

# KAM Plus

# Getting Started

VCL

KAM-AD0842CY-7.1

**Kantronics**

RF Data Communications Specialists



Printed on  
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The KAM Plus is a Kantronics hardware and software design incorporating the AX.25 Level 2 Version 2 Packet protocol as adopted by the American Radio Relay League. This manual contains information from earlier KPC-1, KPC-2, KPC-2400, KPC-3, KPC-4, and KAM manuals and addendums, modified as appropriate.

We have attempted to make this manual technically and typographically correct as of the date of the current printing. Production changes to the TNC may add errata or addendum sheets. We solicit your comments and/or suggested corrections. Please send to Kantronics Co., Inc., 1202 E. 23rd Street, Lawrence, KS 66046.

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## **Kantronics**

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## Who should read this manual?

This manual is intended as a quick reference guide to assist new users in getting started as quickly as possible with the KAM Plus. If you are already familiar with connecting a TNC to your computer and radios, you may want to set the INTFACE command to TERMINAL and proceed directly to the KAM Plus Reference Manual.

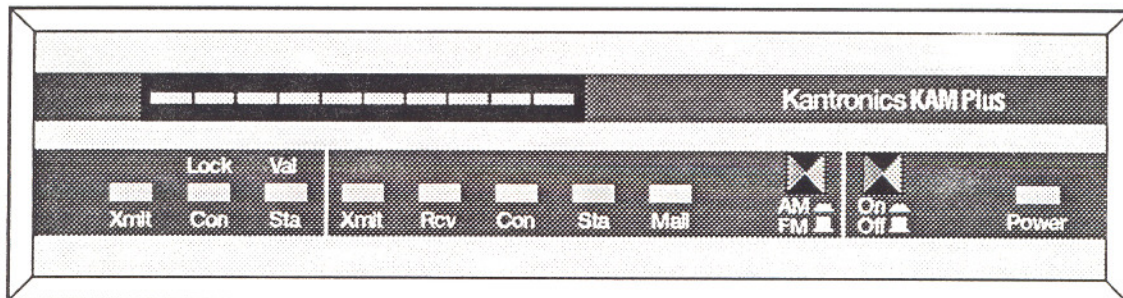
## Before You Start

Please take a moment to read the License Agreement in the front of this manual before you install or use your KAM Plus. Your installation and/or use of the KAM Plus constitutes your agreement to be bound by the terms of the License Agreement.

Your KAM Plus comes with one male DB-9 cable (VHF), one 8-pin DIN cable (HF), one DB-25 cable (computer), one 2.1 mm power jack, and two Y-adapters. You will need to supply the connectors required for your radios (mic jack or accessory plug). Wiring instructions are included in this manual. To help you explore your new Kam Plus, we've included Pacterm, a simple terminal program for the PC on a 5-1/4" disk. You are free to make copies on 3-1/2" disks if necessary. Once you've explored the KAM Plus, you will likely desire to purchase a full-featured program such as Host Master. Pacterm will not be updated.

## About Your KAM Plus

### Front Panel



The front panel of the KAM Plus has two switches, 8 status LEDs and a ten segment bargraph. There are seven LEDs used as operating status indicators. The front panel is divided into two sections, with the left three LEDs indicating HF operation and the next four LEDs VHF operation. The remaining LED indicates the status of your internal mailbox (PBBS).

### HF Section Indicators

**XMIT/RCV** – This LED lights when the KAM is keying the PTT line on your HF radio, or when HF packet data is being received.

**CON/LOCK** – This LED lights when you have an HF packet connection on the current stream or when you are linked to another station on AMTOR or Pactor.

**STA/VAL** – This LED lights when you have unacknowledged HF packets, valid AMTOR data being received, or when operating Pactor at 200 baud. If Pactor speed drops to 100 baud, this LED will go out.

**BARGRAPH** – The bargraph is used to properly tune an HF signal.

## VHF Section Indicators

**XMIT** – This LED lights when the KAM is keying the PTT line on your VHF radio.

**RCV** – This LED lights when you are receiving a signal on the VHF port.

**CON** – This LED lights when you have a VHF packet connection on the current stream. In addition, when operating with a standard terminal program and operating a non-packet HF mode, this LED will blink ON/OFF for approximately 10 seconds if the KAM receives a VHF packet connect request.

**STA** – This LED lights when you have unacknowledged VHF packets.

**MAIL** – This LED stays lit when someone is connected to your PBBS and will flash anytime there is unread mail in the PBBS that is addressed to you.

## Power Indicator

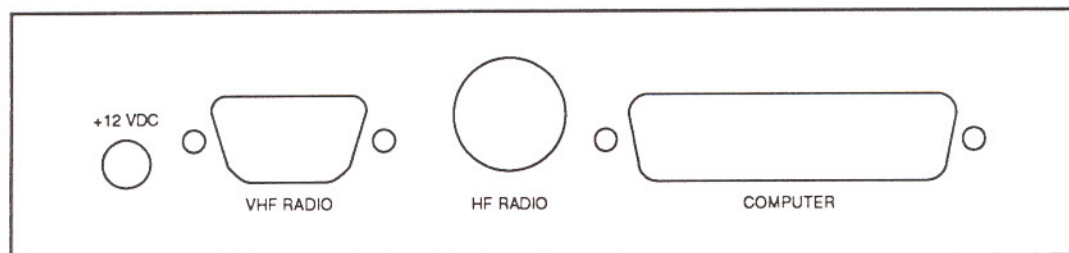
**POWER** – The single LED on the right side of the front panel illuminates when power is applied to the KAM Plus.

## Switches

**ON/OFF** – Provides power control for the KAM.

**AM/FM** – Switches the limiters in or out of the demodulator circuits. The KAM Plus may function better with your specific station in either mode – use the position that provides the best operation for you. Depending on your specific station and mode of operation, the KAM Plus may function better with this switch in either position.

## Rear Panel



The rear panel of the KAM Plus has four connectors located on it. The purpose of each connector is described below:

**+12 VDC (Power)** – Connect this jack (center pin positive) to a 12 VDC power supply. The power supply must be capable of 300 ma, and the DC voltage under load should be between 9 and 15 volts.

