NAME

terminals − descriptions of commonly-used terminals

DESCRIPTION

This page serves as an introduction and index to the pages in Section VII that describe some of the terminals in common use. These pages should help solve those problems that may occur during the actual use of the terminals. Note that no conclusions regarding terminal selection should be drawn from the presence or absence of specific terminals in these pages. Headings on these pages include:

COMMANDS TO ISSUE AFTER LOGIN − this section gives the commands necessary to properly initialize the state of the terminal. The commands usually include *tabs(I)* to set hardware tab stops, and *stty(I)* to set appropriate carriage return and line feed delays.

NORMAL SWITCH SETTINGS − this section notes the required settings for the various switches and toggles of the terminal. It is especially important to be aware of these when using a terminal in a public terminal room, as switches may be left in an unexpected setting, leading to odd results.

SPECIAL CHARACTERS AND STATES − characters having atypical effects are noted here, along with escape sequences that may be needed to generate useful actions.

COMMON PROBLEMS − this section lists problems commonly found when using the terminal and indicates possible remedies for them.

IDIOSYNCRASIES − notes unusual properties of the terminal.

Although almost any full-duplex ASCII terminal can be used with PWB/UNIX, some are much more suitable than others. Because the whole terminal situation changes rapidly, no recommendations are given here regarding choice of terminals.

SEE ALSO

stty(I), tabs(I)
DASI450(VII), GSI300(VII), HP2640(VII), TERMINET(VII), TI700(VII)

NAME

DASI450 − DASI450, DIABLO 1620, XEROX 1700 terminals

DESCRIPTION

The DASI450 is a useful general-purpose terminal, often used in document production. The primary advantages of this terminal include its wide variety of features, availability of many type fonts, high print quality, and ease of changing the print element and ribbon.

The terminal normally produces output 10 or 12 characters to the inch horizontally, allowing total line widths of 132 and 158 characters, respectively. Horizontal spacing is normally controlled by the SPACING switch (see below), but the setting of that switch can be *dynamically overridden* by appropriate control sequences, either from the keyboard or remotely. Vertical spacing is normally 6 lines per inch, and is independent of the horizontal spacing. Vertical spacing can be changed dynamically to 8 lines per inch and back to 6 by (different) control sequences. Using *graphics mode*, the print mechanism may be spaced in horizontal increments of 1/60 inch, and vertical increments of 1/48 inch. Combined with forward and reverse motions, *graphics mode* can be used to produce subscripts, superscripts, reverse line motion, Greek letters, and graphs. Output filters may be necessary for some of these functions: see *450(I)* and *graph(I)*. Graphics mode in entered or left by control sequences that can be generated dynamically, from the terminal or remotely (see COMMON PROBLEMS below).

COMMANDS TO ISSUE AFTER LOGIN

tabs +t450; stty nl0 cr2

This makes sure that tab stops are set. It also sets terminal delays appropriate for most output, especially that containing many contiguous blank lines. At this setting, it takes about 49 seconds per page of C program, and 84 seconds per page of *nroff(I)* output (UNIX manual page). A few rare types of output may not print properly at this setting. Usable settings and their approximate relative time ratios are as follows:

nl0 cr2	1.00
nl0 cr1	1.03
nl0 cr3	1.08
nl2 cr2	1.10
nl2 cr3	1.17

For output with many blank lines, the **cr2** and **cr3** settings seem to work best.

NORMAL SWITCH SETTINGS

Switches are inside the terminal cover, just above the keyboard. From left to right, they should be set as follows:

FORM LENGTH − 11
SPEED − 30
SPACING − 10 (or 12: see below; see also DESCRIPTION above.)
AUTO LF − OFF
PARITY − EVEN
DUPLEX − FULL

Switches at the lower left side of the keyboard should be set as shown:

LOCAL − not depressed
UC ONLY − normally not depressed

The switches at the upper right side of the keyboard should be set:

ERROR RESET − push this when red light at left goes on
FORM FEED − push to jump to top of form, as set by next button
SET TOF − at start of session, align paper to perforation, then push
SCROLL − normally OFF, although you may want to experiment with ON
POWER − ON

