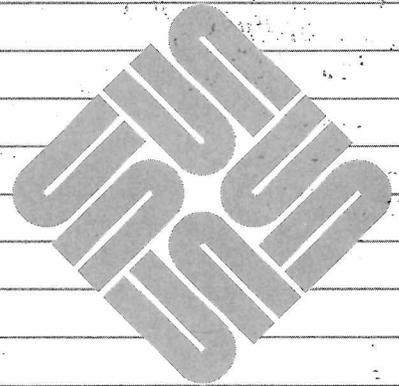




# SunOS Reference Manual



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**NAME**

intro – miscellaneous useful information pages

**DESCRIPTION**

This section contains miscellaneous documentation, mostly in the area of text processing macro packages for troff(1).

A 7V section number means one or more of the following:

- The man page documents System V behavior only.
- The man page documents default SunOS behavior, and System V behavior as it differs from the default behavior. These System V differences are presented under SYSTEM V section headers.
- The man page documents behavior compliant with *IEEE Std 1003.1-1988* (POSIX.1).

**LIST OF MISC. TABLES**

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hier	hier(7)	file system hierarchy
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me	me(7)	macros for formatting papers
ms	ms(7)	text formatting macros
posix	posix(7V)	overview of the IEEE Std 1003.1-1988 (POSIX.1) environment
SunOS	sunos(7)	overview of the SunOS Release 4.1 environment
svidii	svidii(7V)	overview of the System V environment
svidiii	svidiii(7V)	SVIDIII lint library
xopen	x/open(7V)	overview of the XPG Issue 2 (X/Open) environment

**NAME**

ansic – ANSI C (draft of December 7 1988) lint library

**SYNOPSIS**

```
/usr/5bin/lint -n -lansic ansic_src.c
```

**AVAILABILITY**

This environment is not available under SunOS Release 4.1. The environment that most closely approximates an ANSI C environment is the System V environment. The System V environment is available with the *System V* software installation option. Refer to *Installing SunOS 4.1* for information on how to install optional software.

**DESCRIPTION**

ANSI C is a proposed standard for the C language. SunOS Release 4.1 does not currently fully support ANSI C applications. It does support many of the functions described by the ANSI C draft. This man page does not imply that the functions supported by SunOS Release 4.1 and the functions described by the ANSI C draft perform identically. The ANSI C lint library is intended solely as a porting aid.

The ANSI C lint library consists exclusively of ANSI C functions. Users may lint their code with the `-n -lansic` options to catch all non-ANSI C features.

Certain functions defined in the ANSI C lint library are not available in the C library but are available. In particular, math functions are made available only when the `-lm` option is added to `cc(1V)` or `ld(1)` commands.

Other ANSI C functions not supported at all in SunOS Release 4.1 are `raise()`, `fgetpos()`, `fsetpos()`, `div()`, `ldiv()`, `strtoul()`, `strerror()`, and `difftime()`.

**FILES**

```
/usr/5lib/lint/lib-lansic*
```

ANSI C lint library

**SEE ALSO**

`lint(1V)`, `bsd(7)`, `posix(7V)`, `sunos(7)`, `svidii(7V)`, `svidiii(7V)`, `xopen(7V)`

**NAME**

ascii – map of ASCII character set

**SYNOPSIS**

cat /usr/pub/ascii

**DESCRIPTION**

/usr/pub/ascii is a map of the ASCII character set, to be printed as needed. It contains octal and hexadecimal values for each character. While not included in that file, a chart of decimal values is also shown here.

*Octal—Character*

```

1000 NUL|1001 SOH|1002 STX|1003 ETX|1004 EOT|1005 ENQ|1006 ACK|1007 BEL|
1010 BS |1011 HT |1012 NL |1013 VT |1014 NP |1015 CR |1016 SO |1017 SI |
1020 DLE|1021 DC1|1022 DC2|1023 DC3|1024 DC4|1025 NAK|1026 SYN|1027 ETB|
1030 CAN|1031 EM |1032 SUB|1033 ESC|1034 FS |1035 GS |1036 RS |1037 US |
1040 SP |1041 ! |1042 " |1043 # |1044 $ |1045 % |1046 & |1047 ' |
1050 ( |1051 ) |1052 * |1053 + |1054 , |1055 - |1056 . |1057 / |
1060 0 |1061 1 |1062 2 |1063 3 |1064 4 |1065 5 |1066 6 |1067 7 |
1070 8 |1071 9 |1072 : |1073 ; |1074 < |1075 = |1076 > |1077 ? |
1100 @ |1101 A |1102 B |1103 C |1104 D |1105 E |1106 F |1107 G |
1110 H |1111 I |1112 J |1113 K |1114 L |1115 M |1116 N |1117 O |
1120 P |1121 Q |1122 R |1123 S |1124 T |1125 U |1126 V |1127 W |
1130 X |1131 Y |1132 Z |1133 [ |1134 \ |1135 ] |1136 ^ |1137 _ |
1140 ` |1141 a |1142 b |1143 c |1144 d |1145 e |1146 f |1147 g |
1150 h |1151 i |1152 j |1153 k |1154 l |1155 m |1156 n |1157 o |
1160 p |1161 q |1162 r |1163 s |1164 t |1165 u |1166 v |1167 w |
1170 x |1171 y |1172 z |1173 { |1174 | |1175 } |1176 ~ |1177 DEL|

```

*Hexadecimal—Character*

```

| 00 NUL| 01 SOH| 02 STX| 03 ETX| 04 EOT| 05 ENQ| 06 ACK| 07 BEL| |
| 08 BS | 09 HT | 0A NL | 0B VT | 0C NP | 0D CR | 0E SO | 0F SI |
| 10 DLE| 11 DC1| 12 DC2| 13 DC3| 14 DC4| 15 NAK| 16 SYN| 17 ETB|
| 18 CAN| 19 EM | 1A SUB| 1B ESC| 1C FS | 1D GS | 1E RS | 1F US |
| 20 SP | 21 ! | 22 " | 23 # | 24 $ | 25 % | 26 & | 27 ' |
| 28 ( | 29 ) | 2A * | 2B + | 2C , | 2D - | 2E . | 2F / |
| 30 0 | 31 1 | 32 2 | 33 3 | 34 4 | 35 5 | 36 6 | 37 7 |
| 38 8 | 39 9 | 3A : | 3B ; | 3C < | 3D = | 3E > | 3F ? |
| 40 @ | 41 A | 42 B | 43 C | 44 D | 45 E | 46 F | 47 G |
| 48 H | 49 I | 4A J | 4B K | 4C L | 4D M | 4E N | 4F O |
| 50 P | 51 Q | 52 R | 53 S | 54 T | 55 U | 56 V | 57 W |
| 58 X | 59 Y | 5A Z | 5B [ | 5C \ | 5D ] | 5E ^ | 5F _ |
| 60 ` | 61 a | 62 b | 63 c | 64 d | 65 e | 66 f | 67 g |
| 68 h | 69 i | 6A j | 6B k | 6C l | 6D m | 6E n | 6F o |
| 70 p | 71 q | 72 r | 73 s | 74 t | 75 u | 76 v | 77 w |
| 78 x | 79 y | 7A z | 7B { | 7C | | 7D } | 7E ~ | 7F DEL|

```

*Decimal—Character*

0	NUL	1	SOH	2	STX	3	ETX	4	EOT	5	ENQ	6	ACK	7	BEL
8	BS	9	HT	10	NL	11	VT	12	NP	13	CR	14	SO	15	SI
16	DLE	17	DC1	18	DC2	19	DC3	20	DC4	21	NAK	22	SYN	23	ETB
24	CAN	25	EM	26	SUB	27	ESC	28	FS	29	GS	30	RS	31	US
32	SP	33	!	34	"	35	#	36	\$	37	%	38	&	39	'
40	(	41	)	42	*	43	+	44	,	45	-	46	.	47	/
48	0	49	1	50	2	51	3	52	4	53	5	54	6	55	7
56	8	57	9	58	:	59	;	60	<	61	=	62	>	63	?
64	@	65	A	66	B	67	C	68	D	69	E	70	F	71	G
72	H	73	I	74	J	75	K	76	L	77	M	78	N	79	O
80	P	81	Q	82	R	83	S	84	T	85	U	86	V	87	W
88	X	89	Y	90	Z	91	[	92	\	93	]	94	^	95	_
96	`	97	a	98	b	99	c	100	d	101	e	102	f	103	g
104	h	105	i	106	j	107	k	108	l	109	m	110	n	111	o
112	p	113	q	114	r	115	s	116	t	117	u	118	v	119	w
120	x	121	y	122	z	123	{	124		125	}	126	~	127	DEL

## FILES

[/usr/pub/ascii](#)

Online chart of octal and hexadecimal values for the ASCII character set.

**NAME**

`bsd` – overview of the Berkeley 4.3 environment

**SYNOPSIS**

`/usr/bin/lint -n -lbsd bsd_src.c`

**DESCRIPTION**

BSD 4.3 is a set of functions and headers. The SunOS Release 4.1 is a superset of BSD 4.3. It includes all of the functionality described in the BSD 4.3 documentation. See `sunos(7)` for an overview of SunOS functionality.

Note: there may be some cases where the coexistence of another environment overrides the BSD 4.3 semantics. In particular, when there has been a point of conflict between POSIX.1 and BSD 4.3, POSIX.1 has won (see `setsid(8V)` for such an example).

