

COHERENT[®]

OPERATING SYSTEM

\ - MINIMUM SYSTEM
 / - OPTIONAL 'STD' SYSTEM
 ALL OTHERS AVAIL. WITH DEVELOPMENT OPTION

ERROR formatted printing to standard error. then exit	REWRITE rewind a stream	SETW input an integer from a stream	REWIND rewind a stream	AC account for login connect times	CHMOD change the protection modes of a file	DEROFF remove text formatting (moff, etc.) directives
EXIT terminate process gracefully	SETWD obtain name of the current working directory	SETW input an integer from a stream	RINDEX reverse search of a string for a particular character	ACCTON enable or disable process accounting	CHOWN change the user owner of a file	DF report the amount of available disk space
FCLOSE close stream	INDEX scan a string for a character	INDEX scan a string for a character	SCANF formatted read from the standard input	AR file archiver and object file library maintainer	CLRI clear an i-node on disk (file system maintainer)	DIFF summarize differences between two textual files
FDOPEN open a COHERENT file descriptor as a stream	ISATTY determine if a file descriptor is a terminal	ISATTY determine if a file descriptor is a terminal	SETBUF enable or disable buffering for a stream	AS assembler for the PDP-11, Z8002, or R0186	CMP compare the contents of two binary files	DIFF3 summarize differences among three textual files
FLUSH write out buffered data for a stream	LJTOI convert 3 byte file system block addresses to long integers	LJTOI convert 3 byte file system block addresses to long integers	SETJMP, LONGJMP save and restore local context	AT execute commands at a specified later time	COMM print common or uncommon parts of two files	DU print a summary of disk usage by directory
FOETS input string from a stream	LDEXP produce floating point number from exponent and mantissa	LDEXP produce floating point number from exponent and mantissa	SHELLSORT shell sort routine	AWK pattern scanning filter and language	CP copy files	DUMP incremental file system dump (back-up) facility
FOPEN open or create a file as a stream	LTOL3 convert long integers to 3-byte file system block addresses	LTOL3 convert long integers to 3-byte file system block addresses	SLEEP for specified interval stop execution	BANNER print text in large letters	CRON check daemon, schedule activity for the future	DUMPOIR list dump tape directory
FPRINTF formatted output to a stream	MALLOC dynamic memory allocator	MALLOC dynamic memory allocator	SPRINTF formatted copy to a string	BASENAME strip suffixes and prefixes from filenames	CRYPT encrypt or decrypt files	ECHO echo command arguments
FPUTS write a string to a stream	MKTEMP generate a unique temporary file name	MKTEMP generate a unique temporary file name	SSCANF formatted read from a string	BC arbitrary precision programmable desk calculator using infix notation	DATE print or set the current date and time	ED context-oriented text editor with regular expressions
FREAD read binary data from a stream	MODF return integral and fractional parts of a floating point number	MODF return integral and fractional parts of a floating point number	STRCAT concatenate two character strings	DC arbitrary precision programmable desk calculator using reverse polish notation	DB synthetic debugger for PDP-11, Z8002, or R0186	ENROLL establish password for encrypted mail
FREE free dynamically allocated memory	MONITOR enable profiling of a process	MONITOR enable profiling of a process	STRCMP lexically compare two character strings	DCHECK check consistency of file system hierarchy (file system maintenance)	FALSE do nothing unsuccessfully	FILE determine type of files
FREOPEN reopen existing stream as another stream	NLIST list symbol value from load module	NLIST list symbol value from load module	STRCPY copy two character strings	DD determine type of files		
FREXP separate floating point mantissa and fraction	PERIOR print error message about last failed system call	PERIOR print error message about last failed system call	STRLEN return the length of a character string			
FSCANF formatted input from a stream	PMMATCH string pattern matching as in the shell	PMMATCH string pattern matching as in the shell	STRNCAT string concatenation with specified length			
FSEEK reposition a stream	POPEN open a stream to or from another process	POPEN open a stream to or from another process	STRNCMP compare two fixed-length strings			
FTELL return current position in a stream	PRINTF formatted printing to standard output	PRINTF formatted printing to standard output	STRNCPY copy fixed-length string			
FWRITE write binary data to a stream	PUTC, PUTCCHAR write character to a stream	PUTC, PUTCCHAR write character to a stream	SWAB swap byte order of a block of memory			
GETC, GETCHAR input characters from a stream	PWORDS write a string to the standard output	PWORDS write a string to the standard output	SYSTEM exec file in COHERENT shell command line			
GETENV retrieve information from process environment	QSORT quick-sort routine	QSORT quick-sort routine	TTYSLOT return name of terminal associated with a file descriptor			
GETGROUPS obtain group file information	RAND random number generator	RAND random number generator	UNGETC put character back into the input buffer			
GETLOGIN get user name from appropriate file	REALLOC change size of an allocated block of memory	REALLOC change size of an allocated block of memory				
GETPASS read a password from terminal						
GETPW read lines from password file						
GETPWENT read entries from password file						