In 10-pitch mode, output is printed 10 characters/inch horizontally, 6 lines/inch vertically, so that a character is 6 plot increments wide, and 8 (vertical) plot increments high. This mode permits about 65 characters per line, 66 lines/page on normal 8 1/2" by 11" paper. This output size is compatible with many other terminals, and is expected as a default by many UNIX commands, such as *nroff(I)* and *pr(I).* For normal output, the following are appropriate:

nroff −h −T450 *file...* or **nroff −h** *file...* | **450**

In 12-pitch mode, output is printed 12 characters/inch, 6 lines/inch, so that a character is 5 increments wide and 8 high. This mode allows about 80 characters/line. The 12-pitch, 6 lines/inch combination is considered by many to be the most attractive output format. Use:
nroff −h −T450 −12 *files...* or **nroff −h** *files...* | **450**

SPECIAL CHARACTERS AND STATES

The interrupt signal can be generated by hitting either the DEL or BREAK key; the former is usually more convenient. At any point in time, a terminal is either in *graphics mode* or *character mode,* and the interpretations of some characters differ according to mode. In *graphics mode,* it is possible to space a single increment in each direction.

COMMON PROBLEMS

OUTPUT GENERATED IN ONE POSITION, OVERPRINTING − you may accidentally have gotten into *graphics mode.* Type ESC followed by '4' to leave that mode.

GARBAGE OUTPUT, WITH WILD SKIPPING − a DASI may go berserk when faced with many very long lines, long sequences of nonblank, nonidentical characters requiring extreme print wheel motion, or heavy amounts of tabbing. Remove some tab characters or increase terminal delays via *stty.*

PRINT HEAD ZOOMS TO RIGHT SIDE OF CARRIAGE − tab stops are not set. Set them with the *tabs* command.

POOR REGISTRATION AFTER REVERSE PLATEN MOTION − this is most likely to occur when using a forms tractor to perform reverse line feeds or half-line motions. Some (but not all) forms tractors have just enough slack in their mechanism that it is difficult to return exactly to the position you want. For best appearance of such text, or of Greek letters, take the forms tractor off, and use the friction feed instead. This problem is very dependent on the individual terminal.

NO LINE FEED OCCURS WHEN RETURN HIT; NO SYSTEM RESPONSE TO RETURN − you are in a mode where there is no conversion of RETURN to CR-LF echoed to your terminal. There are two situations. First, either the terminal or coupler switch may be set to HALF-DUPLEX, and you may have asked to suppress echoing because you were getting double characters. Change the switches to FULL-DUPLEX, and issue a **stty echo** command. The second case is that a **stty nl** command has been done, or some equivalent action, such as using LINE FEED rather than RETURN during your login sequence. Issue the command **stty −nl,** but terminate it with a LINE FEED, not a RETURN. This will restore the terminal to the normal state, allowing convenient use of RETURN again.

ERROR LIGHT ON, OTHER PECULIAR BEHAVIOR − push the RESET button found at the upper right side of the keyboard. If this does not help, take the cover off and push the CLEAR button at the extreme right. This resets the microprocessor, leaves graphics mode, clears all tabs, and returns the carriage. Then issue *tabs* command to reset the tabs. The error light also turns on if either you or the computer attempt to print while the front cover is off.

IDIOSYNCRASIES

A DASI can perform a high-speed skip when it receives a series of LF characters without other characters intermixed. Unfortunately, a newline is normally a CR-LF pair, and the terminal does not know that it is at the left margin, so that it does sequences of these pairs about 3 times slower than it needs to. As a result, the only way to assure high-speed skipping is to write code to convert a sequence of newlines into a single CR, followed by a sequence of LF's. PWB/UNIX does this under*stty* modes **nl0 cr2** and **nl0 cr3.**

SEE ALSO

450(I), graph(I), stty(I), tabs(I), terminals(VII)

NAME

GSI300 − GSI300 (DTC300 or DASI300) hard-copy terminals

DESCRIPTION

The GSI300 is a useful general-purpose terminal, often used in document production, although it is being supplanted by the newer DASI450 (DIABLO 1620 or XEROX 1700). The advantages of this terminal include its wide variety of features, availability of many type fonts, high print quality, and ease of changing the print element and ribbon.

