Kantronics

User's Guide

Addendum for:

KPC-3 Plus   **KPC-9612 Plus**

KPC-3   **KPC-9612**

KAM Plus & **KAM with**

          Enhancement Board

Errata Sheet #2:
8.2 Firmware and User's Guide (9-23-97)
Release Date Code xxxx-7265.

Since the original release of 8.2 for our TNCs, we've found two bugs in the firmware code for (just) the KPC-3 (digipeating mheard call signs, and holding off transmissions due to receiving an ABORT sequence). These bugs have been fixed with new firmware for the KPC-3, release date xxxx-7265. New proms will be mailed automatically to those who purchased a KPC-3 update directly from us . No other models (TNCs) had these bugs.

One work-around bug was also found for the KAM Plus: if maxusers was set to 0/1 (default is is 10/10), the KAM would stop sending data when connected. A work-a-round is to set maxusers to 1/1 or more. This minor bug is fixed with release xxxx-7265.
FEATURES ADDED. At the request of APRS enthusiasts, we've added two additional features to the 8.2 code with release date code xxxx-7265: call signs specified by the UIDIGI, UIFLOOD, and UITRACE now have priority (over call signs found in MYALIAS, MYNODE, etc), and the UITRACE command now includes an "n" timer and "do not duplicate digipeat within n seconds." As of 9-24-97, we know of no further bugs in the 8.2 releases.

Advanced Digipeating for GPS and APRS:

The purpose of the UIDIGI, UIFLOOD, and UITRACE commands is to add flexibility in reporting GPS/APRS station positions. It is an established procedure of the reporting stations to digipeat with generic call signs and through a number of "APRS" repeaters. In this way, their positions can reach out over a number of digipeaters to a wide area. At the same time, the digipeaters supporting these activities must establish their TNC parameters such that all UI frames "copied" are digipeated sufficiently (in number) but not too often (too may copies). The above commands give each digipeater owner a wide range of ways in which to do this, and we recommend that you work with others in your area to establish an optimum GPS/APRS digipeater network.

Version 8.2 Firmware Update

User's Guide

Addendum for:

KPC-3 Plus, KPC-9612 Plus,
KPC-3, KPC-9612,
KAM Plus and KAM with
Enhancement Board

Kantronics
1202 E. 23rd Street,
Lawrence, Kansas 66046

Orders/ Inquiries (913) 842-7745
FAX (913) 842-2031
e-mail sales@kantronics.com
website: www.kantronics.com

Service / Technical Support (913) 842-4476 (9-12 am, 2-5 pm Central Time, M-F)
FAX (913) 842-2021
e-mail service@kantronics.com

Information in this document is subject to change without notice.

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

The Version 8.2 firmware is manufactured in the U.S.A.

Printed in the United States of America

IMPORTANT: READ THIS PAGE BEFORE YOU INSTALL YOUR NEW KANTRONICS PRODUCT

This product contains SOFTWARE on Programmable Read Only Memory (PROM) and/or diskette which is protected by both United States copyright law and international treaty provisions.

If you install or use this product, you will be deemed to be bound by the terms of the SOFTWARE license shown below. If you do not wish to be bound by such license, return such product and all associated documentation unused to your supplier for refund of the amount you paid.

License Agreement

1. License. In consideration of payment of the License Fee, which is included in the price of the product, the Licensee (you) is granted by the Licensor (Kantronics Company, Inc. - Kantronics) a non-exclusive right to use the SOFTWARE and associated documentation. No ownership rights to the SOFTWARE or its Documentation are transferred from Kantronics to you.

2. Term. This License Agreement is effective until terminated. You may termi-nate this Agreement by destroying the PROM or diskette and documentation. You may not rent or lease the SOFTWARE, but you may transfer the SOFT-WARE and accompanying written materials on a permanent basis provided you retain no copies and the recipient agrees to the terms of this Agreement. Kantronics may terminate this Agreement without notice if you violate any terms or conditions of the Agreement. In the event of termination of the Agreement, provisions relating to Kantronics' disclaimers of warranties, limitation of liabil-ity, remedies, or damages and Kantronics' proprietary rights shall survive.

3. Object Code. The SOFTWARE is delivered in object code only. You shall not reverse compile or otherwise reverse engineer the SOFTWARE.

4. Limited Warranty. This product is covered by the standard Kantronics Co., Inc. Limited Warranty, which is enclosed.

5. General. This License Agreement constitutes the complete Agreement between you and Kantronics.

The SOFTWARE and/or Documentation may not be exported or re-exported in violation of any export laws or regulations of the United States of America or any other applicable jurisdiction.

This Agreement shall be governed by and interpreted under the laws of the State of Kansas, United States of America.

Use, duplication, or disclosure by the Government of the United States is subject to restrictions as set forth in subparagraph (c)(1)(ii) of the Rights in Technical Data and Computer SOFTWARE clause of DFARS 252.227-7013.

Kantronics may in its sole discretion, provide you with upgrades of the SOFTWARE and/or Documentation if you have provided Kantronics your completed Warranty registration with a copy of your receipt showing the amount you paid.

LICENSEE ACKNOWLEDGES HAVING READ AND UNDERSTOOD THIS AGREEMENT AND AGREES TO BE BOUND BY ITS TERMS. LICENSEE FURTHER AGREES THAT THIS AGREEMENT IS THE COMPLETE AND EXCLUSIVE STATEMENT OF THE AGREEMENT BETWEEN LICENSEE AND LICENSOR AND SUPERSEDES ANY PROPOSAL OR PRIOR AGREEMENT, ORAL OR WRITTEN, AND ANY OTHER COMMUNICATIONS RELATING TO THE SUBJECT MATTER OF THIS AGREEMENT.

