



# DISK TERM

INDIANA SOFTWARE DEVELOPMENT CO.





**INDIANA SOFTWARE DEVELOPMENT CO.**

**DISK ORIENTED TERMINAL PACKAGE**

**Version 1.00**

**Model 4 User Manual**

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Welcome to Indiana Software Development Co.'s Disk Oriented Terminal Package, or Disk Term for short. As the name implies this program was written to allow a TRS-80, operating as a terminal, to have access to the disk drives for the storage and transmission of data. Disk Term also allows for total unattended operation.

If you have any questions with regard to Disk Term please contact us at:

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We have thoroughly tested and perfected Disk Term. If you should encounter any bugs please write to us at the address above describing exactly where in the program the bug was encountered, and giving as much detail of the events leading up to the problem as possible.

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## INTRODUCTION

Disk Term was originally written by us for our own use. We needed a program that could transmit any number of files at a specified time from one TRS-80 to another, and do it unattended. Before writing this program we looked at a number of terminal programs; many were capable of transmitting the buffer at a specific time, and others could transmit from disk to disk but required operator assistance. We needed one that could do both. Hence Disk Term.

The whole idea was to take advantage of the greatly reduced phone rates after 11:00 PM. We wanted a program that would allow us to program the computer with the phone number to dial, the programs to be transmitted, and have it do the rest on its own quickly as possible.

We realized that with some additional programming we could add a terminal mode and the rest of the extras to make a complete terminal package with some unique features that might appeal to other people. Here is the results: A complete terminal package with the ability to be programmed for total unattended operation!

As you read this manual and use Disk Term you may come across some areas which you may not understand at first, especially if you are new to this type of computer activity. Do not be alarmed! It is impossible to enter any information that will do any harm to your computer or to anyone with whom you may be communicating. Feel free to experiment and if anything goes wrong, just reboot.

If you feel you would like to know more about serial communication and what makes it work, then we

recommend the book Data Communications For Microcomputers written by Elizabeth A. Nichols, Joseph C. Nichols, and Keith R. Musson. Published by McGraw-Hill Book Company, 1221 Avenue of the Americas, New York, NY 10020. This book is very well written requiring no previous knowledge or experience with data communication. It begins with theory and takes you through practical applications and experiments.

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## SETTING UP YOUR SYSTEM

If this is your first experience with a terminal program and modem we suggest that you first review this manual and become familiar with just what Disk Term is capable of.

Before attempting to use Disk Term make a back up copy. If you are not familiar with making a backup here is an explanation.

Place a system disk in drive 0 and press the red reset button.

Enter the date as requested.

Insert a blank, formatted disk in drive 1.

Type - **BACKUP :0 :1 (X)** .

Remove the system disk from drive 0 and insert the Disk Term disk when the prompt appears.

The rest is automatic; if any errors occur refer to the TRSDOS manual.

When the backup process is complete remove the Disk Term disk from drive 0 and store it in a safe place.

Place the system disk back in drive 0 and press enter.

Type - **DTERM** to load Disk Term.

To load Disk Term enter the Disk Operating System of TRSDOS. Once in DOS type **DTERM** a large "**DISK TERM**" will appear on the screen while the rest of the program is loading.

When the program has loaded the menu will appear on the screen. Prior to operating Disk Term the program must be customized to your modem and memory limitations. To do this select option "**U**" (refer to section "**U**", page 41, for further details).

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Throughout this manual we will refer to the automatic dialing and other automatic control of the modem. To take full advantage of Disk Term your modem must be capable of automatic dialing. If not, you are still able to use Disk Term, but you will only be able to use the automated features to a limited extent.

Disk Term loads its own video and RS-232 drivers. If your DOS has similar drivers do not use them. Although they will not interfere with Disk Term they will occupy memory that could be used by your buffers.

Through out this manual we use quotation marks, "X", to indicate a letter or letters that you will enter. When entering this data enter only the symbols between the quotation marks; never enter the quotation marks themselves.

### **Password Information**

Each copy of Disk Term has a unique password incorporated into the program. When in the transmit or receive mode communicating with another copy of Disk Term, the program checks to see that the receiver and transmitter programs do not have the same password. If they do then no exchange of data is allowed. This feature is solely to protect against pirate copies.

## MENU

## Disk Oriented Terminal Package

- |                        |                         |
|------------------------|-------------------------|
| A. Auto Dial           | N. Execute Auto File    |
| B. Buffer Switch       | O. Time Set             |
| C. Clear Buffer        | P. Printer Switch       |
| D. Duplex Switch       | Q. DOS Command          |
| E. Exit to DOS         | R. Receive Mode         |
| F. List ASCII File     | S. Auto Buf Control     |
| G. List Buffer         | T. Transmit Mode        |
| H. Load System Config. | U. Custom Configuration |
| I. Save System Config. | V. Video Width          |
| J. Split screen format | W. Table Change/Examine |
| K. Transmit ASCII File | X. RS232 Parameters     |
| L. Terminal Mode       | Y. Transmit Buffer      |
| M. Create Auto File    | Z. LF/CR Suppression    |

```

<---RS232---><-----BUFFERS-----><-----OUTPUT-----><-----MISC----->
DUPLX: Half 1 USED: 0 1 FREE: 36116 PRINT SWITCH: No MODM TYPE: 1
BAUD : 300 2 USED: 0 2 FREE: 0 VIDEO WIDTH : 80 AUTO STOP: No
WORD : 7 3 USED: 0 3 FREE: 0 SCR'N FORMAT: Spt AUTO SAVE: No
STOP : 1 RS232 : 256---->> FREE: 256 SUPP LINE FD: Yes NAME:
PARITY: Even PRINT : 256 BUFFER: Open SUPP CARG RT: No TIME: 13:55:29

```

The Menu is divided into two portions. The upper portion contains the options available, the lower portion shows the current status of the displayed options.

There are basically three types of responses when you select one of the menu options. Options B, D, J, P, and Z are toggle switch commands. There is no apparent change in the menu except for the status of that item in the status box.

The simple input commands will replace the status portion of the menu with a prompt for information. After entering the information the status portion of the screen is restored. The following are simple input options, A, C, F, G, H, I, O, Q, S, V and Y.

The remaining options L, M, N, R, T, U, W, and X change the operating mode from the menu to the mode selected.

When selecting A, C, F, H, I, M, N, O, Q, or S a hand will appear pointing to the menu item you selected. The purpose of this is to confirm the option you selected. Many of these options begin with the same prompt, "M" and "N", for example. The hand helps you to realize if you inadvertently pressed the wrong key. To cancel any of these commands once selected but prior to responding to the prompt, press the BREAK key.

## KEYBOARD

All keys function as normal except the BREAK key which is used to toggle back to the menu from the terminal, transmit or receive mode. While in the terminal the BREAK key returns you to the menu. Pressing the BREAK key again returns you to the terminal. This works the same way with transmit and receive.

From most data input options such as the tables, create auto file, time set, etc., the BREAK key will abort and return to the menu.

To enter control codes use the CONTROL key and the desired letter simultaneously. In this manual we indicate control keys as "control A" or "CNTL A".

To enter codes which require an escape key use the F1 key. Escape commands will appear in the manual as either "escape A" or "ESC A".

The F2 key functions as a clear screen key when in the terminal mode. When using a split screen the F2 key clears the top half of the screen and the F3 key clears the lower half.



## **A: AUTO DIAL**

The Auto-Dial feature allows you to store up to 16 numbers in a mini telephone directory. These numbers can be called from the terminal or transmit modes. To enter these numbers refer to section "W" page 47.

When using the auto dial in the terminal mode return to the menu and select "A". The telephone table will be displayed. To select the phone number to be dialed enter the table number or letter that corresponds to the number. After the number is dialed you are returned to the terminal mode if a connection is made. If no connection is made (no carrier tone) then you are returned to the menu.

Pressing the BREAK key prior to making a connection will cancel the dial command and return to the menu.

## **B: BUFFER SWITCH**

The Buffer Switch will toggle the buffer between open and closed. The current status is displayed on the lower portion of the screen.

