TERMINAL COMMUNICATIONS CARTRIDGE

For the Commodore 64

Communications Cartridge

- Upload & Download files
- Uses your CBM 1600 or 1650 Modem.
- Status line with Clock and Alarm Clock
- Function Keys.
- Auto-dialing if used with 1650 Modem.
- Change Color and Character Codes.
- Ability to Load/Save Setup on Disk or Tape.

TelStar 64™
by Eastern House

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1.0 Introduction

The EHS TelStar 64 Communications Package was designed to run on the Commodore 64 using the C2N Cassette Deck or 1541 Disk Drive and the 1600 or 1650 Commodore Modem. If you use the 1650 Modem, then TelStar 64 will provide you with control of the Auto-dial feature.

This manual uses symbols that are not readly available on all word processor printers. In this manual, the following substitutions occur for the CBM 64 special symbols:

CBM 64 Character	Representation in this manual
£ (English Pound Sign)	"L"
← (Back Arrow - TelStar's contol key)	"_"

2.0 INSTALLATION

1- Turn power off to your system.
2- Insert the TelStar 64 Cartridge into the cartridge port of your CBM 64 Computer. Observe the "This Side Up" note on the TelStar 64 Cartridge label.
3- Plug in your Commodore Modem and connect to the Phone Line.
4- Power up your system.
5- Enter the current time via the Basic TI$="hhmmss" command. Example: If the current time is 7:30, enter TI$="073000"
6- Press RUN/STOP and RESTORE keys to begin execution of TelStar 64.
7- Set the Answer/Originate Switch on your modem to Originate ("O"). If you are using the 1650 modem, set the Data/Telephone Switch to Data ("D").
8- Set the Full/Half Duplex switch to Full ("F") if you are using the 1650 Auto Modem.

Immediately after step 6, the screen will display a status line at the top of the screen displaying the time and various other items. It may take a few seconds for the time generator to get started. When started, the time will be displayed in hours, minutes, and seconds.

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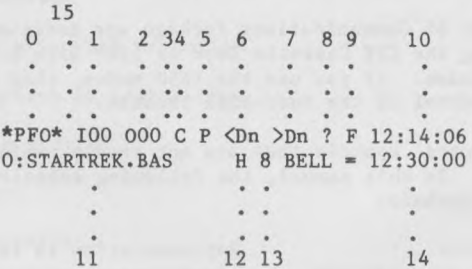
3.0 Description of the Status Line

The following is a description of the Status Line:



Callout	Description
0	Data reception error indicators: P = Parity, F = Framing error, O = Overrun error. If no error then this contains "*****".
1	Hex Code of current ASCII character received from the modem.
2	Hex Code of current ASCII character transmitted to the modem.
3	Normally blank. If this position ever changes to a ´O´, then there has been an overflow in TelStar 64´s modem receiver buffer. TelStar 64 incorporates a 256 character buffer for the modem receiver. Whenever this buffer exceeds 200 characters, an ASCII XOFF protocol control code is automatically sent to the host requesting that transmission be momentarily halted until TelStar 64 sends an XON protocol code. When the buffer is flushed below 30 characters, the XON is sent. If the host computer does not reconize the XOFF and the buffer fills passed 256 characters, some data will be lost. You will be informed via the ´O´ in the status line. This condition should never occur if the host computer properly processes ASCII XON and XOFF control codes.
4	Normally blank. When a blinking ´C´ occurs, this indicates that the " " key (Control Key) has been pressed. When a blinking ´W´, this indicates that the host computer sent an ASCII XOFF requesting TelStar 64 to wait until an XON before resuming transmission. Think of the ´W´ as meaning ´Host Wait Request´. You can override this ´W´ condition by pressing the cursor down key.
5	Normally a blank. When a blinking ´P´, this indicates that the printer is turned on and output will be directed to it.
6	Normally a blank. When >Dn appears, this indicates that data is being saved to disk. n is a code (0-4) which indicates the type file being saved. If >Tn then data will instead be saved to tape.