Any questions concerning this Agreement or any other matter relating to Kantronics Company, Inc. products or business practices may be directed to:

Customer Service Department
Kantronics Company, Inc.
1202 E. 23rd Street,
Lawrence, KS 66046

TABLE OF CONTENTS

Limited Warranty

KANTRONICS CO., INC.
LIMITED WARRANTY

Effective January 1, 1997

To receive notice of future updates, new product information and prompt warranty service, please fill in the Kantronics/rfconcepts Warranty Registration card **COMPLETELY** and return it along with a copy of proof of purchase (to establish purchase date) to Kantronics Co., Inc., 1202 East 23rd Street, Lawrence, Kansas 66046 USA.

NOTE: Return of the Warranty Registration card and proof of purchase is a pre-condition to warranty coverage.

1. WARRANTY. Kantronics Co., Inc. ("Kantronics") warrants to the first consumer purchaser ("you"), for the Applicable Warranty Period (as described below), that the Applicable Product (as described below) will be free from defects in material and workmanship.

2. REMEDY. Kantronics agrees that, for any Applicable Product found by Kantronics to be in violation of the warranty of Section 1 hereof within the Applicable Warranty Period, it will, at its option, repair or replace the defective Applicable Product at no charge to you, excluding in-bound shipping charges.

3. EXCLUSIVE REMEDY. Repair or replacement of the Applicable Product, as provided herein, is the sole remedy available to you against Kantronics, and in no event will Kantronics be responsible for any other liability or damages or for incidental, special, or consequential damages, regardless of whether purported liability is predicated upon negligence, strict tort, contract, or other products liability theory and whether or not Kantronics is warned about the possibility of such liability or damages. **SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY TO YOU.**

4. DISCLAIMER. This Limited Warranty is in lieu of all other warranties expressed or implied and no representative or person is authorized to assume for Kantronics any other liability in connection with the sale of its products. KANTRONICS SPECIFICALLY DISCLAIMS THE IMPLIED WARRANTY

OF MERCHANTABILITY AND IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE FOR ANY APPLICABLE PRODUCT. IF, HOWEVER, YOU ARE A CONSUMER WITHIN THE MEANING OF 15 U.S.C. 2301(3), THE ABOVE DISCLAIMER OF IMPLIED WARRANTIES IS EFFECTIVE ONLY FOR PERIODS OUTSIDE THE APPLICABLE WARRANTY PERIOD. **SOME STATES DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS, SO THE ABOVE LIMITATION MAY NOT APPLY TO YOU.**

5. APPLICABLE PRODUCTS AND PERIODS. Kantronics products are of two types - (1) hardware units and (2) firmware and software for operation of these units, whether incorporated into the units themselves or separate from the units as adjuncts or accessories to the units. Hardware units and the media containing firmware, software and documentation are sold to the consumer purchaser and become property of the purchaser. Firmware and software are licensed for use by the consumer purchaser in return for a fee included in the purchase price of the units and do not become the property of the consumer. (See separate License Agreement provided with these products). The products to which the warranty of Section 1 hereof applies (herein "Applicable Products") and the periods during which the warranty shall apply to such products (herein, "Applicable Warranty Period") are as follows:

Applicable Products:

UNITS:

KPC-9612, KPC-9612 Plus, KAM, KAM Plus, KPC-3, KPC-3 Plus, rfc 2/70, rfc 2/70G, rfc 4-110, rfc 4-310, Mini-Amp 144, Mini-Amp 144P, Mini-Amp 440, Mini-Amp 440P, MAX-Amp 10, MAX-Amp 45.

Applicable Warranty Period: One (1) year from date of purchase.

ACCESSORIES:

KAM Enhancement Board

Applicable Warranty Period: One (1) year from date of purchase.

MEDIA:

EPROMS, diskettes, video or audio cassettes, manuals (however bound), specification and other supplemental pages or any other media on which firmware, software or documentation are supplied

Applicable Warranty Period: Thirty (30) days from date of purchase.

6. EXCLUSIONS. This Limited Warranty does not apply to the cosmetic appearance of the Applicable Product; to broken or cracked cabinets; to any accessory not supplied by Kantronics which is used with the Applicable Product; to any product that has been subject to misuse abuse or overvoltage; to any product that has been modified by non-Kantronics personnel unless specifically authorized **in writing** by Kantronics; or to any product damaged or impaired by shipping (whether or not caused by poor packaging), neglect, accident, wiring not installed by Kantronics, improper parameter settings which are cleared by performing a hard reset, or use in violation of instructions furnished by Kantronics or of generally accepted industry practice. Kantronics does not warrant that the functions contained in any software will meet your requirements or achieve your intended results; or that operation of any software will be uninterrupted or error-free or without effect upon other software used with it. *Responsibility for the selection of the hardware and software program to achieve your intended results rests with you.*

7. REMEDY PROCEDURE. Should you need to make a warranty claim, first contact the dealer from whom you purchased the product. If the dealer is unable to assist you, contact Kantronics Co., Inc., by mail at 1202 East 23rd Street, Lawrence, Kansas 66046 USA; by fax at 913-842-2021; or by phone at our Customer Support number 913-842-4476 (Hours: 9:00 a.m. - noon and 2:00 p.m. - 5:00 p.m. CST). Contact us prior to returning an Applicable Product to receive a Return Authorization Number. (As a practical matter, problems can often be solved in such a manner without the product having to be returned to Kantronics for repair or replacement.)

