

KERMIT IN WINDOWS

Copyright 1990, 1991 by
William S. Hall
3665 Benton Street, #66
Santa Clara, CA 95051

Introduction

The **Kermit** protocol provides error-free file transfer as well as other services between two, possibly very different, computers. If you are a regular Windows user, then you will find several advantages to using **Kermit** directly from Windows. First, since Windows is multitasking, you can run simultaneous transfers from all available communications ports (but see the warnings below) and continue to use other Windows applications. Additionally, transfers continue even when the **Kermit** program is minimized.

If you are running Enhanced Mode Windows, you can even switch to DOS applications during a file transfer and have it continue. But, you **MUST** select background processing in the application's PIF file.

This version of Windows **Kermit** can send and receive text and binary files over seven-bit and eight-bit data paths while using run-length encoding to achieve file compression. You can set many packet and protocol parameters including packet sizes and checksum types. Groups of files can be transferred in a single session, and at any time, the transfer can be aborted in one of four ways.

Windows **Kermit** can perform as a client of a **Kermit** server and supports 'get' and 'send' files as well as the basic remote directory commands. A small set of local commands for navigating through the DOS file system is also provided.

The program currently has no server features and does not have sliding windows, long or attribute packets, or language translation. These are planned for future implementations. One consequence of having no character set translation is that your remote machine may have to understand the Windows character set (essentially ECMA-94 or Latin-1). Latin-1, however, does coincide in the first half of its range with ASCII.

The **Kermit** protocol was originally developed by the Center

for Computing Activities at Columbia University. **Kermit** has been implemented on a large number of platforms from the largest mainframes to the smallest microcomputers. See the references at the end of this document for more information.

Basic Usage

Kermit is very easy to use. To send a file from the local computer (usually the controlling microcomputer) to the remote (host) machine the steps are:

1. Run **Kermit** on the host and choose 'receive'
2. Choose the 'send' option on the local machine, select the files, and confirm your choices. The transfer will begin and continue until all files selected have arrived at the host or the transfer is canceled.

To receive a file:

1. Run **Kermit** on the host and give the 'send' command along with the target file names.
2. Select 'receive' on the local machine. The files will continue to arrive until the transfer is complete or is canceled.

During a session, statistics about the transfer are displayed in a dialog box. When completed, a message window in the dialog shows success or failure. Once a file transfer has begun, you can minimize the window and have the transfer continue 'in the background'. The icon will display the current packet count, rolling over every 10000 packets.

Caveats

File transfers usually fail because of differences between the local and remote parity and word size. If you cannot get even the first packet across, then try changing these parameters.

Windows is multitasking and you can run several instances of the same program. However, if you are running more than one instance of a terminal emulator using **Kermit**, watch out for possible file conflicts such as trying to transfer files to the SAME file from two different remote **Kermits**. The DOS file system does not always protect you from this kind of error. It can happen that while you are receiving a file from one source, the same file can be successfully opened for sending. It usually means disaster for the incoming file.

Similarly, if the target file is a floppy disk, do not remove or replace the diskette until the transfer has completed. Changing the diskette when receiving will certainly result in file corruption.

The Kermit Commands

All commands for **Kermit** are on the 'Kermit' menu and are divided into five main categories: Files, Remote, Local, Parameters, and Cancel. Under each are several commands described below along with their corresponding accelerator keystrokes. Commands having dialog boxes are explained in more detail in subsequent paragraphs.

Before a transfer begins, you can access all but the Cancel commands. During a transfer, only the Cancel functions are available.

The Files Menus

The Files commands are used for sending and receiving files.

Receive (ALT-K-F-R): If the Receive menu is chosen, then the program enters a state where it is awaiting the arrival of one or more files from the remote host. Once the transfer begins, it continues until the last file in the group has arrived or you cancel the operation.

Send (ALT-K-F-S): Displays a dialog box from which you can select files to be sent to the remote host. The transfer continues until the last file has been sent or the session is canceled. The Send dialog can be a bit confusing to use as it features multiple selection. See below for more information.

Get (ALT-K-F-G): Displays a dialog box in which you enter a specification of files to be obtained from the remote host. The remote **Kermit** must be operating in server mode. The format of the file specification depends on the host. Otherwise, getting files is quite similar to receiving files.

Remote Commands

All remote commands require that the host **Kermit** be operating in server mode. In most cases, you must enter some information in a dialog box to complete the command. However, if the dialog's 'OK' button is not initially grayed, then the information is optional.

