

PC-PAKRATT TERMINAL PROGRAM
FOR THE MODEL PK-232 DATA CONTROLLER

USER'S GUIDE

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TABLE OF CONTENTS

1.0	INTRODUCTION.	1
1.1	Welcome to PC-PAKRATT	1
1.2	A few conventions.	3
2.0	INSTALLATION.	4
3.0	GETTING STARTED	5
4.0	THE LOG-ON MENU	7
5.0	THE MAIN SCREEN	9
6.0	SYSTEM STARTUP AND PACKET LOOPBACK TEST	13
7.0	THE PACKET SCREEN	15
7.1	Packet screen windows	15
7.2	The QSO buffer	18
7.3	Entering your callsign	18
7.4	Special keys	19
7.5	Leaving Packet	22
8.0	THE PARAMETER AND STATUS SCREENS.	23
9.0	THE MORSE SCREEN.	25
9.1	Morse screen windows	25
9.2	The QSO buffer	26
9.3	Special keys	27
9.4	Leaving Morse	28
10.0	THE BAUDOT SCREEN	29
10.1	Baudot screen windows	29
10.2	The QSO buffer	30
10.3	Special keys	31
10.4	Leaving Baudot	32
11.0	THE ASCII SCREEN.	33
11.1	ASCII screen windows	33
11.2	The QSO buffer	32
11.3	Special keys	34
11.4	Leaving ASCII	36

12.0	THE AMTOR SCREEN.	37
12.1	AMTOR screen windows	37
12.2	The QSO buffer	39
12.3	Entering MYSEL	39
12.4	Special keys	40
12.5	Leaving AMTOR	42
13.0	THE FAX SCREEN.	43
13.1	FAX screen windows	43
13.2	Special keys	44
13.3	Leaving FAX	45
14.0	THE DUMB TERMINAL SCREEN.	47
14.1	Dumb Terminal windows	47
14.2	Special keys	47
14.3	Leaving the Dumb Terminal	47
15.0	THE EDITOR.	49
16.0	BROWSE.	55
APPENDIX A	57
A.1	Fatal error messages	57
A.2	Non-fatal error messages	58

1.0 INTRODUCTION

1.1 Welcome to PC-PAKRATT!

PC-PAKRATT is a special terminal program for use with the IBM PC and PC compatibles, and with the AEA PK-232 OR PK-87. With PC-PAKRATT and the PK-232, you'll be able to convert your PC into a powerful digital communications center. And, of course, you'll still be able to use your PC for any tasks you're currently using it for.

What kind of computer do you need to run PC-PAKRATT?

PC-PAKRATT is intended for use on IBM PCs PC/XTs, and PC compatibles. That's a pretty broad statement, though, so let's go through the requirements in somewhat greater detail:

- Your computer must be an IBM PC, PC/XT, or compatible. By compatible, we mean a 100% compatible machine, i.e. a machine that's compatible at the DOS, BIOS, and hardware levels. If you've got a machine that's capable of running one of those popular flight simulation games, you're probably in good shape.
- You need to be running IBM PC-DOS version 2.0 or greater. If you're currently using some other version of DOS, such as 1.1, you can upgrade by buying a newer version of DOS.
- Your system must have 320k or more of memory.
- Your system must have an RS-232 serial port, so that you can connect to the PK-232.
- You'll need two 360k floppy disk drives, or a hard disk and one 360k floppy drive.

What about printers?

PC-PAKRATT does allow you to send files and received data to a standard ASCII printer, i.e. a printer that recognizes the standard ASCII characters for carriage return, line feed, etc. Although we haven't been able to test PC-PAKRATT with more than a few printers, we suspect that most printers will work.

There's at least one common problem you may encounter, though. Slow printers, particularly daisy-wheel types, may be unable to print fast enough to keep up with received data. You'll have to experiment to see if your printer falls into this category. Even if it does, you'll be able to store received data in the PC-PAKRATT QSO buffer or on disk, and print it at your leisure sometime later.

If you want to print FAX with the PK-232, you'll need a printer that's listed in your PK-232 manual. For more convenient facsimile operation, we recommend our PK-FAX program also for PC compatibles.

Is this one of those really complicated programs, or what?

PC-PAKRATT does have many features, and it'll certainly take some time for you to become acquainted with all, or even most, of them. But rest assured that you won't need a Ph.D or a Mensa membership card to use it.

There is one thing, though, that can greatly increase your understanding and enjoyment of PC-PAKRATT, namely making sure to read the manual! This manual isn't exactly Gone With the Wind, but it does explain the features of PC-PAKRATT in considerable detail. We suggest looking through the entire manual; it's even useful to read about those features that you don't plan to use right away, so that you'll know where to look when you do decide to use them. Also, be sure to make use of the on-screen help windows when running PC-PAKRATT - but more about that later.

What do I do if I don't know anything about packet or RTTY?

The PK-232 manual contains some excellent tutorial information, as well as a packet/RTTY/AMTOR bibliography. This is material well worth looking at if you're a little shaky at this point.

One thing to note - this manual pretty much assumes you know about the mode or modes you want to work. If you don't know, try this - use the PK-232 to figure out WHAT to do (e.g. to figure out that you have to specify a connect path before you can connect to another station in packet), and use this manual to figure out HOW to do it (e.g. which key to hit before entering the connect message).

One other thing - Please fill out and return the Product Warranty card enclosed. WE WILL NOT BE ABLE TO FURNISH YOU WITH ANY PC-PAKRATT SOFTWARE UPDATES IF YOU DON'T RETURN THE WARRANTY CARD. Thank you.

Acknowledgment - This manual was prepared using an IBM PC/XT and WordPerfect ver. 4.2. Many thanks to Steve Stuart, N6IA, for his help, including his patient explanations to a person who was sometimes only half-listening.

1.2 - A Few Conventions

PC-PAKRATT makes extensive use of special keys on the IBM PC keyboard, so it's essential to know just how the keyboard works.

Function keys - There are ten keys on the left hand side or along the top of your keyboard labeled F1 through F10; these keys are the function keys. When this manual tells you to enter [F1], DON'T type an "F" and a "1" - just hit the function key F1.

Other special keys - PC-PAKRATT also uses the Esc, Home, End, PgUp, PgDn, Ins, Del, and cursor control keys. If you're not sure where these are located, it might pay to spend a few minutes scrutinizing your keyboard. This manual refers to these special keys in the following way:

- [Esc] - Esc (escape) key
- [Home] - Home key
- [End] - End key
- [PgUp] - PgUp key
- [PgDn] - PgDn key
- [UpAr] - "up arrow" cursor key
- [DnAr] - "down arrow" cursor key
- [LfAr] - "left arrow" cursor key
- [RtAr] - "right arrow" cursor key
- [Ins] - Ins (insert toggle) key
- [Del] - Del (delete) key
- [BSP] - backspace key (a key with a large arrow pointing to the left)
- [CR] - "enter" key (carriage return)

Ctrl, Alt, and Shift keys - These keys are similar in that they don't do anything by themselves, but rather modify another keystroke. Think of the shift key on a typewriter - it doesn't cause a character to be typed, but if you hold it down and then press another key, voila, you get a capital letter. And that's exactly how these keys are used - you hold them down, then press another character.

We'll use the following conventions to describe the use of these keys:

[^X] - means you should hold down the Ctrl key, then hit key X. For example, [^F2] means that you should hold down the Ctrl key, then hit function key F2.

[aX] - means you should hold down the Alt key, then hit key X. For example, [aP] means that you should hold down the Alt key, then hit key P.

[Shf-x] - means you should hold down the shift key, then hit key X. For example, Shf-F6 means that you should hold down the shift key, then hit function key F6.

As a rule, we'll indicate the keystrokes or data you have to type with quote marks, e.g. "fred" indicates that you should type the characters f, r, e, and d. DON'T type the quote marks!

2.0 INSTALLATION

Please perform the following steps to prepare your PK-232 to run PC-PAKRATT:

Make a working copy of your PC-PAKRATT disk - This is essential! It's far too easy to accidentally erase your PC-PAKRATT disk (or any disk, for that matter); accidental damage (coffee spills, scratches, dust) are also far more likely than most people like to admit. So use the DOS COPY or DISKCOPY functions to copy the entire contents of the PC-PAKRATT disk to another floppy. Then put your original PC-PAKRATT disk away in a safe place, and use the working copy to run PC-PAKRATT. Do it now, or you'll be sorry.

Update the PK-232 ROMs - The PK-232 contains one or two software ROMs (Read-Only Memories) that tell the PK-232 what to do. If you have obtained any new ROMs with a FAX or other software upgrade, then please remove the ROMs you currently have and install the new ones. PC-PAKRATT requires a PK-232 ROM release of 1987 or later. If you are still using October 1986 or earlier ROMs, then contact AEA for upgrade information. The ROMs go into sockets U2 and U3, with the notch and/or white stripe of the ROM facing the edge of the printed circuit board.

Remove the PK-232 batteries - The PK-232 has a holder that contains batteries used to supply power to internal memory when the unit is off; this memory holds parameters that you would otherwise have to re-enter every time you turn the unit on. You may or may not have placed batteries in this holder; if you have, please remove them. The PC-PAKRATT program keeps track of parameters, and therefore takes the place of the batteries.

Connect the PK-232 to your PC - Make up a proper RS-232 serial cable, or use the Facsimile cable if you have one to connect the PK-232 to your IBM-PC or compatible computer. To construct a proper serial cable, lines 1 through 8 and line 20 must be connected. Do not use cables that connect all 25 lines of the RS-232, lines 1 through 8 and 20 are the only connections that should be made. After you have a proper cable, consult your computer manual if you are not exactly sure how or where this is done. The correct "port" of your computer may be referred to as COM-1 or COM-2 in your computer's manual. Make sure that you DO NOT CONNECT THE PK-232 TO THE PRINTER PORT OFTEN CALLED LPT1 or LPT2. If you do this, you may damage the PK-232 or your computer.

3.0 GETTING STARTED

Getting the PC-PAKRATT software up and running - The PC-PAKRATT software comes on a 360k floppy disk that contains the following files:

PPEXT.COM - PC-PAKRATT program and overlay files
PPEXT.000
UTILMOD.CHN

PCPAKRAT.CFG - configuration file; contains screen colors, etc.
PCPAKR87.CFG - PK-87 configuration file

PCPAKRAT.PAR - parameter file - contains current parameter values
PCPAKRAT.DEF - default parameter file

LCOM.EXE - asynchronous communications handler; this is a
 DOS-resident program that is installed when you
 execute file pp.bat

AUTOCONN - contains autoconnect paths

RADIOGRM - contains sample radiogram created with PC-PAKRATT
 editor

PP.BAT - batch file used to enter PC-PAKRATT

README.PP - contains information on latest updates to PC-PAKRATT

PCPAKRAT.H1 - help files. These files contain the information
PCPAKRAT.H2 that appears in PC-PAKRATT's pop-up help windows.
PCPAKRAT.H3
PCPAKRAT.H4
PCPAKRAT.H5
PCPAKRAT.H6
PCPAKRAT.H7
PCPAKRAT.H8
PCPAKRAT.H9

PCPAKRAT.US1 - user-defined help files.
PCPAKRAT.US2

CONFIG.SYS - system file that must be on your DOS disk

How you install these files depends on whether or not you have a hard disk:

Yes, I have a hard disk - Create a subdirectory called PCPAKRAT, and transfer the contents of the floppy disk to that directory. Note: It's not absolutely necessary to create a separate subdirectory for PC-PAKRATT files, but doing so will improve the organization of your hard disk.

No, I don't have a hard disk - After booting up the system with DOS, remove the DOS disk and place the PC-PAKRATT disk (the copy you made) in drive A.

Modifying CONFIG.SYS - In order to make PC-PAKRATT run reliably, you'll need to add file CONFIG.SYS to your boot disk's root directory. The boot disk is the disk your computer reads DOS from at start-up, and the root directory is the topmost directory on that disk.

If the Root directory of your DOS Boot-disk does not have a CONFIG.SYS file then you may simply copy the file CONFIG.SYS that is supplied on your PC-PAKRATT disk over to your DOS Boot-disk.