Return of any Applicable Product for the enforcement of rights under this Limited Warranty shall be at your expense. Any product returned for warranty service which Kantronics determines to be without defect or not covered by this Limited Warranty shall be subject to a minimum charge of one-half hour labor rate and

the product will be returned to you at your sole expense. Please note, no warranty service will be provided until Kantronics has been furnished with your Warranty Registration card and copy of proof of purchase establishing purchase date.

8. NON-ASSIGNMENT. This Limited Warranty is not assignable by you. Any attempt to assign or transfer any of the rights, duties, or obligations hereof is void.

9. OTHER RIGHTS. This Limited Warranty gives you specific legal rights and you may also have other rights which vary from jurisdiction to jurisdiction.

Version 8.2 Firmware Update

Introduction

Kantronics TNCs (and versions) Being Updated

The 8.2 firmware update applies to the following Kantronics TNCs:

- KPC-3 Plus (updates KPC-3 Plus version 7.0 firmware),

- KPC-3 (updates KPC-3 version 6.0 firmware),

- KPC-9612 Plus (updates KPC-9612 Plus version 8.1 firmware),

- KPC-9612 (updates KPC-9612 version 7.0 firmware),

- KAM Plus (updates KAM Plus version 8.0P firmware),

- KAM with Enhancement Board (updates KAM with Enhancement Board, version 8.0E firmware),

> Note: While EPROMS with version 8.2 firmware are available for each of these TNC models, the firmware is not interchangeable between models. Each product has its own EPROM.

Overview of This User's Guide Addendum

The following topics are covered in this update manual addendum:

- a summary of the version 8.2 update

- summaries of differences between version 8.2 and the previous versions for these devices.
    - a summary of the differences between 7.0 and 8.2 for the KPC-3 Plus
    - a summary of the differences between 6.0 and 8.2 for the KPC-3
    - a summary of the differences between 8.1 and 8.2 for the KPC-9612 Plus
    - a summary of the differences between 7.0 and 8.2 for the KPC-9612
    - a summary of the differences between 8.0P and 8.2P for the KAM Plus

- • a summary of the differences between 8.0E and 8.2E for the KAM with Enhancement Board

- • an overview of advanced GPS/APRS digipeating and new commands to assist this activity

- • documentation of the MODEM mode and an overview of it's use in copying data from the Emergency Managers Weather Information Network (EMWIN)

- • instructions on installing the EPROM containing version 8.2 firmware

- • command reference for digipeating commands new in version 8.2 (five commands for use with UI digipeating)

- • command reference and listing of firmware changes in the KPC-3, KPC-9612, KAM Plus, and KAM with Enhancement Board (with these upgrades, the KPC-3 commands now match those in the KPC-3 Plus and the KPC-9612 commands now match those in the KPC-9612 Plus)

Summary of the Version 8.2 Upgrade

The Version 8.2 firmware upgrades these Kantronics TNCs in several important ways:

☞ Due to physical and application differences between KPC TNCs and KAM TNCs, there are slight differences in some commands in KPC units and KAM units. These differences are documented in the command reference section of this upgrade manual.

Advanced Digipeating

This update responds to requests from users for advanced digipeating capabilities, primarily for GPS/APRS applications. With version 8.2, Kantronics TNCs provide five new commands for use in advanced digipeating: UIDIGI, UI-FLOOD, UITRACE, UIDWAIT and (for multi-port devices only) UIGATE.

The reasons why these commands were added are discussed below and each of these new commands is described and fully documented later in this addendum.

Upgrading Other Commands

Kantronics KPC-3 Plus and KPC-9612 Plus TNCs have had recent firmware upgrades that have enhanced their command sets, by adding, changing, and removing commands. Version 8.2 updates bring the KPC-3 and KPC-9612 up to the

level of the "Plus" devices, so (to the extent allowable with hardware differences) all these units have the same command set, with appropriate differences between single port and multi-port operations). These same updates have been made to the KAM Plus and the KAM with Enhancement Board.

For example, "MODEM" mode has been added to the KPC-3 and KPC-9612, (it was already in the KPC-3 Plus and KPC-9612 Plus). As described below, using MODEM mode allows you to copy the text portions of the NWS EMWIN weather broadcasts with Pacterm (software that ships with Kantronics units). Graphs and Maps can be copied using the "WeatherNode" software, which we stock for sale.

☞ This manual does not contain documentation from previous updates. Hence, if you skipped over some previous update(s) for the KPC-3 or KPC-9612, you may wish to consider purchasing the new KPC-3 Plus or KPC-9612 Plus manual; these are great references, each containing approximately 60 pages of operational information, 80 pages of Command Reference material, and a substantial index.

Version 8.2 Upgrades, for each Model

KPC-3 Plus: Differences Between 7.0 and 8.2

Version 8.2 introduces four new commands for use with GPS (and APRS) activities: UIDIGI, UIFLOOD, UITRACE, and UIDWAIT. These commands may be useful for other activities too. See the command descriptions for details.

KPC-3: Differences Between 6.0 and 8.2

Version 8.2 introduces four new commands for use with GPS (and APRS) activities: UIDIGI, UIFLOOD, UITRACE, and UIDWAIT. These commands may be useful for other activities too. See the command descriptions for details. Firmware 8.2 also adds MODEM mode for copying NWS EMWIN broadcasts - selected via the INTFACE command, redefines a number of the "list" type commands - such as BUDLISTS, and deletes a number of commands - whose function(s) are combined with other commands.

