
ASYNCR ACCULINK User's Manual

Rev. A

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Important Software Diskette Information

For your own protection, do not use this product until you have made a backup copy of your software diskette(s). The backup procedure is described in the user's guide for your computer.

Please read the DISKID file on your new software diskette. DISKID contains important information including:

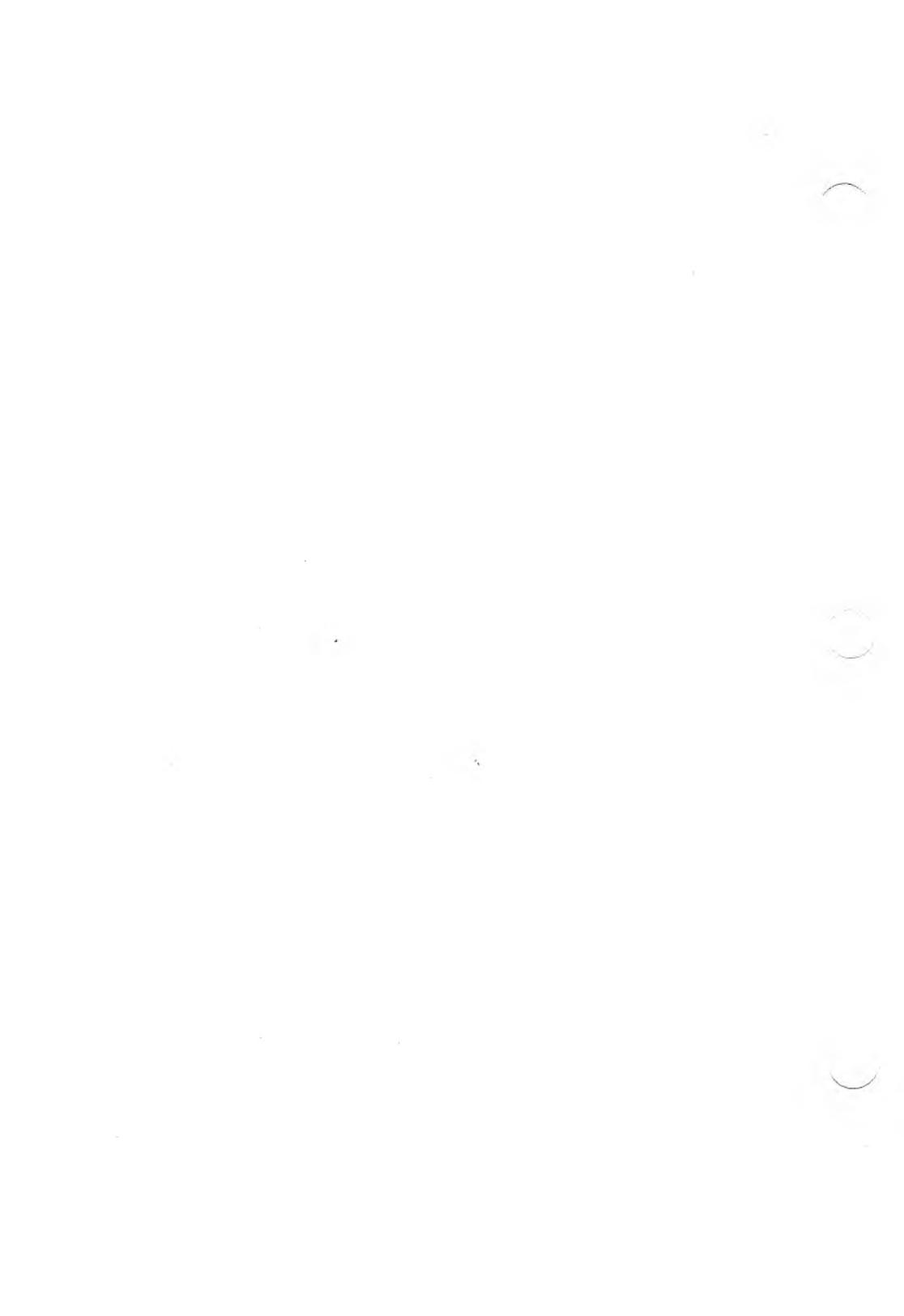
- o The part number of the diskette assembly.
- o The software library disk number (for internal use only).
- o The date of the DISKID file.
- o A list of files on the diskette, with version number, date, and description for each one.
- o Configuration information (when applicable).
- o Notes giving special instructions for using the product.
- o Information not contained in the current manual, including updates, any known bugs, additions, and deletions.

To read the DISKID file onscreen, follow these steps:

1. Load the operating system.
2. Remove your system diskette and insert your new software diskette.
3. Enter --

type diskid(cr)

4. The contents of the DISKID file is displayed on the screen. If the file is large (more than 24 lines), the screen display will scroll. Type CTRL-S (ALT-S) to freeze the screen display; type CTRL-S (ALT-S) again to continue scrolling.



Preface

ACCULINK is a family of data communications software packages for personal computers and minicomputers or mainframe computers such as the Digital Equipment Corporation VAX.

Data communications is the process of transferring information -- text, messages, data files, programs, and so on -- between computers. The information might pass over wires running directly between the computers, over phone lines, or via satellites.

These components form the communications link:

- o A personal computer which supports ACCULINK to process information.
- o A modem to convert the signals from computer data into analog signals for the telephone lines. Modems are not required when connecting directly to the other computer.
- o Transmission paths to allow the transfer of data between the two computers. Transmission paths are usually telephone wires or direct connect cables.
- o A remote computer or terminal that processes information.

ACCULINK provides the following capabilities:

- o You can access public information services such as The Source, CompuServe, or Dow Jones News/Retrieval.
- o You can communicate with remote computers with or without error-checking. If the other computer supports ACCULINK or a compatible program such as

XModem, files can be transferred using error-checking and automatic retransmission procedures.

- o Terminal Emulation allows many microcomputers to emulate the following terminals: TTY (dumb terminal), VT100, VT52, ADM3A, and IBM3101-C.
- o Using ACCUCNFG, you can easily select and store user-configurable communications parameters allowing the microcomputer to communicate with virtually any other asynchronous computer.
- o ACCULINK permits you to use the autodial and autoanswer capabilities of many modems.
- o ACCULINK allows you to keep on disk a phone book of numbers for automatic dialing. You can thus store a name, phone number, and macros. You can refer to all this information by just the name.
- o There are macros for many common communication tasks, such as autodialing many popular modems, and log-on to many Computer Services. If ACCULINK does not contain a macro for the task you wish to perform, you can use the Telecommunications Programming Language (TPL) to modify existing macros or create your own.

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Getting Started

The following tutorial sessions provide you with step-by-step instructions on how to use some of the basic commands provided in the ACCULINK data communications software package. This section introduces material that will be presented in more detail later in the manual. If you are familiar with ACCULINK, you can skip this section and proceed to Chapter 1.

NOTE: Before attempting any of these sessions, make a working copy of your ACCULINK distribution disk(s). You might find it helpful to copy your operating system files along with the ACCULINK files on the new disk(s). ASYNC 2.53a and above run under MS-DOS 2.0 and above only. Use these as your "working disks" and retain the distribution disks in a safe place.

Getting Started Sessions

This section consists of six sessions which include:

1. The fundamentals of the Master Menu
2. Using menus to control the communications session
3. Transmitting data without error-checking
4. Transmitting data with error-checking
5. Using terminal emulation
6. Entering the command line directly from the operating system

Conventions

This manual refers to individual keys on the keyboard as follows:

(cr)	Return key
ESC	Escape key
(sp)	Spacebar
^x	Control key (pressed simultaneously with another key)
Fn	Function key (where n represents the key number)

Errors

If you make an incorrect entry as you go through these sessions, the entry is brought to your attention by a "bell" tone and an error message. Pressing Escape allows you to retry.

Getting Help

Help is available at many different stages of the ACCULINK program. To receive help, you can type "?" from a menu or you can press the function key that is programmed as a Help key.

Exiting the Menus

If you find yourself in a menu you do not want, press the Escape key (ESC) to exit and return to the previous menu, or continue to press Escape until you return to the Master Menu.

Exiting ACCULINK

To exit from I+ mode (Interactive plus mode), enter ^VQ. If you invoked ACCULINK through the menus, pressing ^VQ returns you to the ACCULINK Master Menu. Then press Q to return to the operating system. Otherwise, control returns directly to the operating system.

Session 1: Fundamentals

This session introduces you to the ACCULINK Master Menu, the command line, and Learn mode. To start this session, boot your operating system and insert the ACCULINK disk(s). Enter the following command after the system prompt:

async(cr)

The keyboard file for the Emulator is configured, and the message "++Invoking ACCULINK Menu++" appears on the screen, followed by the ACCULINK Master Menu:

```
ACCULINK MASTER MENU  ACCULINK MENU  Version 2.xx

Set Command Line Fields      Command Line Utilities

P  Primary options          X  eXecute ACCULINK
S  Secondary options        C  Change parameters
B  Baud rate                D  make Default file
F  Filespec                 E  Erase command line
T  Telephone number         Q  Quit to {OS}
N  macro Names              L  enter Learn mode
```

Command line> AC ?

<SPACE> moves to next, <BS> moves to previous,
<RETURN> or <option letter> selects, <ESC> backs
up a level or returns from error, <'?'> gives help

Note the command line at the bottom of the screen. The command line is made up of the necessary elements to invoke the ACCULINK program and to specify options for additional instructions.

The command **AC** is automatically entered when you invoke the Master Menu. The "?" indicates that you have not yet selected options for the command line.

The command line consists of six fields:

1. **Primary Option** -- sets the operating mode (I+ or Datalink mode)
2. **Secondary Options** -- set working conditions for I+ or Datalink mode
3. **Baud Rate** -- sets the transmission speed
4. **Filespec** -- identifies the file to be transmitted/transferred
5. **Telephone Number** -- specifies a telephone number for use with autodial modems
6. **Macro Names** -- specifies a sequence of instructions executed within ACCULINK

Not all of these fields are required. The choice(s) you make for each field will be reflected in the command line as you continue through the menus.

The ACCULINK Master Menu includes Learn mode, a self-teaching facility for those who prefer on-line instruction. If you select Learn mode, you are guided through the menus by on-screen instructions until you return to the ACCULINK Master Menu and the cursor is positioned on "X eXecute ACCULINK." When

you get to this point, proceed to Session 2 for continued instruction on the many ACCULINK functions.

If you do not choose the Learn mode option at this time, go on to Session 2, which also describes the menus in detail.

Session 2: Using the Menus

This session tells you how to build a command line using the ACCULINK menus. You can use the following keys to move around in the menus:

- o Move to next option: Spacebar or Function key labeled DOWN
- o Move to previous option: Backspace or Function key labeled UP
- o Move from one column to another: Function keys labeled LEFT and RIGHT
- o Help: ? or Function key labeled HELP
- o Exit menu (return to previous): Escape key
- o Reset from error: Escape key

You can select an option on the menus in two ways:

- o Press Return after moving the cursor to the letter of the option. The cursor automatically advances to the next position when you return to the menu.
- o Enter the letter of the option. The cursor will not have moved when you return to the menu.

To build the command line, use the options in "Set Command Line Fields" on the Master Menu.

A primary option is the only required option in the command line; you must select it before choosing any other option. If you try to make another selection first, a bell sounds and the following error message appears:

++PLEASE CHOOSE A PRIMARY OPTION BEFORE SETTING...++

If you make such an error, press Escape.

With the cursor positioned on "P Primary options," press Return to invoke the Set Primary Option menu.

SET PRIMARY OPTION ACCULINK MENU Version 2.xx

Primary Options

- I Interactive mode (full duplex)**
- E interactive mode with Echo (half duplex)**
- R Receive a file in datalink mode**
- S Send a file in datalink mode**
- D Disconnect phone (hang up)**

Command line> AC ?

**<SPACE> moves to next, <BS> moves to previous,
<RETURN> or <option letter> selects, <ESC> back up
a level or returns from error, '<?>' gives help**

The first option is "Interactive mode (full duplex)." Interactive mode (I+ mode) contains a built-in ADM3A Emulator and functions correctly with software designed for an ADM3A terminal. In I+ mode, ACCULINK instructs your computer to function as a terminal on the remote computer. Characters typed at your keyboard are echoed by the remote computer.

Select I as the primary option in your command line. The Master Menu reappears. Note the addition of the letter "I" in the command line near the bottom of the screen, denoting the primary option:

Command line> AC I

Secondary Options

Secondary Options are the next field in the command line. These are not required, but you might need to use one or more for additional control of your communications sessions.

The cursor is now positioned on "S Secondary options." Press Return and the Set Secondary Options menu appears.

SET SECONDARY OPTIONS ACCULINK MENU Version 2.xx

Secondary Option Categories Add/Erase Sec. Options

C	Common to all modes	+	add options
D	Datalink mode	-	erase options
I	Interactive mode	*	erase all options
P	Ports and Protocols		
T	Telephone control		

Set secondary options mode: ADD

Command line> AC I

**<SPACE> moves to next, <BS> moves to previous,
<RETURN> or <option letter> selects, <ESC> back up
a level or returns from error, <'?'> gives help**

Each category listed in the Set Secondary Options menu invokes another menu with options relating to that category. You can choose up to ten secondary options.

Since the primary option you chose is I+ mode, the cursor will be positioned on the "Interactive mode" secondary option. Press Return. The Interactive Options menu appears.

INTERACTIVE OPTIONS ACCULINK MENU Version 2.xx

Interactive Secondary Options

- G Get a file from remote computer**
- L echo screen to List device**
- P Put a file to a remote computer**

Select "L echo screen to List device." This secondary option is designated by an "L" in the command line:

Command line> AC IL

Because you can enter more than one secondary option, you do not automatically return to the Master Menu. Press Escape to return to the Set Secondary Options menu and review all the options available by invoking the four remaining menus. When you finish, press Escape to return to the Master Menu.

Baud Rate

Baud rate is the speed at which data is sent across communication lines expressed in bits per second. This speed must be consistent with your computer and modem, and with the remote computer.

Baud rate is an optional field; if you do not enter one, ACCULINK uses the default baud rate for your machine. Press Return to invoke the Set Baud Rate menu.

SET BAUD RATE	ACCULINK MENU	Version 2.xx
Modem Baud Rates		Other Baud Rates
A	300	G 50
B	1200	H 75
Direct Connect Baud Rates		I 110
C	2400	J 134.5
D	4800	K 150
E	9600	L 600
F	19200	M 1800
		N 2000
		O 3600
		P 7200
		Q 38400

Command line> AC IL

**<SPACE> moves to next, <BS> moves to previous,
<RETURN> or <option letter> selects, <ESC> back up
a level or returns from error, <'?'> gives help**

Your microcomputer might not support some of the rates listed on the menu. In this case you will receive the following error message when you try to make a selection:

++Baud rate not supported++

Select "A 300". ACCULINK returns to the Master Menu. Notice the .300 in the command line:

Command line> AC IL.300

When you use the menu to enter the baud rate, ACCULINK automatically adds the "." required before the baud rate.

Filespec

Filespec is used to name the file that is being transmitted to or from your microcomputer. With the cursor positioned on "F Filespec," press Return.

Use the file specification format for your operating system which is reviewed on the Set Transfer Filespec screen -- A:TESTFILE.GET. Type in this filename and press Return. Now the command line should look like this:

Command line> AC IL.300 A:TESTFILE.GET

If you do not specify a file, nothing appears in the filespec field of the command line, and ACCULINK uses the default file specification ACCULINK.DAT on the logged-in drive.

Telephone Number

Telephone Number is the next field in the command line. Select "T Telephone number" from the Master Menu. In order to use the Set Telephone Number feature to place a call automatically: (1) your modem must be equipped with autodial capability, and (2) you must specify a modem macro in the command line.

The format is as follows:

- % to specify tone dialing to speed up dialing time (for example, %5551212)
- _ to enter a pause (for example, when you need to access an outside line: 9__5551212)

ACCULINK provides another way to handle phone numbers, using ACCU-TEL.FIL. You can store numbers in this file and reference them by name (for example, JOHN).

You must precede the phone number with a "\$" in the command line. ACCULINK enters this character automatically when you use the menus.

When you enter the phone number and press Return, the Master Menu command line looks like this:

```
Command line> AC IL.300 TESTFILE.GET $%9__5551212
```

Macros

Macros contain instructions that allow you to use such capabilities as autodial with a modem; this eliminates the keyboard entries needed to dial to the remote computer.

Select "N macro Names" from the Master Menu. When the Set Macro Names screen appears, select "N enter macro Names list." You will be prompted for the name of an existing macro.

Enter the filename HAYES (without the extension) and press Return. ACCULINK enters the [] required around the macro name in the command line. Press Escape to return to the Master Menu.

Now you have a complete command line:

```
Command line> AC IL.300 TESTFILE.GET  
$%9_5551212 [HAYES]
```

To execute the command line, select "X eXecute ACCULINK" from the Master Menu. The following banner appears:

```
++ ACCULINK [2.xxx/YOURCOMPUTER/serial #] ++  
Port:xxxx   Baud:300   Bits:8   Parity:I  
Mode:Int+   Type:BINARY
```

The first line is always the same:

```
Program name (ACCULINK)  
Version number (2.xxx)  
Computer name (Manufacturer/Model)  
Serial number (your copy of the software)
```

The next two lines reflect the parameters of the communications session. These might change according to the selections you make:

- o Port: Access port for your modem or the remote computer
- o Baud: Transmission speed
- o Mode: Transmission mode (Interactive or Datalink)
- o Bits: Number of data bits per character
- o Parity: Used in I+ mode when the remote computer recognizes parity (must be compatible)
- o Type: Type of data transmitted(binary/ASCII)
- o Blockchk: Type of error-checking being used

Press Escape to cancel execution of the Hayes macro.

Because you are not hooked up to a modem, ACCULINK could not execute the macro. You receive this message and return to I+ mode:

++Macro aborted++

Enter ^VQ to return to the Master Menu; then select "Q Quit to (your operating system)."

Session 3: Transmitting Data without Error-Checking

This session describes how to:

- o Download text files from a remote system to your microcomputer using GET
- o Upload text files from your microcomputer to a remote system using PUT

The advantage of transferring data in I+ mode is that ACCULINK is not needed on the remote computer, as long as your microcomputer can communicate with the remote.

Disadvantages are:

- o Error-checking and automatic retransmission are not performed during a GET or a PUT operation; therefore, any corruption to the data suffered during transmission is not detected. If accuracy is critical, you should use Datalink mode for transferring files.
- o Only text file transfers are possible. Command files (executable programs) can be transmitted only in Datalink mode using RECEIVE/SEND.

Invoke the ACCULINK Master Menu by typing **AC** and pressing Return. Make the following selections for the command line:

- o Primary option -- Interactive Plus mode
- o Baud rate -- 300

Execute ACCULINK. The ACCULINK banner appears indicating I+ mode at 300 baud.

A wide variety of commands is available in I+ mode. These options provide versatility during communications sessions. Enter ^VH to display the listing on the screen:

```
++ ACCULINK [2.xxx/YOURCOMPUTER/serial #] ++
Port:xxxx   Baud:300   Bits:8   Parity:I
Mode:Int+   Type:BINARY
```

Interactive mode commands are all of the form '^Vx' where 'x' may be any one of:

A Answer-back strings	O set secondary Options
B change Baud rate [300]	P Put a file
C Clear (reset) screen	Q Quit to O/S
D Disconnect and quit	R Receive file(s)
E terminal Emulator [OFF]	S Send file(s)
F Filename for transfers	T Terminal mode [FDX]
G Get a file	U disk and file Utilities
H display this Help text	V send the ^V character
I change I/O port [xxxx]	W screen Write protect [OFF]
K send a break	n transmit answer-back #n [0-0]
L printer Logging toggle [OFF]	% display connect time
N select macro Name	# change output parity [IGNORE]

Before executing the GET operation, indicate the name of the file on your microcomputer where you want to save the file from the remote computer or the interactive communications session. If you don't specify a filename, ACCULINK uses the default file ACCULINK.DAT.

Enter ^VF to bring the following prompt to the screen:

File specification:

Enter the filename TEST.FIL and press Return.

Now enter ^VG to execute the GET operation. The following message appears at the top of the screen:

**File:TEST.FIL<---Port
File open, rdy to get**

The first line indicates that ACCULINK has created a file TEST.FIL on the default drive, and is ready to write to this file all data transmitted from the remote computer as well as characters keyed in at your microcomputer.

The message "File open, rdy to get" means the data channel to the file is open and the GET operation is in progress. Enter ^VH to display this Help text of GET operation commands:

GET mode commands are all of the format ^Vx, where 'x' is any one of the following:

- C** - toggle data Capture to file [ON]
- H** - display this Help text
- L** - toggle printer Logging [OFF]
- V** - send the ^V character
- Z** - close the file and return to I+ mode
- <ESC>** - cancel GET command (file not saved)

If you press ^VC, two right angle brackets appear on the screen:

<<

Press ^VC again, and two left angle brackets appear:

<<>>

The data displayed between the brackets will not be saved on disk. You can use this option continually throughout the file to edit data as it is being transferred.

You can toggle ^VL to echo characters transmitted to the screen on the printer.

^VZ instructs ACCULINK to close the GET file and return to I+ mode. The following message appears:

++ File received ++

Pressing ^V and Escape cancels a GET operation and returns to I+ mode. The following message appears:

++GET cancelled++

Executing a PUT causes ACCULINK to transmit data from a file on the local computer to a remote system.

The file specification indicates which file on your microcomputer should be transferred to the remote computer.

Use ^VF to enter the following:

File specification:test.fil(cr)

Enter ^VP to execute the PUT operation. The following message appears:

```
File:TEST.FIL--->Port  
File open, 00 sectors
```

The first line indicates data is being transmitted to the remote computer from the file on your microcomputer. The line "File open, 00 sectors" indicates the file size in decimal digits. In this case, the file is empty.

When the PUT is complete, this message appears:

```
++ Raw ASCII file transferred ++
```

Pressing Escape cancels a PUT operation and returns to I+ mode.

If you attempt to do a PUT operation on a file that does not exist, ACCULINK issues the following error message and returns to I+ mode:

```
++Can't open (filename)++
```

When you are actually logged on to a host system, each character transmitted is echoed on the local microcomputer screen during a GET or PUT operation.

Enter ^VQ to return to the Master Menu; then type Q to return to your operating system.

Session 4: Data Transfers with Error-Checking

This session discusses how to make data transfers in Datalink mode using RECEIVE and SEND.

ACCULINK uses special error-checking procedures that automatically attempt to retransmit any block of data in which errors are detected.

To do transfers in Datalink mode, either (1) ACCULINK must be running on both your computer and the remote computer, or (2) ACCULINK must be running on your microcomputer and any communications package that supports XModem must be on the remote computer (see Chapter 5).

Execute ACCULINK as shown in the previous session and invoke the I+ Command Help text.

During a Receive operation, ACCULINK transfers data from a remote computer to your computer.

Use ^VF to enter the file specification:

datalink.fil(cr)

Enter ^VR to initiate a Receive operation.

The ACCULINK banner appears. Note the differences in the third line:

- o "Mode:Datalink" indicates ACCULINK will use error-checking procedures.
- o "Blockchk:Checksum" indicates the error-checking procedure to be used is Checksum. ACCULINK also supports CRC-16 error-checking; you can invoke it with a secondary option.

Notice the message at the top left of the screen:

**File:DATALINK.FIL<--- Port
File open, rdy to rcv**

This message indicates a Receive operation is pending, during which data will be transferred from a remote computer to the file on the local computer.

A message also appears on the top right side of the screen.

"Awaiting # 01" indicates ACCULINK is waiting for the first block of data to be received. During a transmission, the number increments each time a block of data is received accurately.

"Timeout 00" is a counter used to keep track of a period of time (timeout period) within which data must be received. If no data has been received after a predetermined number of timeouts, the following message appears:

**++ Multiple errors encountered ++
Type "Q" to quit, "R" to retry:**

Enter Q. The following messages appear:

++ Unable to receive block from sender ++

++ Transfer cancelled ++

ACCULINK returns to I+ mode. Enter ^VC to clear the screen.

During a Send operation, ACCULINK transfers data to a remote computer from your computer. Enter ^VF and the file specification DATALINK.FIL. ^VS initiates the Send operation.

The ACCULINK banner appears as well as the following messages:

**File:TEST.DAT---->Port
File open, 00 sectors**

Waiting for receiver

The first message indicates the Send operation is pending, during which data will be transferred to the remote computer from the file on the local computer. The file is opened and contains no data.

"Waiting for receiver" indicates the remote computer has not signaled that it is ready to receive data.

Press Escape to cancel the pending Send. This message appears:

++ Transfer cancelled ++

ACCULINK returns to I+ mode.

If you do not cancel the Send operation, you receive the same message as in the Receive operation when the timeout period elapsed. Enter Q, and the following error message appears:

++Time-out waiting for receiver++

You are returned to I+ mode. Enter ^VQ, then Q to return control to your operating system.

