

Distributed Systems Network



WORKSTATION CONFIGURATOR

Reference Manual



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The Workstation Configurator Reference Manual helps you to define your own terminal types by guiding you through the following five steps:

First, it informs you of the Workstation Configurator utility, how it works, how to access it, and what are the available terminal type characteristics.

Second, it leads you through the process of executing the utility, entering information in each menu, moving from menu to menu, and detecting and correcting errors after entering information.

Third, it steps you through the different menus you can access to create (or modify) a terminal type file.

Fourth, it steps you through configuring your terminal type on the HP3000 system.

Fifth, it provides you with the error messages you may receive while operating this utility, along with the cause and recovery for each message.

The version level of the Workstation Configurator software is 30239A.00.10, and it runs on the MPE V/E Operating System, version level G.03.04 (or later). By carefully following the steps outlined in this manual, you should be on your way to successfully using the Workstation Configurator utility.

However, this manual does not try to address all the different terminal types and their characteristics. For additional information on terminal types, refer to the *Point-To-Point Workstation I/O Reference Manual* (30000-90250).

Other manuals that you may find helpful are:

- *Point-To-Point Workstation I/O Reference Manual* (30000-90250).
- *MPE Intrinsics Reference Manual* (30000-90010)
- *Using Files* (30000-90102)
- *MPE Commands Reference Manual* (30000-90009)
- *System Operation and Resource Management Reference Manual* (32033-90005)

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CONVENTIONS USED IN THIS MANUAL

NOTATION	DESCRIPTION
nonitalics	Words in syntax statements which are not in italics must be entered exactly as shown. Punctuation characters other than brackets, braces and ellipses must also be entered exactly as shown. For example: EXIT;
<i>italics</i>	Words in syntax statements which are in italics denote a parameter which must be replaced by a user-supplied variable. For example: CLOSE <i>filename</i>
[]	An element inside brackets in a syntax statement is optional. Several elements stacked inside brackets means the user may select any one or none of these elements. For example: $\begin{bmatrix} A \\ B \end{bmatrix}$ User <i>may</i> select A or B or neither.
{ }	When several elements are stacked within braces in a syntax statement, the user must select one of those elements. For example: $\begin{Bmatrix} A \\ B \\ C \end{Bmatrix}$ User <i>must</i> select A or B or C.
...	A horizontal ellipsis in a syntax statement indicates that a previous element may be repeated. For example: [,<i>itemname</i>]...; In addition, vertical and horizontal ellipses may be used in examples to indicate that portions of the example have been omitted. A shaded delimiter preceding a parameter in a syntax statement indicates that the delimiter <i>must</i> be supplied whenever (a) that parameter is included or (b) that parameter is omitted and any <i>other</i> parameter which follows is included. For example: <i>itema</i>[<i>itemb</i>][<i>itemc</i>] means that the following are allowed: <i>itema</i> <i>itema,itemb</i> <i>itema,itemb,itemc</i> <i>itema,,itemc</i>

CONVENTIONS (continued)

Δ When necessary for clarity, the symbol Δ may be used in a syntax statement to indicate a required blank or an exact number of blanks. For example:

```
SET[(modifier)] $\Delta$ (variable);
```

underlining When necessary for clarity in an example, user input may be underlined. For example:

```
NEW NAME? ALPHA
```

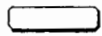
Brackets, braces or ellipses appearing in syntax or format statements which must be entered as shown will be underlined. For example:

```
LET var[[subscript]] = value
```

Output and input/output parameters are underlined. A notation in the description of each parameter distinguishes input/output from output parameters. For example:

```
CREATE (parm1,parm2,flags,error)
```

shading Shading represents inverse video on the terminal's screen. In addition, it is used to emphasize key portions of an example.



The symbol  may be used to indicate a key on the terminal's keyboard. For example, RETURN indicates the carriage return key.

CONTROL *char* Control characters are indicated by CONTROL followed by the character. For example, CONTROLY means the user presses the control key and the character Y simultaneously.

INTRODUCTION TO THE WORKSTATION CONFIGURATOR

SECTION

1

WHAT IS THE WORKSTATION CONFIGURATOR?

The Workstation Configurator is a utility which allows you to define your own terminal types and save the terminal type information in a disc file for later use. It is designed to run on any HP 3000 that uses the MPE V/E Operating System version level G.03.04 (or later) and supports either the Advanced Terminal Processor (ATP) using HIOTERM1 or HIOASLP0, or the Asynchronous Data Communications Controller (ADCC) using HIOTERM2 or HIOASLP2.

NOTE

You must have MPE-V Operating System version level G.03.04 or later to access the Modem Control and Printer Control menus of the Workstation Configurator. With the G.03.06 release of the MPE-V Operating System, the Workstation Configurator program file, TTUTIL, is located in the PUB.SYS account on your system.

The Terminal Type is a set of characteristics that defines much of the relationship between your device and the terminal port (actually, the device driver on the computer). The characteristics include such things as the size of data character your device uses, flow control for inbound and outbound data, whether the device operates in Block Mode, how the computer responds to a Backspace character, and the default state of parity generation and checking for 7-bit characters. It is not necessary to understand Terminal Types in order to operate your device, but it is useful to know they exist. Refer to Appendix C for a list of terminals and supported Terminal Types. Users of some terminals need to alter the Terminal Type of the port when they initiate communication with the computer because the port was configured into the HP 3000 Input/Output System with a Terminal Type that is not suited to their terminal. Often, this is true for dial-up modem ports, where many different terminals may share a single port. The HP 3000 allows the terminal operator to temporarily alter the Terminal Type of a port in order to accommodate a terminal with different protocol characteristics.

WARNING

Users of this product are allowed to create terminal type files without any restrictions. Proper and efficient operation of a specific device by a user-created terminal type is the responsibility of the user. For example, a terminal type that specifies no flow control mechanism will generally create data overruns on the device.

HOW DOES IT WORK?

The Workstation Configurator utility program allows you to create new terminal type files, and modify or inspect existing terminal type files.

NOTE

Terminal Type files are not allowed to reside on private volumes.

The Workstation Configurator is an interactive, menu-driven program; it is driven by a set of VPLUS/3000 screens. The translation between those screens and the internal format of the files is done automatically and is transparent to you.

ACCESSING THE WORKSTATION CONFIGURATOR

A compiled and prepared version of the Workstation Configurator utility resides in the file TTUTIL in the public group of the system account. You must have System Supervisor (OP) capability to access TTUTIL. To use TTUTIL, you must first bring it into memory and pass control to it. You do this with the following command:

```
:RUN TTUTIL.PUB.SYS
```

TERMINAL TYPE CHARACTERISTICS AVAILABLE

The Workstation Configurator utility allows you to specify the following characteristics of your terminal type.

- Data Flow Control
- Block Mode
- Read Trigger
- Special Characters
- Echo
- Line Feed
- Parity
- Modem Control
- Printer Control

For further information on the terminal type characteristics, refer to the *Point-To-Point Workstation I/O Reference Manual*.

Data Flow Control

There are three different methods of controlling the flow of data to and from a terminal. The Enquiry/Acknowledge (ENQ/ACK) and Delay protocols are mutually exclusive and only one of these may be in effect at a time. However, the XON/XOFF protocol may be used in conjunction with either of the other two protocols.

THE ENQ/ACK PROTOCOL. This is one flow control method that is controlled by the driver. When writing data to the terminal, the driver breaks the data into blocks. Before each block is to be written, the driver sends an enquiry character to the device and waits for an acknowledge character to come back from the device. When the device sees the enquiry character it responds with the acknowledge character if it can accept the next full block of data with no problems. If not, the device waits until it can accept the next block before responding with an acknowledge.

With the Workstation Configurator, you can specify the enquiry and acknowledge characters, the data block size, and the action to take if the ten second time period expires.

THE DELAY PROTOCOL. This is an alternate flow control method also controlled by the driver. It is intended for devices, mainly printers, which can otherwise keep up with the flow of data to them, but require extra time to process certain control characters that cause physical motion to the carriage, such as carriage return (CR), line feed (LF), or form feed (FF).

With the Workstation Configurator, you can specify the time to delay for each of the characters CR, LF, and FF in terms of tenths of seconds. The actual time delay is the smallest interval achievable which is greater than or equal to the delay specified. The value specified for the duration of the timer (by tenths of seconds) is in the range of 1 to 31.