**VHF RADIO** – This DB-9 connector accepts the cable (provided) from your VHF radio for packet operation. It is also used for receiving WEFAX pictures by connecting the receive audio from your HF radio.

**HF RADIO** – This 8-pin DIN connector accepts the cable (provided) from your HF radio. All of the non-packet modes are operated through this connector.

**COMPUTER** – This DB-25 connector connects your KAM to the serial port of your computer. The KAM Plus communicates with either RS-232 or TTL levels (jumper selectable) using standard ASCII characters for all commands.

# Wiring your KAM Plus

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## Power Cable

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Connect a 12 volt DC power supply to the 2.1 mm jack (supplied) by connecting the positive terminal to the center of the jack and the negative terminal to the shell. Plug the power jack in to the rear panel of the KAM Plus.

## KAM Plus to Computer Cable

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To connect your KAM Plus to your computer, use the supplied cable. Attach the male connector (the one with the pins) to the connector marked "COMPUTER". The female end of this cable connects to your computer. Plug this end into the COM1 serial port. If your computer requires a 9-pin connector instead of the 25 pin, you can purchase an adapter from Radio Shack or your local computer vendor. You may also use a standard 9-pin to 25-pin *modem* cable available through most computer dealers.

For connection to other types of computers, refer to the manual for your software or terminal program. The KAM Plus will communicate with your computer with a minimum of three wires connected – Txd, Rxd, and SG, although your software (terminal program) may require other wires connected. Refer to the KAM Plus Reference Manual for a complete description of the connections used in the KAM Plus.

The KAM Plus is shipped from the factory configured to use RS-232 levels through the serial port to your computer. If your computer uses TTL levels (such as the Commodore 64/128), you must move the configuration jumper inside the KAM Plus. Refer to the Reference Manual for the location of this jumper.

**WARNING:** The supplied serial cable contains all 25 wires and is designed to be used with your KAM Plus. This cable may not be suitable for other equipment. Check your equipment manuals to determine that no damage will result.

## Initializing the KAM Plus

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Now that the KAM Plus is cabled to your computer, the next step is to initialize. Connect the serial cable to the KAM Plus and to your first computer serial port (COM1). Boot your computer as you normally do. Place the PACTERM disk (shipped with your KAM Plus) into the A drive on your computer and type A:PACTERM and press return. When the program starts, you will see a menu page. Press the backspace key on your computer and you'll be placed in the ONLINE mode of the Pacterm program.

Once the program is operating, turn on the KAM Plus by depressing the ON/OFF switch on the front panel and observe that the green power LED lights. At this point the KAM Plus will begin sending you a message. Since Pacterm is set to communicate at 1200 baud on COM1, you will see some garbage characters and then you'll see the message

PRESS (\*) TO SET BAUD RATE

When you see this message, press the \* (asterisk) key on your keyboard. Do not type the ( ) characters, just the \*. You must press the \* within two (2) seconds of seeing the message printed. If you performed this properly, the KAM Plus will prompt you to ENTER YOUR CALLSIGN=>. If you didn't press the \* quickly enough, the KAM Plus will continue to cycle through all the speeds again, so be patient and try again when you see the message.

Once you have hit the \* at the right time, the KAM Plus prompts you to ENTER YOUR CALLSIGN=>. Type your amateur radio callsign and press return. The KAM Plus now sends its sign-on message:

KANTRONICS ALL MODE COMMUNICATOR PLUS Version 6.1P  
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cmd:

Now that you have initialized your KAM Plus, you are ready to try your first connect. Since you have not connected the radio to the TNC yet, you'll simply connect to your personal mailbox built in to the KAM Plus. This will help you to become comfortable with your KAM Plus operation before connecting your radios. At the cmd: prompt, type CONNECT call-1 (replace "call" with your amateur callsign) and press return. Your KAM Plus connects you to the mailbox. Your screen should look something like this:

```
cmd:CONNECT WK5M-1
cmd:*** CONNECTED to WK5M-1
[KAMP-6.1-HM$]
100000 BYTES AVAILABLE
THERE ARE NO MESSAGES
ENTER COMMAND: B,J,K,L,R,S, or Help >
```

Now you can enter any of the mailbox commands shown (B,J,K,L,R,S, or Help). Later you will want to read the PBBS section of the Reference Manual for more details. If you type the HELP command and press return, you'll see the KAM Plus mailbox help file and then the standard mailbox prompt:

```
ENTER COMMAND: B,J,K,L,R,S, or Help >.
```

Now disconnect (just like you will disconnect from any other user). First, return to Command mode by typing CONTROL-C on your keyboard. To do this, hold down the control key (usually marked CTRL) and type the letter C. Release the control key. You should now see the cmd: prompt. Next you must type the DISCONNE command and press return. You will receive the message \*\*\* DISCONNECTED and a new command prompt.

Congratulations. You have now completed your first connect.

## KAM Plus VHF Port to Radio Cable

The next step in connecting your KAM Plus into your station is to make the cable from the KAM Plus to your VHF radio. In order to transmit and receive, you must connect the following pins from the DB-9 connector on the KAM Plus to the appropriate pins on your radio:

- Pin 1 Transmit audio (white wire) connects to the microphone input of your radio.
- Pin 3 Push-to-Talk (brown wire) connects to the PTT or STBY connection on your radio.
- Pin 5 Receive audio (pre-wired mini-plug) connects to the external speaker jack of your radio.
- Pin 6 Ground (black wire) connects to the ground of your radio.

The actual connections to your radio will vary depending on the type of radio you are using. Please refer to the appropriate diagrams below for the proper wiring for the most commonly used radios. If needed, the Reference Manual contains more information.

After you have completed this cable, connect it to your KAM Plus and secure the DB-9 connector with the screws. Connect the microphone plug to your radio and plug the mini-plug into your external speaker jack.



## Adjusting Receive Volume

To properly adjust the receive volume on your VHF radio, first, turn on your computer, start your terminal program and turn on the KAM Plus. Next, turn on your radio and open the squelch control (fully counter-clockwise). Slowly turn the volume up until the RCV LED on the KAM Plus just lights. Increase the volume control slightly from this point. Next, turn the squelch control clockwise until the LED goes out. Your radio are now properly adjusted for receive volume.