GETTY initialize terminal characteristics and start login process

GREP search for lines matching given pattern (regular expression)

HELP print course online documentation

ICHECK check file system consistency (file system maintenance)

INIT initialization process

KILL destroy a running process

LC list directory by file category in multiple columns

LD linkage editor (loader)

LEARN computer-aided instruction about COHERENT

LEX create a lexical analyzer from a specification

LN create a link to a file

LOAD, LOAD load or unload a loadable device driver routine

LOGIN log into the COHERENT system, verify access rights

LOOK look up words in dictionary, binary search of given file

LPR submit listings to line printer

LS list directory (many formats)

MAIL file, tronic personal message system

MAKE construct and maintain a program or software package

MAKEKEY make a key for encryption

MAN print a section of the online COHERENT manuals

MESQ permit or deny terminal messages from other users

MKDIR make directories

MKFS create and initialize a file system

MKNOD create a special file

MOUNT, UMOUNT mount or dismount file system

MSG send a brief message to another user

MV move or rename files and directories

M4 macro processor language

NCHECK generate file names from i-numbers (file system maintenance)

NEWGRP move to a new group

NICE run a command at a lower (or higher) scheduling priority

NM print entries in symbol table of an object file

NROFF text formatter

OD octal dump

PASSWD set or change login password

PR print a file with titles or multiple columns

PREP produce a list of words from a document

PROF display profiling data

PS print status of processes in the system

PWD print current working directory pathname

QUOT print summary of file system ownership by users

RANLIB construct a random access table for an archive library

RESTOR incremental file system restore

REV reverse the characters in a file

RM delete a file

RMDIR delete a directory

SA print summary of command accounting information

SCAT segmented concatenation of input stream editor

SED stream editor

SH command line interpreter

SIZE print sizes of object files

SLEEP delay running of a process for a given period

SORT sort and merge data files

SPELL find spelling errors in text files

SPLIT split a very large file into smaller pieces

STRIP remove symbol table and relocation information from an executable object file

STTY print or change terminal characteristics

SU login to another user temporarily

SUM produce checksum and number of blocks in a file

SWAP enable swapping of processes from memory to disk

SYNC update file system on disk with information from memory

TAIL output the last part of a file

TAR tape archiver

TEE pipe redirection

TEST evaluate conditional expressions involving files or strings

TIME time the execution of a command

TOUCH change modification time of a file

TP tape archiver

TR transliteration of input characters to output

TRUE do nothing, successfully

TSORT topological sort

TTY print terminal name

TYPO typographical error analysis

UNIO remove or count repetitions in a file

UNITS convert from one unit of measure to another

UPDATE periodic sync

WALL broadcast message

WAIT await completion of child processes

WC count words, lines, and characters in a file

WHO report who is logged into the system

WRITE carry on a conversation with another COHERENT user

XMAIL send or receive encrypted mail

YACC generate a parser from a LALR(1) grammar specification

The COHERENT system calls:

ACCESS return file access status

ACCT turn process accounting on or off

ALARM set up signal to occur at a given time

BRK, SBRK change memory allocation of a process

CHOIR change working directory

CHMOD change the mode (protection information) of a file

CHOWN change ownership of a file

CHROOT change root directory of a process

CLOSE close an open file

CHEAT create a file

DUP, DUP2 duplicate an existing file description

EXEC execute a load module file

EXIT exit from a process

FORK create a new process

FTIME, TIME get current date and time

GETEUID get effective group ID number

GETUID get effective user ID number

GETPID get the process ID number

GETUID get real user ID number

IOCTL device dependent input-output request

KILL kill a process

LINK create a link to a file

LOCK lock a process in memory

LSEEK reposition read or write pointer of a file

MKNOD create a directory or special file

MOUNT, UMOUNT mount or dismount a file system

NICE change process scheduling priority

OPEX open a file for reading or writing

PAUSE suspend execution unit (interrupt)

PIPE create a communications channel between two processes

PROFIL generate execution profile of a process

PTRACE control and trace the execution of child process

READ read data from a file

SETUID set group ID of process

SETUID set user ID of process

SIGNAL tell process to respond to or ignore signals

SLOAD, SLOAD load or unload a device driver

STATFS, STAT obtain attributes of a file

STIME set the current time and date

SYNC flush system I/O cache

TIMES get process execution times

UMASK initialize file creation mask

UNIQUE generate a unique identifying number

UNLINK remove entry for a directory

UTIME set file modification time

WAIT await termination of child processes

WRITE write data onto a file

The C library routines:

ABORT terminate process with memory dump for debugging purposes

ABS return integer absolute value

ATOF convert ASCII string to a floating point number

ATOI convert ASCII string to an integer

ATOL convert ASCII string to a long integer

CALLOC allocate and clear dynamic memory

CRYPT encryption routines using DES

CTIME time conversion routines

CTYPE mechanism for classifying characters

1. Device has wrong type, reported by Paul Higginbottom. /dev/rhd1 is a block device and should be a character device.
✓ User Fix: rm /dev/rhd1
 /etc/mknod /dev/rhd1 c 2 1
Solution: Fix hdproto file on boot/build floppy.
2. Device has wrong name, reported by Paul Higginbottom. /dev/rwd3 should be /dev/rhd3.
✓ User Fix: mv /dev/rwd3 /dev/rhd3
Solution: Fix hdproto file on boot/build floppy.
3. Text messages are wrong, reported by Paul Higginbottom. /etc/logmsg & /etc/motd contain references to Z8000HR, and have the wrong version number in them (0.7.1).
Solution: These references should be removed, and the release number corrected.
4. Microemacs documentation problem reported by Paul Higginbottom. Does not say that it is called "me" on the system.
5. No copyright message on the console at power-up, reported by Frank Hughes.
MWC verdict: tricky to fix since COHERENT doesn't know the nature of the console in this release.
6. /etc/mount deficiency reported by Paul Higginbottom. It should know if a diskette is write protected, and if it is, mount it read-only.
Fix: Will only be fixed when new floppy controller code from Matt Blais is installed in machine, and driver is updated.
7. Low-res console keyboard driver problem, reported by Paul Higginbottom. It generates a <nul> when CTRL-2 is pressed. This should only be generated if the shift is also pressed. CTRL-SPACE should generate a <nul> also, but at present it generates nothing.
8. Release notes omission reported by Paul Higginbottom. /etc/fdformat is not mentioned in the release notes.

9. Request made by Paul Higginbottom. "login" should check to see if user is on console device, and if so, automatically set their TERM variable to the appropriate value.

NOT A BUG - CAN BE IMPLEMENTED BY USER IN .profile

10. "ps" bug reported by Paul Higginbottom. It does not work for non-root users.

User fix: `chmod +s /bin/ps`

Solution: Fix hdproto file on boot/build diskette.

11. /etc/mount bug reported by Paul Higginbottom. It does not list mounted file systems for non-root users.

User fix: `chmod +s /etc/mount`

Solution: Fix hdproto file on boot/build diskette.

12. Syntax `$(VAR)` should be equivalent to the `$(VAR)` but is not supported, says Randall Howard.

MWC says: unable to verify this, but suspect it is a Berkeley extension.

Verdict: Assumed not to be a bug.

13. Randall Howard reported that "malloc" is declared in the header file "stdio.h". He goes on to say that "...users may want to redeclare it to be something other than the unsigned char * that MWC stdio declares it to be."

MWC says: First, none of our versions of stdio.h anywhere declare malloc to be unsigned. Secondly, malloc returns char *, so it should be declared that way, regardless of where it is declared. If one wants to use some other declaration, one must cast from this standard definition.

Verdict: Assumed not to be a problem. If it were that big a deal, I suspect Q-Office might have had problems being built on the C900.

Bugs

COHERENT release 0.7.3

- 14. The "type.h" header file does not contain the "to-ascii" macro. Reported by Randall Howard.
- 15. A program from Randall Howard gets "newline in macro argument" message.

MWC says: This is a strict error message and can be turned off with a compilation option.

Verdict: Cannot ascertain which option does this, but it's NOT a bug.

- 16. Randall Howard reported that "db" does not work.

Verdict: Untrue, non-specific, to be ignored.

- 17. "make" bug reported by Paul Higginbottom. The following makefile was supposed to make a file in the parent directory. The result of the make was a segmentation violation and core dump.

```
../csh: csh.c
cc csh.c -o ../csh
```

- 18. Async line driver problem reported by Frank Hughes. Processes associated with a terminal port are killed if the terminal is disconnected. This problem also means that the break key aborts microemacs because hitting break is effectively the same as disconnecting the terminal.

- 19. Problem with "as" reported by Nazim Kareemi. Long offsets are assembled as short ones. Example:

```
pushl (r14), L10002+4(r13)
```

- 20. Microemacs documentation omission reported by Paul Higginbottom. Does not mention terminal types for console systems - z19 for low-res, and vt100 for high-res.