The buffer may also be controlled from another computer by using "control R" to open the buffer and "control T" to close the buffer. Your buffer will be affected any time these codes are received by your computer.

### **About The Buffer.**

The buffer uses all available free memory, that is, the memory not being used by your operating system and the Disk Term program. This should be about 35k for a 64k computer. This number may vary depending on the operating system being used. The amount of available buffer space and the amount of buffer used are displayed in the status section of the menu. If you have a 128k computer the available buffer is shown in three sections. These sections represent the memory banks available to Disk Term. If your computer has 64k of memory then banks two and three show zero memory.

The buffer is used to store incoming information when in the terminal mode. It is NOT used in the transmit and receive modes. Anything that appears on the screen while in terminal mode is sent to the buffer (if the buffer is open). This includes any entries you make. Therefore it is important to close the buffer before entering any commands if you wish to preserve the buffer. For example, if you just received a program in the terminal mode that program is now stored in the buffer. Now you wish to call another terminal and transmit that data. If

the buffer is open then the dial commands you enter to cause your modem to dial will be saved on the end of your buffer. If, however, you had closed the buffer first then nothing else could get into the buffer and corrupt the data. On the other hand, if you forget to open the buffer none of the incoming data will be saved. Be cautious!

### **C: CLEAR BUFFER**

Clear Buffer will erase all data stored in the buffer. The buffer used status will read zero. As a precaution you will be asked to confirm this command since once the buffer has been cleared there is no way to restore the lost data.

When the buffer is cleared all three banks of the buffer are cleared at once. There is no provision for clearing the buffer bank by bank.

If data in the buffer is of importance, be sure to save it before clearing (see option "S", page 37). The buffer should always be cleared before receiving new data so that any garbage present is removed.

The buffer may be cleared while either open or closed. When using the Auto Save On Full option (see page 36) the buffer will clear automatically each time it becomes full.

## **D: DUPLEX SWITCH**

The Duplex Switch toggles the duplex mode between full and half. The current status is displayed in the lower section.

### **About Duplex**

When communicating with another microcomputer use half duplex. Half duplex means that whatever is entered is displayed on the screen and transmitted to the other computer. Full duplex means that whatever is entered is sent to the other computer without being displayed. The other computer then retransmits the data back to you where it is then displayed on your screen. Full duplex is used for error checking. In this mode if what shows on the display is not what was typed in, an error is detected. However, it does require a full duplex computer which the TRS-80 is not, and a full duplex modem. Check your owner's manual. You may encounter full duplex on some services which you may contact. In such a case you should select full duplex.



## **E: EXIT TO DOS**

Exit will return you to DOS. Before exiting be sure to save any changes to the system configuration and save the buffer if you have received any data.

## **F: LIST ASCII FILE**

Enter file name to be listed. The file will be displayed on the screen in the same manner as the DOS command "LIST". While the file is scrolling the space bar will cause the display to pause. Pressing the space bar a second time will restart the display. The BREAK key will abort the display process. To return to the menu after the display process is complete or after aborting, press the BREAK key.

If the file being listed was originally formed using the split screen (option "J") then it will list out in the same format.

If the buffer is open while listing a file the contents of the file will be stored in the buffer also. This is the only method for loading a file from disk to the buffer.

### **G: LIST BUFFER**

This lists the contents of the buffer. Use the space bar to pause. Use the BREAK key to abort, and return to the menu as is described in section "F" (List ASCII File).

Whenever the buffer is listed it is automatically closed. This is to keep the buffer listing from loading into the buffer and creating a duplication of the buffer.

If the contents of the buffer were originally in the split screen format of the terminal mode, then they will list in the split screen format.

If no data is in the buffer, then the error message "**\* \* NO DATA IN BUFFER \* \***" is displayed and the menu returns.

## H: LOAD SYSTEM CONFIGURATION

Option "H" allows the system configuration to be changed by loading a data file which contains the configuration desired. The data files are created using option "I" and all the items which are affected are shown in that section. The only items shown that are not changed using option "H" are the print buffer size, the serial buffer size, and the modem type. These options are set by the data file that loads when Disk Term is loaded.

When Disk Term is loaded the system configuration file, DTERM/DCF, is also loaded. (DCF stands for Disk Term Configuration File.) This file sets the initial parameters for Disk Term. Use one of the following three ways to change the parameters:

1: Load a new file using option "H". The file must have already been created using option "I". The file you load will not change the two buffer sizes or the modem type as mentioned earlier. To load a new configuration answer the following prompt with the file name that contains the configuration desired:

**Enter File Name:**

The DCF extension will be added to the file name entered unless you use a different extension.

2: Cause a file other than DTERM/DCF to load with Disk Term. To do this enter the file desired along with the command DTERM. For example, to cause Disk Term to load with the configuration contained in a file called OTHER/DCF, rather than DTERM/DCF, enter this command from DOS:

DTERM OTHER/DCF

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3: The last way to change the system configuration is to change the settings contained in DTERM/DCF. Refer to option "I".

Another system configuration file supplied with Disk Term is EBCDIC/DAT. This file adjusts the RS-232 in and out tables to convert from ASCII to EBCDIC. This is a code similar to ASCII used by some mainframe-type computers. Some customizing may be required for individual computers but the general basis for communication is in this configuration.

## I: SAVE SYSTEM CONFIGURATION

The following information is stored in the configuration file:

Duplex	Buffer Status
Word Length	Printer Switch
Stop Bits	Suppress Line Feed
Parity	Suppress Carg. Return
Baud Rate	Video Width
Modem Dial Code	Print Buffer Size
Modem Hang Up Code	Serial Buffer Size
No. of Dial Attempts	Transmit On (XON)
Delay Between Dialing	Transmit Off (XOFF)
Transmission Prompt	Status of all Tables
Split Screen Enable	Split Screen Enable
Nulls on Carriage Return	

Whenever you wish to change the configuration you may store it in a system configuration file. It may then be recalled using option "H" whenever desired. This allows for speedy change from one configuration to another.

When you make a change to the configuration it is important that you save the change prior to exiting Disk Term otherwise the change will not be there the next time you load Disk Term. Once you exit Disk Term the configuration you created is gone unless you saved it. This is particularly important when altering the tables. It seems that people tend to forget to save these once they have changed them. If, for example, you enter names and phone numbers into the telephone table, they will not be there the next time you load Disk Term unless you save them before you exit. The only limit to the number of configuration files you can have is the amount of disk space available.



When you select to save a configuration the following prompt appears:

**Enter File Name:**

Any file name is valid as is any drive number (the configuration files do not need to be on the same disk as Disk Term). If you do not specify a file extension Disk Term will add the extension /DCF (Disk Term Configuration File). If the file already exists Disk Term will alert you and ask if you wish to overwrite the old file. Answer Yes to overwrite, No to enter a different file name.

By saving the configuration in a data file the configuration can be adjusted to frequently used settings merely by loading the file. By creating a file for all frequently used configurations you can switch back and forth by loading the appropriate file. One method of organizing the files is to name them after a service, bulletin board, friend, etc. If you are frequently reconfiguring to communicate with a local bulletin board system you might call that configuration BBS/DCF.

## **J: Split Screen**

This option allows you to separate the incoming and outgoing data when in the terminal mode. With the split screen in effect the screen is divided horizontally with the upper half containing the data you enter and the lower half containing the data being received.

As the data is displayed on the screen the eighth bit of each byte is used to record which half of the screen the particular byte belongs. When the data is listed from the buffer or from disk it is still displayed on the proper half of the screen. Since the eighth bit is used to determine which screen the data belongs on, the split screen option cannot be used when the RS-232 is set to eight bit words. When using eight bit words select option "U" and set the "Enable Split Screen" to off.

If, however, you are receiving eight bit words but are converting them to 7 bit ASCII codes using the conversion tables (option "W") you can still use the split screen. This is because after the incoming data is converted by the conversion tables only the first 7 bits are being used to store the data; the eighth bit can be altered to indicate the proper screen without affecting the data.