Many man pages are marked with a “V” after the section number, indicating some sort of System V conformance. BSD 4.3 functions are also documented on these man pages, as well as on man pages without the “V” section suffix.

By default, the user will get a superset of the BSD 4.3 environment. No path modifications should be necessary. The typical path is `set path = ( /usr/ucb/bin /usr/bin )`

**LINT**

As a portability aid, Sun is providing a lint library that consists exclusively of BSD 4.3 functions. Users may lint their code with the `-n -lbsd` options to catch all non-BSD 4.3 features.

BSD, as with most other environments, continues to evolve. The `-lbsd` lint library will always refer to the most recent BSD release supported by Sun. Some applications may wish to port to a particular release of BSD. They may safely use the more specific name of `-l4.3bsd` (currently the same as `-lbsd`). Lint libraries for BSD releases earlier than 4.3 are not currently available. 4.3 BSD is sufficiently close to 4.2 BSD that the 4.3 BSD lint library usually works.

**FILES**

<code>/usr/bin/*</code>	BSD 4.3 and SunOS specific executables
<code>/usr/ucb/*</code>	BSD 4.3 derived executables
<code>/usr/include/*</code>	BSD 4.3 and SunOS specific header files
<code>/usr/lib/*</code>	BSD 4.3 and SunOS specific library files
<code>/usr/lib/lint/lldlib-lbsd*</code>	BSD 4.3 lint library

**SEE ALSO**

`lint(1V)`, `ansic(7V)`, `posix(7V)`, `sunos(7)`, `svidii(7V)`, `svidiii(7V)`, `xopen(7V)`, `setsid(8V)`

## NAME

eqnchar – special character definitions for eqn

## SYNOPSIS

eqn /usr/pub/eqnchar [ *filename* ] | troff [ *options* ]

neqn /usr/pub/eqnchar [ *filename* ] | nroff [ *options* ]

## DESCRIPTION

eqnchar contains troff(1) and nroff(1) character definitions for constructing characters that are not available on the Graphic Systems typesetter. These definitions are primarily intended for use with eqn(1) and eqn(1). It contains definitions for the following characters

<i>ciplus</i>	⊕	//	//	<i>square</i>	□
<i>citimes</i>	⊗	<i>langle</i>	/	<i>circle</i>	○
<i>wig</i>	~	<i>rangle</i>	\	<i>blot</i>	◻
<i>-wig</i>	≈	<i>hbar</i>	ħ	<i>bullet</i>	•
<i>&gt;wig</i>	≧	<i>ppd</i>	⊥	<i>prop</i>	∞
<i>&lt;wig</i>	≦	<i>&lt;-&gt;</i>	↔	<i>empty</i>	∅
<i>=wig</i>	≡	<i>&lt;=&gt;</i>	↔	<i>member</i>	∈
<i>star</i>	*	<i>/&lt;</i>	⋈	<i>nomem</i>	∉
<i>bigstar</i>	*	<i>/&gt;</i>	⋈	<i>cup</i>	∪
<i>=dot</i>	∴	<i>ang</i>	∟	<i>cap</i>	∩
<i>orsign</i>	∨	<i>rang</i>	∟	<i>incl</i>	⊆
<i>andsign</i>	∧	<i>3dot</i>	⋮	<i>subset</i>	⊂
<i>=del</i>	≠	<i>thf</i>	∴	<i>supset</i>	⊃
<i>oppA</i>	∓	<i>quarter</i>	¼	<i>!subset</i>	⊄
<i>oppE</i>	≡	<i>3quarter</i>	¾	<i>!supset</i>	⊇
<i>angstrom</i>	Å	<i>degree</i>	°		

## FILES

/usr/pub/eqnchar

## SEE ALSO

eqn(1), nroff(1), troff(1)

**NAME**

filesystem – file system organization

**SYNOPSIS**

/  
/usr

**DESCRIPTION**

The SunOS file system tree is organized for easy administration. Distinct areas within the file system tree are provided for files that are private to one machine, files that can be shared by multiple machines of a common architecture, files that can be shared by all machines, and home directories. This organization allows the sharable files to be stored on one machine, while being accessed by many machines using a remote file access mechanism such as Sun's Network File System (NFS). Grouping together similar files makes the file system tree easier to upgrade and manage.

The file system tree consists of a root file system and a collection of mountable file systems. The **mount(8)** program attaches mountable file systems to the file system tree at mount points (directory entries) in the root file system, or other previously mounted file systems. Two file systems, / (the root) and /usr, must be mounted in order to have a fully functional system. The root file system is mounted automatically by the kernel at boot time; the /usr file system is mounted by the /etc/rc.boot script, which is run as part of the booting process.

The root file system contains files that are unique to each machine; it can not be shared among machines. The root file system contains the following directories:

- /dev** Character and block special files. Device files provide hooks into hardware devices or operating system facilities. The **MAKEDEV** command (see **makedev(8)**) builds device files in the /dev directory. Typically, device files are built to match the kernel and hardware configuration of the machine.
- /etc** Various configuration files and system administration databases that are machine specific. You can think of /etc as the "home directory" of a machine, defining its "identity." Executable programs are no longer kept in /etc.
- /home** Mount points for home directories. This directory may be arranged so that shared user files are placed under the directory /home/machine-name on machines serving as file servers. Machines may then be locally configured with mount points under /home for all of the file servers of interest, with the name of the mount point being the name of the file server.
- /mnt** A generic mount point. This is an empty directory available for temporarily mounting file systems on.
- /sbin** Executable programs that are needed in the boot process before /usr is mounted. /sbin contains *only* those programs that are needed in order to mount the /usr file system: **hostname(1)**, **ifconfig(8C)**, **init(8)**, **mount(8)**, and **sh(1)**. After /usr is mounted, the full complement of utilities are available.
- /tmp** Temporary files that are deleted at reboot time.
- /var** Files, such as log files, that are unique to a machine but that can grow to an arbitrary ("variable") size.
- /var/adm** System logging and accounting files.
- /var/preserve**  
Backup files for **vi(1)** and **ex(1)**.
- /var/spool** Subdirectories for files used in printer spooling, mail delivery, **cron(8)**, **at(1)**, etc.
- /var/tmp** Transitory files that are not deleted at reboot time.

Because it is desirable to keep the root file system small, larger file systems are often mounted on `/var` and `/tmp`.

The file system mounted on `/usr` contains architecture-dependent and architecture-independent shareable files. The subtree rooted at `/usr/share` contains architecture-independent shareable files; the rest of the `/usr` tree contains architecture-dependent files. By mounting a common remote file system, a group of machines with a common architecture may share a single `/usr` file system. A single `/usr/share` file system can be shared by machines of any architecture. A machine acting as a file server may export many different `/usr` file systems to support several different architectures and operating system releases. Clients usually mount `/usr` read-only to prevent their accidentally modifying any shared files. The `/usr` file system contains the following subdirectories:

<code>/usr/5bin</code>	System V executables.
<code>/usr/5include</code>	System V include files.
<code>/usr/5lib</code>	System V library files.
<code>/usr/bin</code>	Executable programs. The bulk of the system utilities are located here.
<code>/usr/dict</code>	Dictionary databases.
<code>/usr/etc</code>	Executable system administration programs.
<code>/usr/games</code>	Executable game programs and data.
<code>/usr/include</code>	Include files.
<code>/usr/lib</code>	Program libraries and various architecture-dependent databases.
<code>/usr/pub</code>	Various data files.
<code>/usr/ucb</code>	Executable programs descended from the Berkeley Software Distribution.
<code>/usr/share</code>	Subtree for architecture-independent shareable files.
<code>/usr/share/man</code>	Subdirectories for the on-line reference manual pages.
<code>/usr/share/lib</code>	Architecture-independent databases.

A machine with disks may export root file systems, swap files and `/usr` file systems to diskless or partially-disked machines, which mount these into the standard file system hierarchy. The standard directory tree for exporting these file systems is:

<code>/export</code>	The root of the exported file system tree.
<code>/export/exec/architecture-name</code>	The exported <code>/usr</code> file system supporting <i>architecture-name</i> for the current release.
<code>/export/exec/architecture-name.release-name</code>	The exported <code>/usr</code> file system supporting <i>architecture-name</i> for SunOS <i>release-name</i> .
<code>/export/share</code>	The exported common <code>/usr/share</code> directory tree.
<code>/export/root/hostname</code>	The exported root file system for <i>hostname</i> .
<code>/export/swap/hostname</code>	The exported swap file for <i>hostname</i> .
<code>/export/var/hostname</code>	The exported <code>/var</code> directory tree for <i>hostname</i> .
<code>/export/dump/hostname</code>	The exported dump file for <i>hostname</i> .
<code>/export/crash/hostname</code>	The exported crash dump directory for <i>hostname</i> .

