DesTerm 128 V3.02 User Guide

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Introduction

Before you use DesTerm for too long, please take the time to familiarize yourself with the contents of this User Guide. DesTerm has a whole host of features to help you telecommunicate - if you know how to use them. The Guide is divided into sections that will explain how to perform specific tasks:

Starting DesTerm

To start DesTerm, load the file DESBOOT and run it. For example, if your drive is device number dd, the command is:

RUN"DESBOOT",Udd

You may prefer to use other methods:

DOS2.0:   **LOAD"DESBOOT",**dd
                 RUN

DOS7.0:   **DLOAD"DESBOOT",U**dd
                 RUN

JIFFYDOS: **@#**dd
                 ^DESBOOT

When the DESBOOT program runs, it will display an opening banner and start to 'explore' your '128. When the boot program has finished looking for peripherals, it displays the results.

Next, the boot program loads the various files that comprise DesTerm 128 V3.02. These files are:

RS-232 Driver	Main DesTerm Code	DesTerm Configuration
Character Set	User Settings	Function Keys
Telephone Numbers	Keyboard Tables	Transfer Protocol
Buffer Editor	Terminal Emulation	Modem Configuration

A yellow arrow indicates which file is currently being loaded. If the load is successful, a green 'check mark' or 'tick' is displayed next to it. If the load is not successful, a red 'X' symbol is displayed. Certain files are more important to DesTerm than others, if these files cannot be loaded, DesTerm will display a flashing red message at the bottom of the screen and halt the system.

NOTE:

If you do not think that the information displayed is correct, then perhaps the boot program has an error. Refer to the 'Reporting Bugs' section for details on how to let me know.

TIP:

DesTerm can load rather quickly from Hard Drives and Ram Disks - making it rather difficult to read all the information. The Main DesTerm code will not start if either the Left-Shift key or the Shift-Lock key is pressed. So, to give yourself more time to read the information on the startup screen, press the Shift-Lock key just after the boot program starts to run. To continue with the main DesTerm program, press the Shift-Lock key again.

The Status Line

The top line of the DesTerm terminal screen is the Status Line. It provides at-a-glance information about the status of the terminal. The Status Line is broken up into several fields:

```
              A    B    CD E F  G    H       I     J K    L  M  N  O PQRS
Desterm128 V3.02 LEDS:OOOO ANSI-25W B:C:001/777 00:00:00 C38.4-N-8-1-F TRCX
```

A VT102 terminals have 4 LEDS that can be turned on and off. DesTerm displays these LEDS here. **O** means off. ***** means on.

B The current terminal emulation mode.

C The number of screen lines.

D Line Wrap Mode: **W**: enabled. **N**: disabled.

E Buffer Mode: **B**: buffer (capture), **S**: send (Transmit).

F Buffer Operation: **C**: closed, **O**: open.

G Current Line (Block) Number in buffer.

H Total Line (Block) Number.

I Time. Either Online Time or Time Of Day.

J   If the modem is connected (online) then a '**C**' appears here.

K   The current speed.

L   The current parity setting (**N**: none, **E**: even, **O**: odd, **M**: mark. **S**: space).

M   The current number of bits.

N   The current number of stop-bits.

O   The local echo mode (**F**: no-echo (full-duplex), **H**: echo (half-duplex)).

P   The status of the DTR (out) signal. **T** means DTR is asserted (normal).

Q   The status of the RTS (out) signal. **R** means that RTS is asserted (normal) and that DesTerm is able to accept characters.

R   The status of the CTS (in) signal. **C** means that CTS is asserted (normal) and that the remote computer will accept characters.

S   If Xon/Xoff is being used and this character is **X** then it is an indication that DesTerm has been told to stop transmitting

The Basics...

OK, DesTerm started, you see the status line, tab ruler and a cursor flashing at you. Now what? From the terminal screen, the menu system is accessed by pressing the *CONTROL* and *RUN-STOP* keys simultaneously. The menu is displayed, with the current item highlighted. The current item can be changed by using the Cursor Up and Cursor Down keys (either set will do). Pressing the *RETURN* key will select the current item.

You will notice that certain items have single characters highlighted. You can quickly select a certain menu item by pressing that character (upper and lower case are not distinguished between).

Menus are a very user-friendly method of navigating DesTerm. After some use, it may be a little more convenient to use Hotkeys. Hotkeys are 'shortcuts' to specific menu items. Hotkeys are accessed by pressing the *ALT* key or *C=* key together with an alphabetic key. For a list of the hotkey sequences available, press the *HELP* key.

Supported Hardware

DesTerm supports a wide range of peripherals designed for the Commodore 128. DesTerm is compatible with the following devices:

Ram Expansion:

REU: Both Commodore and CMD units can be used by DesTerm as Super-Fast RamDisks. Many users have expanded their REUs by adding memory chips. DesTerm supports REUs up to 2 Megabytes. (Larger devices will work, but memory above 2 Mb won't be used).

Clock Units:

RTC: The Real Time Clock chips supplied by CMD for use in their RamLink and HardDrive units.

SmartWatch: The SmartWatch is a chip sold by Radio Shack that some people have adapted for use with their Commodore 128.

Disk Drives:

1581:   The sub-partitions used on the 1581 can be accessed in DesTerm.

CMD Drives: The CMD RamLink and HardDrive units are both fully supported by DesTerm. Multiple partitions and directories can be accessed for 'native mode' partitions.

NOTE: If you have both an REU and RamLink, it is recommended that you purchase the RLDIRECT upgrade chip - this will allow you to use the super-fast DesTerm REU-RamDisk and the RamLink at the same time.

Serial Communication Cartridges:

SwiftLink: The SwiftLink can be used by DesTerm at all available speeds.

Turbo232:   The Turbo232 can be used by DesTerm at speeds up to 115200 baud.

HART: The HART cartridge can be used by DesTerm at all available speeds.

NOTE1:   The above devices must be configured to use the NMI interrupt, but can be located at D700, DE00 or DF00.

NOTE2:   Several people have published schematics for hobbyist projects that 'clone' the above devices. These have not been tested, but should work.

Joysticks and Mouses:

1351 Mouse: The 1351 can be used to navigate menus and (depending on User Settings) send cursor positioning codes over the modem. The left mouse button acts as the *RETURN* key. The right button acts as the *CONTROL/RUN STOP* key.

1350 Joymouse: The 1350 can be used to navigate menus and (depending on User Settings) send cursor positioning codes over the modem. The left mouse button acts as the *RETURN* key. The right button has no function.

Joysticks: Any regular joystick can be used to navigate menus and (depending on User Settings) send cursor positioning codes over the modem. The fire button acts as the *RETURN* key.

Quick loaders:

Unlike previous versions of DesTerm, DesTerm 128 V3.02 uses standard Kernel calls for all disk/printer access. Any quick loader that wedges properly into the Kernel will work with DesTerm. RAM-based schemes will probably be overwritten by the DesTerm code. JiffyDos by CMD has been extensively tested and is highly recommended.

About Disk Devices and Unit Letters

In order to simplify the organization of your disk drives a little easier, DesTerm refers to disk units by drive letter (in a similar fashion to DOS). Eight drive letters are available - A to H. Upper and lower case are not distinguished between. During configuration, each drive letter is can be assigned to a disk drive (or the DesTerm REU RamDisk). For devices that support them, partition and directory information is also assigned (1581, CMD RamLink and CMD HardDrive). Any time that a filename is needed in DesTerm, you can prefix it with a drive letter to specify which disk drive to use. Certain operations in DesTerm have default drives they use. They default drives and their use are as follows:

DesTerm Drive: This is the drive where the main DesTerm executable and all related files are stored. Terminal emulations, Transfer protocols, Buffer handlers and configuration files are all found here. Under normal circumstances, this will be the A: drive.

Download Drive: Download protocols that do not first request a filename (Zmodem, Ymodem etc) will always save the files to this drive. Protocols that request a filename will save to this drive unless a drive letter is prefixed.

Upload Drive: Unless a drive letter is specified in the filename or pattern used for upload, this drive will be used.

Buffer Drive: Buffer saves and loads will be performed to and from this drive, unless a drive letter is specified.

When DesTerm first loads. it automatically stuffs the boot device number into the device number for the A: drive. This ensures that the rest of the DesTerm files can be found where expected.

Configuring Your Disk Drives

The **Disk Functions** menu is accessed as the second item in the main-menu or by using the *ALT O* hotkey.

Defining your drives

You will want to assign your drives based upon the hardware you have. Usually, you will assign a drive letter to each of the physical drives on your system. If you have a drive that supports multiple partitions/directories, then you will likely assign drives to be varying partitions and directories on the one device.

Drives are assigned using the "**Define Devs**" menu item. When selected, this item will display a second menu that allows you to select the drive that you wish to assign. When you select the drive you wish to define, DesTerm will prompt you for up to three things:

Device number: Commodore Serial Device number in the range **8**-**24**, or **REU** for the DesTerm RamDisk.

Drive/Partition: The partition number. This is only prompted for if the device supports multiple partitions (CMD RamLink and CMD HardDrive). The default is **0** meaning 'current partition'. This is so that the first time DesTerm boots, the correct partition will be used to locate all the files. You should ALWAYS change this number to the real partition-id of the partition in which the DesTerm files are located.

Path: The path specification. This is either the 1581 "sub-partition name" or the CMD RL/HD "directory path". Leave blank or use **//** for the root directory/sub-partition.

Assigning the default drives

The next job is to assign the default drives. There are four menu items, one for each of the default drives used: **Desterm Drv**, **Download Drv**, **Upload Drv** and **Buffer Drv**. When any of these items is selected, you will be prompted for which drive (**A**-**H**) to associate with it.

NOTE: If the drive you choose is not available, the old drive will remain.

Disk Functions: Selecting a new current drive

You will notice that the Disk Operations menu has a fairly complete set of disk utility functions listed in it. Unless overridden by a drive-letter prefix, all operations in the Disk Operations menu are performed on the 'current drive'. The current drive is shown in the **Disk Status** window. The current drive is changed with the **Pick Drive** menu item. When this item is selected, another menu is presented that lets you select a new current drive from either one of the four default drives or from drives **A**-**H** directly. When DesTerm starts, the current drive is set to **A**:.

