

Z-TERM™

by Bill Blue

A versatile CP/M communications package for the Z80 Apple II
produced by
Southwestern Data Systems

Z~TERM

by Bill Blue

Z-TERM, a sophisticated full-feature terminal package for the CP/M Apple, for use with the Microsoft Z-80 Softcard. The 16K ram cards or Apple Language card are not required, but are very useful to increase the internal buffer size.

It fully supports the Hayes Micromodem, Apple Communications card, SSM-AIO board, CCS Asynchronous Serial card and others! Also supports the Local Apple 40 column screen, M&R Superterm, Videx and Apple Smartterm 80 column boards or external terminal, all interchangeably and with NO reconfiguration necessary!

★ FEATURES ★

- ★ Fully compatible with standard CP/M sequential text files, can send files from disk of ANY size, and can receive up to 36K of data at a time!
- ★ Accommodates four modes of transmission, including variable speed data flow, variable delay after c/r, and adjustable hand-shake and character flow modes.
- ★ Fully supports lower case in all modes (with or without 80 column board provided a lower case display board is installed for the 40 column mode) with the local Apple keyboard (shift-key wiring ready).
- ★ Completely table driven prefix keys allow you to produce any character not already on the Apple keyboard without losing any other keys! You can customize it to suit your specific requirements. Even the keyboard itself is table driven. You can even reassign actual key positions!
- ★ Allows you to display normally invisible characters (i.e. control) for host output analysis while in terminal mode, or while reading from disk file!
- ★ Full file-driven keyboard MACROS allow you to define strings for output with simple keystrokes for fast log-ins to host systems, or to issue various commands from within the system. The MACRO file also contains cross-reference to host phone numbers for auto-dialing with the Hayes Micromodem.
- ★ Auto-disk-relogging takes care of unnecessary BDOS SELECT errors. You can read files or disk directories from within the program, or even exist, ERase or REName files to suit, and reenter the program with all data intact!
- ★ Fully supports COPY to buffer, printer (with or without COPY on), keeps track of free buffer space and if the AUTO-SAVE mode is selected will send XOFF character to host, save file (with operator prompting) and then continue the COPY.
- ★ COPY, MACRO select, PRINTER and all other menu commands can be quickly accessed while in terminal mode. No need to ever lose data because you couldn't change program status quickly enough. STATUS report mode too, so you can examine the current program setup.
- ★ TERMINAL EMULATION allows your 80 column system to emulate the terminal of your choice or, if you are already using a terminal, allows it to emulate that of a different type!

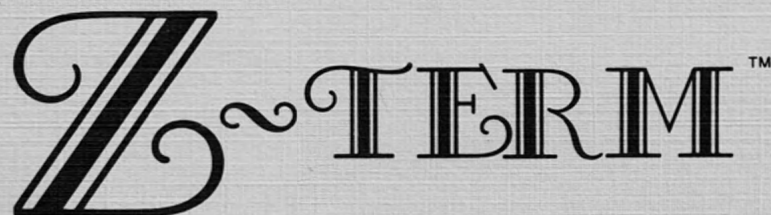
Z-TERM COMMAND SUMMARY

(available at main menu or from within terminal mode)

!	Display program status	A	Show control chars.
B	Baud rate select	C	Clear current buffer
D	Dial or connect (MM)	E	Echo (duplex full/half)
F	Free buffer space	H	Hang up (MM)
I	Disk directory	J	Read disk file to screen
L	Log new disk	M	Macro group select
N	Set delay after c/r	O	Auto-save on/off
P	Printer on/off	R	Copy buffer on/off
S	Send file to host	T	Transpose Backspace/Rubout
V	View current buffer	W	Write buffer to disk
X	Exit to CP/M	Z	80 column screen wrap

This software may revolutionize the standard of terminal software for the Apple system. Written entirely in 8080 assembly code, it's very fast and completely adjustable to fit your requirements.

SOUTHWESTERN DATA SYSTEMS
P.O. BOX 582 • SANTEE, CA 92071 • (714) 562-3670



by Bill Blue

INSTRUCTION MANUAL

produced by
Southwestern Data Systems
10159-I Mission Gorge Rd..
Santee, CA 92071
(714) 562-3670

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INTRODUCTION

Z-TERM is a versatile terminal system for the Apple II computer equipped with the Microsoft Z80 Softcard. It supports terminal communications with either a Hayes Associates Micromodem II, Apple Communications card, CCS Asynchronous Serial card, SSM AIO board, or the LYNX Telephone Linkage System by ESI.

In addition, it will support the local Apple screen, most of the 80 column boards available for the Apple, as well as an external terminal if interfaced to the computer with the Apple Communications card or the CCS Asynchronous serial card.

When using the local Apple keyboard, provision is made for the typing of lower case and other characters normally not available on that keyboard. Of course, in this mode, some form of lower case display board should be present in the computer such as the LAZER systems display board, or the Dan Paymar lower case board. Your system can also be set to full upper case only mode with the CONFIGIO program on the CP/M systems diskette.

Z-TERM is written in 8080 assembly language, and follows the standard Apple CP/M conventions set down by the licensor, Digital Research Inc. In addition, it is mostly self adjusting to your system configuration with certain options changeable by setting conditional "flags" in the program itself.

With Z-TERM you can upload or download text files (standard ASCII text as in .ASM/.HEX/.DOC) with up to a 38k text buffer. You also have full keyboard Macros. The Macros are table driven from a text file you can prepare with the system EDitor, or other word processor. This file also supports the automatic dialing of numbers (Micromodem only) included with your Macro file.

Note:

CP/M is a registered trademark of Digital Research Inc., APPLE II is a registered trademark of Apple Computer Inc., MICROMODEM II is a registered trademark of Hayes Microcomputer Products Inc., SOFTCARD is a registered trademark of Microsoft Consumer Products Inc., SSM is a registered trademark of Solid State Music Corp. and LYNX is a registered trademark of Emtrol Systems Inc.

GETTING STARTED

Provided on the Z-TERM disk are four files:

ZTERM.COM	Executable program.
MACRO.LIB	Library file which contains phone numbers and Macro information.
GO.COM	Restart program (soft Z-TERM softstart)
ZMOD.COM	Customizing configuration program

Note that the disk does NOT include the CP/M operating system. If you wish to be able to boot on this disk you will have to add your own version of CP/M with the "/s" mode of COPY. See your CP/M manual ppg's 5-8 and 5-9 for further details.

The standard CP/M conventions are followed throughout the program and should work correctly with little or no further changes if your system is configured properly. The proper card setup is:

Slot 1 = Printer card
Slot 2 = Modem or comm card
Slot 3 = 80 column board, comm. card (terminal) or blank
Slot 4-7 can be most anything including the Z80 card itself.

NOTE: SLOT 3 MUST BE EMPTY if not being used by an 80 column board or communications card for a terminal.

If your system is set up to these conventions, all you should have to do is type "ZTERM" with the Z-TERM disk in your currently logged drive. Those of you using the Micromodem will display the command menu; those using any other type card will go into terminal mode and stay there until a specific command to call the menu has been given. The command to move to main menu from terminal mode is ^Q^Q (control-Q control-Q), so those not using the Micromodem should try that now, and display the command menu. Once you are familiar with what is on this menu, commands may be given from terminal mode by a single ^Q followed by the command you wish to execute. This "level" is acknowledged with a "*>" prompt. Whenever you see this prompt, you can give a command the same as you would if the menu was displayed. The micromodem, whenever NOT online to a host system, will always return to the "*>" prompt.