If the root directory already has a CONFIG.SYS, then add the line

FILES=16

to it if it does not already have a FILES statement with a number equal to or greater than 16.

To do this you probably can use your favorite word processor if it has the capability of working with "Text" files. If you do not have a word processor or are not sure if it can work with "Text" files, you can use the built-in MS-DOS editor EDLIN to do the job.

Once you install the files per the instructions above, start the PC-PAKRATT program by typing

pp[CR].

Now batch file pp.bat will install the resident communications handler LCOM.EXE, then start the PC-PAKRATT program. The very first thing you'll see as PC-PAKRATT starts to execute is the log-on menu, which brings us to the next section.

Check the COM port parameters - If you type "P", you'll be able to change two serial port parameters:

COM port number - Most PCs or clones allow you to have more than one serial port; just specify the number of the port you're using to talk to the PK-232.

Baud rate - This determines the rate at which your computer exchanges information with the PK-232. It has NOTHING to do with the packet baud rate! The default value is 2400 baud; leave this value alone unless you are using PK-232 firmware released after June 1, 1987. Attempting to operate at speeds greater than 2400 baud with earlier PK-232 firmware may cause strange problems or even cause PC-PAKRATT to lock up altogether.

Ask for help - This is a good time to talk about an important subject:

YOUR FRIEND THE HELP KEY

If you ever need help while running PC-PAKRATT, you can request a pop-up help window by hitting [F1]. As a rule, the help window lists the commands available for the current screen, with one exception: if you invoke the help window in the parameter or status screens, you will get a description of the currently highlighted parameter. Hit [F1] again to make the help window disappear. Optionally you can hit any of the keys listed in the help window to invoke the corresponding function.

It's important to note that you can invoke help only when there are no other pop-up windows currently being displayed.

Go to the main screen - Hitting the space bar will cause the program to initiate communications with the PK-232 and download current parameter values, a process that can take 15 or 20 seconds. When the program is done downloading parameters, it will go to the main screen. If the program can't talk to the PK-232, you'll get one of several error messages - Appendix A explains the error messages in more detail.

5.0 THE MAIN SCREEN

Once you go from the log-on screen to the main screen, you're ready to get down to business. The main screen is sort of the Grand Central Station of PC-PAKRATT. From this screen you can perform a variety of commonly-used DOS functions, load and save files, edit or browse files, access two user-defined files, program a softkey, enter one of six communications screens, or leave the program. Let's take these choices one at a time:

PC-PAKRATT
Copr. 1987 by AEA

MAIN MENU

31-MAY-88
10:54

SELECT MODE		DOS OPERATIONS	
F3 AMTOR	F2 Packet	T set Time/date	C Copy file
F5 ASCII	F4 Baudot	D list Directory	R Rename file
F7 FAX	F6 Morse	P Print file	S erase file
	F8 Dumb Terminal		
MISCELLANEOUS			
B Browse	E Edit	L Load	^F9 define softkey
Q Quit program	V Save	X eXit program	
^F1 User window 1		^F2 User window 2	
<div style="border: 1px solid black; padding: 5px; display: inline-block;">For help type F1</div>			

Performing commonly-used DOS functions: You can invoke any of the following functions with a single keystroke:

Set time and date (type "T") - Use this function to set the DOS time and date of your PC; incidentally, you'll also be setting the time and date used by the PK-232 for packet headers and the like. A pop-up window will ask you for hours, minutes, seconds, month, day, and year.

List directory (type "D") - You can use this feature to list selected files from any directory on any of your disks. You'll be asked to enter a directory "mask" that specifies the files to be displayed. If you want to display all files in the current directory, just hit a carriage return at this point. Some other possible masks include:

C:\FRED - lists all files in directory FRED on disk c:

\TEXT\A*.* - lists all file names starting with the letter A in the directory TEXT on the current drive

B: - lists all files in the root directory of disk b:

Masks are a powerful tool and allow you to send and receive files that are located on a different disks or directories. This way, you can run PC-PAKRATT from the a: drive and send and receive files that are located on the c: drive.

Print a file (type "P") - Specify the name of a text file (i.e. a file that contains text characters) that you'd like to print. Be sure to have your printer connected and on-line.

Copy a file (type "C") - This function copies an existing file to a new file; the existing file isn't changed in any way. You'll be asked to name the file to copy from (the source file) and the file to copy to (the destination file).

Rename a file (type "R") - An existing file will be given a new name that you specify. You'll be asked to enter the file whose name is to be changed and the new name that you want to give it.

Erase a file (type "S") - This function erases an existing file; just enter the name of the file to be erased, and answer "yes" (type "Y") when asked if you're sure you want to erase it. Be careful NOT to erase any of the files provided on the PC-PAKRATT disk (being human, you'll do this by accident sooner or later, so be sure to make that backup disk we talked about earlier!).

Loading and saving files - You can load or save parameters, or the contents of the QSO buffer.

Load (type "L") - This function allows you to load (i.e. read from disk) either a parameter set or QSO buffer data. If you want to load a parameter set, type "P" when the program prompts you, then enter the name of the parameter file to be read. If you want to load new data into the QSO buffer, type "Q" when prompted, then enter the name of the file from which data is to be read.

Save (type "V") - This function allows you to save (i.e. write to disk) either the current parameter set or the contents of the QS0 buffer. If you want to save the current parameter set, type "P" when prompted, then enter the name of the file in which you wish to store the parameter set. If you want to save the current contents of the QS0 buffer, type "Q" when prompted, then enter the name of the file in which you wish to store the data.

Editing or browsing files - From time to time you may want to look at or modify the QS0 buffer or a text file. For example, you may want to look at a file that another station has sent to you, or you may want to create or modify a message file that you plan to send to another station. The browse function (invoked by typing "B") is perfect for looking at the contents of the QS0 buffer or text files. The edit function (invoked by typing "E") lets you create or modify the QS0 buffer or a text file, and also lets you look at all the control codes (e.g. carriage returns, line feeds, bell characters) embedded in the file. The browse and edit functions are sufficiently sophisticated to deserve their own section
- see sections 15.0 and 16.0 for more details.

Accessing two user-defined files (type "[^F1]" or "[^F2]") - The edit and browse functions allow you to look at virtually text file, but sometimes it's convenient to have a way of quickly looking at one or two short, often-used files. For example, you may want to look at a list of local digipeaters, or a list of station locations, but without entering edit or browse. Two user-defined files, PCPAKRAT.US1 and PCPAKRAT.US2, can be viewed in a pop-up window by typing [^F1] or [^F2], respectively. Use the editor to modify these files to suit your taste.

Programming a softkey (type "[^F9]") - Sooner or later you'll discover that there are certain sequences of keystrokes that are entered over and over. For example, you may want to edit a certain file frequently, or save the current parameter file often. Rather than enter the same sequence of keystrokes again and again, you can store as many as twenty different sequences of up to 256 keystrokes each by using the softkey feature. Here's how it works:

Defining a softkey - Softkey sequences can be created or modified by calling up the softkey pop-up window, which is invoked with keystroke [^F9]. Once up, the window will ask you for the softkey you wish to redefine, your choices being softkeys [Shf-F1] through [Shf-F10] or [aF1] through [aF10]. After entering the key you want, you'll be shown the current key sequence assigned to that keystroke, if any, and will be asked if you want to modify this sequence. Answering "no" (by typing "N") will leave the specified key unchanged (if you're like the author, you may occasionally forget the sequence assigned to a certain softkey, and this "no" choice gives you the option of looking at the assigned sequence without changing it). If you answer "yes", you'll be asked to define a new sequence. Just enter the characters you want, and terminate the sequence by hitting the [Home] key.

Sequences cannot be nested, i.e. a softkey sequence cannot invoke another sequence.

Softkeys can be defined from the main screen or any of the communications screens.

Using a softkey - To use a softkey sequence, just type the softkey for that sequence. For example, if you have the key sequence "Hi, Mom!" stored in softkey [aF2], and you wish to say hello to your mother, hit key [aF2] (of course, it makes little sense to issue "Hi, Mom" on the main screen; you'd do this while in one of the communications modes). Softkeys can be used (i.e. invoked) from any screen except the log-on screen (i.e. you can use softkeys inside the editor, but you can't define a softkey while inside the editor).

Entering a communications mode (type "[F2]" - "[F8]") - Typing a single key will take you to one of seven communications modes:

[F2] - packet	[F5] - ASCII
[F3] - AMTOR	[F6] - Morse
[F4] - Baudot	[F7] - FAX
	[F8] - Dumb Terminal

Leaving the program - There are two ways to leave PC-PAKRATT:

Exit (type "X") - Current parameters will be saved, the program will be terminated, and you'll be returned to DOS.

Quit (type "Q") - Similar to "exit", but current parameters will be saved only if the parameter AUTOSAV is ON. The value for AUTOSAV can be modified from the parameter screen; see section 7.0 for details on how to change parameters. As a rule it's wise to use exit, to prevent the inadvertent loss of parameters.

6.0 SYSTEM STARTUP AND PACKET LOOPBACK TEST

If this is the first time you are powering up the PK-232 or PK-87 you may want to perform an Analog Loopback Test to verify that the PK-232 is working properly.

1. Set the RADIO-1/RADIO-2 switch to the RADIO-1 position.
2. Connect a jumper wire between pins 1 and 2 on the PK-232's RADIO-1 (J4) receptacle or between pins 1 and 4 on the PK-87's RADIO connector. This can also be accomplished by plugging the Radio cable into the PK-232 RADIO-1 jack and shorting the green and white wires together.
3. Connect the PK-232 "Y" RS-232 cable between the RS-232 I/O connector of the PK-232 and either the COM1 or COM2 serial communications port of your computer.
4. Turn on your computer and start your Working copy of PC-PAKRATT as described in chapter 3 of this manual. You should then see the Log-on screen as shown in Chapter 4 of this manual.
5. Turn the PK-232 ON by pressing the front panel power switch to the ON position. At this point you should notice that the 4 left-most LEDs light briefly, and then the BAUDOT LED will come on and remain lit. If this does not happen, make sure that a 12 volt DC power supply capable of at least 1 amp is attached to the PK-232 and that the internal batteries are not installed.
6. If you are using serial port COM1 then simply press the spacebar to establish communications and bring up the Main Screen shown in chapter 5. If you are using COM2 then see chapter 4 on changing the COM Port parameters before you press the spacebar.
7. After pressing the spacebar, the top row of LEDs on the PK-232 front panel should flash from right to left before the CMD and PKT LEDs light and stay on. The PC-PAKRATT MAIN MENU as shown in chapter 5 should appear shortly thereafter. If not, turn to Appendix A for a description of the PC-PAKRATT Error Messages.
8. When the MAIN MENU appears, press the [F2] key to enter the Packet mode and and bring up the following Packet screen.

PACKET	CONVERSE	DISCONNECTED	31-May-88	TXF	1024
CHANNEL 0	S01	U00 R00	L2 [10:55	QBF 64512
DISPLAYING ALL			HIT F1 FOR HELP		

9. You are now ready to enter your callsign into the PK-232 so that you may connect to yourself. To do this, press the [F9] key to bring up the PC-PAKRATT Parameter screen as shown below.