Session 5: Using Terminal Emulation

This session discusses some of the basic features of the terminal emulators included with ACCULINK. Emulators are usually needed to run application programs on a Host computer. ACCULINK might not support some emulators on your microcomputer because of hardware limitations. For the same reason, certain functions of those emulators supported might not be available.

Invoke ACCULINK as described in the previous two sessions. When you are in I+ mode, call up the I+ Command Help text. Note that in the item "E - terminal Emulator," the setting is turned OFF.

Enter ^VE to display the Select Terminal Emulator screen. Notice the line:

Emulator: xxxxxxx is OFF

Press the Spacebar repeatedly to display all the emulators available for your microcomputer. Stop when you see the emulator of your choice.

Press Return to toggle the emulator ON. A banner appears indicating which emulator you are using. You are still in ACCULINK at this point.

Enter ^VH and notice the change in the line listing the terminal emulator; the emulator you chose is displayed within the brackets.

Press F1 to display the Setup screen. Use this screen to set the parameters to coordinate your microcomputer for communication with the Host system. Press F1 again to exit Setup mode.

Enter ^VQ to return to the Master Menu, then Q to return to the operating system.

Session 6: The Easy Way In

This session shows you how to enter a command line directly from your operating system. ACCULINK provides this method for the experienced user as a time-saving alternative to building the command line using the various menus.

When you enter the command line directly, these fields are required:

- o ASYNC (to invoke the ACCULINK program)
- o I (or any other Primary option)

We recommend that you enter the baud rate, although it is not necessary because ACCULINK will use the default baud for your computer. The format for the baud rate is:

- o "." immediately following the Primary and/or Secondary options.
- o The selected baud rate. You can enter only the first two digits, or the entire number.

At the system prompt, type in the following command line:

ASYNC I.12

Press Return to execute the command line. The ACCULINK banner appears on the screen, designating I+ mode at 1200 baud.

Invoke the I+ Command Help text and review any of the options that have not been discussed in the previous sessions.

Entering ^VU, for example, displays the following menu:

ACCULINK Disk and File Utilities
Version 2.xx
Copyright (c) IE Systems Inc., 1984

Summary of commands:

C - COPY filespec.sw = filespec.dw	P - PATH pathname
D - DIRECTORY filespec.sw/SYS	R - RENAME filespec.sn = filespec.dn
E - ERASE filespec.sw/ASK	S - STAT drive
H - HELP !!!	T - TYPE filespec.sn PAGE
I - INT+ return to INT+ mode	Q - QUIT to operating system
L - LOGIN drive	? - ? display summary of commands

where: filespec = a valid {O/S} file specification
dn = no wildcards in destination filespec
dw = wildcards allowed in destination filespec
sn = no wildcards in source filespec
sw = wildcards allowed in source filespec
/ = optional switches

A:\>

The preceding commands allow you to use standard disk and file utilities while still running ACCULINK.

Type Q to return to your operating system.

1. Summary of ACCULINK Commands

Chapter 1 gives information on the command line, and describes how to access ACCULINK in three ways: with menus, using the Interactive mode, and through default files. The chapter then tells you how to exit ACCULINK.

1.1 The Command Line

The complete syntax for the ACCULINK command line is:

```
AC P{SS...S}{.BB} {d:FILESPEC.EXT}
    {$telephonespec}{macro list}
```

where:

P is a primary mode (I, E, S, R)

S is a secondary option (up to 10 allowed)

.BB is the baud (BB = 30, 12, 24, 48, 96, 19, etc.)

d:FILESPEC.EXT is the drive name, filename, and file extension of the file to be transferred

\$telephonespec is a phone number or phone book entry, up to 50 characters; for example, \$JOHN or \$12015551212

macro list = [name0 {,name1,,name9}]

{ } denotes optional entries

1.2 Menus

The easiest way to access ACCULINK is to type the program name:

async(cr)

This command loads the program and the menu module, and gives you access to the help facility (type ? at any level) and to Learn mode. From the Master Menu, you must select at least a primary mode and usually a baud rate.

ACCULINK stores the command line for the entire session, or until it is changed or erased. You can exit from the menu, work in I+ and/or Datalink modes, then reinvoke the menu. The command line remains in effect as you left it. Note: Machines with a limited amount of memory (about 128K or less) might not support the command-line-storing feature.

To select an option, either type the option letter or move the cursor to the desired option letter and press Return.

To move the cursor, use the Spacebar to move forward and the Backspace key to move backward.

To exit from any menu (move up the menu tree), press Escape.

To execute the program after building a command line from the menu, type X.

1.3 I+ Mode

The most versatile way to use ACCULINK is to enter I+ mode directly. A typical command line is:

ASYNC I.12(cr)

The components of this command line are explained in these menus:

Help Menu	^VH
Secondary Options Menu	^VO
File Utilities Menu	^VU

You can control file transfers from I+ mode as well as from the command line:

- o To specify the file, type ^VF and respond to the prompt with a filename.
- o To send (or receive) the file with error-checking, type ^VS (or ^VR).
- o To PUT (or GET) the file (transfer without error-checking), type ^VP (or ^VG).

Terminal emulation status is displayed on the Help Menu (^VH), and typing ^VE calls a menu from which you can toggle an emulator and/or switch to another emulator.

You type ^VN to bring the installed set of macro command files to the screen. Entering a number from 0 to 9 invokes the corresponding macro; entering a number and name installs the named macro in that slot. Pressing Return invokes a macro; pressing Escape confirms a macro name change without invoking the macro.

1.4 Default Files

The quickest and most powerful way to invoke ACCULINK is by using default files:

ASYNC * {default filename}

To automatically select the default filename for the configuration you are using, omit the filename. Each default file contains environment information (for example, the handshaking setting) and the command line that is appropriate to a particular task. To build a default file, choose the D option in the Master Menu.

1.5 Exiting ACCULINK

To exit from I+ mode, type ^VQ. If you originally invoked ACCULINK through the menu, ^VQ brings control back to the menu; then enter Q to return to the operating system. Otherwise, ^VQ returns you directly to the operating system.

2. Command Reference Guide

Chapter 2 contains information on:

- o Command line parameters
- o Primary parameters
- o Datalink mode commands
- o I+ mode commands
- o Secondary options

2.1 Command Line Parameters

An ACCULINK command line has the following general format:

ac ps.baud filespec \$phone[macros]

where:

p is one of the following primary commands:

- E Invoke ACCULINK in I+ Echo mode
- I Invoke ACCULINK in I+ mode
- R Invoke ACCULINK in Datalink mode to Receive a file
- S Invoke ACCULINK in Datalink mode to Send a file
- D Invoke ACCULINK in Disconnect mode

s is one or more (up to 10) of the secondary options listed later in this chapter.

filespec is the file specification, or name, of a file to be transferred.

phone is a phone number or ACCU-TEL.FIL phonebook reference (up to 50 characters) for speed dialing.

macros is a list of up to ten macro names separated by commas.

These examples illustrate typical ACCULINK command lines:

AC IP.12 FIL2.TXT \$1-603-555-1212[, ,LOGON*]

Invokes ACCULINK in I+ mode; sets the baud at 1200; places the specified telephone number in the macro command buffer; loads macro LOGON into the MACRO#2 position on the Macro Names List, and invokes it; and specifies that FIL2.TXT on the microcomputer is to be PUT to the remote system when the actual command is given later.

AC SI.12 B:TEST.TXT

If you have already logged on to a host system, or you are using a direct connection, this command line invokes ACCULINK-Micro in Datalink mode; sends file TEST.TXT on drive B to the remote system running ACCULINK; and invokes I+ mode following the transfer.

2.2 Primary Parameters

Each primary parameter consists of a single letter. Specify a primary parameter after the program name (AC) in a command line, entering a space between AC and the primary parameter.

These are the ACCULINK primary parameters:

- E I+ Echo mode, simulated half duplex, which allows you to use your microcomputer as a terminal on the remote system. Your microcomputer echoes the characters you type to your screen.
- I I+ mode, full duplex, which allows you to use your microcomputer as a terminal on a remote system. The remote computer echoes the characters you type back to your screen.
- R If you have already logged on to a host system, or you are using a direct connection, this command line invokes ACCULINK in Datalink mode to receive a file from a remote computer that is running ACCULINK, or supports XModem protocol. In Datalink mode, ACCULINK uses an error-checking protocol to detect transmission errors, then retransmits if any errors are found.
- S If you have already logged on to a host system, or you are using a direct connection, this command line invokes ACCULINK in Datalink mode to send a file from your microcomputer to a remote system that is running ACCULINK or supports the XModem protocol. In Datalink mode, ACCULINK uses an error-checking protocol to detect transmission errors, then retransmits if any errors are found.
- D Disconnects the telephone (with certain autodial modems). Before you place another call, you must either use primary parameter D, or physically hang up the phone.

2.3 Datalink Mode Commands

The Datalink mode commands allow you to issue instructions to ACCULINK while you are performing a file transfer in Datalink mode. The commands are:

- ^C** Clears the work area.
- ^R** Changes the current setting of show characters Received. If ON, displays data received on your microcomputer, including protocol characters.
- ^S** Changes the current setting of show characters Sent. If ON, displays data sent from your microcomputer, including protocol characters.
- ^T** Displays a message summarizing the operation, the status of its progress, and the length of time your microcomputer has been connected to the remote system.
- ^U** Erases the current line.
- ^V** Changes the current setting of View characters sent or received. If ON, displays the text being sent from, and received by, your microcomputer. Control characters that are part of the text being transmitted are shown, but control characters governing transmission do not appear.
- ESC** Aborts the file transfer.

2.4 I+ Mode Commands

The I+ mode commands allow you to issue instructions to ACCULINK while you are in either I+ or I+ Echo mode, without returning control to the operating system.

The I+ mode commands consist of \hat{V} (Control-V) followed by a letter identifying the command:

$\hat{V}x$

where "x" is the appropriate I+ mode command letter.

When you are in I+ mode, type $\hat{V}H$ to see a list of the commands. For those commands which are set to a particular value, or are toggled, the current setting appears in square brackets. If you enter an I+ command that toggles a setting, a message showing the command you entered and whether the setting was turned ON or OFF appears at the lower left of your screen.

Several I+ commands have submenus from which you can select or change the characteristics of your ACCULINK session. To change the setting, press the Spacebar until the desired selection is shown. Press Return to invoke the desired option. Press Escape to preserve the current setting.

Pressing the Backspace key returns you to the first item on the menu. This feature is used mainly for writing answer-back strings to determine the number of spaces needed to make the correct menu choice. Here is an example of an answer-back string that will reach the third baud rate in the I+ mode baud list:

$\hat{V}\hat{B}\hat{H} \hat{M}$

Changes you make from I+ mode are effective only during the current ACCULINK session. If you exit from the program, then reinvoke ACCULINK, the parameters will be those entered on the configuration profile. See Chapter 8 for instructions on building and modifying ACCULINK configurations if you want to make permanent changes.

If you want to use any of the ACCULINK terminal emulators, read Chapter 4.3 for instructions on using I+ commands with emulators.

The following is a list of I+ mode commands, with a short definition of each command and examples to clarify some of them. The asterisk (*) designates the default setting in the configuration.

A* Answer-back strings. Calls a submenu allowing you to change answer-back strings entered in the profile for the configuration in use.

To change a string, enter the number of the string, and press Return. A line similar to this appears:

Answer-back string #3: (format: dlm<string>dlm)

Enter the change, using the same delimiter at both ends of the string, then continue the session. Invoke the answer-back string by typing ^Vn, where n is the number of the string you are invoking.

Some function (PF) keys have not been assigned so that you can attach answer-back strings to them. You can control your ACCULINK session using just the function keys. Check the bottom of your screen for keys that say ansbk0, ansbk1, and so on, to see how many free keys you have.

- B* Change Baud rate. Calls a submenu allowing you to select a baud rate different from the one used to invoke ACCULINK.
- C Clear (reset) screen.
- D Disconnect and quit (with certain autodial modems). Disconnects the phone and/or exits to MS-DOS after execution. The prompt that is displayed gives you a choice.
- E* Terminal Emulator. Calls a submenu allowing you to select or change an ACCULINK emulator to use for the session. Your microcomputer must support the emulator you want to use. If it does not, you get this message:

++ Can not find the xxxx overlay file xxxx.OVL ++

- F* Filename for transfer. Enter a valid filename. Pressing Return without entering a name displays the default filename for the configuration. Entering a filename causes that name to be the default filename for the current session, until you specify another.
- G Get a file from the remote system. No error-checking is performed. For example, these commands GET a file from a DECsystem10 after log-on has been completed:

```
.^VF
File specification: B:JOSHS.TXT(cr)
(cr)
```

The second Return causes the host system prompt to reappear.

```
.COPY TTY:=JOSHS.TXT^VG(cr)
```

The command is executed when you press ^VG.

If you type ^VH during a GET operation, this submenu appears:

GET mode commands are all of the format ^Vx, where 'x' is any one of the following:

- C** - toggle data Capture to file [ON]
- H** - display this Help text
- L** - toggle printer Logging [OFF]
- V** - send the ^V character
- Z** - close the file and return to I+ mode
- <ESC>** - cancel GET command (file not saved)

Toggling C OFF stops the data being transferred from being saved on the disk file. Toggle data Capture ON and OFF to save only the data you want to keep in the file. These characters will appear on the screen as Capture is toggled:

<< >>
(OFF) (ON)

Toggle printer Logging ON and OFF from within a GET by using option L. Use ^VZ to close the file on your microcomputer and return to I+ mode, if the remote system does not transmit an end of file character. A message like this appears on the screen when the file is closed:

++ ASCII file received ++

- H** Display Help text, which lists the I+ commands.
- K** Send the remote a BREAK, which lasts 250ms.
- I*** Change I/O port. Check your computer user's manual to see how ports are assigned.

- L Printer Logging toggle. When ON, sends all input and output to the printer and the microcomputer screen, providing a hardcopy record of the terminal session. (A more efficient way to capture a session is to use ^VF to specify a file, then ^VG to save the session to disk.)
- N* Select macro Name. To invoke a macro already entered on the Macro Names List, type ^Vn and Return, where n is the List position number of the macro you are invoking.

To replace and invoke a macro name on the list, or to see the Macro Names List, type ^VN. A screen showing the current macro name assignments appears along with this prompt:

Macro #

Enter the List position number and the name of the macro, or just the position number if the macro you want is on the list, then press Return.

To replace a macro name on the list without invoking the macro, type ^VN. When the prompt appears, enter the List position number and the name of the macro, then press Escape.

- O Set secondary Options. These options are described later in this chapter.

P Put a file to a remote computer. No error-checking is performed. For example, these commands PUT a file to a DECsystem 10 when log-on has been completed:

```
.^VF
File specification:NEWFILE.TXT(cr)
(cr)
.COPY NEWFILE.TXT=TTY:(cr)
.^VP
```

The command is executed when you press ^VP.

Q Quit to the operating system or to the ACCULINK Master Menu, depending on the source of control when the command was entered.

R Receive file(s) from a remote system that is running ACCULINK or supports XModem protocol. Error-checking protocol is used. For example, these commands Receive a file from a VAX:

```
$RUN ACCULINK(cr)
ACCULINK-VX>SEND TEST.TXT(cr)
^VF
File specification:*.*(cr)
^VR
```

The command is executed when you press ^VR.

S Send file(s) to a remote system which is running ACCULINK or supports XModem protocol. Error-checking protocol is used. For example, these commands Send a file to a VAX:

```
$RUN ACCULINK(cr)
ACCULINK-VX>RECEIVE TEST.TXT(cr)
^VF
File specification:TEST3.TXT(cr)
^VS
```

The command is executed when you press \wedge VS.

- T Terminal mode allows ACCULINK to switch between full duplex [FDX] (I+), and half duplex [HDX] (I+ Echo) mode, without exiting ACCULINK.
- U Disk and file utilities allow you to perform file maintenance from I+ mode. See Chapter 4 for more information.
- V Send the \wedge V character. Type \wedge V \wedge V. The first \wedge V tells ACCULINK a command is coming; the second \wedge V sends the control character.
- W* Screen Write protect. When ON, the high bit is filtered from all data bytes received on the screen. DELETE and all control characters except TAB, CR, LF, BS, and BELL are also filtered. See Chapter 4.4, "Screen-Write-Protect," for more information.
- n* Transmit answer-back #n [0-x]. You can enter up to 10 answer-back strings for each configuration. The number of strings entered in the configuration is shown in square brackets, e.g., [0-5]. To invoke an answer-back string, type \wedge Vn, where n is the number of the string.
- % Display connect time. A counter starts when you enter I+ or Datalink mode. Use this option during the session to see how long you have been connected to the remote system. Set the correct time before you invoke ACCULINK, using the method specified for your operating system.
- #* Change output parity. Calls up a submenu allowing you to change the output parity setting.

2.5 Secondary Options

The secondary options offer a convenient way to issue additional or follow-up instructions to ACCULINK. Each secondary option consists of a single letter. The secondary options described in this section are listed on the Secondary Options Menu in the following categories:

C	Common to all modes
D	Datalink mode
I	Interactive mode
P	Ports and protocols
T	Telephone control

Enter secondary options by including them in a command line or by selecting them in I+ mode from the Secondary Options Menu. The command ^VO invokes this menu, which lists the options and shows the current setting of each.

You can specify up to 10 secondary options in a command line. These options immediately follow the primary parameter, with no blank spaces between options. For example, G and Q are secondary options in the following command line:

```
AC IGQ.30 PATCHES.BAS $5551212[,HELLO*]
```

Using the ^VO command, you can enter secondary options in one of two ways:

- o Type the letter corresponding to the option immediately after you enter ^VO. For example, enter ^VOR to display all characters received on your microcomputer.

- o Invoke the Secondary Options Menu with ^VO, then select an option from the menu. You must reinvoke the Secondary Options Menu for each choice.

As you toggle secondary options, a message appears at the lower left of your microcomputer screen. It shows the name of the option and its new setting.

The following sections list the secondary options by mode, with a brief description of each. An asterisk (*) designates the default setting in the configuration file.

A few of the options cannot be specified with the ^VO command. These exceptions are noted in the lists below. Some secondary options can be used in both I+ and Datalink modes; others can be used in only one of the modes. Two of the secondary options can be used only with some autodial modems.

2.5.1 Options Common to Both Modes (C)

- B Instructs ACCULINK to create a backup file whenever it encounters an existing file with the same name as the file to be transferred.
- H* Enables XON/XOFF handshaking to prevent overrunning the input buffer on the receiving computer. This might occur when transmitting at a high baud. See Chapter 5 for more information on XON/XOFF handshaking.

If handshaking is set ON in the configuration profile, you cannot turn it OFF using the secondary option H in the command line. You can toggle it in ACCULINK I+ mode or in the ACCULINK menu. If handshaking is turned OFF in the

configuration, you can toggle it from the command line by using ^VOH from I+ mode, or using ACCULINK's menu.

- R ACCULINK displays all characters Received by your microcomputer, including protocol characters. This option is useful for debugging a communications link. Due to the time required to display the transmitted characters, do not use this option at a high baud.
- S ACCULINK displays all characters Sent from your microcomputer, including protocol characters. This option is useful for debugging a communications link. Due to the time required to display the transmitted characters, do not use this option at a high baud.
- T Sets TTY mode, in which ACCULINK does not attempt cursor control commands. This option is useful for terminals with slow cursor addressing.
- Q Quiet transmission suppresses ACCULINK status messages, such as the name of the file being transferred and the number of sectors sent. Use Q with terminals that have slow cursor addressing. This option is used mostly during transmissions at high bauds to reduce transmission time by eliminating the requirement to update the screen.

Use this option to suppress the display of data transmitted with a PUT or GET command, or to suppress screen displays in order to enter user messages during Datalink executions.

If you enter Datalink mode directly through the command line, specifying the Q secondary option, the file transfer is complete when control

returns to the operating system. If you invoke Datalink with the Quiet option from I+ mode, there is no status message displayed on your screen to indicate file transfer is complete.

2.5.2 Datalink Mode Options (D)

- C Specifies CRC-16 error-checking procedures rather than Checksum procedures. ACCULINK sends a message to the receiving system indicating that CRC-16 error-checking is to be used.
- F ACCULINK informs the receiver of the file size (in decimal sectors). The receiver can monitor the transfer as it is occurring.
- I ACCULINK enters I+ mode following a file transfer. Use only with primary option R or S.
- E ACCULINK enters I+ Echo mode following a file transfer. Use only with primary option R or S.
- V ACCULINK displays on your microcomputer screen all data sent or received, except protocol characters and status messages. Due to the time required to display the transmitted characters, do not use this option at a high baud.

2.5.3 I+ Mode Options (I)

- G GET a file from a remote system. No error-checking is performed. Enter a ^V to execute.
- L Echoes everything displayed on the microcomputer screen to a List device (printer) if toggled ON.
- P PUT a file to a remote system. No error-checking is performed. Enter a ^V to execute.

2.5.4 Ports and Protocols

- 1-9 The default port is 1 (A). If you select an invalid port, ACCULINK overrides the choice and accesses the default port. Port assignments are machine dependent. Check your microcomputer user's manual for port descriptions.
- U User's group protocol enables you to transfer files with remote systems, such as Computer Bulletin Board Systems (CBBS), that support the public domain XModem protocol.
- X This option enables compatibility if an earlier version of ACCULINK is running on the remote system. ACCULINK Versions 2.xx and later use a protocol slightly different from previous versions.

2.5.5 Telephone Control

These options are available with a limited number of modems. Refer to the manual for your modem to see if you can use them.

- A With certain autodial modems, your computer answers the phone automatically when you use this option in I+ or Datalink mode.
- D With certain autodial modems, ACCULINK prompts the user with a telephone Disconnect message following a file transfer. Type E to exit to the operating system; type D to disconnect the telephone link to the remote system. You cannot specify this option using ^VO.

3. Common Communications Tasks

You can use your ACCULINK package to perform many common communications tasks; this chapter describes the steps necessary to do several of them. The following terminology is used:

- o The **local system** is a microcomputer supporting ACCULINK.
- o The **local operating system** is either CP/M-86, PC-DOS, or MS-DOS.
- o (H) denotes information or processing provided by the host system.
- o (L) denotes information or processing provided by the local system.
- o (H/L) means that a host system prompt appears, but that the command entered is executed by the local system.
- o [...] introduces comments and clarifications at appropriate points.
- o [opt] introduces optional steps you can perform to obtain additional information.
- o O/S denotes the operating system.
- o Dr followed by a letter specifies a drive -- for example, Dr A is drive A.

For all tasks, begin by booting your microcomputer.

The appropriate ACCULINK kernel for each operating system is:

CP/M-86	AC.CMD
MS-DOS and PC-DOS	AC.EXE

3.1 Testing Hardware and Software Installation

You can run the macro SELFTEST included in your ACCULINK software package to ensure that your system is able to send and receive data between its active communications port and the modem. Here is the environment for this sample task; substitute the appropriate prompts for your system.

- o Host System None

- o Local System Microcomputer
 O/S: CP/M-86
 Dr A: AC.CMD
 ACCU-MAC.OVL
 SELFTEST.CTL
 Modem: asynchronous with analog
 loopback (ALB) switch

If your modem does not have an ALB switch, run the SELFTEST using a DB-25P RS232 connector. See Chapter 6 for a diagram showing which pins on the DB-25P should be tied to perform the test. Plug the DB-25P into the asynchronous communications port on the back of your microcomputer.

To run the SELFTEST, follow the steps listed below. The ACCULINK prompts and your responses are given in boldface in the first column, and a description of each appears in the second column.

<u>Command/Response</u>	<u>Description</u>
-------------------------	--------------------

[Your microcomputer is booted, the ALB switch on the modem is ON, and you can now invoke ACCULINK.]

A> O/S prompt

A>async i.30 [selftest](cr)
Invokes SELFTEST at 300
baud

ACCULINK AUTO-LOOPBACK TEST

Loop back test.....Passed

Type 'R' to retry, 'Q' to quit, or 'I' for Int+ mode:

[The preceding message is displayed on your screen if the SELFTEST is successful.]

q Choose option 'Q' to quit

A> O/S prompt returns

[ACCULINK is ready to resume normal processing unless the test was not successful. In that case, the following messages are displayed on the screen.]

ACCULINK AUTO-LOOPBACK TEST

Loopback test FAILED

The loopback test failed, possible problems:

- 1) Is the loopback connector installed
- 2) Is the correct port handler installed

Type 'R' to retry, 'Q' to quit, or 'I' for Int+ mode:

[If the test fails, check Chapter 6 for some possible causes. The loopback test is useful, but is not necessary for using ACCULINK with a modem. Be sure to perform the test if you have problems with the communications link.]

q **Choose option 'Q' to quit**

A> O/S prompt returns

[Ready to resume normal processing.]

3.2 Sample Autodial

If you have an autodial modem, you can use ACCULINK to dial telephone numbers you call frequently. Here is the environment for this sample task. Substitute the appropriate commands and prompts for your system. Be sure the telephone number you want to autodial has been entered in ACCU-TEL.FIL. (See Chapter 6 for ways to specify telephone numbers.)