If you wish to make additional modifications to the program, please consult the section "CUSTOMIZING Z-TERM" in a later section of this manual.

COMMAND MENU SUMMARY

This is a summary of the commands available at command menu. The most often used commands are visually displayed in the command menu, and in addition, there are several others that are not displayed. These are special feature functions and will not be required in most applications.

- !) Display current program status
- A) Show Control characters
- C) Clear current text buffer
- D) Dial or connect (Micromodem)
- E) Echo (full/half duplex)
- F) Free buffer space (used/available)
- H) Hang-up (Micromodem)
- I) Directory of currently logged disk
- J) Print disk file to screen or printer
- L) Change Logged disk
- M) Macro select (0-9)
- P) Printer (on/off)
- R) Copy buffer (on/off)
- S) Send file to host
- V) View current buffer (local screen)
- W) Write file to disk (and clear buff)
- X) eXit to CP/M

Not displayed:

- B) Baud rate change (300/110)
- N) Set Delay after carriage return
- O) Auto-save on/off
- U) View Macro file buffer
- T) Transpose ^H and RUBout
- Z) 80 column screen wrap (on/off)

Now we will explore each command and what it does in more detail. When options or modes vary depending on which communications device is being used, the differences will be mentioned, otherwise, similar behavior will be assumed.

!) DISPLAY CURRENT PROGRAM STATUS

Analyzes the various "flags" used throughout the program and prints a listing of the status of each of those flags. As an example, if you were about to reenter terminal mode, and wanted to make sure the printer or copy flag was on or off you would execute this command. Most statuses which deal with on or off modes are displayed here.

A) SHOW CONTROL CHARACTERS options: on/off

You would use this command when you want to display control characters that would normally not be seen in text. When you receive the package it comes configured to display control characters in this mode as being preceded by "^". So a control-a would display as ^A on your screen. The way in which these characters can be displayed can be programmed in the "CUSTOMIZING Z-TERM" section of the manual. You could assign a prefix character other than "^" or a series of characters or whatever you might want. On certain terminals that have a special character set or inverse/highlighted text capabilities you could set them up to display accordingly.

This is primarily a diagnostics capability. You would use it when you need to examine the exact output of a particular system in an attempt to find a prompt to handshake on, or just to see what particular series of characters is being sent at a given time.

All control characters EXCEPT c/r (^M carriage return) will display but will NOT be acted on by the terminal. So any screen formatting characters will not actually be formatting the screen in this mode. They will just display as part of the normal text.

C) CLEAR BUFFER

This is exactly what it seems. The buffer pointer is reset to zero, essentially "clearing" the buffer. This is also automatically done at the termination of a successful disk save. The response of the "F" command will always reflect this status.

D) DIAL OR CONNECT options: number, / redial last, M dial MACRO

(Micromodem only) Here you can type the number of your choice and the software will dial and wait for carrier. It will continue to wait until it receives carrier, or until any key is depressed. If carrier is received, the screen will clear and you will be in terminal mode. If not, and you depress a key to exit the waiting mode, you will be returned to the command menu. If you want to connect to an already established line, just hitting return instead of indicating a number to dial will cause the Micromodem to simply drop on to the line. Again, it will check for carrier at the start of the connection and continually throughout the exchange. If carrier is lost at any time, it will return to the "*>" command prompt. To redial the last number accessed, just type "/" instead of the number.

Another option is available at this point. Entering the letter "M" will cause the number associated with the previously selected MACRO to be dialed. See further details under "USING THE MACROS".

E) ECHO (DUPLEX FULL/HALF) options: full/half

System default is always full duplex unless otherwise changed in "CUSTOMIZING Z-TERM". Full duplex will cause only characters received from the host system to be displayed on the screen, whereas the half duplex mode assumes no echo from the host system and sends characters from the local console directly to the screen in addition to sending them to the host.

F) FREE BUFFER SPACE

Displays used/free buffer status. In a typical 56k system (language card) with nothing in the buffer the display will look something like 0/37411. The number on the right side of the slash will vary somewhat according the specific system configuration but will always be an accurate representation of the remaining number of bytes in the buffer. The number on the left of the slash will always be your current buffer size.

H) HANG UP PHONE

(Micromodem only) Immediately disconnects from the host. Clears the local line, and returns to command prompt "*>".

I) DISPLAY DISK DIRECTORY

Simply prints the directory of the currently logged disk to the screen. You can use the "L" command to relog the drive to another if you want to read the directory of a different drive, or you can just insert another disk in the current drive and use the "I" command again.

J) PRINT DISK FILE TO SCREEN options: <dr:>filename

Very similar to the TYPE command in CP/M. Whatever filename you choose will be written to the screen. If your printer flag is currently on, it will go to the printer too. The "A" control-show mode is also in effect here if set in the command menu. To start and stop the display, just depress any key except c/r (carriage return) to stop, and again to start. Depressing c/r will abort the display function and close the disk file. The drive specification can also be included in the filename.

L) LOG DISK options: <dr:>

Allows you to change the currently logged drive. In CP/M, a write to disk can only occur to a properly logged disk. Z-TERM automatically resets the disk system prior to each save, so there is no problem with changing disks in the same drive prior to a read or write as long as the disks in question are properly formatted and do not cause any other type of BDOS error. Using the "L" command, you can change which drive is actually logged at the time. You can also specify a new drive to automatically log and read or write to within the filename. If you were currently logged to drive B: and wanted to send a file from drive C: you could either relog with this "L" command or type "C:filename" to force a relog without the separate use of the "L" command.

M) MACRO SELECT options: 0 - 9 : ;

This will allow you to select one of the MACRO groups from your MACRO.LIB file. You input a number from 0 to 9 to select this group. When the program is initially run MACRO 0 is loaded by default. You can change groups at anytime on or off line. This MACRO group also may contain a phone number for automatic dialing of a number. If this is the case, after you have loaded the group you can use the DIAL (D) mode and for the number to dial, type "M" meaning dial the number in the MACRC. For more details see the section entitled "USING THE MACROS".

P) PRINTER ON/OFF options: on/off

This command enables you to simultaneously use your printer while in the terminal mode and connected to a system, in the "V" view buffer mode, or in the "J" print file to screen mode. Using this command will turn the printer off if it's on, or turn it on if it's off (toggle). The current status of the printer (on or off) will be displayed and you will enter terminal mode. Once the printer mode is enabled, it will remain active in the modes described above, until you explicitly turn it off. The "R" copy mode can also be used simultaneously, however copy only will copy while in the terminal mode.

R) COPY ON/OFF options: on/off

Turns the copy buffer on or off. As you change this flag, it's current status will be displayed on the screen. If downloading especially large files and/or you are using this software under somewhat limited memory availability, it would be a good idea to check the F) command to make sure you have adequate space in the buffer for the data you intend to receive. If you should run out of buffer space, the program will turn the copy flag off, sound the bell and display the buffer status as being full. There is no other warning given. Also see the "O" Auto-Save mode described in the section "Special Modes".

S) SEND FILE options: <dr:>filename, L/C, prompt/not, <> speed

Send a file to the host computer. There are several different modes available for this command. Let's say you have prepared the host computer to receive your data and it is waiting. When you type the S command, Z-TERM will come back and ask you the name of the file you wish to send. You specify the name as it appears on the disk in the standard CP/M format, a filename of 8 characters or less and an extent of three characters or less (optional) separated by a "." (period), or a filename with no extent and eleven characters or less. You can also include a drive specifier if you wish.