## KAM Plus HF Port to Radio Cable

The final step in connecting your KAM Plus into your station is to make the cable from the KAM Plus to your HF radio. In order to transmit and receive, you must connect the following pins from the 8-pin DIN connector on the KAM Plus to the appropriate pins on your HF radio:

Pin 1 Transmit audio (white wire) connects to the microphone input of your radio.

Pin 2 Ground (black wire) connects to the ground of your radio.

Pin 3 Push-to-Talk (brown wire) connects to the PTT or STBY connection on your radio.

Pin 6 Receive audio (pre-wired mini-plug) connects to the external speaker jack of your radio.

If you want to operate CW, you must also connect Pin 4 from the KAM Plus to your CW Key jack exactly as you would connect a straight key. (If your radio has a built-in electronic keyer, you must disable it.)

For FSK operation (if your radio supports it) you must connect Pin 5 from the KAM Plus to the FSK input on your radio.

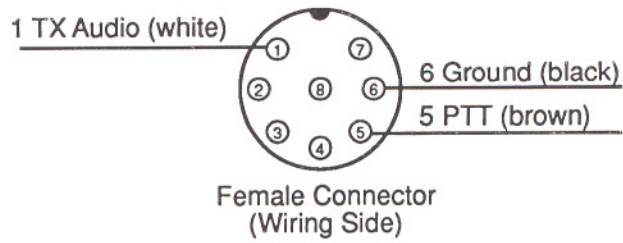
The actual connections to your radio will vary depending on the type of radio you are using. Please refer to the appropriate diagrams below for the proper wiring used for the most common radios. These diagrams show the wiring for AFSK (not FSK) operation and do not show the CW keying line. NOTE that this wiring may be used for Packet, RTTY, ASCII, AMTOR, and Pactor.

# Icom Wiring

## Icom Base Radios (HF or VHF/UHF)

8-pin Mic Connector

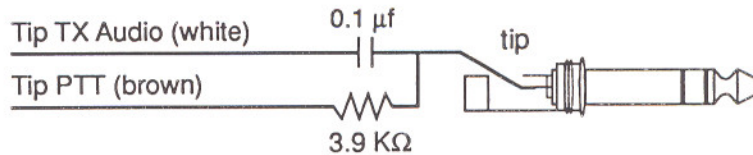
pre-wired cable to speaker jack



## 2AT Style Hand-Held

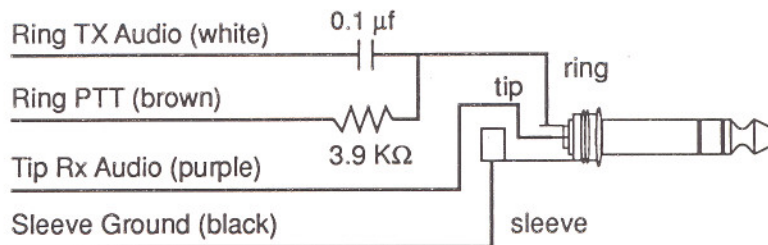
2.5 mm stereo plug to mic jack

pre-wired cable to speaker jack



## W2A Style Hand-Held

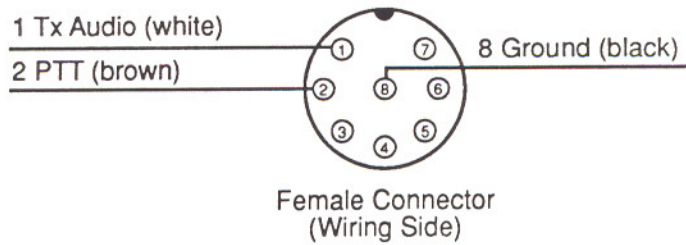
2.5 mm stereo plug to mic/speaker jack



# Kenwood Wiring

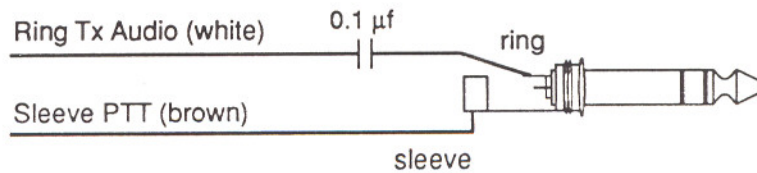
## Kenwood Base Radios (HF or VHF/UHF)

8-pin Mic Connector  
pre-wired cable to speaker jack



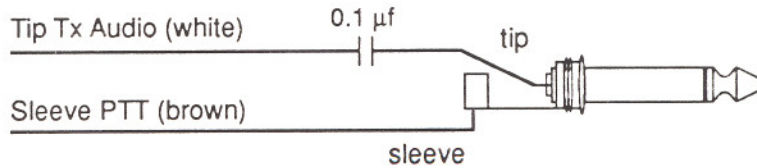
## TR-2600 and later Hand-Held

3.5 mm stereo plug to mic jack  
pre-wired cable to speaker jack (requires adapter, not supplied)



## TR-2500 Hand-Held Radios

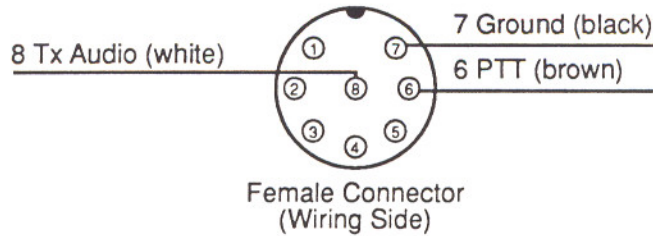
3.5 mm mono plug to mic jack  
pre-wired cable to speaker jack (requires adapter, not supplied)



# Yaesu Wiring

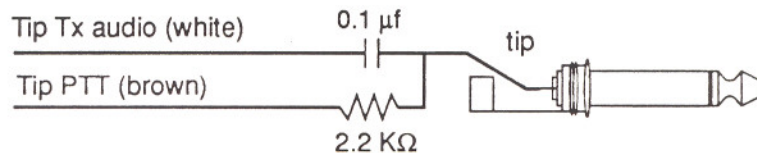
## Yaesu Base Radios (HF or VHF/UHF)

8-pin mic connector  
pre-wired cable to speaker jack



## Yaesu Hand-Helds

2.5 mm mono plug to mic jack  
pre-wired cable to speaker jack



# Operating Packet

As packets are received, the KAM Plus sends them to your terminal for display. A typical received packet might look like this:

Wk5M>KA5ZTX/V: <<I00>>:  
Hello there. How are you today?

