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Test

This menu allows you to start, stop, and quit the program. When you run the test, set one modem to slave mode, then select **Start Test** for the other modem.

Start Test (Dial)	Alt+S
Slave Mode (Answer)	Alt+V
Stop Test	Esc
Exit	Alt+X

Port

You can choose between COM ports 1-4. To change the buffer sizes or to have fast display rates, select **Buffer...** The default buffer sizes are 14,000 bytes, and the range is 1,024 - 32,767 bytes.

Baud

You can choose a transfer speed between 1,200 and 921,600 bit/s. If the Hayes^(TM) ESP^(TM) Communications Accelerator is being used, then baud rates above 115,200 bps are possible. Hayes does not recommend using 115,200 bps in combination with a standard COMM.DRV driver since it may result in a system crash and possible disk corruption.

FileList

The file list is a .TXT file that contains the names of the files to send. By default, the name is JAMMER.TXT and it contains the names of the provided test files.

You can choose whether the test should complete one pass through the file list or repeat until stopped (by pressing Esc). You can also edit the file list (F4) or put special commands in the list to control Jammer.

Modem

You can change the setup, send to dial, or send to answer string.

Connection

Choose a connection and sending method. Since **Direct Connect** does not use modems, this connection method allows you to test Jammer's performance. The various connect/disconnect choices will affect your performance based on the how similar the test files are. If your files are not similar, **Connect/Disconnect for Each File** will provide the highest throughput. The **Send Both Directions** option may also reduce your throughput if you are using an older computer.

Log

Progress information and transfer results are recorded in a log file and to the screen scrollback buffer. For each open port two files are written to disk: JAM_COM1.TXT and JAM_COM1.LOG (the actual file is named after the COM port used (COM1, COM2, etc...)). The JAM_COM1.TXT file contains just the file transfer results in a tab-delimited format compatible with many spreadsheet programs. The JAM_COM1.LOG file is an exact transcript of the on-screen log.

To view and/or print the log, select **Display Log File**.

To erase the log, select **Erase Screen** (Alt+E) or **Erase Log File**.

To set a log message to mark the beginning of a transfer in a log, select **Set Log Message...**

Setup string

Select a configuration and user profile. &F selects the default factory configuration, and &W1 stores the configuration as user profile 1.

Send to dial string

Enter DT (for tone) or DP (for pulse) and the phone number to dial.

Send to answer string

Select a ring number to wait before answer. The default is 0, and the range is 0-255.

Edit File List

You can add or remove file from the file list. When you select **Edit FileList...**, the notepad will be opened. Open the Jammer.txt file and modify the list as necessary.

Character Format and Flow Control

Jammer programs the COMM.DRV serial driver for eight data bits, no parity, and one stop bit character (8-N-1).

Jammer uses CTS flow control. The modem may lower CTS to stop the flow of data, and raise it again to resume. RTS flow control is NOT enabled.

How Jammer Computes BPS

Jammer calculates effective throughput in bits per second:

$$\text{BPS} = (\text{BYTES} * 10) / \text{TIME}$$

The number of bytes is the size of the file under test, plus 34 bytes of framing data. The number of bits is the number of bytes multiplied by ten. The time is measured from when the transmitter starts sending the first byte to when the receiver receives the last byte. The time is accurate to a millisecond by using a special Windows function call.

In order to measure the time elapsed from sender start to receiver complete, both the sending and receiving computer must have synchronized clocks. After each connection the program will exchange clock information with its partner. The sending computer includes the start time in the header of the file transfer. The receiving computer then computes the throughput based on the time it received the last byte, minus the start time from the header (adjusted to be in sync). The receiving computer notes the information in the log and transmits the same information to the sender for display in its log.

Troubleshooting

Problem: Transmitter underrun

A transmitter underrun occurs when Jammer detects that the COMM.DRV transmitter buffer is empty during the transmission of a file. This condition can disrupt the throughput test since the transmission line could go idle if the buffers are not kept full. When this condition occurs, the file being tested is aborted.

Causes/Solutions:

1. The computer is busy with other tasks or disk access. Increase transmit buffer size (under "Port" menu) so the comm driver has sufficient data to send while the computer is busy with other tasks.
2. The computer is too slow. At least a 25mhz 386 computer is required to perform the throughput tests. Try removing background tasks and screen savers. Also try turning off Fast Display Updates in the buffers dialog.