When communicating in full duplex nothing is displayed on the top half of the screen. Because of the design of full duplex communications your data entry is echoed back to you before being displayed therefore it is on the input screen, the lower one. (See page 10 for more on duplex.) If you select half duplex however, then what you enter is displayed on the top half and everything (Both input and output) are displayed on the bottom half.

**K: TRANSMIT ASCII FILE**

This option is very similar to option "Y" (Transmit Buffer). The only difference is that option "Y" transmits the data stored in memory while option "K" transmits data direct from the disks. In this way data files too large to be loaded into memory can still be transmitted. If transmitting to another copy of Disk Term, use the Transmit mode.

When "K" is selected the status portion is replaced by the following prompts:

Pause on Carriage Return (Y/N)?  
Enter Transmit Time (hh:mm:ss):  
Enter Phone Number:  
Enter File Name:

Each prompt appears as the previous prompt is answered. The prompts are explained in detail in section "Y". Briefly, however, the usual reply to "Pause on carriage return" is No. To transmit immediately press ENTER for the transmit time, or to pause, enter the time the transmission is to begin.

Enter the number to be dialed or press Enter to dial no number. To dial a number stored in the Telephone Table enter a number sign (#) followed by the table position

The file name entered should be that of an ASCII file. Although the program does not check the contents of the file being transmitted, if files other than ASCII files are transmitted, they will be garbage at the receiving end. To transmit non-ASCII files use the "CV/CMD" conversion utility supplied with Disk Term. Refer to page C-60 for details.

## L: TERMINAL MODE

Although the terminal mode is where most communication takes place there is not much you need to know to operate here. Basically, what you type in is what the other person sees and vice versa.

Most data transmitted and received in the terminal mode is stored in memory first. If you wish to transmit a data file use option "Y" or "K". If you are receiving data that data must fit into memory (option "S" may allow larger files to be saved to disk). To transmit data files that are too large to store in memory use options "R" and "T", Receive and Transmit modes. Remember that all data transmitted and received in the terminal mode is in ASCII form.

While in the terminal mode the macro-keys may be used. To activate a macro-key press and hold the CLEAR followed by the desired number (1-8). See section "W", page 48, for information on entering the macro-keys. If a "control E" is received while in the terminal mode the macro-key stored in position 1 is activated. This is used for log on procedures. Look at the technical section to see the additional control codes that are available. You'll find codes to clear the screen and other information there.

If you need to return to the menu while receiving data press the BREAK key. The incoming data will be stored in the RS-232 buffer while you are away. The buffer will allow you 8.5 seconds per 1/4 kilobyte at 300 baud (85 seconds maximum), and 2.2 seconds per 1/4 kilobyte at 1200 baud (22 seconds maximum), before becoming full. See section "U", page 42, for setting buffer size.

While you are away from the terminal mode the space remaining in the serial buffer is displayed in the status section of the menu. As this number approaches zero you should return to the terminal mode to prevent any loss of data. Once the buffer is full any additional data received is lost.

If you have trouble establishing communications with someone check option "X" to be sure your RS-232 is set correctly. Also check the duplexes match.



## M: CREATE AUTO FILE

The auto file will allow the functions of the Transmit Mode to be carried out without the need of operator assistance. The commands available are described in the Transmit Mode section. It should be read first as it is necessary to understand how to transmit before being able to understand how to do it automatically.

To transmit automatically the sequence of commands will be stored in an ASCII file. When the file is called up in the transmit mode the commands will be entered just as if you were typing them in.

Here is a review of the valid commands:

- @                      Designates Master Auto File
- ? FILENAME          FILENAME is the file to be transmitted.
- # 18005556789      18005556789 is the number to be dialed
- \$                      To hang up modems.
- & AUTONAME          AUTONAME is an auto file to be executed.
- ! 23:22:00          Delay the next command until 11:22:00 PM.

The first step in creating the file is to name it. When "M" is selected a prompt appears on the lower half of the menu. Respond to the prompt with the file name, optional extension, and optional drive number:

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Enter File Name: AUTO/TXT:1

AUTO/TXT:1 is an example of a response to the above prompt. Any valid file name and drive is acceptable.

If the file already exists Disk Term will alert you and ask if you wish to overwrite the old file. Answer Yes to overwrite, and No to enter a different file name.

If you wish to abort after selecting to create an auto file, press the BREAK key.

### **! - TIME DELAY**

After entering the file name the file is opened and the screen clears. Enter the commands as you wish them to be executed. The first command is normally a time delay. It might look like this:

! 23:45:00

This would cause the auto execution to pause until 11:45 PM.

### **# - DIAL COMMAND**

When using the time delay it will usually follow that the modem will need to dial another modem. The command looks like this:

# 18005556789

If a number is stored in the auto dial table then it can be used like this:

# &3

Where "3" is the position in the table. The "&" symbol tells the program to look to the table.

If no connection is made then Disk Term tries the number again. It will keep trying the number of times specified in section "U" page 43.

### **? - TRANSMIT FILE**

Once a connection is made the next step is usually to transmit a file. Use an "?" command for each file to be transmitted.

? TEST/DAT:1  
? MENU/BAS:0

As many files as desired may be entered. Any type of file may be transmitted: Basic, ASCII, data, machine language. If you want to transmit an invisible file be sure to include the "I" in the file name. Check your DOS manual for proper syntax.

### **\$ - HANG UP MODEM**

After all files have been transmitted you would normally hang up the modems. There is no argument for this command:

\$

**IMPORTANT: DO NOT FORGET TO PLACE A HANG UP COMMAND AT THE END OF THE AUTO FILE.** This is especially important if the auto file is to make a long distance call.

Once your file is complete press the BREAK key to return to the menu.

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This has been an example of a simple auto file containing a wait, call, transmit, transmit, hang up. You could create a more complex file using multiple call, transmit, hang up combinations. For example:

```
! 20:15:00
# 18005556789
? DATA/TST:0
? PROGRAM/BAS:1
$
# &5
? DATA/TST
? PROGRAM/BAS:1
? UTILITY/CMD:0
$
```

This example waits until 8:15 PM, makes a call to 1-800-555-6789, transmits two files, hangs up, calls the number on the auto dial table position 5, transmits 3 files, and hangs up.

### **& - LOAD AUTO FILE FROM AUTO FILE**

Another command that allows even more complex auto files is the "&" command which will call one auto file from another.

The following is an example of a file we will call CALL/TXT:

```
! 02:30:00
& AUTOTRAN/TXT:2
```

This auto file waits until 2:30 AM, then loads AUTOTRAN/TXT, which may contain a phone number and a list of files. In this manner AUTOTRAN/TXT can be transmitted at any time without rewriting the entire file. Only CALL/TXT

which loads AUTOTRAN/TXT needs to be rewritten with the correct time.

Once the "&" command is encountered in a file the rest of that file is discarded and the new file is loaded. To have one file call a series of auto files refer to the section on master auto files which follows.

### **@ - Master Auto File**

A Master Auto File is an auto file which can call a number of other auto files using the & command. Normally an auto file can call another auto file, but once the second file has been called, the first file is gone. With a master auto file the position in the master is remembered when a second auto file is called. When the second file is completed the master takes over again at the point the second file was called. There is no limit to the number of auto files which can be called through a master auto file.

To designate an auto file as a master file place an @ on the first line of the file. Here is an example of a master file:

```
@  
# 18005556789  
? PROGRAM/BAS  
& AUTO1/TXT  
& AUTO2/TXT  
? PROGRAM2/BAS  
& AUTO3/TXT  
$
```

Notice that the master file can transfer program files as well as load additional auto files and do it in any order. In fact the master file is capable of

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executing all the commands available to an auto file.

If a master file is instructed to call another master file (a file beginning with @) that file will be executed. However, it will not be treated as a master file. There can be only one master in control at a given time.

The master file can only be executed using option "N". If a master file is called from another file or loaded manually through the transmit mode (option "T") it is treated as a regular file and execution commences.

