USE OF TERMINAL

Outline:
- Credits
- Get onto host machine
- Act like a dump terminal
- Special characters
- Send a file to host
- Receive a file from host
- Local mode
- Programmer notes

CREDITS:

This program was originally developed by the Small Systems Group of the Institute of Computer Science, University of Guelph, Copyright 1979 by Don Genner.

Adapted to run in a machine independent CP/M environment by John Wilson.

Modified by J. Law, Dept. of Physics, University of Guelph with Don Genner's help.

Extensively modified to be more nearly host independent, to receive into a buffer, to send by logical disk sector, expanded LOCAL MODE, to work with standard BDOS, and many others, George Corliss, Dept. of Math., Marquette University, Milwaukee, WI 53233.

Modified for slow printer and VAX-11 protocol by J. Glenn Brookshear, Summer 1981.

Modified to handle receiver buffer overflow by J. Glenn Brookshear, Spring 1982.

GET ONTO HOST MACHINE

1. Configure the port corresponding to the reader/punch (RDR:/PUN:) devices to the baud rate appropriate to your host. Select a character length of 7 bits, 1 stop bit, and parity appropriate for your host.
2. Machine dependent messages in the program must be provided. Talk to your Systems people. Good luck½
3. Start TERMINAL:
   A TERMINAL   (TERMINAL loads and prompts:)
   TERMINAL MODE

   (Now dial the host and log on as you normally would)

ACT AS A DUMB TERMINAL

While you are in the TERMINAL MODE, any keys you press (with the exceptions noted under SPECIAL CHARACTERS below) are sent to the host. Any characters the host sends back are displayed at the console. Only standard ASCII characters may be sent or received.

SPECIAL CHARACTERS

While you are in TERMINAL MODE, the following characters have special meanings:

P (CONTROL P)
Switch the printer (device LST:) on/off. The switch works like P under CP/M, but it is implemented independently. Depending on your host and your printer, some incoming characters may be missed while you are printing, although the program attempts to avoid this.

A (CONTROL A)

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Initiate LOCAL MODE during which characters are not sent to the host, but are interpreted locally. This is used to send and receive files, among other things. The options available under LOCAL MODE are discussed below. Note that this works even in the middle of a line being typed to the host.

B (CONTROL B)

Set BELL switch. When the next character is received from the host, ring the BELL. This is used to waken the sleepy operator when the host is very slow.

C (CONTROL C)

Return local control to CP/M with no effect on the host. This is an even more flexible "local mode" when it is necessary to do some task locally in the middle of an interactive terminal session. Contact with the host is reestablished by typing A TERMINAL again. This returns you to exactly where you were when C was pressed. Note that is works even in the middle of a line being typed to the host.

E (CONTROL E)

Echo switch toggles on/off the local echoing of characters before they are sent to the host. The default assumes that the host sends all characters back to be displayed.

ESCAPE

Forces the next character entered to be sent to the host. This allows the special characters (P, A, C, E, ESCAPE, or BACKSPACE) to be sent to the host instead of having the effects described here.

BACKSPACE

An ASCII BACKSPACE character is converted into an ASCII DELETE character acceptable to the host before being sent. This feature may be changed or reversed by redefining the variables BADBS (bad backspace) and GOODBS (good backspace) in the program.

SEND FILE TO THE HOST

(This feature is host dependent and may require modification to fit your host's protocol.)

1. Working in TERMINAL MODE, set the host up in a mode to receive a file. This might be done using a utility or an editor. Stop when you receive a prompt, or when the host is ready to actually start receiving the file.
2. Press A to enter LOCAL MODE in order to initiate the sending of the file. Choose S for SEND, and enter the name (eg: B:FN.EXT) of the file you wish to send.
3. When you press RETURN, the transfer process begins. Characters are displayed on the screen as they are echoed back from the host (or as they are sent if E echo switch is on).
4. The protocol assumed is this: After each character is sent to the host, look to see if the host has sent an ASCII XOFF character (S = 13H). If not, transmission proceeds. If an XOFF was received, subsequent characters are echoed as they are received until an ASCII XON character (Q = 11H) is received. Then transmission proceeds.
5. It is usually the case that characters being echoed back by the host are missed whenever a disk read is necessary. All characters are received by the host, but a few are not displayed. If someone is ambitious enough to fix this, please pass the fix along to the author.
6. When the variable EOD (= Z = 1AH) or the end of the file is encountered, the string of characters in the variable HCLOSE is sent to the host to indicate the end of file. This message can be changed to fit your host.
7. At any time during the transmission to the host, the process

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may be terminated by pressing Z. (Sometimes you have to press it twice. A fix is welcome.) When Z is pressed, transmission stops, and the message HCLOSE is send to the host to close the file containing the partial transmission.