21. Release notes problem reported by Paul Higginbottom. No numbers given for creating partitions other than root in the release notes. Example fix:

For the partitions other than root, use the following values:

For /dev/hd1 (/u) and /dev/hd2 (/v):

<u>MINISCRIBE 20Mb</u>	<u>ATASI 42Mb</u>
------------------------	-------------------

/dev/null 10336 1400	/dev/null 31008 4400
-------------------------	-------------------------

For /dev/hd3 (/tmp):

<u>MINISCRIBE 20Mb</u>	<u>ATASI 42Mb</u>
------------------------	-------------------

/dev/null 7000 1000	/dev/null 7000 1000
------------------------	------------------------

22. A linker problem reported by Nazim Kareemi. Appears to be caused because of the confusion of having "ld" and "nld" on the system, and the usage of the "-L" option. An example:

```
ld -X -L -o tx /lib/crts0.o /lib/dtoa.o xx.o yy.o
... /lib/libc.a
```

Results in segmentation violation when tx is executed.

23. C compiler pre-processor problem reported by Nazim Kareemi. It does not interpret ".." correctly when there are nested include files.

24. Nazim Kareemi claims that multiple compiles initiated from 2 shell scripts will cause a segmentation violation and core dumps.

Verdict: If the standard "hello.c" is compiled 10 times simultaneously with a shell script, the entire C900 system crashes.

E.g:

```
for i in `from 1 to 10`
do
cc hello.c -o hello$i &
done
```

25. Nazim Kareemi claims to get file system errors even after being "careful".

Verdict: Too unspecific, not verifiable.

26. Copying a large number of files from one system to another will result in the message:

```
inode(x, y) busy
```

MWC says: Not a bug.

Verdict: Need explanation as to why this is not a bug.

27. Problem with "nm" reported by Lee Erickson.

"When in my 'boot' directory, if I type 'nm rom' I get the error message:

```
Too many variables
```

"I looked at the code, and the message is output when a malloc call fails. In order to determine the address of labels in that module, I use db, which doesn't have any problem with that number of variables.

28. "cc" bug reported by George Breen.

Compile the following program with the command "cc -K test.c"

```
extern char s1[128];
```

```
test()
{
    if (s1) ;
}
```

The compiler blows up with the error message:

```
address error: op=176
operand 0: mode=8010 offs=0 off s1_
At 43: In cc2: fatal error: asngen
```

"cc" bug reported by George Breen.

This does not work. Never mind that the code is stupid, the compiler blows up.

```
unsigned int x;
main()
{
    if (--x < 0) ;
}
```

30. The "-p" option of the C compiler crashes the compiler; reported by Pete Bowman.

31. yacc and lex libraries missing. Reported by Lee Erickson.

The examples in the manual report files not found.

bugs

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32. "lpr" bug.

"lpr" works ONCE after booting the system, and thereafter gives the message "/dev.lp" busy.

33. Missing and misplaced header files.

The following files are missing from /usr/include:

```
param.h
machine.h
io.h
proc.h
n.out.h
```

The file uproc.h includes others mentioned above and therefore can't find them. It is also in the wrong place. It is in /usr/include/sys and the manual states that it should be in /usr/include.

34. C compiler does not check for sum total of data area to exceed 64K, discovered by Nazim Kareemi.

If the following is declared in a program:

```
int flags1[16383];
int flags2[16383];
int flags3[16383];
```

The compiler will produce code which "wraps" within a segment. Norm concedes that the compiler does checks for single objects wrapping, e.g:

```
int flags[33000];
```

But not for the total of all objects.

35. "cpp" bug reported by Bob Welland.

File a.c contains:

```
#if
```

Compile with:

```
cc a.c
```

Bombs out with core dump / segmentation violation.

Bugs

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36. "cpp" bug reported by Bob Welland.

File a.c contains:

```
#ifdef
```

Compile with:

```
cc a.c
```

Hangs after printing:

```
2:Illegal control line
```

There is no line 2 in the file - presumably it's looking for arguments in line 1 and doesn't detect EOF. The hang state isn't permanent. CTRL-C will return the command prompt.

37. "diff" bug reported by Bob Welland.

Hangs on huge files.

Verified by Paul Higginbottom by "cat"ing /usr/lib/units into a temporary file many times, and then "cat"ing that file twice into another and using "diff" to compare the two. The utility dies after much disk activity, but it is not fatal. Pressing CTRL-C will bring back the command prompt.

38. "cc" bug reported by Bob Welland. Casting long expressions to a char causes the code generator to blow up with screens of error messages.

Compile the following:

```
main()
{
    long l;
    char c;

    l = 5L;
    c = (char)(l * 4);
}
```

39. "cc" bug reported by Bob Welland.

Compile the following:

```
struct x y = {AB};
```

The compiler blows up after displaying some readable error messages with a segmentation violation and core dump.