KAYPRO

SUPRTERM™

SUPRTERM

A User's Guide

for the

SUPRTERM Communications Program

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CONTENTS

This documentation consists of two parts: an introduction to some of the features of SUPRTERM and a reference section.

We start off with a tutorial designed to introduce you at a leisurely pace to the various features of SUPRTERM. After the introduction, there are six chapters that cover in more detail the various menu options and capabilities of SUPRTERM.

1 — INTRODUCING SUPRTERM

SUPRTERM is an easy-to-use terminal emulation program for KAYPRO computers. Adding SUPRTERM and a modem to your KAYPRO allows you to contact information utilities, such as The SOURCE and CompuServe, exchange software through computer bulletin board systems, or even use the KAYPRO as a video terminal with another computer.

HOW IT WORKS

SUPRTERM uses the serial interface on your KAYPRO, the RS-232C port. By connecting the RS-232C port through a standard cable to another computer, you can imitate a "smart" Lear-Siegler ADM-3A terminal and transfer programs or data between the KAYPRO and the other machine. By directly connecting to the other computer instead of using a modem and the telephone lines, it is possible to transfer data at a maximum rate of 19,200 baud (or over sixty times faster than most modems.) One such use would be transferring CP/M programs to the KAYPRO minifloppy format from a computer equipped with 8″ floppy disks.

USE WITH MODEMS

When connected to a modem, SUPRTERM enables your computer to communicate with practically any computer that can use a telephone. This allows you to increase your computer's capabilities through time-sharing services or to keep in touch with other computer users through the local computer bulletin board. By using a local number, you can gain access to information resources, such as the Dow Jones News Retrieval Service, and the advanced features of SUPRTERM allow you to keep automatically on your diskettes a copy of what appears on the screen, thus insuring that you pay only once for the information.

SUPRTERM will work with most modems, but it has extra features designed for use with the Hayes Smartmodem and Smartmodem 1200. Among these are automatic dialing and answering of the phone, as well as hanging up when finished. By using the Command File feature shown later, it is possible to tell your KAYPRO to dial someone *by name* and have the machine look up the number, dial it, and, if the line is busy, keep redialing until it has established a connection.

THE FILES ON YOUR DISKETTE

Your master diskette contains two separate files:

* ST.COM — This is the SUPRTERM program with the settings most commonly used; for most users, this will be the only version of SUPRTERM necessary.

* STDOW.COM — This version of SUPRTERM is intended for use with the Dow Jones computer services. In all respects, except the the handling of one special ASCII control code, this program is the same as ST.COM.

TECHNICAL MATTERS

SUPRTERM comes ready for phone communication at a baud (bits per second of data flow) rate of 3ØØ baud, and a simple menu allows you to make adjustments of such things as baud rate, parity (means of detecting errors in transmission), etc. Chapter Eight gives some advice on how and why to make such adjustments; Chapter Fourteen goes into detail on actually making the adjustments.

Whether communicating by direct connection or modem, SUPRTERM allows file transfers, using either the XON/XOFF protocol used by most large computer systems or the protocol developed by Ward Christensen and others for use on the public computer systems called RCP/Ms (remote CP/M systems).

Most of the capabilities of SUPRTERM are natural and easy extensions of using the computer and telephone. In the sections that follow we will introduce you to the features gradually, letting you progress from simply dialing up and exploring a public computer to the sophisticated command files that let the computer remember and dial the phone numbers.

2 — THE PRELIMINARIES

WHAT YOU NEED

To keep the examples consistent and also to show off some of the more useful features, we will assume you have gathered the following equipment and materials together:

- a KAYPRO computer
- a Hayes Smartmodem
- a standard RS-232C cable
- the master diskette containing SUPRTERM
- several blank diskettes.

HOW THE EQUIPMENT WORKS TOGETHER

Once you have made a working copy of your master diskette and have started to run the SUPRTERM program in your computer, the characters you type at the keyboard are converted at the RS-232C port into serial signals. The cable routes these signals to the modem which then converts them into tones that can be carried over the phone lines. The computer or information service at the other end of the phone also has a modem that lets it receive the tones or characters that you have sent. Based on what you have typed — passwords, menu options, or even the Great American Novel — the other machine sends characters to its modem, which in turn converts them to tones and sends them over the phone line to your modem, which converts the tones into a signal that goes through the RS-232C cable back to your KAYPRO, and then shows up on your screen as useful information.

WHAT ARE WE EMULATING?

SUPRTERM is called a terminal emulator because the effect of the electronic daisy chain we just described is equivalent to taking the keyboard and video display of the KAYPRO and grafting them onto the other computer. Whether you

are directly connecting to another computer or using the phone lines, the aim is the same — convincing the computer at the other end that you have a KAYPRO attached as a terminal.

Most computer networks or even sophisticated programs will ask you what type of computer terminal you have. Video displays vary a great deal, and any sophisticated program needs information, such as the number of rows and columns available. *Usually, the cursor-addressing schemes and other details of the KAYPRO video display are best dealt with as "just like an ADM-3A."* There will almost always be a choice on the menu for the Lear-Siegler ADM-3A terminal. All KAYPRO computers are programmed to imitate the ADM-3A, because it was a very popular computer terminal.

NECESSARY EQUIPMENT

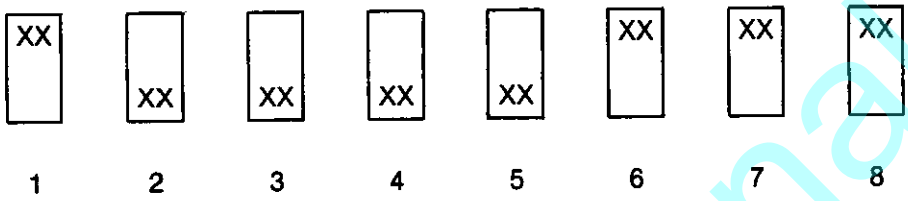
The current version of SUPRTERM will work on all KAYPRO computers without modification. However, owners of the KAYPRO 10 should bear in mind that the comments below about working diskettes needn't apply to them. (Part of the fun of a hard disk is no longer having to make "working diskettes".)

Just about any modem that uses an RS-232C interface will work with SUPRTERM. We have chosen to show examples using the Hayes Smartmodem simply to illustrate how the advanced features, such as automatic dialing, work. Owners of other, non-"smart" modems should keep in mind that discussions of the DIAL menu are specific to the Hayes Smartmodem, and they will have to suffer the agony of telephone dialing without computer assistance.

CONFIGURING THE HAYES SMARTMODEM

All the Smartmodem owners patting themselves on the back right now for their wise investment should get out their Hayes Smartmodem manuals and grab a small screwdriver, because you can't use those advanced features we just mentioned until you have properly set the configuration switches hidden inside the Smartmodem. Below is a diagram showing how those switches should be set for the proper operation of SUPRTERM. The mechanics of setting the switches are covered in detail in the Hayes manuals. For a brief explanation of what the switches do, you can turn to Chapter Eight of this guide, or you can check the Smartmodem manual.

Go ahead and set those switches now. Don't worry, we won't go anywhere without you.