The terminal can produce output at 10 or 12 characters to the inch horizontally, allowing total line widths of 132 and 158 characters, respectively. Vertical spacing can be set to 6 or 8 lines per inch. Both of these settings are under the exclusive control of the PITCH switch (see below). Using*plot mode* , the print mechanism may be spaced in horizontal increments of 1/60 inch, and vertical increments of 1/48 inch. Combined with forward and reverse motions, *plot mode* can be used to produce subscripts, superscripts, reverse line motion, Greek letters, and graphs. Output filters may be necessary for these functions: see *gsi(I)* and *graph(I).* To use the plot mode, the PLOT switch must be ON (see below); once that switch is on, plot mode in entered or left by control sequences that can be generated dynamically, from the terminal or remotely (see COMMON PROBLEMS below).

COMMANDS TO ISSUE AFTER LOGIN

tabs; stty nl0 cr2

This makes sure that tab stops are set. It also sets terminal delays appropriate for most output, especially that containing many contiguous blank lines. At this setting, it takes about 49 seconds per page of C program, and 84 seconds per page of *nroff(I)* output (UNIX manual page). Some types of output may not print properly at this setting. Usable settings and their approximate relative time ratios are as follows:

nl0 cr2	1.00
nl0 cr1	1.03
nl0 cr3	1.08
nl2 cr2	1.10
nl2 cr3	1.17

For output with many blank lines, the **cr2** and **cr3** settings seem to work best; **nl2 cr3** is the safest choice for printing many consecutive lines of blankless text.

NORMAL SWITCH SETTINGS

Switches are inside the terminal cover, just above the keyboard. From left to right, they should be set as follows:

PARITY − EVEN
CODE − ASCII (if switch can be moved; it is a dummy on many terminals)
PLOT − ON (if present: some older terminals don’t have one)
DUPLEX − FULL (if acoustic coupler is used, it should also be set to FULL)
BAUD − 300 (i.e., 30 characters per second)
PITCH − 10 (or 12: see below)
AUTO L.F. − OFF

At the lower left side of the keyboard, the LINE half of the LINE/LOCAL switch must be lit.

The PITCH switch controls both vertical and horizontal spacing in a coupled fashion. In 10-pitch mode, output is printed 10 characters/inch horizontally, 6 lines/inch vertically, so that a character is 6 plot increments wide, and 8 (vertical) plot increments high. This mode permits about 65 characters per line, 66 lines/page on normal 8 1/2" by 11" paper. This output size is compatible with many other terminals, and is expected as a default by many UNIX commands, such as *nroff(I)* and *pr(I).* For normal output, the following are appropriate:

nroff −h −T300 *file...* or **nroff −h** *files...* | **gsi**

In 12-pitch mode, output is printed 12 characters/inch, 8 lines/inch, so that a character is 5 increments wide and only 6 high. This mode allows about 80 characters/line, 88 lines/page on the same size paper. Text printed 8 lines/inch appears almost unreadable, but this mode is a useful paper-saver for dumping files for reference. For example, use:

pr −l88 *file...*

to produce condensed listings.

The 12-pitch, 6 lines/inch combination is considered by many to be the most attractive output format. It is obtained by setting the PITCH switch to 12, the PLOT switch ON, and using:

nroff −h −T300−12 *file...* or **nroff −h** *file...* | **gsi +12**

SPECIAL CHARACTERS AND STATES

The interrupt signal can be generated by hitting either the DEL or BREAK key; the latter is usually more convenient, being independent of the SHIFT key. At any point in time, a terminal is either in *plot mode* or *character mode,* and the interpretation of some characters differs according to mode. If the PLOT switch is ON, the BEL character (octal 006, CONTROL "g" on terminal) changes the mode to *character mode,* and the ACK character (octal 007, CONTROL "f" on terminal) changes the mode from the current mode to the other one. If the PLOT switch is OFF, the terminal is always in *character mode.* In *plot mode,* it is possible to space a single increment in each direction. Useful motion characters include the following:

SP (space, octal 040) − 1/60" right
BS (backspace, octal 010) − 1/60" left
LF (line feed, octal 012) − 1/48" forward
VT (reverse line feed for this terminal, octal 013) − 1/48" backwards

COMMON PROBLEMS

OUTPUT GENERATED IN ONE POSITION, OVERPRINTING − you may accidentally have gotten into **plot mode.** Hold CONTROL down while hitting "g", producing a BEL character to leave that mode.