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7	Normally a blank. When <Dn appears, this indicates that data is being read from disk. n is a code (0-4) which indicates the type file being read. If <Tn then data will instead be read from tape.
8	This is the error message indicator. All messages which have this character as the first character of a line will be displayed in inverse video.
9	Transmission mode. L = Local Mode, F = Full Duplex, H = Half Duplex, E = Echo Mode.
10	Current time displayed in hours/minutes/seconds.
11	Any disk filename or disk command entered appears in this position.
12	Phone Line Status (for 1650 Modem). H = Phone is "hangup", P = Phone is "picked up", C = Host carrier detected.
13	I/O Device that TelStar 64 is to use: 8 = Disk Drive, 1 = Cassette Tape.
14	Time at which screen will flash and and audible tone will sound (Assuming your TV or Color Monitor has sound.)
15	WYLBUR mode indcator. If contains "w" then in IBM WYLBUR mode.

4.0 Getting Started

Immediately after executing TelStar 64, you are in Local mode - note the ´L´ in the status line at callout 9. Local mode means that all transmission is kept local to the terminal. Thus local mode does not send or receive from the modem.

To fully understand how to use TelStar 64, lets become familar with some basic operations. TelStar 64 provides the Commodore 64 with a special control key via the "_" key. Lets experiment. First press the "_" key. Note that the ´C´ indicator flashes in the status line. Press "_" again and it goes off. The state of the ´C´ indicator changes each time you press the "_" key. The ´C´ indicator indicates that the control key has been pressed and the next key pressed forms the control code. For example, to send a control C, press "_" (note the ´C´ in the status line), then press C.

Note that there is a solid non-blinking cursor present. This indicates that you are in character by character transmission mode. Each time you type a character, it is instantly transmitted. Screen editing functions such as cursor up, down, etc. will not function. The INS/DEL key will function like the normal DEL function as it removes the character to the left of the cursor and the CLR/HOME key will clear the screen. You can still cursor to a line on the screen, make a change using normal screen editing, and send the entire line. To do this, you must first

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enter the TelStar 64 line transmit mode. This is done via control "@" or control ">". (Control @ - press " " key then @ key.) When you type control @, the cursor will change from solid to blinking. The cursor will revert back to the solid cursor immediately after you press RETURN. Unlike the character by character mode, the line transmit mode waits until you type RETURN and then sends the whole line as a single burst of characters.
Lets try it. In the character by character mode (solid cursor), type:

LINE XMIT MODE

then press RETURN.
Now enter line transmit mode via control @, cursor up and use normal screen editing functions to change XMIT in the line just typed to TRANSMIT. Then hit RETURN. Easy as pie! Right? Wrong? Or would you rather play Interlude? (Note: If you know what Interlude is, you've been involved in personal computers a long time!)

Commodore provides a shift-lock key that converts characters to upper case. Unfortunately, it converts all characters including special symbols, RETURN, etc. TelStar 64 provides an Alpha case lock that only makes characters A thru Z upper case. Often an Alpha case lock is more useful. Alpha case lock is set via control RETURN - press " " then RETURN. Press control RETURN again and the Alpha case lock is cleared. Lets try it, type: "the stock market is going" then press control RETURN. Now type: "NOWHERE" then press control RETURN a second time, and type: "somewhere". Remember, control RETURN only makes A-Z uppercase.

There are three error conditions that could occur in data received from the modem. These indicators are located at the start of the status line in the "*PFO*" area. If an error is detected, it will be displayed as:

*P*** = Parity error. This could be because of a random noise picked up in reception. If this error occurs immediately after you exit the menu, it could be that you have configured TelStar 64 with the wrong parity.

F = Framming error. This occurs when Start and Stop bits do not properly "frame" the data bits. This could be because of a random noise picked up in reception. If this error occurs immediately after you exit the menu, it may be that you have configured TelStar 64 with a different bits per byte value than that of the host computer.

***O* = Receiver overrun. This will occur if TelStar 64 should fail to service the modem before the receiver buffer overflows.