**Changes from Previous Releases**

The file system layout described here is quite a bit different from the layout employed previous to release 4.0 of SunOS. For compatibility with earlier releases of SunOS, and other versions of the UNIX system, symbolic links are provided for various files and directories linking their previous names to their current locations. The symbolic links provided include:

<b>/bin</b> → <b>/usr/bin</b>	All programs previously located in <b>/bin</b> are now in <b>/usr/bin</b> .
<b>/lib</b> → <b>/usr/lib</b>	All files previously located in <b>/lib</b> are now in <b>/usr/lib</b> .
<b>/usr/adm</b> → <b>/var/adm</b>	The entire <b>/usr/adm</b> directory has been moved to <b>/var/adm</b> .
<b>/usr/spool</b> → <b>/var/spool</b>	The entire <b>/usr/spool</b> directory has been moved to <b>/var/spool</b> .
<b>/usr/tmp</b> → <b>/var/tmp</b>	The <b>/usr/tmp</b> directory has been moved to <b>/var/tmp</b> .
<b>/etc/termcap</b> → <b>/usr/share/lib/termcap</b>	
<b>/usr/5lib/terminfo</b> → <b>/usr/share/lib/terminfo</b>	
<b>/usr/lib/me</b> → <b>/usr/share/lib/me</b>	
<b>/usr/lib/ms</b> → <b>/usr/share/lib/ms</b>	
<b>/usr/lib/tmac</b> → <b>/usr/share/lib/tmac</b>	
<b>/usr/man</b> → <b>/usr/share/man</b>	

The following program binaries have been moved from **/etc** to **/usr/etc** with symbolic links to them left in **/etc**: **arp**, **clri**, **cron**, **chown**, **chroot**, **config**, **dkinfo**, **dmesg**, **dump**, **fastboot**, **fasthalt**, **fsck**, **halt**, **ifconfig**, **link**, **mkfs**, **mknod**, **mount**, **ncheck**, **newfs**, **pstat**, **rdump**, **reboot**, **renice**, **restore**, **rmt**, **rrestore**, **shutdown**, **umount**, **update**, **unlink**, and **vipw**.

In addition, some files and directories have been moved with no symbolic link left behind in the old location:

<i>Old Name</i>	<i>New Name</i>
<b>/etc/biod</b>	<b>/usr/etc/biod</b>
<b>/etc/fsirand</b>	<b>/usr/etc/fsirand</b>
<b>/etc/getty</b>	<b>/usr/etc/getty</b>
<b>/etc/in.rlogind</b>	<b>/usr/etc/in.rlogind</b>
<b>/etc/in.routed</b>	<b>/usr/etc/in.routed</b>
<b>/etc/in.rshd</b>	<b>/usr/etc/in.rshd</b>
<b>/etc/inetd</b>	<b>/usr/etc/inetd</b>
<b>/etc/init</b>	<b>/usr/etc/init</b>
<b>/etc/nfsd</b>	<b>/usr/etc/nfsd</b>
<b>/etc/portmap</b>	<b>/usr/etc/portmap</b>
<b>/etc/rpc.lockd</b>	<b>/usr/etc/rpc.lockd</b>
<b>/etc/rpc.statd</b>	<b>/usr/etc/rpc.statd</b>
<b>/etc/ypbind</b>	<b>/usr/etc/ypbind</b>
<b>/usr/lib/sendmail.cf</b>	<b>/etc/sendmail.cf</b>
<b>/usr/preserve</b>	<b>/var/preserve</b>
<b>/usr/lib/aliases</b>	<b>/etc/aliases</b>
<b>/stand</b>	<b>/usr/stand</b>
<b>/etc/yp</b>	<b>/var/yp</b>

Note: with this new file system organization, the approach to repairing a broken file system changes. One must mount `/usr` before doing an `fsck(8)`, for example. If the mount point for `/usr` has been destroyed, `/usr` can be mounted temporarily on `/mnt` or `/tmp`. If the root file system on a standalone system is so badly damaged that none of these mount points exist, or if `/sbin/mount` has been corrupted, the only way to repair it may be to re-install the root file system.

**SEE ALSO**

`at(1)`, `ex(1)`, `hostname(1)`, `sh(1)`, `vi(1)`, `intro(4)`, `nfs(4P)`, `hier(7)`, `fsck(8)`, `ifconfig(8C)`, `init(8)`, `make-dev(8)`, `mount(8)`, `rc(8)`

## NAME

hier – file system hierarchy

## DESCRIPTION

The following outline gives a quick tour through a typical SunOS file system hierarchy:

```

/      root directory of the file system
/dev/  devices (Section 4)
      MAKEDEV
          shell script to create special files
      MAKEDEV.local
          site specific part of MAKEDEV
      console main system console, console(4S)
      drum   paging device, drum(4)
      *mem   memory special files, mem(4S)
      null   null file or data sink, null(4)
      pty[p-z]*
          pseudo terminal controllers, pty(4)
      tty[ab] CPU serial ports, zs(4S)
      tty[0123][0-f]
          MTI serial ports mti(4S)
      tty[hijk][0-f]
          ALM-2 serial ports mcp(4S)
      tty[p-z]*
          pseudo terminals, pty(4)
      vme*   VME bus special files, mem(4S)
      win    window system special files, win(4S)
      xy*    disks, xy(4S)
      rxy*   raw disk interfaces, xy(4S)
      ...
/etc/  system-specific maintenance and data files
      dumpdates
          dump history, dump(8)
      exports table of file systems exportable with NFS, exports(5)
      fstab   file system configuration table, fstab(5)
      group   group file, group(5)
      hosts   host name to network address mapping file, hosts(5)
      hosts.equiv
          list of trusted systems, hosts.equiv(5)
      motd    message of the day, login(1)
      mtab    mounted file table, mtab(5)
      networks
          network name to network number mapping file, networks(5)
      passwd  password file, passwd(5)
      phones  private phone numbers for remote hosts, as described in phones(5)
      printcap
          table of printers and capabilities, printcap(5)
      protocols
          protocol name to protocol number mapping file, protocols(5)
      rc      shell program to bring the system up multiuser
      rc.boot startup file run at boot time
      rc.local site dependent portion of rc
      remote  names and description of remote hosts for tip(1C), remote(5)
      services
          network services definition file, services(5)

```

**ttytab** database of terminal information used by **getty(8)**  
 ...

**/export/** directory of exported files and file systems for clients, including swap files, root, and **/usr** file systems

**/home/** directory of mount points for remote-mounted home directories and shared file systems

**user** home (initial working) directory for *user*

**.profile** set environment for **sh(1)**, **environ(5V)**

**.project** what you are doing (used by **(finger(1))**)

**.cshrc** startup file for **cs(1)**

**.exrc** startup file for **ex(1)**

**.plan** what your short-term plans are (used by **finger(1)**)

**.rhosts** host equivalence file for **rlogin(1C)**

**.mailrc** startup file for **mail(1)**

**calendar** user's datebook for **calendar(1)**  
 ...

**/lost+found** directory for connecting detached files for **fsck(8)**

**/mnt/** mount point for file systems mounted temporarily

**/sbin/** executable programs needed to mount **/usr/**

**hostname**

**ifconfig**

**init**

**mount**

**sh**

**/tmp/** temporary files, usually on a fast device, see also **/var/tmp/**

**ctm\*** used by **cc(1V)**

**e\*** used by **ed(1)**  
 ...

**/var/** directory of files that tend to grow or vary in size

**adm/** administrative log files

**lastlog** record of recent logins, **utmp(5V)**

**lpacct** line printer accounting **lpr(1)**

**messages** system messages

**tracct** phototypesetter accounting, **troff(1)**

**utmp** table of currently logged in users, **utmp(5V)**

**vaacct, vpacct** varian and versatec accounting **vtroff(1)**, **pac(8)**

**wtmp** login history, **utmp(5V)**  
 ...

**preserve/** editor temporaries preserved here after crashes/hangups

**spool/** delayed execution files

**cron/** used by **cron(8)**

**lpd/** used by **lpr(1)**

**lock** present when line printer is active

**cf\*** copy of file to be printed, if necessary

**df\*** control file for print job

**tf\*** transient control file, while **lpr** is working

**mail/** mailboxes for **mail(1)**  
*name* mail file for user *name*  
*name.lock*  
lock file while *name* is receiving mail

**mqueue/**  
mail queue for **sendmail(8)**

**secretmail/**  
like **mail/**, but used by **xsend(1)**

**uucp/** work files and staging area for **uucp(1C)**  
**LOGFILE**  
summary log  
**LOG.\*** log file for one transaction

...

**tmp/** temporary files, to keep **/tmp/** small  
**raster** used by **plot(1G)**  
**stm\*** used by **sort(1V)**

...

**yp/** Network Information Service (NIS) database files, **ypfiles(5)**

**/usr/** general-purpose directory, usually a mounted file system

**bin/** utility programs  
**as** assembler, **as(1)**  
**cc** C compiler executive, c.f. **/usr/lib/ccom**, **/usr/lib/cpp**, **/usr/lib/c2**  
**cs** the C-shell, **cs(1)**  
**sh** the Bourne shell, **sh(1)**

...

**demo/** demonstration programs

**diag/** system tests and diagnostics

**dict/** word lists, etc.  
**spellhist**  
history file for **spell(1)**  
**words** principal word list, used by **look(1)**

...

**etc/** system administration programs; c.f. section 8  
**catman** update preformatted man pages, **catman(8)**  
**cron** the clock daemon, **cron(8)**  
**dump** file system backup program **dump(8)**  
**getty** part of **login(1)**, **getty(8)**  
**in.comsat**  
biff server (incoming mail daemon), **comsat(8C)**  
**init** the parent of all processes, **init(8)**  
**mount** **mount(8)**  
**yp/** NIS programs  
**ypinit** build and install NIS database, **ypinit(8)**  
**yppush** force propagation of a changed NIS map, **yppush(8)**  
**ypset** point **ypbind** at a particular server, **ypset(8)**

...

...