8. When the sending process is completed, control returns to the LOCAL MODE, and the bell rings to waken the operator.

RECEIVE A FILE FROM THE HOST

(This feature is also host dependent, although to a lesser degree.)

1. Working in TERMINAL MODE, set the host up as you would to display the contents of a file on the screen, but DO NOT ISSUE A RETURN. (Use TYPE, COPY, etc.)
2. DO NOT ISSUE A CARRIAGE RETURN½½½½½
3. Press A to enter LOCAL MODE to get the console ready to receive the file. Choose R for Receive. Enter the name to be given to the incoming file (eg: B:FN.EXT). If that file already exists, you get a warning message, the old file is deleted, and receipt of the new file proceeds. You (currently) are not given a chance to change your mind.
4. After the destination file has been opened, the program sends a RETURN (variable ~~HGO~~ CRMSG) to the host to terminate the line you left hanging at step 1, and transmission from the host begins. Each character is displayed and stored in a memory buffer as it is received.
5. The destination file may be closed in two ways: i) if the variable HSTEOD (= Z = 1AH) is received, the transmission is assumed to be completed, the buffer is written onto disk, and the destination file is closed; ii) if Z is pressed at the console, transmission is stopped by sending the message HNOSND (Host NO SeND) to the host, the buffer is written onto disk, and the destination file is closed. The second method is used either to stop the transmission in the middle of the file, or to close the destination file if the host does not send Z at the end of the file.
6. The size of the receiving buffer can be set at 1 CP/M sector (128 characters), 128 CP/M sectors, or 256 CP/M sectors from LOCAL MODE (see below). In any case if the buffer becomes full the "host stop sending message" will be sent to the host, the contents of the buffer will be written to disk, and the "host start sending message" will be sent. After the "host stop sending message" is sent, the host will continue to be monitored for a short time so that any straggling characters will not be lost. These characters will not appear at the CRT but will be placed in the disk file.
7. After the receiving process is concluded, control is returned to the LOCAL MODE.

LOCAL MODE

LOCAL MODE is provided for some limited communication with the console which is not sent to the host. It is entered from the TERMINAL MODE by A. A HELP list of options is displayed in response to 'H', 'h', or RETURN. Both lower and upper case are recognized. Options designated (L) return to the LOCAL MODE when their function is completed; those designated (E) exit from LOCAL MODE to either the TERMINAL MODE or to CP/M.

B Change the size of the receiving buffer. The choices are (A) for a 1 sector buffer (for systems with only 32K of RAM, (B) for a 128 sector buffer (for systems with 48K RAM, and (C) for a 256 sector buffer (for systems with 64K RAM). The 256 sector buffer is the default. ("Sector" here means 128 bytes.)

C, C Return control to CP/M. These other tasks may be do

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with no influence on the host.

D — Display a disk directory (not implemented yet).

E, T — Return control to the TERMINAL MODE.

H, RET — Help list of options is displayed.

L — Logon. The message in variable LONMSG is sent to the host. This can, of course, be defined to be anything, but it can be used to make log on accurate and easy.

O — Off. The message in variable OFFMSG is sent to the host.

P — Printer switch is toggled on/off. This feature works on the same switch as P from the TERMINAL MODE.

R — Receive a file from the host. See discussion above.

S — Send a file to the host. See discussion above.

W — Wait. When communicating at high baud rates, the host may not be able to accept characters as fast as we can transmit them when sending a file. Accordingly, the WAIT option slows down transmission. The ASCII code for the character entered at the prompt is used as a loop counter. (A = 01H, 1 = 31H, A = 41H, a = 61H, DEL = 7FH, etc.)

V — Change to VAX-11 protocol.

PROGRAMMER NOTES

As much as possible, host dependencies are gathered together at the beginning of the code. Those message can be changed without affecting the terminal program. Other host dependent changes may be necessary in the sending protocol.

All I/O in this program uses the standard BDOS entry point and should be console independent. It does use BDOS function 6 which is only supported under CP/M 2.0 and higher, but a fix using function 11 is included as a comment.

Additional SPECIAL CHARACTERS (or changes in the uses of the existing ones) are easily accomplished by inserting appropriate CPI x, JZ xx commands where the others are tested.

Additional options in the LOCAL MODE are easily implemented by being added to the HLPMSG menu and incuded in the jump table at IFA.

In RDRINPF, any of the characters (LF, BEL, DEL) received from the host are ignored. In each application, a RETURN is used by the program to automatically generate a companion LF whenever appropriate. Ignoring BEL's may be inappropriate for your host, but mine uses BEL as a null character at the beginning of each line.

This program already represents a combined contribution of quite a few people. I would appreciate any feedback, fixes, or modifications you have.

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