A combination of errors could occur such as *PF**, *P*O*, *PFO*, etc. Once an error is detected, the associated indicators remain set until you enter the TelStar 64's menu and then exit. Upon exit, the error indicators clear to

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"*****". Thus if you download a lengthy file, you need not feel you have to meticulously watch the data for errors because TelStar 64 will hold them in the status line for later review. These errors indicate that one or more characters were lost in reception. You have to decide if the received data was critical and whether you should "redo from start".

Now lets go to the TelStar 64 menu. Press control M (press _ then M). Note that a full screen menu will be displayed showing the options available. To select an option, press the associated key. For example, type 'T' to set the timer. Let's try it. Enter a value one minute passed the currently displayed time. Example: 07:46:00 if the time currently displayed is 07:45:00. You must enter the colons. Check your entry on the status line. If its in error, just press 'T' and try again. Now wait until the screen flashes and the bell sounds. Sorry, only the screen flashes if you are using a monitor without sound. This feature is useful if you are connected to a time sharing computer system that charges by the hour and you don't want to get carried away with the charges. Maybe your wife says "Leave that computer at 6:30 and come to supper or else". If your's is like ours, you better be there at 06:30:00.

An explanation of each of the other functions follow:

5.0 Menu Items

A description of the functions that are provided via the menu follows:

@ Set parameters for baud rate and define printer being used. Input is self-prompting. Normally, you need just press RETURN for each prompt.

F Full-Duplex mode. Host computer should echo any character you type. Note "F" in the status line. The modem must be connected and powered or the system may "hang up". This is the most common transmission mode. If you observe that nothing you type appears on the screen, try Half-Duplex.

H Half-Duplex mode. Host computer should not echo characters you type. Note the "H" in the status line. The modem must be connected and powered or the system may "hang up". If everything you type appears double, try Full-Duplex mode.

L Local mode. Terminal isolates itself from modem. Note "L" in status line.

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E Echo mode. Terminal echoes each received character back to connected computer. This is useful if you want to communicate with another TelStar 64 - based computer.

B Go to Basic. Return by pressing RUN/STOP and RESTORE.

M Go to Machine Language Monitor if you have a machine language monitor loaded and initialized else a restore and return to basic will occur. A return to TelStar may be done via:
.G 8009.

T Set audible timer. The entered time will be displayed in the status line at "BELL=hh:mm:ss".

? Change error indicator. Any message sent to the screen where the first character of a line matches the error indicator is displayed in inverse video. Most computer installations have a convention that distinguishes error messages.
Example: The DEC 10 Computer uses "?" as first character of one class of errors and "%" for another. The purpose of the error indicator is to highlight certain error messages.
Try it. In local mode, press RETURN and then type
? ERROR AT LINE 1200.
Note that it is displayed in inverse video.
Another use is to make the error indicator the same as the host computers prompt character. This will then highlight in inverse video each command you enter.

D Disk command. Use standard DOS wedge commands for 1541 disk drives.
Example: "S:TEST" "R:TEST.NEW=TEST.OLD" "$0" etc.
The "/" and "%" commands are not supported.
Be sure and enclose the command in quotes.
Possible forms are:

"$" or "$0" or "$1"	= directory
"S:name"	= scratch file
"C:namex=namey"	= copy file
"I"	= initialize drive
"N"	= new drive
"D1=0" or "D0=1"	= duplicate (backup) diskette (dual-disk systems)
"R:newname=oldname"	= rename a file

To send a command to a disk drive that is not device 8, preceed with 'D' and the device number. For example, to output the directory on device 9, enter: D9 "$0"

P Toggle printer on or off. Typing a "P" causes characters to be sent to the printer buffer. Press "P" again and characters will stop being sent to the buffer.
Note that a "P" appears in the status line when the printer

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is turned on. Nothing is actually sent to the printer until you close ("C") the printer.

W Write to disk. This causes TelStar 64 to begin storing information received from the modem to a disk file. When the message "FILENAME?" appears, respond with the name of the file. Enclose the name in quotes. Example: "C80.DOC". (To specify a write to say disk drive device 9, preceed with D9 as follows: D9 "C80.DOC".) Another message will appear requesting the format of the file - whether it is to be stored as a Basic, MAE, Binary, ASCII, or PET ASCII file.