- o Host System Computer being accessed by
 telephone

- o Local System Microcomputer
 O/S: MS-DOS
 Dr A: AC.EXE
 ACCU-MAC.OVL
 VADIC.CTL
 ACCU-TEL.FIL
 Modem: Racal Vadic Auto Dial

<u>Command/Response</u>	<u>Description</u>
[Boot your microcomputer and enter ACCULINK I+ mode.]	
A>	(L) O/S prompt
A>async i.12 \$HOST	Invokes ACCULINK at 1200 baud; gets host number from ACCU-TEL.FIL and dials

[The \$ tells ACCULINK that the characters following the \$ are a telephone number or an entry in the speed-dialing phonebook ACCU-TEL.FIL.]

Dialing: 666-3333
Status: Ringing...

On line

[Ready to log on to host system. See Chapter 6 for instructions on setting up default files for the telephone numbers you dial most often.]

3.3 Log-on to VAX

This sample log-on demonstrates the steps involved in connecting with a host system.

- o Host System Hardware: VAX
 O/S: VMS
- o Local System Microcomputer
 O/S: CP/M-86
 Dr A: AC.CMD
 VAX.CTL
 ACCU-MAC.OVL

\$

(H) System prompt

[Ready to perform desired VAX processing.]

3.4 Sample SOURCE Log-on

You can access your account with THE SOURCE using the SOURCE macro supplied with your ACCULINK software. Edit your SOURCE macro to include the necessary information for your account; compile the edited macro using ACCUCOMP. See Chapter 10 for instructions on how to edit and compile macros.

Enter your SOURCE macro as MACRO#0 on the Macro Names List. See Chapter 9 for instructions on using an I+ mode command to enter a macro name.

- o Host System SOURCE computer accessed by Telenet communications carrier
- o Local System Microcomputer
O/S: MS-DOS
Dr B: AC.EXE
SOURCE.CTL
ACCU-MAC.OVL
Macro #0-SOURCE

Command/Response

Description

[Your microcomputer is booted and you can now enter ACCULINK I+ mode.]

B>

(L) O/S prompt

B>async i.12[source](cr)

(L) Invoke ACCULINK; type 12 for 1200, 30 for 300 baud; specify SOURCE macro

[Establish telephone contact with Telenet using your network phone number. The SOURCE macro executes all the remaining steps for the log-on. When the sequence is complete, you see the same messages and options displayed as after any successful log-on to THE SOURCE.]

3.5 File Transfers -- Host Does Not Support ACCULINK

You can use ACCULINK to transfer files between your microcomputer and many asynchronous host computers which do not support ACCULINK.

3.5.1 Uploading (Sending a File) to Host Computer Not Supporting ACCULINK

- o Host System Hardware: DECsystem10
 O/S: TOPS-10

- o Local System Microcomputer
 O/S: MS-DOS
 Dr A: AC.EXE
 ACCU-PUT.OVL

<u>Command/Response</u>	<u>Description</u>
[Boot your microcomputer and enter I+ mode.]	
A>	(L) O/S prompt
A>asyn i.30(cr)	(L) Invoke ACCULINK; type 12 for 1200, 30 for 300 baud

[Log on to your host system as you usually do.]

.

(H) HOST prompt

.^VF (H/L) Prompt for filename

File specification:doc.nam(cr)
(L) Specify filename on your microcomputer to be sent to the DECsystem10

(cr) [opt] A second Return causes host system prompt to reappear

.copy file10.nam=tty:(cr)
(H) Invoke DECsystem10 copy utility

^VP (L) Starts transfer of file

[The file DOC.NAM on the microcomputer is sent to DECsystem10 terminal port TTY where it is copied to a file named FILE10.NAM.]

++Raw ASCII file transferred++
(L) Message from ACCULINK indicating requested file successfully transferred

.

(H) System prompt returns

[Ready to resume normal processing.]

3.5.2 Downloading (Collecting) a File from Host Computer Not Supporting ACCULINK

- o Host System Hardware: DECsystem10
 O/S: TOPS-10

- o Local System Microcomputer
 O/S: MS-DOS
 Dr B: AC.EXE
 ACCU-GET.OVL

<u>Command/Response</u>	<u>Description</u>
[Boot your microcomputer and enter I+ mode.]	
B>	(L) O/S prompt
B>async i.30(cr)	(L) Invoke ACCULINK; type 12 for 1200, 30 for 300 baud
[Log on to your host system as you usually do.]	
.	(H) System prompt
.^VF	(H/L) Prompt for filename
File Specification:newfile.nam(cr)	(L) Specify filename to store file to come from DECsystem10
(cr)	[opt] A second Return causes system prompt to reappear

.copy tty:=file10.nam^VG(cr)

(H/L) Invoke DECsystem10
copy utility; start
transfer

[The file FILE10.NAM on the DECsystem10 is copied to terminal port TTY. From there it is transferred to the microcomputer, where it is stored under the name NEWFILE.NAM.]

. (H) System prompt returns,
indicating file has been
transferred

.^VZ (H/L) Closes file on the
micro

++File received++ (L) Message from ACCULINK
indicating file is closed

(cr) (L) Invokes system prompt

. (H) System prompt returns

[Ready to resume normal processing.]

3.6 File Transfers -- Host Supports ACCULINK

ACCULINK-Host software packages can run on the host systems listed below:

<u>Computer</u>	<u>Operating System</u>	<u>ACCULINK Host</u>
VAX	VMS	ACCULINK-VX
DEC-10	TOPS-10	ACCULINK-10
DEC-20	TOPS-20	ACCULINK-20
PDP-11	RSTS	ACCULINK-RS
PDP-11	RSX	ACCULINK-RX

3.6.1 Uploading (Sending a File) to Host Supporting ACCULINK

- o Host System Hardware: VAX
 O/S: VMS
 Software: ACCULINK-VX
- o Local System Microcomputer
 O/S: CP/M-86
 Dr A: AC.CMD
 ACCU-SND.OVL

<u>Command/Response</u>	<u>Description</u>
[Boot your microcomputer and enter I+ mode.]	
A>	(L) O/S prompt
A>async i.12(cr)	(L) Invoke ACCULINK; type 12 for 1200, 30 for 300 baud
[Log on to the host system. You are now ready to enter ACCULINK at the host end.]	
\$	(H) System prompt
\$r acculink(cr)	(H) Invoke ACCULINK-Host
ACCULINK-VX version x.xx [dd-mm-yy] Copyright (C) 1982, IE Systems Inc.	
ACCULINK-VX>what(cr)	(H) [opt] Check switch settings

Mode: ASCII
CRC: OFF
Inform: OFF
Filter: ON
Rsync: OFF
Vers1: OFF

ACCULINK-VX>inform(cr) (H) [opt] Invoke file size switch

ACCULINK-VX>what(cr) (H) [opt] Check switch settings; confirms INFORM is ON

Mode: ASCII
CRC: OFF
Inform: ON
Filter: ON
Rsync: OFF
Vers1: OFF

ACCULINK-VX>rec *.*(cr) (H) Specify filename(s) to be received on VAX; wildcard names are legal

[You are now ready to invoke I+ commands on your microcomputer.]

^VF (L) Prompt for filename

File Specification:*.dat(cr)
(L) Specify file(s) to be sent from your computer; this example sends .DAT files on default drive

^VS (L) Sends file(s) to host system

[The file(s) are now being transmitted.]

++TRANSFER COMPLETE++ (L) Message from ACCULINK indicating requested file(s) transferred

ACCULINK-VX>exit(cr) (H) Exit from ACCULINK-Host (^C also exits)

\$ (H) System prompt returns

[Ready to resume normal processing.]

3.6.2 Downloading (Collecting a File) from Host Supporting ACCULINK

- o Host System Hardware: VAX
 O/S: VMS
 Software: ACCULINK-VX
- o Local System Microcomputer
 O/S: MS-DOS
 Dr A: AC.EXE
 ACCU-RCV.OVL

<u>Command/Response</u>	<u>Description</u>
-------------------------	--------------------

[Boot your microcomputer and enter I+ mode.]

A>	(L) O/S prompt
A>async i.12(cr)	(L) Invoke ACCULINK; type 12 for 1200, 30 for 300 baud

[Log on to the host system. You are now ready to enter ACCULINK at the host end.]

\$	(H) System prompt
-----------	-------------------

\$r acculink(cr) (H) Invoke ACCULINK-Host

ACCULINK-VX version x.xx [dd-mm-yy]
Copyright (C) 1982, IE Systems Inc.

ACCULINK-VX>what(cr) (H) [opt] Check switch settings

Mode: ASCII
CRC: OFF
Inform: OFF
Filter: ON
Rsync: OFF
Vers1: OFF

ACCULINK-VX>send tape.dat(cr) (H) Specify filename(s) to be sent from VAX; wildcard names are legal

[You are now ready to invoke I+ commands on the microcomputer end.]

^VF (L) Prompt for filename

File Specification:*.*(cr) (L) Specify file(s) to be received at microcomputer end; this example receives (writes) .DAT files onto default drive

^VR (L) Receives file(s) from host

[The file(s) are now being transmitted.]

++TRANSFER COMPLETE++ (L) Message from ACCULINK indicating requested file(s) transferred

ACCULINK-VX>exit(cr) (H) Exit from ACCULINK-Host (^C also exits)

\$ (H) System prompt returns

[Ready to resume normal processing.]

3.7 Real-Time Output to Printer

You can use ACCULINK to interactively print out files from a host system.

- o Host System Hardware: DECsystem10
 O/S: TOPS-10
- o Local System Microcomputer
 O/S: CP/M-86
 Dr A: AC.CMD
 Printer

<u>Command/Response</u>	<u>Description</u>
[Boot your microcomputer and enter I+ mode.]	
A>	(L) O/S prompt
A>async i.12(cr)	(L) Invoke ACCULINK; type 12 for 1200, 30 for 300 baud
[Log on to your host system as you usually do.]	
.	(H) System prompt

Typically, to connect two computers directly to each other, you must "cross" the data lines on pin 2 and pin 3 -- pin 2 on L1 goes to pin 3 on L2, and vice versa.

- o Host System None

- o Local System1 Microcomputer
 O/S: CP/M-86
 Dr A: AC.CMD

- o Local System2 Microcomputer
 O/S: MS-DOS
 Dr A: AC.EXE

(L1) denotes Local System1; (L2) denotes Local System2.

<u>Command/Response</u>	<u>Description</u>
[Boot your microcomputer and enter I+ mode.]	
A>	O/S prompt
A>async e.96(cr)	(L1) and (L2) invoke ACCULINK at 9600 baud in Echo mode (e).
[Typing E enters Echo mode. Characters typed at (L1) are displayed on the screen at (L2), and vice versa. If the characters typed at one of the terminals do not appear on the screen at the other terminal, check to see if the cable connections are correct.]	
^VQ	Return to operating system
A>	O/S prompt returns
[Ready to resume normal processing.]	

3.9 Setting Up a Default File

You can use ACCULINK's default file capabilities to store a frequently used command line for easy access. Be sure the telephone number you want to autodial has been entered in ACCU-TEL.FIL. (See Chapter 6 for ways to specify telephone numbers.)

Here is the environment for this sample task; substitute the appropriate prompts for your system. Check Appendix A to see if there is an .MSC file on disk for your autodial modem. If not, see Chapter 10 for instructions on creating a macro to set up such a file.

```
o Host System      None

o Local System    Microcomputer
                  O/S: MS-DOS
                  Dr A: AC.EXE
                      ACCU-MNU.HLP
                      ACCU-MNU.OVL
                      ACCU-MAC.OVL
                      ACCU-CHN.OVL
                      HAYES.MSC
                      ACCU-TEL.FIL
                      ACCUCOMP.COM
                      ACCUCOMP.FRM
                  Modem: Hayes autodial modem
                  Text editor
```


A>async(cr) Invokes ACCULINK Master
Menu

[There are two ways to make selections for your default file from the ACCULINK menus: (1) type in the letter corresponding to the option of your choice; or (2) move the cursor under the letter corresponding to the option of your choice and press Return. Pressing the Spacebar moves the cursor forward through the list of options. Pressing Backspace moves the cursor back through the list of options.]

Command line>AC ? The command line is built
interactively as you set
parameters for your file

[The ACCULINK Master Menu has two lists. "Set Command Line Fields" lists options you can use to build the command line. "Command Line Utilities" lists the utilities included with your ACCULINK software.]

d (or Return) Choose option D (make
Default file) from Command
Line Utilities list

MAKE DEFAULT FILE The default file utility
creates/modifies default
file command lines

[On the Make Default File menu, a ? follows "P Primary Option." This reminds you to select P as your first command line field choice.]

p (or Return) Choose "P Primary Option"
from the Command Line
Utilities list

SET PRIMARY OPTIONS

ACCULINK Menu is invoked and gives the set of primary option choices

i (or Return)

Choose "I Interactive + mode (full duplex)" from Primary Options list

[As you choose options for your default file, notice that each parameter selection is recorded on the ACCULINK menu. Every time you select an option from either the Command Line Fields list or the File Utilities list on the main menu, you invoke a menu with a set of specific options for that field. Your option choices appear next to their fields on the main menu. The command line on the "set" menus is built with options you've chosen.]

DEFAULT Command line>ACCULINK I

Default file utility has redefined the command line

b (or Return)

Choose "B Baud rate" option from Set Command Line Fields

b (or Return)

Set Baud Rate screen appears; choose "B 1200" from Modem Baud Rates

Command line>ACCULINK I.1200

Baud parameter added

t (or Return)

Choose "T Telephone number" from Default File Command Line Fields

CBBS1

Enter the phone entry from ACCU-TEL.FIL

[You can enter a telephone number in digits, or you can enter the label you set up for that telephone number when you entered it into ACCU-TEL.FIL.]

- (cr)** Go back to Default menu
- 1** Choose "1 Write defaults to disk file" from Disk File Utilities

Enter default file name [d:filename]:b:cb1(cr)

[CB1 is the default filename you are using for all the commands you included in your default command line as it is written to disk. Specify "d:" (drive) only if you want the file on a different drive from the one you're logged on. You do not need to specify a file extension; ACCULINK automatically assigns .DFL.]

(ESC)Q Press Escape then Q to exit ACCULINK

[Pressing Escape returns you to the Main Default Menu; Q returns you to the operating system.]

A> O/S prompt returns

[To confirm that CB1 really exists, you can invoke it.]

A> O/S prompt

A>async * b:cb1 "ASYNC *" followed by a default filename is the command line for invoking default files

[Invoking your default file CB1 runs the options you chose for the command line CBBS1 from ACCU-TEL.FIL.]

CONNECT

Response from modem
confirming a carrier
connection

[Ready to start a CBBS session.]

3.10 File Transfers to Telex

To transfer files to Telex, you need to perform some preliminary tasks:

1. If you have an autodial modem, write a macro to autodial Telex, following the instructions in Chapters 9 and 10. If you do not have an autodial modem, follow the steps below, but dial Telex manually to make your connection.
2. You need some specific configuration parameters to access the Telex mailbox. Use ACCUCNFG to build the configuration (see Chapter 8 for instructions).
3. Set the following protocol characters:

MSTART/MSTOP	OFF
HSTART/HSTOP	OFF
4. Set the System Counter "Put Throttle" between 25 and 50, so that characters go out of your microcomputer at a fast rate, but not so fast that the Telex input buffer overflows. You can experiment with the setting.
5. Make a default file named TELEX.DFL while your Telex configuration is in use by ACCULINK.

6. Specify secondary option S, Show Characters Sent. Use the baud needed for Telex transfers. List your autodial macro in the MACRO#0 position on the Macro Names List, so it will be invoked when you use the default file.
7. The task involves PUTting some messages to Telex, then GETting some messages waiting for you on the Telex mailbox. Use your text editor to create a file that includes the messages you want to PUT to Telex. Use the Telex End of Message code, "NNNNN", and End of Transmission code, ".....", where necessary.

Here is the environment for this sample task; substitute the appropriate prompts for your system.

- o Host System ITT Telex
- o Local System Microcomputer
 O/S: MS-DOS
 Dr A: AC.EXE
 ACCU-MAC.OVL
 VADIC.CTL
 TELEX.DFL
 Modem: Racal Vadic autodial
 Text editor

<u>Command/Response</u>	<u>Description</u>
[Boot your microcomputer and invoke ACCULINK.]	
A>	(L) O/S prompt
A>async * telex(cr)	(L) Invoke ACCULINK and your Telex default file

[Your autodial macro will complete your telephone connection with Telex.]

ITT GA (H) ITT message appears

(cr) (L) Verifies connection

Bonjour (L) Enter your Telex
answer-back

^VF(cr) (L) Prompt for filename

File specification:mymess(cr)
(L) Specify the name of the
file you created containing
the messages you want to
PUT

^VP (L) Starts transfer

[Control characters and text of the file show on the
screen, since you set the S (Show Characters Sent)
option ON.]

++Raw ASCII file transferred++
(L) Message from ACCULINK
indicating file
successfully transferred

Call(s) accepted xxxzzz
(H) Message from ITT
indicating file accepted

[A message appears if there are messages for you on
the Telex mailbox. Assume there are for this task.]

^VF (L) Specify a file to
contain your messages from
Telex

^VG	(L) Tell ACCULINK to prepare space for the messages to come
:send messages(cr)	(H/L) Instructs Telex to transfer your messages
sesame(cr)	(L) Enter Telex Passkey
End of Transmission	(H) Telex indicates all messages have been transmitted
^VZ	(L) Closes file
^VQ	(L) Exit ACCULINK

[Now you can hang up the telephone.]

4. Managing Your Microcomputer

Chapter 4 contains information on disk and file utilities, printer handling, terminal emulators, and screen handling.

4.1 Disk and File Utilities

You can do disk file maintenance while in I+ mode. Invoke the Disk and File Utilities menu from I+ mode by pressing ^VU:

ACCULINK Disk and File Utilities
Version 2.xx
Copyright (c) IE Systems Inc., 1984

Summary of commands:

C - COPY filespec.sw = filespec.dw	P - PATH pathname
D - DIRECTORY filespec.sw/SYS	R - RENAME filespec.sn = filespec.dn
E - ERASE filespec.sw/ASK	S - STAT drive
H - HELP !!!	T - TYPE filespec.sn PAGE
I - INT+ return to INT+ mode	Q - QUIT to operating system
L - LOGIN drive	? - ? display summary of commands

where: filespec = a valid {O/S} specification
dn = no wildcards in destination filespec
dw = wildcards allowed in destination filespec
sn = no wildcards in source filespec
sw = wildcards allowed in source filespec
/ = optional switches

A:\>

To invoke a utility, enter the letter that stands for the command. The rest of the command name will appear on the screen. Enter additional parameters when required. Press Return to complete the command; cancel a command by pressing Escape.

The disk and file utility commands are listed below. Each example gives the option letter you type, the command that then appears on the screen, and sample filenames you might be required to type. An explanation of the example follows. The examples assume that you are logged on to drive A. (In CP/M-86, USER is used instead of PATHname.)

C COPY test.dat=b:nutest.dat(cr)

Copies file TEST.DAT to drive B and names it NUTEST.DAT.

D DIRECTORY(cr)

Displays a listing of the files on the logged drive. The SYS option gives statistics on the amount of space each file occupies.

E ERASE news.bad(cr)

Erases the file NEWS.BAD on the logged drive. The ASK option requires your confirmation before the file is erased.

H HELP(cr)

Gives a brief explanation of each of the disk and file commands.

I INT+(cr)

Returns to I+ mode.

L LOGIN b(cr)

Changes the logged drive. If the logged drive is changed and the ACCULINK overlay files are on another drive, returns to the drive containing the overlay files to invoke them.

R RENAME bad.day=good.day(cr)

Changes the name of file BAD.DAY to GOOD.DAY.

S STAT(cr)

Gives the number of bytes used, the number of bytes free, and the total number of bytes on the logged drive.

T TYPE sales.dat(cr)

Displays the contents of the file SALES.DAT. The PAGE option causes the file to be displayed one page at a time.

P PATH 1

Allows you to change the pathname.

Q Quit to {O/S}(cr)

Returns to the operating system.

? - ?(cr)

Shows a summary of utility commands.

4.2 Printer Handling

You can send output directly to your printer using ACCULINK, provided that the printer port on the microcomputer is not used for the communications port. Type ^VL to start printing output. Everything displayed on the screen will be printed. To stop printing, press ^VL again.

If your microcomputer printer buffer becomes full, and the remote system does not stop sending data, printing stops and printer logging is automatically turned off. The following message appears on the microcomputer screen:

++ Print FIFO full -- Turning OFF printer logging ++

To correct the problem, change the ACCULINK protocol characters HSTOP and HSTART to characters recognized by the host computer, if they are available. You can run ACCULINK at a lower baud to decrease the chance of the printer buffer becoming full.

If you turn off HSTOP and HSTART, you risk losing data. The message will not be received and printer logging will not be turned off when the buffer is full.

Toggle the printer back on by typing ^VL again. The output received between the time the message appears and the time you toggle the printer back on will not be printed.

4.3 Using Emulators

Most applications programs used by host computers are written to communicate with a specific terminal. Screen output from these programs is unreadable unless the intended receiver is present, or the actual receiver functions like the terminal the host expects.

Emulation makes it possible for one computer or device to function as if it were another computer or device. See Appendix E for information about individual terminal emulators.

When using an emulator, your microcomputer appears to a host computer to operate just like the terminal being emulated. Characters that have a certain function on the emulated terminal adopt those functions on your microcomputer screen.

The microcomputer is not capable of supporting all the functions of all the emulators. In most cases, however, the operation of an emulator is not significantly affected if a few of the functions are not supported.

Use the I+ command ^VE to invoke a menu that shows which, if any, emulator is active. You can use this menu to change the active emulator. See Chapter 8 for instructions on modifying the Emulator Names List for individual configurations.

When you use an emulator, the screen display parameters of the terminal being emulated control what appears on your microcomputer. If you enter an ACCULINK I+ command while the emulator is in use, the I+ command is superimposed on the emulator screen, with unpredictable results.

Since the emulator is used most often to work with the remote computer's program, I+ commands are rarely issued when the emulator is in control. If an I+ command is needed, either (1) turn off the emulator, enter the I+ command, then turn the emulator back on, or (2) use the I+ command while the emulator is on, then press the SET UP key twice to reset the emulator.

4.4 Screen-Write-Protect

Some host computers send control characters that might have unexpected or unwanted effects when they are received on the microcomputer. Turning the Screen-Write-Protect toggle on filters out the DELETE character and all control characters except TAB, CR, LF, BS, and BELL.

Screen-Write-Protect also filters the 8th, or high, bit from each data byte received. Each ASCII character contains 7 bits, with the 8th bit in the byte normally used for parity, or else ignored. Filtering the bit by using the Screen-Write-Protect ensures that only characters with consistent meaning are received on the microcomputer screen.

Although the filtered characters are prevented from appearing on the microcomputer screen, they appear in the file as it is written to disk. Chapter 8 contains instructions on changing the ACCULINK configuration parameters to keep unwanted characters from your file.

Clearing the Screen

Use the I+ mode command ^VC to clear (erase) the microcomputer screen.

Changing What You See on Your Screen

There are three secondary options that change what is displayed on the microcomputer screen:

- R Show characters Received
- S Show characters Sent
- Q Quiet transmission

These options can be toggled on/off for use in both I+ and Datalink modes. For more information on these options, see Chapter 2.