THE XON/XOFF PROTOCOL. In contrast to the other methods, this is controlled by the terminal or printer device. The driver sends data to the device in a continuous stream. If the device can no longer accept data (because of being put offline, filling its buffer, running out of paper, etc.), it sends the XOFF character to the driver. The driver then stops sending data to the device. When the device is able to accept data again, it sends the XON character to the driver and the driver resumes data transmission to the device.

With the Workstation Configurator, you can specify if a timer should be started when the XOFF character is received. If a timer is started and the timer expires before the XON character is received, a message is printed on the console stating the device is offline. The timer duration can be specified from one to two hundred fifty-five (255) seconds.

Read Trigger

The read trigger character is used to tell the terminal device when to send characters to the driver. It is generated by the driver at the beginning of each read so that it is not sent to the device until the driver is ready to accept data. This character is normally a DC1.

With the Workstation Configurator, you can specify what character (if any) should be used as a read trigger. If the device requires a multiple character sequence for a trigger, the first number minus one (n-1) characters can be sent to the device through a write and the last character can be made the read trigger character.

Block Mode

Block mode is a method of transferring data from the terminal to the computer. Instead of sending each character as it is typed, the terminal buffers a line or more of data and sends the entire block when the terminal operator has finished entering the data and has pressed **ENTER**.

With the Workstation Configurator, you have the ability to specify the type (or types) of block mode supported along with defining the block mode alert and block trigger characters. You can also specify the amount of time the block mode read timer should wait before aborting a block mode read. During block mode reads and VIEW reads performed by VPLUS and similar applications, the loss of a read-terminating character can result in a hung port. For this reason, the ATP/ADCC driver aborts the read if the network delay timer expires. If your network is prone to long delays, you should specify a number of seconds that is large enough to compensate for delays experienced during periods of high network traffic.

Special Characters

There are several characters which have special significance to the terminal driver. These characters cause the driver to take special actions.

With the Workstation Configurator, you are able to define the characters that cause each of the following special actions:

- Console Attention, Backspace, and Cancel
- End-Of-Record
- Subsystem Break



CONSOLE ATTENTION, BACKSPACE, AND CANCEL. These are three of the special functions, normally entered by pressing simultaneously the CNTL (or CTRL) key and the A, H or X character. Console Attention allows you to initiate communication with MPE through the System Console. Backspace deletes the previous character. Cancel deletes the current line prior to pressing RETURN. The terminal verifies the cancellation by printing three exclamation marks (!!!) followed by a carriage return and line feed.

With the Workstation Configurator, you have the option to re-define the characters you wish to perform these special functions.

THE END-OF-RECORD. This function takes place during a read. When a read is issued, it has an expected length associated with it. By entering an end-of-record (EOR) character, the read may be terminated before the full number of characters have been entered.

With the Workstation Configurator, you are able to specify two types of EOR characters. For both types together, you can specify a set of up to 8 characters.

- With the first type, the EOR characters perform like the carriage return (CR). The character terminates the read, but it is not included in the data returned to the program doing the read or the actual count of characters read. Therefore, it is impossible to determine which character in the set was received.

When the EOR character is detected, the driver generates the characters necessary to place the terminal cursor at the beginning of the next line, unless it was disabled through FSETMODE . If the EOR is a CR, the driver generates a line feed (LF); if the EOR is a LF, the driver generates a CR; if the EOR is anything else, the driver generates both a CR and a LF.

- With the second type, the EOR character performs like the alternate EOR specified through FCONTROL(25). The character is included in both the data and the actual count returned. The read is returned with a special status (a returned condition code of CCL on the read, and a file system error number of FSERR 31) indicating the read terminated by the special EOR character. The terminal cursor is not affected. (For further information on FCONTROL, refer to the *Point-To-Point Workstation I/O Reference Manual* or the *MPE Intrinsic Reference Manual*.)

SUBSYSTEM BREAK. This allows you to interrupt execution of a local program or subsystem command. The regular subsystem break character is invoked by pressing the CNTL (CTRL) and Y keys simultaneously.

With the Workstation Configurator, you are able to specify a set of up to three subsystem break characters. Any one of these characters will act like Y^C .

Stripped Characters

With the Workstation Configurator, you are able to define a set of characters which have no special function other than to be removed from the input data. When these characters are typed, they are ignored and do not show up in the data read. For example, if the XON/XOFF flow control is not enabled, then one of the terminal type options allows you to specify that XON and XOFF be stripped from input. If a subsystem break character is entered when subsystem breaks are not enabled, the character may be removed from the input stream. If the console attention character is entered from a terminal which is not the console, it may be ignored or treated as a data character.

Terminal Control

There are several characteristics which allow you to have some control over the terminal.

With the Workstation Configurator, you are able to control each of the following terminal type characteristics:

- Echo
- Line Feed during input
- Form Feed during output
- Backspace response
- Parity

ECHO. When enabled, echo allows the terminal input to be echoed back to the terminal by the computer as it is received.

With the Workstation Configurator, you are able to specify the initial setting for echo (either on or off). Whenever the terminal type is set or changed, the initial setting for echo takes effect.

CAUTION

There are applications that set echo before the terminal type is selected. For your application to function correctly, the program needs to select the terminal type desired first, and then set echo as desired (if it is different than default). (Refer to the discussion at the end of this chapter on "Special Considerations".)

LINE FEED. This is intended to be used with devices that do not provide an automatic wraparound at the end of the display line. If you wish to enter more data for a read than fits on one line, a LF may be typed near the end of the line. The driver will strip the LF from the data and generate a CR in response. Input then can continue at the beginning of the next physical line.

With the Workstation Configurator, you are able to specify if the LF is to have this special significance. If not, no CR is generated in response. The LF may be read as data or specified for any other special character action including being stripped.

THE FORM FEED. This character is not recognized and acted upon by some devices in a useful manner.

With the Workstation Configurator, you are able to specify that each form feed in the outgoing data stream be replaced with a different character. Most often this character is the line feed (LF) character.

THE BACKSPACE. This allows you to delete the previous character. There are several possible responses you may receive from a backspace depending on whether you are using a CRT terminal verses a hardcopy terminal. (For further information on each of the backspace responses, refer to Part 4 in the *Point-To-Point Workstation I/O Reference Manual*.)

With the Workstation Configurator, you have the option to specify the type of backspace response. In all cases the backspace is echoed to the terminal, provided echo is enabled.

PARITY. This allows you to check data for odd parity or even parity. Parity is generated on 7-bit ASCII characters, and checks or sets the eighth bit accordingly.

With the Workstation Configurator, there are five types of parity available, where:

NONE	All eight bits are transferred with no parity bit.
ODD	The number of on bits in the character is odd.
EVEN	The number of on bits in the character is even.
0's	The parity bit is forced to zero.
1's	The parity bit is forced to one.

NOTE

Parity is only allowed with 7-bit data terminal types. Forced to 0's and 1's are not available on the ADCC hardware (HIOTERM2).

There are also three parity specifications. The first is the FOPEN default parity setting; it controls the

parity in effect if the terminal is FOPENed as a device. The other two control the type of parity used when the terminal is speed-sensed depending on whether the parity bit detected is zero or one.

The parity setting of the terminal port is set when the port is allocated (FOPENed or speed sensed). Parity also may be affected through the FCONTROL and FDEVICECONTROL intrinsics. The parity setting is not affected when you change the terminal type while the device is opened.

Modem Control

The modem control functions give you some control over a printer port when it is connected to a modem. You can specify how long a connection will remain active after a listing is printed, perhaps enabling a second listing to be printed over the same connection. This can eliminate the need to create a new connection when consecutive listings are printed. You can also specify how long DTR remains low during a disconnect to ensure that the network can complete the disconnect before the next logon attempt.

Printer Control

The printer control functions provide you with some control over a printer.

The Workstation Configurator enables you to select efficiency mode. Efficiency mode specifies that status requests are issued only after an FOPEN, FCLOSE, or DCLOSE is encountered. This improves the performance of the connection by minimizing the number of times the connection is monitored for errors. You can also specify how long the system should wait for a status request reply and how frequently the system reattempts a read if a status request reply is not received before this timer expires.

The Workstation Configurator also enables you to specify the string of characters that is used to initialize the printer, and to define character sequences to space to each VFC channel.