The results of the commands are posted back to you in a

window contained in the transfer dialog box. If the information returned is extensive, it will be displayed in an Edit window. As a result, you can edit and even transfer the contents to another Windows application using the standard Windows keyboard and mouse commands designated for this purpose.

An Edit window can hold only a limited amount of information (about 30,000 characters). If, for example, you use a client command to type a file and the edit window limit is exceeded, one-third of the contents will be purged and the process will continue. A message will be posted warning you that a part to the information has been lost.

Command (ALT-K-R-O): Executes a command on the host. You must enter the command in the syntax of the host.

Chdir (ALT-K-R-C): Changes the host's working directory to the one you specify. If none is given, then the host's default action for this command is executed. If your host is UNIX, then you are transferred to your home directory.

Directory (ALT-K-R-D): Displays a list of files on the host.

Erase (ALT-K-R-E): Deletes files on the host.

Help (ALT-K-R-H): Shows the remote commands understood by the host.

Space (ALT-K-R-S): Shows disk usage on the host.

Type (ALT-K-R-T): Types a file on the host.

Who (ALT-K-R-W): Displays the current users on the host.

Finish (ALT-K-R-F): Causes the remote **Kermit** to exit server mode.

Logout (ALT-K-R-L): Executes a logout on the remote host.

Bye (ALT-K-R-B): Executes logout on the host and closes the Windows **Kermit** program.

Local Commands

Only one local command is currently in place for Windows **Kermit**. With this dialog, activated by **ALT-K-L-D**, you can change the current working directory and display a file listing. This dialog works quite similarly to a standard Windows file open box except that the list box on the right is used for information

purposes only. Selecting a file in the list has no effect on the dialog's operation.

At the top of the dialog is an edit window where you enter a path specification of the types of files you want to see. On the bottom is the current directory. On the left is a list of drives and directories. Clicking once on an entry will cause a new file specification to appear in the edit window; double-clicking on an entry (or by using the Chdir/Dir button) will effect a directory change command and display the files matching the file specification in the list box on the right.

The Parameters Command

The dialogs associated with these commands are explained in more detail below. For the most part, you will not have to make any changes except possibly to set the outbound and inbound packet lengths.

Set Protocol (ALT-K-P-P): Displays a dialog box in which the user can set various protocol parameters.

Set Packets (ALT-K-P-K): Displays a dialog box in which the user can set parameters for incoming and outgoing packets.

Cancel Commands

After a file transfer or remote command begins, you can cancel the operation in any of four ways. These commands are available from a menu or from the cancel button on the transfer dialog box. Note that if the current program keyboard focus is on the transfer dialog, you can move the focus to the main window (and vice-versa) with ALT-F6 or a mouse click if you want to use the menus.

Cancel file (ALT-K-C-F): Signals the remote **Kermit** to discard the file currently being transferred. The session continues with the next file in the batch, if any. Note that if you have elected to keep partial files, then the current file will NOT be deleted if you are receiving.

Cancel batch (ALT-K-C-B): Signals the remote **Kermit** to terminate the session. Only the current and the files remaining to be transferred are affected. The comment about partial files in the paragraph above also applies.

Cancel nicely (ALT-K-C-N): Terminates the session with an

error packet to the remote **Kermit**. Incomplete files are discarded (or saved, if the partial file flag is set). Use this method to cleanly terminate a transaction once the exchange has started.

Cancel abruptly (ALT-K-C-A): Terminates the session with no signal to the remote **Kermit**. This selection is most useful as a way to cancel a transaction before any exchange of packets has begun. Note that the remote **Kermit** will attempt to continue if it has already started and you will have to use other means to terminate the remote program, or you can simply let it time out.

Following is some detail on the commands having dialog boxes.

The Send Files Dialog

When Send is selected, a dialog box with several controls appears. Two are list boxes; the one on the left contains all files matching the search specification shown in the edit box at the top; this list box functions in Extended Selection mode. The right list box contains the directories and disk drives which can be accessed. The push buttons allow you to select a list of files based on the search specification, send the selected files, or cancel the operation.

The basic principle is: a file name must be highlighted in the list box to be sent. You may send several files. However, you may select only those files from the current directory. Hence files from more than one directory cannot be sent during one transaction.

A file can be selected in several ways. The usual method is to click on the name with the mouse. More than one file can be highlighted by holding down the control key during selection. You can also deselect one of several highlighted items in the list by again depressing the control key and clicking on the item. If you do not hold down the control key, all items will be deselected except the one to which the mouse is pointing.