Next it will ask you if you wish to send the file in the L)ine or C)haracter at a time mode. L)ine mode is preferred for those systems which can maintain 30 characters per second (300 baud) constant throughput. For those that can't (you will quickly find out if your upload arrives with missing or garbaged lines) you may want to try or you can actually slow down the speed of the send with the "<" key.

Output can be sped up with the ">" key. The speed is adjustable on a scale of one to six with six being an absolute snails pace. The program default is always the fastest speed (i.e. no delay between characters), except once you have modified the speed, that new speed will become your default until you reset it, or rerun the program. Another option which can be utilized separately or in combination with the slowed down mode is the "N" option which is called from the main command level. This option determines the amount of delay after each c/r sent during a file transmission. See further details in the "Not displayed" section of the manual.

One other option reserved for real problem cases is the C)haracter mode which outputs one character at a time and waits for the host to echo before sending another. In a half duplex environment you cannot use this mode as there are no host echo characters to interreact with. ABBS systems and certain timeshare systems will require this mode, and the ability to receive data is erratic and has to be paced according to the current system capabilities.

The next question in preparation to send the file is "Prompt to look for?". Here you can either specify the character which the host will send to signify that it is ready for more input, or if you wish to send without prompt checking, just type c/r alone. If you do want to check for a prompt, Z-TERM will send a line of data (in whichever previous mode you had chosen) and then wait for the host to send its prompt telling you it's ready for more. This "handshaking" will continue throughout the rest of the file.

Once the file has been sent your system will sound a bell, and return you to terminal mode. If, at any time you wish to abort the mission to start over, or whatever, typing any key will stop the sending and return you to terminal mode. NOTE that while using the character mode for file sending, you may have to type a key several times to get the systems attention. Characters that you type during this mode, will not be sent to the host.

S)end Mode Options Summary

L)ine at a time:

- Handshake character or not
- Lower and raise send speed with "<" and ">"
- Delay after each c/r set by "N" command

C)haracter at a time:

- Handshake character or not
- (no other options)

V) VIEW BUFFER

Allows you to review on the screen (or on the printer also if your printer is selected at the time) the contents of your buffer. This will scroll across your screen pretty quickly, so provisions have been made to start and stop the scrolling at any time by depressing any key except c/r to stop the scrolling, and again to start again. At any time, either while scrolling or while suspended, typing a c/r will abort the display, but will not alter the contents of the buffer in any way. You can then save it to disk if you choose, or clear the buffer entirely and start over, or if you choose to, you can continue from your current buffer position with more copy.

W) WRITE FILE AND CLEAR BUFFER options: <dr:>filename

This will simply write the contents of the buffer to disk under the filename of your choice. Standard CP/M conventions are followed here, and your filename must be limited to a total of 11 characters if no extent is used, or a total of eight characters, a period, and a three character extent maximum. Failure to observe this may result in truncation or modification of the filename so it will correctly save under proper conventions, which probably will not end up being the same name you typed in. The drive specification can also be included in the filename (as in the example: "B:filename"). The buffer will be cleared only in the event of a successful save. Also, even an attempted but failing save will turn the copy flag off except if the AUTO-SAVE option ("O") is ON. If the save was unsuccessful, the contents of the buffer and flag settings will remain unaltered until you are able to successfully save your data.

X) EXIT TO CP/M

The right way out. Will cleanly exit to your operating system. If you were on-line while using this, no line statuses will be changed. You can do anything you want (short of hitting reset with the Micro-modem) and then rerun Z-TERM (by typing ZTERM) and pick up where you left off in terms of being on line, but all program defaults will be reset to those of the program when it is first run, including the default MACRO file. Another way to reenter the program with all variables and program statuses intact is by typing the command "GO". This will work as long as you have not run another program or disk utility (such as STAT or DDT or equiv), and is considered a "soft" entry point. If you have actually run another program or utility, the image of Z-TERM in memory will be lost, and issuing the GO command will cause the last run program to be re-run.

SPECIAL MODES

As mentioned earlier, there are several modes not displayed on the main command menu. These modes may not apply to all system configurations, and are usually used only for special applications.

B) BAUD RATE CHANGE options: 300/110

The program default baud rate is 300 baud. The B command will toggle the rate to 110 baud, and will display "110" on the screen. There is a slight difference in the way the actual baud change is accomplished depending on which card you are using. If you use the Apple communications card the baud rate change will be immediate. If you are using the Micromodem, and are already online to a host, you will need to reenter terminal mode via the D)ial command. Just hit return in response to "Number". You will then be in the new baud rate. If you are offline when this command is executed, you will enter terminal mode in the new baud rate at your next connect. If using the SSM AIO board or the CCS Asynchronous Serial card, baud rate may be changed only with a hardware select switch located on the board.

N) ADD NULLS (DELAY) options: 0-99

Under certain conditions on timeshare systems (possibly a half-duplex mode), you will encounter a situation where you have no system prompt to handshake on and at the same time, the system cannot accept data at a constant throughput of 300 baud (standard speed). The "N" command allows you to add a specified amount of delay after each c/r sent to the host during a file transfer. This will allow the system time to "catch its breath" as you are sending data. A number from 0 to 99 is valid here and the amount you start with (i.e. the program default) can be set in the configuration table in "CUSTOMIZING Z-TERM". As shipped, it is zero, which is no extra delay over and above the internal program delay. Experimentation will tell you the correct value to use in each specific circumstance. Note that this function is only in effect when you are NOT handshaking with the host. A related function to this one is the ability to slow down and speed up the RATE of transfer. This can be done by typing the "<" and ">" keys while the sending is in progress. "<" slows the sending down and ">" speeds it up. The program default is always at maximum speed unless you explicitly change it in the previously mentioned customization section. See further details under the "S" command.

O) AUTO-SAVE ON/OFF options: on/off

Z-TERM has a very large internal buffer - over 37k in a 56k system and about 24k in a 44k system. Therefore, buffer full protocol is not likely needed, but the option does actually exist. Normally if you were "copying" data ("R" copy mode ON) and did manage to fill up the buffer, your local bell would sound, COPY would be turned off, but your data would just keep on coming. It would be up to you to decide how to handle that particular occasion. With the "O" auto-save option ON, when you ran out of buffer room your local bell will sound to alert you of the condition, Z-TERM will send the XOFF character (programmable, but usually a ^S), and then prompt you for the name under which to save the current buffer. Once this save has successfully occurred, you will be returned to terminal mode, where you would type the XON character (usually a ^Q) to continue. Your copy flag will not have been turned off, so you can just pick up where you left off. If the save was unsuccessful the program will return to the command prompt "*>" to await further instructions.

T) TRANSPOSE BACKSPACE options: on/off

This will change what would normally be the backspace key (left arrow), or ^H (control-H) to a RUBout. If you have already defined backspace as RUBout within the CONFIGIO program on your SYSTEMS master diskette provided by Microsoft, this will convert the RUBout to a ^H. Either way, preceeding either of these two characters with a ^W (see the character substitution chart) will produce the OTHER one. For example, say you had not done any key changes with CONFIGIO, so when you would normally type ^H (bs) that's what the program would actually send. If you then typed ^W^H the system would send a RUBout. Now, if you used the "T" option to reverse these two characters, when you then would type a ^H, a RUBout would be sent. If you typed a ^W^H a control-H would be sent. Some timeshare systems require a RUBout character to send a destructive backspace, and a ^H to act as non-destructive backspace. Others completely ignore the ^H or will at the least, imbed it into actual text. Still others will ignore the RUBout! This way, you have ALL the possibilities covered.