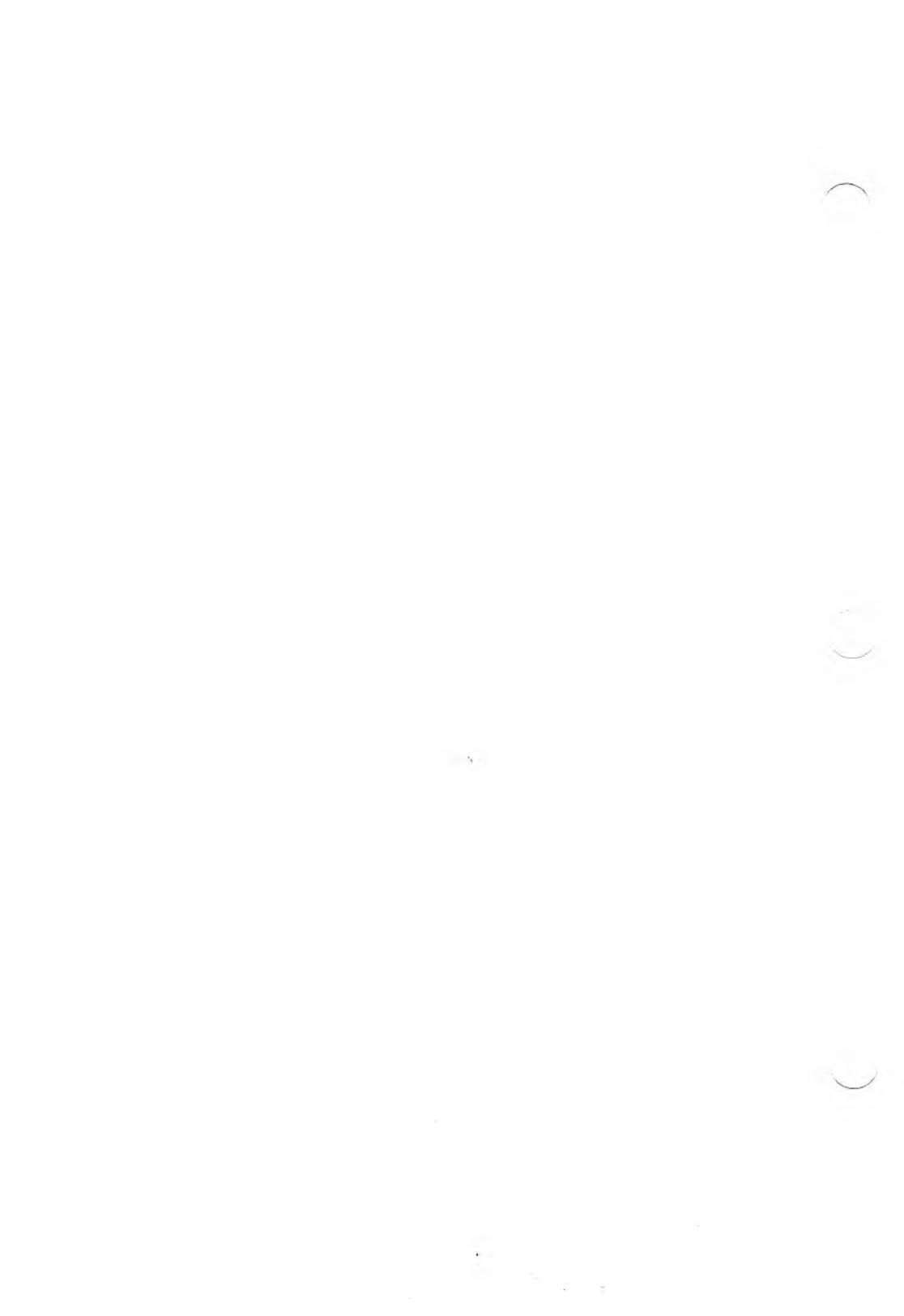
The following commands can be entered directly from Datalink mode. For more information on these options, see Chapter 2.

- ^C Clear work area
- ^R View characters Received
- ^S View charactersSent
- ^T Status message
- ^U Erase current line
- ^V View characters received and sent
- ESC Abort a transfer

4.5 The LABELS Program

With the LABELS program, you can assign values to four function keys in Set 2 by entering those values into the answer-back strings. You can enter the values through either the configuration or the I+ Help menu. The programmed values of the answer-back strings will then appear in the status line for the corresponding function keys.

When you make changes to the programmed values of the answer-back strings, the labels do **not** change accordingly. You must change the labels manually using the LABELS program.



5. Managing the Communications Line

Chapter 5 contains information on:

- o XON/XOFF handshaking
- o Using ACCULINK with XModem
- o ACCULINK Datalink protocol
- o PUT and GET between two microcomputers
- o Secondary screen options

5.1 XON/XOFF Handshaking

The control characters represented by XON and XOFF allows your microcomputer and the host computer to signal each other when data flow is overloading the input buffer on the receiving machine.

XON and XOFF represent "ready" conditions. When the receiving computer signals the sending computer to stop transmitting data, the ready condition is turned OFF (XOFF). When the receiving computer signals the sending computer to resume transmitting data, the ready condition is turned ON (XON).

These are the usual protocol characters:

Micro (M) to Host: MSTOP = XOFF = ^S = 13 Hex
MSTART = XON = ^Q = 11 Hex

Host (H) to Micro: HSTOP = XOFF = ^S = 13 Hex
HSTART = XON = ^Q = 11 Hex

If you use XON/XOFF Handshaking, both your microcomputer and the host must be in XON condition at the start of transmission. In a transfer from host to the microcomputer, if data is being transmitted to the microcomputer too fast for it to handle, and the input buffer on the microcomputer is in danger of overflowing, the microcomputer sends an XOFF (not ready) signal to the host. The host stops transmitting data until the microcomputer sends an XON signal indicating it is "ready" to receive more data. This prevents the loss of data because of input buffer overflow.

If you do not use XON/XOFF Handshaking, turn off MSTOP, MSTART, HSTOP, and HSTART. Select the Change Parameters Menu from the Master Menu. Choose option P (Protocol Characters) and press the Spacebar at each handshaking option. To change the settings permanently, use ACCUCNFG (see Chapter 8 for instructions).

5.2 Using ACCULINK with XModem

ACCULINK can access many public domain computer systems, such as Bulletin Boards, by dialing the correct telephone number.

ACCULINK supports the Ward Christensen XModem protocol, which is a public domain protocol. ACCULINK users can transfer files to and from the many different remote systems that support the XModem protocol. Select Secondary Option U (User's Group protocol) to use XModem protocol.

To Send a file to a system -- for example, a Bulletin Board -- using XModem protocol, follow these steps:

1. Enter this command line to invoke ACCULINK at the baud of the Bulletin Board:

async iu.bb(cr)

2. Establish connection with the remote system, as usual.
3. Follow the Bulletin Board's instructions to get to the menu for a file transfer.
4. To send a file to the Bulletin Board system, enter a command in this format:

XModem R filespec(cr)

5. Type ^VF and specify a filename as usual for an ACCULINK transfer.
6. Type ^VS to send the file.
7. The local system prompt appears when the file transfer is complete.

To receive a file from a remote system supporting XModem, follow the same procedure, but substitute these steps:

4. Enter:

XModem S filespec(cr)

6. Type ^VR to receive the file.

5.3 ACCULINK Datalink Protocol

When ACCULINK is running on both computers, or when the remote computer supports XModem protocol, files can be transferred using the ACCULINK Datalink protocol. You can use this protocol for file transfers between two microcomputers running ACCULINK-Micro, as well as between a microcomputer running ACCULINK-Micro and a host computer running ACCULINK-Host. See Appendix C for instructions on using an ACCULINK-Host.

The ACCULINK Datalink protocol includes sophisticated error-checking features which automatically retransmit any block of data with an error until either the block is accepted, or the preset maximum number of errors is exceeded. This error-checking ensures that data is not lost or distorted by transmission line noise.

5.3.1 User Messages

ACCULINK allows users to exchange messages while in Datalink mode. The user types the message followed by a Return. The message is then sent to the other user's screen. (If ACCULINK-Host is running on the remote system, user messages are ignored by the host.)

A message can use all 85 printable ASCII characters, and can contain up to 80 characters. A message is sent automatically when it reaches 80 characters.

To delete a character from a user message, press Delete or Backspace. Pressing ^U deletes the whole message. Press the Return key or the Linefeed to confirm and send a user message.

5.3.2 Other Features

Several other features add to the versatility of the ACCULINK Datalink protocol:

- o Files can be transferred accurately at 9600 baud, or faster on computers capable of handling higher rates.
- o Wildcard designations can be used so that groups of files can be transferred with one command.
- o Files can be transferred with the computers unattended, if macros are used to handle autodialing and log-on procedures.
- o ACCULINK Datalink supports the Ward Christensen XModem public domain protocol.

The easiest way to use the Datalink protocol between two microcomputers is with the CALL macro. CALL establishes one microcomputer's control over another microcomputer running the Slave macro ANSWER.

5.4 PUT and GET Between Two Micros

The microcomputer doing a PUT in this type of file transfer needs minor adjustments to ACCULINK's protocol characters. The end-of-line turnaround characters, EOL CHAR and EOL ACK, are set to None by pressing the Spacebar at each option in the ACCULINK Change Parameter Menu, or by using ACCUCNFG.

The Receiver Timeout Counter, which is one of the System Counters, is set to 1/4 of its "factory set" value. See Chapter 8 for instructions on changing ACCULINK configurations.

Use the following command line:

async is.bb(cr)

where **bb** represents the first two digits of the baud. Using Secondary Option S causes the characters sent to be displayed on your screen. There is a slight delay between each character sent; this prevents overflow of the input buffer on the other microcomputer.

You can create default files that include the parameters needed to PUT and GET between two microcomputers. Then you can invoke the default file containing the parameters suited to the transfer.

5.5 Secondary Screen Options

Secondary options provide additional ACCULINK features (see Chapter 2 for a description of the secondary options by mode). Include secondary options in a command line or enter them directly from I+ or Datalink mode. The command line can list up to 10 secondary options. Enter the secondary options immediately following the primary mode selection, with no blank spaces between options.

Datalink secondary options must be entered in the command line or from I+ mode. Toggle secondary options from I+ mode in one of two ways:

- o Press \wedge VO to invoke the Secondary Options Menu and choose an option. Invoke the menu again to choose another option.
- o Enter \wedge VO and the letter of the option. For example, enter \wedge VOP to select and toggle secondary option PUT. If you then type \wedge VOS, turning it ON, ACCULINK will display all data sent.

6. Managing the Telephone

Chapter 6 contains information on:

- o Analog Loopback Test for modems
- o Modem modes
- o Autodial and autoanswer
- o Remote control with macros

6.1 Analog Loopback Test (SELFTEST) for Modems

ACCULINK is supplied with a SELFTEST macro to ensure that your microcomputer is able to send and receive data between its active communications port and the modem.

To run the test, plug an asynchronous modem with a properly configured cable into the asynchronous data communications port. If the modem does not have an analog loopback (ALB or AL) switch, then plug a DB-25P RS232C connector into the communications port of your microcomputer.

The pins on the DB-25P should be tied (soldered) together as shown:

2	┌	TD
3	└	RD
4	┌	RTS
5	└	CTS
8	└	DCD
6	┌	DSR
20	└	DTR

All microcomputers need pins 2 and 3 tied, but not all computers need pins 4 and 5 tied and/or pins 6 and 8 and 20 tied.

Start by turning on the ALB switch (or plugging in DB-25P). Run the SELFTEST by typing:

```
async i.xx [selftest](cr)
```

where xx is the correct baud, such as 30 for 300 or 12 for 1200.

The ACCULINK macro executes the test. If it is successful, the following message is displayed:

```
ACCULINK AUTO-LOOPBACK TEST
```

```
Loop back test.....Passed
```

```
Type 'R' to retry, 'Q' to quit, or 'I' for  
Int+ mode:
```

If the test fails, you see this message:

ACCULINK AUTO-LOOPBACK TEST

Loopback test FAILED

The loopback test failed, possible problems:

- 1) Is the loopback connector installed**
 - 2) Is the correct port handler installed**
- Type 'R' to retry, 'Q' to quit, or 'I' for
Int+ mode:**

A failed test requires troubleshooting. If the modem has an ALB switch, check to make sure that:

- o The ALB switch is ON.
- o The modem is connected to the correct port.
- o The cabling is correct (check your modem and microcomputer manual).

If the test still fails, turn the ALB switch off and use the DB-25P connector. If the test works, the problem is probably the modem or cable. If the test does not work, the cause is probably associated with the port on the microcomputer.

If you are using the DB-25P connector, check to make sure that:

- o The DB-25P is plugged into the correct port.
- o The pins on the DB-25P are tied as shown in the diagram earlier in this section.

SELFTEST is useful, but it is not a required test. If you have problems transferring files, be sure to perform the test.

6.2 Modem Modes

ACCULINK uses only asynchronous modems for data communications over a telephone line. The modems can operate at full duplex or at half duplex, depending on the requirements of the remote system.

The modem must be set to an operating mode that permits transfer, such as on-line, and not to an analog or digital loopback mode. Check the modem manuals for instructions on setting the modems correctly.

6.2.1 Originate and Answer Modes

To use ACCULINK for communicating through asynchronous modems, one modem must be set to Originate mode and the other to Answer mode. When communicating with a host system, your microcomputer normally uses Originate mode and the host system uses Answer mode. Check the modem manual to see how to set the modems to Originate and Answer modes.

Either modem can initiate a connection, but the transmit and receive frequencies are configured so that the transmit frequency for Answer mode is the same as the receive frequency for Originate mode, and vice versa. The high-pitched tone heard when connecting with a remote system over the telephone comes from the modem on the remote computer.

6.3 Using an Autoanswer Modem

To autoanswer with a modem, set Data Terminal Ready (DTR) to high, or active. DTR is usually activated by the microcomputer, but often you can turn it on by toggling a switch on the modem.

Use Secondary Option A (Answer) in the command line to cause the modem to answer the telephone.

6.4 Using Autodial Modems

If you have an autodial modem, you can use ACCULINK to dial telephone numbers. You need a macro that invokes your modem's autodial capability. Check the list of macros in Appendix A to see if it contains a macro for your modem. If not, use one of the supplied macros as a model and write your own, following the instructions for editing macros (Chapter 10).

To autodial with a modem, set DTR to high, or active. DTR is usually activated by the microcomputer, but often you can turn it on by toggling a switch on the modem.

6.4.1 Autodialing Your Modem with ACCULINK

There are three ways to specify telephone numbers using ACCULINK: with the command line, with ACCU-TEL.FIL, and with a default file. These methods are described in the next section.

The Command Line

Enter the command line from the operating system or through the menus to autodial a modem. Specify:

- o The primary option
- o Any secondary options
- o Baud
- o The telephone number, using digits preceded by a \$
- o The macro name for the modem enclosed in square brackets []

For example:

```
async i.12 $1-777-888-9999[vadic]
```

The most common use of this method is to test a macro or to log on to a host computer you do not plan to connect with often.

ACCU-TEL.FIL

For telephone numbers that are frequently used or that need to be readily available, use the ACCULINK phonebook, ACCU-TEL.FIL, to store them.

ACCU-TEL.FIL is a telephone directory that is easily added to or edited with a text editor; it is intended for speed dialing.

Each number in ACCU-TEL.FIL must be labeled; use a mnemonic label that is clearly associated with the telephone number. Specify the macro for the modem, as well as macros to do other tasks, such as log-on or transfer a file. (See the User Notes in Chapter 10 for the command to invoke additional macros from a macro.)

Each ACCU-TEL.FIL entry can contain up to 50 characters. The format for entries is:

Mnemonic: phone number[macro] ;comment

Follow these guidelines in creating your entries:

- o The mnemonic must begin with an alphabetic character, but it can include numbers.
- o The telephone number must be in digits with underscores and spaces for pauses.
- o The macro name must be enclosed in square brackets, []. Do not enter a space between the telephone number and the opening square bracket.
- o The semicolon (;) is a delimiter. The words following it are user messages, ignored by the program.

To invoke an entry from ACCU-TEL.FIL, replace the telephone number in the command line with the mnemonic label from ACCU-TEL.FIL, for example:

async i.12 \$telenet(cr)

The Default File

You might want to store some frequently used numbers so that they can be accessed quickly. For these, set up a default file using this procedure:

1. Use the Default File Utility from the ACCULINK Master Menu and set up a command line. Choose option T (Telephone number) as one of the fields and enter the telephone number or ACCU-TEL.FIL entry.
2. Write your default file to disk.
3. To invoke your default file, type:

async * defaultname(cr)

Some operating systems allot a minimum amount of space (for example, 2K) for each file entered on a disk; this might be more space than the default file uses. Also, some operating systems set a maximum number of file directory entries on each disk; each default file becomes a directory entry.

Thus the default file method is the quickest, but it uses more space than the other methods. A line in ACCU-TEL.FIL is an efficient use of space. You should weigh speed versus storage in deciding which numbers merit default files.

6.4.2 Additional Information on Autodial Modems

Tone Dialing

ACCULINK uses pulse dialing as a default during the dialing process. To change to tone dialing, insert a percent sign (%) in the telephone number.

Pauses in the Dialing Process

ACCULINK recognizes the underscore (_) and the space () as pause signals. Some modems recognize other characters as pause signals, such as the comma (,).

If the modem recognizes a pause character different from those ACCULINK recognizes, use the "Standard ACCULINK Phone Number Parser" macro to translate ACCULINK pause characters to those of the modem. This macro is supplied with ACCULINK disk(s), and is included with the sample macros at the end of Chapter 10.

6.5 Remote Control with Macros

This section describes how one microcomputer can control another using macros.

6.5.1 The ANSWER Macro

The ACCULINK software package includes the ACCULINK Remote Control Log-on, or ANSWER, macro. This macro allows one microcomputer to control another microcomputer that is running the ACCULINK ANSWER macro.

Use the ANSWER macro to communicate with a microcomputer that does not support ACCULINK, but does support another communications program that lets the microcomputer act as a terminal. If ACCULINK will be running only on the microcomputer to be controlled, the wiring on the modem, if one is used, or on the terminal in the case of direct connection, must be set up for a DCE (data communication equipment) device.

The supplied ANSWER macro contains a dummy Username and Password for logging on to the macro. Use the TYPE command to read the file ANSWER.MSC. Note the ID and Password.

To change the Username and/or the Password, edit the ANSWER macro with a text editor. Enter the new Username and Password. Then compile the ANSWER macro using ACCUCOMP, to create a new ANSWER.CTL file.

In this discussion, the controlling microcomputer is called Master; the microcomputer being controlled is Slave. The ANSWER macro must be run on the microcomputer that will be controlled, the Slave.

Follow these steps to use the ANSWER macro:

1. If both computers are running ACCULINK, invoke ACCULINK on Master and on Slave at the same baud.

If only Slave is running ACCULINK, invoke the communications program on Master at the desired baud and invoke ACCULINK at that baud on Slave.

2. This message is displayed on Slave:

-->Show user I/O (Type Y or N):

Type Y. Slave displays brief explanations of the commands given at Master. (You can remove this option from the macro using the text editor.)

3. Invoke the ANSWER macro on Slave, either in the command line or using ^VN after you invoke ACCULINK.
4. Press ^C three times on Master as an "attention" signal to ACCULINK that Master is the controlling microcomputer.
5. A prompt for Username is displayed on Master. Enter the Username and press Return.
6. A prompt for Password is displayed on Master. Enter the Password and press Return. Nothing will show on the screen.
7. If the log-on information is correct, this prompt appears on Master:

AC-REMOTE>

8. Type H and press Return. This menu appears:

ACCULINK COMMANDS

B - Bye (logout)
F - Specify file to send/receive
G - Get file
H - display this Help text
P - Put file
S - Send file
R - Receive file
? - Other (ACCULINK I+ commands)
- Send message to operator

9. Choose the desired command and press Return.

ACCULINK can be exited on the Master side. As long as the ANSWER macro is not aborted on Slave, you can invoke ACCULINK again on Master, press ^C three times, and reinstate Master's control over Slave.

To transmit a file when both Master and Slave are running ACCULINK, follow these steps:

<u>Command/Response</u>	<u>Description</u>
AC-REMOTE>Fatest.dat(cr)	Specify name of file to be received on Slave (do not enter a space between F and the first letter of the filename)
AC-REMOTE>^VF	Master prompt for filespec to enter name of file to send
File Specification:bttest.dat(cr)	Specify name of file to be sent from Master
AC-REMOTE>R(cr)	Commands Slave to receive file
(cr)	Asks for prompt
AC-REMOTE>^VS	Commands Master to send the file

As this sequence of file transfer commands demonstrates, Master gives the normal I+ mode commands; Slave gives the commands unique to the ANSWER macro.

If you run ACCULINK only on Slave, just the ANSWER macro commands are used. G (GET) and P (PUT) are

used to transmit files, as they are in a transfer between a microcomputer running ACCULINK and a host system that is not running ACCULINK.

6.5.2 The CALL Macro

If ACCULINK is running on both microcomputer, use the CALL macro to establish one microcomputer as Master over a Slave microcomputer running ANSWER.

Invoke ANSWER on the Slave microcomputer. Invoke CALL on the Master microcomputer. CALL automatically logs on to ANSWER.

This screen appears:

```
CALL ACCULINK<-> ACCULINK FILE TRANSFER MASTER
                                     [1.00]
```

ACCULINK Transfer Options

- S - SEND file to remote computer
- R - RECEIVE file from remote computer
- F - specify FILENAME for transfer
- E - EXIT to ACCULINK I+ mode
- Q - QUIT to system

Current transfer filename: ACCULINK.DAT

Type -- If you want to --

- F Specify the name of the file to be transferred
- S Send the file specified with the F option to the remote computer
- R Receive the file specified with the F option from the remote computer
- E Exit

CALL controls the entire session. ANSWER does not need any separate commands to transfer the file. If you want to send a file from Master, type **F**, specify a filename, then type **S**. Or just type **S**, without specifying a filename, and ACCULINK.DAT will be sent to Slave.

7. Hardware Installation

This chapter describes how to connect cables, ports, and modems.

ACCULINK software is used with either a direct connection to the remote computer, or a connection using asynchronous modems and a telephone line. You can establish a connection with any of the following:

- o A microcomputer running ACCULINK
- o A microcomputer running another asynchronous communications program
- o A terminal
- o A host computer running ACCULINK-Host
- o A host computer not running ACCULINK-Host

7.1 Connecting Cables

Use an RS232C interface cable with a DB-25 connector at each end to attach your microcomputer to another hardware device. See the diagram in Chapter 7.2 for correct cable configurations.

In a direct connection, RS232C wires are joined to these DB-25 pins:

<u>PIN</u>	<u>FUNCTION</u>
2	Transmitted Data
3	Received Data
7	Signal Ground

For a connection using asynchronous modems, RS232C lines are joined to these DB-25 pins:

<u>PIN</u>	<u>FUNCTION</u>
2	Transmitted Data
3	Received Data
7	Signal Ground
20	Data Terminal Ready

7.2 Ports

Ports on computers and modems are one of two standard types:

DCE	Data Communications Equipment
DTE	Data Terminal Equipment

Check the manual for each device to find out the type of port it uses.

The functions of DB-25 pins are defined using a DTE port as the master port. The ports interact with each other through the DB-25 pins to transfer data signals.

Each pin on a DB-25, except the ground pins, sends a data signal in one direction, based on signals traveling between a DTE port and a DCE port. For example, Pin 2, Transmitted Data, sends a data signal from a DTE port to a DCE port. Pin 3, Received Data, sends a data signal from a DCE port to a DTE port.

To connect two hardware devices using the same port type (e.g., DTE port to DTE port), two of the RS232C wires must be crossed. The wire soldered to Pin 2 of the DB-25 at one end of the cable is soldered to Pin 3 of the DB-25 connector at the other end of the cable. This routes the data signals so that they travel in the same direction as if they were going to the opposite type of port.

Some hardware requires a special cable connection. Read your hardware manuals before connecting your microcomputer to another device.

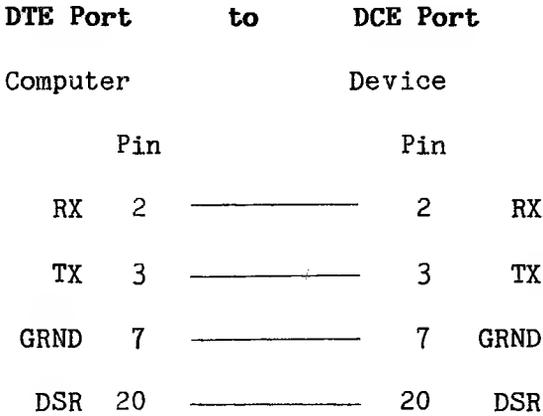
Almost all modems have DCE ports. The table below lists in alphabetical order some types of computers, the kind of port on each, and the type of RS232C cable connection each requires to be connected to a device with a DCE port.

Configuration: Computer to DCE Port

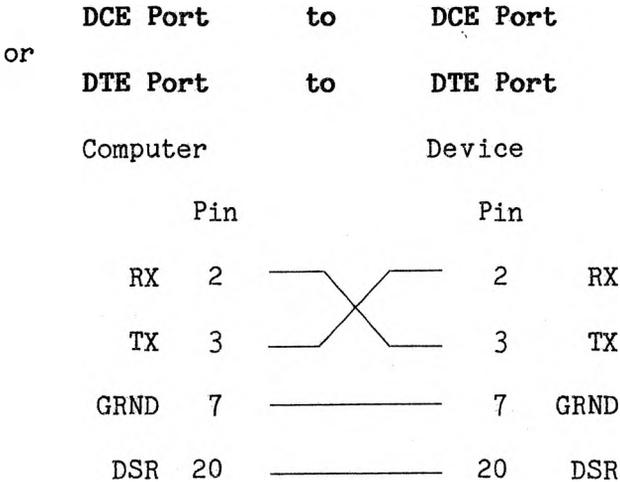
<u>COMPUTER</u>	<u>TYPE OF PORT</u>	<u>CABLE SETUP</u>
Altos	DCE	Crossed
Apple	DCE	Crossed
DEC Rainbow	DTE	Straight
Gavilan	DTE	Straight
HP 150	DTE	Straight
IBM PC (Compaq)	DTE	Straight
Northstar Advantage	DCE	Crossed
Televideo 802	DTE	Straight
Victor 9000	DTE	Straight
Xerox 820	DTE	Straight

The RS232C cable wire attachments to DB-25 pins for both types of connection are shown in the diagram below.