PACKET			
8BITCONV ON	DWAIT 16	MYA	
ALFDISP ON	FRACK 3	MYC PK232	
ALFPACK OFF	FULLDUP OFF	PACLEN 128	
AX25L2V2 ON	HBAUD 1200	PACTIME AF	
AXDELAY 0	HEADERLN ON	PACTIMINT 10	
AXHANG 0	HID OFF	PASSALL OFF	
BEACON EV	ILFPACK OFF	RELINK OFF	
BEACINT 0	MAXFRAME 4	RESPTIME 10	
CASEDISP 0	MBX1	RETRY 10	
CHECK 30	MBX2	SQUELCH OFF	
CHLABEL OFF	MCON 0	TXDELAY 25	
CMSG OFF	MDIGI OFF	TXECHO ON	
CONALRM SOFT	MFIL 00000007	USERS 1	
CONSTAMP OFF	MONITOR 4	VHF ON	
CPACTIME OFF	MRPT ON		
DAYSTAMP OFF	MSTAMP OFF		

MORSE/BAUDOT/ASCII/AMTOR	
ADELAY 4	RFEC ON
ACRRTTY 71	SRXALL ON
ALFRTTY ON	TXREV OFF
ARQTMO 45	USOS OFF
CCITT ON	WIDESHIFT OFF
CRADD OFF	WORDOUT OFF
MYALT NONE	WRU OFF
MYSEL NONE	
PRINTON	
PRINTOFF	
WRUKEY	

FAX	
GRAPHICS 1	

GENERAL	
AUTOSAV ON	WRAP OFF
HIGHTLTX ON	XMITOK ON

F1 - HELP

F9 - GO TO STATUS SCREEN

- With the cursor keys, move the Highlight bar over to the callsign block marked **MYC**. The default call of PK232 must be changed to **YOUR CALLSIGN** in order to connect to other stations.
- After you have entered your callsign, press the [F9] key again twice to return to the Packet Screen.
- Adjust the THRESHOLD control until the DCD LED just goes out. This should occur between the 2-0'clock and 4-0'clock position.
- Press the [F3] key and a window will appear with a blank in which you may enter a connect path. Type **YOUR CALLSIGN** in this window and press the Enter key. After a few moments you should see a message indicating you are Connected to yourself.
- Type a few characters followed by the Enter key and observe that they are received on your screen. This indicates that the PK-232 or PK-87 is able to send and receive 1200 baud Packet data. It is an excellent indication that the controller is working.
- If you have problems with any of the steps above, please re-check all connections and start the procedure again from step 1. Some of the most common problems include trying to connect to a call different from **MYCall**, leaving the DCD LED on or not having the loopback jumper installed correctly.
- If the problems persist, then contact AEA's Customer Service Department. If possible, have the equipment running when you call so we may troubleshoot problems more quickly.

7.0 THE PACKET SCREEN

To operate in packet mode, enter the packet screen from the main screen by typing [F2]; after a second or so the packet screen will appear.

7.1 Packet screen windows

The packet screen is divided into three areas, or windows:

Status window - The three-line status window at the top of the screen contains information on the current status of any packet communications you're carrying out, as well as the status of some PC-PAKRATT functions. Included in this status are the following:

Transmission mode - CONVERSE or TRANSPARENT. The transmission mode is displayed on the first line of the status window.

Link status - indicates the link status of the current transmit channel. The status displayed will be one of the following:

DISCONNECTED
CONNECT IN PROGRESS
CONNECTED TO <station call>
DISCONNECT IN PROGRESS
FRAME REJECT IN PROGRESS

Link status is displayed on the first line of the status window.

TXF - Number of characters remaining in the transmit buffer. If the transmit buffer is empty, TXF will show a value of 1024, indicating that there are 1024 characters left in the buffer. TXF is displayed on the first line of the status window.

CHANNEL - Current transmit channel. Displayed on the second line of the status window.

Link state - The internal link state of the PK-232 for the current channel. These link states are identified as defined in the ARRL AX.25 Level 2.0 specification:

S01 - disconnected	S09 - Remote device busy
S02 - link setup	S10 - Both devices busy
S03 - Frame reject	S11 - 7 and 8
S04 - Disconnect request	S12 - 7 and 9
S05 - Information transfer	S13 - 7 and 10
S06 - REJ frame sent	S14 - 6 and 8
S07 - Waiting acknowledge	S15 - 6 and 9
S08 - Device busy	S16 - 6 and 10

Link status is displayed on the second line of the status window.

Uxx - outstanding packet count for the current channel. A display of U02, for example, indicates that your station has two packets outstanding (i.e. not yet acknowledged) for the current channel. Uxx is displayed on the second line of the status window.

Rxx - number of retries for the current channel. A display of R03, for example, indicates that your station has sent the most-recently-transmitted packet for the current channel three times. Rxx is displayed on the second line of the status window.

PERM - Indicates that your station is permanently connected to another station on the current transmit channel. If a permanent connection is broken, your TNC will attempt to reconnect with the other station indefinitely. PERM is displayed on the second line of the status window.

L2 - indicates you are using AX.25 Level 2 version 2.0 protocol.

[] - Indicates new receive data for other channels. If you have received new data on a channel that you are not currently displaying, the channel number for that data will be displayed between the brackets. If, for example, you are only displaying receive data for channel 0 and data comes in on channel 3, PC-PAKRATT will display [3]. This information appears on the second line of the status window.

Printer enable symbol - Indicates that the printer has been enabled. If you've enabled your printer to print receive window data, a blinking letter "P" will appear on the right hand side of the second status window line.

File transmit enable symbol - Indicates that a file is being transmitted. When you begin to transmit a file, a blinking letter "T" will appear on the right hand side of the second status window line; the "T" will disappear when file transmission is complete or when file transmission has been aborted.

File receive enable symbol - Indicates that data is being placed in a file. If you've enabled a file to store receive window data, a blinking letter "R" will appear on the right hand side of the second status window line.

QBF - Number of characters remaining in the QSO buffer. QBF appears on the second status window line.

Screen hold - Indicates receive screen is being frozen or scrolled. As you'll see later, data in the receive screen can be scrolled up and down, so that you can take a look at earlier transmit and receive data. When the screen is being scrolled, a blinking "SCREEN HALT" indicator will appear on the third line of the status screen.

DISPLAYING xxx - Indicates the receive channel or channels currently being displayed. If only one channel is currently being displayed on the receive screen, that channel's number will be shown; if all channels are being displayed, the word "ALL" will appear. This indicator appears on the third line of the status window.

Receive window - The receive window occupies the central 17 lines of the packet screen; this window displays all received data, monitored data, status messages, and, optionally, all transmitted data. Let's take these different types of data one at a time.

Receive data is data sent to you by other stations to whom you are connected. In packet mode, you have two different options for the way receive data is displayed:

Display receive data for all channels - This option allows you to see data from all channels at once, regardless of the transmit channel you're currently on. This option is selected by setting the **DISPLAYING** parameter on line three of the status screen to **ALL** - see the description of function key [F6] below. If you choose this option, it's possible that data from several different channels will be displayed at once, a situation that can become pretty confusing. If you'd like, you can sort out the different channels by turning on the **CHLABEL** option found on the parameter screen - this option places a channel tag (e.g. **CHANNEL 0**) in the receive window every time the received channel changes.

Display only current channel's receive data - This option allows you to look at only that receive data coming from the station on the current transmit channel; if you want to see receive data from another channel, you'll have to change the transmit channel number to the channel you want to see (which is easy to do - see the description of the [UpAr] and [DnAr] keys below). This option is selected by setting the **DISPLAYING** parameter on line three of the status screen to the current transmit channel number - see the description of function key [F6] below.

Monitored data is data received from stations to which you are not connected. This data is displayed regardless of the current transmit channel number. The types and amounts of data monitored are determined by the **MONITOR** and **MCON** parameters on the parameter screen, and by the **MFROM** and **MTO** parameters and their respective call lists on the status screen.

Status messages alert you to changes in TNC status, such as when a connection is established or terminated. Status messages include:

```
CONNECTED to <callsign>
<callsign> busy
Connect request: <callsign>
FRMR sent: xx yy zz
FRMR rcvd: xx yy zz
Retry count exceeded
DISCONNECTED: <callsign>
LINK OUT OF ORDER, possible data loss
Transmit data remaining
```

These messages are explained in the PK-232 manual.

Transmit data is data that has either been transmitted or is pending transmission from your station. You can highlight (or lowlight) this transmit data text by setting parameter `HIGHLTTX`, found on the parameter screen, to ON. Transmitted data is displayed on the receive screen only in CONVERSE mode. If you'd rather not see transmit data on the receive screen, set parameter `TXECHO`, found on the parameter screen, to OFF.

Transmit window - The transmit window occupies the lower four lines of the packet screen, and contains the data you type in to be transmitted. If you make an error while typing in data, you can erase the error by backing up the cursor with the `[BSP]`, `[^H]`, or `[Del]` keys (provided, of course, that you haven't already transmitted the data).

7.2 The QSO buffer

PC-PAKRATT maintains a buffer in memory into which is placed all of the received data, monitored data, and status messages that the PK-232 sends to your computer; optionally, if parameter `TXECHO` is ON, this buffer will also store data you've sent to the PK-232 for transmission in CONVERSE mode. The size of this buffer, referred to here as the QSO buffer, depends on the amount of RAM (random-access memory) in your system. For a system with 640k of RAM (the maximum amount supported by a plain-vanilla PC) this buffer is 63k-bytes long, but systems with less memory will have a smaller amount of RAM allocated to the buffer.

Because the QSO buffer records incoming and outgoing data, it can serve as a record of what's been sent and received by your station. The QSO buffer can be edited, browsed, or saved to a file (the latter by using the "V" command on the main screen). The `[^F7]` function key clears the QSO buffer and resets it to its empty state.

7.3 Entering your callsign

Before you can start using packet mode, you'll have to enter your station call. You can do this with the following procedure:

- 1.) Once on the packet screen, hit `[F9]`; this will take you to the parameter screen.
- 2.) One of the parameters on the parameter screen will be displayed in reverse video. Move this reverse video patch to the MYC parameter using the `[UpAr]`, `[DnAr]`, `[LfAr]`, and `[RtAr]` keys.
- 3.) Once at MYC, type in your call. If you make a mistake, erase the erroneous character or characters with the `[^H]`, `[Del]`, or `[BSP]` key, and retype your call.
- 4.) Hit the `[F9]` key TWICE; you should be back on the packet screen.

7.4 Special keys

All packet functions and commands are assigned to special keys. This is important to understand, particularly if you're used to using TAPR-like TNCs that have command and converse modes. With PC-PAKRATT, THERE IS NO COMMAND MODE - anything you type into the transmit buffer is transmit data, and any time you want to do a special function, like connecting to another station, you use a special key to do the job. This may sound complicated, but, in fact, it's easier than constantly toggling between command and converse mode. If you haven't used a TAPR-like TNC, don't worry - you just have fewer old habits to unlearn.

Special function keys for the packet screen are:

[F1] - Help - displays a pop-up window that briefly describes all special keys for the packet screen (in effect, an abbreviated version of the information being described in this section).

[F2] - Autoconnect - One of the major pains in operating packet is having to retype the connect path every time you connect to a given station. The autoconnect feature allows you to place commonly-used connect paths in a file called AUTOCONN (you can do this with the editor).

A typical AUTOCONN file might look like this:

```
N6IA V W6AMT
```

```
G6AF VIA AI8A-3 N6IIU-1
```

```
WA2PVV V WA2UMX-1,K1FFK,WA2CXD,WB2STN,WA2FTI,WA2CSQ-15,WN2YIR,N7ML
```

Note that calls can be separated by blanks or commas, and that V and VIA can be used interchangeably. You can list as many calls as you want, but you can list only one connect path per call. Note that paths are NOT preceded by the letter "C"!

Once you've entered the paths in AUTOCONN, you can access them automatically. Just press [F2], and a pop-up window will ask you which station you want to connect to; type in the call and hit [CR]. PC-PAKRATT will then search the AUTOCONN file for the connect path corresponding to the call you entered. If a connect path is found, PC-PAKRATT will attempt to connect to the specified station via that path; the connect attempt will be made on the current transmit channel. If the call isn't found, you'll get an error message.

[F3] - Connect - To connect to a station in the normal manner, press [F3]. A pop-up window will ask you to enter the connect path. Type in a connect path consisting of the call of the station you want to connect to, and, optionally, the word VIA (or the letter V) and the stations you wish to digipeat through, in the order in which the packets will travel through them. A sample connect path follows.

```
WA3MYH-1 V W6AMT,AJ6T,W2JUP
```

Note that calls can be separated by blanks or commas; also note that the connect path is NOT preceded by the letter "C"!

Once you've entered the connect path, hit [CR]; PC-PAKRATT will attempt to connect to the station via the specified path, if any. The connect attempt will be made on the current transmit channel.

[F4] - Disconnect - The PK-232 will attempt to disconnect the current transmit channel. Hitting this key twice will disconnect unconditionally.

[F5] - ID - Sends a special identification packet. This function is more completely described in the PK-232 manual, where it's listed as parameter ID.