### **Hints on using auto files**

If you choose to use two time delays in one auto file care must be taken that enough time is allowed for all commands that follow the first to be completed before the second is encountered. If a time delay is encountered that has already passed the program will wait until that time again the next day. (It is very patient). The following file could be a problem.

```
! 23:00:00
# &6
? DATAFILE/DAT
? PROGRAM/BAS
$
! 23:05:00
# &4
$
```

If the files DATAFILE/DAT and PROGRAM/BAS required more than 5 minutes to transmit then the next command ! 23:05:00 might be encountered at

23:10:00. This means the delay to 23:05 is 23 hours and 55 minutes. The solution is to use only one time delay. If more than one is required allow plenty of time between delays.

Each command in this section may, if desired, be followed by a comment. Following the argument type a blank space, and any comment desired. For example, if you wanted to include a description with a phone number enter it as follows:

# 18005556789 HOME OFFICE

All the files created using option "M" are basically DOS "DO" files. They are constructed in exactly the same manner. Like "DO" files there is no edit provision; if you make a mistake, or wish to insert something, you must kill the file and start over. When larger files are used and the work of retyping becomes too great the file may be created and edited using a word processor. Once the file is written on the word processor it must be converted to ASCII. Most word processors have an ASCII conversion utility if they do not store files in ASCII. Check the instructions for your word processing program.

To create an auto file using a word processor type in the instructions just as you would in the auto create mode. Use a carriage return (ENTER) after each line. Make no line longer than 63 characters (one screen width) then save the file. If your word processor does not store in ASCII convert the file. Now use the file name of your document for the auto file name.

**N: EXECUTE AUTO FILE**

Execute Auto File will automatically set the RS-232 parameters (except baud) to meet its own needs. Then it will enter the transmit mode and begin execution of the command file. The only operator command accepted while an auto file is executing is the BREAK key. The BREAK key will cancel a time delay and move on to the next command. The BREAK key will also cancel a dial command and move on to the next command. There is no provision for returning to the menu until the file is completed or to abort an auto file process once it has begun. If it is necessary to stop execution the computer must be reset. If a telephone connection has been established be sure to disconnect after resetting the computer (usually turning the modem off and on is sufficient).

When selecting to execute an auto file the following prompt replaces the status portion of the screen:

**Enter File Name:**

Enter the file name using extensions and drive numbers as required press ENTER. Pressing the BREAK key will cancel the execute auto command if it is pressed before the auto file has begun.

Long distance safeguards: When calling long distance with an unattended computer the possibility of a communication problem keeping the line open for prolonged periods must be eliminated. To accomplish this Disk term uses a method of hand shaking which causes the auto file to move on to the next command if the current command cannot be completed in a reasonable amount of time.



Prior to transmitting each file the transmitter sends the hand shaking code to the receiver. It attempts to make contact 256 times. If no reply is received the transmitter moves on to the next command. This hand shaking takes about 22 seconds. Also after each sector is received the receiver transmits a code to the transmitter telling it to send the next sector. If no message is received after 22 seconds the transmitter skips the rest of that file and moves on to the next command. This way the transmitter continues with the auto file and will eventually come to the disconnect commands and hang up the phone.

**Caution:** The auto file uses the same memory in which the buffer is stored. To prevent loss of valuable data in the buffer save the buffer (option "S") before executing or creating an auto file.

### O: TIME SET

Time set is used to set the computer clock. Use the format HH:MM:SS where H is hours, M is minutes and S is seconds. It is only necessary to set the clock when automatic transmission is to be used. Be sure to use the 24 hour clock (00:00:00 to 11:59:59 for AM and 12:00:00 to 23:59:59 for PM). If automatic transmissions are to be used regularly it may be easier to set the time when the computer is turned on. Most disk operating systems have a provision for an automatic time prompt on power up.

## **P: PRINTER SWITCH**

When the Printer Switch is on all data entered in the terminal mode will be duplicated to the printer for a hard copy. This includes all data transmitted and received. When using Disk Term in an unattended mode the printer should be on. Hence if any errors are encountered they will be documented. Otherwise an error such as a phone connection problem may not be detected. You may not realize that the data you sent was never received.

Disk Term contains an in-memory print buffer. This buffer will help keep the printer from falling behind by storing data up to the buffer limits until the printer is able to print it. If you have a 120 cps or faster printer and receive data at 300 baud then a small buffer is sufficient. If you use 1200 baud or have a slow printer then use a larger buffer. If you have an external print buffer use the minimal buffer. Details on setting buffer size are on page 42, section "U".

If no printer is connected to your terminal leave the Printer Switch off.

**Q: DOS COMMAND**

A DOS library command may be entered here. This command can be used to check the directory or the free space on a drive, or any other library command that your DOS supports.

When you press "Q" the lower status portion of the menu is replaced with the prompt:

**Enter DOS Command:**

Follow this prompt with the command you wish to enter; a maximum of 32 characters is allowed:

**Enter DOS Command: DIR :1**

Once the command has been executed and the message "DOS command complete" appears, press ENTER to return to the menu.

## **R: RECEIVE MODE**

The Receive Mode is used in conjunction with the Transmit Mode. These two modes allow for data transfer between two copies of Disk Term. The Transmit mode (page 38) must be used to transmit to the receive mode. If you are sending a program to another copy of Disk Term use the transmit mode. The other computer uses the receive mode.

The Receive Mode is fully automatic except for entering the drive number on which the data is to be stored. When "R" is pressed the following prompt is displayed:

### **File destination drive number:**

Enter the drive on which you want the incoming data to be stored.

If no number is specified (pressing ENTER only) then the drive spec on the originating end will be used. For example, if the file name at the origin was DATA/TST:3 the receiving program would attempt to save using the name DATA/TST:3. If there is no drive three at the receiving end or if the disk in drive three is write protected, then an error code is sent to the origin and the operation is aborted.

If no drive spec is present at the origin and no drive spec is entered at the receiver, then the data is written to the first available drive, usually drive 0.

In review, the order of preference for data storage is:

(a) Drive number specified by receiving terminal.

(b) Drive number specified by transmitting terminal.

(c) If neither of the above exists then on the first available drive.

To avoid the possibility of errors or incoming data overwriting existing data with the same file name, we recommend that you always specify the drive. Then place an empty formatted disk in that drive. If you have a single drive system use a bare minimum system disk and specify drive zero.

For single drive users it is possible to select the Receive Mode, then remove the disk with Disk Term and place a bare minimum system disk in drive zero. This will allow maximum storage space on your disk if you feel extra room is needed.

Once the drive is selected the message "**Waiting Enquiry**" appears. This means the receiver is ready to accept data. When data is received the sector number being received is displayed. Once the entire file has been received the message "**Waiting Enquiry**" appears again indicating that the receiver is ready to accept another file. Anytime this message is displayed, you can return to the menu by pressing the BREAK key. You cannot leave the receive mode while it is receiving data.

The following error messages may appear in the receive mode:

**Bad Sector** - The sum of the bits of the sector did not match the sector sum transmitted. The sector is retransmitted until received correctly.

**Lost Data** - The sector contained less than 256 bytes. The sector is retransmitted until received correctly.

**Operation Aborted** - Unrecognizable error encountered. This file was NOT transmitted completely. If this is encountered during execution of an auto file the next step in the auto file will follow.

If the error message is surrounded by a pair of asterisks (\* \* message \* \*) a DOS error has occurred. When a DOS error occurs the transmission is not completed.

### **S: AUTO BUFFER CONTROL**

The Auto Buffer Control will cause the transmitting computer to stop transmitting when your buffer is full. It will then automatically save the buffer. This feature applies to receiving data in the terminal mode only.

To access this section the buffer must be closed first. If you select option "S" with the buffer open the message "Buffer Must Be Closed First" appears and you can go no further.

To automatically stop the transmitter when your buffer is full answer yes to the following prompt:

**Do you wish to use Auto Stop on Buffer Full?**

If you answer Yes, then once the buffer becomes full Disk Term transmits a "control S" to the transmitter. The "control S" will cause it to stop transmitting. To start the transmission again enter a "control Q" (shift, down arrow, and Q all together). If you are using auto save with auto stop Disk Term will automatically transmit the "control Q".