KPC-9612 Plus: Differences Between 8.1 and 8.2

Version 8.2 introduces five new commands for use with GPS (and APRS) activities: UIDIGI, UIFLOOD, UITRACE, UIDWAIT, and UIGATE. These commands may be useful for other activities too. No version 8.1 commands were deleted. See the command descriptions for details.

KPC-9612: Differences Between 7.0 and 8.2

Version 8.2 firmware introduces the five commands noted above, adds MODEM mode for copying NWS EMWIN broadcasts - selected via the INTFACE command, redefines a number of the "list" type commands - such as BUDLISTS, modifies the STREAMSW command - to one character + a port, and deletes a number of commands - whose function(s) are combined with other commands.

KAM Plus: Differences Between 8.0P and 8.2P

Version 8.2 firmware introduces the five commands noted above, adds MODEM mode for copying NWS EMWIN broadcasts - selected via the INTFACE command, redefines a number of the "list" type commands - such as BUDLISTS, and deletes a number of commands - whose function(s) are combined with other commands.

KAM with Enhancement Board: Differences Between 8.0E and 8.2E

Version 8.2 firmware introduces the five commands noted above, adds MODEM mode for copying NWS EMWIN broadcasts - selected via the INTFACE command, redefines a number of the "list" type commands - such as BUDLISTS, and deletes a number of commands - whose function(s) are combined with other commands.

Advanced GPS/APRS Digipeating

☞ Note: If you are not familiar with GPS and/or digipeating, you may wish to read the relevant sections of the KPC-3 Plus or KPC-9612 Plus manuals (note: the KPC-3 Plus manual, which is available for purchase from Kantronics, covers a wide range of material relevant to owners of all Kantronics TNCs). For an introduction to APRS (A Packet Reporting System) developed by Bob Bruninga, WB4APR, consider obtaining a copy of "Getting On Track with APRS," by Stan Horzepa, 157 page paperback, published in 1996 by the ARRL, 225 Main Street, Newington, CT 06111.

Amateurs are using GPS receivers, a packet unit, and an FM transmitter to report the location of their vehicles or stations to others. Their broadcasts use one-way (unproto UI) packets, reporting call sign, latitude and longitude. Packet stations hearing these broadcasts can monitor the location of the vehicles.

A common goal of these position reporting stations is to digipeat a UI packet over a wide area (or a long distance), while moving though areas where the local callsigns may be unknown. An effective solution for not knowing local callsigns is to establish standard generic callsigns for digipeating stations and then use these names in digipeating paths. Of course, this requires the acceptance and use of standards for naming and using digipeating stations, by both the position reporting stations and the digipeating stations.

☞ Common standards have been established by some local APRS groups, with names such as RELAY, WIDE, and TRACE. We encourage you to contact your local GPS (or APRS) interest group before configuring your TNC with its new digipeater capabilities. Usage may vary by area.

Improving Efficiencies of Advanced Digipeating

As described above, mobile location reporting stations are using digipeating paths containing generic digipeating names (e.g., RELAY, WIDE, TRACE) to extend their range of reporting. Using generic digipeating enables a mobile station to use the same digipeating path as it moves around, since there will (presumably) always be nearby GPS/APRS digipeating stations with one or more of these generic names to pick up transmissions (i.e., UI packets) and re-transmit them to a wider area.

Using generically named digipeaters does result in wider coverage of GPS stations, but several inefficiencies may arise from this common practice (depending upon the availability and names of the digipeaters).

Among the problems that may arise in this situation are that: (1) UI packets can be repeated much more than necessary, by the same or by different digipeating stations with the callsigns RELAY, WIDE, or TRACE clogging up the airwaves, and that (2) several stations may re-transmit the same packet at the same time, resulting in a combined signal that cannot be copied by other stations.

Kantronics' version 8.2 upgrade adds a suite of new UI digipeating commands to Kantronics TNCs to deal with inefficiencies that can arise when a number of digipeaters are transmitting in the same area, at the same time, using the same generic names.

Overview of New Digipeating Commands

The following are new commands that support advanced GPS/APRS digipeating capabilities.

The UIDIGI command may be used to set up to four additional aliases/call signs for "special" digipeating service. To-be-digipeated packets received containing one of these aliases will be repeated (once) with the call sign (MYCALL) of the digipeater substituted for the alias in the digipeated frame. See the example shown below and the command description for more detail.

UIFLOOD and UITRACE are a bit more exotic. Each provides for multi-hop digipeating with just one digipeater address per packet, thereby keeping the transmission time short. For example, to digipeat through three TNCs supporting the UIFLOOD command, the reporting station might set a GPS position path as follows:

```
LTP 1 GPS via wide3-3.
```

A digipeater TNC supporting "wide" set by the UNIFLOOD command and hearing the reporting station's transmission would then digi the UI location packet (assuming it had not done so already, within a preset time), using an address of wide3-2. In turn each similar digipeater down line would digi the reporting station's UI packet and reduce (decrement) the ssid of the digipeater address again. A TNC using UIFLOOD has the option of inserting MYCALL, creating two rather than one digipeater addresses in each transmitted digi packet.

With UITRACE, each time a packet is digipeated, each TNC adds its MYCALL, thus creating a "trace" or return path. In effect, the size of the packet grows by one digipeated address with each hop. Again, see the examples below and the command descriptions for detail.