R Read from disk. See W command.

C Close file. This is used to close the printer, the write disk file, or a prematurely terminated read file. Normally a read file is automatically closed by TelStar 64 when end of file is detected.

A Setup TelStar 64 to Answer a call from another computer. This was provided for 1650 modems. The message "WAITING FOR RINGING" will appear until the phone rings. Then the message "RING DETECTED" will be displayed.

+ Manually "pickup" the phone. (1650 Modem only). Note that the Phone Line Status indicator showes "P".

- Manaually "hang up" the phone. This is useful to hangup the phone for a prematurely terminated operation. (1650 Modem only). Note that the Phone Line Status indicator showes "H".

Dial a Phone Number. Simply enter the phone number you want dialed. Punctuation such as "-"'s may be entered. This was provided for the 1650 modem and the D/T switch should be in D. The number is dialed when RETURN is pressed.

! Set screen color. A message will be output showing which function keys change the border, screen, character and status line colors. Pressing SHIFT and associated function key causes the color to change to the previous selection.

: Change character. This is useful to change the ASCII code of a character. For example, assume you need an escape key ($1B) and a delete key ($7F). Note: $1B and $7F are the hex codes for the changed characters. You can assign the escape key to the "+" key as: +=1B and the delete key to the "-" key as -=7F. If you want to filter out all occurances of a certain character, use 00 for null. Ex: To filter out tab characters,

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enter $09=00. (Note: $09 is the Ascii code for tab.)
A Break Key is implemented via the SHIFT and RUN/STOP key.
Just pressing the RUN/STOP key will not cause a break.
The Break Key cannot be assigned.

* Load a previously saved SETUP file from disk or tape.

$ Save the current setup of TelStar 64 on disk or tape as a file named SETUP. The "*" can be used to later reload this setup. The current color setup, baud rate etc., character code assignments, function key assignments, etc. are saved in this file.

1 Set file I/O as Tape. Note the default is disk so you had better select "1" before issuing any file I/O commands.

8 Set file I/O as Disk. This is the default setting and need not be used unless you go back and forth between tape and disk usage.

f Each of the 8 Function Keys may be assigned up to 80 characters each. The function keys may contain logon and password information, and phone numbers (See Part 8, 9).

X Exit menu and return to terminal mode.

CBM D Press and hold down the Commodore Key and then press the "D" key. This action clears the Disk/Tape Buffer.

CBM P Press and hold down the Commodore Key and then press the "P" key. This action clears the Printer Buffer.

CBM V Press and hold down the Commodore Key and then press the "V" key. This action will show the version number of the TelStar Software in the Status Line.

6.0 More Details

If TelStar 64 ever appears to "hang up", check the area of the status line where the control key indicator is located. If it ever changes to a blinking "W", then the terminal program has received a control S (XOFF) from the host computer. But, you can exit this condition by simply pressing the cursor down key. Remember, a blinking "W" indicates that TelStar 64 is "waiting" for the host computer to send a control Q or XON. To illustrate the blinking "W" concept, try the following experiment:

1- Insure that you are in Local terminal mode. An "L" appears in the status line.

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2- Enter control S (press then S)
3- Note that a blinking "W" appears in the status line.
What you have done is to enter a control S or XOFF that was sent back to TelStar 64 because it was in local mode. This causes TelStar 64 to wait until an XON is sent.
4- Verify that any key you press is not displayed on the screen. The keyboard is locked out.
5- Press cursor down key. Note that the blinking "W" disappears. The cursor down key simulates that a control Q was received.
6- Now you can type characters and they will appear on the screen.

Exactly what this means is that a "W" in the status line indicates that the host computer has just sent a control S (XOFF) indicating that you are to wait until reception of a control Q (XON) before sending any more data. When TelStar 64 receives the control Q, the "W" will dissappear. Thus the cursor down is used to abort a hosts XOFF request.