INITIALIZATION. When a printer exists in the spooled system printer category, different people may use the printer in different ways. In order to insure that one user who changes the printer characteristics (such as margins, tabs, or print density) does not affect the next user who does not want those choices of characteristics, an initialization string may be specified.

With the Workstation Configurator, the initialization string sets up the printer in a known and repeatable state which is acceptable to most users. When a device (configured as a printer) is first opened, the initialization string (of up to 120 characters) is automatically sent to the printer by the terminal driver. For spooled printers, this occurs at the beginning of every spool file sent to the device.

VERTICAL FORMAT CONTROL. Many line printers allow the use of Vertical Format Control (VFC). VFC allows a programmer to instruct a printer to skip to predetermined lines on a page with certain carriage control directives instead of counting and outputting a number of blank lines.

Up to 16 VFC channels may be supported by a device with each channel representing one or more places within the vertical page. Each channel performs a standard skip function such as skip to top of next page, skip one line, skip to next quarter page, and so forth. Some serial printers, such as the HP 2631B, allow the use of vertical format control through a set of character sequences. To skip to a particular VFC channel, the corresponding character sequence is sent to the device.

With the Workstation Configurator, each VFC character sequence (up to a maximum of 16 characters each) may be defined. When one of the VFC carriage controls is used (%300 to %317), the driver generates

the character sequence necessary to move the printer carriage to the proper channel. (For further information on Vertical Format Control, refer to the *MPE V System Operation and Resource Management Reference Manual*.)

SPECIAL CONSIDERATIONS

Before using the Workstation Configurator, you should take the following HP 3000 System commands into consideration.

MPE Commands

The capabilities of the following MPE commands should be considered:

- The `:HELLO` command accepts either a terminal type number or a terminal type file name for the `;TERM=parameter`. For instance,

```
:HELLO LEWIS.CIP;TERM=MYTERM
```

If the group and/or account names are omitted, the proposed logon group and/or account name is substituted.

NOTE

If you specify a Termttype in your login string, that Termttype remains in effect until a `:BYE` command is issued. You can specify a Terminal Type by using a login string similar to the following:

```
:HELLO LEWIS.UDC,TERM=TT18
```

If this login is issued, Termttype 18 is used for the duration of the login session. Unless a Termttype is specified in the login string, the default Termttype is used for subsequent logins after a `:BYE` command is entered.

- Through the `;ENV=parameter` of the `:FILE` command, you can use your own terminal type file rather than the configured one for a printer. For instance,

```
:FILE OUTPUT;DEV=HP2631B;ENV=MY31TERM
```

- The `:FILE`, `:LISTF`, and `:BUILD` commands recognize the following file codes:

Mnemonic	Integer	Meaning
TTYPE	1177	The Terminal Type file.
TVFC	1178	The VFC file.

Application Programs

There is one change that involves how echo is handled whenever the terminal type is changed. Currently, terminal type 13 is defined as having echo off, and all other terminal types are defined as having echo on. Therefore, whenever you switch to terminal type 13, echo is turned off; when any other terminal type is selected, the echo is unaffected.

There may be applications that now turn off echo and then set the terminal type. In other words, these applications may depend on echo still being off after setting the new terminal type.

With the Workstation Configurator, whenever any terminal type is selected, the echo is set to the initial setting (whether it is on or off). If echo is set off and a new terminal type is selected, echo is turned on (if that terminal type is defined with echo initially on). For your application to function correctly, the program needs to be modified to select the terminal type desired first, and then set echo as desired.

EXECUTING THE TTUTIL PROGRAM FILE

SECTION

2

In order to create a Terminal Type file, modify an existing Terminal Type file, or inspect the data in an existing Terminal Type file, you must run the program file TTUTIL by entering the following command in response to the MPE colon prompt:

```
:RUN TTUTIL.PUB.SYS
```

NOTE

You must have OP capability to run TTUTIL. If you do not have OP capability, the program will abort.

When this command is accepted, TTUTIL is in control, and you see the following message displaying the version number.

```
HP30239X.XX.XX Workstation Configurator
```

```
(C) Hewlett-Packard Co. 1983
```

Then the screen blanks out, and after a few seconds the Main Menu is displayed (See figure 2-1).

OPTIONS TO EXECUTING TTUTIL

There are two options when running the program file TTUTIL.

- You can ONLY display the version number header and not run the program by entering:

```
:RUN TTUTIL.PUB.SYS,VERSION
```

- You can ONLY access VFC files independently of accessing the Terminal Type file by entering:

```
:RUN TTUTIL.PUB.SYS,VFC
```

```
[      ] Terminal Type File Name

[M] File option
    C - Create
    M - Modify
    V - View

-----

[F] Go to form
    F - Flow control
    S - Special characters
    T - Stripped characters
    C - Control
    M - Modem control
    P - Printer control
    V - VFC definition
```

Figure 2-1. TTUTIL Main Menu

In this and each succeeding menu, fill in the fields that appear in inverse video. Information can be entered only in these areas of the screen, called "unprotected fields", since the rest of the screen is protected against any modification. The cursor automatically moves to the next unprotected field when you reach the end of the present field, or if you press **TAB**. Press **ENTER** when all the appropriate fields have been filled in.

NOTE

Some of the unprotected fields may be already filled in. You may leave these default values if acceptable, or you may type new values or data over anything that appears on a menu in an unprotected field to select values other than the default.

FUNCTION KEYS

The keys labeled **F1** through **F8** on your terminal have special functions assigned to them by TTUTIL. Each key corresponds to the function keys displayed and labeled at the bottom of each screen menu. They are the same function keys for each menu. (For a description of each of the function keys, refer to table 2-1.) Any keys that are unlabeled are inactive.

NOTE

If you are running the program on an HP 264X terminal, the function keys will not appear on the bottom of the screen.

TABLE 2-1. MENU FUNCTION KEYS.

KEY	LABEL	FUNCTION
F1	SAVE DATA	Transfers data to the terminal type file. The data input is saved internally until this function key is pressed.
F4	REFRESH	Refreshes the current screen. It resets the terminal strap settings in case of a hard reset or power failure to the terminal.
F5	PREV FORM	Displays the previous menu, unless the Main Menu is being displayed, in which case there is no previous menu.
F6	NEXT FORM	Displays the next menu unless the last menu (VFC Information Menu) is being displayed.
F7	MAIN MENU	Displays the Main Menu.
F8	EXIT	Terminates the utility. If a file has been altered but not yet saved (by SAVE DATA), a warning message is printed; you may press EXIT again to terminate the utility without saving the changes.

FIELD FORMATS

When you fill in the fields for each menu, many of the fields need specific responses. The possible responses for many of the fields are entered with four different types of data.

Itemized Data

In some cases, the possible responses are listed, either at the right of the field description in parentheses, or in a list under the field with a short description of what each response means.

Numeric Data

- Any numbers entered should be integers only.
- Any fields that require a non-integer value are specified as fractional units, such as the delay times are in tenths of seconds; the number entered should be in multiples of one tenth second. Therefore, if you wish to specify the delay with three tenths of a second, you enter a 3 in the field.

Character Data

- All characters (control or printable) may be entered as a decimal or octal number. Decimal numbers are entered as a string of digits (such as 13 for carriage return) and octal numbers are preceded by a percent sign (such as %33 for an escape).
- Printable characters may be entered enclosing the character in single or double quotation marks, such as 'A' or ",",.

The quote character is entered by enclosing it in the opposite quotation marks, such as "" or ''.

The space is considered a printable character and would be entered in quotation marks, such as ' '.

- Control characters may be entered by their standard two or three character mnemonic, such as BS or DC1 (refer to Appendix B). They may also be entered by preceding the character with an up arrow or circumflex character. For example, backspace could be entered as ^H.

String Data

- A set or string of characters may be entered as a group of individual characters separated by commas. Each character may be entered in any of the above character formats. For example: 'A',BS,%33,^J.
- Several printable characters may be combined within a single set of quotes. For example: DC1,'XYZ',^H.

NOTE

For any single set of characters extending beyond a single input line, each of the first lines may be (but do not have to be) terminated by a comma and an ampersand (&) character. This is because output to these lines will contain the ampersand to indicate the set continues on the next line. However, you do not need to remove the ampersand before entering the modified data.