To automatically save the buffer to disk you first must use the auto stop feature, then answer Yes to the following prompt:

**Do you wish to use Auto Save on Buffer Full?**

Answer the next prompt by entering the file name to be used to save the buffer:

**Enter File Name:**

Always use a valid file name. The drive number and



an extension may be included, but the total number of characters is limited to 11. If an invalid file name, or no file name is entered, the auto save function is automatically set to off.

When the auto save is in operation opening the buffer will also open a file on disk. This is why the buffer has to be closed when you start. Each time the buffer becomes full a "control S" is sent to the transmitter to stop the transmission. There is a two second pause to allow the transmission to stop then the buffer is saved to disk under the file name you provided. Once the data is saved the buffer is cleared to make room for new data. On subsequent saves the data is appended to the end of the file. After each data save a "control Q" is sent to the transmitter and it begins transmitting again.

Since the buffer only writes to the disk when it becomes full it is most likely that when the transmission is complete there will be some data remaining in the buffer which has not been stored. (It is unlikely that the data sent would exactly fill the buffer and cause an auto save to occur.) Therefore there needs to be some way of saving the remaining data to disk. The solution lies in closing the buffer. Whenever the auto save is in effect and the buffer is closed, any data in the buffer will be written to the disk.

Option "S" is also used to save data that is already in the buffer to disk. To save the contents of the buffer answer Yes to the stop on full and save on full prompts. Enter the file name which is to contain the data in the buffer. Now open, then close, the buffer. The buffer contents will be saved and the buffer will be closed.

### T: TRANSMIT MODE

The Transmit Mode is capable of transferring a data file stored on a disk to another computer and storing it on a disk through the receive mode. This can be done manually or automatically at a specified time. When in the transmit mode the following commands are valid:

? **FILENAME**      **FILENAME** is the file to be transmitted.

# **18005556789**      18005556789 is the number to be dialed.

\$                      To hang up modems.

& **AUTONAME**      **AUTONAME** is an auto file to be executed.

! **2~~5~~22:00**              Delay the next command until 11:22:00 PM.

Whenever the cursor appears the transmit commands may be entered. Here are some examples of how to use each.

? **DATA/TST:0** would cause the file **DATA/TST** on drive 0 to be transmitted. If no drive is specified the first drive on which that file name is encountered will be the file transmitted.

# **18005556782** will cause the number entered to be passed to the modem. The attention command for the modem is not used as the Disk Term program inserts that automatically. If your modem is capable of editing out dashes and other non-numbers then they may be used, but Disk Term will not remove

them. Any numbers stored in the auto-dial table can be accessed by using a "&" followed by the table position. For example, # &3 dials the number stored at position 3.

\$ no argument is used. This causes the transmitting modem to hang up if it is capable of doing so. (The telephone system automatically disconnects the receiver when the originator of a call hangs up.) Disk Term will keep trying to hang up until the carrier signal is gone.

& AUTOCALL/TXT will cause the auto file AUTOCALL/TXT to be loaded and executed. For more details see section "M" (Create Auto File).

! 23:45:00 will cause execution to pause until the computers clock reaches 23:45:00. These are most effective in an auto file when followed by dial and transmit commands. To cancel a time delay press the BREAK key. If you are in an auto file when you press BREAK the time delay will be cancelled and the next command will execute.

The following is an example of a series of commands as they might be entered with an explanation of each in parentheses.

# &5	dial number from auto dial table)
? TEST/BAS	(transmit file TEST/BAS)
? PROG/CMD	(transmit file PROG/CMD)
? DATA/TXT:3	(transmit file DATA/TXT stored on drive 3)
\$	(hang up both modems)
Press "BREAK" key (return to menu)	

When a line begins with anything other than a command symbol that line is considered to be a comment and is transmitted to the receiver when the enter key is pressed.

The following error messages may appear in the transmit mode:

**NO ANSWER FROM RECEIVING TERMINAL** - The transmitter is unable to complete the hand shaking sequence with the receiver. The current operation is aborted. If this occurs during an auto file the next step in the file is executed.

**IMPROPER PHONE NUMBER** - One of two errors. Either the position in the telephone table had no number defined or an invalid table position number was used.

If the error message is surrounded by a pair of asterisks (\* \* message \* \*) then it indicates that a DOS error has occurred. If this happens the current operation is aborted. If the error message is preceded by a line which says "**Receiving Terminal Error**" the DOS error occurred at the receiving end. The error is echoed back to the transmitter so you will know that the file transmission was not completed.

## U: CUSTOM CONFIGURATION

This section allows you to customize Disk Term to work with your modem and adjust buffer memory. Each item asked for should be entered to suit your needs. If you do not have an automatic modem press ENTER for each of the modem questions.

All information in the custom configuration is stored as part of the system configuration (option "I"). To make a change permanent save the system configuration whenever the custom configuration is changed.

The following is an example of the display:

Print Buffer Size (1/4k)	2
RS232 Buffer Size (1/4k)	1
Modem Dial Command	ATD
Modem Hang Up Command	+++
Modem Type (1-3)	1
No. of Dial Attempts	4
Delay Between Dialing Attempts (secs)	60
Wait For Carrier (secs.)	30
Transmission Prompt	13
XOFF Control Code (DC3)	19
XON Control Code (DC1)	17
Nulls on Carriage Return	9
Split Screen Enable	Yes

Each value is displayed next to its title. To leave a value unchanged press ENTER. To change a value enter the value desired on the appropriate line press ENTER for the others. To leave this section press the BREAK key. When ENTER is pressed for the last item (Split Screen Enable) you will also be returned to the menu.

All changes entered here take effect immediately except for the two buffers, and the modem type. These three items are set when Disk Term loads. They can only be changed by reloading Disk Term with a different system configuration file (option "H", page 13) that contains the desired settings.

### **Buffer Information**

**Print Buffer Size:** This tells Disk Term how large the print buffer is to be. The number entered here represents the number of quarter kilobytes to be used. For example, if you entered 5 for five quarter kilobytes you would end up with 1 1/4 kilobytes of buffer. The maximum that can be used is 10 quarters, or 2.5 kilobytes. Enter a "0" for 10. Remember, this reduces the size of your terminal buffer.

**RS-232 Buffer Size:** Works the same as Print Buffer Size except this is for the RS-232. Enter the size in quarter kilobytes up to ten quarters.

When Disk Term is loaded the memory is allocated as specified in the system file (section "H" and "I") that loads with Disk Term and cannot be changed without reloading Disk Term. If you want to change the memory allocation you must change the custom configuration "U". Save the configuration "I" then return to DOS and reload Disk Term using that system configuration. See section "H" for loading Disk Term with a specified system file.

The amount of buffer required depends on the baud rate you are using and the amount of data to be buffered. See section "L" page 19 for more information on the RS-232 buffer, and section "P" page 32 for more information on the printer buffer.

### **Modem Information**

**Modem Dialing Command:** This code is transmitted in front of each number to be dialed by the modem. For example: A popular command is ATD (don't forget a space if one is required). If you do not have an automatic modem leave this section blank.

**Modem Hang up Command:** This code causes the modem to "hang up" or reset. One common code is +++ . A two second pause is inserted in front of and behind this code. If your modem is not capable of a software controlled disconnect or reset leave this blank.

In addition to the hang up command Disk Term also uses the "Data terminal ready line" (pin 20) to cause the modem to hang up. Whenever a hang up command is encountered Disk Term switches this line from high to low. On many modems this will cause the modem to hang up.

**Modem Type:** This adjusts Disk Term so that the automatic dial commands that Disk Terms uses are compatible with your modem. The codes and the type of modem they represent are:

1.      **U. S. Robotics  
Hayes**
2.      **Radio Shack Modem II**

As previously mentioned the modem type is determined when Disk Term is loaded. Disk Term must be reloaded to change the modem type.

**No. of Dialing Attempts:** This information is used in the "auto transmit" mode. When the computer is calling a number in an unattended mode it needs to

know what to do if the call does not go through. Basically, the only decision it can make is, Should it try again, and if so, How many times?