OTHER SOURCES OF INFORMATION

Regardless of what type of modem you have, this would be a good time to get the manual and look it over again. The KAYPRO User's Guide that came with your computer, combined with your modem manual, should give you a good idea of how simple it is to connect the RS-232C cable. Likewise, the modem manual should contain instructions on how to connect the modem to the telephone line. If you have any problems, try the guidelines in Section Eight of this User's Guide or check with your dealer.

If you are planning to use a service, such as CompuServe or The Source, you should look through that manual as well. In addition to telephone numbers, account numbers, and passwords, somewhere in the manual they might just have a list of secret codes to be used when describing your terminal. (For example, The Telenet people, for reasons of their own, refer to an ADM-3A type of terminal as a "D1" terminal.) You don't want to search through pages of documentation when there's an expensive computer on the other end of the telephone.

3 — GETTING STARTED

MAKING A WORKING COPY OF SUPRTERM

Having connected all the cables and hardware and set those configuration switches in the Smartmodem, if you have one, you have only to make a copy of the software before getting into the actual operation of the program.

For those who have a KAYPRO 1Ø, this process is absurdly simple:

1) Cold boot with no diskette in the floppy drive. (That is, if the KAYPRO 1Ø is off, turn it on; if the computer is already on, press the RESET button in the rear.)

2) With the AØ> prompt on the screen, put your master SUPRTERM diskette in the floppy disk drive *with the label facing left.*

3) Type: PIP A:=C:*.*[V]
Press the RETURN key.

4) When the AØ> prompt appears again, you are done copying the files from your master SUPRTERM to the hard disk. Remove your master, and store it in a safe place.

Those of you with KAYPRO computers having only floppy disk drives will have to swap diskettes around. The same approach can be used whether you have a KAYPRO II or KAYPRO 4. Make a booting diskette by doing the following:

1) Turn your computer on, or press the RESET button if the computer is already on.

2) Insert your working copy of the CP/M diskette into drive A with the label facing up.

3) Insert a blank diskette into drive B.

4) Close both the drive doors, and wait for the A> prompt.

5) To run the COPY program, type: COPY
Press the RETURN key.

6) Type: B
After reading the display, press the RETURN key.

7) When the COPY menu appears again, exit to CP/M by typing: E

8) When the A> prompt appears, type:
PIP B:=A:PIP.COM[V]
Press the RETURN key.

9) When the A> prompt reappears, replace the diskette in drive A with the diskette from drive B.

1Ø) Warm boot by entering CTRL-C.

11) Put your SUPRTERM master diskette in drive B, and close the drive door.

12) Type: PIP A:=B:*.*[V]
Press the RETURN key.

13) When the A> prompt appears this time, remove your SUPRTERM master diskette from drive B, and store it safely with your other master diskettes.

If you had difficulty with the appropriate section above, and terms like "warm boot" still scare you, then *please* take the time to review your KAYPRO User's Guide on the subject of copying diskettes. It won't take long, and it could save you a lot of grief when it comes to trying to get another master diskette to replace one you accidentally erased.

THE TWO FLAVORS OF SUPRTERM

Congratulations! Whichever route you chose above, you now have two versions of SUPRTERM on the diskette in your A drive. All that remains is to pick a flavor.

The program that most people will find immediately useful is ST.COM, called simply ST. ST is the "vanilla" version of SUPRTERM that assumes you have a push-button telephone that generates tones to dial numbers. All of the examples in this document will assume that you are using ST.COM.

The other program on the diskette is STDOW, called STDOW for SUPRTERM modified for Dow Jones. STDOW is a slight modification of the stock version of SUPRTERM to allow for Dow Jones technicalities.

4 — RUNNING THE PROGRAM

You now have a copy of SUPRTERM in drive A of your computer and the A> or AØ> prompt showing on the screen. Simply type: ST and press the RETURN key. After a short delay for the usual whirrs and clicks, the screen should clear, and you should see some thing like this at the top of your display:

ST v 5 Command?(<ESC>/Break/Cmdfile/Dial/List/Print/Recv/Send/Term/Quit)?

This is called the Main Menu.

THE MAIN MENU

When you first start the SUPRTERM program, the two lines at the top of your screen indicate that SUPRTERM is in what is called *command mode.* To help you understand what a command mode is and how to manipulate the menus, we will make a (very) short digression to consider the inner workings of SUPRTERM. Not to worry. We will keep it short and relatively painless.

Once SUPRTERM seizes control of your KAYPRO, it has to decide which keys to treat as data entry and which to treat as command generators. You may be typing at the keyboard getting, for instance, stock quotes from Dow Jones when you get the bright idea to keep a permanent paper copy of the stock quotes appearing on the screen. All well and good, but how is your computer to know that, when you type a print command of some sort, it is supposed to be paying attention? After all, SUPRTERM is supposed to stay in the background and just send those characters to the computer at the other end of the phone line. It is quite possible that you might want a computer at the other end to be paying attention to those control-Ps and other goofy characters. What's a poor machine to do?

One way around the conflict is to select some characters as extra special and always intercept them. This is an impractical solution for a terminal emulator,

though, because a KAYPRO using SUPRTERM might well be used as a terminal for another computer that needs to use the same special character for something else entirely. It would be most inconvenient if, in toggling on the printer at home, you also erased your last two hours' typing on the big computer at work, wouldn't it?

THE TWO MODES OF OPERATION

In SUPRTERM we avoid ambiguity and most conflicts by using two different modes of operation: communication and command.

In the communications mode the screen only shows what you are receiving on the serial channel. Everything you type goes out the serial channel, except for the character generated when you press the control and hyphen keys simultaneously. The control-hyphen shifts SUPRTERM into the command mode, where the top line of the display offers a menu selection. On the rare occasions when you want to send a CTRL-hyphen character from communications mode, you must press the CTRL-hyphen combination twice: once to enter command mode and a second time to actually send the character to the serial port.

What is a command mode used for? Well, let's take another look at the Main Menu.

ST v 5 Command? (<ESC>/Break/Cmdfile/Dial/List/Print/Recv/Send/Term/Quit)?

The first thing to notice here is that SUPRTERM is announcing itself in the upper left-hand corner. In this case, we are using version 5 of SUPRTERM.

HOW THE MENUS WORK

Every time you see a menu on the screen, the upper left-hand corner will offer you a clue as to where you are in the program. For example, the displayed "Command?" lets you know that you are at the Main Menu.

The Main Menu offers ten choices. Each command is initiated by pressing the first letter of its associated word. That is, to Quit SUPRTERM and go back to CP/M, you press Q. Or to start Dialing a number using the Smartmodem's special capabilities, you press D. All commands that you choose from the SUPRTERM menus will be single keystrokes.

ESCAPE The first item on the menu is, in many respects, the most important. By pressing the ESCape key at the upper left of the keyboard, you can exit the command mode and enter the communications mode. In the communications mode, all menus vanish from the screen and any characters that you type will be directed to the modem port. Remember that the only way to get out of the terminal emulation mode so that you can change things is by pressing the CTRL and hyphen keys at the same time.

The BREAK function is next on the menu and, for most purposes, can usually be ignored. Details are in Chapters Nine and Ten.