[F6] - Toggle show all - This key toggles the DISPLAYING parameter on the third line of the status screen. If DISPLAYING is set to ALL, the receive screen displays receive data from all connected channels; if DISPLAYING is set to the current transmit channel, the only receive data displayed is that from the current channel (NOTE: Receive data for other channels won't be lost, but won't be displayed until you go to the appropriate transmit channel). Hitting [F6] toggles DISPLAYING between ALL and the current transmit channel.

[F7] - Toggle CONVERSE/TRANSPARENT - Toggles between the converse and transparent modes. See your PK-232 manual for the distinction between these modes.

[F8] - Toggle PERM - Alternately enables and disables the PERM parameter for the current transmit channel; PERM can be enabled only if a connect is currently in progress on that channel.

[F9] - go to parameter screen - Hitting [F9] takes you to the parameter screen; hitting it a second time will take you to the status screen; and hitting it a third time returns you to the packet screen. Information on the parameter and status screens is given in section 8.0.

[^F1] - display user file 1 - Same as for the main screen - see section 5.0.

[^F2] - display user file 2 - Same as for the main screen - see section 5.0.

[^F3] - enter message file names - You can specify the names of up to ten files to be transmitted. Hitting [F3] puts up a pop-up window listing the names of these files; you can then change the names of any or all of these files. For information on how to transmit a file, see the description of keys [a0], ..., [a9] below.

[^F5] - begin file receive - If you'd like to store received or monitored data in a file, hit [F5]; a pop-up window will ask you for the name of the file in which you want to store the data (you can name a new or existing file - if you name an existing file, that file will be overwritten!). Once you've entered the file name and hit [CR], file reception will begin, as noted by a blinking "R" that will appear on the second line of the status screen. To end file reception, hit [^F6] (see below).

The general rule for file reception is this: any new data that appears on the bottom of your receive screen will be stored in the receive file, including received data, monitored data, status messages, and transmit data.

[^F6] - end file receive - Hitting [^F6] terminates file reception and closes the receive file. The end of file reception will be indicated by a small pop-up window that temporarily appears, and by the disappearance of the blinking "R" on the second line of the status screen.

[^F7] - clear QSO buffer - This key clears the PC-PAKRATT QSO buffer.

[^F8] - clear transmit buffer - This key clears the PC-PAKRATT transmit buffer (an internal buffer used to store pending and past transmit data), the transmit window, and the transmit buffer in the PK-232. In effect, all pending transmit data is wiped out, and a file transmission in progress will be terminated.

[^F9] - program softkey - same as for the main screen; see section 5.0.

[^F10] - print received data - If you'd like to print received or monitored data in a file, hit [^F10]; a blinking "P" will appear on the second line of the status screen. To end printing hit [^F10] again.

The general rule for printing is the same as that for file reception: any new data that appears on the bottom of your receive screen will be printed, including received data, monitored data, status messages, and transmit data.

WARNING - IF YOU ENABLE PRINTING BUT YOU HAVEN'T PLACED YOUR PRINTER ON-LINE, PC-PAKRATT WILL "FREEZE". PLACING YOUR PRINTER ON-LINE WILL ALLOW PC-PAKRATT TO RESUME NORMAL OPERATION.

[Home] - show connect status - Hitting [Home] will call up a pop-up window that shows the connect status of all ten channels; hitting any other key will remove this window.

[End] - show heard list - Hitting [End] will produce a pop-up window that shows up to 18 most-recently-heard stations. If parameters MONSTAMP and DATESTAMP are ON, the calls will be accompanied by the time and date heard, respectively; MONSTAMP and DATESTAMP are found on the parameter screen. Hitting "Y" will clear the list, hitting any other key will remove this window.

[a0], ..., [a9] - transmit a file - These keys correspond to message files 0 through 9, which are defined using key [^F3] as described above. To transmit, say, message file 3, you would hit [a3]. A reverse video "3" will appear in the transmit window, and the corresponding message file will be transmitted. A blinking letter "T" will appear on the second line of the status window to indicate that file transmission is in progress, and will disappear when file transmission is complete. File transmission can be aborted by hitting [^F8] (clear transmit buffer).

[UpAr], [DnAr] - increment/decrement transmit channel - Hitting [UpAr] will make the PK-232 go to the next-higher transmit channel; hitting [DnAr] will make the PK-232 go to the next-lower transmit channel. One can quickly scan through all channels by hitting [UpAr] or [DnAr] repeatedly.

[PgUp], [PgDn] - scroll up or scroll down receive screen. These keys access a powerful feature of PC-PAKRATT, namely the ability to look at previously-received or transmitted data on the receive screen. Depending on the amount of memory your system has, you can see as many as 511 previous receive lines.

Hitting either [PgUp] or [PgDn] will cause the receive screen data to halt, as indicated by a blinking "SCREEN HALT" legend on the third line of the status screen. [PgUp] will place the previous seventeen receive screen lines on the receive screen; by hitting [PgUp] repeatedly, you can scroll up through receive screen data. Hitting [PgDn] places the next seventeen receive screen lines on the receive screen; using [PgDn] repeatedly lets you scroll down through receive screen data.

To get out of screen halt mode, hit any other key.

Note that while PC-PAKRATT is in screen halt mode, the program is not receiving data from the PK-232. In most cases no data will be lost, because the PK-232 has a small (approximately 2k-byte) buffer in which to store incoming data. The PK-232 will signal that this buffer is full by flashing the MULT light.

Special transmit keys - There are three special keys used when transmitting data:

[aE] - Place escape character in transmit buffer. In the event that you need to transmit an escape character, enter [aE].

[aS] - Send packet. As a rule, packets are transmitted when you type a carriage return, or when you enter more than PACLEN characters in the transmit buffer (PACLEN is the maximum packet length parameter, and is found on the parameter screen). But if you want to send a packet that isn't terminated by a carriage return, type [aS], and the data currently in the transmit window will be transmitted.

[aM] - Place carriage return in transmit buffer, don't transmit. Placing a carriage return ([CR]) in the transmit buffer forces the data currently in the buffer to be transmitted. You can enter a carriage return that doesn't force packet transmit by typing [aM].

7.5 Leaving Packet

Exit packet mode by typing [Esc]; PC-PAKRATT will return to the main screen. Any remaining packet connections will remain intact, but a file transmission in progress will be aborted.

8.0 THE PARAMETER AND STATUS SCREENS

The American Heritage Dictionary defines the word "parameter" as:

"a variable or an arbitrary constant appearing in a mathematical expression, each value of which restricts or determines the specific form of the expression"

or, alternately,

"a characteristic element" .

The PC-PAKRATT manual, which is unlikely ever to be cited as a reference in such matters, defines the word "parameter" as:

"something you change to make the PK-232 behave differently".

An example of a parameter is PACLEN, which determines the maximum length of a packet. You can set PACLEN to any of a number of allowable values. If it's set to 100, for example, the PK-232 will be told to restrict the maximum transmitted packet length to 100 characters.

If you've looked at the PK-232 manual, you know that the PK-232 has lots of parameters! Rather than have you memorize well over a hundred parameters, PC-PAKRATT lists its parameters on two screens - the parameter and status screens. The parameter screen contains a number of "short" parameters (i.e. those that can be specified in a few characters) while the status screen contains longer parameters, such as UNPROTO, and call lists.

Getting to the parameter and status screens - The parameter screen can be entered from the Morse, Baudot, ASCII, AMTOR, or packet screens by hitting [F9]. Hitting [F9] again will take you to the status screen, and hitting [F9] once again will return you to the communications screen you started from.

Changing parameters - When on the parameter or status screen, use the [UpAr], [DnAr], [LfAr], and [RtAr] keys to move the reverse-video rectangle to the parameter to be changed. Once at the parameter, change it using one of two methods, depending on the type of parameter:

Toggle parameters - Toggle parameters take on one of a small set of values; these parameters include:

- all parameters that assume values of ON or OFF,
- parameters BEACON and PACTIME, which assume values of EV (every) or AF (after),
- parameter SQUELCH, which assumes values of POS (positive) or NEG (negative)
- parameter HBAUD, which can assume values of 300, 600, 1200, 2400, 4800 or 9600 baud

- parameters CFROM, DFROM, MFROM, and MTO, which can assume values ACCEPT ALL, REJECT ALL, ACCEPT LIST, and REJECT LIST.

To change a toggle parameter, hit [CR] until the parameter assumes the value you want.

"Fill-in-the-blank" parameters - These parameters, which include all parameters not mentioned above, are changed by typing in the desired parameter value; the [Del], [BSP], or [^H] keys can be used to correct typing errors.

Figuring out what a parameter means - You may have noticed that this manual does not contain descriptions of the individual parameters on the parameter and status screens. That's because a description of each parameter is built into PC-PAKRATT. To access this description, move the reverse-video rectangle to the parameter of interest, then hit [F1]. A pop-up window will appear containing information on the parameter in question.

Saving and restoring parameters - PC-PAKRATT initializes the values of all parameters on the parameter and status screens by reading values from the current parameter file whenever you execute the program. The first time you use the PC-PAKRATT program, parameters will be read from file PCPAKRAT.PAR, a file supplied with the program. When you exit PC-PAKRATT, or when you quit PC-PAKRATT with parameter AUTOSAV'ON, current parameter values will automatically be stored in this file.

But if you regularly operate on different bands and in different modes, you may want to save several sets of parameters and recall them when needed. Current parameters can be saved using the save command on the main screen; just hit "V", then hit "P" to indicate you want to save a parameter file, then enter the name of the file to which you want to save the parameters (use any file name you'd like, but be careful not to inadvertently overwrite an existing file). To recall one of these parameter files, use the load command on the main screen; just type "L", then type "P" to indicate you want to read in a new set of parameters, then type the name of the parameter file you wish to read.

Note that when you leave PC-PAKRATT and return to DOS, current parameters are saved to the current parameter file, which is the parameter file most recently named in a load or save operation.

9.0 THE MORSE SCREEN

To operate in Morse mode, enter the Morse screen from the main screen by typing [F6]; after a second or so the Morse screen will appear.

9.1 Morse screen windows

The Morse screen is divided into three areas, or windows:

Status window - The three-line status window at the top of the screen contains information on the current status of any Morse communications you're carrying out, as well as the status of some PC-PAKRATT functions. Included in this status are the following:

TRANSMIT/RECEIVE - Indicates whether your PK-232 and transceiver are in transmit or receive mode. TRANSMIT/RECEIVE is displayed on the first line of the status window.

TX xx WPM - Indicates transmit speed in words per minute. Transmit speed is displayed on the first line of the status window.

TXF - Number of characters remaining in the transmit buffer. If the transmit buffer is empty, TXF will show a value of 1024, indicating that there are 1024 characters left in the buffer. TXF is displayed on the first line of the status window.

RX xx WPM - Indicates receive speed in words per minute. Receive speed is displayed on the second line of the status window.

LOCK - Receive speed locked. This legend, if present, indicates that the PK-232 is not attempting to track the receive speed of the incoming signal. LOCK is displayed on the second line of the status window.

Printer enable symbol - Indicates that the printer has been enabled. If you've enabled your printer to print receive window data, a blinking letter "P" will appear on the right hand side of the second status window line.

File transmit enable symbol - Indicates that a file is being transmitted. When you begin to transmit a file, a blinking letter "T" will appear on the right hand side of the second status window line; the "T" will disappear when file transmission is complete or when file transmission has been aborted.

File receive enable symbol - Indicates that data is being placed in a file. If you've enabled a file to store receive window data, a blinking letter "R" will appear on the right hand side of the second status window line.

QBF - Number of characters remaining in the QSO buffer. QBF appears on the second status window line.

Screen hold - Indicates receive screen is being frozen or scrolled. When the screen is being scrolled, a blinking "SCREEN HALT" indicator will appear on the third line of the status screen.

Receive window - The receive window occupies the central 17 lines of the Morse screen; this window displays all received data, status messages and, optionally, all transmitted data:

Receive data is any data your PK-232 receives off the air.

Status messages alert you to PK-232 status. The only status message applicable to Morse is "Transmit data remaining", which indicates that a buffer in the PK-232 still has data to be transmitted after you've switched from transmit to receive.

Transmit data is data that has been transmitted from your station. You can highlight (or lowlight) this transmit data text by setting parameter **HIGHLTTX**, found on the parameter screen, to ON. If you'd rather not see transmit data on the receive screen, set parameter **TXECHO**, found on the parameter screen, to OFF.