Z) FORMAT SCREEN options: on/off

This is primarily only for terminals or screen devices that do not automatically issue a carriage return at the 79th or 80th column if a given line of text is actually longer than that. In that case, the characters will just keep coming, but you won't see them as they'll be off the right margin. Turning this mode on, will automatically issue a cr/lf (carriage return/line feed) to the screen device at the 80th column and continue its display on the next line.

ISSUING MACRO STRINGS AND SPECIAL CHARACTERS

Z-TERM issues MACROS and special characters as a part of its PREFIX character system. A PREFIX character is one that proceeds another character, with the pair of them forming an instruction or a substitution. The prefix character for this mode is ^W (control-w). Typing ^W<char> where <char> is a character from 0-9, ":" or ";", will cause a pre-set string, or MACRO to be sent to the host computer. Any other character typed after a ^W will then be checked against a substitution table which is user programmable. If the character does not exist in the table then that character will be output to the host. If it is contained in the table, a substitute character will be taken from the table and output instead.

This technique for character substitution is especially useful when dealing with the local Apple keyboard which is not able to produce several of the 128 ASCII characters required by some hosts, without having to sacrifice any characters currently available on that keyboard. The same technique can be used for external keyboards or terminals connected to the Apple.

The following characters are produced by first typing the ^W and then the character in the chart:

^W^B	=	BREAK	
^W ,	=	[	lt. bracket
^W .	=	]	rt. bracket
^W O	=	_	underscore
^W^O	=	^	control-underscore
^W /	=	\	rev. slash
^W ?	=	^]	control-rt. bracket
^W^H	=	^H or RUB	depends on "T" command
^W^W	=	^W	
^W^Q	=	^Q	
^W ESC	=	ESCape	

Note that ^H on the Apple keyboard is the left arrow, and ^U is the right arrow. This may not be the case on all keyboards.

This substitution chart is completely programmable. If you wish to add other conversions or modify existing ones, see further details in "CUSTOMIZING Z-TERM". Also, be aware that any keyboard assignments that are made within the CONFIGIO program on your systems disk happen BEFORE they get to Z-TERM. They can, however, be re-modified by this table. It is just a matter of your personal preference. Note that any character typed after a ^W prefix that is not in the prefix substitution table, or a legal MACRO number will be sent to the host unmodified.

The internal firmware of most 80-column boards usually converts a ^K to a [left bracket, while a ^N is converted to] right bracket. If those characters are important to you, you may need to define the brackets BACK to the control characters with the CONFIGIO program on your systems master, or you can make the same sort of changes within Z-TERM if you choose. Also, ^A and ^V are usually reserved for card functions and cannot be generated in ANY way except again, by substitution of other keys in CONFIGIO or by using the conversion table in Z-TERM. Carefully read the section on CONFIGIO starting at page 5-16 in your CP/M manual and specifically the keyboard redefinition section starting at page 5-23.

Lower case with the Apple keyboard NOT being used with an 80 column board is provided by using the ESCape key as a shift toggle key. You start out in lower case. This default can be set in the "CUSTOMIZING Z-TERM" section. Typing ESCape once will cause the next letter you type to be output in upper case. Subsequent letters will return to lower case. Typing ESCape twice in a row, is shift-lock and will cause all the letters you type to be in upper case until another ESCape is typed at which point you will return to the lower case mode. Of course, you must have a lower case display board installed in your Apple in order to display the lower case.

There is one other keyboard shift option. If you have your keyboard shift key connected to SW2 (or PB3 depending on which document you're looking at) as recommended in the 80-column board manuals, you can take advantage of that hookup with this software as well. No further program modifications need to be made. In this mode, you can use either ESCape or SHIFT as your shift key, but note that the ESCape function takes precedence. So if it is shift-locked you will have no lower case. If it is in the lower case mode, your shift key will work normally. Also, the newer Apple II computers that have a separate decoder board mounted under the main keyboard (the ones with the ability to set control-reset as a reset function) have a spot for another switch that is not (of course) supplied with the computer. Installing this switch will give you true lower case with the shift key of your Apple keyboard, at the expense of not being able to type the "@" and "^" characters. Those can then be created by either using the keyboard character substitution table or the ^W prefix table.

Now, you might wonder how you would type a real ESCape or for that matter, a ^Q or ^W to send to the host. Simple! Just precede it with a ^W. So to send a real ESCape, type ^W ESCape, to send a ^W type ^W^W etc. ^Q and ^W must be typed in this manner regardless of what keyboard you use, as they are system prefix characters.

USING MACROS

MACROS are an entire series or "string" of characters that can be output to the host by a simple two key operation. They live in file form on disk and can easily be changed or modified with the system Editor, or other word processor.

MACROS are called by a sequence of two characters, a ^W followed by a character from "0" to ";", the result of which will cause these pre-defined strings to be output to the host system just as if you had typed them yourself. This procedure can be used for logging into a system or for issuing intermediate commands at any time. The file in which these MACROS are stored is on the disk under the name MACRO.LIB. There are a total of 12 groups of MACROS available (enough for 12 unique systems) and each of those groups can have up to 12 strings defined in it.

In the file MACRO.LIB supplied on the original diskette are some examples of how to set up and organize each entry. The file must be set up in exactly the way described to work correctly. You must also be very aware of its size as you are building it. The program as shipped can accomodate a MACRO.LIB of up to 2048 characters. Greater than that will destroy other variables stored in Z-TERM. In the system editor "ED" you can check file size by the difference between the two numbers displayed when you issue the "OV" command.

Each MACROS group can be called separately with the M)acro command on the main menu (or ^QM from terminal mode). All you do is tell it the group number you want to access. The numbering is from "0" to ";" in this order: "0" - "9", ":", ";". The colon and semi-colon at the end are the next characters in numeric order on the ASCII chart. This is why they were used. In addition, when the program is first run each time, the group of MACROS defined as MACRO group 0 are loaded in as the system default. You usually would set them up as general purpose log-in and access as opposed to being setup for a specific system.

SETTING UP MACRO.LIB

The MACRO.LIB file supplied on the disk will serve as an example of how to create a MACRO file to your own uses. The Z-TERM MACRO file MUST follow a specific format to prevent erroneous results and to keep the file as compact as possible.

Up to twelve MACRO groups are allowed and each group can have up to 12 entries. This file may contain a maximum of up to 2048 bytes. That is, by checking the file while in the EDitor with the "OV" command, the difference between the numbers given must be less than 2048. This whole file is loaded into the program into a declared buffer, and must not exceed 2048 bytes.

The format is as follows:

```

line #1          Macro 0 label #phone number
      2          element 0
      3          element 1^this is a remark
      4          element 2
      ... etc.
      ""         termination of that MACRO group
                  Macro 1 label #phone number
                  element 0
                  element 1
                  element 2^this is a remark
      "" and so on. (except at end of very last element)
      $$ end of file

```

The last line of the file is indicated by \$\$ on a line by itself.