The COMMAND FILE option is a rather sophisticated case that takes a bit of work to understand. The payoff is that Command Files will make the process of dialing a lot easier with the Hayes Smartmodem.

In the next chapter we will look at the DIAL, PRINT, and RECEIVE commands.

The SEND command transmits whole files and will be useful for exchanging software.

The TERMINAL option deals with configuring SUPRTERM for different baud rates, data words, and other technical matters that most users will never have to touch.

And, as we have already mentioned, the QUIT option will send you back to CP/M.

In the next section you will learn how to dial into a computerized bulletin board and how to save on the diskette or printer whatever looks interesting there. This would be a good time to find the telephone number of the nearest computer bulletin board by looking through the latest computer magazines or calling your local dealer. After reading the example in the next section, you will probably want to try SUPRTERM by calling one of those numbers.

5 — THE FIRST CALL

Once again we will start with the Main Menu.

ST v 5 Command? (<ESC>/Break/Cmdfile/Dial/List/Print/Recv/Send/Term/Quit)?

In the last section we mentioned that you will always start your SUPRTERM sessions from this menu. If you are directly connected to another computer and don't have to adjust anything in the TERM menu, you could wind up using only three commands in your entire session:

1) From the Main Menu you would press the ESCape key in the upper left of the key board to start communicating with the other computer.

2) When you finished, you'd press the CTRL- hyphen key pair to get back to the Main Menu.

3) Then you'd press Q to exit to CP/M.

You could also use a simple sequence like that if you were using an acoustic modem without any "smarts" like automatic dialing.

When you want to talk to another computer using the Hayes Smartmodem, things get only a little bit more complicated. We'll go through a couple of examples to show you what to expect.

The first thing to accomplish is to get in touch with the other computer. For this first example, we will call a fictional bulletin board in California and explore a bit. In your own adventures you should find a local system, unless you are extremely wealthy. The popular bulletin boards are scattered all over the continental U.S., and you can run up a huge phone bill in a surprisingly short time. (As one KAYPRO owner put it, "Long distance is the next best thing to being poor.")

THE DIAL MENU

Having secured a good phone number, you will want to dial it. From the menu above, simply type D for DIAL and, after a short delay as SUPRTERM programs the Smartmodem, you should be rewarded with the display shown here:

St v 5 Dial Option? (<ESC>/Answer/Dial/Hangup/Online/Retry)?

In this second menu (covered in Chapter Twelve), SUPRTERM offers a set of options as before. Before investigating them, however, we will tell you about the RETURN key. Pressing RETURN when you have a menu selection will bounce you back to the previous menu. Right now, for example, if you suddenly change your mind and don't want to dial a number, you could press RETURN and get back to the Main Menu. This feature will come in handy later on.

The first item on the Dial Menu is a reminder that you can enter the communications mode by pressing the ESCape key. A couple of the other options should be pretty obvious from their names, and all of them are detailed in later chapters. The Answer option is used when you want the Smartmodem to answer incoming calls — useful when you have a friend's computer calling your KAYPRO for some program swapping, for instance. The Hangup option does just what it says. If you are on the phone with a system, and their computer locks up and "goes off to Miami", you can stop the call without resorting to violent means, such as cutting the phone cord or unplugging the modem. From the communications mode, the key sequence would be:

1) CTRL-hyphen to get to the Main Menu

2) D to get into the Dial menu

3) H to Hangup the phone.

DIALING THE NUMBER

Right now, the most important option is actually Dialing the phone number, so we press D.

At this point, SUPRTERM asks for the number we want to call. We type in the phone number (including a 1 (one) and the area code, if necessary) and listen to the sound effects from the Smartmodem.

Note that it is quite all right to add hyphens and parentheses to the number for readability. The dialing procedures follow the Hayes manual closely, and all of the examples given below illustrate valid methods of typing phone numbers:

- 1-(213)-555-1212
- P1(213)5551212
- 1,213,5551212

The second example above is an illustration of the ability of the Smartmodem to switch from the default of tone dialing to pulse dialing. Most users will never change from the normal dialing mode that uses tones; those users of SUPRTERM who live in an area that will not accept the normal push-button tones will have to preface each number they dial with a P to notify the Smartmodem to change to pulse dialing mode.

The comma is another special symbol for Hayes Smartmodems; it creates a pause of about two seconds while the modem waits for a dial tone. For more information about the dialing option, see Chapter Twelve. For more information on which characters are allowed in a Smartmodem phone number, see Chapter Five of the Smartmodem Owner's Manual.

Let's get back to the business of dialing. If we hear a busy tone, we can ignore the prompts on the screen and press a couple of keys to get back to the Dial Menu to choose the Retry option. Retry allows your KAYPRO to dial a number and wait for another computer's modem to answer the phone. If the line is busy, SUPRTERM will patiently hang up, wait a minute or so, and then try again. If the line is not answered by a modem in a reasonable amount of time, the program will keep redialing and pausing until it gets through or until you tell it to stop.

RCP/M SIGN-ON

When the phone is answered and you hear the tell-tale sound of two computers whistling at each other, SUPRTERM will turn off the speaker in the modem and enter the communications mode. This is the point at which SUPRTERM's operation becomes transparent, and all your responses are based on what the other computer does. There is a delay, and you may have to press the RETURN key a

couple of times to let the other system know you're alive. In this (imaginary) case, we finally get through and see the following questions appear on the screen:

#~

HOW MANY NULLS DO YOU NEED (Ø-9)? *none*
HOW MANY NULLS DO YOU NEED (Ø-9)? *Ø*

CAN YOUR TERMINAL DISPLAY LOWER CASE? (Y/N)? *y*

Welcome to the Mythical RCPM

ØØØ - 555 -1212 (11Ø - 3ØØ baud)

Germanium Junction, CA. T. Hacker, SYSOP

What is your FIRST NAME? *donald*
What is your SECOND NAME? *duck*

Searching user file...

While that system is looking to see if Mr. Duck is a frequent user, we will note a couple of things about what's happened so far.

After our responses (underlined above), we always pressed the RETURN key. It isn't a universal rule, but most computer systems will need a RETURN to let them know you are done typing your response.

We've told the system that our KAYPRO isn't an old Teletype machine and hence doesn't need any nulls (extra characters that don't do anything except waste time — which is their job).

Then, we said our system can handle such recent innovations in communication as lowercase letters.

This sort of questioning is common in dial-up computer systems, because the users of the system might be using old, slow equipment that can only print upper-case letters. In this case, we have a pretty fast KAYPRO as a terminal, and so we got the full announcement without any time-wasting nulls.

From the sign-on, we learned that the Mythical RCP/M (remote CP/M system) is located just south of San Jose, California, and it is run by a SYStem OPerator named Hacker.

For future reference we can note the baud rates supported; in this case, there is no need to use an expensive 12Ø0-baud modem, because the computer we're calling can only handle 3Ø0 baud.