The first line is the header line which displays the callsigns of the stations talking. The /V indicates that this packet was received on the VHF port of the KAM Plus. A packet received on the HF port would show /H at the end of the header line. The following line(s) are the actual transmitted message. You may see the RCV LED light at times, indicating that a signal is being received, although nothing displays on your screen. This is normal and is the result of many monitoring commands which are discussed in detail in the KAM Plus Reference Manual.

As you monitor, you will begin to learn which stations are in your area and will then want to try to connect to one of them.

To instruct your KAM Plus to connect, disconnect, or to change any of the operating parameters in the KAM Plus, you must be in the COMMAND mode. To send data from your keyboard over the radio, you will need to be in the CONVERS mode. The KAM Plus automatically switches to the CONVERS mode when you connect to someone and returns to the COMMAND mode when a disconnect occurs. If you are in the CONVERS mode and want to force your KAM Plus back to the COMMAND mode, type CONTROL-C. Remember... you must be in the COMMAND mode in order to give instructions to your KAM Plus.

## Connecting on VHF

---

Suppose you want to connect to KA5ZTX, a station monitored on VHF. First, be sure you have the KAM Plus in Command mode. To do this, type a CONTROL-C and press return. You should see a command prompt (cmd:). Since this station was monitored on VHF, you must make sure your KAM Plus is ready to transmit packet on VHF. Type the vertical bar (|) and then the letter "a". This will set the KAM Plus to transmit on the A stream of the VHF port. Now use the CONNECT command to start the connection. To connect to KA5ZTX, simply type CONNECT KA5ZTX and press return, just as you did in the sample connect to your mailbox.

In some cases you may need to use a relay station, called a digipeater, to contact another station. This is similar to using a voice repeater when the station you want to talk to is out of simplex range. To connect to a station using digipeaters, you still use the CONNECT command, but you must also specify the callsigns (or aliases) of the digipeaters that must be used. For instance, if you need to use two digipeaters with callsigns of WØXI and WDØEMR in order to connect to KA5ZTX, you enter the connect command as:

```
CONNECT KA5ZTX VIA WØXI,WDØEMR
```

Once the connection has been made, you'll receive a message back on your screen from the KAM Plus that says \*\*\* CONNECTED to KA5ZTX (or \*\*\* CONNECTED to KA5ZTX via WØXI,WDØEMR). At that point, you are ready to start talking to the other station since the KAM Plus automatically switched into the Convers mode.

After you have completed your conversation, simply press CONTROL-C to return your KAM Plus to the Command mode (cmd: appears) and then instruct your KAM Plus to disconnect as you did above with the mailbox.

## Connecting on HF

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If the station you want to connect to is on HF (indicated by the /H in the monitored data) you must first switch your KAM Plus to transmit on HF packet. To do this, type the tilde character (~) and then the letter "a". This sets the KAM Plus to transmit packet on the A stream of the HF port. Once this is done, you would then connect just as you did above, using the CONNECT command. Normally it is not necessary to use digipeaters on HF. After the conversation, you disconnect exactly as you did above.

Note that the vertical bar (|) and the tilde (~) are the streamswitch characters defined in the KAM Plus, with the vertical bar indicating VHF and the tilde indicating HF. You switch back and forth between the two by simply typing the streamswitch character followed by the letter of the stream you want to use. The KAM Plus defaults to ten (10) streams for HF and ten for VHF, identified by the letters A-J.

## Operating Modes other than Packet

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This section of the manual describes how to use the KAM Plus to operate in the non-packet modes. All of these modes use the HF connector on the back of your KAM Plus, and therefore will normally be used with your HF radio. It is NOT necessary to streamswitch to the HF port (see above) when selecting these modes, as the KAM Plus automatically selects the HF port when you enter a non-packet mode.

To operate a non-packet mode, you must first be sure the KAM Plus is in the Command mode. Type CONTROL-C and then return. You will see the command prompt (cmd:) and you can now enter the command for the mode you wish to operate.

## RTTY

---

When operating this mode using AFSK (mic input), set your HF radio in lower sideband (LSB). This is general practice in the amateur community for digital communications. You should also have the VOX disabled since the KAM Plus will key your transmitter. When transmitting, the amount of power generated by your station can be adjusted with the mic gain control on your radio. You should set this control just to the point of maximum power output. If your radio has an ALC indicator, adjust mic gain for minimal indication. NOTE: Your radio may not be capable of handling full power for continuous transmissions when operating RTTY, hence, you may have to reduce mic gain. Check the manual for your radio to determine its limitations.

From the cmd: prompt, type RTTY and press return. The KAM Plus enters the RTTY mode and sends the following message to your display screen:

—RTTY 45—

This indicates that you are in the RTTY operating mode, ready to receive RTTY at 45 baud. If you now tune to a RTTY signal, your KAM Plus decodes the information and displays it on your screen.

To transmit RTTY, type CONTROL-C and then the letter T (do not hold the control key while typing the T). This keys your transmitter, the bargraph on the front of the KAM Plus will go dark, and the red LED at the far left of the front panel of the KAM Plus lights indicating you are transmitting. Now type your message on the keyboard. The KAM Plus sends this message over the radio. Once you have finished typing your message, you must tell the KAM Plus that you are done, allowing it to return to the receive mode. To do this, type CONTROL-C followed by the letter E. The KAM Plus returns to the receive mode after all of the input data has been transmitted.