**games/**  
**backgammon**

```

lib/      library directory for game scores, etc.
quiz.k/   what quiz(6) knows
          africa  countries and capitals
          index   category index
          ...
          ...
hosts/    symbolic links to rsh(1C) for commonly accessed remote hosts
include/
  standard #include files
  a.out.h  object file layout, a.out(5)
  images/  icon images
  machine/ header files from /usr/share/sys/sys/machine; may be a symbolic link
  math.h   intro(3M)
  net/     header files from /usr/share/sys/sys/net; may be a symbolic link
  nfs/     header files used in the Network File System (NFS)
  stdio.h  standard I/O, intro(3)
  sys/     kernel header files, c.f. /usr/share/sys/sys
          ...
lib/      object libraries, compiler program binaries, and other data
ccom      C compiler proper
cpp       C preprocessor
c2        C code improver
eign      list of English words to be ignored by ptx(1)
font/     fonts for troff(1)
          ftR     Times Roman
          ftB     Times Bold
          ...
libc.a    system calls, standard I/O, etc. (2,3,3S)
libm.a    math library, intro(3M)
lint/     utility files for lint
          lint[12] subprocesses for lint(1V)
          llib-lc dummy declarations for /usr/lib/libc.a, used by lint(1V)
          llib-lm dummy declarations for /usr/lib/libm.a
          ...
units     conversion tables for units(1)
uucp/     programs and data for uucp(1C)
          L.sys   remote system names and numbers
          uucico  the real copy program
          ...
local/    locally maintained software
old/      obsolete and unsupported programs
pub/      publicly readable data files
sccs/     binaries of programs that compose the source code control system (SCCS)
src/      system source code tree
stand/    standalone programs (not run under the Sun Operating System)
share/    architecture independent files
          lib/     architecture independent data files
          termcap  description of terminal capabilities, termcap(5)

```

**tmac/** macros for **troff(1)**  
**tmac.an**  
           macros for **man(7)**  
**tmac.s** macros for **ms(7)**  
       ...  
**man/**    ...  
           on-line reference manual pages, **man(1)**  
**man?/**  source files (**nroff(1)**) for sections 1 through 8 of the manual  
           **as.1**  
       ...  
**cat?/**  preformatted pages for sections 1 through 8 of the manual  
       ...  
**sys/**    SunOS kernel source and object modules  
**ucb/**    binaries of programs developed at the University of California, Berkeley  
**ex**     line-oriented editor for experienced users, **ex(1)**  
**vi**     screen-oriented editor, **vi(1)**  
       ...  
**/vmunix**  
       the SunOS kernel binary

**SEE ALSO**

**filesystem(7)**, **find(1)**, **finger(1)**, **grep(1V)**, **ls(1V)**, **rlogin(1C)**, **whatis(1)**, **whereis(1)**, **which(1)**, **ncheck(8)**

**BUGS**

The locations of files are subject to change without notice; the organization of your file system may vary. This list is incomplete.

The Network Information Service (NIS) was formerly known as Sun Yellow Pages (YP). The functionality of the two remains the same; only the name has changed.

**NAME**

iso\_8859\_1 – map of character set

**SYNOPSIS**

cat /usr/share/lib/locale/LC\_CTYPE/iso\_8859\_1

**DESCRIPTION**

/usr/share/lib/locale/LC\_CTYPE/iso\_8859\_1 is a map of the ISO\_8859/1 character set, to be printed as needed.

This character set is available if `setlocale(3V)` is declared as:

```
setlocale(LC_CTYPE, iso_8859_1)
```

or:

```
setlocale(LC_ALL, iso_8859_1) see setlocale(3V) for more information about declaring categories and locales.
```

**ISO Latin 1 Character Set**

The following table displays the ISO 8859/1 character set.

ISO Latin 1				
Row/Col	Decimal	Octal		Name
02/00	032	040	SP	SPACE
02/01	033	041	!	EXCLAMATION POINT
02/02	034	042	"	QUOTATION MARK
02/03	035	043	#	NUMBER SIGN
02/04	036	044	\$	DOLLAR SIGN
02/05	037	045	%	PERCENT SIGN
02/06	038	046	&	AMPERSAND
02/07	039	047	'	APOSTROPHE
02/08	040	050	(	LEFT PARENTHESIS
02/09	041	051	)	RIGHT PARENTHESIS
02/10	042	052	*	ASTERISK
02/11	043	053	+	PLUS SIGN
02/12	044	054	,	COMMA
02/13	045	055	-	HYPHEN, MINUS SIGN
02/14	046	056	.	FULL STOP (U.S.: PERIOD, DECIMAL POINT)
02/15	047	057	/	SOLIDUS (U.S.: SLASH)
03/00	048	060	0	DIGIT ZERO
03/01	049	061	1	DIGIT ONE
03/02	050	062	2	DIGIT TWO
03/03	051	063	3	DIGIT THREE
03/04	052	064	4	DIGIT FOUR
03/05	053	065	5	DIGIT FIVE
03/06	054	066	6	DIGIT SIX
03/07	055	067	7	DIGIT SEVEN
03/08	056	070	8	DIGIT EIGHT
03/09	057	071	9	DIGIT NINE
03/10	058	072	:	COLON
03/11	059	073		
03/12	060	074	<	LESS-THAN SIGN
03/13	061	075	=	EQUALS SIGN
03/14	062	076	>	GREATER-THAN SIGN
03/15	063	077	?	QUESTION MARK

ISO Latin 1 (continued)				
Row/Col	Decimal	Octal		Name
04/00	064	100	@	COMMERCIAL AT
04/01	065	101	A	LATIN CAPITAL LETTER A
04/02	066	102	B	LATIN CAPITAL LETTER B
04/03	067	103	C	LATIN CAPITAL LETTER C
04/04	068	104	D	LATIN CAPITAL LETTER D
04/05	069	105	E	LATIN CAPITAL LETTER E
04/06	070	106	F	LATIN CAPITAL LETTER F
04/07	071	107	G	LATIN CAPITAL LETTER G
04/08	072	110	H	LATIN CAPITAL LETTER H
04/09	073	111	I	LATIN CAPITAL LETTER I
04/10	074	112	J	LATIN CAPITAL LETTER J
04/11	075	113	K	LATIN CAPITAL LETTER K
04/12	076	114	L	LATIN CAPITAL LETTER L
04/13	077	115	M	LATIN CAPITAL LETTER M
04/14	078	116	N	LATIN CAPITAL LETTER N
04/15	079	117	O	LATIN CAPITAL LETTER O
05/00	080	120	P	LATIN CAPITAL LETTER P
05/01	081	121	Q	LATIN CAPITAL LETTER Q
05/02	082	122	R	LATIN CAPITAL LETTER R
05/03	083	123	S	LATIN CAPITAL LETTER S
05/04	084	124	T	LATIN CAPITAL LETTER T
05/05	085	125	U	LATIN CAPITAL LETTER U
05/06	086	126	V	LATIN CAPITAL LETTER V
05/07	087	127	W	LATIN CAPITAL LETTER W
05/08	088	130	X	LATIN CAPITAL LETTER X
05/09	089	131	Y	LATIN CAPITAL LETTER Y
05/10	090	132	Z	LATIN CAPITAL LETTER Z
05/11	091	133	[	LEFT SQUARE BRACKET
05/12	092	134	\	REVERSE SOLIDUS (U.S.: BACK SLASH)
05/13	093	135	]	RIGHT SQUARE BRACKET
05/14	094	136	^	CIRCUMFLEX ACCENT
05/15	095	137	_	LOW LINE (U.S.: UNDERSCORE)
06/00	096	140	`	GRAVE ACCENT
06/01	097	141	a	LATIN SMALL LETTER a
06/02	098	142	b	LATIN SMALL LETTER b
06/03	099	143	c	LATIN SMALL LETTER c
06/04	100	144	d	LATIN SMALL LETTER d
06/05	101	145	e	LATIN SMALL LETTER e
06/06	102	146	f	LATIN SMALL LETTER f
06/07	103	147	g	LATIN SMALL LETTER g
06/08	104	150	h	LATIN SMALL LETTER h
06/09	105	151	i	LATIN SMALL LETTER i
06/10	106	152	j	LATIN SMALL LETTER j
06/11	107	153	k	LATIN SMALL LETTER k
06/12	108	154	l	LATIN SMALL LETTER l
06/13	109	155	m	LATIN SMALL LETTER m
06/14	110	156	n	LATIN SMALL LETTER n
06/15	111	157	o	LATIN SMALL LETTER o