One of the interesting things about the bulletin board systems and RCP/Ms is that they handle messages just like normal bulletin boards. In checking the "user file", the Mythical system will be looking to see if we have any messages we haven't picked up. The system will also be looking for a flag indicating that D. Duck is a screwball who has been wasting computer time and therefore has become *persona non grata.* (You should be considerate when using other people's computer systems; SUPRTERM is not the only piece of software that can hang up a phone!)

Now, from experience, we know that users can often get some information on these systems by typing ? or perhaps HELP, but it would be prudent to use the printer to make a copy of what we learn for future reference. There are two ways to do this.

THE PRINT OPTION

The first way is to use the Print function at the Main Menu. The Print function will take the characters currently on the screen and print them on the parallel printer. (This is often called a "screen dump".) This approach is relatively straightforward, but it means we must previously have set up the printer and, worse yet, when we do the screen dump, the display should be static — which means that we have to slow things down temporarily by sending a CTRL-S character to the system to tell it to stop for a while. This means that we are increasing our phone bill and tying up the other system while we are waiting for the printer to print everything. Also, this approach means we only get the one copy.

As luck would have it, the Mythical RCP/M is a pretty busy system with thousands of users in its files (what other reason could there be for it taking so long to respond?), and we have some time to go through the steps necessary to keep a copy of what happens on diskette.

CREATING A TRANSCRIPT FILE

First, we go back to the Main Menu by pressing CTRL-hyphen. We are still in contact with the RCP/M, and if anything happens at the system, we will see the

text appear on the lower portion of the screen. Entering the command mode will not stop reception of characters. From the main menu, we press R, and another menu appears:

ST v 5 RECV Option? (<ESC>/AddIf/File/Lowup/onOFF)?

We will keep a record of the contact with the RCP/M system in a file called MYTHICAL.LOG. First, we tell SUPRTERM to set up a new file by pressing F.

SUPRTERM next asks what sort of file it should be. By pressing T for the Terminal option, we choose to keep a record of the ASCII characters sent to and from the terminal. The Block mode option is for the transfer of information already in the form of a file, such as programs.

The next question has to do with a protocol called XON/XOFF. Unless you know from the system documentation that this approach will lead to disaster, go ahead and press the RETURN key. (By displaying the <Y>, SUPRTERM allows you to press the RETURN key to select "yes" as a default. Typing Y would have done just as well.)

XON/XOFF

As a technical note, what has just happened is that SUPRTERM asked you how it was going to tell this system "whoa!" when it had taken as much information as possible. Incoming text in the terminal reception mode shows on the display and is also stored in a section of RAM called a buffer. When received text has filled the buffer, SUPRTERM will tell the system to wait a bit and then proceed to put the information in the buffer on the diskette in the form of an ASCII file. When the buffer is empty, SUPRTERM will tell the other computer to start sending again. There are two reasons we can make the assumption that the computer on the other end can handle the XON/XOFF protocol: it is a very common procedure; and, even when XON/XOFF isn't used, it may take a half hour or more to fill up the buffer with text.

Next, SUPRTERM asks you to name this file, and we respond by typing MYTHICAL.LOG and pressing RETURN. If there is no problem with the name we

have chosen being the same as an already-existing file, we will see the following display:

ST v 5 RECV Option: (<ESC>/Addlf/File/Lowup/onOFF)? TF = A:MYTHICAL.LOG

In the upper right-hand corner is the name of the terminal file you just created.

All that remains is to turn on file reception by pressing O. You might want to hit the O a couple of times to notice the difference between the onOFF and the ONoff status flag. When the display shows ONoff, you are all set. From this menu you can press ESCape to go back to communications mode again.

With the receive file set up, anything that shows on the screen will be put in an ASCII file called MYTHICAL.LOG. At the end of this session, we can finish the file by simply entering the Main menu and Quitting by pressing Q. Technically, the Quit command closes all the open files before returning control of the KAYPRO to CP/M.

Later on, we can use the standard CP/M utility called PIP to print the file on our printer or even use a word processor to edit the log so that we only have those parts we need. In the next section we will deal with another type of file that allows us to pick up all manner of software for the cost of a phone call.

6 — DOWNLOADING SOFTWARE

When we left the Mythical RCP/M, it had gone off for a conveniently long time to find out if our duck was a welcome guest. We will assume for the purpose of this section that the owner of this RCP/M doesn't mind people using pseudonyms when using this system, and your investigation of the system has disclosed a public domain S-BASIC program called XLATE.BAS that interests you.

CAPTURE MODE

At this point, you have the interesting problem of transferring the program to your KAYPRO. You could use the "capture" technique by turning on the Receive File option in terminal mode. Since, in the terminal mode, all incoming characters are copied onto diskette, with the receive file toggled on, you could tell the RCP/M system in California to TYPE XLATE.BAS, and the remote system would proceed to type the XLATE program in S-BASIC onto your screen. All the text would be saved in a file which you could later edit with a text editor to delete the preceding information about the Mythical RCPM. However, using that approach will cost more money, as a thirty-kilobyte program could have a .BAS source file twice as large.

TYPEing a program's source file is a useful technique to remember. Because the system under discussion is a RCP/M capable of using the Ward Christensen/ MODEM7 protocol, we have an alternative. All too often, in dealing with big computer systems, you will find that listing a program or document with a terminal file turned on is the only way to tranfer that information.

BLOCK MODE

Another way to handle the situation is to ask the RCP/M system to send you a copy of the compiled S-BASIC program. Normally, this program would be called XLATE.COM, but when programs are on the RCP/M system and available for transfer, the file name extension is OBJ instead of COM. Unfortunately, a command file like XLATE.COM is made up of 8Ø8Ø instructions instead of ASCII symbols and is bound to include some types of information that cannot be displayed via the TYPE command. What we need is a way of transferring files that consists of non-printable characters.

One of the neat things about RCP/M systems in general, and this one in particular, is that they support a file transfer protocol named after its creator, Ward Christensen. The Christensen protocol is normally supported by programs such as MODEM7 and XMODEM. In SUPRTERM, the Block mode of file transfer uses the very same protocol. This means that we can tell the Mythical system to send (or receive) a CP/M file using the XMODEM program on the RCP/M and have SUPRTERM receive (or send) that file with no trouble and usually only a few steps.

The first step is to tell SUPRTERM to stand by for file reception. This use of the Receive File menu is very similar to what we did in the previous episode, only this time we answer the file mode question with a B to choose the block transfer option. Since we were using a file for text capture (called MYTHICAL.LOG, remember?), when we attempt to create the new XLATE.COM file, SUPRTERM will politely ask if we are finished with the first file by saying:

OK to close "A:MYTHICAL.LOG(Y/N)<N>?

We could press RETURN to back out and leave MYTHICAL.LOG alone. But this time we will type Y and then press RETURN. (This will close the MYTHICAL.LOG file so that any text in the RAM buffer will be written to disk.) Once the choice is made, SUPRTERM starts prompting us for information about the new file. In this case, to answer the question about the file's mode of reception, we type B for block mode and, for the file name to receive, we type XLATE.COM.

When SUPRTERM responds with the main Receive Menu, we *don't* turn the reception on with the onOFF flag. Not yet. First, we must tell the other system to start sending the file. This is rather easy.

1) Press ESCape to get into the communications mode.