Transmit window - The transmit window occupies the lower four lines of the Morse screen, and contains the data you type in to be transmitted. If you make an error while typing in data, you can erase the error by backing up the cursor with the [BSP], [^H], or [Del] keys (provided, of course, that you haven't already transmitted the data).

9.2 The QSO buffer

PC-PAKRATT maintains a buffer in memory into which is placed all received data and status messages that the PK-232 sends to your computer; optionally, if parameter **TXECHO** is ON, this buffer will also store data you've transmitted. The size of this buffer, referred to here as the QSO buffer, depends on the amount of RAM (random-access memory) in your system. For a system with 640k of RAM (the maximum amount supported by a plain-vanilla PC) this buffer is 63k-bytes long, but systems with less memory will have a smaller amount of RAM allocated to the buffer.

Because the QSO buffer records incoming and outgoing data, it can serve as a record of what's been sent and received by your station. The QSO buffer can be edited, browsed, or saved to a file (the latter by using the "V" command on the main screen). The [^F7] function key clears the QSO buffer and resets it to its empty state.

9.3 Special keys

All Morse functions and commands are assigned to special keys:

[F1] - Help - displays a pop-up window that briefly describes all special keys for the Morse screen (in effect, an abbreviated version of the information being described in this section).

[F2] - Lock receive speed - If you're receiving a Morse signal, you may notice that the receive speed jumps around quite a bit, particularly if the signal is noisy. That's because the PK-232 tries to continually adjust its receive speed to match that of the incoming signal. Sometimes reception can be improved by disabling this tracking feature. To disable speed tracking, hit [F2]; a "LOCK" indicator will appear on the second line of the status screen. Tracking is re-enabled when you hit [F2] a second time, or when you go to transmit. Note that locking the receive speed won't prevent you from changing the speed manually - just use [F5] and [F6], as described below.

[F3] - Transmit - Places the PK-232 and your transceiver in transmit mode.

[F4] - Receive - Places the PK-232 and your transceiver in receive mode.

[F5] - Decrease speed - [F5] decreases transmit speed by 1 WPM every time you hit it.

[F6] - Increase speed - [F6] increases transmit speed by 1 WPM every time you hit it.

[F7] - Call up break-in buffer - Sometimes you may type quite a bit of data into the transmit buffer while receiving a signal from another station, in anticipation of sending that data to the station. But what if you suddenly need to break in and respond to that station? Rather than clear the transmit buffer and start over, you can invoke a break-in buffer by hitting [F7], thus placing the PK-232 and your transceiver in transmit and displaying the (blank) break-in buffer in the transmit window. You can now type break-in text. When you return to receive, the data that was in the transmit buffer prior to break-in will be redisplayed.

[F9] - go to parameter screen - Same as for packet - see section 7.4.

[^F1] - display user file 1 - Same as for the main screen - see section 5.0.

[^F2] - display user file 2 - Same as for the main screen - see section 5.0.

[^F3] - enter message file names - Same as for packet - see section 7.4.

[^F5] - begin file receive - Same as for packet - see section 7.4.

[^F6] - end file receive - Same as for packet - see section 7.4.

[^F7] - clear QSO buffer - Same as for packet - see section 7.4.

[^F8] - clear transmit buffer - Same as for packet - see section 7.4.

[^F9] - program softkey - same as for the main screen; see section 5.0.

[^F10] - print received data - Same as for packet - see section 7.4.

[a0],...,[a9] - transmit a file - Same as for packet - see section 7.4.

[PgUp], [PgDn] - scroll up or scroll down receive screen - Same as for packet - see section 7.4.

Special transmit keys - There are a number of special keys used when transmitting Morse data:

[^D] - Return to receive. The conventional way to return to receive is to hit [F4]. Alternately, you can place a [^D] character at the end of your transmit data; when the PK-232 encounters a [^D] in the transmit data, it will return to receive. This is handy if you want to embed a "return to receive" command in a file you're transmitting.

[^T] - Send time. When the PK-232 encounters a [^T] in the transmit data, it transmits the current time.

Prosigns: The following prosigns can be sent with a single keystroke:

To send	type	To send	type
AA	>	KA	%
AR	+	KN	(
AS	&	SK	*
BT	=	SN	!

9.4 Leaving Morse

Exit Morse mode by typing [Esc]; PC-PAKRATT will return to the main screen. If you were transmitting when you hit [Esc], the PK-232 and your transceiver will be returned to receive; a file transmission in progress will be aborted.

10.0 THE BAUDOT SCREEN

To operate in Baudot mode, enter the Baudot screen from the main screen by typing [F4]; after a second or so the Baudot screen will appear.

10.1 Baudot screen windows

The Baudot screen is divided into three areas, or windows:

Status window - The three-line status window at the top of the screen contains information on the current status of any Baudot communications you're carrying out, as well as the status of some PC-PAKRATT functions. Included in this status are the following:

TRANSMIT/RECEIVE - Indicates whether your PK-232 and transceiver are in transmit or receive mode. TRANSMIT/RECEIVE is displayed on the first line of the status window.

xxx BAUD - Indicates transmit/receive speed in baud; displayed on the first line of the status window.

RX INVERTED - Indicates that receive tones have been reversed. This legend, if present, is displayed on the first line of the status window.

TXF - Number of characters remaining in the transmit buffer. If the transmit buffer is empty, TXF will show a value of 1024, indicating that there are 1024 characters left in the buffer. TXF is displayed on the first line of the status window.

LETTERS - This legend appears temporarily, to indicate that you have hit LETTERS key [F5] - see the explanation of [F5] in section 9.3 below. LETTERS appears on the second line of the status window.

Printer enable symbol - Indicates that the printer has been enabled. If you've enabled your printer to print receive window data, a blinking letter "P" will appear on the right hand side of the second status window line.

File transmit enable symbol - Indicates that a file is being transmitted. When you begin to transmit a file, a blinking letter "T" will appear on the right hand side of the second status window line; the "T" will disappear when file transmission is complete or when file transmission has been aborted.

File receive enable symbol - Indicates that data is being placed in a file. If you've enabled a file to store receive window data, a blinking letter "R" will appear on the right hand side of the second status window line.

QBF - Number of characters remaining in the QSO buffer. QBF appears on the second status window line.

Screen hold - Indicates receive screen is being frozen or scrolled. When the screen is being scrolled, a blinking "SCREEN HALT" indicator will appear on the third line of the status screen.

Receive window - The receive window occupies the central 17 lines of the Baudot screen; this window displays all received data, status messages and, optionally, all transmitted data:

Receive data is any data your PK-232 receives off the air.

Status messages alert you to PK-232 status. The only status message applicable to Baudot is "Transmit data remaining", which indicates that a buffer in the PK-232 still has data to be transmitted after you've switched from transmit to receive.

Transmit data is data that has been transmitted from your station. You can highlight (or lowlight) this transmit data text by setting parameter **HIGHTTX**, found on the parameter screen, to ON. If you'd rather not see transmit data on the receive screen, set parameter **TXECHO**, found on the parameter screen, to OFF.

Transmit window - The transmit window occupies the lower four lines of the Baudot screen, and contains the data you type in to be transmitted. If you make an error while typing in data, you can erase the error by backing up the cursor with the [BSP], [^H], or [Del] keys (provided, of course, that you haven't already transmitted the data).

10.2 The QSO buffer

PC-PAKRATT maintains a buffer in memory into which is placed all received data and status messages that the PK-232 sends to your computer; optionally, if parameter **TXECHO** is ON, this buffer will also store data you've transmitted. The size of this buffer, referred to here as the QSO buffer, depends on the amount of RAM (random-access memory) in your system. For a system with 640k of RAM (the maximum amount supported by a plain-vanilla PC) this buffer is 63k-bytes long, but systems with less memory will have a smaller amount of RAM allocated to the buffer.

Because the QSO buffer records incoming and outgoing data, it can serve as a record of what's been sent and received by your station. The QSO buffer can be edited, browsed, or saved to a file (the latter by using the "V" command on the main screen). The [^F7] function key clears the QSO buffer and resets it to its empty state.

10.3 Special keys

All Baudot functions and commands are assigned to special keys:

[F1] - Help - displays a pop-up window that briefly describes all special keys for the Baudot screen (in effect, an abbreviated version of the information being described in this section).

[F2] - Change speed - Pressing [F2] changes the Baudot transmit/receive speed; you'll see the new speed setting on the first line of the status screen. Hitting [F2] repeatedly allows you to access any of the following speeds: 45, 50, 75, or 100 baud.

[F3] - Transmit - Places the PK-232 and your transceiver in transmit mode.

[F4] - Receive - Places the PK-232 and your transceiver in receive mode.

[F5] - Force LETTERS - In Baudot, the transmitting station sends figures (i.e. digits, like 1,2,3,...) by first sending a FIGURES character. Then the digit or digits are sent, then a LETTERS character that returns your station to letters mode (think of FIGURES and LETTERS as the analog of pressing and releasing the shift key on a bizarre sort of typewriter). But if your station misses a LETTERS character, you'll receive a string of digits where letters were intended. You can correct this situation by hitting [F5], which forces your station back into letters mode. The legend LETTERS will briefly appear in the status window to indicate a switch to letters mode.

[F6] - Reverse receive tones - You can reverse the receive tones your PK-232 expects to see by hitting [F6]; the legend RX INVERTED will appear on the first line of the status window. Hitting [F6] again returns the tones to normal.

[F7] - Call up break-in buffer - Same as for Morse - see section 9.3.

[F9] - go to parameter screen - Same as for packet - see section 7.4.

[^F1] - display user file 1 - Same as for the main screen - see section 5.0.

[^F2] - display user file 2 - Same as for the main screen - see section 5.0.

[^F3] - enter message file names - Same as for packet - see section 7.4.

[^F5] - begin file receive - Same as for packet - see section 7.4.

[^F6] - end file receive - Same as for packet - see section 7.4.

[^F7] - clear QSO buffer - Same as for packet - see section 7.4.

[^F8] - clear transmit buffer - Same as for packet - see section 7.4.

[^F9] - program softkey - same as for the main screen; see section 5.0.

[^F10] - print received data - Same as for packet - see section 7.4.

[a0],...,[a9] - transmit a file - Same as for packet - see section 7.4.

[PgUp], [PgDn] - scroll up or scroll down receive screen - Same as for packet - see section 7.4.

Special transmit keys - There are a number of special keys used when transmitting Baudot data:

[^D] - Return to receive. The conventional way to return to receive is to hit [F4]. Alternately, you can place a [^D] character at the end of your transmit data; when the PK-232 encounters a [^D] in the transmit data, it will return to receive. This is handy if you want to embed a "return to receive" command in a file you're transmitting.

[^F] - Send CW ID, return to receive. Similar to [^D], except that the PK-232 sends a CW ID (using the call given in parameter MYC) before returning to receive.

[^N] - Send FIGURES character. The PK-232 automatically inserts a FIGURES character, where needed, when transmitting digits. But you can also transmit a FIGURES character manually by placing a [^N] in the transmit buffer.

[^O] - Send LETTERS character. The PK-232 automatically inserts a LETTERS character, where needed, when transmitting letters. But you can also transmit a LETTERS character manually by placing a [^O] in the transmit buffer.

[^T] - Send time. When the PK-232 encounters a [^T] in the transmit data, it transmits the current time.

10.4 Leaving Baudot

Exit Baudot mode by typing [Esc]; PC-PAKRATT will return to the main screen. If you were transmitting when you hit [Esc], the PK-232 and your transceiver will be returned to receive; a file transmission in progress will be aborted.

11.0 THE ASCII SCREEN

To operate in ASCII mode, enter the Morse screen from the main screen by typing [F5]; after a second or so the ASCII screen will appear.

11.1 ASCII screen windows

The ASCII screen is divided into three areas, or windows:

Status window - The three-line status window at the top of the screen contains information on the current status of any ASCII communications you're carrying out, as well as the status of some PC-FAKRATT functions. Included in this status are the following:

TRANSMIT/RECEIVE - Indicates whether your PK-232 and transceiver are in transmit or receive mode. TRANSMIT/RECEIVE is displayed on the first line of the status window.

xxx BAUD - Indicates transmit/receive speed in baud; displayed on the first line of the status window.