GARBAGE OUTPUT, WITH WILD SKIPPING − a GSI may go berserk when faced with many very long lines, long sequences of non-blank, non-identical characters requiring extreme print wheel motion, or heavy amounts of tabbing. The GSI's microprocessor exceeds its 128-character buffer and becomes very confused. Remove some tab characters, use the *gsi* command's delay option, or increase terminal delays via *stty.*

PRINT HEAD ZOOMS TO RIGHT SIDE OF CARRIAGE − tab stops are not set. Set them with the *tabs* command.

POOR REGISTRATION AFTER REVERSE PLATEN MOTION − this is most likely to occur when using a forms tractor to perform reverse line feeds or half-line motions. Some (but not all) forms tractors have just enough slack in their mechanism that it is difficult to return exactly to the position you want. For best appearance of such text, or of Greek letters, take the forms tractor off, and use the friction feed instead. This

problem is very dependent on the individual terminal.

NO LINE FEED OCCURS WHEN RETURN HIT; NO SYSTEM RESPONSE TO RETURN − you are in a mode where there is no conversion of RETURN to CR-LF echoed to your terminal. There are two situations. First, either the terminal or coupler switch may be set to HALF-DUPLEX, and you may have asked to suppress echoing because you were getting double characters. Change the switches to FULL-DUPLEX, and issue a **stty echo** command. The second case is that a **stty nl** command has been done, or some equivalent action, such as using LINE FEED rather than RETURN during your login sequence. Issue the command **stty −nl,** but terminate it with a LINE FEED, not a RETURN. This will restore the terminal to the normal state, allowing convenient use of RETURN again.

FAULT LIGHT ON, OTHER PECULIAR BEHAVIOR − push the RESET button found under the right side of the cover. This resets the microprocessor, gets out of plot mode, clears all tabs, and returns the carriage. Then issue *tabs* command to reset the tabs.

IDIOSYNCRASIES

A GSI can perform a high-speed skip when it receives a series of LF characters without other characters intermixed. Unfortunately, a newline is normally a CR-LF pair, and the terminal does not know that it is at the left margin, so that it does sequences of these pairs about 3 times slower than it needs to. As a result, the only way to assure high-speed skipping is to write code to convert a sequence of newlines into a single CR, followed by a sequence of LF's. PWB/UNIX does this under*stty* modes **nl0 cr2** and **nl0 cr3.**

SEE ALSO

gsi(I), graph(I), stty(I), tabs(I), terminals(VII)

NAME

HP2640 − Hewlett-Packard 2640 CRT terminal family

DESCRIPTION

This family contains a large and growing number of models that appear to be similar, but have slight variations in keyboard layout and major variations in options and peripheral devices. The HP2640B appears to be the most popular model at the current time. It is suitable for both programming and documentation work. Positive features of the terminal include hardware tab stops, large local memory (up to 8K bytes) with convenient scanning, ability to lock several lines on the display, display enhancements which permit readable display of most *nroff(I)* output, and displayable graphics for control characters.

Quick perusal of *nroff* output can be obtained using the *hp(I)* filter:

nroff −h *options files...* | **hp**

COMMANDS TO ISSUE AFTER LOGIN

tabs +thp; stty nl0 cr0

This sequence sets UNIX standard tab stops (every 8 columns), then turns off (unnecessary) line feed and carriage return delays.