ENTERING INFORMATION

Once you have entered (or modified) information on a menu, you must press **ENTER** to send the information to the computer. TTUTIL operates in block mode, which means **ENTER** performs a function similar to that of **RETURN** in character mode. (In block mode, **RETURN** does nothing other than position the cursor at the beginning of each line.) The information just entered is then redisplayed.

NOTE

The **ENTER** key must be pressed to send the information entered before going to another menu.

At this point, the data entered is kept internally until you press the **SAVE DATA** (**F1**) function key. The data is then transferred to the Terminal Type file.

NOTE

The **SAVE DATA** (**F1**) function key only needs to be pressed after all the information on all the menus have been entered.

MOVING FROM MENU TO MENU

There are three function keys that allow you to access the different menus. If you wish to access a specific form through the Main Menu, simply press the **MAIN MENU** (**F7**) function key and it brings you back to the Main Menu where you can reach any other menu by entering a character. You can press the **NEXT FORM** (**F6**) function key to bring you through a loop of menus that are logically linked together. Also, pressing **PREV FORM** (**F5**) sends you backwards through the loop.

DETECTING ERRORS

TTUTIL can detect errors after you enter information with **ENTER**. It positions the cursor at the first field in error and displays an error message at the bottom of the screen. (For information on the recovery you should take in response to an error message, refer to Appendix A.)

After you correct the error and press **ENTER**, TTUTIL may detect other fields that are in error. This process is repeated until no further errors are encountered.

CORRECTING ERRORS

If you make an error, you can correct it by positioning the cursor under the wrong character(s) and typing the correct character(s).

After correcting the error, you must re-enter the corrected information by pressing **ENTER**. Once you have made all the corrections on a particular menu, you may move to a different menu to input more information, or save the information with the **SAVE DATA** (**F1**) function key.

Table 3-1 contains the names of the menus that appear in TTUTIL. This section defines and illustrates each menu, and provides a discussion of each field on the menu.

TABLE 3-1. TTUTIL MENUS

Menu Title	Page
Main Menu	3-2
Flow Control Menu	3-4
Special Characters Menu	3-6
Stripped Characters Menu	3-8
Control Menu	3-10
Modem Control Menu	3-12
Printer Control Menu	3-14
VFC Head Menu	3-16
VFC Information Menu	3-17

MAIN MENU

The Main Menu, see Figure 3-1, enables you to specify the following:

- the file name
- the file option
- the menu or form you want to modify

The screenshot shows a terminal window with a main menu. At the top, there is a shaded bar with the text "[] Terminal Type File Name". Below this, the menu is divided into two sections by a dashed line. The first section is titled "[M] File option" and lists three options: "C - Create", "M - Modify", and "V - View". The second section is titled "[F] Go to form" and lists seven options: "F - Flow control", "S - Special characters", "T - Stripped characters", "C - Control", "M - Modem control", "P - Printer control", and "V - VFC definition". At the bottom of the terminal window, there is another shaded bar.

```
[ ] Terminal Type File Name

[M] File option
    C - Create
    M - Modify
    V - View

-----

[F] Go to form
    F - Flow control
    S - Special characters
    T - Stripped characters
    C - Control
    M - Modem control
    P - Printer control
    V - VFC definition
```

Figure 3-1. Main Menu.

The Main Menu addresses the following fields:

- **Terminal Type File Name field.** This field contains the name for the Terminal Type file. You should input a valid file name for the file you want to create, modify, or view. Valid file names contain up to three parts, each of which contains from 1 to 8 alphanumeric characters, the first of which must be alphabetic. The file name must be in the following format:

filename[.groupname[.acctname]]

The default *groupname* and *acctname* are the logon group and account.

Before any other menu can be accessed, this field must contain a valid file name.

- **File option.** This field enables you to specify whether you want to create a new file, modify an existing file, or view the data in an existing file.

If you specify either M (Modify) or V (View), the information from the existing file is copied into the work area of the utility. To modify the file, you must have write access to the file. However, to view a file, you only need read access.

If you specify C (Create), a new file is created with default values and saved. The file is then automatically reopened through the Modify option.

- **Go to form.** This field enables you to specify the next form (or menu) to go to for Terminal Type information. The following menus can be accessed to create (or modify) a Terminal Type:
 - Flow Control
 - Special Characters
 - Stripped Characters
 - Control
 - Modem Control
 - Printer Control
 - VFC Definition

FLOW CONTROL MENU

The Flow Control Menu is the second menu. To select this menu, either type F in the last field of the Main Menu, or press the **NEXT FORM** (**F6**) function key from the Main Menu. The menu shown in Figure 3-2 is then displayed on your terminal.

FLOW CONTROL	
[Y]	Does driver use an enquiry/acknowledge protocol (Y,N) Characters: Enquiry [ENQ], Acknowledge [ACK]; Block size [80] Acknowledge time out option [1] 1 - send next block 2 - send another enquiry
[N]	Does driver use a delay protocol (Y,N) Delays: CR [], LF [], FF []
[Y]	Does driver use an XON/XOFF protocol (Y,N) [N] Timer enabled? (Y,N); [] Timer period (seconds)
[B]	Block mode support (N,L,P,B) Characters: Alert [DC2], Trigger [DC1] Network Delay Time (seconds): [10]
[DC1]	Read trigger character
[N]	Does driver resume the read with an XON after every echoed XOFF received (Y,N)

Figure 3-2. Flow Control Menu.

The Flow Control Menu addresses the following fields:

- **Does driver use an enquiry/acknowledge protocol.** This field enables you to select the ENQ/ACK protocol. If ENQ/ACK is enabled, then the enquiry and acknowledge characters must be entered; the block size must be entered in terms of the number of characters in each data block between enquiry characters; and the time out option must be entered by specifying one of the options listed to the side of the field. Valid block sizes are 1 to 255 characters.

The two options allow you to either send the next block of data or send another enquiry and begin the acknowledge wait cycle from the beginning.

If ENQ/ACK is disabled, then the fields are automatically cleared.

- **Does driver use a delay protocol.** This field enables you to specify the delay protocol. If delay is enabled, then each delay value must be filled in. Delay values are in tenths of seconds. For instance, if a one second delay is desired for LF, then 10 should be entered in the LF delay field. Valid delays are in the range of 0 to 31.

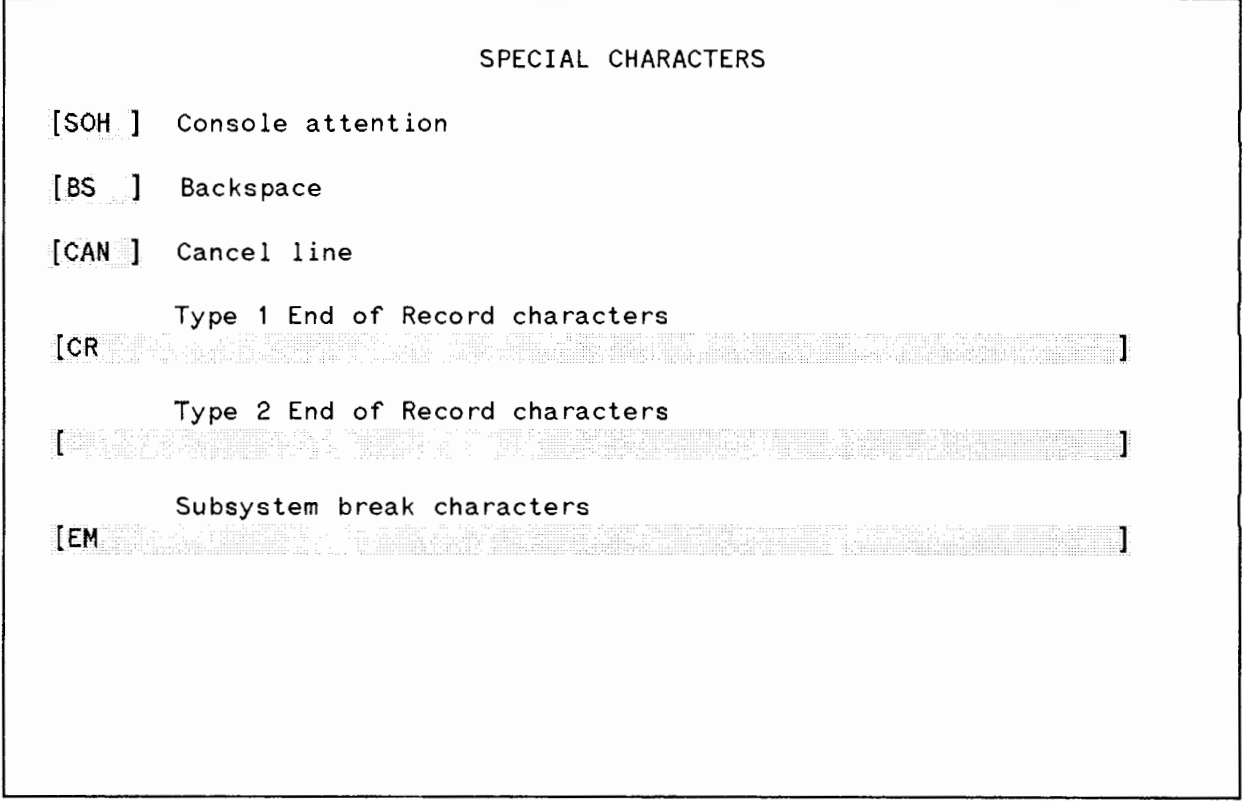
If delay is not enabled, the subfields are automatically cleared.