2) Type XMODEM S XLATE.OBJ

3) Press RETURN.

4) Press CTRL-hyphen.

This will execute the XMODEM program at the RCP/M and tell it to start Sending the file XLATE.OBJ when the RCP/M receives the proper handshaking signal from the KAYPRO.

To get the process under way, we go back to the command mode. In this case, as we entered the communications mode from the Receive Menu, we return to the Receive menu. Now, we toggle the receive file on. SUPRTERM will ask a question about using CRC. Usually XMODEM will announce if the RCP/M system has CRC capabilities. If it has, answer by typing C, and the transfer is started.

The rest of the file transfer is automatic. Small blocks of data will be individually sent and checked, using the Cyclic Redundancy Check. (The CRC is merely a means of verifying that the information received was, in fact, the information sent.) When the entire file is on our diskette, we will have the option again of transferring files using the same steps or using the communications mode for more snooping.

Note that, if you had written that wonderful XLATE program and wanted to share it with the world by putting it on an RCP/M, the steps would be very similar. The difference would be that you would tell the XMODEM program to receive a file using R instead of S as used above, and (obviously) in SUPRTERM, you would be using the Send File option instead of the Receive File option.

So far, we have covered transferring files in both the XON/XOFF and the Christensen protocol, as well as discussing some of the simpler features of SUPRTERM. In the next section we will show you how to set up a Command file.

7 — WHAT'S IN A NAME?

COMMAND FILES

After you have typed the phone number for your favorite computer system several times, the thrill and excitement of the Dial menu will probably begin to fade a bit. Looking up the phone number and dialing it might even become irksome. After all, the idea of a computer is to save you a little mental effort. You might expect that your KAYPRO, a computer powerful enough to do accounting, inventory, stock portfolio analysis, and play Adventure would be able to keep track of a couple of phone numbers for you. And you'd be right.

One of the more sophisticated features of SUPRTERM is the program's ability to accept a series of commands from a file on your diskette. For example, by telling the computer to execute the Command file named FRED, you might have SUPRTERM dial the phone number of your friend's computer. Essentially any sequence of commands that you can type at the keyboard can be automated by putting them in a Command file.

CREATING COMMAND FILES

To create a Command file for SUPRTERM, you enter the Command File menu from the Main Menu by pressing C. You should see a display like this:

ST v 5 CMDFILE Option (<ESC>/Create/Execute)?

Before you can Execute a Command file, you must first Create it. Pressing C will cause SUPRTERM to check to see if a Command file is already being used. (This is an obvious restriction; no Command file can create another Command file.) As with Receive and Send files, if there is a Command file already being used, you will be asked if you want to abandon the earlier file or not.

Once you have settled the matter of whether there is a Command file already in operation, you can enter the file name that you wish to use. (It never hurts to be

descriptive with file names; see if you can come up with something better than X or FRED.) If you choose a name that is already being used, SUPRTERM will prompt you for a decision on whether or not to erase the existing file.

Assuming that you have chosen a descriptive file name that doesn't conflict with existing files, the Command file will now be storing all the commands that you type. SUPRTERM will be reminding you of this in the upper right-hand corner:

ST v 5 CMDFILE Option (<ESC>/Create/Execute)? CF = A:FRED

Although Command files can be quite long and sophisticated, in this example we will be satisfied with dialing up Fred's computer system. Press RETURN. You have returned to the Main menu.

Follow the procedure covered in Chapter Five to Dial into Fred's computer as you would normally do. (If the number is a busy one, you can use the Retry option to keep SUPRTERM dialing Fred's number until it connects.) Believe it or not, you are almost finished with setting up the Command file. The only thing left to do is "close" the file so that no more commands are stored on disk.

Press the CTRL-hyphen key combination to go to the Main Menu. Now press CTRL-Z. The CTRL-Z combination will close the current Command file. You are all set to run the file.

Gotcha warning: When dialing another computer, you must make a connection to properly set up the command file. If nobody answers your call, you won't be able to set up the proper command file.

RUNNING A COMMAND FILE

Once you have created a Command file on the diskette, it can be executed whenever you wish.

1) Enter the Command file menu by pressing C.

2) Press E for Execute.

3) Give the Command file name. Press RETURN.

That's all there is to it.

In this particular case, upon entering SUPRTERM from CP/M, all you have to do to call Fred's computer is press C for Command file, then E for Execute, followed by FRED and pressing RETURN.

For the sake of space and clarity, we have deliberately chosen a rather limited example of using a Command file. Experimentation will give you an idea of the usefulness of Command files better than words on paper can. For example, a simple extension of what we have already done is to add some more commands after the modem has established contact. You could use a word processor to edit a (non-document) text file containing your name and password for a computer system and then, after the Dial option in your Command File, enter a CTRL-hyphen command, and add the Send Terminal file option. There are many possibilities.

This is the last section that deals with SUPRTERM in a tutorial fashion. The next section is a collection of hints for those times when you know *something* isn't quite right, but are unable to pin down the difficulty. The sections after that are just elaborations of the options available in the various menus. For the majority of your use of SUPRTERM, you will probably never have to refer to them.

8 — HELP

One of the most vexing things about serial communications is that it *seems* so simple. There are two signal lines that carry the information one bit at a time, and there are some other signal lines to stop and start the flow, depending on conditions. What could go wrong?

Well, when you are talking to the Hayes Smartmodem, things are pretty well taken care of. That is, whatever computer is on the other end of the phone is probably running the standard default arrangement from the TERM menu. Eight bits per character, no parity, etc. Few people have problems running SUPR-TERM (or KAYPROs for that matter) with a modem. The real fun begins when you stick a computer or machine other than a modem at the other end of that RS-232C cable. Each occasion will be different, but the following hints may help.

DTE OR DCE?

The RS-232C pin numbers and their associated functions are spelled out in the KAYPRO User's Manual. This sort of information should be compared with the documentation accompanying the other computer. The names given to the pins of a RS-232C serial port will differ depending on the orientation of the equipment. Most terminals (and the KAYPRO modem port) are configured as Data Terminal Equipment or DTE, while most modems are configured as Data Communication Equipment or DCE. This works out well, as the whole idea of RS-232C communication is letting one DTE device talk to one DCE device.

As stated above, letting a KAYPRO (DTE) talk to a standard modem (DCE) is a snap. Unfortunately, when you want to have your KAYPRO talk to another computer using RS-232C, you have perhaps a 5Ø-5Ø chance that the other computer will want to be the DTE half of the pair instead of the DCE device. When this happens, you can use a device known as a "null modem" — a rewired RS-232C cable — to make each half think it is really the DTE half of the pair. Instructions for constructing "null modems" appear every so often in the computer magazines, or you might ask your dealer for assistance. As a last resort, you can try making your own null modem by following the instructions in:

Data Communications for Microcomputers by Elizabeth Nichols, et al. (McGraw-Hill, ©1982) This is an expensive paperback, but well worth the money if you are incommunicado.

DATA FORMAT AND BAUD RATE

If you are pretty sure that you have taken care of any hardware problems in the cabling between your two RS-232C devices, either through verifying the signals through the other device's documentation or by noticing that some characters are getting through, then the next step is to see if the timing and format of the characters are the same. Usually a baud rate (speed of data transmission) error or parity bit mistake will give the appearance of gibberish getting through every now and then.