If TelStar 64 appears to hang up due to for example accidentally outputting to a non-existant device such as to disk when there is no disk, simply press RUN/STOP and then RESTORE to return to the TelStar 64 Menu. If this still does not work, exit TelStar 64 via the "B" menu option, and reenter by pressing the RUN/STOP and RESTORE keys.

Disk File Format Basics

All communications between the terminal and the host computer is in Industry Standard ASCII. To transmit/receive a file to/from the host computer may require translation of the file to ASCII if to read from disk, or translation from ASCII if to write to disk. TelStar 64 supports four disk file translation formats. They are:

0	BASIC	- All BASIC programs are stored on disk in a mixed binary and PET ASCII file format. File type is Program.
1	MAE	- The EHS MAE Assembler/Editor uses a mixed Binary Coded Decimal (BCD) and ASCII file format. File type is Program.
2	BINARY	- Machine language object code is stored in binary format. File type is Program.
3	ASCII	- A pure ASCII file is just that - 100% ASCII. File type is Sequential.
4	PET ASCII	- A file containing PET ASCII characters. File type is Sequential.

TelStar 64 establishes communications between the terminal and the host computer using ASCII character transmissions. Thus if a Basic program is to be sent to the host, you must tell TelStar 64 the file type.

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TelStar 64 uses this information so it will know how to translate the file to ASCII.

Most host computers have commands to display the contents of a file on the terminals screen. For example, DEC host computers have the command: .TYPE filename. When this is entered, the file is sent to the terminal in ASCII. The TelStar 64 can perform internal translation of this ASCII data to one of the 5 CBM 64 file formats: BASIC, MAE, BINARY, ASCII, or PET ASCII. Assume for a moment that the host computer has a Basic program named ANIMAL.BAS that you would like to run on your CBM 64. Simply enter the menu, select "W" item to write to disk. Use the Basic file format (0). Next, exit (via "X" menu item) to terminal mode and enter an appropriate host command which displays the contents of the file. When the file has been completely displayed, reenter the menu and use the option to close the file. What do we have now? We have a copy of the program on our disk that is in Commodore Basic format and ready to load and run. There may be some minor changes required before we can actually run this program on the CBM 64. For example, DEC 10 Basic raises a number to a power via 2**2. In Commodore Basic, we would change this to 2^2. You may find some Basic instructions that are somewhat different but we are sure that you can easily change these to run on your computer.

To upload a Commodore Basic program to the host computer, simply invoke the host computers text editor and enter insert mode. Then enter the TelStar 64's menu, select the Read a disk file item with format type Basic. TelStar 64 will translate this file from Basic file format to ASCII and send it to the host computer in pure ASCII. You do not have to close the read file as TelStar 64 will automatically close the file when end of file is reached.

MAE files can be similarly transferred to the host and other file types can be used to accomplish your intended purpose.

TelStar 64 can be used to do local file translations. For example, assume you have a Basic program that needs extensive editing and you would like to use the MAE's text editor to make some changes. What we need to do is enter local mode, select to Read in Basic file format, and also select to simultaneously Write in MAE file format. As soon as we exit the menu, TelStar 64 will immediately begin reading the Basic program and translating it to ASCII, then translating ASCII to MAE format. This is done very fast as TelStar 64 is all machine code.

7.0 TelStar 64 Quick Read

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TelStar 64 provides a quick and convient way to load often used data and command strings from disk with a minimum of key strokes. This is called Quick Read. Ten different Quick Read files can be created. To perform a quick read, type control n where n is a number from 0-9. TelStar 64 will then read the ASCII disk file n.*. For example control 2 will load any disk file named 2.*. Note that the * is the Commodore wild card character. Thus control 2 would load the file named 2.LOGON.DEC10, or 2.OFF, etc. You can use the Quick Read feature to perform a logon, perform often repeated keyboard operations such as editing functions, or compose some text prior to logging onto a system in order to save on connect time and phone charges.