RX INVERTED - Indicates that receive tones have been reversed. This legend, if present, is displayed on the first line of the status window.

TXF - Number of characters remaining in the transmit buffer. If the transmit buffer is empty, TXF will show a value of 1024, indicating that there are 1024 characters left in the buffer. TXF is displayed on the first line of the status window.

Printer enable symbol - Indicates that printer has been enabled. If you've enabled your printer to print receive window data, a blinking letter "P" will appear on the right hand side of the second status window line.

File transmit enable symbol - Indicates that a file is being transmitted. When you begin to transmit a file, a blinking letter "T" will appear on the right hand side of the second status window line; the "T" will disappear when file transmission is complete or when file transmission has been aborted.

File receive enable symbol - Indicates that data is being placed in a file. If you've enabled a file to store receive window data, a blinking letter "R" will appear on the right hand side of the second status window line.

QBF - Number of characters remaining in the QSO buffer. QBF appears on the second status window line.

Screen hold - Indicates receive screen is being frozen or scrolled. When the screen is being scrolled, a blinking "SCREEN HALT" indicator will appear on the third line of the status screen.

Receive window - The receive window occupies the central 17 lines of the ASCII screen; this window displays all received data, status messages and, optionally, all transmitted data:

Receive data is any data your PK-232 receives off the air.

Status messages alert you to PK-232 status. The only status message applicable to ASCII is "Transmit data remaining", which indicates that a buffer in the PK-232 still has data to be transmitted after you've switched from transmit to receive.

Transmit data is data that has been transmitted from your station. You can highlight (or lowlight) this transmit data text by setting parameter HIGHLTTX, found on the parameter screen, to ON. If you'd rather not see transmit data on the receive screen, set parameter TXECHO, found on the parameter screen, to OFF.

Transmit window - The transmit window occupies the lower four lines of the ASCII screen, and contains the data you type in to be transmitted. If you make an error while typing in data, you can erase the error by backing up the cursor with the [BSP], [^H], or [Del] keys (provided, of course, that you haven't already transmitted the data).

11.2 The QSO buffer

PC-PAKRATT maintains a buffer in memory into which is placed all received data and status messages that the PK-232 sends to your computer; optionally, if parameter TXECHO is ON, this buffer will also store data you've transmitted. The size of this buffer, referred to here as the QSO buffer, depends on the amount of RAM (random-access memory) in your system. For a system with 640k of RAM (the maximum amount supported by a plain-vanilla PC) this buffer is 63k-bytes long, but systems with less memory will have a smaller amount of RAM allocated to the buffer.

Because the QSO buffer records incoming and outgoing data, it can serve as a record of what's been sent and received by your station. The QSO buffer can be edited, browsed, or saved to a file (the latter by using the "V" command on the main screen). The [^F7] function key clears the QSO buffer and resets it to its empty state.

11.3 Special keys

All ASCII functions and commands are assigned to special keys:

[F1] - Help - displays a pop-up window that briefly describes all special keys for the ASCII screen (in effect, an abbreviated version of the information being described in this section).

[F2] - Change speed - Pressing [F2] changes the ASCII transmit/receive speed; you'll see the new speed setting on the first line of the status screen. Hitting [F2] repeatedly allows you to access any of the following speeds: 45, 50, 57, 75, 100, 110, 150, 200, or 300 baud.

[F3] - Transmit - Places the PK-232 and your transceiver in transmit mode.

[F4] - Receive - Places the PK-232 and your transceiver in receive mode.

[F6] - Reverse receive tones - You can reverse the receive tones your PK-232 expects to see by hitting [F6]; the legend RX INVERTED will appear on the first line of the status window. Hitting [F6] again returns the tones to normal.

[F7] - Call up break-in buffer - Same as for Morse - see section 9.3.

[F9] - go to parameter screen - Same as for packet - see section 7.4.

[^F1] - display user file 1 - Same as for the main screen - see section 5.0.

[^F2] - display user file 2 - Same as for the main screen - see section 5.0.

[^F3] - enter message file names - Same as for packet - see section 7.4.

[^F5] - begin file receive - Same as for packet - see section 7.4.

[^F6] - end file receive - Same as for packet - see section 7.4.

[^F7] - clear QSO buffer - Same as for packet - see section 7.4.

[^F8] - clear transmit buffer - Same as for packet - see section 7.4.

[^F9] - program softkey - same as for the main screen; see section 5.0.

[^F10] - print received data - Same as for packet - see section 7.4.

[a0],...,[a9] - transmit a file - Same as for packet - see section 7.4.

[PgUp], [PgDn] - scroll up or scroll down receive screen - Same as for packet - see section 6.4.

Special transmit keys - There are a number of special keys used when transmitting ASCII data:

[^D] - Return to receive. The conventional way to return to receive is to hit [F4]. Alternately, you can place a [^D] character at the end of your transmit data; when the PK-232 encounters a [^D] in the transmit data, it will return to receive. This is handy if you want to embed a "return to receive" command in a file you're transmitting.

[^F] - Send CW ID, return to receive. Similar to [^D], except that the PK-232 sends a CW ID (using the call given in parameter MYC) before returning to receive.

[^T] - Send time. When the PK-232 encounters a [^T] in the transmit data, it transmits the current time.

[aE] - Place escape character in transmit buffer. In the event that you need to transmit an escape character, enter [aE].

11.4 Leaving ASCII

Exit ASCII mode by typing [Esc]; PC-PAKRATT will return to the main screen. If you were transmitting when you hit [Esc], the PK-232 and your transceiver will be returned to receive; a file transmission in progress will be aborted.

12.0 THE AMTOR SCREEN

To operate in AMTOR mode, enter the AMTOR screen from the main screen by typing [F3]; after a second or so the AMTOR screen will appear.

12.1 AMTOR screen windows

The AMTOR screen is divided into three areas, or windows:

Status window - The three-line status window at the top of the screen contains information on the current status of any AMTOR communications you're carrying out, as well as the status of some PC-PAKRATT functions. Included in this status are the following:

TRANSMIT/RECEIVE - Indicates whether your station is transmitting information or receiving it. TRANSMIT/RECEIVE is displayed on the first line of the status window.

AMTOR mode - You'll see one of the following legends indicating the current AMTOR mode:

```
STANDBY
ARQ      - Mode A
ARQ LISTEN - Mode L
FEC      - Mode B
SELFEC   - Mode B selective calling
```

AMTOR mode is displayed on the first line of the status window.

RX INVERTED - Indicates that receive tones have been reversed. This legend, if present, is displayed on the first line of the status window.

TXF - Number of characters remaining in the transmit buffer. If the transmit buffer is empty, TXF will show a value of 1024, indicating that there are 1024 characters left in the buffer. TXF is displayed on the first line of the status window.

TX LOCKED - Indicates that the transmit buffer is locked; see the description of the [Home] key in section 12.4.

AMTOR status - Indicates AMTOR status; you'll see one of the following legends:

```
STANDBY
PHASING
CHANGEOVER
IDLE
TRAFFIC
ERROR
RQ
```

AMTOR status is displayed on the second line of the status window.

LETTERS - This legend appears temporarily, to indicate that you have hit **LETTERS** key [F5] - see the explanation of [F5] in section 10.3. **LETTERS** appears on the second line of the status window.

Printer enable symbol - Indicates that the printer has been enabled. If you've enabled your printer to print receive window data, a blinking letter "P" will appear on the right hand side of the second status window line.

File transmit enable symbol - Indicates that a file is being transmitted. When you begin to transmit a file, a blinking letter "T" will appear on the right hand side of the second status window line; the "T" will disappear when file transmission is complete or when file transmission has been aborted.

File receive enable symbol - Indicates that data is being placed in a file. If you've enabled a file to store receive window data, a blinking letter "R" will appear on the right hand side of the second status window line.

QBF - Number of characters remaining in the QSO buffer. **QBF** appears on the second status window line.

Screen hold - Indicates receive screen is being frozen or scrolled. When the screen is being scrolled, a blinking "SCREEN HALT" indicator will appear on the third line of the status screen.

Receive window - The receive window occupies the central 17 lines of the **AMTOR** screen; this window displays all received data, status messages and, optionally, all transmitted data:

Receive data is any data your **PK-232** receives off the air.

Status messages alert you to **PK-232** status. The only status message applicable to **AMTOR** is "Transmit data remaining", which indicates that a buffer in the **PK-232** still has data to be transmitted after you've switched from transmit to receive.

Transmit data is data that has been transmitted from your station. You can highlight (or lowlight) this transmit data text by setting parameter **HIGHTTX**, found on the parameter screen, to **ON**. If you'd rather not see transmit data on the receive screen, set parameter **TXECHO**, found on the parameter screen, to **OFF**.

Transmit window - The transmit window occupies the lower four lines of the **AMTOR** screen, and contains the data you type in to be transmitted. If you make an error while typing in data, you can erase the error by backing up the cursor with the [BSP], [^H], or [Del] keys (provided, of course, that you haven't already transmitted the data).

12.2 The QSO buffer

PC-PAKRATT maintains a buffer in memory into which is placed all received data and status messages that the PK-232 sends to your computer; optionally, if parameter TXECHO is ON, this buffer will also store data you've transmitted. The size of this buffer, referred to here as the QSO buffer, depends on the amount of RAM (random-access memory) in your system. For a system with 640k of RAM (the maximum amount supported by a plain-vanilla PC) this buffer is 63k-bytes long, but systems with less memory will have a smaller amount of RAM allocated to the buffer.

Because the QSO buffer records incoming and outgoing data, it can serve as a record of what's been sent and received by your station. The QSO buffer can be edited, browsed, or saved to a file (the latter by using the "V" command on the main screen). The [^F7] function key clears the QSO buffer and resets it to its empty state.

12.3 Entering MYSEL

Before you can start operating AMTOR, you'll have to enter your station's selective call, or SELCAL; this is a four-letter code derived from your station call. You can do this with the following procedure:

- 1.) Once on the AMTOR screen, hit [F9]; this will take you to the parameter screen.
 - 2.) One of the parameters on the parameter screen will be displayed in reverse video. Move this reverse video patch to the MYSEL parameter using the [UpAr], [DnAr], [LfAr], and [RtAr] keys.
 - 3.) Once at MYSEL, type in a four-letter code for your call. If you make a mistake, erase the erroneous character or characters with the [^H], [Del], or [BSP] key, and retype your call.
- Note: There is a convention for deriving a four-letter SELCAL from your amateur callsign - see the PK-232 manual for details.
- 4.) Hit the [F9] key TWICE; you should be back on the AMTOR screen.

12.4 Special keys

All AMTOR functions and commands are assigned to special keys:

[F1] - Help - displays a pop-up window that briefly describes all special keys for the AMTOR screen (in effect, an abbreviated version of the information being described in this section).

[F2] - Mode A selective call - To make a mode A selective call, press [F2]; a window will appear, asking you for the SELCAL of the other station. Type in the SELCAL and hit [CR], and the mode A selective call will begin.

[F3] - Mode B transmit - Places your PK-232 and transceiver in mode B transmit.

[F4] - Mode B selective call - To make a mode B selective call, press [F4]; a window will appear, asking you for the SELCAL of the other station. Type in the SELCAL and hit [CR], and the mode B selective call will begin.

[F5] - Force LETTERS - In AMTOR, the transmitting station sends figures (i.e. digits, like 1,2,3,...) by first sending a FIGURES character. Then the digit or digits are sent, then a LETTERS character that returns your station to letters mode (think of FIGURES and LETTERS as the analog of pressing and releasing the shift key on a bizarre sort of typewriter). But if your station misses a LETTERS character, you'll receive a string of digits where letters were intended. You can correct this situation by hitting [F5], which forces your station back into letters mode. The legend LETTERS will briefly appear in the status window to indicate a switch to letters mode.

[F6] - Reverse receive tones - You can reverse the receive tones your PK-232 expects to see by hitting [F6]; the legend RX INVERTED will appear on the first line of the status window. Hitting [F6] again returns the tones to normal.

[F7] - Call up break-in buffer - Similar to that for Morse - see section 9.3. Note that, in AMTOR, you must exit from the break-in buffer explicitly - see the description of [^F7] below.