Using an REU as a DesTerm Drive

As with previous versions of DesTerm, V3.02 has a built in, super fast RamDisk. As fast as devices such as the RamLink are,

the DesTerm RamDisk is much faster. It now supports REUs of up to 2 Mb in size (hobbyists have been performing surgery on their own REUs for years to increase the capacity - CMD recently started selling the 1750XL REU - an REU with 2 Mb straight out of the box - cool!). In order to use the REU as a RamDisk, DesTerm must be 'given permission' to write to it. This is to prevent other data being overwritten by mistake. Select the **Ram Format** menu item and choose **Format as RamDisk** from the resulting menu to enable DesTerm to get control of the REU. Next, select an unused drive letter to be used for the RamDisk. Now that we have a drive letter assigned to the RamDisk, we need to format it (just like any other new disk). Use **Pick Drive**, to select the newly created drive letter. Verify that you have chosen the correct drive by examining the Disk Status line at the bottom of the screen. Next, select **Format Disk**. For the RamDisk, the name is ignored - just type a few characters - it doesn't matter what (a blank disk-name will abort the format). When you press return, you will a menu will pop-up to verify that you really want to go ahead. Assuming that you do, select **Yes, do it**. The Disk Operations menu will disappear (it does for Format and Validate operations, which on real disk drives can take a long time). Re-enter the Disk Operations menu - you will notice that the RamDisk now behaves like any other disk drive.

Example drive configuration:

Suppose your system consists:

Commodore 1581, unit 8.
Commodore 1571, unit 9.
CMD HardDrive, unit 12: with the following layout:

partition #1:	**utilities/**
partition #2:	**desterm/**
	desterm/buffer/

CMD RamLink, unit 16: with the following layout:

partition #1:	**uploads**

REU, configured as the DesTerm RamDisk.

In this case, you could configure your drives as so:

A: Unit 12	Partition 2	Directory **//**
B: Unit 12	Partition 2.	Directory **//buffer/**
C: Unit 16	Partition 1.	Directory **//**
D: Unit REU		
E: Unit 8		Directory **//**
F: Unit 9		

And then configure the default drives as follows:

DesTerm Drive:	**A:**	(Permanent)
Download Drive:	**D:**	(Really fast downloads)
Upload Drive:	**C:**	(Available outside DesTerm, fairly fast uploads)
Buffer Drive:	**B:**	(Permanent)

Remember, the other drives and partitions are available at any time by prefixing any filename with the appropriate letter.

Configuring DesTerm For Your Interface & Modem

There are several factors to take into account when configuring DesTerm for use with your modem: The capabilities of the serial interface you are using, the capabilities of the modem you are using and the capabilities of the service you will be calling.

With serial communications, there are three steps to getting data from one computer to another: The local computer-modem interface, the modem-modem interface and the remote modem-computer interface. In most cases, we are only concerned with the local computer-modem interface and perhaps with the modem-modem interface. The **Protocol Settings** menu item configures the format of data used to speak to the modem. The **Modem Settings** menu item describes properties of the Modem itself.

Protocol Settings

The items in this menu describe the format of the data bytes sent to the modem, and how flow control is to be performed. It is important that these settings match those of the computer that you are trying to communicate with.

Baud Rate	The speed in Bits Per Second (BPS) that characters are sent to the modem. The choices vary depending on the interface that you are using.
Data Bits	The number of bits to send in a data byte. The choices are **8** (256 characters) or **7** (128 characters). Most

	systems use 8 bits.
Parity Mode	Parity is a method of error detection. Most systems use no parity, but it can be:
None	no extra bit is added.
Odd	A '1' or '0' to make the total number of 1's in the byte an odd number.
Even	A '1' or '0' to make the total number of 1's in the byte an even number.
Mark	Always a '1'.
Space	Always a '0'.
NOTE:	DesTerm will always generate the correct parity for bytes that it sends. It doesn't check incoming parity - it just isn't that useful!
Stop Bits	The stop bit is the method that asynchronous RS232 uses to distinguish between the end of one byte and the start of another. There can be **1** or **2** stop bits. Most systems use 1 stop bit.
Flow Control	There are three methods for temporarily halting transmission of characters:

	None	The local computer must handle the characters as fast as the remote computer sends them. Not a very good idea, really.
	Xon/Xoff	A special character (Xoff) is transmitted by the local computer to inform the remote computer to stop. When the local computer is ready to accept characters, it sends another character (Xon). Though this method is better than nothing, it suffers from the time it takes for the character to get from one computer to the other.
	RTS/CTS	The local computer signals (RTS) the local modem to stop sending data (which is almost immediate). The local modem then tells the remote modem to stop, which will then tells the remote computer to stop. When the local computer is ready to accept more characters, it signals the computer, which starts sending the data again. CTS is the same, but works from the remote computer to the local. This method of flow control should be used whenever possible.

Threshold	This is the number of characters that are allowed to be in the 256 byte input buffer before DesTerm will signal using RTS. Values range from **128** (half full) to **248** (almost full). If your modem continues to send a few extra characters after RTS is lowered, you may wish to use a lower value.
Mask High Bit	DesTerm can be instructed to only treat the lowest 7 bits of an incoming byte as significant (ignore the 8th bit). This can occasionally cure mismatches in data length and parity settings between two computers.
Local Echo	On most systems, the remote computer will 'echo' any characters that it receives back to you - so you can see what you are typing. Some systems don't - they require you to display your own characters. This feature is often known (incorrectly) as half duplex.
Local Only Mode	This feature specifies whether data bytes are sent to the modem or not:
	RS232 On Characters are sent to the modem as you would expect.
	RS232 Off Characters are not sent to the modem. This mode is usually used in conjunction with 'Local Echo'.

Modem Settings

This menu deals with the details of your modem. You will probably need the manual for your modem so you may tell DesTerm the codes it should send.

RS232 Type	This option only applies to modems and interfaces that plug into your User Port. DesTerm will ignore these settings if a SwiftLink, Turbo232 or HART is detected.

	Cheap RS232	Some home-grown (and cheaper commercial) modem interfaces don't properly invert certain control signals. This option allows DesTerm to function properly with these interfaces.
	Proper RS232	This option is for serial interfaces (such as the VIC 1011A) that support the proper RS232 signal polarity.
	Commodore 1670	You have a Commodore 1670 modem.
	Commodore 1650	You have a Commodore 1650 or compatible modem.
	Commodore 1660	You have a Commodore 1660 or compatible modem.

Hayes Setup	These options only apply to Hayes compatible modems (most non-Commodore modems are Hayes compatible). The Commodore 1670 is also Hayes compatible. Set the following items to best suit your modem:

	Max Baud Rate	DesTerm should communicate with your modem at the highest speed that both DesTerm and the modem support. This option is used when DesTerm dials a phone number for you.
	Set Connect Rate	Most modems today are able to fix the speed at which they speak to the host computer. (They always speak to the host computer at the same speed, regardless of the speed that it is communicating to the other modem at) If your modem is capable

		of this feature, enable it, and set this option to 'No'. If your modem will adjust the communication speed to match that of the modem-modem speed, set this option to 'Yes'.
	`Init Sequence`	This is the sequence of characters that DesTerm sends to the modem in order to initialize it. NOTE: See the 'DesTerm Meta-Characters' section for details about sending control characters and including pauses.
	`Hangup Sequence`	This is the sequence of characters that DesTerm will send to the modem in order to hang-up the phone. NOTE: See the 'DesTerm Meta-Characters' section for details about sending control characters and including pauses.
	`Dial String (1-3)`	A Dial String is a sequence of characters sent to the modem just before the telephone number. DesTerm allows three Dial Strings to be defined. This allows slightly different commands to be used under differing circumstances.
	`Connect xxxxx`	If your modem does not support a fixed communication speed, you will need to inform DesTerm what responses the modem sends when a connect is made at varying speeds. Speeds above 19200 are not listed, since all modems that operate at 19200 and above are able to fix the communication speed.
	`Busy`	This should be set to the response that the modem gives if the desired phone number.
	`No Carrier`	This should be set to the response that the modem gives if the modem connection is lost.
	`No Dial Tone`	This should be set to the response that the modem gives if there is no-dial tone.
	`No Answer`	This should be set to the response that the modem gives if the remote modem does not answer.
	`Voice`	This should be set to the response that the modem gives if the modem detects that a human has answered the phone.
	`Error`	This should be set to the response that the modem gives if an error is reported.
	`Ring`	This should be set to the response that the modem gives if the modem detects an incoming call.
Resend Init		This menu item will simply re-send the modem initialization string (`Init Sequence`) to the modem.
Tune Bit In		See the 'Tweaking the DesTerm RS232 Serial Routines' section.
Tune Bit Out		See the 'Tweaking the DesTerm RS232 Serial Routines' section.
Tune Half Bit		See the 'Tweaking the DesTerm RS232 Serial Routines' section.
Save Config		This option allows you to save the configuration for your modem. The name is usually `modem.mdm`, but if you use more than one modem, you may like to use a different name for each (each name must end with '`.mdm`').

Tweaking the DesTerm RS232 Serial Routines

These three options have no effect if a SwiftLink, Turbo232 or HART is detected. DesTerm includes high performance RS232 routines. Many hours were spent in front of an oscilloscope fine-tuning these routines to give accurate speeds of up to 9600 bps. Several modems were tested, and during this time, we noticed that some modems idea of the correct speed was off - we even discovered that the timing on some modems changed depending on how hot they were. The three menu items here allow minor adjustment of the timing that DesTerm uses - in the hopes that reliable communication can still be achieved with a less-than-perfect modem. For each speed (up to 9600, though more are listed), the timing that DesTerm may be modified in increments of 1% from -5% to +5%. When DesTerm transmits a character, it uses a timer to know how long each bit should last. When DesTerm detects an incoming character (the start bit) , it uses a timer to calculate when to examine the incoming bit. Hopefully, the incoming bit will be sampled exactly in the middle of the incoming bit. This initial time should be equal to 1.5 bit times (the start bit, followed by half of a bit). For the rest of the data byte, the incoming bits are sampled 1 bit time apart.
Thus, the three parameters that can be changed are:

	`Tune Bit In`	Adjusts the time an incoming bit is expected to last.
	`Tune Bit Out`	Adjusts the time an outgoing bit will last.
	`Tune Half Bit`	Adjusts the bit-and-a-half time so we can sample in the middle of a bit.

Adjusting DesTerm to suit you

Now that you have configured DesTerm to work correctly with your disk drives and modem, we can now concentrate on adjusting the program to your preferences. These settings are available from the '**User Settings**' item in the main menu.

Background Colour	Selects the background colour of the screen. Most users will select black.
Menu Colour	Selects the colour of the text in all the menus.
Frame Colour	Selects the colour of the menu frames.