NORMAL SWITCH SETTINGS

The ON/OFF switch is at the left rear of the terminal. The following switches are at the upper left of the keyboard:

DUPLEX − FULL
PARITY − EVEN
BAUD RATE − 300 (1200 could be used with proper modem)
BLOCK MODE − not depressed
REMOTE − depressed
CAPS LOCK − not depressed (for most uses)
MEMORY LOCK − not depressed unless lines are to be locked on screen
AUTO LF − not depressed

None of the other latching keys should be depressed.

SPECIAL CHARACTERS AND STATES

An interrupt can be generated by DEL or BREAK. The location of the BREAK key varies among models.

COMMON PROBLEMS

NO LINE FEED OCCURS WHEN RETURN HIT; NO SYSTEM RESPONSE TO RETURN − you are in a mode where there is no conversion of RETURN to CR-LF echoed to your terminal. There are two situations. First, either the terminal or coupler switch may be set to HALF-DUPLEX, and you may have asked to suppress echoing because you were getting double characters. Change the switches to FULL-DUPLEX, and issue a **stty echo** command. The second case is that a **stty nl** command has been done, or some equivalent action, such as using LINE FEED rather than RETURN during your login sequence. Issue the command **stty −nl,** but terminate it with a LINE FEED, not a RETURN. This will restore the terminal to the normal state, allowing convenient use of RETURN again.

If the terminal does not seem to work, try the RESET button. Note that this action clears tab stops.

IDIOSYNCRASIES

When the terminal receives a Horizontal Tab character that occurs beyond the last tab stop (if any), the effect is that of a newline. Thus,*tabs(I)* may cause rapid scrolling while clearing tabs.

SEE ALSO

hp(I), stty(I), tabs(I), terminals(VII)

NAME

TermiNet − GE TermiNet 300 (and 1200) terminals

DESCRIPTION

The TermiNet 300 is a reasonable terminal for general-purpose use. Because it does provide hardware tab stops, it is useful for both programming and documentation. It prints up to 118 characters (10-pitch), utilizing a continuously-moving band of print elements. The terminal is reasonably compact. A useful feature is the fact that the first tab stop set on the terminal becomes the left margin. Some users prefer this terminal's column position lights and lack of large moving print element. Visibility of current typed line is adequate.

The TermiNet 1200 is a 1200-baud version of the 300.

COMMANDS TO ISSUE AFTER LOGIN

tabs or **tabs +ttn**

This assures setting of UNIX standard tab stops. By default, you also have delays set as by **stty nl0 cr1,** which should generally work, but may fail for some types of output. On a TermiNet 300 at this setting, it takes about 49 seconds per page of C program, and 84 seconds per page of *nroff* output (UNIX manual page), the latter figure assuming output is tabbed. Usable settings and their relative time ratios are as follows:

nl0 cr2	1.00
nl0 cr1	1.03
nl0 cr3	1.08
nl2 cr2	1.10
nl2 cr3	1.17

The TermiNet 1200 is about 2.5 times faster than the 300 at corresponding settings, but may not be able to print properly at the fastest settings.

NORMAL SWITCH SETTINGS

Several switches are on back of the terminal:

(Back left) − NORM (not CAPS ONLY)
(Back left, on some models) − FULL DUPLEX
(Back right) − power ON

Light switches on front left:

ON LINE − push so that it becomes lit
INTERRUPT − if lit, push it so it goes out

Switches on right front:

TRANSPARENCY − OFF
INHIBIT − NORM
RATE − 30
LINE FEED − 1
AUTO L.F. − OFF

COMMON PROBLEMS

NO LINE FEED OCCURS WHEN RETURN HIT; NO SYSTEM RESPONSE TO RETURN − you are in a

mode where there is no conversion of RETURN to CR-LF echoed to your terminal. There are two situations. First, either the terminal or coupler switch may be set to HALF-DUPLEX, and you may have asked to suppress echoing because you were getting double characters. Change the switches to FULL-DUPLEX, and issue a **stty echo** command. The second case is that a **stty nl** command has been done, or some equivalent action, such as using LINE FEED rather than RETURN during your login sequence. Issue the command **stty −nl,** but terminate it with a LINE FEED, not a RETURN. This will restore the terminal to the normal state, allowing convenient use of RETURN again.