If you would like to operate RTTY at a different speed (perhaps 75 baud), you can enter the RTTY mode from the command prompt with the speed specified after the command (e.g. RTTY 75). This results in this message from the KAM Plus:

—RTTY 75—

You are then be ready to receive and transmit RTTY at 75 baud.

When you finish operating RTTY and want to change to another mode, you must first return to the Command mode. Type CONTROL-C and then the letter X. This exits the RTTY mode and returns to Packet mode, giving you the cmd: prompt from the KAM Plus.

## ASCII

---

When operating this mode using AFSK (mic input), set your HF radio in lower sideband (LSB). This is general practice in the amateur community for digital communications. You should also have the VOX disabled since the KAM Plus will key your transmitter. When transmitting, the amount of power generated by your station can be adjusted with the mic gain control on your radio. You should set this control just to the point of maximum power output. If your radio has an ALC indicator, adjust mic gain for minimal indication. NOTE: Your radio may not be capable of handling full power for continuous transmissions when operating ASCII, hence, you may have to reduce mic gain. Check the manual for your radio to determine its limitations.

From the cmd: prompt, type ASCII and press return. The KAM Plus enters the ASCII mode and sends this message to your display screen:

—ASCII 110—

This indicates that you are in the ASCII operating mode, ready to receive ASCII at 110 baud. If you now tune to an ASCII signal, your KAM Plus decodes the information and displays it on your screen.

To transmit ASCII, type CONTROL-C and then the letter T (do not hold the control key while typing the T). This keys your transmitter, the bargraph on the front of the KAM Plus will go dark, and the red LED at the far left of the front panel of the KAM Plus lights indicating you are transmitting. Now type your message on the keyboard. The KAM Plus sends this message over the radio. Once you have finished typing your message, you must tell the KAM Plus that you are done, allowing it to return to the receive mode. To do this, type CONTROL-C followed by the letter E. The KAM Plus returns to the receive mode after all of the data you have typed has been transmitted.

If you would like to operate ASCII at a different speed (perhaps 200 baud), you can enter the ASCII mode from the command prompt and specify the speed specified after the command (e.g. ASCII 200). The following message results:

- ASCII 200 -

You are then ready to receive and transmit ASCII at 200 baud.

When you are through operating ASCII and wish to change to another mode, you must first return to the Command mode. Type CONTROL-C and then the letter X. This exits the ASCII mode and returns to Packet mode, giving you the cmd: prompt from the KAM Plus.

## AMTOR

When operating this mode using AFSK (mic input), set your HF radio in lower sideband (LSB). This is general practice in the amateur community for digital communications. You should also have the VOX disabled since the KAM Plus will key your transmitter. When transmitting, the amount of power generated by your station can be adjusted with the mic gain control on your radio. You should set this control just to the point of maximum power output. If your radio has an ALC indicator, adjust mic gain for minimal indication.

From the cmd: prompt, type AMTOR and press return. The KAM Plus enters the AMTOR mode and sends the following message to your screen:

<AMTOR STANDBY>

This indicates that you are in the AMTOR operating mode, ready to receive an AMTOR FEC transmission. If you now tune to an AMTOR FEC signal, your KAM Plus decodes the information and displays it on your screen. When in the AMTOR STANDBY mode, you will not be able to monitor any stations already linked using AMTOR ARQ. To monitor these conversations, you must use the LAMTOR mode (see below).

To transmit AMTOR FEC, type CONTROL-C and then the letter T (do not hold the control key while typing the T). This keys your transmitter, the bargraph on the front of the KAM Plus will go dark, and the red LED at the far left of the front panel of the KAM Plus lights indicating you are transmitting. Now type your message on the keyboard. The KAM Plus sends this message over the radio. Once you have finished typing your message, you must tell the KAM Plus that you are done, allowing it to return to the receive mode. To do this, type CONTROL-C followed by the letter E. The KAM Plus returns to the AMTOR STANDBY mode after all of the data you have typed has been transmitted. This is the method you use to call CQ in AMTOR, and when the KAM is in the AMTOR STANDBY mode, it will respond to another station who attempts to link to you using AMTOR ARQ with your SELCAL.

If you are monitoring AMTOR FEC and you see someone call CQ, you might choose to link to that station to carry on a qso. To do this, you first leave the AMTOR STANDBY mode and then start the link. Type CONTROL-C followed by the letter X. This leaves the AMTOR STANDBY mode and you will see the cmd: prompt. Now type AMTOR xxxx (where xxxx is the SELCAL of the station you wish to talk to) and press return. The KAM Plus begins the link process, and when the other station responds, you receive a message saying:

<LINKED to XXXX>

You are now linked with the other station, and, since you initiated the link, you are the Information Sending Station (ISS). You now type a message on the keyboard, and the KAM Plus sends this data to the other station. When you are finished with your message and want to let the other station send to you, you must perform a "change-over". In AMTOR ARQ, this is done by typing "+?" (not the quotes, just the plus and question mark). The other station becomes the ISS, and you become the Information Receiving Station (IRS). When the other station is through talking and wants you to talk again, he sends a +? to you. When this appears on your screen, you become the ISS and may again send to the other station.

It is possible to interrupt the other station – that is, when you are the IRS and want to become the ISS, you may "seize" the link by typing CONTROL-C and then the letter T.

When you are finished with your qso and want to discontinue the link (break the link), type CONTROL-C and the letter D. If you are the IRS, a changeover occurs and then the KAM Plus sends the proper shutdown sequence to the other station. If you are the ISS, it simply performs the proper shutdown sequence. When the link has been terminated, you again see the <AMTOR STANDBY> message on your screen.

When you finish operating AMTOR and want to change to another mode, you must return to the Command mode. Type CONTROL-C and then the letter X. This exits the AMTOR mode and returns to Packet mode, giving you the cmd: prompt from the KAM Plus.

## LAMTOR

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If you want to monitor AMTOR stations that are already linked to each other, you must use the LAMTOR (Listen AMTOR) mode. To enter this mode, first you must have the cmd: prompt from the KAM Plus, then type LAMTOR and press return. The KAM Plus enters LAMTOR, and allows you to monitor ARQ or FEC AMTOR transmissions from other stations. NOTE: You can not transmit from the LAMTOR mode.