Ruler Colour	Selects the colour of the 'Tab Ruler' (second line on the screen).
Prompt Colour	Selects the colour of DesTerm prompts.
Char Colour	Selects the character colour used in the terminal window.
Status Colour	Selects the colour of the Status Line (top line on the screen). Also used as the 'highlight' colour in the menus.
Key Click	Enables or Disables a small 'click' noise whenever a key is pressed.
Printer Device	The Commodore serial device number of the printer/interface you have. Devices **4** to **7** are supported.
Printer Sec Address	The Commodore serial secondary address of the printer/interface you have. Printer interface cartridges often use the secondary address to set the printer into a particular mode. Secondary Addresses **0** to **8**, **15** and **20** are supported.
Printer Type	If your printer expects Commodore-style ASCII (a.k.a. CMBSCII or PETSCII) select '**Commodore**'. If your printer expects real ASCII, select '**Ascii**'.

NOTE 1:   Most printer interfaces will do this conversion for you if you flick the correct switches or use the correct secondary address.

NOTE 2:   It is highly recommended that you use real-ASCII whenever possible. DesTerm works internally in real ASCII - the less conversion the better!

Append Linefeed	Some printers will automatically advance the printer-paper when they receive a carriage return (CR) character - some don't. DesTerm will add a line-feed (LF) character if you select '**Required**'.

NOTE: Most printers and printer interfaces have a similar option. Be sure that only one of DesTerm, the printer interface and the printer has this option enabled - or you may get several blank lines per each line printed!

Joystick Or Mouse	DesTerm can use a joystick or mouse to control Menu Selection and cursor movement. This option allows you to select 'Joystick' if you are using a joystick or '1351 Mouse' if you are using a Mouse.

NOTE: The 1350 Mouse (JoyMouse) is considered a joystick.

Mouse Mode	The movement of the mouse can be directed to affect only menu selection ('**Menus Only**') or menu selection and cursor movement in the terminal ('**Terminal & Menus**').
Control Port #	The Commodore 128 has two joystick/mouse ports. This item allows you to select the back ('**Back (2)**') or front ('**Front (1)**') port.
Information Windows	DesTerm can display a small banner message on the display indicating a particular event (such as a buffer being opened, closed, exhausted, filled etc). If you do not want to see these windows, select '**No**' otherwise select '**Yes**'.
Transfer & Dial Tunes	Upon completion of an upload, download or a successful dial, DesTerm can make some noise to alert you. You can select from '**None**' for nothing, '**Music**' for an amusing little ditty or '**Tone**' for an annoying series of notes.
Select Timer	The time display at the top of the screen can be configured to display either the On-Line ('**Online Time**') time (time the modem has been connected) or the actual time of day ('**Time Of Day**').

NOTE: DesTerm supplies no way of setting the actual time. This time is set at boot-time from either a CMD-RTC chip or from a Smartwatch.

Save Settings	This option will save the current settings into a file. The default filename is **prefs.set**, but you may keep several sets of settings by picking any name ending in '**.set**'

Configuring Terminal Emulation Parameters

      DesTerm comes with several terminal emulation protocols. These protocols are supplied as loadable modules. To find out how to load a terminal emulation protocols, see the 'Controlling DesTerm File Settings' section. It is possible to adjust the default behavior of the DesTerm terminal emulations using the items in the '**Terminal Settings**' menu. The following items may be configured:

Set Backspace	The *INST/DEL* key is used as the backspace key. This option selects whether this key sends the code **8** (ASCII BS, Backspace) or code **127** (ASCII DEL, Delete).
Set Delete	The *CLR/HOME* key is used as the delete key. This option selects whether this key sends the code **8** (ASCII BS, Backspace) or code **127** (ASCII DEL, Delete).
Backspace Mode	Some remote systems expect that code 8 (ASCII BS, Backspace) will simply move the cursor one space back ('**Non Destructive**'). Others expect that the character being backspaced-over will be removed ('**Destructive**'). If the display looks a little odd when using a remote editor, it is likely you have chosen the incorrect mode.
Line Wrap Mode	Some remote systems expect that the next line will automatically be used when the cursor reaches the right edge of the screen ('**Wrap On**'). Others expect characters to over-write each other in the last character position at the

right edge ('**Wrap Off**'). If you notice that text appears to be missing or in the wrong place, it is likely that you have chosen the wrong mode.

NOTE 1:   Some terminal emulation protocols (such as VT102) have special codes that turn this feature on and off automatically.

NOTE 2:   The current setting of the Line Wrap Mode is displayed on the Status Line, just after the terminal emulation type and screen length. '**W**' indicates that wrap mode is enabled, '**N**' indicates that it is not.

VT 102 Decid   The remote computer can request that the terminal identify itself. The choices are:

VT 100   Responds as if the terminal were are VT-100.

VT 101   Responds as if the terminal were are VT-101.

VT 102   Responds as if the terminal were are VT-102.

NOTE: This function is only applicable if the VT-102 emulation mode is loaded.

Answerback   The remote computer can request that a user-defined string be sent to it. Use this menu item to enter the string that gets sent.

NOTE 1:   This function is only applicable if the VT-102 emulation mode is loaded.

NOTE 2:   See the 'DesTerm Meta-Characters' section for details about sending control characters and including pauses.

Set Tabs   By default, the tab stops are set every eight character positions. You may change the tab settings using the following menu items:

Reset   Reset the tab settings to every 8 characters.

Clear   Clear all tab stops.

Edit   Edit the position of each tab stop. The cursor will move into the tab line, use the following keys:

ESC   Stop editing the Tab lines.
SPACE   Remove the tab at the current cursor position.
RETURN   Set a tab at the current cursor position.
LEFT   Move the cursor left one character.
RIGHT   Move the cursor right one character.

Default   Reset the tabs to the way they were when you last **Store**d them.

Store   Save the current tabs settings, so you may restore them later using '**Default**'.

NOTE 1:   Some terminal emulation protocols (such as VT102) have special codes that turn this feature on and off automatically.

Transmit CR   Determines which characters are sent when you press the return key:

Send CR = CR   Just send a carriage return (ASCII 13).

Send CR = CR LF   Send a carriage return (ASCII 13) and linefeed (ASCII 10).

Receive CR   Determines what action occurs when a carriage return (ASCII 13) is received:

Show CR = CR   Move the cursor to position 0.

Show CR = CR LF   Move the cursor to position 0 and move to the next line.

Colour Mode   You can choose to have DesTerm not display colours or other attributes (underline, blinking or reverse video). This speeds up the display to over twice as fast as when colours are displayed.

Colour   Display colours and attributes as normal.

Mono   Do not display colours or attributes.

Screen Length   DesTerm can be configured to display various numbers of lines in the terminal window.

23n   Display 23 lines in the terminal (25 total). Non-interlaced.

24n   Display 24 lines in the terminal (26 total). Non-interlaced.

25n   Display 25 lines in the terminal (27 total). Non-interlaced.

30n   Display 30 lines in the terminal (32 total). Non-interlaced.

48i   Display 48 lines in the terminal (50 total). Interlaced.

50i   Display 50 lines in the terminal (52 total). Interlaced.

52i   Display 52 lines in the terminal (54 total). Interlaced.

62i   Display 62 lines in the terminal (64 total). Interlaced.

NOTE 1:   The last four modes use screen-interlacing. Double the information is displayed on the display in this mode. You will notice some flicker.

NOTE 2:   The 30 and 62 line modes push the VDC/Monitor limits to the extreme. Only use these modes if you have a monitor capable of syncing to a wide range of signals.

NOTE 3:   You can adjust the screen parameters to suit your particular monitor in the **SETUP** program supplied in the distribution package.

Cursor Mode   The blink mode of the cursor can be selected from four choices:

Non Blink   The cursor does not blink.

Blank	The cursor is not displayed.	
Fast Blink	The cursor blinks at a fast rate.	
Slow Blink	The cursor blinks at a slow rate.	

Cursor Style The style (shape) of the cursor can be selected from two choices:

Block	The cursor is the entire size of a character.
Underline	The cursor is a single line at the bottom of the character.

Screen Mode The entire screen can be placed into '**Normal**' video mode or '**Reverse**' video mode with this item.

> NOTE: Some terminal emulation protocols (such as VT102) have special codes that turn this feature on and off automatically.

Pre Scroll The slowest part of the screen update is when the screen scrolls. To speed things up, DesTerm can scroll several lines in one go. You can select the maximum number of lines to pre-scroll with this option: **None**, **1**, **2**, **4**, **8** or **16**.

> NOTE: This feature is smart: even if you request a pre-scroll of 16 lines, DesTerm will only scroll by the number of lines that will be actually used.

Video Mode It is possible to tell DesTerm not to display incoming characters on the screen. This feature may be of some use if you buffer all your text, and don't want to slow the system down with unnecessary screen updates.

Yes	Display characters on the screen as normal.
No	Do not display characters on the screen.

Defining Your Function Keys

DesTerm allows 8 user definable function keys. When these keys are pressed in terminal mode, a pre-programmed set of characters will be transmitted to the remote computer. The function keys are programmed from the '**Define Fkey**' item in the main menu. The function keys can be edited by selecting the menu item that corresponds to the key you wish to define:

Fkey *x* (Alt *x*) Define function key #.

Save Functions Save the function key file. The default name is **function.fnc**. You may save several different sets of function keys by supplying a different name. The new name must end with '**.fnc**'.

> NOTE 1: Unlike most other terminal programs, the function keys are accessed by pressing the *ALT* or *C=* key in conjunction with the numeric key representing the function key number. ie Function Key 3 is transmitted by pressing *ALT* & *3* or *C=* & *3*.
> NOTE 2: Special function keys exist for your login name and password. These keys are configured on a telephone number basis. See the 'Defining Your Telephone Book' section for details.
> NOTE 3: See the 'DesTerm Meta-Characters' section for details about sending control characters and including pauses.
> NOTE 4: Characters transmitted using function keys are subject to the '**Inter Character Pause**' and '**Inter Line Pause**' delays as defined in the 'Transfer Settings' section.

Defining Your Telephone Book

DesTerm has the capability to store frequently used telephone numbers for you. Up to sixteen numbers may be loaded at a time. As well as defining the telephone number and a comment, each entry has several other configurable items so that the terminal is properly configured as soon as a connection is made. The Telephone Book is accessed from the '**Edit Number File**' section in the main menu. The first 16 entries in the menu correspond to the 16 numbers that are stored. The other options in this menu are:

Save Telephone File Saves the telephone book. The default name is **numbers.tel**. You may save several different sets of telephone numbers by supplying a different name. The new name must end with '**.tel**'.

Transfer Numbers to Buffer This option will append the contents of the telephone book to the current contents of the buffer. You can then print out copies of you phone book for later reference.