ISO Latin 1 (continued)				
Row/Col	Decimal	Octal		Name
07/00	112	160	p	LATIN SMALL LETTER p
07/01	113	161	q	LATIN SMALL LETTER q
07/02	114	162	r	LATIN SMALL LETTER r
07/03	115	163	s	LATIN SMALL LETTER s
07/04	116	164	t	LATIN SMALL LETTER t
07/05	117	165	u	LATIN SMALL LETTER u
07/06	118	166	v	LATIN SMALL LETTER v
07/07	119	167	w	LATIN SMALL LETTER w
07/08	120	170	x	LATIN SMALL LETTER x
07/09	121	171	y	LATIN SMALL LETTER y
07/10	122	172	z	LATIN SMALL LETTER z
07/11	123	173	{	LEFT CURLY BRACKET
07/12	124	174		VERTICAL LINE
07/13	125	175	}	RIGHT CURLY BRACKET
07/14	126	176	~	TILDE
10/00	160	240		NO-BREAK SPACE
10/01	161	241		INVERTED EXCLAMATION MARK
10/02	162	242		CENT SIGN
10/03	163	243		POUND SIGN
10/04	164	244		CURRENCY SIGN
10/05	165	245		YEN SIGN
10/06	166	246		BROKEN BAR
10/07	167	247		PARAGRAPH SIGN, (U.S.: SECTION SIGN)
10/08	168	250		DIAERESIS
10/09	169	251		COPYRIGHT SIGN
10/10	170	252		FEMININE ORDINAL INDICATOR
10/11	171	253		LEFT ANGLE QUOTATION MARK
10/12	172	254		NOT SIGN
10/13	173	255		SHY SOFT HYPHEN
10/14	174	256		REGISTERED TRADEMARK SIGN
10/15	175	257		MACRON
11/00	176	260		RING ABOVE, DEGREE SIGN
11/01	177	261		PLUS-MINUS SIGN
11/02	178	262		SUPERSCRIP TWO
11/03	179	263		SUPERSCRIP THREE
11/04	180	264		ACUTE ACCENT
11/05	181	265		MICRO SIGN
11/06	182	266		PILCROW SIGN, (U.S.: PARAGRAPH)
11/07	183	267		MIDDLE DOT
11/08	184	270		CEDILLA
11/09	185	271		SUPERSCRIP ONE
11/10	186	272		MASCULINE ORDINAL INDICATOR
11/11	187	273		RIGHT ANGLE QUOTATION MARK
11/12	188	274		VULGAR FRACTION ONE QUARTER
11/13	189	275		VULGAR FRACTION ONE HALF
11/14	190	276		VULGAR FRACTION THREE QUARTERS
11/15	191	277		INVERTED QUESTION MARK

ISO Latin 1 (continued)			
Row/Col	Decimal	Octal	Name
12/00	192	300	LATIN CAPITAL LETTER A WITH GRAVE ACCENT
12/01	193	301	LATIN CAPITAL LETTER A WITH ACUTE ACCENT
12/02	194	302	LATIN CAPITAL LETTER A WITH CIRCUMFLEX ACCENT
12/03	195	303	LATIN CAPITAL LETTER A WITH TILDE
12/04	196	304	LATIN CAPITAL LETTER A WITH DIAERESIS
12/05	197	305	LATIN CAPITAL LETTER A WITH RING ABOVE
12/06	198	306	CAPITAL DIPHTHONG AE
12/07	199	307	LATIN CAPITAL LETTER C WITH CEDILLA
12/08	200	310	LATIN CAPITAL LETTER E WITH GRAVE ACCENT
12/09	201	311	LATIN CAPITAL LETTER E WITH ACUTE ACCENT
12/10	202	312	LATIN CAPITAL LETTER E WITH CIRCUMFLEX ACCENT
12/11	203	313	LATIN CAPITAL LETTER E WITH DIAERESIS
12/12	204	314	LATIN CAPITAL LETTER I WITH GRAVE ACCENT
12/13	205	315	LATIN CAPITAL LETTER I WITH ACUTE ACCENT
12/14	206	316	LATIN CAPITAL LETTER I WITH CIRCUMFLEX ACCENT
12/15	207	317	LATIN CAPITAL LETTER I WITH DIAERESIS
13/00	208	320	CAPITAL ICELANDIC LETTER ETH
13/01	209	321	LATIN CAPITAL LETTER N WITH TILDE
13/02	210	322	LATIN CAPITAL LETTER O WITH GRAVE ACCENT
13/03	211	323	LATIN CAPITAL LETTER O WITH ACUTE ACCENT
13/04	212	324	LATIN CAPITAL LETTER O WITH CIRCUMFLEX ACCENT
13/05	213	325	LATIN CAPITAL LETTER O WITH TILDE
13/06	214	326	LATIN CAPITAL LETTER O WITH DIAERESIS
13/07	215	327	MULTIPLICATION SIGN
13/08	216	330	LATIN CAPITAL LETTER O WITH OBLIQUE STROKE
13/09	217	331	LATIN CAPITAL LETTER U WITH GRAVE ACCENT
13/10	218	332	LATIN CAPITAL LETTER U WITH ACUTE ACCENT
13/11	219	333	LATIN CAPITAL LETTER U WITH CIRCUMFLEX
13/12	220	334	LATIN CAPITAL LETTER U WITH DIAERESIS
13/13	221	335	LATIN CAPITAL LETTER Y WITH ACUTE ACCENT
13/14	222	336	CAPITAL ICELANDIC LETTER THORN
13/15	223	337	SMALL GERMAN LETTER SHARP s
14/00	224	340	LATIN SMALL LETTER a WITH GRAVE ACCENT
14/01	225	341	LATIN SMALL LETTER a WITH ACUTE ACCENT
14/02	226	342	LATIN SMALL LETTER a WITH CIRCUMFLEX ACCENT
14/03	227	343	LATIN SMALL LETTER a WITH TILDE
14/04	228	344	LATIN SMALL LETTER a WITH DIAERESIS
14/05	229	345	LATIN SMALL LETTER a WITH RING ABOVE
14/06	230	346	SMALL DIPHTHONG ae
14/07	231	347	LATIN SMALL LETTER c WITH CEDILLA
14/08	232	350	LATIN SMALL LETTER e WITH GRAVE ACCENT
14/09	233	351	LATIN SMALL LETTER e WITH ACUTE ACCENT
14/10	234	352	LATIN SMALL LETTER e WITH CIRCUMFLEX ACCENT
14/11	235	353	LATIN SMALL LETTER e WITH DIAERESIS
14/12	236	354	LATIN SMALL LETTER i WITH GRAVE ACCENT
14/13	237	355	LATIN SMALL LETTER i WITH ACUTE ACCENT
14/14	238	356	LATIN SMALL LETTER i WITH CIRCUMFLEX ACCENT
14/15	239	357	LATIN SMALL LETTER i WITH DIAERESIS

ISO Latin 1 (continued)			
Row/Col	Decimal	Octal	Name
15/00	240	360	SMALL ICELANDIC LETTER ETH
15/01	241	361	LATIN SMALL LETTER n WITH TILDE
15/02	242	362	LATIN SMALL LETTER o WITH GRAVE ACCENT
15/03	243	363	LATIN SMALL LETTER o WITH ACUTE ACCENT
15/04	244	364	LATIN SMALL LETTER o WITH CIRCUMFLEX ACCENT
15/05	245	365	LATIN SMALL LETTER o WITH TILDE
15/06	246	366	LATIN SMALL LETTER o WITH DIAERESIS
15/07	247	367	DIVISION SIGN
15/08	248	370	LATIN SMALL LETTER o WITH OBLIQUE STROKE
15/09	249	371	LATIN SMALL LETTER u WITH GRAVE ACCENT
15/10	250	372	LATIN SMALL LETTER u WITH ACUTE ACCENT
15/11	251	373	LATIN SMALL LETTER u WITH CIRCUMFLEX ACCENT
15/12	252	374	LATIN SMALL LETTER u WITH DIAERESIS
15/13	253	375	LATIN SMALL LETTER y WITH ACUTE ACCENT
15/14	254	376	SMALL ICELANDIC LETTER THORN
15/15	255	377	LATIN SMALL LETTER y WITH DIAERESIS

SEE ALSO

**setlocale(3V)**

**NAME**

**man** – macros to format Reference Manual pages

**SYNOPSIS**

**nroff** –**man** *filename*...

**troff** –**man** *filename*...

**DESCRIPTION**

These macros are used to lay out the reference pages in this manual. Note: if *filename* contains format input for a preprocessor, the commands shown above must be piped through the appropriate preprocessor. This is handled automatically by **man(1)**. See **Conventions**.

Any text argument *t* may be zero to six words. Quotes may be used to include SPACE characters in a "word". If *text* is empty, the special treatment is applied to the next input line with text to be printed. In this way **.I** may be used to italicize a whole line, or **.SB** may be used to make small bold letters.

A prevailing indent distance is remembered between successive indented paragraphs, and is reset to default value upon reaching a non-indented paragraph. Default units for indents *i* are ens.

Type font and size are reset to default values before each paragraph, and after processing font and size setting macros.

These strings are predefined by **–man**:

**\\*R**     '®', '(Reg)' in **nroff**.

**\\*S**     Change to default type size.

**Requests**

<i>Request</i>	<i>Cause Break</i>	<i>If no Argument</i>	<i>Explanation</i>
<b>.B</b> <i>t</i>	no	<i>t</i> =n.t.l.*	Text is in bold font.
<b>.BI</b> <i>t</i>	no	<i>t</i> =n.t.l.	Join words, alternating bold and italic.
<b>.BR</b> <i>t</i>	no	<i>t</i> =n.t.l.	Join words, alternating bold and roman.
<b>.DT</b>	no	.5i li...	Restore default tabs.
<b>.HP</b> <i>i</i>	yes	<i>i</i> =p.i.*	Begin paragraph with hanging indent. Set prevailing indent to <i>i</i> .
<b>.I</b> <i>t</i>	no	<i>t</i> =n.t.l.	Text is italic.
<b>.IB</b> <i>t</i>	no	<i>t</i> =n.t.l.	Join words, alternating italic and bold.
<b>.IP</b> <i>x</i> <i>i</i>	yes	<i>x</i> =""	Same as <b>.TP</b> with tag <i>x</i> .
<b>.IR</b> <i>t</i>	no	<i>t</i> =n.t.l.	Join words, alternating italic and roman.
<b>.IX</b> <i>t</i>	no	-	Index macro, for Sun internal use.
<b>.LP</b>	yes	-	Begin left-aligned paragraph. Set prevailing indent to .5i.
<b>.PD</b> <i>d</i>	no	<i>d</i> = <i>.4v</i>	Set vertical distance between paragraphs.
<b>.PP</b>	yes	-	Same as <b>.LP</b> .
<b>.RE</b>	yes	-	End of relative indent. Restores prevailing indent.
<b>.RB</b> <i>t</i>	no	<i>t</i> =n.t.l.	Join words, alternating roman and bold.
<b>.RI</b> <i>t</i>	no	<i>t</i> =n.t.l.	Join words, alternating roman and italic.
<b>.RS</b> <i>i</i>	yes	<i>i</i> =p.i.	Start relative indent, increase indent by <i>i</i> . Sets prevailing indent to .5i for nested indents.
<b>.SB</b> <i>t</i>	no	-	Reduce size of text by 1 point, make text boldface.
<b>.SH</b> <i>t</i>	yes	-	Section Heading.
<b>.SM</b> <i>t</i>	no	<i>t</i> =n.t.l.	Reduce size of text by 1 point.
<b>.SS</b> <i>t</i>	yes	<i>t</i> =n.t.l.	Section Subheading.