When you are finished monitoring, you can return the KAM Plus to the Command mode and leave LAMTOR by typing CONTROL-C and then the letter X.

## FEC AMTOR

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When operating this mode using AFSK (mic input), set your HF radio in lower sideband (LSB). This is general practice in the amateur community for digital communications. You should also have the VOX disabled since the KAM Plus will key your transmitter. When transmitting, the amount of power generated by your station can be adjusted with the mic gain control on your radio. You should set this control just to the point of maximum power output. If your radio has an ALC indicator, adjust mic gain for minimal indication.

You may also operate FEC mode with your KAM Plus by typing FEC and pressing return at the cmd: prompt. This places your KAM Plus in the FEC mode of operation, allowing you to receive and transmit FEC AMTOR. This mode is very useful when you want to have a discussion with several people at the same time. Only one station may transmit at a time, but everyone will be able to copy the FEC "broadcasts." When it is your turn to transmit, type CONTROL-C and then the letter T to start transmitting, type your message, and then type CONTROL-C and E to return to receive.

You could have an FEC roundtable discussion from the AMTOR STANDBY mode, but you will receive the <AMTOR STANDBY> message every time a station stops transmitting.

When you are finished with the FEC mode and want to change to another mode, type CONTROL-C followed by the letter X. You receive a command prompt (cmd:) from the KAM Plus.



## CW

From the cmd: prompt, type CW and press return. The KAM Plus enters the CW mode and sends the following message to your display screen:

–20–20–

This indicates that you are in the CW operating mode, ready to receive CW at 20 words per minute. If you now tune to a CW signal, your KAM Plus decodes the information for display on your screen.

To transmit CW, be sure you have the CW Key line from the KAM Plus connected to your HF radio Key jack. You must have your HF radio in the CW mode with the VOX turned on. Type CONTROL-C and then the letter T (do not hold the control key while typing the T). This places the KAM Plus in the transmit mode, but there will be no indication on the KAM Plus or on your HF radio that you are ready to transmit. Type your message on the keyboard, and the KAM Plus sends this to your radio by keying the CW Key line. Your radio senses the closing of the key line and transmits the code. Once you have finished typing your message, you must instruct the KAM Plus to return to the receive mode. To do this, type CONTROL-C followed by the letter E. The KAM Plus returns to receive mode after all of the data you have typed has been transmitted.

Some HF radios require you to provide a Push-to-Talk signal to the radio before you can transmit CW – especially those that do not have VOX capability. If your radio requires this, you should set the CWPTT command ON allowing the KAM Plus to key the PTT line of your radio. If you do this, the bargraph on the front of the KAM Plus will go dark and the red HF transmit LED will light whenever you place the KAM Plus in transmit.

If you would like to operate CW at a different speed (perhaps 10 wpm), you can enter the CW mode from the command prompt with the speed specified after the command (e.g. CW 10). This results in the message from the KAM Plus showing:

–10–10–

You are ready to receive and transmit CW at 10 wpm.

When you finish operating CW and want to change to another mode, you must first return to the Command mode. Type CONTROL-C and then the letter X. This exits the CW mode and returns to Packet mode, giving you the cmd: prompt from the KAM Plus.

## Pactor

When operating this mode using AFSK (mic input), set your HF radio in lower sideband (LSB). This is general practice in the amateur community for digital communications. You should also have the VOX disabled since the KAM Plus will key your transmitter. When transmitting, the amount of power generated by your station can be adjusted with the mic gain control on your radio. You should set this control just to the point of maximum power output. If your radio has an ALC indicator, adjust mic gain for minimal indication.

From the cmd: prompt, type PACTOR and press return. The KAM Plus enters the Pactor mode and sends a message to your display screen that says:

<PACTOR STANDBY>

This indicates that you are in the Pactor operating mode, ready to receive Pactor. If you now tune to a Pactor signal, your KAM Plus decodes the information and displays it on your screen.

To transmit Pactor FEC, type a CONTROL-C and then the letter T (do not hold the control key while typing the T). This keys your transmitter, the bargraph on the front of the KAM Plus will go dark, and the red LED at the far left of the front panel of the KAM Plus lights indicating you are transmitting. Now type your message on the keyboard. The KAM Plus sends this message over the radio. Once you have finished typing your message, you must tell the KAM Plus that you are done, allowing it to return to the receive mode. To do this, type CONTROL-C

followed by the letter E. The KAM Plus returns to the receive mode after all of the data you have typed has been transmitted. This is the method you use to call CQ in Pactor, and when the KAM is in PACTOR STANDBY mode, it will respond to another station who attempts to link to you using Pactor ARQ with your MYPTCALL.

If you are monitoring Pactor, and you see someone call CQ, you may choose to link to that station to carry on a qso. To do this, you must leave the PACTOR STANDBY mode and then start the link. Type CONTROL-C followed by the letter X. This leaves the PACTOR STANDBY mode and you will see the cmd: prompt. Now type PACTOR xxxxxx (where xxxxxx is the callsign of the station you wish to talk to) and press return. The KAM Plus begins the link process, and when the other station responds, you receive a message saying:

<LINKED to XXXXXX>

You are now linked with the other station, and, since you initiated the link, you are the Information Sending Station (ISS). You now type a message on the keyboard, and the KAM Plus sends this data to the other station. When you finish with your message and want to let the other station send to you, you must perform a "change-over". In PACTOR ARQ, this is done by typing a CONTROL-C and the letter E. The other station then becomes the ISS, and you become the Information Receiving Station (IRS). When the other station is through talking and wants you to talk again, he normally sends some text indicating it is your turn to talk... perhaps even say "so back to you". Your KAM Plus begins a long transmit cycle and short receive cycle, indicating that you are the ISS and may again send to the other station.

It is possible to interrupt the other station – that is, when you are the IRS and want to become the ISS, you may "seize" the link by typing CONTROL-C and then the letter T.

When you finish operating PACTOR and want to change to another mode, you must return to the Command mode. Type CONTROL-C and then the letter X. This exits the Pactor mode and returns to Packet mode, giving you the cmd: prompt from the KAM Plus.