To create a Quick Read file, enter Local mode, select the write disk file item with file type 4 (PET ASCII). Name the file anything you want except that the first character must be a numeral and the second character a period (.). An example filename for Quick Read 6 would be 6.EDIT. Then exit the menu to terminal mode and type exactly what you want to appear when you do the quick read. When done, close the file. If you make a mistake on a line, you can backspace up to the previous RETURN via the INST/DEL key.

8.0 Function Keys

TelStar 64 allows you to assign up to 80 characters (2 screen lines) of text to each of the eight (f1-f8) function keys.

To assign a function key, enter the menu via control M (_ then M), press the function key you want to assign, and then enter the associated characters. Note that the cursor blinks when you type in the characters. You have full screen editing until you press RETURN which terminates the function key entry. If you want to embed a carriage return character, use the "↑" character. All "↑" characters are translated to returns when you press the function key outside the menu.

If you are using the 1650 Auto Dial Modem, a telephone number can be embedded in the function key similar to the following: L 1-(919) 748-8446 CC L. NOTE: The "L" is the English Pound Sign key. The first "L" indicates the start of the phone number, the phone number can have any kind of punctuation as only digits are dialed. Each "C" indicates to wait one second or until a carrier detect. This is useful to provide an anticipated delay until the host computer answers. More than one "C" may be entered as "CCCCCCCCCC" which provides a delay of either 10 seconds or until the carrier is detected, which ever comes first. A "W" could be entered which waits one second no matter if a carrier is detected or not. Like the "C" more than one "W" may be entered for longer waits.

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9.0 Auto-Dialing of Phone Numbers

TelStar 64 supports auto-dialing via the 1650 Commodore Modem. If you are using the 1600 modem, auto-dialing cannot be done. The 1600 modem can still be used with TelStar 64 but you will have to manually "let your fingers do the dialing".

Using the 1650 Modem, there are three ways to dial a phone number using TelStar 64:

1- Enter the menu, select the "#" option and type the number to be dialed. TelStar 64 will automatically pick up and dial the phone number. You do not need to press the "+" menu option to pickup the phone.

2- Use the function key to store a phone number. Since a function key can also contain text, we need to specially identify a phone number. We do this using the "L" to identify start of a phone number and a second "L" to terminate the phone number These "L"s are the English Pound character next to the CLR/HOME key. An example is: L 1-(919) 748-8446 WWWW 3761 CCCC L. Note that punctuation characters (Dash and Parens) may be entered. Each "W" that appears will cause a one second wait. Each "C" will cause a one second wait if a carrier detect is not sensed. If a carrier detect is sensed then there is no wait. These are useful when it is desired to compensate for normal waits for the host computer to answer.

3- Use the Quick Read file to contain a phone number. The format of the phone number is the same as provided for function keys.

When a connection to the computer is established, the carrier will be sensed and the LED lamp on the 1650 modem will illuminate. The status line will show "C" (Carrier Detected) for phone status. The next step is to perform whatever logon sequence is needed to communicate with the host computer.

10.0 Modes of Operation

To make things simple, whenever you use TelStar 64, the modem switch should always be in the Full ("F") position. TelStar 64 does what is necessary to accomplish the Half-Duplex Function if it is selected.

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In Half-Duplex mode, the host computer does not echo back what we type on the keyboard. TelStar 64 has to send to the screen each character you type. If you observe that each character you type is displayed twice on the screen, you need to select TelStar 64's Full-Duplex Mode.

In Full-Duplex mode, we want the host computer to echo back what we type on the keyboard. Each character will be echoed by the host computer and received and displayed by TelStar 64. Full-Duplex is the most popular and desired mode. Since the key we type is sent to the host and then the host echoes it back, we can look at the screen to make sure that the host correctly received what we typed. If you observe that the host sends data OK but what you type is not displayed, then select the Half-Duplex mode.

Local mode does not send or receive from the modem. Just as its name implies, its use is local to the CBM 64 only.

Echo mode is useful when two TelStar 64's are communicating with each other. One should be in echo mode and the other in full-duplex mode. The CBM 64 in echo mode is considered the host which retransmitts back to the connected CBM 64 each character it receives.