Element 0 of a Macro group is produced by typing ^W0 when in the terminal mode. Element 1, ^W1 etc thru 9. Element 10 (11th) ^W: (colon) and element 11, (12th) ^W; (semi-colon). This may seem a little confusing at first but it will become quite easy to handle in no time. I usually use 0 as my log-off command for any system, 1 thru 9 as general purpose macros and : ; as special use macros.

There are a couple of special characters used in the MACRO files also. The "^" (carat) is used to define the area of a REMark statement. See the MACRO file example on the next page. Any characters up to a "^" will be considered part of the MACRO. Anything after that will be ignored and serve only as remarks or notes to you. If you do use these remarks, make them very short and as direct as possible. Space is at a premium in this file. If you would like to send a macro that is NOT terminated with a carriage return, add a " (quote) to the end of it. This would be useful on a system that you had a long command string to execute a particular function, and the command string argument would vary on different occasions. You would then use this type MACRO to output the largest or most repetitious part of the string, then type the remainder and carriage return in manually.

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To change macro groups you would type ^QM and then the group number you wish to select. If a particular group does not exist it will tell you "not found". If MACRO.LIB was not present when the program was run, it will ignore you altogether. Whenever the program is initially run, group zero will automatically be resident, so you could set it up as your default macro for the system or circumstance you would want to be the default.

Following is the contents of the MACRO.LIB file on your disk. Note that the line numbering is not actually present in the file, but is a result of using the "ED" program to manipulate the file.

```
1:*0* sys default
2:g;n^this is zero
3:John Doe
4:Computerville, Md.
5:301-555-1212
6:system command
7:system command
8:This is supposed to be a line with no c/r"
9:^nothing in this one
10:""(end of this group)
11:*1* PMS Santee Ca. #1-714-449 5689**
12:g;n^logoff command with no comments
13:John Doe
14:Computerville, Md.
15:301-555-1212
16:generall4^download programs
17:generall5^upload files/programs
18:alt^change message packs
19:""
20:*2* The Source #your local telenet access number
21:off^Source logout
22:hp26^Telenet terminal identifier
23:c 30138^connect to sysll
24:id tcz123 ^C^T^E^logon with ctrl char pswd
25:mailck^check your mail
26:mail read "^output partial string, you add number
27:""
28:*3* Local ABBS
29:^nothing here
30:??JOHN^the question mark slows that macro down
31:??DOE
32:??COMPUTERVILLE, MD.
33:??301-555-1212
34:$$ (end of file)
```


Note that many of these comments are just added to help explain things to you. In practice, most of them would not be needed. The *1* and *2* are not necessarily needed in that form. That is just to catch your eye in identifying each group.

MACRO FILE SPECIAL CHARACTER CHART

following digits are phone number for this MACRO.
^ following characters are a remark.
? Slow speed MACRO.
* Delay 2 seconds each during dialing of number.
" Send this data with no c/r at end.
"" End of this MACRO element.
\$\$ End of file.

Now let's look at several of the entries for specific examples of what the various characters mean. Line # 1, 11, 20 and 28 are MACRO group identifiers. They serve two purposes - 1) to indicate which system the following group of strings is for, and 2) to hold a phone number for that system if applicable. *0* or *1* are just eye catching ways to identify the name of the system. If a phone number is to be listed, it should start with the "#" symbol followed by the digits to dial. Any time a "*" is contained anywhere in the number string a two second pause will occur. Place these characters to slow down dialing in applicable places if needed.

The next line of each MACRO group is the #0 MACRO for that group, next is #1, #2 etc. When there are no more entries for that particular group, the characters "" (quote quote) on a separate line terminate that group.

Remarks can be added to any particular string by preceeding them with the "^" symbol, followed by the remark. This symbol should DIRECTLY follow the MACRO string itself with no spaces. All characters up to "^" will be taken as the MACRO.

Line #8 is a good example of how to terminate a line in the MACRO file so that when it is actually output, there will be no string terminating character sent. (No c/r at the end of the line).

In the #3 MACRO group, notice that each of these strings is being preceeded with a "?". This question mark serves to slow down the output speed of that MACRO so that systems that cannot accept data at 300 baud can still be used with the MACROS. ABBS systems and certain others, (even some timeshare systems) are unable to receive data at a full 300 baud rate. During a file transfer this is compensated for by the ability to send data in the "C)haracter at a time" mode, or by one of the other techniques of slowing down the data rate. In the sending of macros, however, we can obtain a similar effect by just slowing down the output to approximately 1/3 of what it would normally be. We tell the program when to send in this slowed down mode by preceeding the particular string in question with the question mark "?". This neatly takes care of the speed problem by simply including or removing these question marks from any given line of the file. They can also be mixed fast and slow within the same macro group.

Throughout this file, keep things very brief and concise. Do not waste a single byte that you do not really need to set things up properly. When Z-TERM is intially run, a workspace of 2048 bytes is allocated for this file. If this size is exceeded, eventually the data in the part of the file that is in excess of 2048 bytes, will be "stomped on" by other areas of the program. If this happens, you may find your MACROS outputting data that you did not originally set up in the file.

CUSTOMIZING Z-TERM

Z-TERM is initially configured to run correctly in most Apple installations without any further modifications. However, occasionally there are certain default values that may be necessary to change for use in a particular system. In addition, character tables are provided for terminal emulation modes, character reassignment for prefixed and standard keyboard characters, as well as selection of characters to suppress completely. The types of changes possible and where each location is described in the following pages. Some knowledge of the CP/M operating system and familiarity with HEX numbers is assumed.

THE I/O CONFIGURATION BLOCK

TERMINAL EMULATION TABLE
[110h-125h]

The Microsoft implementation of CP/M on the Apple II has a clever I/O configuration block which is not normally part of the CP/M environment. It is essentially a conversion table in which various screen formatting characters can be converted or defined as another. This is the table that is modified when you run the CONFIGIO program on your systems master diskette. While in most cases this table is very useful, especially due to the wide variation in available screen display devices for the Apple II, in a few instances during on-line communications, it gets in the way.

Because of this, Z-TERM "swaps" this table with one of its own each time it's run, and then restores it when exited. Unless you specifically set it up, the swap table in Z-TERM contains all zeroes, which have the effect of completely disabling the original table which lets your display be "transparent" to incoming data. This is especially necessary when you are using an intelligent terminal for display, and are communicating with a system that will format your screen directly. In other cases, it may be useful to install an "alternate" conversion table which behaves differently than the originally defined table would. This could be especially useful when you want your 80 column card or terminal to "emulate" a terminal of another type. When you exit Z-TERM in the proper way with the "X" command, the tables are swapped back thus restoring the original systems configuration. Note that if you exit the program in any way besides the "X" command, the tables will not swap back, and in order to restore your original table, you will need to reboot. (Not a warm boot, either).

Z-TERM Appendix

To emulate a terminal with your 80 column board or to have your local terminal behave as another one in terms of screen formatting characters one only has to set up this I/O table to indicate the necessary substitutions. This table is an exact parallel to the I/O table described starting on page 2-13 in your Z-80 Softcard manual. The actual table in Z-TERM starts at 110h while the table for the main system starts at 0F396h. Both continue for 22 (16h) bytes. The current setup of the table in the main system is of no importance to Z-TERM unless you want exactly the SAME conversions to happen when Z-TERM is ran. In this case you would simply assign exactly the same bytes present in the main system, into the Z-TERM table. (There are 22 total). If you prefer Z-TERM to be completely neutral, the entire table should be zeroes.