- **Does driver use an XON/XOFF protocol.** This field allows you to enable the XON/XOFF protocol. If XON/XOFF is enabled, you can specify whether a timer is started when the XOFF is received. You can also specify the length of the timer period, in seconds. Valid timer periods are in the range from 1 to 255 seconds.
- **Block mode support.** This field enables you to specify the type of block mode supported. The types of block mode available are None, Line, Page, or Both. If block mode is supported, you must enter values for the block mode trigger and alert characters, and for network delay time.
- **Read trigger character.** This field is an optional field which specifies the read trigger character. This character is used to signal the terminal device that the HP3000 is ready to receive data. If the field is left empty, then no trigger character is written by the driver at the beginning of a read.
- **Does driver resume the read with an XON after every echoed XOFF received.** This field enables you to specify whether the driver will send an XON to restart a read after an XOFF was received and echoed by the HP 3000. This may be necessary as an echoed XOFF can cause certain types of network devices to hang.

For further information on data flow control, refer to Part 2 and Part 4 in the *Point-to-Point Workstation I/O Reference Manual*.

SPECIAL CHARACTERS MENU

The Special Characters Menu is the third menu. To select this menu, either type an S in the last field of the Main Menu, or press the NEXT FORM () function key from the Flow Control Menu. The menu shown in Figure 3-3 is then displayed on your terminal.



The screenshot shows a terminal window with the title "SPECIAL CHARACTERS". Below the title, there are several menu items, each consisting of a character in brackets followed by a description. The items are: "[SOH] Console attention", "[BS] Backspace", "[CAN] Cancel line", "Type 1 End of Record characters" (indented), "[CR]" (with a long dotted line), "Type 2 End of Record characters" (indented), "[]" (with a long dotted line), "Subsystem break characters" (indented), and "[EM]" (with a long dotted line). The dotted lines represent the continuation of the menu items.

```

                                SPECIAL CHARACTERS

[SOH ] Console attention
[BS  ] Backspace
[CAN  ] Cancel line
      Type 1 End of Record characters
[CR ] .....
      Type 2 End of Record characters
[ ] .....
      Subsystem break characters
[EM ] .....
```

Figure 3-3. Special Characters Menu.

The Special Characters Menu addresses the following fields:

- **Console attention, Backspace, and Cancel line.** These three fields specify the console attention, backspace, and cancel line characters. These are required characters and may be input in any character format (refer to the discussion on Field Format in Section 2 of this manual).
- **Type 1 End of Record characters and Type 2 End of Record characters.** These two end of record (EOR) characters are optional. You can specify zero (0) or up to a maximum of eight EOR characters. For further information on the difference between Type 1 and Type 2, refer to the discussion on "The End-of-Record" in Section 1.
- **Subsystem break.** The subsystem break character is also optional. You do not have to specify any characters as subsystem break characters. You can specify a maximum of three subsystem break characters.

NOTE

If more than one character is specified for each field, they are separated by commas. (For further information, refer to the discussion on Field Format in Section 2 of this manual.)

STRIPPED CHARACTERS MENU

The Stripped Characters Menu is the fourth menu. To select this menu, either type T in the last field of the Main Menu, or press the **NEXT FORM** () function key from the Special Characters Menu. The menu shown in Figure 3-4 is then displayed on your terminal.

STRIPPED CHARACTERS

Are the following characters stripped from input data (Y,N)

[Y] XON and XOFF if handshake disabled (standard editing)

[N] XON and XOFF if handshake disabled (standard & transparent editing)

[Y] Subsystem break if disabled

[N] Console attention if disabled

Other characters stripped and ignored on input

[NUL,DEL

Figure 3-4. Stripped Characters Menu.

The Stripped Characters Menu addresses the following fields:

- **XON and XOFF if handshake disabled (standard editing).** If the XON/XOFF handshake is disabled, this field enables you to specify whether XON and XOFF characters are stripped from the input during character and block mode reads. Enter Y (YES) to strip the XON/XOFF characters from the data input, or enter N (NO) to allow XON/XOFF characters to be received as input data.

If XON/XOFF is disabled and an N is entered in the field, then XON/XOFF characters may be read as data.

- **XON and XOFF if handshake disabled (standard & transparent editing).** If the XON/XOFF handshake is disabled, this field enables you to specify whether the XON and XOFF characters are stripped from the data input during all reads, other than binary reads.
- **Subsystem break if disabled.** This field enables you to specify whether the subsystem break character should be stripped from the input buffer when subsystem break is disabled.
- **Console attention if disabled.** This field enables you to specify whether the console attention character should be stripped from the input buffer when the input device is not the console or when the console attention is disabled.
- **Other characters stripped and ignored on input.** This field enables you to specify an additional set of characters that you want stripped from the input. Characters in this set may not already have any other special significance.



CONTROL MENU

The Control Menu is the fifth menu. To select this menu, either type C in the last field of the Main Menu, or press the **NEXT FORM** () function key from the Stripped Characters Menu. The menu shown in Figure 3-5 is then displayed on your terminal.

CONTROL

[ON] Initial echo (ON,OFF)

[Y] Is form feed allowed in output data (Y,N)
Replacement character for form feed **[]**

[Y] Is line feed accepted in input data (Y,N)

[1] System response to backspace
 1 - nothing
 2 - end of medium
 3 - line feed
 4 - slash
 5 - erase character

[7] Number of data bits per character
 Default FOPEN parity **[NONE]**
 Parity sensed as odd (0), use **[NONE]**
 Parity sensed as even(1), use **[EVEN]**

Figure 3-5. Control Menu.

The Control Menu addresses the following fields:

- **Initial echo.** This field enables or disables the initial echo by entering the value ON or OFF. The value set takes effect whenever the Terminal Type is established. It occurs at speed sense or FOPEN time for the default Terminal Type or when the Terminal Type is changed through FCONTROL or FDEVICECONTROL (refer to Part 3 in the *Point-To-Point Workstation I/O Reference Manual*).
- **Is form feed allowed in output data. Replacement character for form feed.** These fields enable you to specify whether a form feed is allowed to be output to the terminal, and, if so, what that form feed character will be. If a form feed is not allowed then you must supply a character that replaces any form feeds (FFs) in the data stream. Typically, you should enter LF.
- **Is line feed accepted in data input.** This field enables you to accept a line feed in input data. A line feed (LF) in input is used to provide a wraparound for terminals that do not have an automatic wraparound at the end of each physical line. To input a line of data that is longer than the physical line of the terminal (and the terminal does not automatically wrap to the next line), simply enter a LF near the end of the line of data.

If this option is disabled, the LF will not have its wraparound function. The LF may be input as a data character or specified as having another special function if desired (such as being stripped).

- **System response to backspace.** This field enables you to specify the response to a backspace character. You should input a value as a digit ranging from one to five. The responses and their meanings are displayed to the right of the backspace response field.

In all cases, when echo is enabled the backspace is echoed to the device, which may cause some action to the device. Additional response from the system may be required for better cursor positioning.

Response 1 is used for standard CRT devices. There is no additional response necessary.