The best way of dealing with this sort of problem is by comparing the KAYPRO User's Guide with the other device's documentation.

Are both machines set for the same baud rate? If the data rate is 300 baud or below, are both machines using the same number of stop bits? (Most communication faster than 300 baud uses only one stop bit, but you never can tell.) What about the parity bit? Is the data word seven bits with a parity bit added for a total of eight bits, or is it really eight bits of data with no parity? Perhaps the other system doesn't echo the characters that you are sending it, and all you have to do is change the Echo option to echo outgoing characters.

All these nuances are easily changed using the TERM menu, but you need a clue as to what needs changing. If you want to learn about these things, the Nichols book mentioned above is an excellent source of information. But if you want the shortest path to getting the bugs out, your best bet will be getting a manual for the system in question and/or an enlightened user, and then using the TERM menu to adapt SUPRTERM to the oddity.

9 — MODES OF SUPRTERM OPERATION

COMMUNICATIONS MODE

In this mode, characters typed at the keyboard are sent out the serial port and characters received at the serial port are displayed on the screen.

Communications mode can be reached from most menu displays by pressing the ESCape key. This mode is also reached as a result of some menu selections, the most common example being a successful phone connection made using the DIAL menu.

Characters received at the RS-232C connector are normally channeled to the video display with minimal filtering. This means that the KAYPRO display will react like a Lear-Seigler ADM-3A terminal for cursor positioning, etc. (For user-programmable filters, see the AddIf and Lowup options in the TERMinal Characteristics menu.)

The one significant case of filtering occurs in the STDOW version of SUPRTERM. STDOW was designed to facilitate communication with the Dow Jones News Retrieval Service when it was discovered that the normal operation of that service generates a Record Separator control code following each transmitted block of information. Unfortunately, that control code is a Home Cursor command for ADM-3 terminals; after several paragraphs the screen becomes unreadable with the normal version of SUPRTERM. The STDOW version of SUPRTERM solves this problem by ignoring all incoming Record Separator characters. In all other respects, STDOW operates the same as ST.

All characters typed in communications mode, with one exception, are sent out pin 2 of the serial connector. The one exception is the character generated by pressing the CTRL and hyphen keys simultaneously; this character is captured by SUPRTERM as a control code that toggles the program into the command mode. The CTRL-hyphen combination does not generate a character at the serial port, nor does it stop the display of incoming characters on the screen. To send CTRL-hyphen, press CTRL-hyphen while in the main Command Menu.

Please note that the BREAK "character" that some computers recognize as an I/O channel interrupt is not sent via the communications mode. To send a Break signal, you must enter the Main Command menu and press B. Sending a Break will automatically return you to communications mode.

COMMAND MODE

When you first enter SUPRTERM, you are in the command mode instead of communications mode. All adjustments to the actual parameters of serial transmission and reception, such as baud rate and transfer protocol, are made using the command mode. In this mode, SUPRTERM will display two lines at the top of the screen and await your menu selection or other information. The various menus are covered in some detail in the rest of this manual.

When the top line of the video display shows a menu of choices, SUPRTERM is waiting for a single keystroke corresponding to the first letter of the menu choice. Thus, from the Main Command menu described in the next section, the TERM option (used to set the TERMinal characteristics) is selected by pressing T. In the event of a mistake, pressing the RETURN key will return you to the previous menu.

Command mode is entered from communications mode by simultaneously pressing the CTRL and hyphen keys. Most menus have <ESC> as the first option; by pressing the ESCape key, you can return to the communications mode.

1Ø — MAIN COMMAND MENU

This menu is covered in some detail in Chapter Four.

ESCape: Enters the communications mode.

Break: Sends the break signal (an "illegal" character lasting about a third of a second) and then enters the communications mode. Some computer systems will recognize a break as a request to interrupt and/or discontinue the flow of transmitted data. This is a useful feature on the occasions when you suddenly realize that you just asked for three hundred pages of information to be sent at 3ØØ baud, and you don't have all day to watch the screen.

Cmdfile: Enters the Command File menu See the next chapter for details.

Dial: Enters the Dialing menu. (The Dialing option applies only to those users with either a Hayes Smartmodem or Smartmodem 12ØØ.) See Chapter Twelve for details.

If this is the first time the Dial Menu has been entered since entering SUPRTERM, the Smartmodem will be set to non-echo, non-verbose command mode, and the default dial mode will be specified as tone. Other settings are not changed.

List: Clears the screen and displays a sorted file directory. SUPRTERM will ask for a "file name"; this specification of files follows the same rules as the ambiguous file names used with the CP/M DIR command. In contrast, however, LIST will order the files found alphabetically. Pressing RETURN instead of giving a filespec aborts the procedure and returns to the main menu.

LIST shows the number of sectors and the size in kilobytes of each file, as well as the current user number and size of used/free storage. A disk reset is performed automatically, so this command may be used to reset the disk parameters of CP/M in a manner similar to the famous "warm boot" when a new diskette is inserted.

(Caution: LIST will not work on disks containing more than 64 files in the current user area on the specified logical drive. This means that KAYPRO 1Ø owners should be careful to not LIST in an over-crowded user area.)

Print: Screen dump. Prints a screen image to the parallel printer port. Note that SUPRTERM will lose serial data received during the printing. If the system you are connected to supports the protocol known as XON/XOFF, use CTRL-S to stop data transmission before using the print function and CTRL-Q to restart transmission when you are done printing the contents of the screen.

Recv: Enters the Receive menu for storing serial data as a CP/M file; see Chapter Thirteen for details.

Send: Enters the Send menu for transmission of disk files. See Chapter Thirteen for details.

Term: Enters the Terminal Characteristics menu for modification of such matters as baud rate and parity settings. See Chapter Fourteen.

Quit: Closes any open files, exits SUPRTERM, and warm boots to re-enter CP/M.

11 — THE COMMAND FILE MENU

Command files can be used to simplify such things as setting baud rate and parity, or calling a computer system and automatically keeping a record of the displayed information. Almost anything that SUPRTERM allows in the command mode can be automated using command files. (Assuming, of course, that you have a Hayes Smartmodem or Hayes Smartmodem 1200.)

A command file is a means of stringing together a series of SUPRTERM commands in a CP/M text file. The way it works is fairly simple:

1) You tell SUPRTERM to pay attention (that is, you select the Create option of the Command File menu.) From the Main menu, this means pressing C twice.

2) You enter the file name that you want to associate with the upcoming sequence of commands.

3) Step through the commands you want to automate in the order you want them performed.

4) When the sequence of commands is complete, enter CTRL-Z to store the file on disk.

When a command file is executed, it continues until:

- terminal mode is entered,
- a message is presented which requires user attention, or
- the end of the command file is reached.

If a command file is stopped by entering communications mode, it will resume when command mode is reentered with a CTRL-hyphen. If it is stopped because of a message, execution will resume when you press RETURN. When the end of the command file is reached, a message to that effect will appear, and following the ritual of your pressing the RETURN key, you will enter the Main menu.