<b>.TH</b> <i>n s d f m</i>	yes	-	Begin reference page <i>n</i> , of section <i>s</i> ; <i>d</i> is the date of the most recent change. If present, <i>f</i> is the left page footer; <i>m</i> is the main page (center) header. Sets prevailing indent and tabs to <i>.5i</i> .
<b>.TP</b> <i>i</i>	yes	<i>i=p.i.</i>	Begin indented paragraph, with the tag given on the next text line. Set prevailing indent to <i>i</i> .
<b>.TX</b> <i>t p</i>	no	-	Resolve the title abbreviation <i>t</i> ; join to punctuation mark (or text) <i>p</i> . * n.t.l. = next text line; p.i. = prevailing indent

### Conventions

When formatting a manual page, **man** examines the first line to determine whether it requires special processing. For example a first line consisting of:

```
\" t
```

indicates that the manual page must be run through the **tbl(1)** preprocessor.

A typical manual page for a SunOS command or function is laid out as follows:

#### **.TH** *TITLE* [1-8]

The name of the command or function in upper-case, which serves as the title of the manual page. This is followed by the number of the section in which it appears.

**.SH** *NAME* The name, or list of names, by which the command is called, followed by a dash and then a one-line summary of the action performed. All in roman font, this section contains no **troff(1)** commands or escapes, and no macro requests. It is used to generate the **whatis(1)** database.

#### **.SH** SYNOPSIS

##### Commands:

The syntax of the command and its arguments, as typed on the command line. When in boldface, a word must be typed exactly as printed. When in italics, a word can be replaced with an argument that you supply. References to bold or italicized items are not capitalized in other sections, even when they begin a sentence.

Syntactic symbols appear in roman face:

- [ ] An argument, when surrounded by brackets is optional.
- | Arguments separated by a vertical bar are exclusive. You can supply only one item from such a list.
- ... Arguments followed by an ellipsis can be repeated. When an ellipsis follows a bracketed set, the expression within the brackets can be repeated.

##### Functions:

If required, the data declaration, or **#include** directive, is shown first, followed by the function declaration. Otherwise, the function declaration is shown.

#### **.SH** DESCRIPTION

A narrative overview of the command or function's external behavior. This includes how it interacts with files or data, and how it handles the standard input, standard output and standard error. Internals and implementation details are normally omitted. This section attempts to provide a succinct overview in answer to the question, "what does it do?"

Literal text from the synopsis appears in boldface, as do literal filenames and references to items that appear elsewhere in the *SunOS Reference Manual*. Arguments are italicized.

If a command interprets either subcommands or an input grammar, its command interface or input grammar is normally described in a **USAGE** section, which follows the **OPTIONS** section. The **DESCRIPTION** section only describes the behavior of the command itself, not that of subcommands.

**.SH OPTIONS**

The list of options along with a description of how each affects the command's operation.

**.SH FILES**

A list of files associated with the command or function.

**.SH SEE ALSO**

A comma-separated list of related manual pages, followed by references to other published materials.

**.SH DIAGNOSTICS**

A list of diagnostic messages and an explanation of each.

**.SH BUGS**

A description of limitations, known defects, and possible problems associated with the command or function.

**FILES**

`/usr/share/lib/tmac/tmac.an`

**SEE ALSO**

`man(1)`, `nroff(1)`, `troff(1)`, `whatis(1)`

*Formatting Documents.*

## NAME

me – macros for formatting papers

## SYNOPSIS

**nroff** -me [ options ] file ...

**troff** -me [ options ] file ...

## DESCRIPTION

This package of **nroff** and **troff** macro definitions provides a canned formatting facility for technical papers in various formats. When producing 2-column output on a terminal, filter the output through *col(1)*.

The macro requests are defined below. Many **nroff** and **troff** requests are unsafe in conjunction with this package, however, these requests may be used with impunity after the first **.pp**:

.bp begin new page  
 .br break output line here  
 .sp n insert n spacing lines  
 .ls n (line spacing) n=1 single, n=2 double space  
 .na no alignment of right margin  
 .ce n center next n lines  
 .ul n underline next n lines  
 .sz +n add n to point size

Output of the **eqn**, **neqn**, **refer**, and **tbl(1)** preprocessors for equations and tables is acceptable as input.

## REQUESTS

In the following list, "initialization" refers to the first **.pp**, **.lp**, **.ip**, **.np**, **.sh**, or **.uh** macro. This list is incomplete.

Request	Initial Value	Cause	Explanation
.(c	-	yes	Begin centered block
.(d	-	no	Begin delayed text
.(f	-	no	Begin footnote
.(l	-	yes	Begin list
.(q	-	yes	Begin major quote
.(xx	-	no	Begin indexed item in index <i>x</i>
.(z	-	no	Begin floating keep
.)c	-	yes	End centered block
.)d	-	yes	End delayed text
.)f	-	yes	End footnote
.)l	-	yes	End list
.)q	-	yes	End major quote
.)x	-	yes	End index item
.)z	-	yes	End floating keep
;++ <i>m H</i>	-	no	Define paper section. <i>m</i> defines the part of the paper, and can be C (chapter), A (appendix), P (preliminary, for instance, abstract, table of contents, etc.), B (bibliography), RC (chapters renumbered from page one each chapter), or RA (appendix renumbered from page one).
+.c <i>T</i>	-	yes	Begin chapter (or appendix, etc., as set by <b>;++</b> ). <i>T</i> is the chapter title.
.1c	1	yes	One column format on a new page.
.2c	1	yes	Two column format.
.EN	-	yes	Space after equation produced by <b>eqn</b> or <b>meqn</b> .
.EQ <i>x y</i>	-	yes	Precede equation; break out and add space. Equation number is <i>y</i> . The optional argument <i>x</i> may be <i>I</i> to indent equation (default), <i>L</i> to left-adjust the equation, or <i>C</i> to center the equation.
.GE	-	yes	End <i>gremlin</i> picture.
.GS	-	yes	Begin <i>gremlin</i> picture.

.PE	-	yes	End <i>pic</i> picture.
.PS	-	yes	Begin <i>pic</i> picture.
.TE	-	yes	End table.
.TH	-	yes	End heading section of table.
.TS <i>x</i>	-	yes	Begin table; if <i>x</i> is <i>H</i> table has repeated heading.
.ac <i>A N</i>	-	no	Set up for ACM style output. <i>A</i> is the Author's name(s), <i>N</i> is the total number of pages. Must be given before the first initialization.
.b <i>x</i>	no	no	Print <i>x</i> in boldface; if no argument switch to boldface.
.ba + <i>n</i>	0	yes	Augments the base indent by <i>n</i> . This indent is used to set the indent on regular text (like paragraphs).
.bc	no	yes	Begin new column
.bi <i>x</i>	no	no	Print <i>x</i> in bold italics (nofill only)
.bu	-	yes	Begin bulleted paragraph
.bx <i>x</i>	no	no	Print <i>x</i> in a box (nofill only).
.ef 'x'y'z	****	no	Set even footer to <i>x y z</i>
.eh 'x'y'z	****	no	Set even header to <i>x y z</i>
.fo 'x'y'z	****	no	Set footer to <i>x y z</i>
.hx	-	no	Suppress headers and footers on next page.
.he 'x'y'z	****	no	Set header to <i>x y z</i>
.hl	-	yes	Draw a horizontal line
.i <i>x</i>	no	no	Italicize <i>x</i> ; if <i>x</i> missing, italic text follows.
.ip <i>x y</i>	no	yes	Start indented paragraph, with hanging tag <i>x</i> . Indentation is <i>y</i> ens (default 5).
.lp	yes	yes	Start left-blocked paragraph.
.lo	-	no	Read in a file of local macros of the form <i>.*x</i> . Must be given before initialization.
.np	1	yes	Start numbered paragraph.
.of 'x'y'z	****	no	Set odd footer to <i>x y z</i>
.oh 'x'y'z	****	no	Set odd header to <i>x y z</i>
.pd	-	yes	Print delayed text.
.pp	no	yes	Begin paragraph. First line indented.
.r	yes	no	Roman text follows.
.re	-	no	Reset tabs to default values.
.sc	no	no	Read in a file of special characters and diacritical marks. Must be given before initialization.
.sh <i>n x</i>	-	yes	Section head follows, font automatically bold. <i>n</i> is level of section, <i>x</i> is title of section.
.sk	no	no	Leave the next page blank. Only one page is remembered ahead.
.sm <i>x</i> -	no		Set <i>x</i> in a smaller pointsize.
.sz + <i>n</i>	10p	no	Augment the point size by <i>n</i> points.
.th	no	no	Produce the paper in thesis format. Must be given before initialization.
.tp	no	yes	Begin title page.
.u <i>x</i>	-	no	Underline argument (even in <i>troff</i> ). (Nofill only).
.uh	-	yes	Like <i>.sh</i> but unnumbered.
.xp <i>x</i>	-	no	Print index <i>x</i> .