Response 2 is used for special CRT devices, which use the End of Medium (EM) character to reposition the cursor (such as the HP2600 terminal). The driver outputs an EM character to the device to reposition the cursor.

Response 3 is used for certain hard copy devices, which have reverse carriage motion. The response to the device is to output a line feed moving the carriage to a new position one line below the current typed line.

Response 4 is used for hardcopy devices that do not have reverse carriage motion. The response to the device is to output a slash and the deleted character.

Response 5 is used for standard CRT devices. The response to the device is to output a space and a backspace character, which erases the character from the display.

NOTE

If echo is disabled, then the selected responses will not occur.

- **Number of data bits per character.** This field enables you to specify the number of data bits per character. The number of data bits you can specify is either seven or eight data bits. If you specify seven data bits, then you must specify the type of parity (NONE, ODD, EVEN, 0's or 1's) for each of the three cases specified.

MODEM CONTROL MENU

The Modem Control Menu is the sixth menu. To select this menu, either type M in the last field of the Main Menu, or press the **NEXT FORM** ( 6) function key from the Stripped Characters Menu. The menu shown in Figure 3-6 is then displayed on your terminal.

NOTE

Changes made to this menu are not implemented until the system is initialized. You must perform a system shutdown and a coolstart to implement these changes. Refer to the *System Operation and Resource Management Reference Manual* for information on this procedure.

MODEM CONTROL

NOTE: The driver recognizes changes made on this screen only at system initialization.

[10] Wait time for FOPEN before disconnect (0..90 seconds or 99, 99=infinite)

[10] DTR minimum low time on disconnect (5..30 seconds)

Figure 3-6. Modem Control Menu.

The Modem Control Menu addresses the following fields:

- **Wait time for FOPEN before disconnect.** This field is applicable only for printer Termtypes and is used to specify the amount of time the ATP or ADCC maintains a connection after a listing is printed and will have to establish a new connection if an FOPEN occurs. If this field is set to 0, the ATP/ADCC driver immediately disconnects the connection after a listing is printed. If this field is set to a value greater than 0, the ATP/ADCC driver waits the specified number of seconds after printing a listing for an FOPEN before dropping DTR. This means that a

remote spooled printer on a modem port can be set up so that the connection is not dropped after each listing that is sent the printer. Either enter a value in the range of 0 and 90 seconds or enter a value of 99. If a number of seconds in the range of 0 through 90 is entered, the system will wait that number of seconds for an FOPEN to arrive before dropping the connection. If 99 is entered, the timer value is infinite and the timer is disabled.

- **DTR minimum low time on disconnect.** This field is applicable only for printer Termtypes and enables you to specify the number of seconds the ATP/ADCC driver holds DTR low after the previously described **wait time for FOPEN** timer expires. This field is useful when the default time of 5 seconds may not be long enough for the entire network to recognize the disconnect. Enter a value in the range of 5 through 30 seconds.

PRINTER CONTROL MENU

The Printer Control Menu is the seventh menu. To select this menu, either type P in the last field of the Main Menu, or press the **NEXT FORM** () function key from the Modem Control Menu. The menu shown in Figure 3-7 is then displayed on your terminal.

NOTE

Changes made to this menu are not implemented until the system is initialized. You must perform a system shutdown and a coolstart to activate these changes. Refer to the *System Operation and Resource Management Reference Manual* for information on this procedure.

PRINTER CONTROL

NOTE: The driver recognizes changes made on this screen only at system initialization.

[Y] Status Requests: Efficiency Mode enabled (Y,N)

[60] Wait time for reply to status request (5..180 seconds)

[10] Read retries for XON and status request reply (0..100 retries)

Figure 3-7. Printer Control Menu.

The Printer Control Menu addresses the following fields:

- **Status Requests: Efficiency Mode enabled.** This field is a user configurable option that enables you to enable/disable efficiency mode. When Efficiency Mode is enabled, status requests are made only at FOPEN, FCLOSE, and DCLOSE. Efficiency Mode increases performance over the connection by limiting the number of status checks over the connection. Enter Y (YES) to enable

Efficiency Mode, or enter N (NO) to permit the ATP/ADCC driver to perform status requests for every line of output sent to the printer.

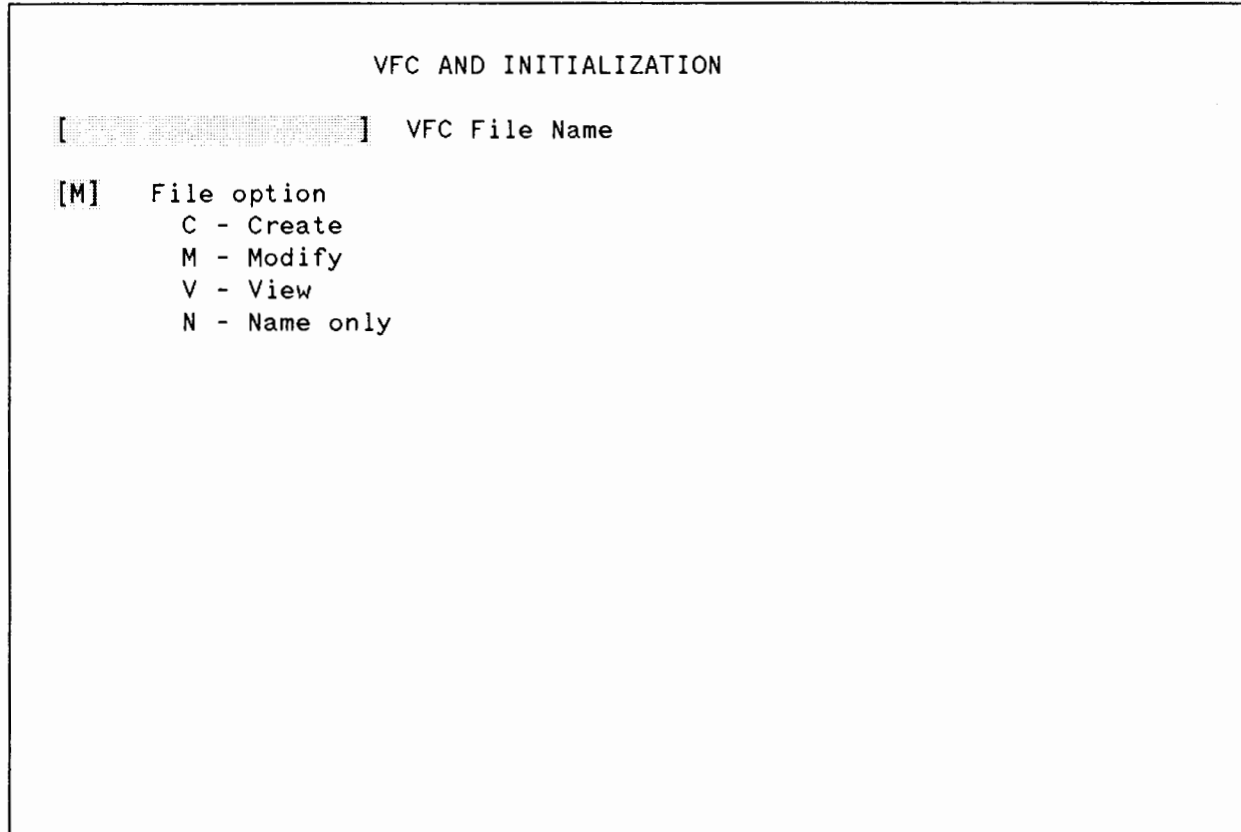
- **Wait time for reply to status request.** This field enables you to configure the wait time for a status request reply. Immediately after the timer expires, the connection is dropped. Enter a value in the range of 5 and 180 seconds to specify the amount time the driver will wait for a status request reply. You should specify a time that is long enough for the status request reply to return during peak periods of network traffic.
- **Read retries for XON and status request reply.** This field enables you to specify the number of read retries that are made when the wait timer expires. When the wait time for reply to status request timer expires, the ATP/ADCC driver sends a message to the console and restarts the read for the status request for as many attempts as are specified in this field. When the number of attempts is equal to this value, the printer I/O is aborted. Enter a value in the range of 0 to 100 to specify the number of read retries. If a value of 0 is entered, the printer I/O is aborted as soon as the timer expires.