When entering this number there are two things to consider (which is why you must make this decision). First, the call may not go through. A busy signal or a bad connection may prevent a connection. In this case it could keep trying indefinitely or until a connection is finally made with the receiving modem without doing any harm. The second problem is a wrong number without doing any harm. If a wrong number is reached the modem does not know it. All the modem knows is that it did not reach another modem. If the wrong number is the fault of a switching error on the part of the phone company (unlikely) the next time it tries it should make a connection. A problem exists when the wrong number is reached because you entered the wrong number in the auto file, or use the wrong position number in the Auto-Dial Table. (If the modem kept dialing the wrong number every minute or so all night long it would be quite annoying to the person who was on the receiving end.) For this reason we suggest that you only attempt to make contact two or three times.

**Wait for Carrier:** Enter the number of seconds that Disk Term should wait for a connection. This is the time from the beginning of the dial command until the carrier tone is received. Twenty seconds is usually sufficient for pulse dialed calls within the United States. Some modems duplicate this feature in their own design. If you want Disk Term to control this feature you must set the modem delay to a high number. See your modem manual for details.



### Other Information

**Transmission Prompt:** This prompt is used in buffer transmit. See section "Y" page 56 for details on how the prompt affects transmissions. When entering a prompt enter the ASCII code for the character or control code desired. For a carriage return enter 13, for a semicolon enter a 59, etc.

**XOFF Control Code:** The Control Code transmitted to stop a transmission. Character 19 is standard in almost every application. See page T-64 for more about control codes.

**XON Control Code:** The Control Code transmitted to restart a transmission following a XOFF code. Character 17 is standard. See page T-64 for more about control codes.

**Nulls on Carriage Return:** This number determines the number of null characters transmitted after a carriage return. This applies mostly to auto transmit (option Y) and is basically nothing more than a slight delay in the transmission following each line. If you communicate with a system that requires this pause, enter the number here. At 300 baud, 30 characters produce about a one second delay.

**Split Screen Enable:** Whenever the split screen is enabled Disk Term uses the eighth bit of each word to mark which half of the screen the data belongs on. If you are communicating with eight bit words the split screen must be disabled so that all eight bits can be used to encode data.

## V: VIDEO WIDTH

Adjusting the Video Width will cause a line feed if the incoming data is wider than your screen. The line feed occurs at the first blank space after reaching the size you selected. For a 64 character wide screen format around 55 to 60. This will allow a few character overrun while looking for a blank.

To see the effects of screen formatting try listing an ASCII text file (option "F") using different video widths. A word processor document would be a good file to use if it is saved in ASCII. You will be able to demonstrate to yourself the effect of this option much better than we are able to explain it.

With the eighty character wide screen of the Model 4 it will not often be necessary to format the screen. This option is used mostly when you contact a system using a wider screen format than your computer is capable of. We know of no one using a screen wider than 80 characters. It is possible however, if you contact a narrower screen system (a Model III perhaps) that you may need to format to 64 so that the data he transmits remains formatted.

### **W: TABLE CHANGE/EXAMINE**

The Disk Term tables include the Telephone Directory, the Macro-Keys and the Input and Output Filters.

The following prompt appears when "W" is selected.

**Select Table; Te,Mk,Ki,Do,Pr,rI,rO**

To select the proper table press only the capital letter that corresponds to the table desired. The tables are:

T	Telephone
M	Macro-Keys
K	Keyboard filter
D	Display filter
P	Printer filter
I	RS-232 input filter
O	RS-232 output filter

### **Telephone Tables**

Enter a "T" for Telephone Table. The screen will clear and the table will appear. The table position numbers appear on the left side of the screen (0-9, A-F). Answer the prompt:

**Line Number:**

Enter the number or letter of the position to be changed. If there is data in the table it can be overwritten or corrected by selecting the associated number.

To cause a pause during the dialing of a number enter an exclamation mark (!) into the number. Each

exclamation mark will cause a one-second delay. This is useful when a pause is necessary to obtain a dial tone on an outside line. Here is an example that waits 5 seconds for the outside line then dials the number:

9!!!!1-800-555-6789

This could also be used when connecting to one of the new long distance services, although they are not as reliable for transmitting data as the AT&T system.

The removal of non-number characters is not supported by Disk Term. Most auto dial modems do remove these extra characters, however. If your modem will remove extra characters you may use them in the table.

### **Macro-Keys**

The Macro-Keys Table "M" contains the macro-key commands. The macro-keys allow you to store a series of characters that can be recalled with a pair of key strokes. For example, if you enter your name as macro-key one, then whenever you wish to transmit your name you need only press CLEAR and 1 simultaneously. Whatever is stored in the macro-key is entered just as if you actually typed it in. You can store commonly used phrases, names, commands, log on procedures, anything you desire and then recall it in the terminal mode. To stop the execution of a macro-key press BREAK or call an undefined macro-key.

The macro-keys can be up to 63 characters in length. When you select table "M" the current

values of the macro-keys are displayed and you are asked which one you want to change:

**Enter Macro-Key Number:**

Select a number from 1 to 8 and type in the contents. To cause a carriage return after a macro-key type a semicolon (;) at the end of the description. Otherwise after the macro-key contents are displayed the cursor will appear at the end of the macro-key. Semicolons can be placed anywhere a line feed is desired.

To call one macro-key from another enter an ampersand (&) followed by the key desired. This is useful for entering an address. Here is an example with the first three macro keys containing an address:

- 1: John Smith;&2
- 2: 1234 N. Eastern Ave.;&3
- 3: Somewhereville, ST 54321;

In this example key one prints the name, then calls key two which prints the street. Key two calls key three which prints the city and state.

Another way to print the same address while using only one macro key is:

- 1: John Smith; 1234 N. Eastern Ave.;  
Somewhereville, ST 54321;

In this case the semicolons cause a line feed even though the information is all typed on one line.

To cause a pause in the display process of a macro-key enter an exclamation mark (!) in the line.

This will cause a one-second pause before the rest of the line is displayed. Multiple explanation marks increase the length of the delay. Enter the following macro-key to see how the pause is used:

1: This is a pause! So is this !!

Retype the line and add an &1 to the end. When this macro key is called it will repeat indefinitely. Pressing BREAK will stop the repeat function but the key must be held until the end of a pause. Change the &1 to ;&1 and a line feed will follow the line each time.

### **Input and Output Filter Tables**

The purpose of the Input and Output Filters is to allow you to configure the data being transmitted and received to be compatible with the equipment with which you are communicating. When communicating with another TRS-80 it is not necessary to alter any of the I/O tables.

All data in the tables is hexadecimal. These filter tables allow you to change the ASCII codes which are normally associated with a certain letter. In the keyboard for example, when a key is pressed an ASCII code is generated. By filtering the keyboard the code generated by each key can be changed. This is useful in generating otherwise unobtainable codes or difficult to obtain codes. For example, the cursor control codes (technical section page T-64) require that an escape key precede the desired key number. The TRS-80 has no escape key so we take an unused key, such as the F1 key, and change it so whenever F1 key is pressed a character 1B (escape) is generated.

The display for each filter shows the table on the left two third's of the screen. The table consists of the bytes 00 to 0F along the top and 00 to FF down the side. The table shows which code will be output for each code that is input. If the code has been changed it is displayed in reverse video. The name of the table is in the upper right hand corner of the screen. Below this is the input prompt.

Let us go through how the byte 81 (F1 key) in the keyboard table was changed to 1B to produce the escape code necessary for the cursor control keys. (This change already exists in the tables supplied with Disk Term.)