The current setting of UIDWAIT determines whether or not a delay is added to UI digipeat packets (those formed by UIDIGI, UIFLOOD, or UITRACE) before transmission, once the channel is clear. If UIDWAIT is ON, the delay is determined by slottime or persist settings.

The purpose of the UIGATE (which is in multi-port devices only) is to prevent heavy high speed UI frame activity from congesting ("flooding") the low speed (port 1) frequency.

Each of these commands is documented below in the "New Commands" section.

Examples of New "UI" Digipeat Commands in Action

The following are actual monitored outputs of a lab system consisting of one position reporting station and three digipeaters, where each digi is configured using the UIDIGI, UIFLOOD, or UITRACE command and where UIDWAIT is set ON. We set UIDWAIT ON to force the system to digipeat all or most of the UI frames without collision. In all examples, the reporting station, NØGRG, is used to launch a UI packet with the path set by the UNPROTO command.

With UIDWAIT OFF, several digipeaters would transmit at the same time, resulting in corrupted packets. In actual on-the-air use, a system of digipeaters may work well with UIDWAIT OFF, depending upon their mix of location and transmitter power.

☞ In actual use, GPS/APRS reporting stations would set their path with the LTP command.

Configuring Three Digis Using the UIDIGI Command:

Here, three digis, with MYCALLs of A, B, and C, are configured with aliases of RELAY, WIDE, and TRACE (using UIDIGI); and UIDWAIT is set ON. For example station A's UIDIGI aliases are set as follows:

```
cmd: UIDIGI ON RELAY, WIDE, TRACE
```

Launching a UI packet and monitoring the resulting action

The reporting station path is then set to GPS via RELAY, WIDE, TRACE, and a UI packet is launched.

Any one of the stations monitoring will then display the resulting action as follows:

```
cmd:NØGRG>GPS,RELAY,WIDE,TRACE: <UI>:5
NØGRG>GPS,B*,WIDE,TRACE: <UI>:5
NØGRG>GPS,A*,WIDE,TRACE: <UI>:5
NØGRG>GPS,B,A*,TRACE: <UI>:5
NØGRG>GPS,A,B*,TRACE: <UI>:5
NØGRG>GPS,C*,WIDE,TRACE: <UI>:5
NØGRG>GPS,B,C*,TRACE: <UI>:5
NØGRG>GPS,A,C*,TRACE: <UI>:5
NØGRG>GPS,B,A,C*: <UI>:5
NØGRG>GPS,A,B,C*: <UI>:5
NØGRG>GPS,C,A*,TRACE: <UI>:5
NØGRG>GPS,B,C,A*: <UI>:5
```

```
NØGRG>GPS,C,B*,TRACE: <UI>:5
NØGRG>GPS,A,C,B*: <UI>:5
NØGRG>GPS,C,A,B*: <UI>:5
NØGRG>GPS,C,B,A*: <UI>:5
```

All digis hear the first UI frame and store it. Due to the setting of UIDWAIT, some stations may wait longer than others to digipeat; hence, when they do, they may have several frames stored up - for example, the original and a digipeat from another station. Trace station B as an example. It digipeats the original UI frame from the "reporting station," swapping its MYCALL for RELAY (B) and marking it (*), then repeats a frame from A and one from C, and, finally, repeats two more (from A,C and C,A) — a total of five! Note that each repeater digis five times so the total number of digipeated packets is 15!

Configuring Three Digis Using the UIFLOOD Command

Here, three digis, with MYCALLs of A, B, and C, are configured with an alias of WIDE, and UIDWAIT is set ON. For example station A's UIFLOOD call is set as follows:

```
cmd: UIFLOOD   wide,30,ID
```

The reporting station path is then set to GPS via WIDE4-4, and a UI packet is launched. Any one of the stations monitoring will then display the resulting action as follows:

```
NØGRG>GPS,WIDE4-4: <UI>:5
NØGRG>GPS,A*,WIDE4-3: <UI>:5
NØGRG>GPS,B*,WIDE4-3: <UI>:5
NØGRG>GPS,C*,WIDE4-3: <UI>:5
```

Note that all three digis see the UI frame addressed to GPS via WIDE4-4. They then, in turn digipeat that frame, inserting and marking as digipeated (*) their MYCALL, and include the new to- be-digipeated and decremented field of WIDE4-3. Note that each digi hears the UI frames repeated by the others but does not digipeat those in turn since a timeout of 30 seconds was specified by the UIFLOOD command. See the command specification for details.

Configuring Three Digis Using the UITRACE Command

Updated UITRACE Command:

As per a number of requests, we've added the "n" timer and "do not duplicate digipeat within n seconds" features to the UITRACE command - just like that for the UIFLOOD command (see the UIFLOOD command in the addendum for these features.) The purpose of the change is to cut down on the number of UI frames digipeated. Compare the example below that reduces the number of frames digipeated with those of the addendum example for UITRACE. The new format for the command is as follows:

UITRACE   name, n

Example: Digipeaters A,B,C, and D are set with UITRACE trace,30. Digipeater B then launches a UI frame using UN GPS via TRACE4-4. The following results:

B>GPS,TRACE4-4/1 <UI>:QWER
B>GPS,A*,TRACE4-3/1:<UI>:QWER
B>GPS,D*,TRACE4-3/1:<UI>:QWER
B>GPS,C*,TRACE4-3/1:<UI>:QWER

Stations A, D, and C hear B and digipeat the UI frame, inserting their MYCALL and decrementing the SSID of trace. A does not re-digipeat D or C because its "n" timer is set to 30 seconds; that is, it will not repeat any frame again within that time that includes the same source or destination and data (in this case QWER).