ESCape: Enters the communications mode.

Create: Creates a new command file. The name you choose for the command file must be considered valid by CP/M, and duplicate file names are not allowed.

Only one command file may be active at a time. If you attempt to create a command file when one is already in use, you will be informed of the conflict and asked if it is okay to stop executing or storing the first file. If you press RETURN, or N and RETURN, the old command file will remain in use. If you enter Y and press RETURN, the old file will be closed.

Once the issue of file quantity is resolved, you will be asked to specify a file name. If you press RETURN without giving a file name, no file will be created. If you pick a file name that is already being used on your disk, you will be told that the file already exists and asked if it is okay to delete the previous file. If you press RETURN or press N and RETURN, the file will not be deleted.
If you enter Y and press RETURN, the existing file will be deleted and a new file will be created with the same name.

If a command file is currently being created and the command file menu is entered, the file name will be shown on the right-hand side of the top command line, and the word "CREATE" will be displayed to remind you of the open file.

Execute: Executes the commands in an already existing command file. SUPRTERM will ask for the name of the command file to execute. If no file name is entered (a RETURN only), nothing happens. When a file name is entered, the directory of the currently logged-in disk is examined. If the file doesn't exist, or, if you made a typing error, SUPRTERM will admit defeat, and nothing will happen. If the file exists and a command file is currently open, the command file will be closed, and, after announcing the new command file, execution of the commands in the file will begin. (Note that execution of command files occurs so rapidly that you may not be able to read the commands as they occur.)

RETURN: Returns to the Main Menu.

12 — THE DIALING MENU

NOTE: All the Dialing menu functions assume a Hayes Smartmodem or Smartmodem 12ØØ is being used.

When the dial menu is first entered after program initialization, the Hayes Smartmodem is sent a sequence of commands to set it up for "non-verbose, no echo" command mode, and to set up the default dial mode. The phone number buffer is empty on initialization, but can be loaded via a command file, if desired.

When SUPRTERM is operated in remote mode from another system, the Dial menu cannot be accessed. After all, attempting to access the Smartmodem while connected via the RS-232C port could lock out the remote user and "crash" the system.

Another note: All the references below to ATA and other cryptic quotes are command strings for the Smartmodems. They are covered, as you might expect, in the *Hayes Smartmodem Owner's Manual.*

ESCape: Enters the communications mode.

Answer: When this command is entered, SUPRTERM will enter the command mode *of the Smartmodem* and will wait for a ring response code from the modem, indicating an incoming call. When an incoming call is detected, SUPRTERM will do an ATA command to answer the call and will then wait for a carrier tone indicating the presence of another modem at the other end of the phone line. If no carrier is received, the phone will hang up and SUPRTERM will wait for another call.

If a carrier tone is detected, SUPRTERM will enter remote mode, which means that the caller will be able to run SUPRTERM as though locally connected. There are a few differences, however. In remote mode, during block mode file transfer, no sector or retry counts are displayed, as this would appear as received data to the remote system. (This is equivalent to the "quiet" mode used on other programs.) Also, issuing the Quit command will not allow the user into CP/M, but instead will hang up the phone and go back to waiting for another call. SUPRTERM will also disconnect and go back to waiting for a call in the event of carrier loss (e.g., the other computer hanging up suddenly.)

Dial: Waits for you to enter a phone number. A phone number may include any of these characters:

- any number,
- hyphens or parentheses — may be used for clarity
- commas — may be used to pause approximately two seconds for another dial tone
- P or T — may be used to shift between pulse and tone dialing.

EXAMPLE: P9,T(619) 555-1212 would allow you to use pulse dialing to get an outside line (9,) from a PBX and then switch to tone dialing. More details are available in the Smartmodem manuals.

Internally, all dial commands are prefixed with ATMØD, (to disable the modem speaker while dialing) and suffixed with ;M1. After the number is dialed, SUPRTERM sends an ATO command to go online and wait for a carrier tone. While waiting, any key pressed on the keyboard will abort the call and hang up the phone. (The phone number entered will still be in the SUPRTERM phone number buffer, however, and can be dialed again via the Redial function.)

Hangup: Enters the command mode and hangs up the phone.

Online: Waits for a carrier tone indicating another modem is connected. When a carrier tone is detected, an ATO is sent to the Smartmodem so that the current mode (either answer or originate) is used to go on-line.

If no carrier is present, this command will send an ATD command to the Smartmodem in order to go on-line and wait for a carrier in the originate mode. Use the Answer option to go on-line and wait for connection in the answer mode.

Note that you can use the Dial option to send an R to the Smartmodem and thereby originate a call but still go on-line in answer mode.

Retry: If a phone number has been previously entered, it will be dialed, and there will be a wait for the carrier tone indicating another modem. Attempting a Retry without first Dialing a number will not work.

If the call is aborted by typing any key on the keyboard, or the time limit (3Ø seconds) for waiting for a carrier tone expires, the program will hang up the phone, pause 2Ø seconds, and then dial again. If a key is pressed during the 2Ø-second pause, the retries will cease. Note that the amount of time in the delay waiting for a carrier tone is a programmable function of the Hayes Smartmodem and adjustable via the communications mode.

RETURN: Returns to the Main Menu.

13 — THE RECEIVE AND SEND FILE MENUS

The Receive and Send File menus differ mainly in the direction of data flow. In the Receive File mode, characters coming from the serial channel are stored on diskette as CP/M files. In the Send File mode, characters already on diskette are sent out the serial channel to the other computer. Regardless of the direction of the file transfer, the handshaking protocols are the same.

Receiving files in the Terminal protocol means that a copy of every character sent to the screen is put in the KAYPRO's memory. When the memory buffer area is full, a special character is sent to the system at the other end of the serial link that signals it to stop sending data (XOFF). When the information has been written from memory to diskette and the buffer is empty, another special character, XON, is sent out the serial channel to indicate that the KAYPRO is now ready to receive more data. This XON/XOFF protocol is very common; it is used in many serial printers as well as most computer systems.

Transmitting files in the Terminal protocol means that text files already on diskette are sent to the other system as if you had typed them (very quickly) at the keyboard. (Note that you must have already created the file with a word processor before entering SUPRTERM.)

The XON/XOFF protocol means the same procedure mentioned above in file reception is followed for transmitting files, except that now the KAYPRO will look for an XOFF character from the other computer as a signal to hold the character transmission for a while.

Because the memory buffer in the KAYPRO is fairly large, it is quite possible to send and receive files using XON/XOFF without ever seeing any evidence of handshaking. Remember, data flow is stopped only when the buffer is full.

Thanks to the efforts of Ward Christensen and others in the CP/M User's Group, another protocol is fairly common for file transfer. The Christensen protocol is a more sophisticated way of transferring data and programs. Unlike XON/XOFF, the Christensen protocol allows easy transfer of programs and text in a batch mode. That is, you can now say to another computer running SUPRTERM or its equivalent "send all the files starting with S on drive A to the computer on the other end of the modem." In SUPRTERM, this is called Block mode, mainly because, in the process, the files are broken into small chunks and transferred a piece at a time.