If you pick one of the 16 telephone book entries, you are presented with another menu that allows you to select the properties for that entry. Most of the entries are duplicates of ones found in the '**Protocol Settings**' and '**Terminal Settings**' menus and will not be discussed here.

Comment A brief description of the service that you are calling.

Number The telephone number for this service.

Dial Prefix # The dial prefix (defined in the **Modem Settings**->**Hayes Setup** menu) to use for this number.

Char Filename The name of the character-set to load when this entry is selected. Blank means that the current character set is kept. Character set filenames must end with '**.chr**'

Fkey Filename The name of the function-key file to load when this entry is selected. Blank means that the current function definitions are kept. Function key filenames must end with '**.fnc**'.

Logon Name This item allows you to define your logon name. This definition is available in terminal mode by pressing *ALT 9* or *C= 9*. This definition is also available for use in script files.

	NOTE:	See the 'DesTerm Meta-Characters' section for details about sending control characters and including pauses.
Password!		This item allows you to define your password. This definition is available in terminal mode by pressing *ALT 0* or *C= 0*. This definition is also available for use in script files.
	NOTE:	See the 'DesTerm Meta-Characters' section for details about sending control characters and including pauses.
Script File		This item selects the name of the script file to use when connected to this number.
	NOTE:	Script files are not currently supported in DesTerm V3.02.

Transfer Settings

The transfer of information is the primary use for telecommunications. Smooth, accurate transfer of files is a must. The following items will help ensure that data is communicated reliably and accurately.

Inter Char Pause   It is sometime surprisingly easy to 'choke' a remote computer by jamming characters at it too fast. This item defines a pause (in 1/60ths) of a second between characters transmitted. The values range from **None** to **6**.

Inter Line Pause   This item is similar to the one above, but the delay only takes effect between lines. The values are in tens of 1/60ths of a second and range from **None** to **60**.

> NOTE: The Inter Char Pause and Inter Line Pause affect the timing of just about all automatically send text strings: Modem initialization, Hang-up, function keys, buffer-sends and ASCII uploads.

Punter Block   The Punter family of protocols allows a maximum block size to be defined, in the hopes that a smaller block size may allow better transfer of files over bad line conditions. The values range from **40** bytes to **255** bytes.

Default Filetype   Commodore Filesystems default different filetypes. This option allows you to select whether downloads will create '**Prg**' or '**Seq**' files.

> NOTE: This option is not currently supported. All files will be created as '**Prg**' files.

Duplicate File   Several of the transfer protocols support 'automatic' filenames - the user is not required to supply one. If the filename supplied already exists on the disk, you can select to '**Alter Filename**' or '**Replace File**'. If the file name is altered, the first letter is replaced by increasingly higher digits (**0**-**9**) until a unique filename is generated. The transfer will fail if no unique filename can be made.

Ascii Send LF   Normally, DesTerm will send a single carriage return (ASCII 13) as and end of line marker ('**Send CR = CR**'). You can also chose to send a carriage return (ASCII 13) linefeed (ASCII 10) pair ('**Send CR = CR LF**').

> NOTE: This option affects ASCII uploads and buffer sends.

Xoff Timeout   If you are using Xon/Xoff flow control, it is entirely possible that the remote end will send DesTerm an Xoff character - but never send an Xon. Instead of just waiting for something that will never happen, DesTerm has a timeout - a time that it will wait for the Xon response. If the time expires, DesTerm will continue as if the Xon response was received. The timeout values range from **1** second to **120** seconds.

File Selection   When uploading several files using one of the batch protocols, a method is needed of selecting the files to send. This option allows you to select '**Pattern**' if you wish to use the DesTerm pattern matching feature or '**Buffer List**' if you wish to use the buffer list feature.

> NOTE: See the 'Pattern Matching and Buffer Lists' section for more details.

Xmodem Padding   The Xmodem family of protocols all suffer from a problem due to the fact that they do not specify an exact filesize. Extra characters are added to the end of the file to make the final block complete. If '**Strip**' is selected, DesTerm will attempt to remove this padding using a fairly smart algorithm. If '**Leave**' is selected, DesTerm will leave the padding bytes alone.

Xmodem Timing   The Xmodem family of protocols define a set of 'timeout' values that should ensure a fairly rapid, error free transfer. With today's modems that have error-correction built-in, delays are often incurred when the correction kicks in - causing the transfer to fail. If you select '**Normal**' the precise timeouts are used - '**Relaxed**' extends the timeouts to account for slightly longer delays.

Filename Case   Some of the batch protocols allow the sender to specify the filenames in upper and lower case. It is often convenient to have DesTerm to convert filenames to be all lower-case ('**Force Lower**'). If you wish to leave the filenames intact, select '**Upper & Lower**'.

Auto Download   Zmodem has the ability to automatically start a download when it sees a particular series of incoming characters. The following options are provided:

| **Never** | Ignore the download request. |
| **Always** | DesTerm will attempt to load the Zmodem protocol from the DesTerm Drive (if not |

already loaded), then proceed with the download.

> **If Loaded** DesTerm will proceed with the download if the Zmodem protocol is loaded, and ignore it otherwise.
>
> NOTE: You should only select '**Always**' if the DesTerm files are available on the DesTerm Drive at all times (if you have multiple drives or partitions available).

Disk Functions

Several of the items in the '**Disk Functions**' menu were already discussed in the 'About Disk Devices and Unit Letters' section. This section discusses all of the options in more detail:

> **Directory** A listing of the current drive is displayed on the screen. If the directory is longer than the space available, the next 'page' is available by pressing *RETURN*. The *ESC* key will stop the directory display at any time.
>
> NOTE: Only files that match the current '**Dir Pattern**' (next menu item) are displayed.

> **Dir Pattern** This item selects the pattern that DesTerm uses to select files for inclusion in the **Directory** and **Dir > Buffer** functions. The default pattern is '*****', meaning all files.
>
> NOTE: See the 'Pattern Matching and Buffer Lists' section for more details.

> **Dir > Buffer** This item is very similar to the '**Directory**' function, except that the directory listing is appended to the buffer.

> **Init Disk** The Commodore DOS Initialize command (**I0**) is sent to the drive. This function should be used whenever a new disk is placed in the drive.

> **Validate Disk** The Commodore DOS Validate command (**V0**) is sent to the drive. This function causes the Block Allocation Map and Directory Sectors to be re-consolidated with the contents of the disk.
>
> NOTE 1: This function should be used whenever 'Splat' files (indicated by a '*****' after the filetype) occur on a disk.
>
> NOTE 2: This operation can take a fair amount of time (minutes for large HardDrive partitions). For this reason, the Disk Operations menu is exited when this command is in effect so you may continue with other non-disk operations.

> **Reset Disk** The Commodore DOS Reset command (**U:**) is sent to the drive. This function causes a cold-reset of the current Drive. This command should be used if the current drive seems to be acting a little strange.
>
> NOTE: This operation takes a couple of seconds to execute on most drives.

> **Send Command** This item sends the user-specified command string to the current drive. No checking is done to verify that the command is valid.
>
> NOTE: Be careful when using this command, some commands can perform serious damage to your files.

> **Scratch File** This item deletes files. Files are either selected from a user-defined pattern or the buffer, depending on the '**File Match**' setting.
>
> NOTE 1: See the 'Pattern Matching and Buffer Lists' section for more details.
>
> NOTE 2: A verification menu pops up to ensure that you really to wish to delete files.

> **Format Disk** This item formats a disk. The name is prompted for. Unless the name is preceded by a drive letter, the current drive will be used. If you want a 'quick' format, just a name is necessary ("**disk-name**"). If you want a 'full' format, you should specify a disk id ("**disk-name,id**").
>
> NOTE 1: If you are formatting the DesTerm RamDisk, the name is not used, but must be non-blank.
>
> NOTE 2: A blank name will abort the format.
>
> NOTE 3: A verification menu pops up to ensure that you really to wish to format the disk.

> **Copy File** This option copies files from one drive to another. Source files are either selected from a user-defined pattern or the buffer, depending on the '**File Match**' setting. The Destination drive is prompted for.
>
> NOTE: This is the only way to copy files to and from the DesTerm RamDisk - since it is not available outside of DesTerm.

> **Pick Drive** This item allows you to select the current drive. The fist four options select the **DesTerm**, **Download**, **Upload** and **Buffer** directories respectively. The next eight options pick the raw drives **A:** through **H:**.

> **DesTerm Drive** This option selects which drive should be used to access DesTerm files.

> **Download Drive** This option selects the drive upon which downloaded files are stored.

> **Upload Drive** This option selects the drive from which uploads are retrieved.

> **Buffer Drive** This option selects the drive that is used to load and save buffer files.

> **Drive Define** This option allows you to define the disk device, partition and directory for each of the drives **A:** through **H:**. First, you are prompted for the drive you wish to define, then for the disk device (**8-23** or the **REU**). If the unit you select supports partitions and/or directories, then you will be prompted for these too.

> **Ram Format** This item determines whether DesTerm should attempt to use the REU as a RamDisk:
>
> **Leave REU Alone** DesTerm will not allow the REU to be formatted as a RamDisk - thus protecting any data that happens to be in it.

Format as RamDisk DesTerm will allow the REU to be formatted as a RamDisk. This option does not actually perform the format - it just allows the **Format Disk** command to operate on the REU.

File Match This option allows you to select '**Pattern**' if you wish to use the DesTerm pattern matching feature or '**Buffer List**' if you wish to use the buffer list feature. This selection affects the '**Scratch File**' and '**Copy File**' functions.

NOTE: See the 'Pattern Matching and Buffer Lists' section for more details.

Pattern Matching and Buffer Lists

Anybody that has used Commodore disk drives for any length of time will be familiar with the concept of pattern matching. DesTerm extends the capabilities of Commodore style pattern matching plus adds an extremely useful method of using the buffer to store lists of filenames. You may select Pattern Matching or Buffer Lists from either the **Disk Functions**->**File Match** or **Transfer Settings**->**File Selection** menu items.

DesTerm Pattern Matching

DesTerm extends the Commodore pattern matching in the following way: the '*****' character (which matches 0 or more characters) can be used anywhere in the pattern up to two times. The Commodore '*****' character can only be used at the end of a pattern. In summary:

? Matches any single character. Any number of these characters can be used in a patten.
* Matches 0 or more characters. Up to two of these characters can be used in a pattern.

Examples

"**?**"   Matches all filenames that have only one character.
"***.?**"   Matches all filenames that end with '**.**' and a single character.
"*****"   Matches all filenames.
"***.***"   Matches all filenames that have a '**.**' in them somewhere.
"***.chr**"   Matches all filenames that end with "**.chr**". (DesTerm character sets)
"**des*.00**"   Matches all filenames that start with "**des**" and end with "**.00**".