NOTE

If you enabled an XON/XOFF protocol in the Flow Control Menu, the value you entered for the number of Read retries is also used to determine how many times XON reads are restarted.

VFC AND INITIALIZATION MENU

There are two VFC and Initialization Menus. The VFC Head Menu (see Figure 3-8) is used to specify the VFC file to be associated with the Terminal Type being modified.



```
VFC AND INITIALIZATION

[XXXXXXXXXXXX] VFC File Name

[M] File option
    C - Create
    M - Modify
    V - View
    N - Name only
```

Figure 3-8. VFC Head Menu.

The VFC Information Menu (see Figure 3-9) is used to enter information into the selected VFC file.

VFC AND INITIALIZATION			
[] VFC File Name			
[N] Is device to be initialized (Y,N)			
INITIALIZATION STRING			
[]			
[]			
[]			
[N] Is VFC defined for the device (Y,N)			
STRING	CODE	STRING	CODE
[]	%300	[]	%301
[]	%302	[]	%303
[]	%304	[]	%305
[]	%306	[]	%307
[]	%310	[]	%311
[]	%312	[]	%313
[]	%314	[]	%315
[]	%316	[]	%317

Figure 3-9. VFC Information Menu.

To create a new VFC file, you must select the VFC Head Menu by either typing V in the last field of the Main Menu, pressing the **NEXT FORM** (**F6**) function key from the Control Menu, or by running the TTUTIL program and specifying the following parameters:

```
:RUN TTUTIL.PUB.SYS,VFC
```

If a VFC file is already associated with the Terminal Type, the VFC Information Menu is displayed.

To change the VFC file associated with the Terminal Type file, press the **PREV FORM** (**F5**) function key from the VFC Information Menu, to return to the VFC Head Menu.

The first VFC menu addresses two separate fields.

- The first field specifies the file name of a VFC file to be associated with this Terminal Type.
- The second field allows you to specify how the VFC file will be accessed.

The following file options are available:

- C - Creates a new VFC file.
- M - Modifies an existing VFC file.
- V - Views data in an existing VFC file.
- N - Places the name of the VFC file in the Terminal Type.

Menus

file without accessing the VFC file.
(The **N** option is invalid when using the VFC entry point.)

The second VFC menu addresses three fields.

- The first field is a display only field; it shows the name of the VFC file selected.
- The second field is the initialization string with a maximum of 120 characters.
- The third field allows you to specify the VFC sequences with a maximum of 16 characters per VFC channel.

CONFIGURING THE TERMINAL TYPE

SECTION

4

Once the terminal type file has been created, you can configure the terminal type file onto your system through INITIAL or SYSDUMP. For further discussion of the Initial and Sysdump dialogue, refer to the *System Operation and Resource Management Reference Manual*.

Each program steps you through an interactive dialogue between you and the HP 3000 system. As the questions or prompts appear on your console, enter the appropriate replies through the console keyboard.

NOTE

In all responses, Y or N can be used for YES or NO. A carriage return (RETURN) is equivalent to NO.

Applicable portions of the dialogue are listed below.



STEP DIALOGUE

14 ENTER [TERM TYPE #],[DESCRIPTOR FILENAME]?

This question is asked only if the device type is 16 or 32 (subtype 14 or 15). To specify a default terminal type to be used at log on, enter one of the numbers listed in the *System Operation and Resource Management Reference Manual*.

To specify the created terminal type to be used at log on, you can enter the fully qualified filename in addition to or instead of the terminal type number. To specify both, enter the terminal type number followed by the filename separated by a comma.

When you enter your own terminal type, be aware of the following:

- If no account name is specified, SYS is assumed. If no group or account is specified, PUB.SYS is assumed.
- If you enter a terminal type number without a file name, the device operates with the characteristics from the default file for the terminal type number specified.

•
•
•

NOTE

Once you have responded to step 14, the next question that prompts you for any information on configuring a new terminal type file onto your system is step 49.

STEP DIALOGUE

49 TERMINAL TYPE CHANGES?

Enter YES if you plan to add, delete or change the terminal type file name specifications, then continue to step 50. Otherwise, enter NO; the dialogue skips to 57.

50 LIST TERMINAL TYPE FILES?

Enter YES for a list of Terminal Type Files and their associated logical devices. (This prompt appears regardless of whether any terminal type files have been specified.) The list of file names may look like the following:

FILE NAME		LOGICAL DEVICES
HP264X	.PUB .SYS	20,21,22,23,25,27
HP2631B	.TERMTYPE.SYS	24
MYTERM	.LEWIS .CIP	28

51 DELETE TERMINAL TYPE FILES?

Enter YES to delete the previously defined files, then continue to step 52. Otherwise, enter NO; the dialogue skips to 53.

52 FILES?

Enter the file names, separated by commas. If no account name is specified, SYS is assumed. If no group or account is specified, PUB.SYS is assumed. The FILES? prompt is repeated until you press **RETURN** with no file names.

53 ADD TERMINAL TYPE FILES?

Enter YES to define new terminal type files. Otherwise, enter NO; the dialogue returns to step 49.

54 FILE NAME?

Enter the fully qualified file name. If no account name is specified, SYS is assumed. If no group or account is specified, PUB.SYS is assumed. Otherwise, press **RETURN** to skip to step 56.

55 LOGICAL DEVICE NUMBERS?

Enter the logical device numbers of the devices which use the file name above, separated by commas. The prompt is repeated until you press **RETURN** with no logical device number. Control then returns to step 54.

56 LIST TERMINAL TYPE FILES?

Enter YES for a list of Terminal Type Files and their associated logical devices including any changes made in the above dialogue. Press **RETURN** and the dialogue skips to step 57.

57 CLASS CHANGES?

ERROR MESSAGES

APPENDIX

A

The error messages listed in Table A-1 may occur while entering data for a terminal type. The messages are displayed in inverse video on the bottom line of the display screen. If the error(s) are related to a field (or fields) of the display menu, then the fields are highlighted in full bright, inverse video. If more than one field contains an error, only the error message for the first highlighted field is displayed.

TABLE A-1. ERROR MESSAGES.

MESSAGE	CAUSE	RECOVERY
Cannot do both ENQ/ACK and DELAY.	You have input Y for both ENQ/ACK and DELAY selection, but only one may be selected.	Select only one of the two options.
Character already has other function.	The character entered has been defined elsewhere to have a different special meaning. Each character may have only one special function.	Choose a different character for this special function, or release this character for use by selecting a different character for the other special function.
Character value out of range.	The character input was out of range of the characters allowed for that function.	Input a character within range.
File is damaged; checksum error.	The file has been damaged so that the checksum is no longer correct. The utility will still read the data from the file into the work area, and when saving the data back to the file, a correct checksum will be generated.	You must press (ENTER) again to go to the form selected. All data should be checked for correctness.
File is not a valid VFC file.	The file name specified for the VFC file is not a valid VFC file.	Specify a file which is a VFC file.
File is not a valid terminal type file.	The file specified is not a valid terminal type file.	Specify a file which is a valid terminal type file.

TABLE A-1. ERROR MESSAGES (continued).

MESSAGE	CAUSE	RECOVERY
Invalid file name.	The file name specified does not meet the requirements for an HP 3000 file name. It may be because the name starts with a non-alphabetic character or contains non-alphanumeric characters.	Enter a valid file name.
File System Errors.	If a file system error occurs in attempting to open the file specified, the file system error message will be displayed in the error window.	
Invalid file option.	The file option given was not one of C, M, or V.	Enter one of the correct file options.
Invalid form identifier.	The letter entered in the form specifier field is not one of the known form identifiers.	Enter one of the listed form identifiers in the field.
Invalid number.	You attempted to input a character in numerical format, but the number was not an integer.	Input a valid number. Refer to the discussion on "Field Formats" in Section 2.
Maximum number of nn characters allowed is nn.	You have input more than the maximum allowed number of characters for the specified function.	Reduce the number of characters input to less than or equal to the maximum specified in the error message.
Missing character.	In the input of a string, the program is expecting another character, but none follows. This is most likely caused by two commas in a row, or a comma at the end of a line without the ampersand.	Remove the extra comma, or insert the appropriate character.

TABLE A-1. ERROR MESSAGES (continued).