While the remote CP/M computer systems (known as RCP/Ms) and other telecomputing outlets support the Christensen protocol, it is not universal. You find some systems have the ability to transfer files, but only without the benefit of "CRC". The Cyclic Redundancy Check is an option on Block mode transfers that offers much greater data integrity than trusting to the fates. An important difference between transmitting and receiving files in the Block mode is that only the receiving computer can request the use of CRC.

ESCape: Enters the communications mode.

AddIf: Toggles a software flag in SUPRTERM to add Line Feeds to Carriage Returns. Displayed as "AddIf" when off and "ADDLF" when on. When toggled on in the Receive mode, it will add a Line Feed character to every Carriage Return (RETURN) character that arrives. The added Line Feed characters are both displayed and, if a Receive Terminal file is enabled, added to the file being stored on diskette.

When toggled on in the Send mode, ADDLF will add Line Feed characters to every RETURN typed at the keyboard and, if applicable, to every RETURN character transmitted from a file.

(AddIf is not usable with Block mode file transfer.)

File: On entry, SUPRTERM will ask you to specify the mode of file transfer. If another send or receive file is already in operation, an error will occur. (Only one send or receive file can be open at any one time.) You will be offered the choice, in such a conflict, of which file to give priority.

After file conflicts are resolved, you will be asked the file mode to be used (Terminal or Block mode). If you press RETURN, no file will be opened, and you will return to the menu where you started. If you press B, block mode will be selected. If you press T, terminal mode will be selected. In no case will transfer of data begin until you start it through the Onoff toggle mentioned below.

If you select Terminal mode, you will be asked whether to use the XON/XOFF protocol or not. Next you will be asked for the name of the file to store characters in (Receive mode) or to send characters from (Send mode). When all file names and modes are settled, SUPRTERM will return to the Receive (or Send) menu.

If you select Block mode, when you are prompted for a file name, you will be able to respond with wild cards, such as *.COM, etc. Again, if you press RETURN (with no file name entered), no file will be opened, and you will return to the menu (either Send or Receive) from which you started. If you enter a non-ambiguous file name, that file will be opened. If you use an ambiguous file name, then the transfer will occur in Batch mode. The advantage of Batch mode is that

the individual file names will be automatically assigned to separate files during the transfer. In batch mode reception, all the files wind up on your diskette with the file names they had on the original system. In batch mode transmission, the files are transmitted to the other system with the file names they have on your KAYPRO diskette.

Block mode is similar to Terminal mode, regardless of direction of data flow. In this regard, no file transfer will occur until you toggle the Onoff option mentioned below.

Lowup: A software toggle similar in action to the AddIf flag mentioned above. In this case, instead of adding Line Feed characters, the flag controls whether characters, as part of the transfer, are converted to upper case from lower case. (Some older computer systems have problems with lower case letters.) Initially, this function is disabled and the word "Lowup" is displayed in upper and lower case.

When enabled in the Receive File menu, the word, LOWUP is displayed in all upper case, and all incoming ASCII lower-case characters are converted to upper case before being displayed on the screen or stored in the terminal mode receive file.

When toggled on in the Send menu, LOWUP will convert all lower-case ASCII characters sent to the serial channel to upper case. (Like the AddIf function mentioned above, this function has no effect on block mode transfer of files.)

Onoff: Toggles the file storage flag on and off. As mentioned above, you must turn this flag on to start file transfers. Initially the flag is off, indicated as "onOFF". When on, this is indicated as "ONoff".

If turned on in the Receive File Block mode, you will be asked whether or not CRC mode is to be used. If a C is entered, CRC mode is used. If an N is entered, the default (checksum) mode is used. And if an A is entered, the file is turned off, and the user returns to the receive menu. After CRC/NOCRC has been selected, block mode reception is initiated, and a file is received and then closed with an appropriate ending message to indicate a successful or a non-successful transfer. If a wild card file specification was used, multiple files can be received from another SUPRTERM or a MODEM7-compatible program.

If turned on in the Send Terminal File mode, no file will be sent until you enter the communications miode by pressing ESCape. If the other system does not echo characters, you can monitor the text file you are sending by changing the TERM menu option called ECHO to a Send Echo mode.

RETURN: Returns to the Main menu.

14 — TERMINAL SETTINGS MENU

This menu can be used to change the baud rate clock (transmit/receive speed) and the characteristics of the Z8Ø SIO chip, including full- or half-duplex operation; echo mode; number of nulls following carriage returns and the data format.

ESCape: Enters the communications mode.

Baud: Used to select a baud rate. The change in baud rate will take place immediately. (A = 11Ø, B = 3ØØ, C = 6ØØ, D = 12ØØ, E = 24ØØ, F = 48ØØ, G = 96ØØ and H = 19,2ØØ baud.)

Duplex: Used to select full- or half-duplex operation. The default selection is full duplex. In contrast to the Echo option discussed below, the choice between the two duplex modes is based on the characteristics of the data channel being used.

Full-duplex operation implies that the I/O channel in use is capable of simultaneously sending and receiving data. In full duplex, the Request to Send signal, (RTS), will always be asserted, and the Clear to Send signal (CTS) will be ignored.

Half-duplex operation means that the channel in use will support data transmission in either direction, but not in both directions at the same time. In half-duplex, RTS is raised before data is transmitted, and SUPRTERM will wait indefinitely for CTS before sending the data. (Note that switching to half-duplex and sending data will hang the program if the CTS signal is not supported by your modem or other equipment.

The RS-232C signal pin numbers are listed in the back of your KAYPRO User's Guide.

Echo: Used to select echoing of received or sent data, both, or neither. Not the same thing as the duplex mode of the data channel. Some computer systems require that every character they send out be echoed for either operator convenience or verification of successful transmission. For example, CP/M "echoes" the characters you type at the keyboard to the video display as an aid.

Send echo means data typed at the keyboard is echoed to the screen locally as well as being transmitted to the remote system. Receive echo means that data received from a remote system is echoed back to that system.

Having both is usually called for if the other system has no echo. It allows SUPRTERM to behave like a computer system, while the other behaves like a terminal. Having no echo (the default setting) is usually used when calling remote systems which echo received data.

Send echo is sometimes called half duplex or local echo, while no echo is sometimes called full duplex. Since character echoing is often confused with the actual half-/full-duplex line turnaround protocol, the send/receive/none/both approach was chosen for describing echo control.

Format: Used to set the number of data bits per character (5, 6, 7 or 8); Parity (Even, Odd or None); and number of stop bits per character, (1, 1.5 or 2). The format changes do not take place until you exit the Format menu by pressing either ESCape or RETURN.

Nulls: The NULL character is an ASCII character whose sole function is to be ignored and waste time. Nulls are often added to a string of transmitted characters in order to give the receiving device some "breathing room" for mechanical activity before the next set of characters. This is better than just turning things "off" for a while, because the appearance of Nulls indicates that the serial channel is still available and working.

The Nulls option is used to set or view the number of nulls sent after every transmitted carriage return. (Only in the terminal mode or from a Terminal format file. This option has no effect on block mode.)

RETURN: Returns to the Main menu.

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