DesTerm Buffer Lists

The '**Dir > Buffer**' item in the **Disk Functions** menu is used to send a copy of a disk directory to the buffer. The **Buffer List** concept uses this feature to allow the specification of multiple filenames.

NOTE: This feature will work with either the character buffer (**buffer.edt**) or the editable buffer (**editable.edt**). If you wish to remove or add entries, however, you will need to use the editable buffer.

Suppose you want to upload several files from your Upload drive, but there is no pattern that will specify only these files - no problem! Use the '**Dir > Buffer**' menu item to place a listing of the entire Uploads Drive in the buffer. Next, enter the buffer editor and remove the names of the files you don't wish to upload. Now select '**Buffer List**' from the **Transfer Settings**->**File Selection** menu item. When you request upload using one of the batch protocols, instead of asking for a pattern to be specified, the filenames will automatically be taken from the buffer.

Another advantage of this method is that the drive letter is included with the filename when it is placed in the buffer. This means that you can upload, copy or scratch files from several different drives by simply performing a '**Dir > Buffer**' function for each drive in question. This can save time and disk space since you no longer have to place all the files in one place before you can use them.

NOTE: DesTerm looks for a specific 'format of characters' when choosing filenames from the buffer. There is no need to remove other text or to clear the buffer before you use this feature.

Editing DesTerm Buffer Lists

The '**Dir > Buffer**' function puts directory entries into the buffer in the following format:

Disk Header The drive letter, and equal sign, the disk name (padded to 18 characters), the disk id and finally the DOS type of the disk.
Filename The drive letter, a colon, the filename (padded to 18 characters) and the filetype (PRG, SEQ etc).

Entries in your buffer will lokg something like the following:

```
a=desterm3.02        00 1h
a:desterm            PRG
a:function.fnc       PRG
a:sequential-file    SEQ
```

You may create your own entries in the buffer if you follow this format.

DesTerm Meta-Characters

There are several places in DesTerm that allow text to be defined that will be sent to the remote computer/modem. In all cases, meta-characters can be used to extend the range of characters that can be sent. DesTerm uses a total of four meta-characters:

^	(caret, Ascii 94)	Treat next character as control character, send resultant code.
~	(tilde, Ascii 126)	Pause for 1/2 second (no character is sent).
$	(dollar, Ascii 36)	Treat next two characters as hex number, send resultant code.
****	(backslash, Ascii 96)	Treat next character as literal (allows any of the four meta-characters to be sent).

Examples:

Send a BELL character (Ascii 7):	"**^g**", "**^G**" or "**$07**"
Send "Hello ", Pause for 1 second, Send "World":	"**Hello~~World**"
Send each of the meta characters as literals:	"**\^\~\$**"

NOTE 1:   See the DesTerm Keyboard Mappings Appendix for details on which keys to use to generate the ^, ~ and I characters.
NOTE 2:   See the ASCII to Commdore ASCII Conversion Chart Appendix for details on control code sequences.

Loading DesTerm Configuration Files

When DesTerm first runs, it loads several configuration files. It is possible to load each of these files at a later time by using the items in the '**File Settings**' menu. Special three character filename extensions have been created for each of the configuration files. Only files with the correct extension for a particular configuration item can be loaded. When you select the appropriate item, DesTerm scans the DesTerm drive for all filenames that end with the correct extension. Once this is done, one of three things happens depending on the number of matching filenames found:
0:          There is no file to load - the load is aborted.
1:          There is exactly one file that can be loaded - this file is loaded with no prompting.
>1:   There are at least two files that could be loaded. A 'file requester' menu is displayed that contains the names of each matching file. The file to be loaded is then selected from this list.

The configuration files that can be loaded are:

Name	Extension	Description
Char File	***.chr**	Character set definition files. DesTerm is supplied with several character sets.
Setup File	***.set**	Main DesTerm settings files. They contain all the settings defined in the **Disk Functions**, **Protocol Settings**, **User Settings** and **Transfer Settings** menus. Files of this type are created by using the **Save Settings** item in the **User Settings** menu.
Fkey File	***.fnc**	Function Key Files. They contain information defined and saved in the **Define Fkey** menu.
Number File	***.tel**	Telephone Book Files. They contain information defined and saved in the **Edit Number File** menu.
Key File	***.key**	Keyboard mapping definition files. For the moment there is only one: **desterm.key**. A keyboard mapping editor is under development that will allow the user to change what each key does.
Protocol Prg	***.dpr**	Transfer Protocol files. These files contain the programs that support the various transfer protocols.
Editor Prg	***.edt**	Buffer Editor files. These files contain the programs that allow the buffer space (Ram Bank 1) to be used in different ways.
Emulation Prg	***.emu**	Terminal Emulation files. These files contain the programs that define the terminal emulation being used.
Modem File	***.mdm**	Modem Description files. They contain the information defined in the **Modem Settings** menu.
Script File	***.dsl**	DesTerm Scripting Language files. They contain the compiled script programs that DesTerm uses. NOTE: Scripts are not currently supported in DesTerm V3.02.

Saving Your DesTerm Configuration

The first item in the '**File Settings**' menu is '**Save Name File**'. This function writes the names of the currently loaded configuration files to a special file called **config.cfg**. It is the contents of this file that determines which of your configuration files get loaded at DesTerm boot time.

DesTerm Configuration: Character Sets

All DesTerm character sets are found on the DesTerm drive and have the extension '**.chr**'. The supplied character sets are:

ibmset.chr	For use when connected to PC based systems.
amigaset.chr	For use when connected to Amiga based systems.
cbmcgset.chr	For use with Commodore-Colour-Graphics based systems.
cbmset.chr	General set based on the C128 ROM characters.
vt102set.chr	For use with VT-102 emulation mode.
vt52set.chr	For use with VT-52 emulation mode.

Character sets for DesTerm differ from those normally associated with Commodore computers. Each character is 8 bytes each as normal, but the character order is true ASCII. Since the VDC takes care of character reverse, only 256 characters are needed. The file size should be 2050 bytes (2048 for the data + 2 for the load address).

The first character (0) is a little special. This character is never actually displayed on the screen in any terminal emulation mode, so it is used to define which characters are to be used for the menu borders. Each of the bytes in the first character represents the character to be used for a particular part of the border:

Top Left	byte 0	Top Middle	byte 1	Top Right	byte 2
Middle Left	byte 3			Middle Right	byte 4
Bottom Left	byte 5	Bottom Middle	byte 6	Bottom Right	byte 7

A special DesTerm character set editor has been included with the DesTerm V3.02. See the DesTerm Configuration: Editors section for details.

DesTerm Configuration: Transfer Protocols

All transfer protocol program files are found on the DesTerm drive, and have the extension '**.dpr**'. The following transfer protocols are supplied:

xmodem.dpr	The original Xmodem protocol. The DesTerm version supports both CRC and Checksum mode automatically.
xmodem1k.dpr	The Xmodem-1K protocol. Pretty much the same as Xmodem, but can extend the block-size to 1K.
xmodem1g.dpr	The Xmodem-1K/G protocol. The same as Xmodem-1K, except that no error recovery is possible. Only use this protocol when the line-noise immunity is high (error correcting modems or direct connect).

ymodem.dpr	The Ymodem batch protocol. Very similar to Xmodem-1K, except that multiple files can be transferred in one session and the filenames are transmitted automatically.
ymodemg.dpr	The Ymodem/G batch protocol. The same as Ymodem, except that no error recovery is possible. Only use this protocol when the line-noise immunity is high (error correcting modems or direct connect).
zmodem.dpr	The Zmodem batch protocol. A high reliability, environment tolerant file transfer protocol. Only use this protocol when RTS/CTS flow control is being used. NOTE: At this time, only Zmodem receive is supplied.

DesTerm Configuration: Editors

All editor program files are found on the DesTerm drive, and have the extension '**.edt**'. The following editors are supplied:

buffer.edt	This is a character based capture buffer program. Each byte is stored one after another in memory. The capacity of the buffer is 60912 bytes. This buffer is not editable.
editable.edt	This is a line based capture buffer program. The editable buffer can store 733 lines of 80 column text. As the name implies, this buffer is editable.
help.edt	This is a hypertext based help system. You may notice several files with the extension '**.hlp**' in the DesTerm directory. These are help files that can be viewed with the help viewer.
fontedit.edt	This is a Character Set Editor program specifically designed for DesTerm 128.

NOTE 1: The character and editable buffers both leave a signature in memory. If for some reason you need to reset your computer, but did not save the current contents of the buffer - do not worry. When DesTerm loads, the buffer program that loads checks for the special signature. If it recognizes the signature as its own, the buffer is restored. If it recognizes the signature of another editor program, it leaves the memory intact (and unusable) until the buffer is explicitly cleared. This allows you to load the appropriate editor program before the data is destroyed.

NOTE 2: See the 'Using the Buffer Viewer', 'Using the Buffer Editor', 'Using the Character Editor' and 'Getting Help' sections for details on how to use each of the above programs.

DesTerm Configuration: Terminal Emulation

All terminal emulation program files are found on the DesTerm drive, and have the extension '**.emu**'. The following terminal emulations are supplied:

tty.emu	A fairly generic no-frills 80 column teletype emulation.
ansi.emu	A complete implementation of the ANSI X3.64 standard. (With modifications for compatibility with the IBM-PC).
ccg40.emu	Commodore Colour-Graphics terminal (40 columns-wide). The colours will not quite match correctly.
ccg80.emu	Commodore Colour-Graphics terminal (80 columns-wide). The colours will not quite match correctly.
vt52.emu	An implementation of the DEC VT-52 Terminal. Features beyond the capabilities of the VDC chip are not implemented.
vt102.emu	A fairly complete implementation of the DEC VT-102 Terminal. Features beyond the capabilities of the VDC chip are not implemented.

NOTE 1: See the appropriate appendix for a discussion of the control-code sequences used in each emulation mode.

NOTE 2: You may also notice that files exist with the same names as the terminal emulations but with the extension '**.eky**'. These files are keyboard mappings specific to each emulation. If, for some reason, the appropriate '**.eky**' file cannot be found on the DesTerm drive, the default keyboard mapping will be used. Most functions will still work, but specialized keys (such as the VT102 PFkeys) will not be available.