MESSAGE	CAUSE	RECOVERY
Modification of data is not allowed.	You pressed (ENTER) for a menu after choosing the View file option. In View mode, modification of data is not allowed.	Use only the soft keys.
Number of bits may be only 7 or 8.	The field requires a value of either 7 or 8, but some other value was entered.	Change the value to either 7 or 8.
Response must be in the range from nn to nn.	The field contains a value that is not within the range specified.	Enter a value within the correct range.
Response must be None, Line, Page, or Both.	The field requires N, L, P, or B as a valid response, but a different value was input.	Change the value to N, L, P, or B.
Response must be ON or OFF.	The only valid values for this field are ON and OFF, but some other value was entered.	Change the value to either ON or OFF.
Response must be YES or NO.	The field requires either a Y or an N as a valid response, but a different value was input.	Change the value to a Y or N.
The field can only contain digits.	The field is designed to accept only positive integers. The value entered contains characters other than digits.	Enter a positive integer for the field.
The required field is empty.	The specified field requires a value and no value was input.	Enter a value in the field.
There is no next form.	The NEXT FORM function key was pressed while at the last form menu, and therefore there is no next form.	Do not use the NEXT FORM function key at the last form.
There is no previous form.	The PREV FORM function key was pressed while at the Main Menu, or when the VFC option was selected (RUN TTUTIL.PUB.SYS). There is no previous form.	Do not use the PREV FORM function key at the Main Menu, or when you selected the VFC option.

TABLE A-1. ERROR MESSAGES (continued).

MESSAGE	CAUSE	RECOVERY
There is no VFC defined.	You specified V for the View file option and to go to the VFC Menu, but this terminal type file does not have a VFC file associated with it.	Specify a different menu.
This key is invalid when no file is selected.	The function key used is invalid when no file has been specified.	Specify a file name first, or use a valid function key.
This option is invalid when no terminal type is defined.	You used N, the Name Only option, when using the VFC entry point, therefore there is no terminal type file to store the name.	Enter another option (C, M, V) in the VFC Head Menu.
This option cannot be selected. The termtyp currently displayed is not a printer termtyp file.	The indicated field(s) contain invalid data.	Either blank out the indicated fields or go to another screen. Enter another option (C, M, V) in the VFC Head Menu.
This option cannot be changed. The termtyp currently displayed is a Network Printer termtyp file, and this option is non-configurable for this type of file.	You attempted to modify a Termtyp whose attributes cannot be reconfigured.	You should enter the previous value of the indicated fields once again, or go to another screen. Enter another option (C, M, V) in the VFC Head Menu.
Unknown character.	The character input does not match one of the accepted character input formats, or the character mnemonic cannot be found in the recognized list.	Input a valid character.

TABLE A-1. ERROR MESSAGES (continued).

MESSAGE	CAUSE	RECOVERY
Unknown character input format.	You attempted to input a character, but the character could not be determined.	Input a valid character.
Unknown string input format.	You attempted to input a string, but the input cannot be decoded.	Input in the correct string input format.
User does not have write access to file.	You specified M, for the Modify file option, but you do not have write access to the file. Therefore you cannot modify it.	Specify a different file, or use the View option.
WARNING: data not saved.	You tried to exit or specify another file name after modifying the current file but without saving the modifications made.	Press SAVE DATA if you want to save the modifications. If not, you may press either EXIT, or ENTER a second time, to perform the desired operation.

CONTROL CHARACTERS MNEMONICS

APPENDIX**B****TABLE B-1. CONTROL CHARACTER MNEMONICS.**

MNEMONIC	OCTAL	CHARACTER	MEANING
NUL	0	^@	Null
SOH	1	^A	Start of Heading
STX	2	^B	Start of Text
ETX	3	^C	End of Text
EOT	4	^D	End of Transmission
ENQ	5	^E	Enquiry
ACK	6	^F	Acknowledge
BEL	7	^G	Bell
BS	10	^H	Backspace
HT	11	^I	Horizontal Tabulation
LF	12	^J	Line Feed
VT	13	^K	Vertical Tabulation
FF	14	^L	Form Feed
CR	15	^M	Carriage Return
SO	16	^N	Shift Out
SI	17	^O	Shift In
DLE	20	^P	Data Link Escape
DC1	21	^Q	Device Control 1
DC2	22	^R	Device Control 2
DC3	23	^S	Device Control 3
DC4	24	^T	Device Control 4

TABLE B-1. CONTROL CHARACTER MNEMONICS (continued).

MNEMONIC	OCTAL	CHARACTER	MEANING
NAK	25	^U	Negative Acknowledge
SYN	26	^V	Synchronous Idle
ETB	27	^W	End of Transmission Block
CAN	30	^X	Cancel
EM	31	^Y	End of Medium
SUB	32	^Z	Substitute
ESC	33	^[	Escape
FS	34	^\ ^\\	File Separator
GS	35	^]	Group Separator
RS	36	^^	Record Separator
US	37	^-	Unit Separator
DEL	177		Delete

TERMINAL TYPES

APPENDIX

C

Table C-1 describes the available Terminal Types and the terminal attributes associated with these Terminal Types:

TABLE C-1. TERMINAL TYPES.

Term Type	ENQ ACK	XON/XOFF	Sys. Delay	Typical Workstation	Block Mode	Backspace Reply	Comments
4	No	Opt	No	Datapoint	No	Ctrl-Y	Series 39/4X/6X Subtypes 0,1.
6	No	Opt	Yes	Non-HP Hardcopy Term.	Yes**	LF	May not support DC1/DC2 handshake
9	No	Opt	Yes	Non-HP CRT Terminal	No	None	ESC A through E, ESC H, I, and J are stripped.
10	Yes	Opt	No	General HP CRT Term. (HP 264X, HP 262X)	Yes *	None	
12	Yes	Opt	No	HP 8-Bit CRT on ATC (2645K)	Yes *	None	
13	No	Opt	No	Telenet "pseudo terminals"	No	None	No echo.
15	Yes	Opt	No	HP-Hardcopy (8-bit)	Yes**	LF	May not support DC1/DC2 handshake
16	Yes	Opt	No	HP-Hardcopy (7-bit)	Yes**	LF	May not support DC1/DC2 handshake
18	No	Opt	No	Non-HP terminal	No	None	No DC1 send to start read. No status checking.
19	No	Yes	No	Serial spooled printer.	N/A	N/A	Uses 7-bits. Status request on FOPEN, FCLOSE, DCLOSE, FWRITE, and XOFF.

+ The HP 2635B and most non-HP terminals do not support the DC1/DC2 handshake.

* Block mode may be enabled by escape sequences sent by an application program.

TABLE C-1. TERMINAL TYPES (continued).

Term Type	ENQ ACK	XON/XOFF	Sys. Delay	Typical Workstation	Block Mode	Backspace Reply	Comments
20	No	Yes	No	Serial spooled printer. (HP 2631B, HP 293X)	N/A	N/A	Uses 8 bits. Status request on FOPEN, FCLOSE, DCLOSE, FWRITE, and XOFF.
21	No	Yes	No	Serial spooled printer. (HP 2631B, HP 293X)	N/A	N/A	Uses 7 bits. Status request on DCLOSE, FCLOSE, FOPEN, and FWRITE
22	No	Yes	No	Serial spooled printer. (HP 2631B, HP 293X)	N/A	N/A	Uses 8 bit pass-through. Status request on FOPEN, FCLOSE, DCLOSE, and FWRITE.
26	No	Yes	No	Serial spooled printer. (HP 2631B, HP 293X)	N/A	N/A	Status request on FOPEN, FCLOSE, and DCLOSE.
TTPCL18	No	Yes	No	Non-HP Terminal.	N/A	N/A	No DC1 sent to start read. No status checking.
TTPCL19	No	Yes	No	PCL Serial Spooled Printer.	N/A	N/A	Uses 7-bits. Status request on FOPEN, FCLOSE, DCLOSE, FWRITE, and XOFF.
TTPCL22	No	Yes	No	PCL Serial Spooled Printer.	N/A	N/A	Uses 8-bit pass-through. Status request on FOPEN, FCLOSE, DCLOSE, and FWRITE.
TTPCL26	No	Yes	No	PCL Serial Spooled Printer.	N/A	N/A	Status request on FOPEN, FCLOSE, and DCLOSE.
TT7550	No	Yes	No	HP 7550A Plotter	N/A	N/A	7550A plotter only.

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