Now, let's take a for instance. Let's say you wanted your 80 column board to behave as if it was a VT-52 standard. (This is arbitrary, by the way. The only difference in other choices would be the specific choice of screen characters). Looking at the chart starting on page 2-14 of your Softcard manual, the two middle columns of that chart are ominously labeled "Software" and "Hardware". "Software" means the data coming in and "Hardware" means outgoing data, or the converted characters. Look at the values used in the following chart and the descriptions for each of them found in the Softcard manual.

Function#	Software Input-Vt52		Hardware Output-Datamedia		Purpose
	address	byte	address	byte	
	110h	20h	11Bh	A0h	Cursor offset
	111h	1Bh	11Ch	00	Leadin or 0=none
1	112h	0Ch	11Dh	0Ch	Clear screen
2	113h	CAh	11Eh	0Bh	Clear to end pg.
3	114h	CBh	11Fh	1Dh	Clear to end ln.
4	115h	00	120h	00	Hilite 0=none
5	116h	00	121h	00	Lolite 0=none
6	117h	C8h	122h	19h	Home cursor
7	118h	D9h	123h	1Eh	Adress cursor
8	119h	C1h	124h	1Fh	Cursor up
9	11Ah	C3h	125h	1Ch	Cursor fwd.

Looking at the enclosed ASCII character chart in the back of this manual will help you understand certain relationships in this chart. For instance, the bytes at location 110h/11Bh both indicate a cursor offset of 32 (20 hex), but the second one, A0h is a 20h with the high bit set which tells which order the cursor coordinates are sent in. In function 1, the clear screen character is 0Ch for both input and output (^L). Whenever these are the same, the exact same results can be produced by setting both to 00, which indicates no modification, thus just passing the ^L right on through with no further checking.

In the back of the manual are some typical examples of various terminals which can be emulated by Z-TERM with an 80 column board, and the bytes you would use for each. Also see the section on "USING Z-MOD" to make the necessary patches.

SHOWING CONTROL CHARACTERS [126h-12Dh]

Most display devices do not have the capability to display non-printing control codes (ASCII 0-31), but there are often times when this capability is necessary for examining host system output for presence or absence of a particular character. Z-TERM has a special mode in it which, when activated looks for control characters coming through. When such a character happens by, Z-TERM will consult a special table to determine how to display this character. The table will contain the bytes of code to be sent to the screen device before and after the character itself is sent.

As an example, when Z-TERM is shipped it is set up to display a control code as a "^" followed by the upper case equivalent of the character. Thus, a control-a would come out as "^A" on the screen when this mode is activated. It could just as easily be modified to send your terminal a sequence to go to inverse mode, then send the upper case equivalent of the character, and finally the sequence of characters that will instruct the terminal to return to normal display mode. The control-a in this case would show up on the screen as an inverse A.

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This table starts at 0126h. Space is reserved for up to 8 bytes of code. Up to three to change display mode, a zero to indicate end of sequence, then up to three more characters to instruct a "return to normal" code sequence, followed by a "\$" to end the table. In the case of the above example, we would have only three characters in the table, first a 5Eh ("^"), a zero, and then a 24h ("\$") to terminate the sequence. What comes after that doesn't matter, but it is good practice to set the remaining bytes of the table to zero.

```
126h    5Eh,00,24h,00,00,00,00,00
         ^      $ dummies
```

Creates "^char" on the screen.

Next, one terminal uses ESCape,"@", "A" to go into inverse mode, and ESCape,"@","@" to return to normal mode. Thus:

```
126h    1Bh,40h,41h,0,1Bh,40h,40h
         ESC @  A    ESC @  @
```

Will display the control character as an inverse upper case letter.

TERMINAL CLEAR SCREEN CHARACTER

[12Eh-12Fh]

When using the 40 column Apple screen, or any of the 80 column boards, the program will automatically handle the clear screen function, as it knows what is required for each of these devices. However, when being interfaced to an external terminal, any number of different characters may be required to clear the screen. The bytes at location 12Eh-12Fh contain this code. It is shipped as 0Ch,00. The first byte is a ^L with its high bit off. The second byte holds a prefix character if there is a need for one. In that case, the hi bit of the actual clear character (first byte) should be set so the program will see the prefix byte. A non prefixed ^L is fairly standard for most terminals, but can be changed to whatever you need it to be.

As a further example, a Soroc IQ-120 terminal requires the sequence of an ESCape character, followed by "*" to clear its screen. Therefore, the SECOND clear character would be 1Bh (ESCape), but the first character would be 0AAh ("*" with its high bit set). The high bit being set, tells the program to send the second character first.

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CHARACTER TO SEND AFTER C/R [130h]

When a file is actually being sent from Z-TERM, linefeeds, if present in the original file are suppressed. This is due to the fact that the vast majority of systems do not require linefeeds or any other special character to be sent directly after a carriage return. In fact, some will become quite upset if linefeeds are present during an upload. Others may not like linefeeds, but may instead require another character (often ^S or ^Q) to be sent. Provisions are made to tell Z-TERM what character (if any) to send directly following a c/r. This byte is at location 130h.

INITIAL PARITY [131H]

This byte determines the parity/word length/# stop bits which the program will begin running in. As shipped it is 11h which corresponds to an eight-bit word, no parity and two stop bits. This selection will work adequately for 95% of the host systems. If, however you need to change this, consult the instruction booklet for the particular i/o card you are using, or check the PARITY table later in the manual for other combinations. This byte is at location 131h.

INITIAL CASE [132h]

This merely determines whether when you enter your terminal mode, you start out in lower case (shipped default) or upper case. A zero in this location indicates lower case default, while a two indicates upper case. The byte location is 132h.

INITIAL DUPLEX [133h]

Determines whether your program duplex default is full or half. As shipped is full (80h). To change to half duplex default, use zero. This byte location is 133h.

TRANSPOSE MODE ON/OFF [134H]

As shipped, is set to zero, or NO transposition. See further details under the "T" command description. If you want transposition on for the default, set this byte to one. Location is 134h.

INITIAL DELAY AFTER C/R (N MODE)
[135h]

The program comes configured for maximum speed, or a value of zero. The effective range for this can be 0-99 decimal or 0-63 hex. Experimentation for a particular value may be necessary if zero does not work correctly. See more details under the "N" command. Byte location 135h.

PRINTER LF (^J) CONVERT
[136h]

Shipped value = zero. No modification of characters going to printer. If set to one, will convert linefeeds that are not preceded by c/r's to cr/lf. This would be useful when printing information from a system that uses additional linefeeds for blank lines instead of the conventional cr/lf. Some printers will not respond to a linefeed by itself, so this byte at 136h will convert it.

INITIAL SEND SPEED OF "L" MODE
[137h]

Shipped value = zero. No delay between each character sent during the L)ine at a time mode. As this value is increased to six, the rate of character flow will decrease. (varied with the "<" and ">" keys. See more details under description of "S" command). Byte 137h.

AUTO-SAVE MODE DEFAULT ON/OFF
[138h]

The default for this is OFF and can be toggled with the "O" command at main menu. The proper value for OFF should be zero. If you would rather ON be the default, set this byte to one. Location 138h.

XOFF CHARACTER TO SEND
[139h]

The normally used XOFF character is ^S which is 13h. That is the program default value as shipped. Change to suit. See further details under the description of the "O" command. Location 139h.