Dialing the Telephone

The numbers that you have defined in the '**Edit Number File**' menu can be dialed using the options available in the '**Dial Directory**' menu item:

Dial Number	This option will present a menu that contains the currently available telephone book entries. Simply select the number you wish to dial and press **RETURN**.
Redial Last	This option will re-dial the last number that was dialed.
Multiple Dial	This option allows you to select one or more entries from the telephone book. Entries to dial are selected by moving the highlight bar to the desired entry and pressing **RETURN**. The selection acts like a toggle: a selected number will become de-selected. Selected numbers are flagged by a '**<**' in the small window beside the entries. Four other items appear in this menu:

Select All Numbers	All numbers become selected.
UnSelect All Numbers	All numbers become de-selected.
Toggle All Numbers	All numbers toggle (selected becomes un-selected, un-selected becomes selected).
Dial Selected Numbers	The numbers that have been selected will be dialed until:

a)   A successful connection is made. The successful number is de-selected (so that subsequent multiple dials will not dial that number again).

b)   ESC is pressed. Quit. The entire dial-process is stopped - if a dial was in progress, the call is canceled.

c)   RETURN is pressed. Return to Terminal. The entire dial process is stopped. A call in progress is not canceled.

Dial Wait   This is the amount of time that DesTerm will wait before deciding that the remote computer is not going to pick up the phone. It is recommended that this number be set fairly high, since most modems have an S-register setting for the same purpose. (Better to let the modem to abort the call). The time intervals range from **30** to **120** seconds.

Dial Pause   This setting supplies the time interval between the conclusion of one dial attempt and the start of the next. Some modems and telephone lines require at least two seconds of 'on hook' time before another call can be made. The time intervals range from **None** to **10** seconds.

The Dialing Status Window

Whenever a number is being dialed, DesTerm displays a window containing the status of the current call. The status items are:

This call: The description from the phonebook of the number currently being dialed.

Telephone: The telephone number of the call being made.

Status: The current action (**Dialing**, **Waiting**, **Dial Pause** etc).

Response: Any modem-reports the modem may make (**BUSY**, **ERROR**, **NO ANSWER** etc).

Time Left: The amount of time left until this dial-attempt is aborted.

Last Attempt: The reason that the previous dial attempt (if any) failed. (**Busy**, **Timed Out**, **Interrupted by User** etc).

The user may press the following keys to affect the dialing process:

SPACE   Abort the current dialing attempt. Dial the next number (multiple dial) or the same number (single dial).

ESC   Abort the current dialing attempt. Return to menu mode.

RETURN   Return to terminal mode. If a dial is in progress, the call is not terminated.

The DesTerm Capture Buffer

Most terminal programs have some ability to store a certain amount of data in memory for rapid retrieval. DesTerm is no exception! DesTerm comes with two 'buffer' options:

buffer.edt   A simple minded 'character' based buffer that will store 60912 bytes of text. This buffer is not editable.

editable.edt   A 'smart' buffer that stores the information in up to 733 80-character lines. The text is editable.

NOTE 1:   These capture buffer options are selectable from the **File Settings** -> **Load Editor Prg** menu.

NOTE 2:   The contents of the buffer may be viewed/edited from the terminal screen by pressing '*ALT V*

The **Buffer Settings** menu is used to access the buffer, its features and modes:

Mode   In '**Capture**' mode, text will be received from the modem and saved in the buffer. In '**Transmit**' mode, text will be taken from the buffer and sent to the modem.

NOTE: For data to be sent-to or taken-from the buffer, it must be 'opened'. The buffer is 'opened' by using the Hotkey sequence '*ALT +*' and 'closed' with '*ALT -*'.

Save   The buffer contents will be saved to a disk file. The file may be saved as either true Ascii or Commodore-Ascii.

Load   The contents of a file will be loaded into the buffer. You will be prompted as to whether the file is to be appended (**Append**) to the end of the current buffer or simply replace it (**Overwrite**). You will be prompted as to whether file was saved in 'Ascii' or Commodore-Ascii format.

Auto   The 'Automatic' buffer feature of DesTerm can be very useful. It allows the contents of the buffer to be saved to disk any time the buffer gets full:

    Auto Save   '**Yes**' to enable auto-save, '**No**' to disable.

    Filename   The filename to use as the 'root name' for the files that will be created. Each filename will be the 'root name' plus a two digit number. '**00**', '**01**', '**02**' etc.

    File Mode   Select from '**Commodore**' Ascii or True '**Ascii**'.

    Purge   This option is used to save the last portion of the buffer that has not yet been saved.

    NOTE: At this time, the auto-save feature only works with the editable buffer.

Strip   Several of the emulation protocols supported send 'hidden' control codes that adjust the position of the cursor, the text colour etc. If you select 'Don't Strip', all characters will be saved in the buffer. If you select 'Strip', only the text will be saved: control sequences will be removed.

Print   The contents of the buffer will be printed.

Clear   The contents of the buffer will be cleared.

Capture Buffer Hotkeys

Most of the time, the buffer will be accessed via Hotkeys. These Hotkeys deserve special attention:

ALT C Toggle between Capture and Send mode. In Capture mode, characters are saved into the buffer, in Send mode, characters are taken from the buffer and transmitted. The buffer-mode character in the status line is '**B**' for capture and '**S**' for send.

ALT + Open the buffer: The buffer-operation character in the status line is '**O**'.

In Capture mode, characters will be saved.

In Send mode, characters will be transmitted.

NOTE 1: The transmission of characters is throttled according to the '**Inter Char Pause**' and '**Inter Line Pause**' as defined in the **Transfer Settings** menu.

NOTE 2: The transmission of characters starts from 'where it left of'. If you wish to start from the beginning of the buffer again, toggle the Capture/Send mode - this will reset the 'output' pointer.

ALT - Close the buffer: The buffer-operation character in the status line is '**C**'.

In Capture mode, characters will not be saved.

In Send mode. characters will not be transmitted.

ALT Q Clear the buffer.

Using the Buffer Viewer (buffer.edt)

The character buffer (buffer.edt) allows you to view what has been buffered. To access the buffer, use the hotkey sequence ***ALT V***. The viewer has the following functions:

Function	Key Sequences	
Screen Down One Line	*CURSOR DOWN*	*KEYPAD 2*
Screen Up One Line	*CURSOR UP*	*KEYPAD 8*
Screen Left 10 Characters	*CURSOR LEFT*	*KEYPAD 4*
Screen Right 10 Characters	*CURSOR RIGHT*	*KEYPAD 6*
Quit	*ESC*	*CTRL RUN/STOP*

Using the Buffer Editor (editable.edt)

The editable buffer (editable.edt) allows a wide-range of text-processing features. The editor has two modes:

Insert mode: Characters typed are inserted at the current cursor position. No line may be more than 80 characters long. If you are typing at the end of a line, then at the 80th column, the cursor will move down to the start of the next line. No new line is inserted! If you are typing in the middle of a line, characters will be inserted until the line is 80 characters wide, then new characters will be ignored.

Overwrite mode: Characters typed overwrite the characters underneath the cursor. When the 80th column is reached, the cursor moves to the start of the next line, and text will overwrite what is there.

NOTE: Pressing ***RETURN*** will always cause the line to split at the cursor. (creating a new line)

Cursor Movement

Cursor Down 1 Line	*CURSOR DOWN*	*CTRL X*	*KEYPAD 2*		
Cursor Up 1 Line	*CURSOR UP*	*CTRL E*	*KEYPAD 8*		
Cursor Left 1 Char	*CURSOR LEFT*	*CTRL S*	*KEYPAD 4*		
Cursor Right 1 Char	*CURSOR RIGHT*	*CTRL D*	*KEYPAD 6*		
Move to Start of Line			*KEYPAD 7*	*CTRL Q/S*	
Move to End of Line			*KEYPAD 1*	*CTRL Q/D*	
Move to Top of Buffer			*CTRL KEYPAD 7*	*CTRL Q/R*	
Move to Bottom of Buffer			*CTRL KEYPAD 1*	*CTRL Q/C*	
Page Up	*CTRL R*	*KEYPAD 9*			
Page Down		*CTRL C*	*KEYPAD 3*		
Top of Screen				*CTRL Q/E*	
Bottom of Screen				*CTRL Q/X*	

Insertion of Text

Toggle Insert/Overwrite		*CTRL V*	*KEYPAD 0*	
Insert New Line		*CTRL N*		
Break Line at Cursor	*RETURN*			
Insert Literal Char*		*CTRL P*		

Deletion of Text

Del Char Under Cursor	*CLR/HOME*	*CTRL G*	*KEYPAD .*	
Del Char Before Cursor	*INST/DEL*			
Del Line	*CTRL Y*			
Join Lines		*CTRL J*		
Del to End Of Line				*CTRL Q/Y*

*   The Control-Q sequence allows characters that would not normally be accessible to be entered. Type CTRL Q followed by any other Control Character sequence and it will be inserted. Control characters are displayed highlighted. See the ASCII to Commdore ASCII Conversion Chart Appendix for a list of Ascii Characters, including Control Codes.

Using the Character Set Editor

At one time or another, most Commodore 64/128 owners have fiddled around with customized character sets. DesTerm uses character sets that are in TRUE Ascii order which makes them difficult to construct with regular character set editors. A full featured character set editor is now included with DesTerm. The character set editor is named 'fontedit.edt' and is loaded as if it were one of the buffer editors - don't worry any information in the buffer is kept intact. When you start the character set editor (**ALT V**) you will see four areas on the screen:

1)   A status line, that identifies the current character and start of block.
2)   A large 8x8 grid containing the character to be edited.
3)   All 256 characters that are available to be edited.
4)   A quick description of the keys.

Selecting Which Character To Edit

Use the cursor keys to move the cursor over the character you with to edit. Press **RETURN** to start editing the selected character. The current character number (in hex) is displayed on the top line.

Editing A Character

Once you have selected the character you wish to edit, and have pressed **RETURN**, you are in 'edit' mode. The cursor moves into the edit box. As you would expect, the Cursor keys act to move the cursor around the edit box. The following functions are also available:

Turn Pixel On	*SPACE*	Turn Pixel Off	*PERIOD* (.)
Reverse Pixel (Toggle)	*ENTER*	Clear Character	*INST/DEL*
Mirror Image	*M*	Flip Image (Upside Down)	*F*
Invert Image	*I*	Rotate 90 deg Left	*L*
Rotate 90 deg Right	*R*	Upside Down	*U*
Shift Character Up	*KEYPAD 8*	Shift Character Down	*KEYPAD 2*
Shift Character Left	*KEYPAD 4*	Shift Character Right	*KEYPAD 6*
Undo Changes	*Q*	Exit Edit Mode	*ESC*

Block Mode

Block mode allows certain operations to be performed on more than one character at a time. To define a block, move the cursor to the first character of the block and press '*B*'. Then move the cursor to the final character in the block. The following functions work in block mode:

Clear Character	*INST/DEL*	Exit Edit Mode	*ESC*
Mirror Image	*M*	Flip Image (Upside Down)	*F*
Invert Image	*I*	Rotate 90 deg Left	*L*
Rotate 90 deg Right	*R*	Upside Down	*U*
Shift Character Up	*KEYPAD 8*	Shift Character Down	*KEYPAD 2*
Shift Character Left	*KEYPAD 4*	Shift Character Right	*KEYPAD 6*

Picking Menu Border Characters

Unlike previous versions, there are only eight characters that need to be specially defined specially for DesTerm. The eight characters make up the borders that DesTerm uses for its windows. Character 0 is never displayed on the screen by DesTerm - so it is now used to define the characters that should be used for the borders. The Keypad keys 1,2,3,4,6,7,8 and 9 are used to assign the current character to be used for one of the eight border graphics. The relationship is simple:

```
789
4 6
123
```

Since most character sets include their own set of 'utility graphic' characters, these can be used to draw the menu borders instead of needing to define some especially.