## KAM Plus Commands

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Your KAM Plus, as shipped from the factory, has 30 commands available to you, simplifying the operation for the new user of Packet and other digital modes. These commands are fully described in the Reference Manual, and a Quick Reference guide is included here for your use.

Once you feel comfortable with these 30 commands, you may want to enable the full command set of the KAM Plus, which consists of over 200 commands. At that point, you should read the complete Reference Manual to fully understand these commands. To access all commands, set the INTFACE command to TERMINAL. The full command set is immediately available to you and you may return to the abbreviated command set with the command INTFACE NEWUSER.

The Reference Manual starts with an alphabetical listing of all commands (mainly for reference), followed by an Operational section which will describe how to use the various commands as you operate. You will also find a section in the Reference Manual detailing the PBBS (mailbox), KA-Node, Wefax mode, and each of the non-packet operating modes (RTTY, ASCII, AMTOR, CW, NAVTEX, and Pactor). We urge you to use the Reference Manual by reading it while you are at your station so that you can try the many commands that are described.

If you use the KAM Plus with the Pacterm program provided, set the following commands as listed:

```
BKONDEL ON
ECHO OFF
TXDELAY 30
```

These settings along with the KAM Plus default values for the rest of the parameters allow you to connect to other stations and have a pleasant screen display while conversing.

Of the commands listed in the Quick Reference guide, a few brief descriptions may help show the purpose of the commands. Full details of ALL the KAM Plus commands are found in the Reference Manual.

BKONDEL may be set to ON or OFF. While typing a line to send to a friend, you may make some mistakes. When you press the backspace key, you would like your screen to show exactly what will be transmitted. To do this, you need BKONDEL ON. When operating in a non-packet mode, this will only correct your screen display if the data you are trying to erase has not already been sent to the other user.

ECHO may be set ON or OFF. When ON, the KAM Plus echoes everything you type. With a split-screen terminal program like Pacterm, you want this command OFF, since Pacterm displays the characters you type in a separate window. If you aren't using a split-screen program and everything you type appears double (lliikkee tthhiiss) then you need to set ECHO OFF.

TXDELAY causes a delay between the time the KAM Plus activates the Push-to-Talk of your radio and the time it actually starts sending packet data. All radios take some definite amount of time to switch into transmit, and the default setting of 30 (300 milliseconds) is normally enough. Hand-held radios, however, are usually very slow to switch into transmit, so you must allow a longer time. We would recommend a setting of 50 as a good starting point for hand-held radios. With the KAM Plus, you can set the TXDELAY for the HF port to one value, and the TXDELAY for the VHF port to a different value. This is done by specifying two values separated with a / character as arguments to the command. For instance typing TXDELAY 30/50 at the command prompt sets the HF TXDELAY to 30 (300 milliseconds) and the VHF TXDELAY to 50 (500 milliseconds).

DAYTIME is used to set the clock in your KAM Plus. The format of the command is:

DAYTIME yymmddhhmmss

The yy is the two digit year, followed by mm (two-digit month), dd (two-digit day), hh (two-digit hour in 24 hour format), mm (two-digit minute) and ss (two-digit seconds). So, to set your clock for April 15, 1993 at 4:25 pm, you type:

DAYTIME 930415162500

# Quick Reference Guide

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(For a complete description of these commands and their format, see the Reference Manual.)

The 30 commands available as shipped from the factory, and their use, are:

**ASCII** Places the KAM Plus in ASCII mode.

**AMTOR** Places the KAM Plus in AMTOR STANDBY mode. If a SELCAL is specified, start a link with the specified station.

**BKONDEL** When ON echoes a backspace-space-backspace sequence to the screen each time you press the backspace key to erase errors from your screen. When OFF, echoes a \ for each press of the backspace key.

**CONNECT** Used to establish a packet connection with another station on the current port (HF or VHF) and stream.

**CONVERS** Places the KAM Plus in Convers mode.

**CW** Places the KAM Plus in CW mode.

**DISCONN** Used to disconnect from a packet station you have been talking to.

**DAYTIME** Used to set the clock in the KAM Plus.

**DELETE** Determines the character received from the computer which will cause the previous character to be removed from the transmit buffer.

**DISPLAY** Causes a screen display of all KAM Plus parameters.

**DWAIT** Time delay imposed to insure that packet digipeaters have priority access to the radio frequency.

**ECHO** When ON characters you type on the keyboard are echoed back to your terminal. When OFF characters you type are not be echoed.

**FEC** Places the KAM Plus in AMTOR FEC mode.

**HELP** Displays a complete list of all available commands on your screen.

**INTERFACE** Selects the abbreviated (30) command set or the complete (over 200) command set. Also used to place the KAM Plus in HOST, BBS, or KISS mode.

**K** Places the KAM Plus in Convers mode (same as CONVERS).

**LAMTOR** Places the KAM Plus in the Listen AMTOR mode.

**MONITOR** When ON allows the KAM Plus to display monitored packets on the screen. When OFF, no packets will be displayed unless someone actually connects to you. To monitor Pactor stations in the PACTOR STANDBY mode, this command must be ON. Other non-packet modes are not affected by this command.

**MHEARD** Displays a short list of packet stations that have recently been heard by your KAM Plus.

**MYCALL** Used to set the callsign of your KAM Plus. This is transmitted with every packet. It is also used as the Pactor callsign of your station by default.

**MYPBBS** Sets the callsign used for your personal mailbox in the KAM Plus.

**PACTOR** Places the KAM Plus in PACTOR STANDBY mode. If a callsign is specified, starts a link with the specified station. You may monitor other Pactor stations in this mode if MONITOR is ON.

**PBBS** Used to set the size (Kbytes) of the Personal BBS in your KAM Plus.

**PTLISTEN** Places the KAM Plus in the Listen Pactor mode. This is a receive only mode so you can simply monitor other stations.