Straight Connection



Crossed Connection



7.3 Modems

Connect the modem to your microcomputer using an RS232C cable with a DB-25 connector set up for the type(s) of ports you are using for the interface. The modem can be connected to a telephone either through a modular telephone cable direct to the telephone line, or through an acoustic coupler, which holds the telephone handset. Consult the modem manual for instructions on connecting the modem to your telephone.

See Chapter 6 for additional information on modems.

8. Software Installation

Chapter 8 describes:

- o Profile menu options
- o Building and modifying configurations
- o Profile card parameters and utilities
- o Making configuration default files

ACCULINK's configuration program, ACCUCNFG, is organized so that a user can maintain different communications configurations to suit various remote systems. The menus for ACCUCNFG are set up to resemble a file drawer, with an individual profile card for each communications configuration.

ACCULINK comes with a configuration containing "factory set" parameters. These are the most common values for each setting, and this basic configuration allows you to use ACCULINK with many other systems without making any changes.

8.1 Profile Card Drawer Organization

The profile card drawer holds up to 25 profiles, and the cards are numbered sequentially. Each profile, or configuration, you build becomes the last card in the drawer. If you erase a profile, the cards following that profile are renumbered.

The card at the "top" of the profile card drawer is the Active card, the one being worked on. You can move a card to the "top" of the drawer by moving cards backward and forward through the drawer. The Active or top card is highlighted like this:

[1. FACSET]<=Active

A status line at the bottom of the Profile Menu shows:

- o The number of the profile card that is active
- o The total number of cards in the drawer
- o The profile currently in use by ACCULINK

The ACCULINK profile contains the configuration ACCULINK uses each time the ACCULINK is invoked, until you select another configuration.

8.1.1 Configuration File Locations

The configuration in use by ACCULINK is automatically loaded into the file ACCULINK.PRO. Other configurations (profile cards) are contained in the file DRAWER.PRO. The contents of ACCULINK.PRO are loaded into the ACCULINK kernel when you invoke ACCULINK.

S SELECT the profile card containing the configuration ACCULINK will use. Any new cards being built will be initialized with the values of the profile currently selected.

These are the profile card drawer options:

- + Move toward the back of the card drawer, with each card moving to the top from first to last.
 - Move toward the front of the card drawer, with each card moving to the top from last to first.
- C Close drawer/exit. Invokes the Close Drawer screen. Then you can choose either option Q (Quit) and return to the operating system, or C (Close) the drawer, which saves any changes made to any of the profile cards during the ACCUCNFG session.

8.1.3 Changing the Configuration in Use

To change the configuration in use by ACCULINK, choose option S (Select) from the Profile Menu. The Select Profile screen appears.

Move the card for the configuration to the "top" of the drawer by pressing + or -. When the desired card is at the Active position, choose option S again.

The profile is written to disk and the status line at the bottom of the screen changes to reflect the number of the profile card. The name of the ACCULINK Profile also changes.

8.1.4 Closing Profile Card Drawer

Press Escape to return to the Profile Menu, and choose option C to close the drawer and exit from the menu. The Close Drawer screen appears.

If you made no changes to any profiles since you invoked ACCUCNFG, choose option Q (Quit) and return to the operating system. If you changed any programs, select option C, so that the changes are saved.

8.2 Building/Modifying Configurations

The parameters that can be altered are the same whether a new profile is built or an existing one is modified, so the menus are the same for either option. The only difference is that choosing option B (Build) from the Profile Menu leads to a screen where you enter the name of the new profile. Then press Return and the Change Profile Menu appears with the name entered last on the list of profile cards.

Choosing option M (Modify) from the Profile Menu leads to the Modify Profile screen. Move the desired card to the "top" of the drawer, and choose option M to confirm the choice. When the Change Profile Menu appears, the card chosen to be modified is the Active card.

8.3 Profile Card Parameters

The Change Profile Menu looks like this:

CHANGE PROFILE ACCULINK CONFIGURATION v2.xx

Set Profile Card Parameters Profile Card Utilities

A Answer-back strings	I Initialize profile card
C system Counters	S profile card Summary
D profile Description	
E Emulator names	
F File management	
H Hidden characters	
N macro Names	
O Output parity	
P Protocol characters	
T option Toggles	

PROFILE CARD> TELEX

The following sections describe each of the options on the menu.

8.3.1 Answer-Back Strings

You can enter up to 10 answer-back strings for each configuration. Each string can contain up to 80 characters.

If your microcomputer has function (PF) keys, some of them have been left free for you to use for answer-back strings you enter. Check the bottom of your screen for keys that say ansbk0, ansbk1, and so on, to see how many free keys you have.

By writing answer-back strings to perform key sequences used frequently, you can control an ACCULINK session using the function keys.

Answer-back strings can be used as mini-macros by embedding a ^V command in the string. For example, answer-back string #1 could contain autodial instructions, string #2 could contain the log-on sequence, and string #3 could contain ^VP to PUT a file to the host system.

The ^Vn command can be embedded in an answer-back string to invoke another answer-back string. An answer-back string should not invoke itself again, or it will cause an infinite loop. (Press Escape to exit an infinite loop.)

8.3.2 System Counters

Option C invokes the System Counters screen. Setting these counters affects the way your microcomputer handles data flow from a remote system. A brief description of each option follows:

- A Characters skipped after EOL ACK. Some remote systems send characters after the normal EOL ACK at the end of a record. These characters must be ignored.
- B Size of I/O buffer (sectors). This sets the number of 128-byte sectors received that are buffered in memory. Usually, 16 is a safe setting. If you cannot use handshaking, the entire file might need to be buffered in memory. A safe upper limit setting is 128 sectors.

- C GET character mask (bits). If a remote system sends bits that are not wanted in the receiving file, such as a parity bit, set the mask to the number of bits in each byte to allow in the file. If the mask number is set at 7, the eighth bit is turned off in the file.
- D Number of error retries. Used in Datalink mode to set the number of times to retransmit a data block after a protocol error is found.
- E Default port number. Always set to 1 in the "factory set" configuration.
- F Number of answer-back strings entered for the configuration [0-x].
- G Character output throttle. Use to adjust the speed at which characters go out of the microcomputer during a PUT. Set from 0 to 100. A high setting slows output.
- H Receiver timeout counter. The timeout counter value specified is the duration of one time unit for your microcomputer. The number of time units the receiving computer waits depends on the operation. This value is not usually changed because ACCULINK is designed so the "factory set" value works in most situations.
- I Transmitter timeout counter. The timeout counter value specified is the duration of one time unit for your microcomputer. The number of time units the transmitting computer waits depends on the operation. This value is not usually changed, because ACCULINK is designed so the "factory set" value works in most situations.

8.3.3 Profile Description

To enter a short explanation of the purpose of the profile, choose option D from the Change Profile Menu.

8.3.4 Emulator Names

The ACCULINK software includes emulators that your microcomputer supports. See Appendix E for specific information on each emulator. See Chapter 4.3 for general information about emulators.

The Emulators Names List for the "factory set" ACCULINK configuration contains the names of five emulators. Any emulator can be invoked if there is an .OVL file on disk.

To enter an emulator name on the list, or change the list position of an emulator, move the cursor to the position number and press Return. Enter the name of the emulator and press Return again.

The emulator in position #1 is invoked automatically when the configuration is used, if Always Invoke Emulator is toggled ON. Emulators not included on the list will not be in active memory when the configuration is invoked.

8.3.5 File Management

Option F allows you to organize some of the files connected with the configuration:

- A Drive containing overlay (OVL) modules. Drive can be A through P, or Default. Many ACCULINK users copy all their overlay files to one disk, and specify that disk drive. If the drive is

specified in all configurations, or all the overlay files are on the default drive, and the disk is in the drive, ACCULINK can always retrieve any overlay files needed.

- B Default filename for file transfers. If a filename has not been specified since invoking ACCULINK, whatever name is entered here is used whenever this configuration is used.

8.3.6 Hidden Characters Saved

Choosing option H from the Change Profile Menu displays a chart that shows all 256 characters. Individual characters can be toggled to SHOW or HIDE in a GET or a PUT. Characters toggled to SHOW appear in a file; characters toggled to HIDE are not in the file. The box will be blank if a character is toggled to HIDE.

The chart goes from 0 through F hex, across and down. Use the Spacebar, Backspace, <, and > to scroll down, up, and across the chart.

Read across the chart, then down, to find the hexadecimal notation for each character. To find the hexadecimal notation OD for a CR, press the Spacebar to scroll down until CR appears in one of the boxes. See which of the numbers along the top is above the box holding CR. It is 0, which is the first hexadecimal value for CR. Read down the outside left column to the value opposite CR. It is D, which is the last hexadecimal value for the character designating CR.

Move the cursor to the box on the chart containing the character, then press Return to toggle SHOW or HIDE.

8.3.7 Stored Macro Names

Choose option N from the Change Profile Menu to enter macro names. The default names for the macros on the ACCULINK disk are MACRO#0 through MACRO#8, with SELFTEST in the MACRO#9 position.

You can replace any or all of the default names with the names of macros you use regularly. The names entered become the default names for macros when the configuration is used.

You can also use different default macro names with different configurations. Macro names specified in a command line override default macro names.

If the MACRO#0 position is kept empty (that is, if you do not enter a macro name), you can also specify macros in the command line without invoking any macros. Do this by using a comma to fill the MACRO#0 place. If the MACRO#0 position is not empty, the macro in MACRO#0 is invoked.

Move the cursor to the position of the macro name to replace, or do not make any entry to keep the position empty. Press Return, then enter the new name for the macro. Press Return again to confirm the choice.

8.3.8 Parity for Output

Output parity controls the eighth bit of a binary character. Each bit in a binary character is either a 0 or a 1.

ACCULINK software takes control of parity from the microcomputer hardware while the program is running. ACCULINK transmits an 8-bit data word in and out of the communications port regardless of the parity setting.

In I+ mode, parity can be set or ignored, depending on the requirements of the remote system. Datalink mode requires all 8 bits in the data word, so a parity set by the user is not in effect during a Datalink transfer.

The parity settings ACCULINK supports are:

- E Even. The number of 1's in the eight bits must be even. If there is an even number of 1's in the first seven bits, the eighth bit will be 0.
- I Ignore. The eighth bit is transmitted whether it is 1 or 0.
- M Mark. The eighth bit is always set to ON, which is 1.
- O Odd. The number of 1's in the eight bits must be odd. If there is an even number of 1's in the first seven bits of the character, the eighth bit will be 1.
- S Space. The eighth bit is always set to OFF, which is 0.

8.3.9 Protocol Characters

Protocol characters ensure that your microcomputer and the remote system communicate using predictable signals.

Handshaking

The handshaking character settings change only if the remote computer uses characters other than ^S (XOFF) and ^Q (XON) to control data flow. Press the Spacebar at each handshaking character to turn the option OFF. See Chapter 5 for more information on handshaking.

Turnaround Characters

- o **End of Line Characters (EOL CHAR and EOL ACK):** At the end of each line of data, or record, transmitted during a PUT, the microcomputer sends an EOL CHAR to the remote computer. The microcomputer waits for a response from the remote before transmitting another record.

The remote computer acknowledges the EOL CHAR signal by sending an EOL ACK to the microcomputer. All characters received from the remote computer are ignored until EOL ACK. Characters are displayed on the screen, but nothing more is sent from the microcomputer until EOL ACK is received.

- o **End of File Characters:** These characters signal to the receiving computer that the end of the file being transmitted has been reached, and to close the file. The file must be closed in order to be saved on disk.

File closing procedures for most remote systems vary according to the operation. The end of file character is sent from the microcomputer to the remote computer at the end of a PUT operation to close the file on the remote.

The end of file character must be received on the microcomputer at the end of a GET operation to close the file on the microcomputer. The character is usually sent from the remote system.

Both sender and receiver must use the same end of file character. If you set the option to None by pressing the Spacebar, the character signal to close the file must be entered manually, or the file is not saved. Many systems use ^Z to close a file. SUB is the ASCII mnemonic for ^Z.

When a file transfer is completed during a GET, the following message appears:

++File Received++

If the message doesn't appear and the host system prompt appears, indicating the transfer is complete, press ^VZ to close the file on the microcomputer.

8.3.10 Preset Option Toggles

The final option on the Change Profile Menu that affects communications parameters is T (preset option Toggles):

- A Skip Character after EOL CHAR. During a PUT operation, microcomputer software, such as a text editor, often inserts an LF after a CR. This means that an extra LF can be included in a record if CRs used as the EOL CHAR are followed by LFs from the microcomputer, and LFs indicating EOL ACK are sent from the remote computer. See your microcomputer manual to find out what is combined with CR.

Skip Character after EOL CHAR Settings:

REMOTE COMPUTER GETTING							
LINE FEED SENT				NO LINE FEED SENT			
M I C R O P U T I N G	EOL CHAR	EOL ACK	SKIP CHARACTER AFTER EOL CHAR	EOL CHAR	EOL ACK	SKIP CHARACTER AFTER EOL CHAR	
CR/LF SENT	CR	LF	YES	NONE	NONE	IGNORED BY PROGRAM	
CR ONLY SENT	CR	LF	NO	NONE	NONE	IGNORED BY PROGRAM	

- B Write-protect-screen. (See Chapter 44.)
- C Always invoke emulator. Toggle ON to invoke the emulator in position #1 on the Emulator Names List whenever the configuration is used. See Chapter 4.3 and Appendix E for instructions on using ACCULINK's terminal emulators.
- D Check drive A for file. This option is used when the ACCULINK kernel is on a disk drive other than A, and the disk with ACCULINK overlay files is on drive A. Toggle ON to have ACCULINK automatically search drive A for an overlay file that is specified, but is not on the logged drive.
- E Expand tabs. Increases every tab setting by 8 columns, starting from column 0.

- F Newline mode. Sends LF after CR if toggled ON. If ON during a GET, newline mode inserts EOL ACK (LF) into the file whenever EOL CHAR (CR) is received. If ON in I+ mode, newline mode displays EOL ACK whenever there is EOL CHAR. Newline mode sends EOL ACK if Skip Character After EOL CHAR is toggled OFF.
- G Keep overlays resident. If toggled OFF, overlay files are not kept in active memory after use.
- H Use handshaking. Toggle ON for XON/XOFF handshaking. See Chapter 5.1 for more information.

8.4 Profile Card Utilities

Two utilities are available while running ACCUCNFG:

- I Initialize profile card. Use this option to set the configuration of the current profile card to the "factory set" ACCULINK configuration.

When ACCUCNFG is invoked, the parameters and settings of the selected configuration are in use. If a new profile card is being built, and you want all but certain settings to be those of the "factory set" configuration, enter a name for the new profile, and press Return. When the Change Profile Menu appears, choose I for the first option.

Initialize can be used to return the configuration to the "factory set" parameters, and start again.

S Profile card Summary. Shows the setting assigned to each parameter of the profile card being edited. Changes can be checked for accuracy before the profile card drawer is closed.

PROFILE SUMMARY ACCULINK CONFIGURATION v2.xx

Profile Card #1 R Return to CHANGE PROFILE menu

FACSET

Sectors/buffer: 16; Error limit: 10; Rcv/Xmt t-o counters: 1280/1280
Default port: 1; Answerbacks: 10; Character throttle: 0

PUT eof: CHAR=<CR>; (ACK=<LF>); Don't send next char
eof: <SUB> sent at end of file Default name: ACCULINK.DAT
GET msk: Characters masked to 7 bit(s) Backup ext : MBK
eof: <SUB> will close file OVL drive : Default drive

Protect : OFF Handshake: ON Mstop:<XOFF> Mstart:<XON>
Emulation: OFF Newline : OFF Hstop:<XOFF> Hstart:<XON>
Expd tabs: ON Resident : ON Parity:Ignore

Macros:

MACRO0,MACRO1,MACRO2,MACRO3,MACRO4,MACRO5,MACRO6,MACRO7,MACRO8,SELFTST

In the Summary format, information coming from the remote computer appears in parentheses. Information coming from your microcomputer appears without parentheses. For example:

PUT eol: CHAR=<CR>; (ACK=<LF>); Don't send next char

indicates that the microcomputer sends a CR at the end of each line or record during a PUT, and the remote computer acknowledges the CR by sending an LF. Since the microcomputer combines an LF with a CR, the character sent after the CR is ignored, so that there is not an extra LF in the file PUT to the remote.

8.5 Making Configuration Default Files

Make default files with communications configurations you use regularly. When you are satisfied with the configuration, use the Select option to make it the profile ACCULINK uses. Close the profile file drawer, saving the configuration, and exit ACCUCNFG.

Invoke ACCULINK and use the default file utility to set up a default file with the mode, baud, and other options desired. Since ACCULINK is using the configuration built previously while creating the default file, the file contains the parameters of that communications configuration.

When the default file is specified in a command line, ACCULINK uses the configuration parameters the default file contains.

9. Using Macros

ACCULINK uses macros to perform functions automatically that are otherwise performed interactively. For example, a macro might perform the steps necessary to log on to a host system.

Macros are especially useful for heavy users of ACCULINK. They can minimize the time spent manually controlling the ACCULINK program.

You can use three methods for adapting ACCULINK's macro capability to your needs:

- o Use the supplied macros.
- o Customize supplied macros by editing the source code.
- o Write your own macros using the instructions in Chapter 10.

The ACCULINK macro capability has three parts:

- o A macro compiler, ACCUCOMP
- o A macro interpreter, which is built into ACCULINK Version 2 and all later versions
- o An instruction-forms file, ACCUCOMP.FRM, containing the instructions you need to write macros

WARNING: ACCUCOMP.FRM must be on the same disk drive as the compiler, and must not be altered in any way. Otherwise, the macro compiler and macro interpreter will not function properly.

9.1 Specifying Macros to ACCULINK

There are five ways to specify ACCULINK macros to the macro interpreter:

- o At the end of a command line
- o Using Master Menu option N
- o Using the I+ command ^VN
- o Within the ACCU-TEL.FIL phonebook file
- o By entering the macro names in the configuration profile

These methods are described in the following sections.

9.1.1 Specifying/Invoking Macros in a Command Line

Include a list of macro names as the last field in the ACCULINK command line. The list of macro names must be delimited by square brackets ([]). You can specify up to 10 macro names separated by commas.

The first macro name listed in a command line is automatically assigned to the MACRO#0 position. The other macro names are assigned, in the order listed, to MACRO#1, MACRO#2, and so on, up to MACRO#9. (MACRO#9 is usually reserved for SELFTEST.)

To bypass a position on the list, put a comma in that position. This method is used to reserve some position(s) on the macro names list, perhaps for a name entered into the configuration profile.

If there is a macro in the MACRO#0 position in the configuration profile, that macro is invoked even if you put a comma in the MACRO#0 position. See Chapter 8 for instructions on using ACCUCNFG to store macro names.

For example, a command line that assigns no name to MACRO#0 and LOGON.CTL to MACRO#1 appears as follows:

ac i.12 [,logon]

If there is a macro in the MACRO#0 position in the configuration profile, however, that macro will be invoked.

Only one macro can be invoked directly from a command line. This can be done in one of two ways:

- o Place the name of the macro in the MACRO#0 position in the list.
- o Place the macro name elsewhere in the list and append an asterisk (*) to it.

Here are some examples to illustrate specifying macros in ACCULINK command lines:

ac i.30 [logon]

Causes ACCULINK to enter I+ mode at 300 baud and invokes the macro LOGON.CTL, which is in the MACRO#0 position.

ac i.12 \$555-1234[,logon]

Causes ACCULINK to enter I+ mode at 1200 baud, initializes the macro command buffer with telephone number 555-1234, and places LOGON.CTL in the MACRO#1 position without invoking it.

This command line would invoke any macro specified in the configuration profile in MACRO#0 position.

ac i.30 [logon,,send,,receive,,,,help*]

Causes ACCULINK to enter I+ mode at 300 baud and invokes the macro HELP.CTL. It does not invoke the other macros specified. It assigns them to the macro names list as follows: LOGON to MACRO#0, SEND to MACRO#2, RECEIVE to MACRO#4, and HELP to MACRO#8.

9.1.2 Specifying Macros Using Master Menu Option N

Up to ten macros on the Master Menu can be stored on a temporary basis, by changing the names on the macro names list to the names of macros desired. The entries stay in effect as long as the command line is in effect, or until the names are changed from I+ mode.

9.1.3 Specifying and Invoking Macros With ^VN

Macros can be specified with the ^VN command in either of two ways:

- o Enter ^VNx and Return, where x is the list position of the desired macro. For example, entering ^VN7 and Return invokes MACRO#7.
- o If you type ^VN without specifying a macro number, the Macro Names List Menu showing the current macro names appears. Type the number of the macro you want and press Return to invoke the macro.

Use the ^VN command to replace a macro on the Macro Names List, without invoking it, in either of two ways:

- o Type ^VN followed immediately by the number of the macro you want to replace, for example, #5. "Macro #5:" will appear. Type in the new macro name and press Escape.
- o Type ^VN without specifying a macro number and the Macro Names List Menu appears. Type the number of the macro you want to replace and the new name for the macro, then press Escape.

If you want to cancel the ^VN command before you enter any characters, press Escape.

9.1.4 Specifying Macros in ACCU-TEL.FIL

You can enter macros in ACCU-TEL.FIL. See Chapter 6 for more information.

9.1.5 Specifying Macros in the Configuration Profile

Macro names can be entered in each configuration profile. The names are stored in that configuration, and are the default macros for the configuration. See Chapter 8 for instructions on building and modifying configurations.

9.2 Compiling ACCULINK Macros

Customize macros with ACCULINK by editing the source (.MSC) files of supplied macros or by creating new Writing/Editing Macro Source Files for instructions.

The .MSC file must be compiled into a .CTL file before it can be used. Do this by invoking the ACCULINK macro compiler, ACCUCOMP:

```
ACCUCOMP d:filename.typ -psc(cr)
```

The command line specifications are:

d: The disk drive containing the source file

filename The name of the source file

typ The file extension. The default extension .MSC is assigned if none is specified.

psc User-specified options which must be preceded by a minus (-) sign:

- p display source file with line numbers
- s display symbol table
- c display generated control file

Only one minus sign is needed, even if more than one user-specified option is chosen.

If no errors occur during compilation, a macro control file named "d:filename.CTL" is produced.

9.3 Compiler Errors

There are five classes of compiler errors:

- o SYNTAX errors include missing operands, operands of the wrong data type, invalid label names, and invalid string constants. They cannot be corrected by the compiler, and no .CTL file is produced.
- o WARNING errors occur when, for example, statements contain too many operands. They can be corrected by the compiler, and a .CTL file is produced.
- o UDF (undefined label) errors occur when a label that has not been previously defined is referenced. No .CTL file is produced.
- o FATAL errors occur when a specified file cannot be accessed because: the disk is full; the file cannot be found; or the compiler command line does not include a valid filename. Compilation stops if there is a fatal error.
- o BUG errors occur when the compiler has been corrupted in some way. If you encounter a BUG error, attempt to compile your macro again. If the BUG error still occurs, send a listing of your macro file, along with the text of the error message, to Victor Technologies Support Department.

ERRORS and WARNINGS are reported with messages as follows:

- o A statement containing the error message is displayed.
- o An arrow appears, pointing to the approximate position of the error.
- o The class of error and an error description are displayed.

The following example illustrates the display of a syntax error message:

```
100:      SETINT      TRIES,"10"      ;Set max.  
ERR>                                     ^      retries
```

```
**ERROR: Operand not an integer label
```

FATAL, BUG, and UDF errors are reported as follows:

```
*class: error-description
```

The following example illustrates a UDF error -- the label "terminal" was used, but not defined:

```
* UDF: TERMINAL is undefined
```

```
0 error(s)  
1 undefined label(s)  
0 warning(s)
```

```
**WARNING: There were errors, CTL file not  
made
```

10. Macro Instructions Guide

Chapter 10 contains information on:

- o Writing and editing macro source files
- o Macro instruction syntax
- o Macro instructions
- o User notes

10.1 Writing and Editing Macro Source Files

To customize or write new macros, use the option of the text editor that allows source files to be created or edited. The file must have a valid filename and should have an .MSC extension, such as LOGON.MSC, to identify it as a source file. Include instructions in the macro source file that will perform the desired tasks.

Follow these conventions in an ACCULINK macro:

- o The name of a variable or label can be any combination of up to 9 of the following characters: A-Z (upper- or lowercase); 0-9; the period (.); the underscore (_).
- o At least one of the characters must be nonnumeric.
- o Lowercase letters are treated as uppercase.
- o No variable or label can be the same as the name of an ACCULINK macro instruction.