[F8] - AMTOR Standby - Places your PK-232 and transceiver in AMTOR standby.

[F9] - go to parameter screen - Same as for packet - see section 7.4.

[F10] - ARQ Listen - Places your PK-232 and transceiver in ARQ listen mode.

[^F1] - display user file 1 - Same as for the main screen - see section 5.0.

[^F2] - display user file 2 - Same as for the main screen - see section 5.0.

[^F3] - enter message file names - Same as for packet - see section 7.4.

[^F4] - Return from break-in buffer - In AMTOR, you must press [^F4] to return from the break-in buffer to the normal transmit buffer.

[^F5] - begin file receive - Same as for packet - see section 7.4.

[^F6] - end file receive - Same as for packet - see section 7.4.

[^F7] - clear QSO buffer - Same as for packet - see section 7.4.

[^F8] - clear transmit buffer - Same as for packet - see section 7.4.

[^F9] - program softkey - same as for the main screen; see section 5.0.

[^F10] - print received data - Same as for packet - see section 7.4.

[a0],...,[a9] - transmit a file - Same as for packet - see section 7.4.

[PgUp], [PgDn] - scroll up or scroll down receive screen - Same as for packet - see section 7.4.

[Home] - Toggle transmit buffer lock - There may be times when you want to disable the transmission of the data in your transmit buffer until you've had a chance to edit or finish it. Hitting [Home] will lock the transmit buffer, preventing transmit buffer data from going out on the air; the legend TX LOCKED will appear on the second line of the status window. Hitting [Home] again will unlock the buffer.

Special transmit keys - There are a number of special keys used when transmitting AMTOR data:

[End] - Transmit "+?", the special AMTOR changeover character sequence; send this when you're done transmitting information, and want to receive information from the other station.

[^C] - Force changeover; send this when the other station is transmitting information, and you want to break in and send information to him.

[^D] - Shuts off transmitter; the PK-232 shuts off the transmitter as soon as it encounters a [^D] in the transmit data.

[^F] - Send CW ID, shut off transmitter. Similar to [^D], except that the PK-232 sends a CW ID (using the call given in parameter MYC) before shutting off the transmitter.

[^N] - Send FIGURES character. The PK-232 automatically inserts a FIGURES character, where needed, when transmitting digits. But you can also transmit a FIGURES character manually by placing a [^N] in the transmit buffer.

[^O] - Send LETTERS character. The PK-232 automatically inserts a LETTERS character, where needed, when transmitting letters. But you can also transmit a LETTERS character manually by placing a [^O] in the transmit buffer.

[^T] - Send time. When the PK-232 encounters a [^T] in the transmit data, it transmits the current time.

12.5 Leaving AMTOR

Exit AMTOR mode by typing [Esc]; PC-PAKRATT will return to the main screen. If you were transmitting when you hit [Esc], the PK-232 and your transceiver will be returned to receive; a file transmission in progress will be aborted.

13.0 THE FAX SCREEN

With the introduction of AEA's PK-FAX facsimile screen display program for the IBM-PC and compatibles, this mode of PC-PAKRATT will probably not be needed. Still, there are special applications where it may be useful to print Facsimile directly from the PK-232.

FAX mode lets you receive weather diagrams, press photos, and other FAX pictures from a variety of sources. There's no need for a graphics board in your computer, because all FAX data is sent directly from the PK-232 to your dot-matrix printer. PC-PAKRATT supports FAX reception only, and not transmission.

To receive FAX pictures, enter the FAX screen from the main screen by typing [F7]; after a second or so the FAX screen will appear. A pop-up window will ask you to connect the special printer cable to your printer. The cable referred to is part of the cable that connects the PK-232 to the computer; just attach the free end, (the one with a Centronics(tm)-style connector) to your printer.

Once you've connected the cable, hit any key (except [Esc]). You're now ready to receive FAX.

13.1 FAX screen windows

The FAX screen has only a single active area - the three-line status window at the top of the screen. The status window contains information pertaining to FAX reception, and also displays some of the more-frequently-changed FAX parameters. Included in the status window are the following:

xxx LPM - The current scan rate, or number of lines per minute you want to receive. To change scan rate, use [F2] - see the description in section 13.2.

SCAN L->R/R->L - Indicates the picture scan direction. Some stations send data left-to-right, others right-to-left; set the scan direction accordingly. To change scan direction, use [F7] - see the description in section 13.2.

RX TONES NORMAL/REVERSED - Indicates whether the PK-232 receive tones are normal or reversed. To change the receive tone setting, use [F6] - see the description in section 13.2.

FAX status - Indicates PK-232 FAX state. If this field is SYNC, the PK-232 is currently printing a picture (or is at least trying to); if this field is STANDBY, no picture is currently being printed. The PK-232 is set to SYNC or STANDBY in one of two ways: by the reception of special tones sent by the transmitting station at the beginning and end of a picture; or manually, using the [F3] or [F4] keys, respectively. For the latter, see the descriptions of [F3] and [F4] in section 13.2.

ASPECT x - Indicates the aspect ratio with which pictures are being printed. To change aspect, use [F8] - see the description in section 13.2.

IMAGE NORMAL/REVERSED - Indicates whether the picture will be printed normally or in reverse image (i.e. with black and white areas of the picture reversed). To change this parameter, use [F5] - see the description in section 13.2.

13.2 Special keys

All FAX functions and commands are assigned to special keys:

[F1] - Help - displays a pop-up window that briefly describes all special keys for the FAX screen (in effect, an abbreviated version of the information being described in this section).

[F2] - Change scan rate. Pressing [F2] changes the scan rate; you'll see the new scan rate setting on the first line of the status screen. Hitting [F2] repeatedly allows you to access any of the following scan rates: 60, 90, 120, 180, or 240 lines per minute.

[F3] - Force print. Pressing [F3] forces the PK-232 to print, regardless of whether or not there's an incoming signal. This feature is useful when you've tuned into a FAX signal, but too late to catch the sync pulse at the beginning of the picture. When you press [F3], the FAX status field in the status window will change to SYNC.

[F4] - Force standby. Pressing [F4] forces the PK-232 to go to standby mode; printing will stop soon thereafter. This feature is useful when you've received all of a FAX picture, but missed the tone at the end of the picture that's meant to place you in standby mode. When you press [F4], the FAX status field in the status window will change to STANDBY, and the legend FORCE STANDBY will appear briefly.

[F5] - Reverse black/white. Pressing [F5] will produce a picture with the black and the white areas reversed. Hitting [F5] again will cancel this feature. The state of this toggle is displayed on the second line of the status window.

[F6] - Reverse receive tones - You can reverse the receive tones your PK-232 expects to see by hitting [F6]; the legend RX TONES REVERSED will appear on the first line of the status window. Hitting [F6] again returns the tones to normal.

[F7] - Reverse scan direction. Hitting [F7] will reverse scan direction - i.e. the direction in which incoming data is eventually placed on paper - from left-to-right to right-to-left. Hitting [F7] again will return the scan direction to left-to-right. The current scan direction is displayed on the first line of the status window.

[F8] - Change aspect. The aspect number, a digit from 1 to 6, indicates the number of scan lines printed out of every 6 scan lines received. Changing this number modifies the aspect ratio of the printed picture. Aspect can be changed by hitting [F8] repeatedly, until the desired aspect is displayed on the second line of the status window.

[F9] - go to parameter screen - Same as for packet - see section 7.4.

[F10] - Justify picture. If you start printing a picture after the synchronization signal has been sent, you'll probably notice a black vertical stripe somewhere in the middle of the paper - this is the edge of the picture. The justify command is used to move this stripe to the left hand side of the paper, so that the picture is printed correctly. To justify, hit [F10]; a window will appear, asking you to enter the number of half-inches needed to move the stripe to the left of the picture. If, for example, the stripe is 5 inches from the left edge of the picture, enter 10, then hit [CR]. The PK-232 will then move the stripe the specified amount. If you don't guess correctly the first time, feel free to try justifying again.

[^F1] - display user file 1 - Same as for the main screen - see section 5.0.

[^F2] - display user file 2 - Same as for the main screen - see section 5.0.

[^F9] - program softkey - same as for the main screen; see section 5.0.

13.3 Leaving FAX

Exit FAX mode by typing [Esc]; a window will appear, asking you to disconnect the special cable from the printer. Once you've done this, hit any key and PC-PAKRATT will return to the main screen.

14.0 THE DUMB TERMINAL SCREEN

A Dumb Terminal mode has been provided in PC-PAKRATT to allow K-232 calibration and SIAM(tm) operation. There may be other times where it is convenient to leave the host mode to control the PK-232 in the old manner. The Dumb terminal mode has very few commands and so all operation should be referenced to the PK-232 operators manual.

To operate in the Dumb Terminal mode, enter the Dumb Terminal screen from the main screen by typing [F8]; after a second or two the Dumb Terminal screen will appear.

14.1 Dumb Terminal windows

The Dumb Terminal screen is divided into two areas, or windows:

Status window - The three-line status window at the top of the screen contains time and date information only. Since the PK-232 is no longer in host mode at this point, no other status information can be obtained.

Data window - The lower 22 lines comprise the transmit/receive data window. There is no split-screen operation in the Dumb Terminal mode.

14.2 Special Keys

The Dumb Terminal mode is meant only to provide a simple means of controlling the PK-232 in Verbose-command mode; and so there are very few special features and keys.

[F1] - Help - displays a screen that describes the special keys that are used in the Dumb Terminal screen. Pressing [F1] again removes the window.

[Shf-F1]...[Shf-F10] and [aF1]...[aF10] - Programmed softkeys may be sent

14.3 Leaving the Dumb Terminal

Exit the Dumb Terminal mode by typing [Esc]; PC-PAKRATT will return to the main screen after first pausing to restore parameters.

If you are using a printer in the Dumb Terminal mode, make sure the commands PRCON and PROUT are both off before exiting. Failure to do so may cause PC-PAKRATT to lock up. All parameters will be restored, but the operating mode upon exiting the Dumb Terminal mode will be preserved.

Cursor movement commands - These commands move the cursor and allow you to view different parts of the data:

- [PgUp] or [^R] - move up one page
- [PgDn] or [^C] - move down one page
- [LfAr] or [^S] - move cursor left one character
- [RtAr] or [^D] - move cursor right one character
- [UpAr] or [^E] - move cursor up one line
- [DnAr] or [^X] - move cursor down one line
- [^W] - scroll up one line
- [^Z] - scroll down one line
- [F5] or [^Q]S - move cursor to start of current line
- [F6] or [^Q]D - move cursor to end of current line
- [F9] or [^Q]R - go to beginning of data
- [F10] or [^Q]C - go to end of data
- [^O]N - go to a certain line (you'll be asked which line you want to go to)

Data insert/delete commands - These commands allow you to insert and delete data:

- [Del],[BSP],[^G],[^H] - delete a single character
- [F4] or [^J] - restore the last deleted line (this is sometimes referred to as the UNDO feature)
- [^P] - insert control character (type [^P], then type the letter corresponding to the control character you want to enter)
- [Ins] or [^V] - toggle insert mode. In insert mode, text will be inserted into existing data, rather than replace existing data. When the editor is in insert mode, the letters "INS" will appear on the editor status line.
- [^Y] - delete current line
- [^Q]Y - delete all characters from current cursor position to the end of the line.

15.0 THE EDITOR

PC-PAKRATT contains a powerful, full-featured screen editor. If you're familiar with MicroPro's WordStar(tm) program, you'll find the editor commands familiar. With the editor you can create, modify, or examine most files on your system, including message files. The editor also allows you to examine or modify the QSO buffer.

Entering the editor - Enter the editor from the main screen by typing "E". Once in the editor, you'll be asked to specify the data to be edited:

To edit the QSO buffer - type Q
To edit a message file - type the message file number
To edit a file - type F, then enter file name

Note that there are two ways to specify a message file: by the file number or the file name. The former is usually more convenient.

It's not absolutely necessary that you specify the data you want to edit. If you'd like to use the editor as a sort of scratchpad, leaving the matter of where this scratchpad data is to be stored until you leave the editor, then type "[Esc]" instead of entering one of the options above.