To select a range of files, select the first one, then move to the second one and click on it while holding down the shift key. You can also use the arrow keys together with the shift key to highlight contiguous items in the list.

If you do not have a mouse, then selection is made easier by switching the list box into Multiple Selection mode. Use Shift F8 to toggle between Multiple and Extended Selection modes.

The default search specification is "*.*". You can choose

another string to limit the files displayed in the list box. For example, if you tab to the edit box (or point to it with the mouse), type "*.txt", and press the RETURN key or the SELECT push-button. Not only will all files having that extension be displayed, but they will be selected as well. You can then send the entire list by pressing or clicking on the SEND button.

At any time, you can deselect all files but one in the list box by simply pointing and clicking on that file. You can deselect all files in the box by clearing the contents of the edit box and pressing RETURN.

You can move to another drive or directory by typing it into the edit box and pressing RETURN or double-clicking on the corresponding item in the directory list box. The current search specification is appended to the path, the program moves to the new directory, and all matching files are displayed. A second RETURN or a push of the SELECT button then highlights the files list.

Finally, at any time, a single file located anywhere in the system can be selected and sent. Simply type its name, along with any required drive and/or path information, and hit RETURN. If the file can be found, then a switch is made to that directory and the file name is displayed and selected. If the file cannot be found, no action takes place.

You may cancel the operation at any time by pressing the CANCEL button. Pushing SEND with no files highlighted has the same effect.

The Set Protocol Menu

Currently you may select the following items:

Timer (ALT-T): If this item is checked, then after a certain number of seconds have elapsed with no packets received, a retry will be attempted. If the number of retries exceed a given threshold, then the protocol exits. The elapsed time and the number of retries can be set.

Warning bell (ALT-W): If checked, the bell sounds when a transaction is complete or canceled.

Discard partial file (ALT-P): If checked, then any file being received in which the protocol has been interrupted by an error condition or by the user will be deleted.

Duplicate file warning (ALT-D): If checked, then an incoming file with the same name as an existing one will be renamed so as not to overwrite the old one. The new name appends

or replaces part of the old name with a unique generation number.

1-Byte Checksum (ALT-1): Selects the standard **Kermit** 1-byte checksum computation. This has proved to be quite robust in practice.

2-Byte Checksum (ALT-2): Selects the standard **Kermit** 2-byte checksum computation.

3-Byte CRC Checksum (ALT-3): Selects a cyclic redundancy checksum computation. This is most useful when transferring long packets or when operating on noisy lines.

Send delay for first packet: Sets the elapsed time in seconds before the first packet is sent when sending a file. It is mainly used to give the receiver time to get ready before the initialization packet arrives.

Retry limit: Sets the number of retries in reading a packet before the protocol gives up.

Save setting (ALT-S): If this box is checked, then win.ini will be modified to reflect the new defaults under [Kermit].

The Set Packets Dialog

Inbound and outbound packets have a number of parameters which can be altered for varying circumstances. You may set the following for each type. Note that you may also have to set the corresponding values on the remote **Kermit** as well for communications to take place.

Start of packet: The character which is used to mark the start of a **Kermit** packet. The default is SOH (CTRL-A). You would change this character if the remote machine intercepts SOH.

Timeout: The number of seconds that the remote **Kermit** should wait before timing out. The default is 5 seconds.

Padding count: The number of padding characters to send before a packet. The default is 0.

Padding character: The character to use for padding. The default is NUL (CTRL-@).

End of line character: The character which terminates a packet. The default is a carriage return (CTRL-M).

Quote character: The character used to signal that the next character is in the range 0 - 31, 128 - 159, or is a delete character (127). The default is '#'.

Packet size: The maximum length of a packet in bytes from

the sequence number byte and including the checksum characters.
The default is 80.

If you check **Save Settings (ALT-S)**, then the new values will be written to win.ini under the heading [Kermit].

References

[1] Catchings, Bill and da Cruz, Frank, "Kermit, a File Transfer Protocol, BYTE Magazine, June and July, 1984.

[2] da Cruz, Frank, Kermit, a File Transfer Protocol, Digital Press, 1987.

[3] Gianone, Christine M., "Using MS-DOS Kermit", Digital Press, 1990

[4] Kermit Development and Distribution, Kermit News, Number 4, 1990, Columbia University Center for Computing Activities, 612 West 115th Street, New York, NY 10025.