3.0 - removed.

pkon/pkoff:
V7 - packet protocol system calls.
3.0 - removed.

ptrace:
V7 - request types 7 and 9 can pass an address value not equal to 1; This address is used as the restart address.
3.0 - request types 7 and 9 can have an address value of 1 only; The restart address must be in the user pc.

read:
3.0 - function changed somewhat to reflect the new open modes.

signal:
3.0 - 4 new signals have been added. Caution - note the warning that they may not remain. This affects the kill system call also.

tell:
V7 - used to return the current pointer location.
3.0 - removed; must use lseek to get pointer location.

time:
V7 - system call ftime returns a "timeb" structure which has timezone, etc.
3.0 - timezone is a global (extern) long which is maintained by the time system call; ftime has been removed.

utime:
V7 - utime call takes a 2nd argument of type time_t.
3.0 - utime's 2nd argument is a pointer to

a struct utimbuf.

write:

3.0 - function changed somewhat to reflect the new open modes.

3.2. New System Calls

chroot:

change root directory (this is NOT the same as chdir).

fcntl:

file control, supersedes dup.

getpid:

get process id.

getpgrp:

get process group id.

getppid:

get parent process id.

setpgrp:

set process group id.

ulimit:

get/set limits on user file/mem sizes. Default maximum file size is 1 Megabyte.

uname:

return UNIX system name (from Kernel).

ustat:

return file system statistics.

4. SUBROUTINES

4.1. Changed Subroutines

intro: In general, 3.0 has several subroutines that are not available on V7. See section III of the User Manual.

ctime: V7 - global function timezone used to return the name of the the time zone.
3.0 - uses the global TZ and the function tzset to change/return the timezone.

ctype: 3.0 has several added functions.

dbm: V7 - data base management functions.
3.0 - removed. Distributed by ONYX.

exp: V7 - log10 function returns a base 10 logarithm.
3.0 - removed.

floor: 3.0 - added fmod function.

hypot: V7 - function cabs returned euclidean distance from structure argument.
3.0 - removed.

open: Documentation change - V7 under fopen, 3.0 under open. V7 - open modes are read, write and append (at EOF).
3.0 - open modes are read, write, append (at EOF) read/write, also r+, w+ and a+.

printf: 3.0 - added some formatting parameters.

sin: Documentation change only - V7 found under sin and sinh, 3.0 under trig and sinh.

string:

V7 - functions index and rindex return pointer to char location in a string, null if char not there.

3.0 - index and rindex renamed to strchr and strrchr. A few other functions have been added.

4.2. New Subroutines

a64l,164a:

convert between long and base 64 ints.

bsearch:

binary search function.

ctermid:

return a name for a terminal for controlling process.

cuserid:

return login name of owner (process).

gamma:

log gamma function.

getopt:

return options from argv.

logname:

get login name from environment.

lsearch:

linear search function.

putpwent:

write password entry (opposite of getpwent).

regex:

regular expression functions.

ssignal:

software signals, used by the standard C library.

tmpfile:

create a temp file; file removed on program exit.

tmpnam:

return a unique name for a temp file.

5. GENERAL SYSTEM DIFFERENCES

a) Boot Procedures:

The 3.0 mechanism for going between single- and multi-user states is substantially different from V7. V7 had two states, single or multi. 3.0 has up to 9 states. The exact meaning of these states is defined by the combined information of /etc/inittab and /etc/rc. The init program performs the following actions:

- 1) It reads /etc/inittab and kills the processes that are indicated.
- 2) It then executes /etc/rc (which can find out what state the system was in, what state it is in, and how many times it has been there).
- 3) Finally, init starts up the terminal processes indicated by the inittab file.

The Manual pages on getty and init should be read before making any changes to /etc/rc and /etc/inittab. For most users it is sufficient to know that init state 1 is single-user mode (in which the system comes up initially) and init state 2 is multi-user. The process "INIT" shows up in the process table, so a "ps" can be done to determine what state the system is running in.

b) File System:

The super block of a 3.0 file system contains information that was not maintained by V7 (or PWB...or V6...). Because the 3.0 super block is a super set of the V7 super block, a V7 dump tape can be restored on a 3.0 system. Under 3.0 run MKFS first, RESTOR the tape, and then run LABELIT and FSCK on the new file system.

V7 tar and 3.0 tar programs are compatible and can be used for transporting files.

c) I/O:

It turns out that most previous UNIX systems treated an attempt to read past the end of a physical device as an error. This meant that multi-block reads had to be of the exact size of the device or the read would not be completed (hence the old recommendation that the bs value in a DD

command be some even divisor of the device size). Most 3.0 device drivers now treat the end of a device as EOF.

d) Terminal Control:

The tty handler of 3.0 has been changed from V7. As distributed the tty handler uses the modem control lines of the tty line. This means that if your terminal is unplugged or turned off, or if your "RESET" button drops carrier, System III will kill your child processes and log you out. If this is undesirable, there is a mode in which the modem control lines are ignored (see the "clocal" mode of the stty command).

e) Shell Interpreter:

Minor differences exist between the V7 shell and 3.0's. Some of the differences are:

- i) The PWB restricted shell (rsh) has been added.
- ii) The login command is no longer executable from the shell. You must use CONTROL and D to log out from the Bourne shell.
- iii) There is an added special command to test conditional expressions.
- iv) The default search path for super-user does NOT include the current directory. This is somewhat painful to remember, but provides better security.

6. GENERAL NOTES

In most cases a Version 7 object file will run on a 3.0 system. The functionality of some of the system calls, however, has changed between V7 and 3.0. This should be carefully evaluated to determine if recompilation - and possibly modification - is necessary.

e.g.

fcntl
ioctl - changed significantly.
ptrace