SUPPRESS CONTROL CODES YES/NO
[13Ah]

Normal program operation for this byte is NO, or zero. If you wanted your display screen to be completely immune to all control codes except c/r and l/f you would set this byte to one. Byte 13Ah.

^W PREFIXED CHARACTERS
[13Bh-14Ah] sub [14Ch-15Bh]

This table sets up the characters which you want to substitute using the ^W prefix, and what the actual substitutes would be. It comes configured as described in the manual, but you are free to make whatever changes you feel necessary for your situation. This table is in two parts, the lookup and the substitute. The lookup section begins at 13Bh and contains up to sixteen possible keychecks. The substitute sections begins at 14Ch and contains up to sixteen substitutions for the above keychecks. The tables run parallel to each other. That is, if you wanted a ^W0 to become an underscore, you would put the ASCII value for 0 in location 13Bh and what is to substitute for it in location 14Ch etc. The last byte of the table should always be a zero. This will tell the program it has reached the end of the table, and if it has not found a match, then the character is to be taken literally and not converted.

<u>Lookup</u> <u>address</u>	<u>char</u>	<u>Sub</u> <u>address</u>	<u>char</u>
13Bh	2Ch (,)	14Ch	5Bh ([)
13Ch	2Eh (.)	14Dh	5Dh (])
13Dh	0Fh (^0)	14Eh	1Fh (^_)
13Eh	4Fh (0)	14Fh	5Fh (_)
13Fh	2Fh (/)	150h	5Ch (\)
140h	3Fh (?)	151h	1Dh (^])
141h	0	152h	0
142h	0	153h	0
143h	0	154h	0
144h	0	155h	0
145h	0	156h	0
146h	0	157h	0
147h	0	158h	0
148h	0	159h	0
149h	0	15Ah	0
14Ah	0	15Bh	0
14Bh	0 (always)	15Ch	0 (always)

CHARACTER SUPRESSION TABLE

[15Dh-164h]

This table selects which incoming characters will be completely suppressed from the system. For instance, certain timeshare systems use the RUBout character (ASC 7Fh) or the NULL character (ASC 0) as "padding" characters. Time wasters essentially. In this instance, you would want to suppress any of these types of characters that are of no importance to your operation, or especially should not be present within text files. You simply add all the characters you DON'T want into this table, and they will be completely suppressed. As shipped, the only character currently in the table is the RUBout, ASC 7Fh. The terminating byte (the byte which marks the end of the table) is 80h.

Supression Table

address	byte
15Dh	7Fh (RUB)
15Eh	80h (table terminator -
15Fh	0 move to one byte
160h	0 after last actual
161h	0 suppression char.)
162h	0
163h	0
164h	0
165h	80h (always)

KEYBOARD SUBSTITUTION

[166h-1C5h] sub [1C7h-226h]

This is the actual keyboard substitution table. As with the ^W prefix table, it also is in two parts that run parallel. First half is the actual key to change, and the second half is the key to change it to. The first half of the table begins at 166h and continues for 96 characters followed by a zero end character. The second, parallel half begins at 1C7h and also continues for 96 characters also followed by the zero end character. Actual key substitution is implemented exactly the same as in the previous table. The last effective byte (if less than 96 characters are being substituted should be a zero to mark end of table). As shipped, this table is all zeroes as no major keyboard reassignments have been made. If you wanted to do a major rearrangement of keys on your keyboard, such as a modification to the DSK (Dvorak Simplified Keyboard) layout, this is where you would set up the changes.

Z-MOD CUSTOMIZING CONFIGURATION PROGRAM

This is the program that makes all these neat changes we've been talking about up to this point. It is very simple to operate and all you need to know to use it is what addresses you wish to modify and what bytes you want to change or substitute.

First, decide whether you want to modify your existing version of Z-TERM or whether you want to produce different versions for different applications. Assuming the latter, you have two options from which to choose:

- 1) Produce a completely new diskette for each new version or
- 2) Produce another version of Z-TERM under a different name on the same diskette.

To do procedure #2, and assuming the Z-TERM diskette is in drive B: and the standard CP/M systems diskette is in drive A:, and you want to create a separate special version of Z-TERM to work with an 80 column board to simulate a VT52 terminal, type:

```
A:PIP B:ZTERMMR.COM=B:ZTERM.COM
```

and you will produce an identical copy of Z-TERM on the same diskette, but under a different name. You would then proceed to make the emulation or other changes to the second version. Now, when done, you are free to run either one on that disk depending on your particular application at the time.

To utilize procedure #1, the first step we should do is to make a copy of the Z-TERM disk. Follow the normal procedures of formatting and copying to a new disk and produce your new Z-TERM diskette. Be sure and label them adequately as to the different version types.

Select whichever disk you wish to make the first modification on, and type ZMOD. This will invoke the file ZMOD.COM on the disk. It will come back and ask you the name of the program you wish to modify. In this case, since files have not been renamed you would tell it ZTERM.COM, but it may be whatever you are calling that version of the program. However, IT MUST ALWAYS BE A Z-TERM PROGRAM!

After the program to modify has been indicated, the next prompt of the ZMOD program is which address to change. Simply input the HEX address you wish to modify. It will return with the value currently at that address and prompt you for the replacement value. If you do NOT wish to make a change, just type c/r by itself. Anytime, while the program is prompting you for ADDRESS you can type c/r alone and it will increment by ONE the value of the last accessed address. This way, you can quickly "step" through a series of addresses without having to enter them individually each time.

Follow your charts and selected values carefully. If you are unsure whether you correctly changed a particular address, just recall that address and see what value displays for it, and modify as needed.

When you have made all the necessary changes, simply enter a "0" for the value of the next address. The program will ask you if you are indeed done. Answer yes, and it will come back and ask you if you want to write the modifications to disk, or if you want to exit without making any modifications. IF YOU ARE NOT SURE THINGS WENT RIGHT, OR YOU THINK YOU DID SOMETHING WRONG, DON'T SAVE THE FILE! Exit without saving and rerun the ZMOD program and try again.

PARITY CHART

The parity byte contains the various bit patterns that tell your particular i/o device which word-length/parity type/stop bits pattern to use while it is talking to the host computer. The following chart is effective for most i/o cards, including the Hayes Micromodem, the Apple communications card and others. If you are unsure, consult the manual for your particular card and make the necessary substitutions.

Value		Word length	parity	#stop bits
dec	hex			
1	1	7 bits	even	two
5	5	7 bits	odd	two
9	9	7 bits	even	one
13	D	7 bits	odd	one
17	11	8 bits	none	two (default)
21	15	8 bits	none	one
25	19	8 bits	even	one
29	1D	8 bits	odd	one

TERMINAL EMULATION CHARTS (more details starting pg 2-13 of your
Microsoft CP/M manual)

Function:	1	2	3	4	5	6	7	8	9		
Datamedia	A0	00	0C	0B	1D	0E	0F	19	1E	1F	1C
Soroc IQ-120	20	1B	AA	D9	D4	A9	A8	1E	BD	0B	0C
Hazletine 1500	80	7E	9C	98	8F	99	9F	92	91	8C	10
Adds Regent series	20	1B	0C	EB	CB	00	00	01	D9	1A	06
DEC VT52 standard	20	1B	0C	CA	CB	00	00	C8	D9	C1	C3

If you were using an 80 column board, which looks like a Datamedia setup, and wanted the board to be completely neutral to incoming characters (i.e. no conversion) all table values should be set to zero. If say, you wanted it to behave like a Soroc IQ-120, you would take the values shown for Soroc as the INPUT values (software) and the values shown for the Datamedia for OUTPUT (hardware). If you were using an external Soroc IQ-120 for a local terminal (as opposed to the 80 column board) and wanted it to behave like a VT52, you would setup the VT52 as the INPUT values and the Soroc as the OUTPUT values.