First select "K" for keyboard (having already selected "W" for the tables). The table shows all the current values. Notice that the code 1B is displayed in reverse video. This indicates that the byte which is normally here is being changed to the byte displayed. To change the code generated by a given key enter the ASCII code for that key followed by the code you desire it to generate. For example, to change the F1 key, ASCII 81, to 1B enter the following:

Byte-Value  
811B

This change is already entered when you receive Disk Term. If you found you preferred to use a different key for an escape key you could change 81 back to 81 by typing 8181. That filters 81 back to 81 (notice the reverse video is gone). Now to make a different key 1B. Say the question mark was going to be the escape key. First you need to know which key the question mark is. Look in the TRSDOS manual on page A-59. Then look down the column

labeled keyboard (the third column) until you find the ? symbol. Now look to the left along that same row under the hex. column, it says 3F. That means whenever the ? is typed the keyboard generates the ASCII code 3F. What you want to do is change the 3F to a 1B. In the keyboard table type:

Byte-Value  
3F1B

Now whenever you press the ? key an ASCII 1B is generated instead of 3F.

The same process applies to the rest of the tables. Basically here is the effect of each table:

**Keyboard (Ki):** Whatever is entered from the keyboard is filtered and altered before reaching the computer.

**Display (Do):** Filters and adjusts information before being sent to the screen. Data to be sent to the display is first compared to the filter table. If a change is found it is made then the corrected characters are displayed.

**Printer (Pr):** Has the same effect as the display filter except the effect is on the printer.

**RS-232 INPUT (rI):** Data coming into the RS-232 from an outside source is filtered and altered before continuing into the computer.

**RS-232 OUTPUT (rO):** Data leaving the computer is filtered and altered before exiting the RS-232.

Using the RS-232 I/O filters, codes other than ASCII can be transmitted and received. By using the



RS-232 as a translator to translate ASCII to a different "language code" the receiving computer understands. The RS-232 then listens to this "language code" coming in from the other computer and translates it back to ASCII. The EBCDIC/DAT configuration file works in this way.

**X: RS-232 PARAMETERS**

Enter the desired setting for each option. Pressing the enter key will leave the option unchanged. The RS-232 parameters are:

**BAUD  
STOP**

**WORD  
PARITY**

**BAUD** rate is the speed in bits per second that data is transmitted by the RS-232. When communicating to a modem the normal speed is 300 baud with some more sophisticated modems capable of 1200 baud.

Disk Term is capable of operating at all the speeds shown below. However, when using baud rates in excess of 4800 the transmit and receive modes begin to fall behind. The result is, the faster you try to transmit, the more attempts are required for accurate transmission, and the longer it takes.

Acceptable baud rates for Disk Term are : 50, 75, 110, 134, 150, 300, 600, 1200, 1800, 2000, 2400, 3600, 4800, 7200, 9600.

**WORD** refers to the number of data bits that make up a character. You will find that 7 is the most common although 8 is also frequently encountered; 5 and 6 are also allowable. The Disk Term Transfer and Receive modes use 8 bit words, however, these are set automatically when the transmit and receive modes are entered. You do not need to adjust the word length from 7 to 8 to use the transmit or receive modes.

**STOP** refers to the number of bits used to tell the receiver the end of a word has arrived. The possibilities are 1 and 2; 1 being the most common.

**PARITY** refers to an error checking system that counts the number of logical 1 bits in a word. There is either an even or odd number. If even parity is used the parity bit is set to make the total number of logical 1's an even number. If the number is odd to start with the addition of the parity bit makes the total number even. If the number is even to start with the parity bit is not used. The reverse holds true for odd parity. When a word is received the receiver checks the parity bit to see if it is set correctly for the data received. If it is the data was probably received correctly. If not, a transmission error has occurred and that byte is retransmitted. If no parity is selected parity is not checked.

To set the parity the receiver and the transmitter must agree on the type of parity. Beyond that parity is handled mostly by the software.

If you are not sure how to set any of the RS-232 parameters the overriding rule of thumb is: The baud, word, stops and parity at one computer must match the baud, word, stops and parity at the other.

### **Y: TRANSMIT BUFFER**

To transmit the data stored in the buffer press "Y". The data stored in the buffer is stored in ASCII and the data transmitted is in the same format. To load data into the buffer see the section "F" (listing an ASCII file).

When you select to transmit the buffer you are asked if you wish to pause on a carriage return:

#### **Pause on Carriage Return?**

If you chose to pause on carriage return then each time the transmitter encounters a carriage return (character 13) it will stop and wait for a transmission prompt. What is a transmission prompt? When communicating with another micro computer a transmission prompt usually is not required. Just answer No to pause on carriage return. When communicating with some services a prompt is transmitted back to you after each line telling you to transmit the next line. If this is the case then answer Yes. (The transmission prompt is stored in section "U" custom configuration but is explained here since it deals with buffer transmission). If you know the prompt enter it in section "U". If you don't know the prompt you can usually assume that it (whatever it is) is followed by a carriage return. You can tell Disk Term to respond to the carriage return of the prompt by entering a 13 (character 13 is a carriage return). When you are using a prompt Disk Term transmits until it encounters a carriage return, then stops and waits for a prompt.

Do not confuse the "Pause on Carriage Return" with the momentary pause caused by null characters which was explained in section "U". The pause

caused by null characters is a momentary pause and requires no prompt before transmission resumes. The "Pause on Carriage Return" is an indefinite pause and transmission will stop until a prompt for more data is received. Unless you know that you need to use one of these pauses during the transmission of data, it is best not to use either.

After the pause on carriage return prompt the following prompt appears:

**Enter Telephone number:**

This feature works in conjunction with the timed delay transmission (the next prompt). When using the timed delay transmission option the numbered entered here will be dialed when the transmission time is reached. You can enter a number to be dialed by typing that number in just as it is to be dialed, or use one of the numbers stored in the telephone table of numbers. To use one of the numbers stored in the table, enter a number sign (#) followed by the table position. To dial the number stored in table position C, for example, enter #C. Press ENTER to skip this option.

**Enter Transmit Time:**

This allows you to enter the time to begin the transmission. To begin immediately press ENTER. To use the time delay enter the time at which you want the transmission to begin. Remember that the computer uses a 24 hour clock.

If you have set a time delay but decide that you want the transmission to begin now, press the BREAK key. The time delay will be canceled and the transmission will begin immediately.

**Z: LINE FEED / CARRIAGE RETURN SUPPRESSION**

Line Feed Suppression is used to suppress line feeds at the end of a line. Some systems transmit a carriage return and a line feed at the end of each line. This will cause a double line feed after each line since the TRS-80 automatically generates a line feed for every carriage return. With line feed suppression set to Yes, or On, the line feed is ignored and normal spacing occurs. If a string of line feeds are received only the first is ignored.

Carriage return suppression is used when the video width has been changed. Normally a carriage return is transmitted at the end of each line by the transmitting system. If the transmitter is using 80 characters per line then the TRS-80 would display 64 characters on the first line, 14 on the next, then the carriage return caused a line feed. With the carriage return suppressed the next line continues where the previous one left off.

After selecting option "Z" you can toggle the line feed or the carriage on and off.

Pressing "C" will toggle carriage return from OFF to ON or from ON to OFF

Pressing "L" will toggle line suppression from OFF to ON or from ON to OFF.

## **Disk Term Conversion Utility**

This utility will convert a file from **BINARY** to **ASCII**, or from **ASCII** to **BINARY**. This will allow binary data files to be loaded into the buffer for transmission to other computers. It is necessary to convert files transmitted in the terminal mode only. You **DO NOT** need to convert files prior to using Transmit and Receive modes.

## C-60      Disk Term Conversion Utility

### **Binary files include:**

Basic programs NOT stored using the "-A" option.  
Machine language files  
Data files  
Some word processor files

The above files must be converted before they are transmitted in the terminal mode.

### **ASCII files include:**

"DO" files (files created using build command)  
Disk Term auto and master files  
Some word processor files

The above files do not need to be converted prior to transmission.

To use this conversion utility type CV from the DOS Ready prompt. The convert file will load and display the following prompt:

**Enter Source File Name      :**

Enter the name of the file to be converted. You may enter either a Binary file or an ASCII file, depending on which way you want to convert.

After entering the source file you are asked for the destination file:

**Enter Destination File Name    :**

Enter the name of a new file which will contain the name of the converted data. Do not use the same name you entered in the source file as it will not be accepted.