These are valid and invalid variable or label names:

<u>VALID</u>	<u>INVALID</u>
DOLOG	DO (Instruction name)
ALPHA_1	\$GOGET (Illegal character)
Password	MY_VARIABLE (Too long)
123D1	123 (Lacks nonnumeric)

An ACCULINK macro variable is one of three data types:

<u>DATA TYPE</u>	<u>VALUES</u>
INTEGER	-32768 through +32767 (decimal)
BYTE	0 through 255 (unsigned, decimal)
STRING	Any sequence of characters, up to a maximum of 255, delimited by quotation marks

The following apply to integer operands only:

<u>OPERATION</u>	<u>SYMBOL</u>
Greater than	>
Less than	<
Equal	=
Not equal	~

A STRING constant can contain any ASCII set character and any of these special sequences:

<u>SEQUENCE</u>	<u>MEANING</u>
""	Puts a single quotation mark (") in the string
\\	Puts a single backslash (\) in the string
\n	Carriage return and linefeed (new line)
\c	Carriage return only
\m	Carriage return only
\l	Linefeed only
\j	Linefeed only
\^x	Inserts the control character represented by ^x into the string; for example, ^j inserts ^j (linefeed); \^[inserts the ASCII character for ESCAPE. Use the up-arrow key (^) to represent the control character in a macro, for example, ^V.
\O	Causes the SENDW instruction to wait for a character without sending a character. This prevents an unwanted LF from being echoed into the input buffer. Used mainly with \c.

The data type of an ACCULINK variable is determined by its initial use in the macro and cannot be reinitialized to another data type later in the macro.

ACCULINK macro labels must be the first (or only) fields in a statement, and must end with a colon (:). A statement can have more than one label.

The data type rule for variables also applies to labels. If an operand is used as a label initially, that operand can be used only as a label throughout the macro.

10.2 Macro Instruction Syntax

The instructions are listed in alphabetical order, and are presented in the following format:

instruction-name fields

where:

instruction-name is the name of the instruction.

fields is one or more of the following operands, separated by blanks, tabs, or commas:

integer is an INTEGER constant, INTEGER label, or defined INTEGER constant (see .defint).

const is an 8-bit constant, with maximum value 255.

int_label is a valid INTEGER label.

string is a STRING constant, STRING label, or defined STRING constant, with maximum length 255 (see .defstr).

str_label is a valid STRING label.

label is a valid label.

operator is a valid operator.

Some of the ACCULINK macro instructions use flags to pass special directions or values to the macro interpreter. These flags and their meanings are:

MACERR Set when (1) a timeout occurs while ACCULINK is waiting for a character, (2) a string search fails, or (3) a Datalink file transfer aborts.

TIME Specifies the number of seconds ACCULINK is to wait before invoking a timeout. The default number is 10, and it can be changed. Some instructions provide their own timeout count.

SHOW Turned ON to display all characters received from the remote computer on the terminal screen.

UPPER Turned ON to translate all characters received from the remote computer to uppercase.

HAND Turned ON to collect all input to the remote computer by means of HSTART/HSTOP values.

10.3 Macro Instructions

The ACCULINK macro instructions are listed and described in this section.

ADD int_label integer

Adds two integers and puts the result into the first. **int_label** must be a valid INTEGER label. **integer** can be either an INTEGER label or an INTEGER constant:

```
(int_label) = (int_label) + integer  
or  
(int_label) = (int_label) + (integer)
```

Flags used: none.

Examples:

```
SETINT int1    0    ;sets int1 = 0  
SETINT int3    50   ;sets int3 = 50  
  
ADD   int1    100   ;adds 100 to 0, int1 = 100  
ADD   int1    int3  ;adds 50 to 100, int1 = 150
```

CAPTURE str_label const

Captures into **str_label** the next **const** characters sent by the remote computer:

```
(str_label) = character * const
```

where * means "times".

Flags used: MACERR, TIME, SHOW, UPPER.

Example:

```
CAPTURE Output 30      ;Output contains 30
                        ;characters from remote
```

CLEAR const

Waits for line inactive for **const** seconds; any characters are ignored. The maximum value of **const** is 256.

Flags used: SHOW, UPPER.

Example:

```
CLEAR 5                ;waits 5 seconds for line inactive
```

CONCAT str_label string

Concatenates the contents of **string** to the contents of **str_label** and puts the result into **str_label**. If the resulting string is longer than 255 characters, the string is truncated.

```
(str_label) = (str_label) || string
or
(str_label) = (str_label) || (string)
```

where || means "concatenate".

Flags used: none.

Examples:

```
SETSTR start "Say"      ;sets start = "Say"
SETSTR ending " to me" ;sets ending = " to me"
CONCAT start " hello"  ;start = "Say hello"
CONCAT start ending    ;start = "Say hello to me"
```

DO string

Sends an I+ command string to ACCULINK. After the command executes, control returns to the macro file. If the string includes ^Vn to invoke an answer-back string, or a ^VNn to invoke a macro, either of those commands must be the last ^V command in the DO statement. Any commands or text that follow either of those calls are ignored.

Flags used: none.

Examples:

```
DO "\^VFHELLO.FIL\c"      ;specifies filename
                           ;HELLO.FIL
DO "\^VN2\c"              ;invokes MACRO#2
                           ;current macro replaced
```

End

Terminates execution of the macro. An END is automatically inserted at the end of the .CTL file. More than one END instruction can be used in the same macro file to halt execution under specific conditions.

Flags used: none.

Example:

END

GETCMD str_label

Reads the current contents of the command buffer into **str_label**. See PUTCMD.

Example:

```
PUTCMD "8887777"           ;Store phone # in buffer  
DO "\^VNOdialup\c\^VNO\c" ;Load macro, then invoke it
```

```
      .  
      .  
      (DIALUP.MSC)  
      .
```

```
GETCMD Telnum             ;Get phone # from buffer
```

A phone number included in a command line is automatically placed in the command buffer. If no phone number is specified, the command buffer is initialized with a null string.

GETSTR str_label

Reads a string entered from the terminal, and ended with a CR, into **str_label**.

```
(str_label) = user input
```

Flags used: none.

Example:

```
GETSTR Hello             ;reads a string from the  
                        ;terminal into Hello
```

GOTO label

Causes a branch to the instructions following **label**.

Flags used: none.

Example:

```
GOTO Start                ;branches to label Start
GOTO Begin                ;branches to label Begin
```

Hand

Turns on automatic HSTOP/HSTART buffering, and sends an XOFF character to the remote. Use this instruction only if you have previously used the NOHAND instruction to turn off automatic HSTOP/HSTART buffering, and wish to turn it back on.

Flags used: HAND.

IF int_label operator integer label

Compares the contents of **int_label** against the contents of **integer** relative to **operator** (>, <, =, or ~; see Chapter 9 for definitions). If the test is true, control branches to **label**; if the test is false, the next instruction is executed.

Flags used: none.

Example:

```
SETINT Trys 3
SETINT Retrys 1
IF Trys < 5 Start        ;branches to Start
IF Trys > Retrys end     ;executes next instruction
```

NOCASE

Turns off the uppercase translation of characters being transmitted from the remote system.

Flags used: UPPER.

Nohand

Turns off automatic HSTOP/HSTART buffering by sending an XON character to the remote system. This is useful when XON/XOFF characters are not wanted, e.g., when using a macro to control an autodial modem.

Flags used: HAND.

Noshow

Turns off the display of characters being received from the remote system.

Flags used: SHOW.

Onerror label

Causes a branch to **label** if the MACERR flag is set. Automatically set to ON if a Send or Receive operation is aborted for any reason.

Flags used: MACERR.

Example:

```
SENDW "H"
ONERROR Errhand      ;if timeout occurred during
                     ;execution of SENDW, control
                     ;branches to Errhand
```

PRINT string

Displays the contents of **string** on the terminal screen.

Flags used: none.

Example:

```
SETSTR Say,"I"      ;sets Say = "I" shows "HELLO"
PRINT "HELLO"      ;shows "HELLO" on screen PRINT
Say                ;shows "I" on screen
```

PURGE

Empties the current I/O buffer. The CLEAR instruction also empties the I/O buffer, but waits for the remote to stop sending data.

Flags used: HAND, CASE, UPPER.

PUTCMD string

Puts the contents of **string** into a 255-byte command buffer. This instruction is used to send a command string to another macro. See GETCMD.

SEARCH str_label string label

Searches **str_label** for the contents of **string** and branches to **label** if the contents of **string** is found.

Flags used: MACERR.

Example:

```
SEARCH Bard "ID" Found      ;if Bard contains "ID"
                             ;branch to Found
SEARCH Bard Hello Found    ;if Bard contains contents
                             ;of Hello branch to Found
```

SEND string

Sends the contents of **string** to the remote system without waiting for characters to be echoed back to the microcomputer.

Flags used: none.

Example:

```
SEND "PASSWORD\c"          ;sends "PASSWORD" and a
                             ;carriage return, no echo
SEND Logon                  ;sends contents of Logon,
                             ;no echo
```

SENDW string

Sends the contents of **string** to the remote system and waits for characters to be echoed back to the microcomputer.

Flags used: MACERR, TIME.

Examples:

```
SENDW "LOGIN"           ;sends "LOGIN", waits for echo
SENDW Logstr            ;sends contents of Logstr,
                        ;waits for echo
```

SETINT int_label integer

Sets **int_label** to the contents of **integer**, as follows:

```
(int_lab) = integer
or
(int_lab) = (integer)
```

Flags used: none.

Examples:

```
SETINT Trys 0           ;sets Trys = 0
SETINT Trys Userr       ;sets Trys = contents of
                        ;Userr
```

SETSTR str_label string

Sets **str_label** to the contents of **string**, as follows:

```
(str_lab) = string
or
(str_lab) = (string)
```

Flags used: none.

Examples:

```
SETSTR Hello,"HELLO"      ;sets Hello to "HELLO"  
SETSTR Bye,Hello          ;sets Bye to contents of  
                           ;Hello
```

SETTIME const

Sets the global timeout flag to **const** seconds. This sets the timeout flag for other commands such as WHEN or SENDW. The setting used depends on the response time of the microcomputer and on the job being done.

Flags used: TIME.

Examples:

```
SETTIME 1                  ;sets TIME to 1 second  
SETTIME 10                 ;sets TIME to 10 seconds
```

SHOW

When ON, characters received from the remote system are displayed.

Flags used: SHOW.

STRLEN int_label string

Counts the number of characters in the contents of **string** and puts this number into **int_label**.

Example:

```
STRLEN Cmdlen Telnum      ;Put length of Telnum
                           ;into Cmdlen
IF Cmdlen > 0 Dodial      ;If anything there, do
                           ;Dodial
```

SUB int_label integer

Subtracts the contents of **integer** from the contents of **int_label**, as follows:

```
(int_label) = (int_label) - integer
or
(int_label) = (int_label) - (integer)
```

Flags used: none.

Example:

```
SETINT Trys 10             ;sets Trys to 10
SETINT Notrys 5            ;sets Notrys to 5
SUB Trys 1                  ;Trys = 9
SUB Trys Notrys            ;Trys = 4
```

SUBSTR str_label string const1 const2

Writes **const2** characters from **string**, beginning with the **const1** character, into **str_label**. If fewer than **const2** characters are available in **string**, all available characters are written to **str_label**.

Example:

```
GETCMD Command ;Get string from buffer
SUBSTR Telnum Command 1,10 ;Pull phone # from
;string beginning with
;character 1, for
;10 characters
```

UPPER

Turns on uppercase translation of characters being sent from the remote system.

Flags used: UPPER.

WHEN string const label

Causes a wait either for the contents of **string** to be received from the remote system, or for **const** characters to be received. If neither occurs, there is a branch to **label**.

Flags used: MACERR, TIMER, UPPER, SHOW.

Example:

```
WHEN "." 255 Noprompt ;waits for "." or for 255
;characters
;if neither, branches to
;Noprompt
WHEN Prompt 30 Retry ;waits for contents of
;Prompt or 30 characters
;if neither, branches to
;Retry
```

10.4 Macro Pseudo-Instructions

The following ACCULINK directions are not instructions, but they function like instructions; they are called pseudo-instructions.

.DEFSTR str_label string

Sets **str_label** to the contents of **string**.

.DEFINT int_label integer

Sets **int_label** to the contents of **integer**.

Restrictions:

- o **String** and **integer** must be constants; labels are not permitted.
- o **Str_label** and **int_label** can be used only in STRING and INTEGER fields; they cannot have a value assigned to them during macro execution.

Uses:

- o Define timeouts, passwords, user numbers, and so on, at the beginning of the macro file, where definitions can easily be changed for system tailoring.
- o Less storage is used because string constants require less space than string variables.

Examples:

```
.DEFSTR Password,"HELLO" ;sets Password to "HELLO"  
.DEFINT Retries,10      ;sets Retries to 10
```

10.5 User Notes

The following notes should help users write and use ACCULINK macros effectively.

1. Stopping a macro during execution: To abort an executing macro, press Escape. Any characters typed in at the terminal while a macro is running are ignored.
2. Saving file space: A .CTL file is limited to 4000 bytes. Try to use the same variable in more than one place, and wherever possible use STRING constants instead of STRING variables to save .CTL file space. Also, split macros into submacros, and invoke them with DO.
3. Status of relevant secondary options: When a macro is invoked in ACCULINK, the secondary options Show Characters Received (R) and Show Characters Sent (S) are turned OFF, and the secondary option Create Backup Files (B) is turned ON.
4. Restrictions on non-interrupt driven computer systems that do not have XON/XOFF handshaking:

If the computer system is non-interrupt-driven and it does not have XON/XOFF handshaking, macros can be used to perform simple log-ons or to send one-line commands. Macros are not able to perform more complex functions, like error-checking and string searching, because characters are very likely to be lost.

The maximum number of characters that macros can recognize successfully after starting up the remote system is 256; therefore, you must code macros accordingly.

Use a minimal number of characters with the WHEN command.

5. Hints for creating macro files:

- o Consider all the elements that might influence execution of the tasks. For example, when writing a macro to log on to a host system, detached jobs, invalid entries, and the host system's log-on queue are all pertinent factors.
- o Before writing a macro, run through the procedure and perform all possibilities. Keep a record for reference by using ^VF and ^VG to capture the entire terminal session on disk, or use ^VL to invoke print logging.
- o ACCULINK provides macros for performing log-ons to a number of computer systems. Simply enter your user number and password in the appropriate fields to use the macros.

Here are some additional suggestions:

- o Most computer systems expect to receive only the CR character when Return is pressed. Therefore, use \c at the end of a command string instead of \n, which produces a CR/LF. However, some computers do expect a CR/LF, so it is important to know what the computer system expects to receive as a Return.
- o When the macro has to recognize a prompt character that is also used in other ways, such as the period (.) on a DECsystem10, you should cause it to look for the LF that always precedes the prompt character. For example, use "LF." instead of ".".

- o There are two instructions for sending character strings:

SENDW waits for an echo (FDX).

SEND does not wait for an echo (HDX). For most FDX systems, use SEND for a password; use SENDW for all other commands.

- o When the DO instruction sends ACCULINK an I+ command, input is sometimes expected from the keyboard. For example, if the DO command string is "\^VFfilename", the macro does not proceed until the user enters a CR at the terminal. This is useful when the filename should be entered manually.

If the DO string is "\^VFfilename\c", however, no manual intervention is needed.

- o Insert a command in the macro to invoke another macro. The format is:

DO "\^VNx\c"

The macro must be assigned to the position in the Macro Names List that you specify, for example, MACRO#8 SOURCLOG. The autodial macro for the SOURCE includes this instruction to invoke the SOURCE log-on macro:

DO "\^VN8\c"

Load a macro name using DO:

DO "\^VN VADIC\["

Load a name and invoke the macro:

DO "^VN VADIC\c"

- o Do not use the DO instruction to repeat the same command; for instance, do not have a macro reinvoke itself from the statement, because it causes an infinite loop. (Press Escape to exit from an infinite loop.)
- o After the CR is sent, the remote computer usually sends back a CR/LF. Thus, there is an LF in the input buffer. To screen out this character, either:
 1. Follow the CR with a WHEN, CLEAR, or CAPTURE command, which absorbs the character; or
 2. Include "\0" with the SENDW (such as SENDW "\c\0").
- o If the computer system is an interrupt-driven system, there might be stray characters that are not purged from the interrupt buffer before a SENDW is executed. Issue a CLEAR command before the SENDW to purge the interrupt buffer. For an example, see the NLOG section of the DECsystem10 log-on sample macro.
- o If incoming characters are in uppercase and the search strings are in lowercase, there can be no match.

10.6 Macro Examples

This section gives examples of macros.

10.6.1 Logging On a DECsystem10

The following sample macro illustrates a log-on to a DECsystem10 host after a physical connection has been made.

```
; date 06/03/84
;
;       DEC10 LOGON
;

.Defstr userno,"1234,56789"
.Defstr Passwd,"ZYXW"

Show           ; Show characters
               ; received
Upper          ; Translate to upper
               ; case on input
Setint  Trys,0 ; Initialize "tries"
               ; counter
Print  "DEC10 login ... \n"

Again: Settime 1
Sendw  "\c"           ; Prompt the remote
Onerror Again        ; Loop if no response
Settime 2
When   ".,255 Again  ; Wait for the period

Dolog: Sendw  "LOGIN\c" ; Send the login
               ; command
Capture Test,31      ; Capture next 31
               ; characters
Search  Test "?PLEASE" Logged
When   "#",255 Again ; Wait for the PPN
               ; prompt
```

```

Sendw  Userno
Sendw  "\c"          ; Send the PPN

Dopass: When  ":",255 Again ; Wait for the
           ; password prompt
Send      "ZYXW\c"        ; Send the password
Capture  Test,20         ; Capture the next
           ; 20 characters
Search   Test,"INVALID",Nlog ; Did we get the
           ; INVALID message
Search   Test,"LGNJSP",Goatt ; Attach to job
Goto     Endit          ; then end it all

```

; Here to attach to job

```

Goatt:  When  "\J",255 Nlog
Send    "\^O"
Print   "\n\n-- Account detached, Enter job
        number or EXIT: "

Getstr  Test
Search  Test,"EXIT",Endit
Clear   1
Sendw   "ATT "
Sendw   Test
Sendw   " ["
Sendw   Userno
Sendw   "]\c"
Goto    Dopass

```

```

Logged: Print "User already logged on\n"
Goto     Endit

```

; Here to try again

; Here to parse the phone number

```
Parse: Setint Dptr,0           ; Set up the phone pointer
      Setstr Tel_num,""       ; Init. the parsed number

Ploop: Add Dptr 1             ; Increment counter
      Substr Digit Raw_num Dptr,1 ; Collect a digit from phone number
      Search Digit "-" Pignore ; Ignore dashes
      Search Digit "_" Ppause ; Translate to pause character
      Search Digit " " Ppause ; " " " " " " "
      Search Digit "0" Padd ; Make sure a valid character
      Search Digit "1" Padd ; " " " " " " "
      Search Digit "2" Padd ; " " " " " " "
      Search Digit "3" Padd ; " " " " " " "
      Search Digit "4" Padd ; " " " " " " "
      Search Digit "5" Padd ; " " " " " " "
      Search Digit "6" Padd ; " " " " " " "
      Search Digit "7" Padd ; " " " " " " "
      Search Digit "8" Padd ; " " " " " " "
      Search Digit "9" Padd ; " " " " " " "
; Search Digit "*" Padd ; Uncomment for tone dial
; Search Digit "##" Padd ; Uncomment for '##'
; Search Digit "#" Padd ; Uncomment for '#!'
      Goto Pignore           ; Ignore other characters
```

; Here to add a character to telephone number

```
Padd: Concat Tel_num,Digit     ; Add digit to phone number
      Goto Pignore             ; See if at the end
```

; Here to translate pause character

```
Ppause: Setstr Digit PAUSE     ; Set to pause character
      Goto Padd                 ; Add to phone number
```

; Here to ignore a character

```
Pignore: If Dptr ~ len Ploop ; Loop til end of phone number
```



```

Init:  Settime 100 ; Set timeout to 4 seconds
      Sendw "ATM1VO\c" ; Set up the modem --
      ; 1) Sound dialing
      ; 2) Error codes numeric
      Capture input 1 ; Collect response code
      Onerror Moinit ; -- Bad or no code -- retry
      Search input,"0" dial ; -- Good response code, dial

Noinit: Add Errors 1 ; Bump the error counter
        If Errors < Maxret Init ; Retry till limit

Goto Nosoap ; Just forget it

; Here after we have initialized the modem

Dial: getcmd number
Reent: strlen numsiz,number
      if numsiz > 0 offhook ; is the no. in buffer?
      print "\nTelephone number to dial ? " ; no, ask for it
      getstr number

offhook:
Settime 250
Print "\nDialing: " ; advise user of dial start
Sndnum: Purge ; clear the buffer
        Sendw "ATDP" ; send the lead-in (pulse dial)
        Strlen numsiz,number
        setint count,1

sdddig: substr digit,number,count,1 ; send the phone number digits
        Print digit
        sendw digit
        add count,1
        if count > numsiz numfin
        goto sdddig

Numfin: Sendw "\c" ; the turnaround char
        Purge
        When "!" 5 Error ; wait for carrier detect by
        ; looking for the response code

```

```
; Here for successful connection

Done:  Purge
       Print  "-- Connection made\n"
       End

; Here for no success

Error:  Add      Errors 1                ; Bump error counter
       If      Errors < Maxret Sndnum ; Retry til limit
       Print   "\n-- Can't make connection\n"
       End

Nosoaop: purge
         print  "\^G\^G\^G"
         Print  "-- Can't initialize modem \n"
         End
         .. SEPT 19, 1984
```



Appendix A: Explanation of ACCULINK Files

This appendix is divided into two sections. Appendix A.1 describes the various files contained on the distribution disk(s). Appendix A.2 lists tasks you can perform and the files you need to perform them.

Executable files (signified by *) have different extensions corresponding to different microcomputer operating systems. The file extensions are:

.xxx*	PC-DOS and MS-DOS
.CMD	CP/M-86

The correct programs for your operating system are contained on your distribution disk.

A.1 ACCULINK Files

Communication Files

AC.xxx*	Main program: the file always needed on disk to run ACCULINK
---------	--

Configuration Files

ACCUCNFG.xxx*	Configuration program: allows user to change default settings
ACCUCNFG.HLP	Help file for configuration utility
ACCULINK.PRO	Profile data: contains the "factory set" configuration settings
DRAWER.PRO	Profile card drawer configurations
LABELS.EXE	Contains the LABELS program

ACCULINK Operation Files

ACCU-RCV.OVL Controls Datalink Receive
ACCU-SND.OVL Controls Datalink Send
ACCU-PUT.OVL Controls I+ PUT
ACCU-GET.OVL Controls I+ GET
ACCU-MAC.OVL Macro .CTL interpreter
ACCU-DSK.OVL Contains disk and file utilities
ACCU-CHN.OVL Controls chaining between modules;
 keeps as much of ACCULINK in memory
 as possible; not needed if total free
 memory size is greater than 128K

Additional ACCULINK Files

ACCU-MNU.OVL ACCULINK menu
ACCU-MNU.HLP Text for learn mode and help screens
ACCU-TEL.FIL Phone book file: text file of
 telephone numbers

Terminal Emulation

VT52.OVL VT52 emulator file
VT100.OVL VT100/VT52 emulator file
IBM3101.OVL IBM3101-C emulator file

Telecommunication Programming Language (TPL)

ACCUCOMP.xxx* TPL compiler: compiles TPL source code

ACCUCOMP.FRM ACCUCOMP support file containing the TPL instruction set

Supplied Macros

PARSE.MSC Phone number pause character translator

UDS212A.MSC Autodial for UDS 212A modem

CDS.MSC Autodial for Control Data System 2400 modem

VADIC.MSC Autodial for Racal-Vadic 212 modem

HAYES.MSC Autodial for Hayes Smartmodem

MULTI.MSC Autodial for Multitech modem

DEC10.MSC Log-on for DECsystem10

DEC20.MSC Log-on for DECsystem20

RSTS.MSC Log-on for PDP-11 with an RSTS operating system

VAX.MSC Log-on for VAX

SOURCE.MSC Log-on for The Source using Telenet

XFER.MSC Sample automatic file transfer macro using ACCULINK-Host on the remote computer

SELFTEST.MSC Loopback macro
ANSWER.MSC Remote Slave macro
CALL.MSC Local Master macro

ACCULINK User-Generated File Extensions

.DFL Default file: automatically submits
 commands to ACCULINK

.CTL TPL command file: built by ACCUCOMP
 from .MSC source file

.SAV SAVE setups, generated by emulators

.MSC TPL source files

A.2 ACCULINK Files for Various Tasks

When you use ACCULINK, you do not need to have all of the files on the active mass storage system (floppy or hard disk). To help you decide what files you need to keep on active storage (the working diskette), some tasks and the required ACCULINK files are described below:

The file that must be on disk any time you use ACCULINK is:

AC.xxx*

To run ACCULINK with a special user configuration, add:

ACCULINK.PRO

To use disk and file utilities, also include:

ACCU-DSK.OVL
ACCU-CHN.OVL

To use the menu, with its help screens and Learn mode, also add:

ACCU-MNU.OVL
ACCU-MNU.HLP (optional)

To set up the program for a new configuration, you need:

AC.xxx*
ACCUCNFG.xxx*
ACCUCNFG.HLP (optional)

To utilize terminal emulation, you need:

AC.xxx*
plus the desired emulator .OVL file(s)

To create or modify macros, you need:

ACCUCOMP.xxx*
ACCUCOMP.FRM
plus any .MSC file you need to compile

To run a macro, use:

AC.xxx*
plus the .CTL file you want to execute

To do autodialing, you need:

AC.xxx*
ACCU-TEL.FIL
and the .CTL file for the autodial modem you want to use

To create a default file, the necessary files are:

AC.xxx*
ACCU-MNU.OVL
ACCU-MNU.HLP (optional)
ACCU-CHN.OVL

To run a default file, use:

AC.xxx*
the .DFL file you set up, plus ACCU-TEL.FIL
and/or any .CTL file(s)

Files never used during execution:

Files with the extension .MSC

Appendix B: ACCULINK Error Messages

Most ACCULINK errors are non-fatal and the messages serve only to alert the user when invalid data is entered, or when trouble was encountered during a file transfer. The only fatal errors are those that occur when an incorrect command line is entered (which is not usually possible when using the menu), or when a file transfer cannot take place.