Answer, Originate

Most of your communications will be in Originate mode where you "originate" the call by dialing the host computer. If you want TelStar 64 to "answer" a call, you should enter the answer mode. Be sure and select the ANSWER (A) switch on your modem.

Baud Rate, Word Length, Parity, Stop Bits, Printer Setup

These selections are altered by entering the menu and selecting the "@" option. The 1600 and 1650 modems will operate only at 300 baud. The other TelStar 64 data rates can not be used unless you purchase a more expensive modem. The word length, parity, and number of stop bits are dependencies on the type of host computer you are trying to communicate with. Often times, this is not known and you have to experiment with different setups. Some host computers have the capability to figure out which mode is needed. A popular configuration is 8-bits word length, no parity, and 1 stop bit.

TelStar 64 communicates with both Ascii and Commodore Printers. TelStar 64 can be configured (also via "@") for the printers device number, secondary address, and if a line-feed is needed for each Carriage Return.

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11.0 Setup File

Once you have setup TelStar 64 the way you like it via the "@", color (!), any character reassignment (:), etc., you can save this setup on disk or tape for later retrieval.

To save a setup, enter the menu and select either Disk (8) or Tape (1), and then select "$" to save the setup. This causes a file to be saved using the name "SETUP".

To load a setup, enter the menu and select either Disk (8) or Tape (1), and then select "*" to load the setup file.

12.0 Technical Details

TelStar 64 software was written entirely in 6502 Assembly Language using the EHS MAE Software Development System. TelStar 64 software is 100 % Machine Language and occupies nearly all of the 8K ROM contained in the Cartridge. In addition to the 8K of ROM software, TelStar 64 uses three 8K buffers at memory locations $2000 thru $7FFF, and read/write variable storage at $C000. The three 8K buffers are used as follows:

```
$0801-$2800 = Disk Write
$4000-$5FFF = Disk Read
$6000-$7D00 = Printer
```

If any of these buffers fill up, an XOFF will be sent so that the transmission will stop giving time for TelStar to flush the buffer. Then an XON will be sent causing communication to resume. This is all done automatically.

TelStar 64 intercepts the Restore vector and causes an entry into the menu whenever RUN/STOP & RESTORE keys are pressed. A useful use of this is to press RUN/STOP & RESTORE if TelStar 64 "hangs up" due to output to a non-existent device. (Example: If you output to disk when you don't have a disk drive.)

Cassette tape-based systems by nature are not as flexible as disk drive-based systems. Some limitations using TelStar 64 with tape-based sytems are:

- Quick Read Files are not so quick.
- Disk commands obviously are not available.
- TelStar 64 defaults to disk, thus you must enter the menu

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and select "1" for tape.
- MAE files not Valid.

TelStar 64 uses the XON/XOFF protocol scheme to control transmission. TelStar 64 will send an XOFF to the host computer whenever the receiver buffer contains over 200 characters and will send an XON when the buffer flushes down to 30 or less characters.

13.0 Examples

Extract the ASCII file HAMARB.BAS from the host computer:

```
Control M          < to enter TelStar 64 menu.
    W              < select write to disk option.
                     Use file type 0 for Basic format.
    X              < exit menu.
.TYPE HAMARB.BAS   < enter a similar host computer command
                     to list the file. This may vary depending
                     on the host computer.
Control M          < to reenter the TelStar 64 menu.
    C              < to close the write file.
```

Send the Commodore Basic file STARTREK to host computer:

```
.MAKE STAR.BAS     < execute host computers text editor and
   *I                invoke insert text mode.
                     This may vary depending on the host computer.
Control M          < enter TelStar 64 menu.
    R              < select read from disk option.
                     Use file type 0 for Basic format.
    X              < exit menu.
                     File will be read and transmitted immediately
                     after you exit. Wait until done listing.
                     Remember, all read files are automatically
                     closed when EOF is encountered.
```

CBM 64 to CBM 64 File Transfer

TelStar 64 can be used to accomplish a CBM 64 to CBM 64 transfer of a program. or data file. To do this:

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a) Both CBM 64s should be in Half-Duplex mode.
b) If your modem has an answer/originate switch, the calling CBM 64 should be in originate and the answering CBM 64 in answer position.