Once you've specified the data you want and the editor has retrieved and displayed it, you'll notice a few things:

- The top line of the editor screen displays current editor status. The name of the data being edited is displayed, as well as the cursor line and column number. There's also an indicator that tells you if you're in insert mode.
- If the data you've selected contains control characters, those characters will be displayed in reverse video. A carriage return, for example, is displayed as a reverse video "M", and a line feed is displayed as a reverse video "J".
- If a data line is less than 80 characters long, unused character positions will be indicated with a small dot.

With data in the editor, you're ready to examine or change that data using a variety of commands.

Find/replace commands - These commands allow you to find or replace a specified text pattern:

^Q]F - find text pattern. You'll be asked to type a text pattern (a series of characters) to be searched for. You'll then be asked to specify options that control how the search is to be done:

B = search back from current cursor position (normally the editor searches forward, beyond the current cursor position).

G = global search. Search through all data.

U = ignore case. If case is ignored, a lower case character will match to an upper case character, and vice versa. For example, searching for "FrEd" will find the words "FRED", "fred", or "fReD".

= find the #th occurrence, where # is a number.

[^Q]A - find and replace text pattern. You'll be asked to type a text pattern (a series of characters) to be searched for, and also for the text with which this pattern will be replaced once found. You'll then be asked to specify options that determine how search and replacement are carried out:

B = search back from current cursor position (normally the editor searches forward, beyond the current cursor position).

G = global search. Search through all data.

N = replace without asking. The editor, once having found the text pattern, asks you if want to replace it. If the N option is specified, the editor will perform the replacement without asking permission.

U = ignore case. If case is ignored, a lower case character will match to an upper case character, and vice versa. For example, searching for "FrEd" will find the words "FRED", "fred", or "fReD".

= replace # occurrences of the text pattern, where # is a number.

Multiple options can be specified; for example, to search for 10 occurrences of a text pattern without regard to case, and to replace without asking, you would type:

NU10[CR]

The options can be specified in any order. If you don't want any options, just type [CR].

[^L] - Repeat find or replace. This command repeats the last "find" or "find and replace" command entered.

Block commands - Sometimes it's convenient to manipulate data as a block, rather than character-by-character or line-by-line. The PC-PAKRATT editor allows you to define a data block with the following commands:

[F7] or [^K]B - mark start of block. When you press either of these keys, the editor marks the current line as the beginning of the block.

[F8] or [^K]K - mark end of block. When you press either of these keys, the editor marks the current line as the end of the block.

You won't see anything happen on the screen until you've marked BOTH the beginning and end of a block - once both are marked, the characters in the block will change color (they'll be displayed in the block color discussed in section 4.0). The block can now be manipulated with the following commands:

[^K]C - copy block. The block is copied to the line following the current cursor line. The original block text is left in place.

[^K]V - move block. The block is moved (not just copied!) to the line following the current cursor line.

[^K]Y - delete block. The contents of the block are deleted.

[^K]H - hide block. This command "hides" the block, causing it to revert to normal text color. Typing the "hide block" command a second time re-enables block display.

[^Q]B - go to start of block. This command moves the cursor to the first character of the first block line.

[^Q]K - go to end of block. This command places the cursor after the last character of the last block line.

Read data command - It's often convenient to be able to read new data into the editor after you've begun editing. The [^K]R command serves just this purpose. When you type [^K]R, you'll be asked to name the type of data you'd like to read, just as you're asked when you enter the editor. Once you've specified the source of the new data, that data will be added to current editor data starting on the line following the current cursor position.

Example: Suppose you want to send a radiogram to your friend Wally. You can start by entering the editor and telling it that you want to edit the file WALLY.GRM (or any name you choose). Presumably this is a new file, so the editor will create it for you. But now what? You don't want to create your own radiogram form from scratch, that's for certain. Fortunately, there's a radiogram form file called RADIOGRM on your PC-PAKRATT disk. To read it into the editor, type [^K]R and specify file RADIOGRM when asked for the data source. The radiogram will be read into the editor, and you can begin to place your message in it. Note two things:

1.) When you read RADIOGRM (or any other file), the data source name at the top of the screen does not change - you're still working on the original file or buffer.

2.) The file or buffer from which you read the data is not affected in any way.

There are lots of handy uses for the "read data" command - experiment!

Exit commands - There are two ways to exit the editor:

[Esc] - This command saves current editor data by placing it in the file or buffer named in the status line, and exits the editor.

[^K]Q - This command exits the editor, but does NOT save current editor data. This is handy if you've started editing, say, a file, made a horrific mistake, and want to prevent the file from being changed. In either case, you'll be returned to the main screen.

Accessing character graphics - The IBM PC provides a special set of graphics characters that are useful for drawing lines, boxes, forms, and the like. The PC-PAKRATT editor allows access to these characters so that you can create your own forms, which can then be used on the air. The following graphics characters are available directly:

[a1] -	[a2]	
[aQ] r	[aW] T	[aE] 7
[aA] 1	[aS] +	[aD] 4
[aZ] L	[aX] 1	[aC] J

Other characters are available indirectly, by holding down the [ALT] key and entering the ASCII value for the character via the keypad (NOTE: You MUST use the keypad, and not the top-row number keys!). ASCII values for commonly-used characters are given in table 1.

There's one important thing to note concerning the transmission of graphics characters: If the station on the receiving end doesn't have an IBM PC or compatible, or if that station is configured to receive 7-bit ASCII, the received text isn't going to make a whole lot of sense!

Char	ASCII value	Char	ASCII value	Char	ASCII value
=	205				
	186				
ƒ	201	ƒ	213	π	214
ƒ	203	ƒ	209	π	210
ƒ	187	ƒ	184	π	183
ƒ	204	ƒ	198	π	199
ƒ	206	ƒ	216	π	215
ƒ	185	ƒ	181	π	182
ƒ	200	ƒ	212	π	211
ƒ	202	ƒ	207	π	208
ƒ	188	ƒ	190	π	189

Table 1: ASCII codes for commonly-used graphics characters.

16.0 BROWSE

The browse function is similar to the editor, except that it only allows you to examine data, not change it.

The browse function also displays data slightly differently - it does not display carriage returns and line feeds, and it does pad out each line with dots in the unused character positions. And if the WRAP parameter (found on the parameter screen) is enabled, data will be wrapped so as to avoid word splits; the legend WW will appear on the status line if wrap is enabled. The end result is that data is easier to read.

The following commands are available in browse:

```
[PgUp] or [^R] - move up one page
[PgDn] or [^C] - move down one page
[LfAr] or [^S] - move cursor left one character
[RtAr] or [^D] - move cursor right one character
[UpAr] or [^E] - move cursor up one line
[DnAr] or [^X] - move cursor down one line
           [^W] - scroll up one line
           [^Z] - scroll down one line
[F5] or [^Q]S - move cursor to start of current line
[F6] or [^Q]D - move cursor to end of current line
[F9] or [^Q]R - go to beginning of data
[F10] or [^Q]C - go to end of data
           [^O]N - go to a certain line (you'll be asked
                    which line you want to go to)
```


APPENDIX A - ERROR MESSAGES

A.1 Fatal (to the program, not you) error messages

These messages indicate that your computer, RS-232 cable, or PK-232 has a problem serious enough to prevent PC-PAKRATT from running:

PCPAKRAT.DEF not found. Program terminating. - If, during program initialization, PC-PAKRATT can't find the current parameter file, it attempts to read default parameter file PCPAKRAT.DEF. If PC-PAKRATT can't find the default file, you'll get this message. The best remedy is to copy files PCPAKRAT.PAR and PCPAKRAT.DEF from your original PC-PAKRATT disk.

PCPAKRAT.DEF has been corrupted. Program terminating. - Similar to the message above; the default has been found, but can't be read. Again, the best remedy is to copy files PCPAKRAT.PAR and PCPAKRAT.DEF from your original PC-PAKRATT disk.

Unable to open serial port. Please refer to your PC-PAKRATT manual. Program terminating. - This indicates one of two problems:

- 1.) Your serial port is defective or unavailable.
Solution: - Check your serial port hardware.
- 2.) You've tried to execute file ppxt.com rather than running batch file pp.bat.
Solution: - Don't do that!

Unable to establish communications with your PK-232. Please refer to your PC-PAKRATT manual. - This indicates one of several problems:

- 1.) The RS-232 cable is loose on one end or the other.
Solution: - Check the cable connections and try again.
 - 2.) The PK-232 baud rate is different from the PC-PAKRATT baud rate.
Solution: - Turn the PK-232 off for about 5 seconds, then back on, and try again.
- You've left the batteries in your PK232. Turn off the PK-232, remove the batteries, and try again.

Software revision date of your PK-232 is xx/xx/xx. You need a PK-232 software update!

- The software inside your PK-232 is out of date. Replace the read-only memories in your PK-232 with a newer release version; see section 2.0 for details.

A.2 - Non-fatal error messages

These messages indicate that something has gone wrong that, in most cases, can be easily fixed:

File does not exist - You've tried to access a non-existent file.

File is not open for input - indicates you're trying to write to a file that PC-PAKRATT is currently reading.

File is not open for output - indicates you're trying to read from a file that PC-PAKRATT is currently writing to.

Disk write error occurred - An error occurred while PC-PAKRATT attempted a disk write. Check the disk in question.

Illegal file name or directory full - You've either specified an illegal file name, or you've tried to add a file to a directory that is full.

No more memory available - PC-PAKRATT has just run out of memory. You'll most likely see this in the editor if you attempt to add too much data to a large file.

Invalid integer - You've just entered a bad integer value.

Not found - The search pattern you specified in a find or replace command was not found in the data.

Disk full - There's no more room on the disk that PC-PAKRATT is attempting to write data to.

File or QSO buffer too big! Partial read - The editor or the browse function ran out of memory while trying to read the data you specified; only some of the data has been read.

Block not defined - You've tried to do an editor block operation without first defining the block.

Printer not ready - You've attempted to print something, but the printer is either disconnected or off-line.

Printing error - An error occurred while using the printer.

Error reading print file - PC-PAKRATT cannot read data from the file you want to print.

Print file not found - PC-PAKRATT cannot find the file you want to print.

Illegal drive or no room on drive - you've tried to access a file on a non-existent drive, or on a drive that has no more room (the latter being of importance only if you're trying to write data to a file.)

Can't find help file - PC-PAKRATT can't find the help file containing the data you need. Be sure to have all the help files (files with names PCPAKRAT.Hxx, where xx is a one- or two-digit number) in the same directory as the PC-PAKRATT program.

Changes to PCPAKRAT.DEF not allowed! or Didn't save parameters (can't overwrite PCPAKRAT.DEF) - Either you or PC-PAKRATT attempted to write to PCPAKRAT.DEF, a special default parameter file used only if PC-PAKRATT can't find the current parameter file. Changes to PCPAKRAT.DEF are not allowed.

RS-232 link error - will reinitialize - An error, possibly noise, has been detected on the RS-232 link between the computer and the PK-232. When you hit [Esc], PC-PAKRATT will re-initialize the link. Possible causes for this message include:

- using 4800 or 9600 baud with an older version of PK-232 firmware
- loose connectors
- too much RF in your shack

Not while connected - You've tried to do something that isn't allowed during a connection.

Need MYCALL - You've tried to start a packet connection without first having specified your call in the MYC parameter on the parameter screen.

Different connectees - You've tried to reconnect, but the connectee you've specified is different from the one you're currently connected to.

Not in this mode - you've tried to do something that isn't allowed in the current communications mode.

Bad call - You've entered an illegal call sign in the autoconnect window.

Can't find autoconnect file - PC-PAKRATT can't find file AUTOCONN.

Can't find connect path - PC-PAKRATT can't find a connect path for the call you've entered in the autoconnect window, or the path that it has found is a bad one. Add a path to file AUTOCONN, or correct the path that's currently there.

HID must be on for ID - You've tried to send an ID packet, but this can't be done unless parameter HID (on the parameter screen) is set ON.

Can't open message file - You've tried to transmit a message file that doesn't exist.

Connected - can't change MYC, AX25L2V2 - You can't change either parameter MYC or AX25L2V2 while a connect is in progress.

Can't load param file while connected - You've tried to load a parameter file while connected - this isn't allowed.