## FILES

/usr/share/lib/tmac/tmac.e  
 /usr/share/lib/me/\*

## SEE ALSO

eqn(1), nroff(1), troff(1), refer(1), tbl(1)

*Formatting Documents*

## NAME

ms – text formatting macros

## SYNOPSIS

**nroff** –ms [ options ] filename ...

**troff** –ms [ options ] filename ...

## DESCRIPTION

This package of **nroff**(1) and **troff**(1) macro definitions provides a formatting facility for various styles of articles, theses, and books. When producing 2-column output on a terminal or lineprinter, or when reverse line motions are needed, filter the output through **col**(1V). All external –ms macros are defined below.

Note: this –ms macro package is an extended version written at Berkeley and is a superset of the standard –ms macro packages as supplied by Bell Labs. Some of the Bell Labs macros have been removed; for instance, it is assumed that the user has little interest in producing headers stating that the memo was generated at Whippany Labs.

Many **nroff** and **troff** requests are unsafe in conjunction with this package. However, the first four requests below may be used with impunity after initialization, and the last two may be used even before initialization:

<b>.bp</b>	begin new page
<b>.br</b>	break output line
<b>.sp n</b>	insert n spacing lines
<b>.ce n</b>	center next n lines
<b>.ls n</b>	line spacing: <i>n</i> =1 single, <i>n</i> =2 double space
<b>.na</b>	no alignment of right margin

Font and point size changes with **\f** and **\s** are also allowed; for example, **\fIword\fR** will italicize *word*. Output of the **tbl**(1), **eqn**(1) and **refer**(1) preprocessors for equations, tables, and references is acceptable as input.

## REQUESTS

Macro Name	Initial Value	Break? Reset?	Explanation
<b>.AB x</b>	–	y	begin abstract; if <i>x</i> =no do not label abstract
<b>.AE</b>	–	y	end abstract
<b>.AI</b>	–	y	author's institution
<b>.AM</b>	–	n	better accent mark definitions
<b>.AU</b>	–	y	author's name
<b>.B x</b>	–	n	embolden <i>x</i> ; if no <i>x</i> , switch to boldface
<b>.B1</b>	–	y	begin text to be enclosed in a box
<b>.B2</b>	–	y	end boxed text and print it
<b>.BT</b>	date	n	bottom title, printed at foot of page
<b>.BX x</b>	–	n	print word <i>x</i> in a box
<b>.CM</b>	if t	n	cut mark between pages
<b>.CT</b>	–	y,y	chapter title: page number moved to CF (TM only)
<b>.DA x</b>	if n	n	force date <i>x</i> at bottom of page; today if no <i>x</i>
<b>.DE</b>	–	y	end display (unfilled text) of any kind
<b>.DS x y</b>	I	y	begin display with keep; <i>x</i> =I, L, C, B; <i>y</i> =indent
<b>.ID y</b>	8n,.5i	y	indented display with no keep; <i>y</i> =indent
<b>.LD</b>	–	y	left display with no keep
<b>.CD</b>	–	y	centered display with no keep
<b>.BD</b>	–	y	block display; center entire block
<b>.EF x</b>	–	n	even page footer <i>x</i> (3 part as for <b>.tl</b> )
<b>.EH x</b>	–	n	even page header <i>x</i> (3 part as for <b>.tl</b> )
<b>.EN</b>	–	y	end displayed equation produced by <b>eqn</b>

<b>.EQ</b>	<i>x y</i>	–	y	break out equation; <i>x</i> =L,I,C; <i>y</i> =equation number
<b>.FE</b>		–	n	end footnote to be placed at bottom of page
<b>.FP</b>		–	n	numbered footnote paragraph; may be redefined
<b>.FS</b>	<i>x</i>	–	n	start footnote; <i>x</i> is optional footnote label
<b>.HD</b>	undef		n	optional page header below header margin
<b>.I</b>	<i>x</i>	–	n	italicize <i>x</i> ; if no <i>x</i> , switch to italics
<b>.IP</b>	<i>x y</i>	–	y,y	indented paragraph, with hanging tag <i>x</i> ; <i>y</i> =indent
<b>.IX</b>	<i>x y</i>	–	y	index words <i>x y</i> and so on (up to 5 levels)
<b>.KE</b>		–	n	end keep of any kind
<b>.KF</b>		–	n	begin floating keep; text fills remainder of page
<b>.KS</b>		–	y	begin keep; unit kept together on a single page
<b>.LG</b>		–	n	larger; increase point size by 2
<b>.LP</b>		–	y,y	left (block) paragraph.
<b>.MC</b>	<i>x</i>	–	y,y	multiple columns; <i>x</i> =column width
<b>.ND</b>	<i>x</i>	if t	n	no date in page footer; <i>x</i> is date on cover
<b>.NH</b>	<i>x y</i>	–	y,y	numbered header; <i>x</i> =level, <i>x</i> =0 resets, <i>x</i> =S sets to <i>y</i>
<b>.NL</b>	10p		n	set point size back to normal
<b>.OF</b>	<i>x</i>	–	n	odd page footer <i>x</i> (3 part as for .tl)
<b>.OH</b>	<i>x</i>	–	n	odd page header <i>x</i> (3 part as for .tl)
<b>.P1</b>		if TM	n	print header on first page
<b>.PP</b>		–	y,y	paragraph with first line indented
<b>.PT</b>	- -		n	page title, printed at head of page
<b>.PX</b>	<i>x</i>	–	y	print index (table of contents); <i>x</i> =no suppresses title
<b>.QP</b>		–	y,y	quote paragraph (indented and shorter)
<b>.R</b>	on		n	return to Roman font
<b>.RE</b>	5n		y,y	retreat: end level of relative indentation
<b>.RP</b>	<i>x</i>	–	n	released paper format; <i>x</i> =no stops title on first page
<b>.RS</b>	5n		y,y	right shift: start level of relative indentation
<b>.SH</b>		–	y,y	section header, in boldface
<b>.SM</b>		–	n	smaller; decrease point size by 2
<b>.TA</b>	8n,5n		n	set TAB characters to 8n 16n ... (nroff) 5n 10n ... (troff)
<b>.TC</b>	<i>x</i>	–	y	print table of contents at end; <i>x</i> =no suppresses title
<b>.TE</b>		–	y	end of table processed by tbl
<b>.TH</b>		–	y	end multi-page header of table
<b>.TL</b>		–	y	title in boldface and two points larger
<b>.TM</b>	off		n	UC Berkeley thesis mode
<b>.TS</b>	<i>x</i>	–	y,y	begin table; if <i>x</i> =H table has multi-page header
<b>.UL</b>	<i>x</i>	–	n	underline <i>x</i> , even in troff
<b>.UX</b>	<i>x</i>	–	n	UNIX; trademark message first time; <i>x</i> appended
<b>.XA</b>	<i>x y</i>	–	y	another index entry; <i>x</i> =page or no for none; <i>y</i> =indent
<b>.XE</b>		–	y	end index entry (or series of .IX entries)
<b>.XP</b>		–	y,y	paragraph with first line exdented, others indented
<b>.XS</b>	<i>x y</i>	–	y	begin index entry; <i>x</i> =page or no for none; <i>y</i> =indent
<b>.1C</b>	on		y,y	one column format, on a new page
<b>.2C</b>		–	y,y	begin two column format
<b>.]-</b>		–	n	beginning of refer reference
<b>.[0</b>		–	n	end of unclassifiable type of reference
<b>.[N</b>		–	n	N= 1:journal-article, 2:book, 3:book-article, 4:report

## REGISTERS

Formatting distances can be controlled in `–ms` by means of built-in number registers. For example, this sets the line length to 6.5 inches:

```
.nr LL 6.5i
```

Here is a table of number registers and their default values:

Name	Register Controls	Takes Effect	Default
PS	point size	paragraph	10
VS	vertical spacing	paragraph	12
LL	line length	paragraph	6i
LT	title length	next page	same as LL
FL	footnote length	next .FS	5.5i
PD	paragraph distance	paragraph	1v (if n), .3v (if t)
DD	display distance	displays	1v (if n), .5v (if t)
PI	paragraph indent	paragraph	5n
QI	quote indent	next .QP	5n
FI	footnote indent	next .FS	2n
PO	page offset	next page	0 (if n), ~1i (if t)
HM	header margin	next page	1i
FM	footer margin	next page	1i
FF	footnote format	next .FS	0 (1, 2, 3 available)

When resetting these values, make sure to specify the appropriate units. Setting the line length to 7, for example, will result in output with one character per line. Setting FF to 1 suppresses footnote superscripting; setting it to 2 also suppresses indentation of the first line; and setting it to 3 produces an .IP-like footnote paragraph.