On some cue, one CBM 64 user should enter the menu and select the Write File option while the other should select the Read File option. The CBM 64 that is to receive the file (i.e. the on that is to write to disk) should exit the menu first. A good way to do this is the CBM 64 that is to receive the file should enter the menu first, select the write option, exit the menu, and then type READY TO RECEIVE and press return. The user at the CBM 64 that is to send the file will be waiting for this message who then enters the menu, selects to read the file, and then exits the menu. Upon exit, the file will be read and transmitted to the receiving CBM 64.

14.0 TelStar 64 Users Group

Eastern House plans to maintain a users group for the distribution of telecommunications information and for distribution of useful TelStar file translation programs. Possible file translation programs could be those that translate various software packages file formats to a form that TelStar 64 can upload and download. New software packages are announced almost daily and it is hoped that this Users Group can help provide these translation programs to group members. Other items that this group can provide are phone numbers of various computers, data bases, and bulletin boards. So, be sure and return your warantee card so you can get access to this hopefully very popular users group.

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TelStar 64 Quick Reference Chart

_ = Control key (ctl) (i.e. the back arrow key.)

ctl @ = Enter line transmit mode (provides screen editing)

ctl RETURN = Alpha case lock function.
(Characters A-Z.)

ctl M = Enter menu.

ctl n = Where n = 0 - 9. Quick Read. Ex: ctl 0 .

File Formats: 0 = Basic
1 = MAE
2 = Binary
3 = ASCII
4 = PET ASCII

ASCII Protocol Control Codes

ctl S = XOFF. Momentarily stop sendind data.
ctl Q = XON. Continue after XOFF.

RUN/STOP and RESTORE = Panic return to Menu.

SHIFT & RUN/STOP = Break Key Function.

Phone Numbers: 0-9. Punctuation allowed.
W = Wait one second. Multiple W's allowed.
C = Wait one second or until carrier detected. Multiple C's allowed.
L = English Pound sign delimits Phone numbers in Function Keys and Quick Read files.

Reentry into TelStar 64:

From Basic = SYS 8*4096+9 From Monitor = .G 8009
(or by pressing RUN/STOP and RESTORE keys.)

Transmission Errors:

PFO Indicators:
P = Parity ERROR. F = Framming Error. O = Overrun Error.

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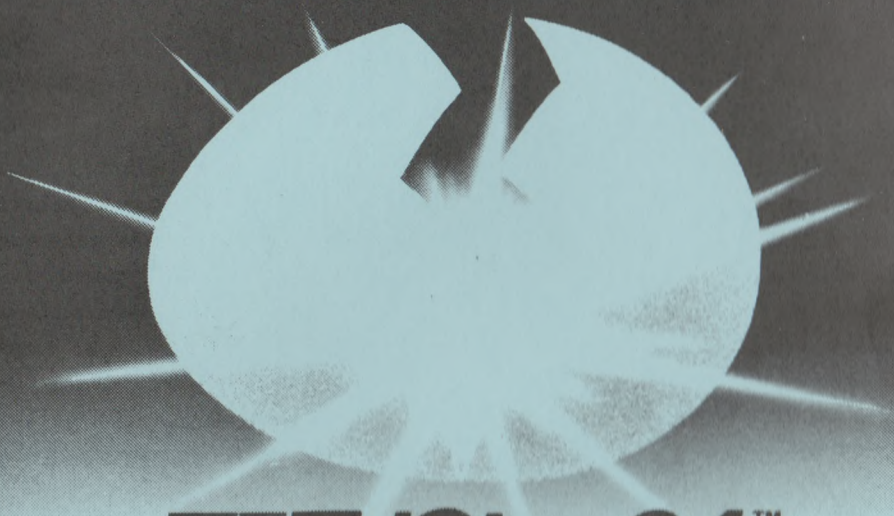
A Star is Born.



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