**RTTY** Places the KAM Plus in the RTTY mode.

**RESET** Causes the KAM Plus to perform a soft reset.

**STATUS** Displays the status of the current stream and all connected streams.

**TXDELAY** Sets the time delay between Push-to-Talk and the beginning of packet data.

**UNPROTO** Sets the destination field and digipeaters used for any unconnected packets transmitted.

**VERSION** Displays the current version number of the Eprom (firmware) in your KAM Plus.

**NOTE:** To switch to full command set of the KAM Plus, give the command **INTERFACE TERMINAL**.

# Pacterm Manual

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## To Start Pacterm

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It is best to leave your TNC off until you have Pacterm setup and in the terminal mode. Having the TNC on early will cause data to be backed up between the computer and TNC. Then when Pacterm is put in the terminal mode, what is in the TNC will dump rapidly to the screen.

Have your computer logged onto the drive and directory where you have stored the Pacterm files and type PACTERM at the DOS prompt. When Pacterm starts, its help menu is displayed on the screen. This menu can be accessed at anytime by pressing the F1 key.

## Setup

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It is important that you first set the communication port and baud rate. Pacterm must know what port to use to talk to the TNC, and how fast to talk.

### F7 increment communication port number

Pressing F7 causes Pacterm to toggle between the communication ports: com1 and com2. The port that is in use is shown near the bottom of the screen. COM1 is default and must be reset, if necessary, each time you begin the program.

### F8 increment baud rate

Pressing F8 will cause Pacterm to step through the available baud rates. The default is 1200 baud and must be reset, if necessary, each time you begin the program. Available rates are: 300, 600, 1200, 2400, 4800, and 9600.

This rate corresponds to the ABAUD command in the TNC. Until the ABAUD rate is set and PERMed, the TNC will run an autobaud routine to determine how fast the computer is talking. (The battery backup option, for the TNC, will also store the ABAUD rate, after the ABAUD command is set.)

### F3 toggle KPC / UTU-XT selection

Pressing F3 toggles between the KPC (packet) Help Menu and the UTU-XT (other modes) Help Menu. Leave this toggle in the KPC selection.

F3, F7, and F8 work only while the Help Menu is on the screen. Other commands work only while in the Terminal Mode.

## Exiting Pacterm

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Pressing F10 will exit to DOS from any screen. The TNC power must remain on when exiting this way because commands are being sent to the TNC.

The Escape key or a Ctrl-C will also exit to DOS from the Help Menu.

## Terminal Mode

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### **PRESS BACKSPACE TO CONTINUE.**

Pressing the backspace key will put Pacterm in the terminal mode. This is the mode used to talk to the TNC. The top part of the screen will display data received from the TNC. Data typed on the keyboard will display between the two lines. The bottom line is the status bar.

If you are just starting, now is the time to turn on the TNC. At anytime the F1 key can be pressed to display the help menu. The backspace key will return you to terminal mode.

### **Autobaud Routine**

If the ABAUD command in the TNC has not been set, the TNC will run an autobaud routine to determine the baud rate of the computer. The TNC will send the same message over and over again at different baud rates. This will look like a lot of garbage until the baud rate of the TNC matches the baud rate set in Pacterm. Then the screen will display:

PRESS (\*) TO SET BAUD RATE

At this time you should press the asterisk, \*. Then the TNC will send its sign-on message, ask you for your callsign, and then the cmd: prompt will appear. See your TNC Operations Manual for more information.

### **F5 toggle type ahead / transmit mode**

Pressing F5 causes Pacterm to toggle between an immediate transmit mode (to TNC), or a type ahead buffer. You will see either ONLIN or OFLIN in the status bar.

When ONLIN appears, everything you type will go immediately to the TNC.

When OFLIN appears you are in the type ahead mode – what you type will be stored in the computer's memory; it will be sent to the TNC when you press another F5, and Pacterm will return to ONLIN at this time. F5 does not add a carriage return to the data. In packet you must remember to end what you have to say with the return key, or the TNC will not transmit it.

Alt-R can also be used to go OFLIN to the type ahead buffer. And Alt-T can be used to go ONLIN. Alt-T sends a return at the end of the data.

The type ahead buffer can hold up to 1,000 characters.

### **F9 exit to cmd: mode**

Pressing F9 will return the TNC to command mode. When using the KPC menu this will send three Ctrl-Cs to the TNC. The screen will be cleared (except for the two lines and status bar), and the cmd: prompt will appear (unless you were already in command mode). The status bar is reset to its default and many software variables are reset.

## Flow Control

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Pacterm uses hardware flow control. RTS and CTS status are shown on the right side of the status bar. RTS indicates the TNC is allowed to talk to the computer. CTS indicates the computer is allowed to talk to the TNC.

## **F6 toggle RTS**

Pressing F6 will toggle Request To Send (RTS). By default, XON and RTS show in the status bar. This indicates that data is allowed to flow from the TNC to the computer. Pressing F6 will turn RTS off and XON will change to XOFF. This will stop the flow of data from the TNC to the computer. Pressing F6 again, will restart the flow of data from the TNC.

## **Saving Data to Disk**

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### **Alt-B buffer control**

The Alt-B command toggles the buffer on and off. When the buffer is on, data that appears in the receive section (top) of the screen will be saved in your computer's memory. BUFF appears in the status bar when the buffer is on. Using F9 will also turn the buffer off.

The size of the buffer depends on the amount of memory in your computer.

### **Alt-C clear holding buffer**

Pressing Alt-C will erase all information stored in the buffer.

### **F2 save holding buffer to file**

Pressing F2 brings up a request to enter file name. After entering the file name, press return. The file will be saved and Pacterm will return to terminal mode. Pacterm supports drive designators when saving files, but does not support directories.

If the information is stored with a normal file name, carriage return/line feeds will be added as needed. To save data exactly as received use a .bin suffix following the file name (binary file).

## **Sending a File from Disk**

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### **Alt-F file transmit**

Pressing Alt-F will display a · (\$FA) on the screen. Then type the file name followed by another Alt-F. The file name must be exact. Do not add spaces between the Alt-Fs and the file name. Pacterm supports drive designators as part of the file name, but does not support directories.

## **Printer**

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The Alt-P command toggles the printer on and off. When the printer is on, data that appears in the receive section (top) of the screen will also be sent to your printer. PRINT appears in the status bar when the printer is on. Using F9 will also turn the printer off.