SEE ALSO

stty(I), tabs(I), terminals(VII)

NAME

TI700 − TI 745, 735, and 725 terminals

DESCRIPTION

The TI745 (and to a lesser extent, the TI735) are lighter and smaller than the older TI725, and their keyboards are more suitable for general-purpose UNIX usage. In particular, the DEL key and backslash are favorably placed, and they provide an underscore in place of the 725's back-arrow. *Nroff(I)* output is thus more readable on the 745 and 735. Output is printed on thermal paper, with a carriage width of 80 characters. The TI745 accepts a smaller roll of paper than the others, but is much more portable.

COMMANDS TO ISSUE AFTER LOGIN

stty −tabs nl0 cr2

This requests UNIX to simulate standard UNIX tab stops (every 8 columns). It also lessens carriage return and line feed delays to the minimum acceptable to the terminal. If the terminal cannot print something at this setting, various other settings may be tried. At the **nl0 cr2** setting, it takes about 65 seconds per page of C program, and 93 seconds per page of *nroff* output (UNIX Manual page). Usable settings and their relative time ratios are as follows:

nl0 cr2	1.00
nl0 cr1	1.03
nl0 cr3	1.06
nl2 cr2	1.08
nl2 cr3	1.14

The lack of hardware tabs causes these terminals to require about 15-20% more time than 300-baud terminals providing tabs.

NORMAL SWITCH SETTINGS (745)

Most switches are right-left toggles in front of the keyboard.

UPPER CASE (left front) − right side depressed
HALF DUP (right front) − right side depressed
LOW SPEED (right front) − right side depressed
ON LINE (right front) − left side depressed
MARK-EVEN-ODD (right rear) − EVEN
ON-OFF (right rear) − toggle back

NORMAL SWITCH SETTINGS (735-725)

Most of the switches are on the upper left side of the terminal:

LINE FEED − SINGLE
SPEED − 30
DUPLEX − FULL
PARITY − EVEN
INTERFACE − INT

In addition, the PWR switch must of course be turned on, and the ON LINE switch depressed. You will be in local mode otherwise, and get no response whatsoever.

SPECIAL CHARACTERS

To generate a Horizontal Tab character from the keyboard, hold CTRL down and hit "i".

You can interrupt an executing program with either the DEL or BREAK keys.

COMMON PROBLEMS

NO LINE FEED OCCURS WHEN RETURN HIT; NO SYSTEM RESPONSE TO RETURN − you are in a mode where there is no conversion of RETURN to CR-LF echoed to your terminal. There are two situations. First, either the terminal or coupler switch may be set to HALF-DUPLEX, and you may have asked to suppress echoing because you were getting double characters. Change the switches to FULL-DUPLEX, and issue a **stty echo** command. The second case is that a **stty nl** command has been done, or some equivalent action, such as using LINE FEED rather than RETURN during your login sequence. Issue the command **stty −nl,** but terminate it with a LINE FEED, not a RETURN. This will restore the terminal to the normal state, allowing convenient use of RETURN again.

SEE ALSO

stty(I), terminals(VII)

NAME

tmac.name − standard nroff and troff macro packages

DESCRIPTION

A number of standard macro packages have been written for use with the UNIX text formatters, *nroff(I)* and *troff(I)*. When using either of these commands, an argument of the form **−m***name* requests inclusion of the file named **/usr/lib/tmac.***name*.

The following macro packages are supported by PWB/UNIX. All but the last can be used with either *nroff* or *troff*. The last one works with *troff* only.

Name	*Description/Documentation*
a	Same as /usr/man/man0/caa. See *PWB/UNIX Manual Page Macros* by E. M. Piskorik.
m	PWB/MM; a unified, general-purpose set of macros for memoranda, manuals, letters, etc. See *PWB/MM − Programmer's Workbench Memorandum Macros* by D. W. Smith and J. R. Mashey.
org	BTL organization chart macros.
uom	UNIX Operations Manual macros; uses −mm.
v	View graph and slide macros. See *PWB/UNIX View Graph and Slide Macros* by T. A. Dolotta and D. W. Smith.

SEE ALSO

nroff(I), troff(I)