Next you must decide which way you are converting.  
The prompt is:

**Convert <B>inary to ASCII    :**  
**Convert <A>SCII to Binary**

Select "A" or "B" as appropriate. If you wish to convert a binary file for transmitting select "B". If you are converting a file you received so that it can be executed select "A".

The entire operation can be aborted at any time by pressing the BREAK key for any one of the three prompts. When the BREAK key is pressed you are returned to the DOS Ready mode.

After conversion is complete the first prompt appears again. You may enter another file to convert or press the break key to exit the program.

If a read or write error occurs during the conversion an error message is displayed. The message remains until you press a key. The occurrence of a DOS error stops execution of the conversion utility and any conversion in process is not completed. If you encounter an error you need to correct the situation which caused the error, and try to convert again.

## **Disk Term Technical Section**

The Technical Section contains information that may be desired by the more advanced programmer. The average user of Disk Term need not be concerned with the information in this section, although the curious are more than welcome to look.

This section contains escape and control codes as well as the format of the Disk Term configuration files (DTERM/DCF). We suggest that only the most competent programmers attempt to alter this file directly. For most users Disk Term configuration modes are the easiest and safest ways to change these files.

### **Escape Codes**

The Escape Code, as was mentioned in section "W" on page 20, has been filtered so that the F1 key generates the ASCII 27 (1B hex) code. To enter the following codes press and release the F1 key (ESC), followed by the letter shown in the table below.

ASCII	Key Board	Description
27 - 65	ESC-A	Move cursor up 1 line
27 - 66	ESC-B	Move cursor down 1 line
27 - 67	ESC-C	Move cursor right 1 space
27 - 68	ESC-D	Move cursor left 1 space
27 - 72	ESC-H	Move cursor to home
27 - 74	ESC-J	Clear to end of page
27 - 75	ESC-K	Clear to end of line
27 - 106	ESC-j	Clear screen

For convenience you may find it easier to change the keyboard filter to cause an additional key to generate the ASCII code 106 (6A hex, lower case j) needed to clear the screen. One convenient key is the right arrow. On the keyboard filter table enter 5D6A, now escape right arrow will clear the screen.

### Control Codes

The following Control Codes are recognized by Disk Term. To enter a control code press the CONTROL key (CTL) and while holding this keys press the desired key from the table below.

ASCII	Key board	Description
05	CTL E	Macro-key one
12	CTL L	Clear screen
17	CTL Q	Transmission start
19	CTL S	Transmission stop
18	CTL R	Open buffer
20	CTL T	Close buffer

The CTL Q (transmission start) will function only when preceded by a CTL S (transmission stop). These control codes can be used to control incoming data provided the source of the data recognizes these codes.

When the CTL R is received the message \* \* \* OPEN BUFFER \* \* \* is displayed in the terminal mode. The message \* \* \* CLOSE BUFFER \* \* \* is displayed when CTL T is received. When you transmit these codes you will affect the receivers buffer provided it recognizes these codes.

### **Input and Output Filter Status of DTERM/DCF**

The following changes to input and output are supplied in the original DTERM/DCF Configuration file. These can be altered to suit your needs through option "W".

Byte	Filtered to	Effect
Keyboard		
81	1B	F1 to Escape
82	0C	F2 to clear screen
83	8C	F3 to clear lower screen
Display		
15	00	Space Compression to Null
16	00	Alternate Char. to Null
17	00	Double Wide Char. to Null
Printer		
08	25	Backspace to "%"
1F	00	Double Wide Char to Null

### **Macro-Keys**

The Macro-Keys are executed when the keyboard generates a value of B1 hex to B8 hex (CLEAR 1 to CLEAR 8). If desired, other keys may be filtered to produce these codes.

**Disk Term Data File Format**

The following is a map of the Disk Term data files as they are laid out on the disk:

sector 0		
byte 0	Buffer status	0=closed not 0=open
byte 1	Video width	0-99 binary
byte 2	Duplex	0=half not 0=full
byte 3	Suppress LF	0=no not 0=yes
byte 4	Suppress CR	0=no not 0=yes
byte 5	Printer Switch	0=off not 0=on
byte 6	Split Screen	0=off not 0=on
byte 7-8	Print buffer size	number of bytes
byte 9-10	Serial buffer size	number of bytes
byte 11-18		Mdm dial command
byte 19-26		Mdm hang up cmdnd
byte 27	Mdm Type	1-3 binary
byte 28	No. of dial attempts	0-99 binary
byte 29	Delay 'tween dialing	0-99 binary
byte 30	Wait for carrier	0-99 binary
byte 31	Transmission prompt	
byte 32	Stop Transmission (DC3)	
byte 33	Start transmission (DC1)	
byte 34	Nulls after CR	0-3 binary
byte 35	Split screen enable	0=off not 0=on
byte 36	Baud rate	Details below
byte 37	RS-232-C parameter	Details on next page
byte 38-255		undefined
sectors 1-3 - byte 0-255		Telephone table (Te)
sectors 4,5 - byte 0-255		Macrokey table (Mk)
sector 6 - byte 0-255		Keyboard table (Ki)
sector 7 - byte 0-255		Display table (Do)
sector 8 - byte 0-255		Printer table (Pr)
sector 9 - byte 0-255		RS232 in table (rI)
sector 10 - byte 0-255		RS232 out table (rO)

**Baud Rate Table** (the code is stored in byte 34)

code	binary	rate
00	0000	50
01	0001	75
02	0010	110
03	0011	134.5
04	0100	150
05	0101	300
06	0110	600
07	0111	1200
08	1000	1800
09	1001	2000
10	1010	2400
11	1011	3600
12	1100	4800
13	1101	7200
14	1110	9600
15	1111	19200

The first four bits determine the transmit rate; the second four, the receive rate. For Disk Term they must always be the same.

**RS-232-C parameters** (byte 35)

bit 7	Parity	1=even	0=odd
bit 6,5	Word Length	00=5 bits	10=6 bits
		01=7 bits	11=8 bits
bit 4	Stop bits	0=1 bit	1=2 bits
bit 3	Parity on/off	0=on	1=no parity
bit 2	Transmit on/off	0=disable	1=enable
bit 1	Data terminal ready	0=no	1=yes
bit 0	Request to send	0=no	1=yes

**Transmission speed in Transmit mode**

Drive Type	Speeds given in seconds per sector	
	300	1200
Floppy to Floppy	10.3	2.9
Hard to Hard	8.8	2.3

Times determined using 2 Model III's operating on Dos Plus. 100 sector data files were used in calculating an average time.

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## CORRECTIONS TO THE MODEL 4 MANUAL

The following minor changes to this manual will lead to a better understanding of the operation of Disk Term. Please review them.

- 1) On page 3 the terminal buffers are labled 1, 2, and 3. These refer to the memory banks and should read 0, 1, and 2.
- 2) On page 19 paragraph two the phrase ' "Y" or "U" ' should read ' "Y" or "K" '.
- 3) On page 20 line five the 'and' should be 'any'.
- 4) On page 38 in the middle of the page the '!21:22:00' should read '!23:22:00'.
- 5) On computers equiped with more than 64k RAM it is important that buffer bank zero have at least 32700 bytes of memory available (total of USED and FREE space in bank zero). Adjust the size of the print and RS232 buffers to keep the terminal buffer above 32700 bytes. If the terminal buffer drops below this size, parts of the print and RS232 buffers will be lost when banks one and two are used.

## NEW FEATURES OF MODEL 4 DISK TERM

- 1) To operate Disk Term under DOSPLUS re-boot with a DOSPLUS system disk and install the following patch to a backup copy of Disk Term:

PATCH DTERM/CMD PLUSPTCH/PAT

- 2) When using 'Auto-Save on Full' (page 36) it is now possible for incoming data to span diskettes. When one disk becomes full a Disk Full Error is reported. When this happens remove the full diskette from the drive and insert an empty (formatted) one. Press ENTER and the data remaining in the buffer will be written to the new diskette using the same file name as before. There is no duplication of data using this feature. When the Disk Full Error is reported you may abort the auto-save by pressing any key except ENTER.