Here is a list of string registers available in `-ms`; they may be used anywhere in the text:

Name	String's Function
\*Q	quote (" in <code>nroff</code> , " in <code>troff</code> )
\*U	unquote (" in <code>nroff</code> , " in <code>troff</code> )
\*-	dash (-- in <code>nroff</code> , — in <code>troff</code> )
\*(MO	month (month of the year)
\*(DY	day (current date)
\**	automatically numbered footnote
\*'	acute accent (before letter)
\*`	grave accent (before letter)
\*^	circumflex (before letter)
\*,	cedilla (before letter)
\*:	umlaut (before letter)
\*~	tilde (before letter)

When using the extended accent mark definitions available with `.AM`, these strings should come after, rather than before, the letter to be accented.

#### FILES

`/usr/share/lib/tmac/tmac.s`  
`/usr/share/lib/ms/ms.???`

#### SEE ALSO

`col(1V)`, `eqn(1)`, `nroff(1)`, `refer(1)`, `tbl(1)`, `troff(1)`

*Formatting Documents*

#### BUGS

Floating keeps and regular keeps are diverted to the same space, so they cannot be mixed together with predictable results.

**NAME**

`posix` – overview of the IEEE Std 1003.1-1988 (POSIX.1) environment

**SYNOPSIS**

`/usr/5bin/lint -n -lposix posix_src.c`

**AVAILABILITY**

This environment is available with the *System V* software installation option. Refer to *Installing SunOS 4.1* for information on how to install optional software.

**DESCRIPTION**

POSIX.1 is a set of functions and headers. The SunOS Release 4.1 implementation of POSIX.1 is a superset — it includes all of the functionality described in the IEEE standard as well as most of the SunOS functionality. See the `sunos(7)` man page for a description of SunOS functionality.

All man pages that are associated with POSIX.1 are marked by a “V” after the section number. Not all “V” pages, however, are POSIX.1. Some “V” pages may be part of other System V based environments such as X/Open.

If a user desires to work in a POSIX.1 (or System V) environment, the user should set the path variable to include `/usr/5bin` before anything else. The typical path is `PATH=/usr/5bin:/bin:/usr/bin:/usr/ucb`.

**LINT**

As a portability aid, Sun is providing a lint library that consists exclusively of POSIX.1 functions. Users may lint their code with the `-n -lposix` options to catch all non-POSIX.1 features.

POSIX.1 is primarily an operating system interface. POSIX.1 also specifies a subset of the functions defined by ANSI C. These are included in the `posix` lint library. Because of the additional functionality provided by ANSI C, Sun will also be providing an ANSI C (based on the December 7, 1988 draft) lint library. A portable application may want to lint with `-n -lposix -lansic` for the most complete coverage of functions.

POSIX.1 as with most other environments, continues to evolve. The `-lposix` lint library will always refer to the most recent standard supported by Sun. Some applications may wish to port to a particular version of the standard; they may safely use the more specific name of `-lposix1-88` (currently the same as `-lposix`).

Certain functions defined in the `posix` lint library are not available in the C library. In particular, math functions are made available only when the `-lm` option is added to `cc(1V)` or `ld(1)` commands.

**FILES**

<code>/usr/5bin/*</code>	POSIX.1 and System V specific executables
<code>/usr/5include/*</code>	POSIX.1 and System V specific headers
<code>/usr/5lib/*</code>	POSIX.1 and System V specific library files

**SEE ALSO**

`lint(1V)`, `ansic(7V)`, `bsd(7)`, `sunos(7)`, `svidii(7V)`, `svidiii(7V)`, `xopen(7V)`

*IEEE Std 1003.1-1988*

**NAME**

*sunos*, SunOS – overview of the SunOS Release 4.1 environment

**SYNOPSIS**

**lint** *sunos\_src.c*

**DESCRIPTION**

The SunOS Release 4.1 lint library is a superset of the 4.3 BSD lint library. It includes all of the 4.3 BSD functionality, most of System V release 3.2 functionality, as well as extensive additional functionality in the networking and file system areas.

It is important to note that the default environment in SunOS Release 4.1 provides BSD 4.3 compatibility. Sun also provides a System V compatible environment (see *svidii(7V)*).

Note that many man pages are marked with a “V” after the section number, indicating some sort of System V compliance. SunOS functions are also documented on these man pages, as well as on man pages without the “V” section suffix.

By default, the user will get the SunOS environment. No path modifications should be necessary. The typical path is set `path = ( /bin /usr/bin /usr/ucb )`

**FILES**

<code>/usr/bin/*</code>	SunOS executables
<code>/usr/ucb/*</code>	BSD derived executables
<code>/usr/include/*</code>	SunOS specific header files
<code>/usr/lib/*</code>	SunOS specific library files

**SEE ALSO**

*lint(1V)*, *ansic(7V)*, *bsd(7)*, *posix(7V)*, *svidii(7V)*, *svidiii(7V)*, *xopen(7V)*

**NAME**

svidii – overview of the System V environment

**SYNOPSIS**

```
/usr/5bin/lint -n -lsvidii sys5_src.c
```

**AVAILABILITY**

This command is available with the *System V* software installation option. Refer to *Installing SunOS 4.1* for information on how to install optional software.

**DESCRIPTION**

SVID II is a set of functions and header files. The SunOS Release 4.1 implementation of SVID II is a super-set — it includes all of the functionality described in the SVID issue 2 documents as well as most of the SunOS functionality. See the `sunos(7)` man page for a description of SunOS functionality.

All man pages that are associated with SVID II are marked by a “V” after the section number. Not all “V” pages are SVID II, however. Some “V” pages may be part of other System V based environments such as X/Open.

If a user desires to work in a SVID II environment, the user should set the path variable to include `/usr/xpg2bin` and `/usr/5bin` before anything else. The typical path is:

```
set path=( /usr/xpg2bin /usr/5bin /bin /usr/bin /usr/ucb )
```

As a portability aid, Sun is providing two lint libraries that consist exclusively of SVID II functions as defined in the SVID issue 2. Users may lint their code with the `-n -lsvidii` options to catch all features that are not found in SVID issue 2, all volumes. Using lint with the `-n -lsvidii-3` options is just like `-n -lsvidii` except that it does not include volume 3 (which contains new directory reading routines and new signal functions that appeared in System V release 3.2).

**FILES**

<code>/usr/5bin/*</code>	System V specific executables
<code>/usr/5include/*</code>	System V specific header files
<code>/usr/5lib/*</code>	System V specific library files

**SEE ALSO**

`lint(1V)`, `ansic(7V)`, `bsd(7)`, `posix(7V)`, `sunos(7)`, `svidiii(7V)`, `xopen(7V)`

**NAME**

svidiii – SVIDIII lint library

**SYNOPSIS**

`/usr/5bin/lint -n -lsvidiii svidiii_src.c`

**AVAILABILITY**

This environment is not fully tested under SunOS Release 4.1 as there is no test suite available. The environment that is believed to closely approximate a SVIDIII environment is the System V environment. The System V environment is available with the *System V* software installation option. Refer to *Installing SunOS 4.1* for information on how to install optional software.

**DESCRIPTION**

SVIDIII is a future environment that Sun intends to support. SunOS Release 4.1 does not currently fully support SVIDIII applications. It does support many of the functions described by the SVIDIII document. This man page does not imply that the functions supported by SunOS Release 4.1 and the functions described by the SVIDIII document perform identically. The SVIDIII lint library is intended solely as a porting aid.

The SVIDIII lint library consists exclusively of SVIDIII functions. Users may lint their code with the `-n -lsvidiii` options to catch all non-SVIDIII features.

**FILES**

`/usr/5lib/lint/llib-lsvidiii*` SVIDIII C lint library

**SEE ALSO**

`lint(1V)`, `ansic(7V)`, `bsd(7)`, `posix(7V)`, `sunos(7)`, `svidii(7V)`, `xopen(7V)`

**NAME**

xopen – overview of the X/Open Portability Guide Issue 2 (X/Open) environment

**SYNOPSIS**

```
/usr/5bin/lint -n -lxopen xopen_src.c
```

**AVAILABILITY**

This command is available with the *System V* software installation option. Refer to *Installing SunOS 4.1* for information on how to install optional software.

**DESCRIPTION**

X/Open is a set of functions and header files. The SunOS Release 4.1 implementation of X/Open is a superset — it includes all of the functionality described in the */usr/group Standard 1984* — as well as much of the System V functionality, and much of the SunOS functionality.

All man pages that are associated with X/Open are marked by a “V” after the section number. Not all “V” pages are X/Open, however. Some “V” pages may be part of other System V based environments such as POSIX.1.

If a user desires to work in a X/Open (or System V) environment, the user should set the path variable to include */usr/xpg2bin* and */usr/5bin* before anything else. The typical path is:

```
set path=( /usr/xpg2bin /usr/5bin /bin /usr/bin /usr/ucb )
```

As a portability aid, Sun is providing a lint library that consists exclusively of X/Open functions. Users may lint their code with the *-n -lxopen* options to catch all non-X/Open features.

X/Open, as with most other environments, continues to evolve. The *-lxopen* lint library will always refer to the most recent document supported by Sun. Some applications may wish to port to a particular version of the environment; they may safely use the more specific name of *-lxpg2* (currently the same as *-lxopen*).

**FILES**

<i>/usr/xpg2bin/*</i>	X/Open specific executables
<i>/usr/xpg2include/*</i>	X/Open specific header files
<i>/usr/5include/*</i>	System V specific header files
<i>/usr/xpg2lib/*</i>	X/Open specific library files
<i>/usr/5lib/*</i>	System V specific library files

**SEE ALSO**

lint(1V), ansic(7V), bsd(7), posix(7V), sunos(7), svidii(7V), svidiii(7V)