Loading and Saving Character Sets

Character sets can be saved by pressing the '**S**' key. Remember to use a filename extension of '**.chr**' so that DesTerm can identify the file as a character set. Character sets are loaded by pressing the '**L**' key. A list of potential character sets is displayed on the screen for you to choose from.

Hanging up the Phone

In almost all cases, signaling the remote service that you wish to log-off is quite enough to get the phone-call terminated. If for some reason you wish to terminate the call manually, use the 'Hangup Modem' item in the main-menu. First of all, you'll be asked if you're sure. Assuming that you are, up to three things happen:

1)   The DTR signal sent to the modem is lowered. If your modem is appropriately configured, loss of DTR will immediately cease the phone call. DesTerm checks the state of the Carrier Detect line to verify the state of the connection.
2)   If the DTR trick didn't work, then DesTerm falls back to sending the 'Hangup Sequence' as defined in the Modem Settings menu.
3)   If that doesn't work, then you're on your own -- DesTerm gives up.

Answering the Telephone

The DesTerm Answer Phone function is quite simplistic. When this feature is activated, DesTerm will wait for the 'RING' sequence (as defined in the Modem Settings menu). When this sequence is received, DesTerm will answer the call and wait for the connect string (changing speed if necessary). That's it.

NOTE: This function only works with Hayes compatible modems.

Exiting DesTerm

In the unlikely event that you ever want to exit DesTerm (like, as if!), you should select the 'Exit DesTerm' item from the main-menu. You'll be asked if you are sure and you'll be given the opportunity to save anything in the buffer.

Getting Help

DesTerm comes complete with an on-line documentation service. The Help Viewer program is loaded as if it were one of the buffer-editor programs. Load the file '**help.edt**' from the File Settings->Load Editor Prg menu item. DesTerm comes supplied with several help files with the extension '**.hlp**'. To load these files, either use the Buffer Settings->Load menu item or the *ALT L* hotkey sequence. To view the help file you've loaded, use the *ALT V* hotkey sequence.

NOTE: Any information in the buffer that has not been saved will be lost.

Each help file is broken up into pages. You always start viewing the help file at the first page. You will notice that certain areas of the screen are highlighted — these areas signify 'links' or ways to view other pages. The cursor keys allow you to move the cursor around each page (which can be more than one screen in length). You will notice that if the cursor moves into one of the highlighted areas then that area becomes inverted — this signals that the link is active — pressing *RETURN* at this point will take you to the page that describes the link in question. To further aid in navigating the help pages, certain keys perform special functions:

KEYPAD 9   Move the cursor up by one screen length.
KEYPAD 3   Move the cursor down by one screen length.
KEYPAD 7   Move the cursor to the start of the current line.
KEYPAD 1   Move the cursor to the end of the current line.
B   Move back one page. This means that you will be viewing the page just before the page that you are viewing now. You can use this function to re-trace your steps right back to the first page.
F   Move forward one page. If you used '*B*' to move back by one or more pages, you can use 'F' to move forward to pages that you 'went to next' previously.
L   Move to next Link. The cursor will be moved to the first (and then subsequent) Links on the current page. This function is much quicker than using the cursor keys to move from link to link.
K   Move to previous Link. Much like the '*L*' function - but the links are selected in reverse order.
N   Go to the Next page. The next page in memory is viewed - it may have nothing to do with the current page.
P   Go to the Previous page. The previous page in memory is viewed - it may have nothing to do with the current page.
T   Go to the First page in the help file (Top).
Q   Quit the Help Viewer.

Appendix A: Hotkey Sequences

ALT A	Redial the last number that was dialed
ALT B	Open the Baud Rate menu
ALT C	Toggle between buffer capture and send modes
ALT D	Open the Dial Number menu
ALT E	Toggle Local Echo
ALT F	Open the Define Fkey menu
ALT G	Open the Terminal Settings menu
ALT H	Attempt to hang-up the phone call
ALT J	Reset Terminal
ALT K	Save From Buffer
ALT L	Load Into Buffer
ALT M	Open Multiple Dial menu
ALT N	Open the Edit Number File menu
ALT O	Open the Disk Functions menu
ALT P	Print the Buffer contents
ALT Q	Clear Buffer contents
ALT R	Receive (Download) Files
ALT S	Send (Upload) Files
ALT U	Open User Settings menu
ALT V	View/Edit Buffer
ALT W	Dump the current Screen to Printer
ALT X	Execute Script (not implemented)
ALT Z	Clear Screen
ALT +	Enable Buffer (open -> input/output)
ALT -	Disable Buffer (close -> no input/output)
ALT ESC	Send Break Character
ALT 9	Send Logon Name (as defined for the telephone book entry)
ALT 0	Send Password (as defined for the telephone book entry)

NOTE: Function keys are: ALT 1 through ALT 8. Use either main or numeric keypad numbers. The C= key can be used in place of ALT.

Appendix B: ASCII to Commdore ASCII Conversion Chart

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

Appendix C: ANSI X3.64 Control Sequences

Code	Byte Sequence	Meaning
ESC	**$1B**	Escape character
CSI	**ESC [or $9B**	Control Sequence Introducer
SM	**CSI Ps;...;Ps h**	Set all present Ps modes to on.
RM	**CSI Ps;...;Ps l**	Set all present Ps modes to off.
CUU	**CSI Pn A**	Move cursor up Pn lines. Stop at top
CUD	**CSI Pb B**	Move cursor dn Pn lines. Stop at bot
CUF	**CSI Pb C**	Move cursor rt Pn cols. Stop at edge
CUB	**CSI Pb D**	Move cursor lf Pn cols. Stop at edge
CUP	**CSI Pl ; Pc H**	Move cursor to Pl,Pc from origin.
HVP	**CSI Pl ; Pc f**	Move cursor to Pl,Pc from origin.
IND	**ESC D or $84**	Move cursor down. Scroll up if necessary
RI	**ESC M or $8D**	Move cursor up. Scroll down if necessary
NEL	**ESC E or $85**	Move start of next line. Can scroll
LNM	**CSI 20 h or l**	Select linefeed/newline mode.
SRM	**CSI 12 h or l**	Select local echo.
SGR	**CSI Pn;...;Pn m**	Set Graphics Rendition
HTS	**ESC H or $88**	Set tab at cursor position.
TBC	**CSI g or CSI 0 g**	Clear tab at cursor position.
	CSI 3 g	Clear all tabs.
EL	**CSI K or CSI 0 K**	Clear cursor to end of line.
	CSI 1 K	Clear start of line to cursor.
	CSI 2 K	Clear entire line. Cursor stays put.
ED	**CSI J or CSI 0 J**	Clear cursor to end of screen.
	CSI 1 J	Clear start of screen to cursor.
	CSI 2 J	Clear whole display. Cursor goes to home.
DCH	**CSI Pn P**	Delete Pn characters.
ICH	**CSI Pn @**	Insert Pn characters.
IL	**CSI Pn L**	Insert Pn Lines.
DL	**CSI Pn M**	Delete Pn Lines.
IRM	**CSI 4 h or l**	Select auto insert mode.
RIS	**ESC c**	Reset

SGR CODES:

0	Turn off all attributes.
1	Select bold (bright).
4	Select underline.
5	select blink.
7	select inverse video.
3x	select character colour x.
	If x would make characters invisible, x+1 is chosen.
4x	select background colour x.

The VDC cannot show a separate background colour for each character. The background change will only take effect when the screen is cleared. Then, the whole screen will become this colour. When using menus, the user selected background colour is temporarily used.

where x:

0	black	1	red	2	green	3	yellow
4	blue	5	magenta	6	cyan	7	grey

Cursor Key	Output Codes
_UP_	**ESC [A**
DOWN	**ESC [B**
LEFT	**ESC [C**
RIGHT	**ESC [D**