Configuring Digis for HF/VHF Gateway Operations

In this example, we demonstrate cross-band (gateway) digipeating. A UI frame is launched on HF and repeated on VHF four times. A KAM Plus and two KPC-3 Pluses (with call signs C, B, and D) are configured as digipeaters and another KAM Plus (call sign A) is set to launch a UI frame from its HF port. The digis are configured with an alias of FLOOD and UIDWAIT is set ON. In addition, MYGATE for digi C (the KAM Plus) is set to C-3 and its UIGATE is set ON/OFF; that is, it is enabled to digi from HF to VHF but not from VHF to HF. The KAM Plus, with call sign A, is then used to initiate an unproto packet with the path GPS via C-3, FLOOD4-4. Either KAM Plus will then display the resulting action as follows:

```
A>GPS,C-3,FLOOD4-4/H:  <UI>:234
A>GPS,C-3*,FLOOD4-4/V:  <UI>:234
A>GPS,D*,FLOOD4-3/V:  <UI>:234
A>GPS,C*,FLOOD4-2/V:  <UI>:234
A>GPS,B*,FLOOD4-3/V:  <UI>:234
```

Station C hears the HF unproto packet of station A and digipeats it via its GATE-WAY out its VHF port. Digis B and D hear the VHF UI packet and store it for digipeating, and D transmits first. In turn station C hears station D's repeat of the frame and digipeats the frame, decrementing flood to "FLOOD4-2." It didn't digipeat its own "FLOOD4-4" frame because it can't hear itself! Station B finishes last due to the slot/persist algorithm. D digipeats the frame only once even though it hears both B's and C's transmissions since they are within 30 seconds of it's own transmission.

Copying Weather Broadcasts

NWS EMWIN Broadcasts: The NWS Emergency Managers Weather Information Network (EMWIN) is a wireless direct-to-computer information service that the National Weather Service (NWS) provides with help from the Federal Emergency Management Agency. The NWS feeds a constant stream of weather information (@ 1200,8,N,1), from around the world, to a satellite orbiting the Earth. Many cities are coming on line now to capture this stream and rebroadcast it on fixed VHF commercial FM frequencies just above the 2-meter ham band.

Using the MODEM mode included in version 8.2 firmware and an FM receiver or scanner, a KPC-3, KPC-3 Plus, KPC-9612, KPC-9612 Plus, KAM Plus, or

KAM with Enhancement Board and a PC with communications software, you can copy the broadcasts.

The content of the broadcasts may be plain ASCII text (copyable with Pacterm - shipped with Kantronics TNCs) or graphics or imagery (copyable with "Weather-Node" software, carried by Kantronics).

To copy the broadcasts, simply cable together the equipment mentioned above, tune your VHF FM receiver to the local EMWIN frequency, set the KPC interface command to MODEM, and follow the text on your PC screen.

The content of the broadcasts may be plain ASCII text or graphics or imagery. Interpretation of the content of the products is up to the software. For updated information on EMWIN and software to copy its modes, search the Internet.

Modem Mode

Modem mode, already in the KPC-3 Plus and KPC-9612 Plus, has been added to the firmware for the KPC-3 and KPC-9612. Version 8.2 upgrades to the KAM Plus and KAM with Enhancement Board also add the Modem mode to those units. This section documents the Modem mode in detail.

In modem mode, the TNC demodulates the audio signal from the radio on port 1 and passes this data through to its RS-232 port unmodified. No "protocol" adjustments are made to the data; the TNC simply acts as a dumb modem. In other words, it simply reflects out the RS-232 port what it "sees" coming in the radio port. For example, if ASCII information is received at 1200 baud, the TNC presents your computer with ASCII at 1200 baud. With a simple terminal program running at 1200 baud too, you'd be able to copy the text.

To place the TNC in modem mode use the INTface command. At the cmd: prompt, type INT MODEM and return. Then turn your TNC power OFF and back ON.

To leave modem mode, send three Ctrl+C (command) characters to the TNC at 1200 baud. If ABAUD was set to something other than 1200, that setting will remain after you exit modem mode. Hence it may be convenient for you to set the TNC to 1200 baud before entering modem mode.

☞ Note: Some computers may lose some of the data stream if a full RS-232 cable is used. This can occur because the RS232 CD line, which is "tied" to the TNC's receive LED, may be cycling up and down. In this case, set CD to EXTERNAL before entering INT MODEM.

Installation

Note: Since the 8.2 firmware for each model TNC is different, be sure you have the EPROM for your TNC before installing it.

☞ Hint: Remember to save command parameters before installing the new chip if you wish to do so.

> Be sure to ground yourself before handling the upgrade memory chip; and, of course, make sure that power to the unit is disconnected.

To install the firmware (contained in the EPROM included with your update shipment):

1.   Remove the TNC cover,

2.   Locate the old EPROM - it's the chip with the copyright sticker on it, note orientation, remove it, and put the new one in its place, and

3.   Once the EPROM chip is installed, do a hard reset (see your manual for instructions), and you are ready to go.

Command Reference: Digipeating Commands

Version 8.2 adds four digipeater commands for the single port TNCs (KPC-3 Plus and KPC-3) and five digipeater commands for the multi-port TNCs (KPC-9612 Plus, KPC-9612, KAM Plus and KAM with Enhancement Board).