Problem: Receiver buffer overflow

A receiver buffer overflow occurs when the receiver buffer that the COMM.DRV driver is using overflows with too much data. When this condition is detected, the file being received is aborted.

Causes/Solutions:

1. The computer is busy with other tasks or disk access. Increase the receive buffer size (under "Port" menu) so the comm driver has sufficient space to store incoming data while the computer is busy with other tasks.
2. The computer is too slow. At least a 25mhz 386 computer is required to perform the throughput tests. Try removing background tasks and screen savers.

Problem: Receiver UART overrun

A UART overrun occurs when data arrives so fast that the COMM.DRV driver does not have sufficient time to service the interrupts.

Causes/Solutions:

1. The computer is disabling interrupts for a long period of time. Try turning off background software, or re-booting without network drivers.
2. Your computer has a 8250 or 16550 UART chip capable of buffering only a single character. Use the Hayes ESP Communications Accelerator driver and card to eliminate this problem.
3. Your computer has a 16550A UART chip capable of buffering up to 16 characters, but interrupts are still disabled for an extended period of time. Use the Hayes ESP Communications Accelerator driver and card to eliminate this problem.

Problem: Bad frame check sequence

The data received is corrupted. All data exchanged is encoded into packets with a Frame Check Sequence (FCS) so that any change in the data can be detected. This problem should not occur unless the modems are connected without an error-correcting protocol.

Problem: Computer crashes and reboots at 115,200 bps.

The standard Windows COMM.DRV driver is not capable of reliable communications at this speed. Use a slower speed, or use the Hayes ESP Communications Accelerator driver and card to eliminate this problem..

Special Commands

Special commands may be included in the file list to change some of the Jammer settings. These special command lines begin with an @ character, and they are executed whenever they are encountered in the file list. The following special commands are available:

Command	Action
@ATSetup= <string>	Change the modem setup string (next call)
@ATDial= <string>	Change the dial string (next call)
@ATAnswer= <string>	Change the answer string (next call)
@ATHangup= <string>	Change the hangup string (next call)
@Bidirectional= <0/1>	Single (0) or both directions (1)
@LogComment= <string>	Include the string in the log output.

You can also include commands in the command line of JAMMER.EXE (Select properties from the File menu in the Windows Program Manager). You can specify "-V" to cause Jammer to initiate the slave mode once it is started and "-S" to start the test (master). You can also specify a filename on the command line to use for the file list.

Default Test Files

Filename	Bytes	Type
1X30.TST	983040	TIA-38 GRAPHIC test file
2X10.TST	327680	TIA-38 TEXT test file
3X06.TST	196608	TIA-38 EXE test file
4X04.TST	131072	TIA-38 RANDOM test file
5X16.TST	524288	TIA-38 MIXED test file
DBASE.ORA	1254400	ORACLE database file
FILE.ZIP	168922	PKZIP compressed file
FOX.TST	852805	"THE QUICK BROWN FOX....."
PARROT.GIF	58368	GIF graphics file
SPREAD.XLS	723127	EXCEL spreadsheet file
USER.TXT	731136	ASCII text document (User's guide)

Running the Test

To run Jammer:

- 1) Install the ESP Communications Accelerator cards. Refer to the Installation Guide as necessary.
- 2) Connect the modems. Refer to the User's Guide as necessary.
- 3) At the DOS prompt, type:
MD \JAMMER
CD \JAMMER
COPY A:INSTALL.EXE
INSTALL
- 4) In the Program manager:
Create a new Icon and assign it to JAMMER
Program: JAMMER.EXE
Directory: C:\JAMMER (be sure to specify default directory)
- 5) Install Jammer on a second computer, or just run two copies on the same computer (if you have at least a 25MHz 386).
- 6) Select or create a .TXT file that contains the names of the files that you want to send. By default, this file is named JAMMER.TXT.
- 7) Pick a baud rate, port, and connection method.
- 8) Edit the modem strings to include the correct phone numbers.
- 9) On one side, run "Slave" (Alt+V) mode first, then on the other side, select "Start Test" (Alt+S).

When you run the test, a status indicator bar will appear to show the transfer progress.

* The left cell turns green when active and yellow when flowed off. It also shows the number of bytes sent or received.

* The middle cell displays the name of the file being sent or received.

* The right cell displays the estimated BPS based on the computer's estimate of the driver I/O. The actual BPS recorded in the log is based on the receive/end time minus the transmit/start time.