Remember now, the first half of the emulation table is the INPUT, or FROM part, and the second half of the table is the OUTPUT, or TO. So what you would actually type in for the latter example would be:

```

20 1B 0C CA CB 00 00 C8 D9 C1 C3 20 1B AA D9 D4 A9 A8 1E BD 0B 0C
[          VT52 code          ] [          Soroc code          ]

```

Also remember that if any two terminals or setups require the same character sequences to execute a particular function (except the first two bytes of each half of the table) that entry position in both sections of the table may both be zeroes, so the original sequence will pass through unaltered.

PEOPLES' MESSAGE SYSTEM, SANTEE, CA
(714) 443-8754

Full ASCII Character Chart

0	\$00	128	\$80	NUL^@	32	\$20	160	\$A0	SPC	64	\$40	192	\$C0	@	96	\$60	224	\$E0	`
1	\$01	129	\$81	SOH^A	33	\$21	161	\$A1	!	65	\$41	193	\$C1	A	97	\$61	225	\$E1	a
2	\$02	130	\$82	STX^B	34	\$22	162	\$A2	"	66	\$42	194	\$C2	B	98	\$62	226	\$E2	b
3	\$03	131	\$83	ETX^C	35	\$23	163	\$A3	#	67	\$43	195	\$C3	C	99	\$63	227	\$E3	c
4	\$04	132	\$84	EOT^D	36	\$24	164	\$A4	\$	68	\$44	196	\$C4	D	100	\$64	228	\$E4	d
5	\$05	133	\$85	ENQ^E	37	\$25	165	\$A5	%	69	\$45	197	\$C5	E	101	\$65	229	\$E5	e
6	\$06	134	\$86	ACK^F	38	\$26	166	\$A6	&	70	\$46	198	\$C6	F	102	\$66	230	\$E6	f
7	\$07	135	\$87	BEL^G	39	\$27	167	\$A7	^	71	\$47	199	\$C7	G	103	\$67	231	\$E7	g
8	\$08	136	\$88	BS ^H	40	\$28	168	\$A8	(	72	\$48	200	\$C8	H	104	\$68	232	\$E8	h
9	\$09	137	\$89	HT ^I	41	\$29	169	\$A9	)	73	\$49	201	\$C9	I	105	\$69	233	\$E9	i
10	\$0A	138	\$8A	LF ^J	42	\$2A	170	\$AA	*	74	\$4A	202	\$CA	J	106	\$6A	234	\$EA	j
11	\$0B	139	\$8B	VT ^K	43	\$2B	171	\$AB	+	75	\$4B	203	\$CB	K	107	\$6B	235	\$EB	k
12	\$0C	140	\$8C	FF ^L	44	\$2C	172	\$AC	,	76	\$4C	204	\$CC	L	108	\$6C	236	\$EC	l
13	\$0D	141	\$8D	CR ^M	45	\$2D	173	\$AD	-	77	\$4D	205	\$CD	M	109	\$6D	237	\$ED	m
14	\$0E	142	\$8E	SO ^N	46	\$2E	174	\$AE	.	78	\$4E	206	\$CE	N	110	\$6E	238	\$EE	n
15	\$0F	143	\$8F	SI ^O	47	\$2F	175	\$AF	/	79	\$4F	207	\$CF	O	111	\$6F	239	\$EF	o

16	\$10	144	\$90	DLE^P	48	\$30	176	\$B0	0	80	\$50	208	\$D0	P	112	\$70	240	\$F0	p
17	\$11	145	\$91	DC1^Q	49	\$31	177	\$B1	1	81	\$51	209	\$D1	Q	113	\$71	241	\$F1	q
18	\$12	146	\$92	DC2^R	50	\$32	178	\$B2	2	82	\$52	210	\$D2	R	114	\$72	242	\$F2	r
19	\$13	147	\$93	DC3^S	51	\$33	179	\$B3	3	83	\$53	211	\$D3	S	115	\$73	243	\$F3	s
20	\$14	148	\$94	DC4^T	52	\$34	180	\$B4	4	84	\$54	212	\$D4	T	116	\$74	244	\$F4	t
21	\$15	149	\$95	NAK^U	53	\$35	181	\$B5	5	85	\$55	213	\$D5	U	117	\$75	245	\$F5	u
22	\$16	150	\$96	SYN^V	54	\$36	182	\$B6	6	86	\$56	214	\$D6	V	118	\$76	246	\$F6	v
23	\$17	151	\$97	ETB^W	55	\$37	183	\$B7	7	87	\$57	215	\$D7	W	119	\$77	247	\$F7	w
24	\$18	152	\$98	CAN^X	56	\$38	184	\$B8	8	88	\$58	216	\$D8	X	120	\$78	248	\$F8	x
25	\$19	153	\$99	EM ^Y	57	\$39	185	\$B9	9	89	\$59	217	\$D9	Y	121	\$79	249	\$F9	y
26	\$1A	154	\$9A	SUB^Z	58	\$3A	186	\$BA	:	90	\$5A	218	\$DA	Z	122	\$7A	250	\$FA	z
27	\$1B	155	\$9B	ESC^[	59	\$3B	187	\$BB	;	91	\$5B	219	\$DB	[	123	\$7B	251	\$FB	{
28	\$1C	156	\$9C	FS ^\	60	\$3C	188	\$BC	<	92	\$5C	220	\$DC	\	124	\$7C	252	\$FC	|
29	\$1D	157	\$9D	GS ^]	61	\$3D	189	\$BD	=	93	\$5D	221	\$DD	]	125	\$7D	253	\$FD	}
30	\$1E	158	\$9E	RS ^^	62	\$3E	190	\$BE	>	94	\$5E	222	\$DE	^	126	\$7E	254	\$FE	~
31	\$1F	159	\$9F	US ^_	63	\$3F	191	\$BF	?	95	\$5F	223	\$DF	_	127	\$7F	255	\$FF	

^ = Control

First two columns of each group are dec & hex ascii value with hi bit off.
Second two columns each group are dec & hex values with hi bit on.

Using the APPLE LYNX with Z-TERM

Z-TERM will perform correctly with no changes with the APPLE LYNX telephone linkage system by EMTRON SYSTEMS, INC. The APPLE LYNX will behave according to the manual the same as other peripherals with the following exceptions:

- 1) Initial parity is determined by the switch settings on the back of the APPLE LYNX unit. See its instruction manual for selection details. To change the parity, you must change the switch positions on the APPLE LYNX, and then re-execute Z-TERM.
- 2) The D)ial command of Z-TERM can be used as carrier wait command. This will cause the program to go into a "wait loop" of about 30 seconds while you try to establish connection. Upon receipt of carrier, the screen will clear and you will automatically be in terminal mode, just as described for the operation with the Micro-modem. The only difference is there will be no prompting for phone number. Like the Micromodem, the carrier detect function can be suppressed by a simple parameter change which is described in the Z-TERM Appendix.
- 3) The H)ang-up command is not supported.