This appendix lists error messages you might receive, grouped in the following categories:

- Command-line errors
- I+ mode errors
- Macro execution errors
- File I/O errors
- Datalink fatal errors
- File transfer errors in Datalink modes

The error messages appear in the following format:

Error Message Text

Problem: The reason the error occurred.

Action: The action taken by ACCULINK after the error.

Solution: What the user should do after the error message is received.

B.1 Command Line Errors

++ Can't find menu overlay file 'ACCU-MNU.OVL' ++

Problem: The ACCULINK menu overlay file cannot be found on the system.

Action: ACCULINK is aborted.

Solution: Copy the menu overlay file ACCU-MNU.OVL from the ACCULINK distribution disk to your disk, or enter ACCULINK by specifying a valid command line or default file.

++ Can not find ACCULINK default file -- Invoking menu ++

Problem: You specified a non-existent default file on the command line.

Action: The menu is invoked.

Solution: Reenter the command line with a valid default filename.

++ Default file must be version 2.0 or later ++

Problem: A default file made with an earlier version of ACCULINK was specified in the command line.

Action: The ACCULINK menu is entered.

Solution: Erase the old default file and create a new one using the ACCULINK menu.

++ Invalid option on ACCULINK command - "?" ++

Problem: An invalid option was encountered on the ACCULINK command line.

Action: ACCULINK is aborted.

Solution: Reenter the ACCULINK command line using only valid options, or use the ACCULINK menu to build a valid command line.

++ Invalid baud rate ++

Problem: The baud you entered on the command line is invalid.

Action: ACCULINK is aborted.

Solution: Reenter the command line using a valid baud for your machine, or use the ACCULINK menu to build a command line with a valid baud.

++ Cannot find file 'ACCU-TEL.FIL' ++

Problem: An entry in the phonebook file was specified as the phone number to autodial, but ACCU-TEL.FIL was not found on the system.

Action: ACCULINK is aborted.

Solution: ACCU-TEL.FIL must be on the logged-on disk drive of your computer. Check your other disks to see if the file exists. If not, create ACCU-TEL.FIL using the instructions in Chapter 5.

++ Error in phone number ++

Problem: An invalid autodial phone number was entered, for instance, one including both digits and letters.

Action: ACCULINK is aborted.

Solution: Reenter the command line using a valid telephone number or ACCU-TEL.FIL entry.

++ No phone number found ++

Problem: The marker (\$) specifying a telephone number was entered on the command line without a telephone number or an ACCU-TEL.FIL reference.

Action: ACCULINK is aborted.

Solution: Reenter the command line either with a telephone number or ACCU-TEL.FIL entry, or without the telephone number marker (\$).

++ Can not simultaneously place and answer call ++

Problem: The secondary option Answer (A) was used, and a telephone number was entered to autodial.

Action: ACCULINK is aborted.

Solution: Specify either the ANSWER phone option or an autodial phone number, but not both.

++ No match found in 'ACCU-TEL.FIL' for ENTRY ++

Problem: An ACCU-TEL.FIL entry was specified, but was not found in the phonebook file.

Action: ACCULINK is aborted.

Solution: Reenter the command line with a valid ACCU-TEL.FIL entry. Enter the reference in ACCU-TEL.FIL if it is not specified.

++ Unexpected EOF in overlay module ++

Problem: ACCULINK tried to invoke an overlay module, but the module was corrupted.

Action: The overlay file is not loaded.

Solution: Copy the overlay module from your ACCULINK distribution disk to another disk.

++ Invalid parity selection: X ++

Problem: The output parity specified in ACCULINK (X) is invalid.

Action: ACCULINK is aborted.

Solution: Use ACCUCNFG to enter a valid output parity -- M, S, E, O, N, or I.

Note: This error will not occur under normal ACCULINK usage.

++ ACCULINK cannot be restarted ++

Problem: The ACCULINK kernel is corrupted.

Action: ACCULINK is aborted.

Solution: Copy the executable program file from the ACCULINK distribution disk to another disk.

B.2 I+ Mode Errors

++ Invalid macro number ++

Problem: The Macro Names command \wedge VN was used with an invalid macro number.

Action: None.

Solution: Reenter the command using a valid macro number, 0-9.

++ Invalid secondary option ++

Problem: The Set Secondary Options command \wedge V0 specified an invalid secondary option.

Action: None.

Solution: Use the \wedge V0 command to get a list of valid secondary options.

++ Invalid parity selection ++

Problem: An invalid parity option was selected.

Action: None.

Solution: Reenter the ^VOO command and use one of the following for output parity: M, S, O, E, N, or I.

++ This command (^VX) is only valid during a GET ++

Problem: The abort command ^VX was used without a file GET in progress.

Action: None.

Solution: Use the ^VX command only to abort a PUT, a GET, or an executing macro.

++ Can't find file utilities overlay file 'ACCU-DSK.OVL' ++

Problem: The command ^VU was used, but the disk and file utilities overlay file was not found on the system.

Action: None.

Solution: Copy the file ACCU-DSK.OVL from the ACCULINK distribution disk to your disk.

++ Can not find the xxxx overlay file xxxx.OVL ++

Problem: The Invoke Emulator command ^VE was used, but the emulator overlay file was not found on the system.

Action: None.

Solution: Make sure your ACCULINK package came with the terminal emulator you tried to invoke. If it did, make sure that emulator is on the Emulator Names List for the configuration you are using.

Note: This error message might be received as soon as you enter I+ mode if the ACCULINK default option "always invoke emulator" has been turned ON.

++ Overflow buffer FULL (Please check HSTOP/HSTART values) ++

Problem: While GETting a file, data came in at too fast a rate for the computer to handle.

Action: The current buffer is saved and the GET continues, but data is lost.

Solution: One of the following should correct the problem:

1. Check the HSTART and HSTOP values using either ACCUCNFG or the ACCULINK menu, and make sure the settings are correct for your HOST system.
2. If there are no HSTART and HSTOP values for your system, use option "P Protocol Characters" on the Change Parameters Menu to set the values to none.
3. If possible, use a lower baud.
4. If you have an interrupt-driven system, use ACCUCNFG or the Change Parameters Menu option for Changing

System Characteristics to set the size of the I/O buffer to 001 sectors.

5. As a last choice, increase the size of the I/O buffer and break up files into one-buffer chunks.

++ Print FIFO full -- Turning OFF printer logging ++

Problem: Printer logging was turned ON, but the printer is too slow to keep up with incoming data.

Action: Printer logging is turned OFF.

Solution: ACCULINK buffers data going to the printer. If your printer is slow, do the following:

1. If possible, run at a baud less than or equal to that of the printer when you use printer logging.
2. Turn the HSTART and HSTOP values ON so ACCULINK can control the flow of incoming data.

B.3 Macro Execution Errors

++ Can't find macro file D:FILENAME.CTL ++

Problem: The macro file D:FILENAME.CTL cannot be found on the drive.

Action: The macro is aborted.

Solution: Use the ^VN command to enter the name of an existing macro, or compile the macro file D:FILENAME.MSC with ACCUCOMP to produce the D:FILENAME.CTL file.

++ Unknown instruction encountered in macro CTL file++

Problem: The current macro control (CTL) file has been corrupted.

Action: The macro is aborted.

Solution: Perform the following steps until the macro runs without an error:

1. Recompile the macro source file using ACCUCOMP.
2. Move the files ACCUCOMP.xxx* and ACCUCOMP.FRM from the ACCULINK distribution disk to another disk and retry step 1.

If the error persists, send a copy of the macro MSC and non-working CTL file to Victor Technologies Support Department.

Note: Changing the ACCUCOMP.FRM file can produce this error.

B.4 File I/O Errors

++ No such file(s) as d:FILENAME.EXT ++

Problem: The filename specified to send or PUT cannot be found on the drive.

Action: File transfer is aborted.

Solution: Check your disk file directory to get the valid filename or drive.

++ File d:FILENAME.EXT exists ++

Problem: The filename specified to receive or GET is already on your disk.

Action: None.

Solution: You are given a choice whether to add the file to the existing file, erase the existing file, create a backup of the file, or abort.

++ Cannot create backup file d:FILENAME.MBK ++

Problem: ACCULINK cannot create a backup file when instructed to do so.

Action: The file RECEIVE or GET is aborted.

Solution: Your disk directory might be full or there is an error on your disk's directory tracks.

++ Can't create file d:FILENAME.EXT ++

Problem: ACCULINK cannot create the specified file.

Action: The file RECEIVE or GET is aborted.

Solution: Your disk directory is probably full. Either erase some unneeded files or use a new disk.

++ Can't open file d:FILENAME.EXT ++

Problem: The file specified to send or PUT does not exist.

Action: The file SEND or PUT is aborted.

Solution: Retry using the name of a valid file on your system.

++ Can't close file d:FILENAME.EXT ++

Problem: ACCULINK cannot close the file specified for a receive or GET, probably because the disk is full.

Action: The file RECEIVE or GET is aborted.

Solution: Retry the file transfer.

++ Read error for file d:FILENAME.EXT ++

Problem: ACCULINK cannot read the file specified to SEND or PUT.

Action: The file SEND or PUT is aborted.

Solution: The file is corrupted; use your operating system file recovery tools.

++ Error writing file d:FILENAME.EXT ++

Problem: ACCULINK cannot write to the disk.

Action: The file RECEIVE or GET is aborted.

Solution: You will be asked to close the file to save whatever data was received before the error message. Your disk is probably full.

B.5 Datalink Fatal Errors

++ Unable to receive file name -- Aborting ++

Problem: ACCULINK was unable to receive the filename from the sender.

Action: The file RECEIVE is aborted.

Solution: Make sure sender and receiver are connected properly and retry the file transfer.

++ Unable to receive block -- Aborting ++

Problem: ACCULINK was unable to receive a file because of too many errors.

Action: The file RECEIVE is aborted.

Solution: Retry the file transfer and take note of transfer errors.

++ Can't send sector -- Aborting ++

Problem: ACCULINK was unable to send a file because of too many errors.

Action: The file SEND is aborted.

Solution: Retry the file transfer and take note of transfer errors.

++ ACCULINK cancelled ++

Problem: The file SEND or RECEIVE was cancelled by the remote system.

Action: None.

Solution: You might have typed ^X. Retry the transfer.

++ Time-out waiting for receiver ++

Problem: ACCULINK did not obtain a response from the receiver.

Action: The file SEND is aborted.

Solution: Check that (1) your system and the remote are connected properly, and (2) the remote system is in file receive mode.

++ Multiple errors encountered++

Problem: Too many errors occurred while doing a file SEND or RECEIVE.

Action: None.

Solution: Retry the file transfer and take note of transfer errors.

B.6 File Transfer Errors in Datalink Modes

Errors sometimes occur during file transfers in Datalink modes. The errors are usually caused by an incorrectly set-up remote system, or telephone line interference. In most cases, the data can be transferred successfully after retries.

When the number-of-total-errors count (XX) exceeds the maximum number of error retries set in the ACCULINK parameters, however, the file transfer is aborted.

Name: Timeout XX Receiver has timed-out waiting for sender to send the filename of the file to receive.

Name: Bad Msg XX Sender has sent an incorrect message to the receiver. This error should not occur in versions 2.05 or later.

Name: Cksum XX Filename data received is incorrect and has generated a checksum error.

Name: No EOT XX	Sender did not end the filename message with the EOT character.
Timeout XX	Receiver sent a message to the sender but did not receive a response and timed-out.
Cksum Timeout XX	Receiver received the data position of a block, but did not receive the checksum byte and timed-out.
Bad Msg Type XX	Receiver received the start of a message, but the type of message was unknown.
Bad message XX	The sender did not end the data block with the NAK character.
Bad sector number XX	The sender sent a data block with an out-of-place sector number.
Checksum Error XX	The receiver's and sender's checksums of the current data block did not match.
CRC-16 Error XX	The receiver's and sender's CRC-16 check of the current data block did not match.
MSTART time-out XX	The sender sent an MSTOP without a matching MSTART and the receiver timed-out.

Record Rejected XX	The receiver rejected the last data block sent and wants it sent again.
<ACK> timeout XX	The receiver has not sent the ACK character in response to the last data block sent and the sender timed-out.
XXH rcd, not <SOH>	The character XX (hex) was received instead of the expected SOH character.
XXH rcd, not <ACK>	The character XX (hex) was received instead of the expected ACK character.
waiting XX	ACCULINK is receiving multiple files, but has not received a filename in response to its polls.

Run-Time Package C-86 Compiler Error Message

CORE	Overlays have used more memory than the machine has safely available.
-------------	---



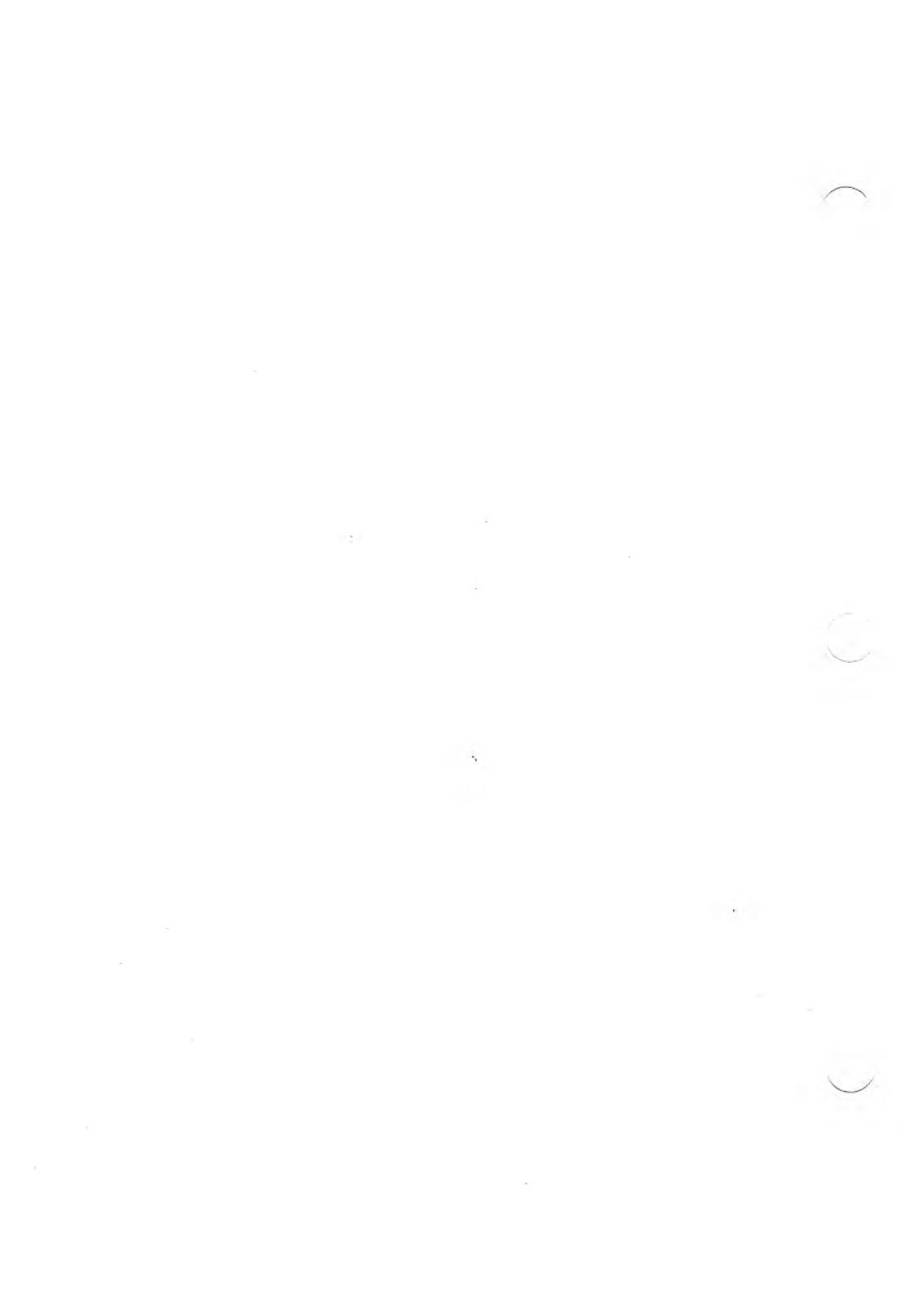
Appendix C: Differences from Version 1.xx

Default files you built with version 1.xx must be built again with version 2.xx, since they will not be compatible.

The following commands have changed in version 2.xx.

	<u>Current Command</u>	<u>Previous Command</u>
Program Name	AC	IE/MODEM
Operating Modes	I+ I+ Echo	Terminal mode TermEcho
Primary Options	I	T
Secondary Options	F T	I X
I+ Options (^Vx)	E Q	Y E

Many other new features have been added to ACCULINK 2.xx. These features are explained in detail in the manual.



Appendix D: Using an ACCULINK-Host Package

Versions of ACCULINK run on large systems such as the DECsystem10, the DECsystem20, the VAX-11, and the PDP-11. There is a separate version of ACCULINK-Host for each of these systems:

<u>Computer</u>	<u>Operating System</u>	<u>ACCULINK-Host</u>
VAX	VMS	ACCULINK-VX
DEC-10	TOPS-10	ACCULINK-10
DEC-20	TOPS-20	ACCULINK-20
PDP-11	RSTS	ACCULINK-RS
PDP-11	RSX	ACCULINK-RX

When ACCULINK is running on both the host system and a microcomputer, you can transfer executable (binary) files as well as text (ASCII) files. You can use wildcard names to represent entire sets of files for transfer.

ACCULINK uses special error-checking algorithms to detect transmission errors, and performs automatic error correction by means of retries.

D.1 Using ACCULINK on a Host System

The correct version of ACCULINK must be installed on the host system. The procedure for using an ACCULINK-Micro to ACCULINK-Host combination follows:

1. Invoke ACCULINK in I+ mode on your microcomputer.
2. Make sure your microcomputer and the host are operating at the same baud.
3. Establish telephone connection with the host system.
4. Log on to the host system, using your normal log-on procedures.
5. Run ACCULINK on the host system.
6. Use ACCULINK commands and switches to issue instructions to the ACCULINK-Host program; for example, specify whether a file is to be received or sent by the host system.
7. Use ACCULINK I+ commands to invoke ACCULINK-Micro in Datalink mode to execute the file transfer.

You can use macros to perform many procedures you would otherwise do manually. For example, you can use macros to autodial and log on to a host system, and to perform file transfer procedures.

Your ACCULINK software package includes several macros to perform autodialing and log-on procedures. You can use these macros as is, you can customize them by editing them, or you can write your own macros. See Chapters 9 and 10 for information about using and writing macros.

For detailed instructions on using host system versions of ACCULINK, see the user's manual for the particular host system. For example, the ACCULINK-VX User's Manual gives instructions for using the version of ACCULINK that runs on the VAX-11.

D.2 ACCULINK-Host Commands and Switches

You can use ACCULINK-Host commands and switches to specify the following instructions to the ACCULINK program:

- o Whether the transfer is to or from the host system
- o The specification of the file(s) to be transferred
- o The format to save the file under
- o Whether CRC-16 or checksum error-checking is used

You enter ACCULINK-Host commands and switches on command lines, following the ACCULINK-Host prompt. Each host system version of ACCULINK has a slightly different prompt. The prompt for ACCULINK running on a VAX is:

ACCULINK-VX>

The following sequence illustrates the use of ACCULINK-VX commands and switches:

```
ACCULINK-VX>MODE BLOCK(cr)  
ACCULINK-VX>RSYNC ON(cr)  
ACCULINK-VX>RECEIVE DOCD$: [TOM.SUB]TOMS.TXT(cr)
```

In the preceding sequence of commands, MODE and RSYNC are ACCULINK-VX switches. RECEIVE is an ACCULINK-VX command specifying that a file is to be received by the host. In this command line, the file is to be listed in the directory [TOM.SUB] on device DOCD\$ (a disk) with the name TOMS.TXT.

To transfer a file to TOMS.TXT on the host, you must invoke ACCULINK-Micro in Datalink mode, specifying the microcomputer file that is to be transferred. The microcomputer file can have the same name you specified in the RECEIVE command line, or it can have a different name.

D.3 Examples

The following examples illustrate file transfers between a microcomputer running ACCULINK-Micro and a host running ACCULINK-Host.

Microcomputer <--- VAX-11

This example illustrates sending a binary file from a VAX-11 to a microcomputer.

<u>Command/Response</u>	<u>Description</u>
A>AC I.12(cr)	Invoke ACCULINK on microcomputer
[Establish contact with the VAX-11 and log on.]	
\$RUN ACCULINK(cr)	Invoke ACCULINK on VAX
ACCULINK-VX>HAT(cr)	

Current Mode: ASCII
CRC switch is OFF
Rsync switch is OFF
Filter switch is ON

ACCULINK-VX>MODE BLOCK(cr)

Specify binary format

ACCULINK-VX>SEND ACTION.EXE(cr)

^VF

File specification:ACTION.EXE(cr)

^VR Invoke Datalink mode

[File ACTION.EXE is transferred to the microcomputer at 1200 baud; ACCULINK displays status messages during the transfer.]

++ Transfer complete ++

ACCULINK-VX>EXIT(cr)

Microcomputer ----> DECsystem10

This example illustrates sending several files from a microcomputer to a DECsystem10.

<u>Command/Response</u>	<u>Description</u>
A>AC I.30(cr)	Invoke ACCULINK on microcomputer
[Establish contact with the remote DEC-10 and log on.]	
.R ACCULINK(cr)	Invoke ACCULINK on host
ACCULINK-10>INFORM(cr)	Optional switch

ACCULINK-10>RECEIVE *.*(cr)

The *.* wildcard means all files specified in the microcomputer File Specification are transferred

^VF

File specification:*.TXT(cr)

^VS

Invoke Datalink mode

[All .TXT files are transferred to the DECsystem10 at 300 baud; ACCULINK displays status messages during the transfer.]

++ Transfer complete ++

ACCULINK-10>EXIT(cr)

Appendix E: Keyboard Configuration and Emulator Information

This appendix gives information about the VT102/VT52, the IBM 3101-C, and the built-in ADM3A terminal emulators and lists the VICTOR 9000 keyboard configurations for each.

E.1 VICTOR 9000 Keyboard Configuration for ACCULINK I+ Mode (Built-in ADM3A Terminal Emulator)

This section contains tables showing the keyboard configuration for ACCULINK's Interactive mode.

Substitute the following keys or key sequences to access function keys 8 through 10 on the VICTOR 9000 keyboard, which does not contain those physical keys:

F8	HELP
F9	ALT + 9 (numeric keypad)
F10	ALT + 0 or 00 (numeric keypad)

You can also substitute 0 through 9 on the numeric keypad on either of the VICTOR 9000 keyboards in place of function keys 1 through 10.

**VICTOR 9000 Function Keys -- I+ Mode Values
(Built-in ADM3A)**

Set #	1	2	3
<u>Name</u>	<u>General</u>	<u>--</u>	<u>Macros</u>
F1	HELP	DISK	MACRO1
F2	FILENAME	I-3101	MACRO2
F3	SEND	TVI950	MACRO3
F4	RECEIVE	VT52	MACRO4
F5	PUT	ANSBK5	MACRO5
F6	GET	ANSBK6	MACRO6
F7	VT102	ANSBK7	MACRO7
F8	MACRO0	ANSBK8	MACRO8
F9	TIME	QUIT	SELFTE
F10	NEXT	NEXT	NEXT

VICTOR 9000 Function Keys -- ACCULINK Menu Values

	<u>Master Menu</u>	<u>Disk and File Utilities Menu</u>	<u>ACCUCNFG</u>
F1	HELP	HELP-(down arrow)	HELP
F2	I.30	DIR-(down arrow)	CLOSE
F3	I.12	TYPE	BACK
F4	I.96	ERASE	FRONT
F5	SELECT	RENAME	SELECT
F6	CANCEL	COPY	CANCEL
F7	UP	PATH	UP
F8	DOWN	LOGIN	DOWN
F9	LEFT	INT+-(down arrow)	LEFT
F10	RIGHT	QUIT-(down arrow)	RIGHT

VICTOR 9000 Cursor Keys -- ACCULINK Values

<u>Key Label</u>	<u>Key Only Value</u>	<u>SHIFT + Key</u>	<u>ALT + Key</u>
(up arrow)	UP	UP	BRIGHTNESS UP
(down arrow)	DOWN	DOWN	BRIGHTNESS DOWN
(left arrow)	LEFT	LEFT	CONTRAST UP
(right arrow)	RIGHT	RIGHT	CONTRAST DOWN

Note: Use the brightness control in the SET UP mode of the VT102, VT52, and TVI950 emulators to save the desired settings.