Appendix D: VT102 Control Sequences

Code	Byte Sequence	Meaning
ESC	`$1B`	Escape character
CSI	`ESC [ or $9B`	Control Sequence Introducer
SM	`CSI Ps;...;Ps h`	Set all present Ps modes to on.
RM	`CSI Ps;...;Ps l`	Set all present Ps modes to off.
DECSTBM	`CSI Pt ; Pb r`	Set top margin to Pt, bottom to Pb.
DECOM	`CSI ? 6 h`	Relative origin mode.
	`CSI ? 6 l`	Absolute origin mode.
CUU	`CSI Pn A`	Move cursor up Pn lines. Stop at top
CUD	`CSI Pb B`	Move cursor dn Pn lines. Stop at bot
CUF	`CSI Pb C`	Move cursor rt Pn cols. Stop at edge
CUB	`CSI Pb D`	Move cursor lf Pn cols. Stop at edge
CUP	`CSI Pl ; Pc H`	Move cursor to Pl,Pc from origin.
HVP	`CSI Pl ; Pc f`	Move cursor to Pl,Pc from origin.
IND	`ESC D or $84`	Move cursor down. Scroll up if necessary
RI	`ESC M or $8D`	Move cursor up. Scroll down if necessary
NEL	`ESC E or $85`	Move start of next line. Can scroll
DECSC	`ESC 7`	Save cursor position & graphic mode
DECRC	`ESC 8`	Restore cursor pos or Home if none
DECAWM	`CSI ? 7 h`	Select Auto wrap.
	`CSI ? 7 l`	Turn off Auto wrap.
DECSCNM	`CSI ? 5 h or l`	Select light or dark screen.
LNM	`CSI 20 h or l`	Select linefeed/newline mode.
DECANM	`CSI ? 2 l`	Select VT52 compatibility.
SRM	`CSI 12 h or l`	Select local echo.
DECCKM	`CSI ? 1 h or l`	Select cursor key mode.
DECKPAM	`ESC =`	Application keypad mode.
DECKPNM	`ESC >`	Numeric Keypad mode.
SCS	`ESC ( A,B,0,1 or 2`	Select character set as G0.
	`ESC ) A,B,0,1 or 2`	Select character set as G1.
SGR	`CSI Pn;...;Pn m`	Set Graphics Rendition
HTS	`ESC H or $88`	Set tab at cursor position.
TBC	`CSI g or CSI 0 g`	Clear tab at cursor position.
	`CSI 3 g`	Clear all tabs.
EL	`CSI K or CSI 0 K`	Clear cursor to end of line.
	`CSI 1 K`	Clear start of line to cursor.
	`CSI 2 K`	Clear entire line. Cursor stays put.
ED	`CSI J or CSI 0 J`	Clear cursor to end of screen.
	`CSI 1 J`	Clear start of screen to cursor.
	`CSI 2 J`	Clear whole display. Curs stays put.
DCH	`CSI Pn P`	Delete Pn characters.
ICH	`CSI Pn @`	Insert Pn characters.
IL	`CSI Pn L`	Insert Pn Lines.
DL	`CSI Pn M`	Delete Pn Lines.
IRM	`CSI 4 h or l`	Select auto insert mode.
DSR	`CSI 5 n`	Computer request: status report.
	`CSI 0 n`	Response: OK.
	`CSI ? 15 n`	Computer request: printer status.
	`CSI ? 13 n`	Response: NOT CONNECTED.
	`CSI 6 n`	Computer request: cursor position.
	`CSI Pl ; Pc R`	Response: Pl line, Pc column.
DA	`CSI c or CSI 0 c`	Computer request: device attributes
DECID	`ESC Z`	Computer request: device attributes
DA	`CSI ? 6 c`	Response: VT102
	`CSI ? 1 ; 0 c`	Response: VT101

Code	Byte Sequence	Meaning
	`CSI ? 1 ; 2 c`	Response: VT100
RIS	`ESC c`	Reset
DECALN	`ESC # 8`	Fill screen with capital E's
DECLL	`CSI 0 q`	Reset all LEDS
	`CSI Pn;...;Pn q`	Enable LEDS Pn;...;Pn (1,2,3 or 4)

Cursor Key Modes:

	Cursor Mode	Application Mode
Set Mode	`ESC [ ? 1 l`	`ESC [ ? 1 h`
UP	`ESC [ A`	`ESC O A`
DOWN	`ESC [ B`	`ESC O B`
LEFT	`ESC [ C`	`ESC O C`
RIGHT	`ESC [ D`	`ESC O D`

Keypad Key Modes:

	Keypad Mode	Application Mode
Set Mode	`ESC >`	`ESC =`
0	`0`	`ESC O p`
1	`1`	`ESC O q`
2	`2`	`ESC O r`
3	`3`	`ESC O s`
4	`4`	`ESC O t`
5	`5`	`ESC O u`
6	`6`	`ESC O v`
7	`7`	`ESC O w`
8	`8`	`ESC O x`
9	`9`	`ESC O y`
- (minus)	`- (minus)`	`ESC O m`
+ (plus)	`+ (plus)`	`ESC O l`
. (period)	`. (period)`	`ESC O n`
ENTER	`CR or CR/LF`	`ESC O M`
PF1 (F1)	`ESC O P`	`ESC O P`
PF2 (F3)	`ESC O Q`	`ESC O Q`
PF3 (F5)	`ESC O R`	`ESC O R`
PF4 (F7)	`ESC O S`	`ESC O S`

Linefeed/Newline mode:

Mode	Key Pressed	Code Sent	Code Received	Action
Off	*RETURN*	CR	CR	Cursor to start of line
Off	*LINEFEED*	LF	LF/FF/VT	Cursor Down 1 line
On	*RETURN*	CR/LF	CR	Cursor to start of line
On	*LINEFEED*	LF	LF/FF/VT	Cursor new line

Appendix E: DesTerm Keyboard Mappings

There are several Ascii characters that have no keycap on a Commodore 128. This table lists these characters and the key sequences used to generate them.

Character	Ascii Code	Name	Key Sequence
Backspace	$08 (8)	Backspace/Delete	*INST/DEL*
[	$5B (91)	Open Braket	*SHIFT :*
\	$5C (92)	Back Slash	*POUND (£)*
]	$5D (93)	Close Braket	*SHIFT ;*
^	$5E (94)	Caret	*UP ARROW (↑)*
_	$5F (95)	Underscore	*LEFT ARROW (←)*
`	$60 (96)	Back Tick	*SHIFT @*
{	$7B (123)	Open Brace	*SHIFT +*
|	$7C (124)	Vertical Bar	*SHIFT POUND (SHIFT £)*
}	$7D (125)	Close Brace	*SHIFT -*
~	$7E (126)	Tilde	*SHIFT UP ARROW (SHIFT ↑)*
Delete	$7F (127)	Delete/Backspace	*CLR/HOME*

NOTE: The *INST/DEL* and *CLR/HOME* keys can both be programmed to transmit either code $08 or code $7F via the Terminal Settings menu.

At certain times it is necessary to be able to generate control codes (characters in the range $00 (0) to $1F (31)). Most codes are generated by pressing CONTROL (*CTRL*) and the appropriate alphabetic key. Other codes may not be so obvious.

Code	Name	Key Sequence	Code	Name	Key Sequence
$00 (0)	NUL	*CTRL 2, CTRL SPACE*	$10 (16)	DLE	*CTRL P*
$01 (1)	SOH	*CTRL A*	$11 (17)	DC1	*CTRL Q*
$02 (2)	STX	*CTRL B*	$12 (18)	DC2	*CTRL R*
$03 (3)	ETX	*CTRL C*	$13 (19)	DC3	*CTRL S*
$04 (4)	EOT	*CTRL D*	$14 (20)	DC4	*CTRL T*
$05 (5)	ENQ	*CTRL E*	$15 (21)	AAK	*CTRL U*
$06 (6)	ACU	*CTRL F*	$16 (22)	SYU	*CTRL V*
$07 (7)	BEL	*CTRL G*	$17 (23)	ETB	*CTRL W*
$08 (8)	ES	*INST/DEL, CTRL H*	$18 (24)	CAN	*CTRL X*
$09 (9)	HT	*TAB, CTRL I*	$19 (25)	EM	*CTRL Y*
$0A (10)	LF	*LINEFEED, CTRL J*	$1A (26)	SUB	*CTRL Z*
$0B (11)	VT	*CTRL K*	$1B (27)	ESC	*ESC, CTRL 3, CTRL :*
$0C (12)	FF	*CTRL L*	$1C (28)	FS	*CTRL 4, CTRL POUND (£)*
$0D (13)	CR	*RETURN, CTRL M*	$1D (29)	GS	*CTRL 5, CTRL ;, CTRL =*
$0E (14)	SO	*CTRL N*	$1E (30)	RS	*CTRL 6, CTRL UP ARROW (↑)*
$0F (15)	SI	*CTRL O*	$1F (31)	VS	*CTRL 7, CTRL LEFT ARROW (←)*
			$7F (127)	DEL	*CLR/HOME, CTRL 8*

Appendix F: Reporting Bugs

As with any complex piece of software, DesTerm is prone to having errors. DesTerm is tested principally by the authors, and from time to time by a set of testers. The most important testers of any piece of software are the users (that's you). If you think that you have found a bug, there are several things you should do:

1)   Read any documentation that you can find. Many errors turn out to be little more than misuse or confusion about how something works.
2)   Try asking somebody else that uses DesTerm - they may have similar experiences and be able to help. Members of a local Commodore club are a great resource. If you have access to internet news, try posing a question in comp.sys.cbm.
3)   If you have access to the web, try looking at the two Official DesTerm 128 information sources:
        -The Official DesTerm Page [XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX].
        -City Limits BBS [XXXXXXXXXXXXXX, 24hrs]
        Late breaking news, tips and a list of known errors will be posted to these sources regularly.
4)   Send electronic mail. The internet address to use is XXXXXXXXXXXXXXXXXXXXX. If you use fidonet, send netmail to Matthew Desmond at XXXXXXX. The more specific information about the problem you can supply, the easier the problem can be tracked down and fixed. Please supply the following information:

        Which model of Commodore 128 you have.
        Any hardware mods you may have made (Second SID chip, extra VDC ram etc).
        Disk Drive types, device numbers, hardware/software revision numbers.
        REU type & Ram Size.
        Installed Fast loaders.
        RS232 cartridges.
        Your Modem.
        Your Printer & interface.
        Extra hardware or peripherals you may have.
        Any other information you feel important.

        The C128 systems used to develop DesTerm would be reported like this:

                Commodore 128, Flat model, 16K VDC, NTSC video, No internal JiffyDOS.
                Commodore 128, Flat model, VDC expanded to 64K, NTSC video, No internal JiffyDOS.
                Commodore 1581, device 8, JiffyDOS 6.0 installed.
                Commodore 1571, device 9, JiffyDOS 6.0 installed.
                CMD HardDrive, device 12, uses parallel cable, has RTC. Software v1.92.
                CMD RamLink, device 16. 4Megs installed, RTC installed, RLDIRECT installed. Software v2.01.
                Commodore 1750 REU - stock, 512K.
                CMD 1750XL - stock, 2048K.
                JiffyDOS installed in all disk drives, supported via the RamLink.
                CMD SwiftLink, with extra 1.8432 crystal added via switch, default IO address, NMI selected.
                CMD Turbo232 - at default IO address, NMI selected.
                GVC 14400 Fax modem.
                Panasonic KX-P2124 dot matrix printer, Xetec Super Graphics Jr, non-translate mode.
                Smartwatch - home built Real Time Clock.
                Acer several-sync monitor that allows the 32 & 64 line VDC modes.

        I am quite notorious for two things:
                1) Not responding to mail
                2) Taking far too long to make a new release of software.
        Guilty on both counts I'm afraid. Generally speaking, If I receive e-mail that is worthy of a response, then it will get one. If not, then I take a note of the problem/comment then save the message somewhere. No mail ever gets ignored.

5)   Please do not send physical mail - I have a bad enough time paying bills on time.

This is the first release of DesTerm in quite a number of years, and it is bound to have many problems - please be patient, report the errors and I'll address them. It is impossible to fix a problem that you don't know about.

Addendum (August 2023)

This document was updated in Summer 2023 by Matthew Desmond (the original author). The bulk of the content has not been changed save to fix a couple of spelling mistakes and omissions plus removal of outdated contact information. For more information, please visit factorofmatt.com.