☞ Slight differences between some commands in KPCs and KAMs (due to physical and application differences in these units) are documented in this section.

Note: Digipeater priority for call signs is as follows: MYCALL, MYNODE, MYALIAS, UIDIGI, UIFLOOD, UITRACE (e.g. if you assign the same call sign to MYALIAS and UIDIGI, a to-be-digipeated frame with that call sign will be digipeated according to the rules that apply to MYALIAS.)

UIDIGI ON [+|-] call1[,call2[,call3[,call4]]]   *

---

* Multi-port command on the KPC-9612 Plus and KPC-9612. Operational in the VHF port only of the KAM Plus or KAM with Enhancement Board.

default OFF NONE/OFF NONE

Up to 4 call signs can be specified for special digipeater duty. If any of the UIDIGI calls appears in the to-be-digipeated field of a UI packet, and if MY-CALL does not appear in the source field or any of the has-been-digipeated fields, the UIDIGI call in the to-be-digipeated field will be replaced by MY-CALL with the H bit set and the packet will be digipeated.

See also: dewait, persist, uidwait, unproto

UIDWAIT   [ON|OFF] *

---

* Multi-port command on multi-port devices

default   OFF/OFF

When UIDWAIT is OFF, "special" digipeat packets (those formed by UIDIGI, UIFLOOD, or UITRACE only) have their usual channel access; that is, there is no wait DWAIT or slottime added before transmission once the channel is clear. However, if UIDWAIT is set ON, the packets awaiting to be digipeated will be subject to the same wait times as not-to-be-digipeated packets awaiting transmission.

☞ By subjecting "special" to-be-digipeated packets to a delay determined by slot-time and persist, it is more likely that to-be-digipeated packets of two or more stations in the same vicinity would not collide. This may be good if one wants to guarantee that a digipeated packet will "make it out" of its neighborhood but bad if one wishes to limit the number of times a packet is redigipeated, such as in APRS applications.

See also: dwait, persist, uidwait

```
UIFLOOD name, n, [ID|NOID]  (name= 5 char max)(n=0-255)  *
```

* Multi-port command on the KPC-9612 Plus and KPC-9612. Operational in the VHF port only of the KAM Plus or KAM with Enhancement Board.

default   disabled,30,NOID/disabled,0,NOID

When a UI frame is received with a call in the to-be-digipeated field of the form 'name'x-y where x is a number (1-7) appended to 'name' and y is a ssid (1-7), the ssid is decrement and the UI frame is digipeated without setting the H bit. When the packet is digipeated, a checksum is formed over the source, destination, and data fields of the packet. This checksum is kept for n seconds (0-255). If an incoming UI packet is eligible for digipeating as above, but its checksum matches one of those being saved, the packet is discarded (not digipeated). The buffer holds a maximum of 64 checksums. If the optional parameter ID is selected, the MYCALL call sign is inserted in an additional digipeater address field with its H bit set.

See also: uidwait

```
UIGATE ON|OFF  *
```

* This multi-port command is only present in multi-port devices.

default OFF/OFF

The purpose of this command is to prevent heavy high speed UI frame activity from congesting ("flooding") the low speed port (port 1) frequency.

UI packets with a to-be-digipeated address of MYGATE that enter a port with UIGATE ON will be digipeated out the other port. If UIGATE is OFF for a port, UI packets with a to-be-digipeated address of MYGATE entering that port will be discarded.

See also: digipeat, mygate

```
UITRACE name *
```

* Multi-port command on the KPC-9612 Plus and KPC-9612. Operational in the VHF port only of the KAM Plus or KAM with Enhancement Board.

default   disabled/disabled

When a UI frame is received with a call in the to-be-digipeated field of the form 'name'x-y where x is a number (1-7) appended to 'name' and y is a ssid (1-7), and MYCALL does not appear in the source field or any of the has-been-digipeated fields, MYCALL with the H bit set is inserted before the to-be-digipeated field, the ssid of the to-be-digipeated field is decremented, and the UI frame is digipeated without setting the H bit of the to-be-digipeated field.

☞ If the packet should already have 8 digipeater fields, MYCALL is not inserted.

See also: dwait, persist, uidwait

Command Reference: Other Commands

For the KPC-3 Plus and the KPC-9612 Plus: Other than the addition of the digipeating commands covered above, version 8.2 does not delete, change or add any commands in the KPC-3 Plus or KPC-9612 Plus from their previous versions.

For the KPC-3 and the KPC-9612: In addition to the "UI" digipeater commands added to TNCs in Version 8.2, a number of other commands have been deleted, changed, or added, in version 8.2 for the KPC-3 and the KPC-9612 (to conform more closely with the KPC-3 Plus and KPC-9612 Plus command sets).

For the KAM Plus and the KAM with Enhancement Board: In addition to the "UI" digipeater commands added to TNCs in Version 8.2, a number of other commands have been deleted, changed, or added, in version 8.2 for the KAM Plus and the KAM with Enhancement Board.

This section includes:

- a summary listing of the differences between 8.2 commands in the KPC-3 and KPC-9612 and earlier versions of these TNCs.

- full documentation for all new and changed commands (and a list of commands that have been removed).

☞ Slight differences between some commands in KPCs and KAMs (due to physical and application differences in these units) are documented in this command reference.

Summary of Version 8.2 Differences

For the KPC-3, KPC-9612, KAM Plus and KAM with Enhancement Board, Version 8.2, introduces one new mode of operation (MODEM), compared to previous versions, and version 8.2 drops eight commands, changes eleven commands, and adds three new commands (MHEADER, PBLIST and BREAK), as well as the digipeating commands covered above.