VICTOR 9000 Keyboard -- Miscellaneous ACCULINK Equivalents

<u>Key Label</u>	<u>Key Only Value</u>	<u>SHIFT + Key</u>	<u>ALT + Key</u>
1/4-1/2	}	{	}
OFF-RVS-ON	UNDEFINED	UNDEFINED	ESCAPE
o-+/-	ESCAPE	ESCAPE	~
1-!	!	!	
.	.	>	UNDEFINED
,	,	<	UNDEFINED
/-?	/	?	\
DELETE	DELETE	DELETE	DELETE
INS	LF	LF	LF

E.2 Simulated Modes and Other Differences Between the VT102/VT100/VT52 Emulator and a VT102/VT100/VT52 Terminal

This section describes the modes and features that differ between the standard VT102/VT100/VT52 emulator and an actual VT102/VT100/VT52.

VT102/VT100/VT52 Terminal

Emulator

ALT. ROM CSET	Same as CS 0 and CS B.
FDX B, FDX C HDX A, HDX B	Special modes that deal with half/full duplex communications and hardware handshaking. The emulator always runs in FDX A mode.
DISCONNECT CHAR DISCONNECT DELAY INITIAL DIRECTION AUTO TURNAROUND	Special modes/values used with FDX B, FDX C, HDX A, and HDX B operating modes which are not supported.
PRINTER BAUD, WORD SIZE	Must be set by an operating system utility.
MODEM PARITY	These modem parities are not supported: 7N, 8O, 8E.
2 STOP BITS	ACCULINK always uses 1 stop bit.
POWER	Always 60 Hz.
Separate XMIT and RCV BAUD Rates	ACCULINK supports only one XMT and RCV baud rate.

VT102/VT100/VT52

Terminal	Emulator
DECTST	DEC's terminal Selftest. ACCULINK resets the screen.
132 COLUMNS	Not supported.
GRAPHICS CHARACTERS	Some of the graphics characters might differ slightly.
DOUBLE WIDTH/ HEIGHT	Characters are displayed at every other column. Graphics characters are lost if the line attribute is changed after the line is displayed.
SMOOTH SCROLL	Jump scrolls with delay.

E.3 VT102/ANSII Modes Simulated or Not Supported

The following modes have been simulated:

- o Smooth scroll: Delays between lines
- o Graphics: All horizontal scan lines (1, 2, 3, 5, 7) display as scan lines. CR, LF, NL, VT, and so on have been simulated with arrows. Cancel character is 3 horizontal lines. Not-equal appears as two exclamation marks (!!).

The following modes are not supported:

- o Underline with reverse video character attribute
- o Auto-repeat OFF
- o 132-column screen

E.4 Additions to a Standard VT102 Terminal

SETUP HELP	Both toggle and general help is available.
SETUP.SAV	File containing saved setup features.
SETUP B SWITCH	Toggles:
8:1	Prints double height bottom lines
8:2	Status line ON/OFF
8:3	Cursor row/column display ON/OFF
8:4	Setup mode help screen ON/OFF
6:3	Not a function
6:4	Forces VT100 emulator
SETUP B HELP	When the cursor is over a toggle in SETUP B, the title and possible values for that toggle are displayed.
SAVED BAUD RATE	Baud is usually specified in the ACCULINK command line; if it is not, the baud in the last saved setup will be used.
STATUS LINE	When enabled, the status line displays LEDs, emulation mode (VT102/VT100/VT52), KBD LOCKED, line status (ONLINE/LOCAL), CAPS, NO SCROLL, cursor position, and printer status.

E.5 Keyboard Configuration for the VT102/VT52 Terminal Emulators

This section lists tables showing the keyboard configuration for the VT102/VT52 terminal emulators.

VICTOR 9000 Function Keys -- VT102/VT52 Emulator Values

	<u>VT102 Emulator</u>	<u>VT52 Emulator</u>
F1	SET UP	SET UP
F2	BREAK	BREAK
F3	LONG BREAK	LONG BREAK
F4	ANSWERBACK	*UNDEFINED
F5	PRINT SCREEN	PRINT SCREEN
F6	AUTO PRINT	AUTO PRINT
F7	UP or (up arrow)	UP
F8	DOWN or (down arrow)	DOWN
F9	LEFT or (left arrow)	LEFT
F10	RIGHT or (right arrow)	RIGHT

VICTOR 9000 Numeric Keypad -- VT102/VT52 Emulator Values

<u>Key Label</u>	<u>Key Only Value</u>	<u>SHIFT + Key</u>	<u>ALT + Key</u>
1	1	1	F1
2	2	2	F2
3	3	3	F3
4	4	4	F4
5	5	5	F5
6	6	6	F6
7	7	7	F7
8	8	8	F8
9	9	9	F9
0	0	0	F10
00	0	0	F10
=	PF1	=	PF1
%	PF2	%	PF2
+	PF3	/	PF3
X	PF4	*	PF4
-	-	-	-
+	,	+	,
.	.	.	.
ENTER	ENTER	CR	LF
BACKSPACE	BACKSPACE	DELETE	BACKSPACE
PAUSE/CONT	SCROLL/NO	SCROLL/NO	SCROLL/NO

E.6 IBM 3101-C General Information

Consult an IBM 3101 Terminal User's Guide for detailed information about using an IBM 3101 terminal (this manual is available from IBM Corporation).

The following table lists simulated modes and other differences between the IBM 3101-C emulator and an IBM 3101 terminal. Only those modes and features that differ between the standard IBM 3101-C emulator and an actual IBM 3101 terminal are described. Other machine-dependent features might or might not operate.

<u>IBM 3101 Terminal</u>	<u>Emulator</u>
LOGICAL KEYBOARD LOCK FUNCTION	Rings bell only when more than 7 contiguous NULL, XON, or XOFF characters are received.
XPARENT MODE	Displays incoming control characters only when turned ON. Transparent control characters remain onscreen whether Xparent mode is ON or OFF. Control characters are displayed in reverse video as characters (J is linefeed, [is escape).
SEND MARK	Displayed as a diamond character (^v).
PARITY ERROR	Displayed as a blinking question mark (?).
AUX PORT	Not supported.
LINE HANDSHAKING	RTS, CTS, and so on are not supported.

These are additions to the standard IBM 3101:

- SETUP MODE Allows modification of front panel switches. The current configuration can be saved, and is restored whenever the emulator is invoked (see Setup mode help).
- ROW, COL DISPLAY Displays cursor's screen position on the status line (set in Setup mode).
- XOFF/XON If supported by host system, emulator uses handshaking to control incoming data (set in Setup mode).
- HDX DISPLAY Message on status line indicates when operating in HDX mode.

Emulator Status Line

1	2	3	4	5
CHAR MODE	(XPARENT)	HDX	LOCK-	ERROR MESSAGE
6	7	8		
EDIT KP	P	LOCAL		

<u>Field #</u>	<u>Contents Indicate</u>
1	Current operating mode, always either CHAR mode or Setup mode.
2	(1) XPARENT mode when ON. (2) Cursor row and column (RC=??,??) appear if enabled, and not XPARENT mode.
3	HDX operation.
4	Keyboard locked. Press RESET or SETUP key to clear.
5	Error message field. Press RESET or SETUP key to clear if operator error (consult IBM 3101 manual for more information).
6	Keypad mode. (1) EDIT KP: keypad sends PF and print key codes. (2) NUM KP: keypad sends 0-9, -, comma, ., and ENTER codes.
7	Printing capability. When displayed, emulator responds to print functions. When blank, print functions are ignored.
8	Local mode. When ON, I/O to/from the remote system is disabled.

Setup Mode Notes

- o These switches control critical functions and must be set to match those of the actual IBM 3101 for normal operation:

1-2, 1-6, 1-7, 1-8, 2-2, 2-3, 3-1, 3-2, 3-3, 3-4

Setup Mode Notes

- o These switches control critical functions and must be set to match those of the actual IBM 3101 for normal operation:

1-2, 1-6, 1-7, 1-8, 2-2, 2-3, 3-1, 3-2, 3-3, 3-4
- o To enter Setup mode, press the F1 key. The following conditions will be in effect:
 - CHAR mode screen is usually saved unless a Restore Setup command is entered while in Setup mode.
 - Keyboard lock (LOCK-) indicator is reset.
 - Prohibited keys are reset.
 - Operator error messages are cleared.
- o Press I to Initialize emulator. This clears tab stops and defaults the baud switches, 4-1 through 4-4.
- o Use these keys to move the cursor to switches:

LEFT Left arrow or Backspace
RIGHT Right arrow or Spacebar
- o Use these keys to toggle switches:

ON Up arrow
OFF Down arrow
- o Fixed setup switches have one valid position and cannot be changed. Only one position is shown on the Switch Help line for these switches.

- o A bell rings and the message "Mode/Setup Check" appears if you attempt to do any of the following:
 - change a fixed switch
 - turn on a switch already ON
 - turn off a switch already OFF
- o You can change the baud by (1) pressing B, or (2) toggling the 3101 baud switches, 4-1 through 4-4.
- o The Baud Display line (above the Switch Help line) always displays the current rate, even if switches are positioned in an incorrect sequence.
- o If the current baud has been defaulted, or is not valid for a normal 3101, switches 4-1 through 4-4 are in the ON (1) position.
- o Press S to save the current configuration. Press R to restore the configuration immediately preceding the current configuration.
- o These parameters are saved in a configuration:
 - all changeable setup switches
 - tab stops (indicated by T under switches)
 - EDIT KP/NUM KP mode
 - key click mode
 - current switch baud rate (if you enter an invalid sequence, or you are in default mode, the baud entered in the ACCULINK command is saved)

E.7 Keyboard Configuration for the IBM 3101-C Terminal Emulator

This section contains tables showing the keyboard configurations for the VICTOR 9000 keyboard and numeric keypad for the IBM 3101-C terminal emulator.

VICTOR 9000 Function Keys -- IBM 3101-C Emulator Values

F1	SET UP
F2	RESET
F3	BREAK
F4	CANCEL
F5	AUX
F6	*UNDEFINED
F7	UP
F8	DOWN
F9	LEFT
F10	RIGHT

VICTOR 9000 Numeric Keypad -- IBM 3101-C Emulator Values

Note: The default setting is Edit Keypad mode.

<u>Key Label</u>	<u>Key Only Value</u>	<u>SHIFT + Key</u>	<u>ALT + Key</u>
1	PF1	1	F1-SETUP
2	PF2	2	F2-RESET
3	PF3	3	F3-BREAK
4	PF4	4	F4-CANCEL
5	PF5	5	F5-AUX
6	PF6	6	F6-*UNDEF
7	PF7	7	F7-UP
8	PF8	8	F8-DOWN
9	HOME	9	F9-LEFT
0	LOCAL	0	F10-RIGHT
00	LOCAL	0	F10-RIGHT
=	ERASE EOL	=	ERASE EOL
%	ERASE INP	%	ERASE INP
+	ERASE EOS	/	ERASE EOS
X	CLEAR	*	CLEAR
-	PRINT LINE	-	PRINT LINE
+	KEY CLICK	+	KEY CLICK
.	PRINT MSG	.	PRINT MSG
ENTER	PRINT PAGE	CR	UNDEFINED
BACKSPACE	BACKSPACE	DELETE	BACKSPACE
PAUSE/CONT	EDIT/NUM KP	EDIT/NUM KP	EDIT/NUM KP

Code	Dec	Hex	Oct	Binary
NUL	0	00	000	000 0000
SOH	1	01	001	000 0001
STX	2	02	002	000 0010
ETX	3	03	003	000 0011
EOT	4	04	004	000 0100
ENQ	5	05	005	000 0101
ACK	6	06	006	000 0110
BELL	7	07	007	000 0111
BS	8	08	010	000 1000
HT	9	09	011	000 1001
LF	10	0A	012	000 1010
VT	11	0B	013	000 1011
FF	12	0C	014	000 1100
CR	13	0D	015	000 1101
SO	14	0E	016	000 1110
SI	15	0F	017	000 1111
DLE	16	10	020	001 0000
DC1	17	11	021	001 0001
DC2	18	12	022	001 0010
DC3	19	13	023	001 0011
DC4	20	14	024	001 0100
NAK	21	15	025	001 0101
SYN	22	16	026	001 0110
ETB	23	17	027	001 0111
CAN	24	18	030	001 1000
EM	25	19	031	001 1001
SUB	26	1A	032	001 1010
ESC	27	1B	033	001 1011
FS	28	1C	034	001 1100
GS	29	1D	035	001 1101
RS	30	1E	036	001 1110
US	31	1F	037	001 1111
SP	32	20	040	010 0000
!	33	21	041	010 0001
"	34	22	042	010 0010
#	35	23	043	010 0011
\$	36	24	044	010 0100

Code	Dec	Hex	Oct	Binary
%	37	25	045	010 0101
&	38	26	046	010 0110
'	39	27	047	010 0111
(40	28	050	010 1000
)	41	29	051	010 1001
*	42	2A	052	010 1010
+	43	2B	053	010 1011
,	44	2C	054	010 1100
.	45	2D	055	010 1101
/	46	2E	056	010 1110
0	47	2F	057	010 1111
1	48	30	060	011 0000
2	49	31	061	011 0001
3	50	32	062	011 0010
4	51	33	063	011 0011
5	52	34	064	011 0100
6	53	35	065	011 0101
7	54	36	066	011 0110
8	55	37	067	011 0111
9	56	38	070	011 1000
:	57	39	071	011 1001
;	58	3A	072	011 1010
<	59	3B	073	011 1011
-	60	3C	074	011 1100
>	61	3D	075	011 1101
?	62	3E	076	011 1110
@	63	3F	077	011 1111
A	64	40	100	100 0000
B	65	41	101	100 0001
C	66	42	102	100 0010
D	67	43	103	100 0011
E	68	44	104	100 0100
F	69	45	105	100 0101
G	70	46	106	100 0110
H	71	47	107	100 0111
I	72	48	110	100 1000
J	73	49	111	100 1001
	74	4A	112	100 1010

Code	Dec	Hex	Oct	Binary
K	75	4B	113	100 1011
L	76	4C	114	100 1100
M	77	4D	115	100 1101
N	78	4E	116	100 1110
O	79	4F	117	100 1111
P	80	50	120	101 0000
Q	81	51	121	101 0001
R	82	52	122	101 0010
S	83	53	123	101 0011
T	84	54	124	101 0100
U	85	55	125	101 0101
V	86	56	126	101 0110
W	87	57	127	101 0111
X	88	58	130	101 1000
Y	89	59	131	101 1001
Z	90	5A	132	101 1010
[91	5B	133	101 1011
\	92	5C	134	101 1100
]	93	5D	135	101 1101
^	94	5E	136	101 1110
-	95	5F	137	101 1111
`	96	60	140	110 0000
a	97	61	141	110 0001
b	98	62	142	110 0010
c	99	63	143	110 0011
d	100	64	144	110 0100
e	101	65	145	110 0101
f	102	66	146	110 0110
g	103	67	147	110 0111
h	104	68	150	110 1000
i	105	69	151	110 1001
j	106	6A	152	110 1010
k	107	6B	153	110 1011
l	108	6C	154	110 1100
m	109	6D	155	110 1101
n	110	6E	156	110 1110
o	111	6F	157	110 1111
p	112	70	160	111 0000

Code	Dec	Hex	Oct	Binary
q	113	71	161	111 0001
r	114	72	162	111 0010
s	115	73	163	111 0011
t	116	74	164	111 0100
u	117	75	165	111 0101
v	118	76	166	111 0110
w	119	77	167	111 0111
x	120	78	170	111 1000
y	121	79	171	111 1001
z	122	7A	172	111 1010
{	123	7B	173	111 1011
	124	7C	174	111 1100
}	125	7D	175	111 1101
~	126	7E	176	111 1110
DEL	127	7F	177	111 1111



Appendix G: Command Line Parameters

This appendix summarizes the ACCULINK command line format and lists the parameters, secondary options, and mode commands.

The command line format is:

ac ps.baud filespec \$phone[macros]

where:

p	is one primary parameter
s	is one or more of the secondary options, up to 10
filespec	is the file specification
phone	is a phone number or ACCU-TEL.FIL reference
macros	is a list of up to 10 macro names separated by commas

Primary Parameters

E	I+ Echo mode, simulated half duplex
I	I+ mode, full duplex
R	Datalink RECEIVE
S	Datalink SEND
D	Disconnects the telephone (certain autodial modems)

Secondary Options

Common to Both Modes (C)

B create a Backup file
H enables XON/XOFF Handshaking
R displays all characters Received
S displays all characters Sent
T TTY mode
Q Quiet transmission

Datalink Mode Options (D)

C CRC-16 error-checking
F ACCULINK informs the receiver of the file size
I ACCULINK enters I+ mode following a file transfer
E ACCULINK enters I+ Echo mode following a file transfer
V View characters sent or received

I+ Mode Options (I)

G GET a file from a remote system; no error-checking
L Echoes to a List device (printer)
P PUT a file to a remote system; no error-checking

Ports and Protocols

1-9 Set I/O port
U User's group protocol, XModem protocol
X Version 1.xx switch

Telephone Control

- A Answer the phone automatically (certain autodial modems)
- D Disconnect the phone (certain autodial modems)

Datalink Mode Commands

- ^C Clears work area
- ^R show characters Received
- ^S show characters Sent
- ^T Status message
- ^U Erases current line
- ^V View characters sent or received
- ESC Aborts the file transfer

I+ Mode Commands (^Vx)

- A Answer-back strings
- B change Baud rate
- C Clear (reset) screen
- D Disconnect and quit (certain autodial modems)
- E terminal Emulator
- F Filename for transfer
- G Get a file from the remote system; no error-checking
 - C toggle data Capture to file
 - H display this Help text
 - L toggle printer Logging
 - V send the ^V character
 - Z close the file and return to I+ mode
- ESC cancel GET command (file not saved)
- H display Help text, which lists the I+ commands
- K Send the remote a Break, which lasts 250ms
- I Change I/O port
- L Printer Logging Toggle
- N select macro Name
- O set secondary Options

P Put a file to a remote computer; no error-checking

Q Quit to MS-DOS or to the ACCULINK Master Menu, depending on the source of control when the command was entered

R Receive file(s) from a remote system in Datalink mode

S Send file(s) to a remote system in Datalink mode

T Terminal mode full duplex [FDX] (I+), and half duplex [HDX] (I + Echo) mode

U disk and file utilities

V send the ^V character

W screen Write protect

n transmit answer-back n [0-x]

% display connect time

change output parity

Glossary

AC -- program name for ACCULINK used in command lines.

analog loopback test -- a test in which analog signals are sent from the communications port on the microcomputer to the modem and back, to verify accuracy of data transmission.

asynchronous -- transmission in which characters are delimited by start and stop bits. The intervals between characters can be of unequal length.

baud -- measures data transmission rate, in bits per second. For example, 300 baud is approximately 30 characters per second.

boot -- to invoke the operating system on a computer.

buffer -- temporary storage space in memory to hold input or output data.

CBBS -- Computer Bulletin Board System that runs bulletin board system software, is usually maintained by private persons, and is usually free except for the cost of the phone call.

checksum -- method of checking the integrity of data transfers by comparing a number calculated by both computers in a communications link. Different values for this number indicate an error in transmission.

communications line -- any physical link that connects two or more workstations.

CRC (Cyclic Redundancy Check) -- a check value representing the contents of a data sector that is calculated at each computer in the communications link. If these values differ, there is a transmission error.

download -- to obtain a file from a remote system on a local system.

echo -- a transmitted character that is reflected back to the sender.

emulation -- enabling one device to imitate the functions of another device.

error-checking -- method of detecting transmission errors during data transfer.

Interactive plus (I+) -- an ACCULINK mode that includes interactive processing with a remote system in its features.

macro -- a set of executable instructions with a unique name. The name is used in a command or in another macro to invoke the set of instructions to be executed.

modem (modulator-demodulator) -- a device that converts digital signals from a computer to analog signals for transmission over telephone lines to another modem, which converts the signals back to digital on the receiving computer.

parity -- the value of a non-information bit appended to the data bits in a character during output. The requirements of the remote system determine the setting for the value.

port -- point where data enters and leaves a computer or other data communications device.

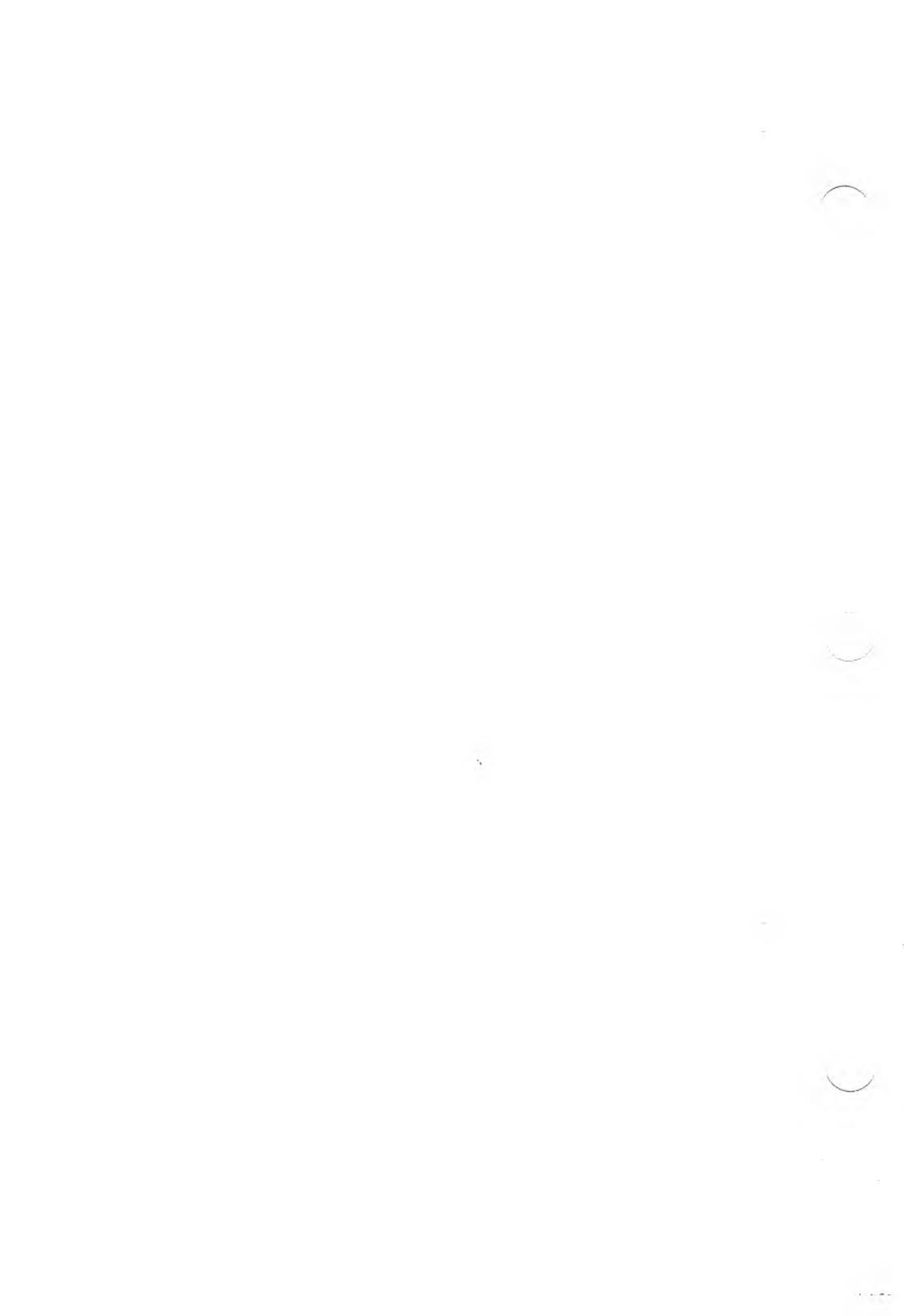
protocol -- the set of rules or conventions governing communications between two computer systems.

TPL -- Telecommunications Programming Language.

upload -- to specify and transfer a file to a remote computer system.

wildcard -- a method of designating groups of files for transfer by using the symbols * and ? to represent all or part of the filenames.

XModem Protocol -- a public domain, asynchronous communications protocol written by Ward Christensen.



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