☞ As noted above, these changes were already made in the KPC-3 Plus and KPC-9612 Plus.

- The INTFACE command has a new mode: MODEM (documented above).

- LCSTREAM has been set ON permanently and the command has been removed.

- The MHCLEAR, NDHCLEAR, and PHCLEAR commands have been removed; the clearing function is now a parameter of the MHEARD, NDHEARD, and PHEARD commands.

- The RESP time command has been deleated from all units. Its function is taken care of internally.

- The BUDLIST and BUDCALLS commands have been combined into the BUDLIST command; the SUPLIST and SUPCALLS commands have also been combined into the SUPLIST command. In addition, BUDLIST and SUPLIST parameters have been expanded to allow more specific monitoring.

- STATSHRT has been removed and its function has been combined with the STATUS command. STATUS always shows the 'short' status unless the LONG parameter is added to the STATUS command.

- The CONLIST and LLIST commands now have their own list of callsigns instead of sharing with BUDLIST and SUPLIST as before.

- The FULLDUP command has been expanded to include a LOOPBACK parameter. In earlier versions, receive circuits were still active while transmitting when FULLDUP was OFF. Now when FULLDUP is OFF,

the receive circuit is inactive while transmitting. When FULLDUP is set to LOOPBACK, the receive circuit is active while transmitting.

- The STREAMSW command has been modified. Previously, there were separate steamswitch characters for each port; now there is a single streamswitch character (defaulted to "|"), which is followed by the port number and the channel letter. KPC-3 users can still use the old syntax.

  This change does not apply to the KAM Plus or the KAM with Enhancement Board.

- The function of the XCD pin has changed. If CD is set to EXTERNAL, the pin will function as before as an indicator of channel activity and valid modem signals on the received audio line. If CD is INTERNAL or SOFTWARE, the XCD pin functions as an additional transmit inhibit.

- The MHEADER command has been added to the monitor functions. When this command is off, only the data from monitored packets is shown. To avoid confusion, use of BUDLIST is recommended if the MHEADER command is off.

- A PBLIST command has been added for the PBBS. This command allows the owner to add family members who are also hams to the list of 'owners'. If PBLIST is ON, the mail-status LED will blink when mail is available for anyone on the list and the List-mine, Read-mine, and Kill-mine commands are based on this list.

- The BREAK command is now in all these units. A BREAK at the keyboard causes a return to Command Mode.

The rest of this version 8.2 Command Reference is in three parts:

- **Deleted Commands:** An alphabetical list of earlier commands that have been deleted from the version 8.2 upgrade. For reasons for each deletion, see the summary of version differences section, above.

- **Changed Commands:** Full documentation of all commands that have been changed, given in alphabetical order (so you can use this addendum instead of the a previous Command Reference for these commands). For reasons for each deletion, see the summary of version differences section, above.

- **New (Non-Digipeating) Commands:** Full documentation of commands that have been added in Version 8.2, given in alphabetical order.

Deleted Commands

BUDCALLS
LCSTREAM
NDHCLEAR
MHCLEAR
PHCLEAR
RESP
STATSHRT
SUPCALLS

Commands that have been Changed

```
BUDLIST [ON|OFF]  [NONE | {+|-}call | call1,call2,...]
        where call={callsign | {<|>}callsign |
        callsign{>|<>}callsign}
```

default OFF NONE

BUDLIST is used to determine which received packets will be monitored. When OFF or NONE, BUDLIST will allow monitoring of all packets, even if it has callsigns in it's list.

The maximum number of callsigns allowed in BUDLIST is 10. Up to 10 callsigns may be entered at once, using the format shown after the command name, and the new list of from 1 to 10 callsigns will replace whatever list was there before. The BUDLIST command can be used to add a single callsign (+callsign), so long as there is room for the new callsign on the list (if there is not, the TNC responds with "EH?" and returns you to the command prompt). Similarly, you can remove a single callsign (-callsign) from the list. And to remove all items from the current list, enter BUDLIST NONE.

A callsign entered without a SSID will match any SSID of that callsign. To match a specific SSID only, enter the callsign with that SSID: for example, callsign-n, where n = 0-15.

More selective monitoring is enabled when a callsign or two callsigns is combined with a ">" and/or a "<" character. For example, entering ">callsign" will enable monitoring of packets TO that callsign (assuming BUDLIST is ON), entering "<callsign" will enable monitoring of packets from the callsign, entering "callsign1>callsign2" will enable monitoring of packets from callsign1 to callsign2, and entering "callsign1<>callsign2" will enable monitoring of packets from callsign1 to callsign2 and vice versa.

☞ Note that an entry of callsign1>callsign2 or callsign1<>callsign2 counts as 2 of the 10 allowed callsigns.

<u>CD</u>   {INTERNAL | EXTERNAL | SOFTWARE **}   *

** "SOFTWARE" can only be used in port 1 for the KPC-9612 Plus or KPC-9612.

* Multi-port command on multi-port devices

default INTERNAL/INTERNAL

The CD command selects which carrier detect method will be used for a given port.

For either port, set to INTERNAL, the TNC will detect a signal present on the channel — using an energy type carrier detect — allowing shared voice and data on the same channel.

For each port, set to EXTERNAL, the carrier detect is supplied by an external device, connected to the XCD pin on that radio port.

If port 1 is set to SOFTWARE, the firmware inside the TNC will detect the presence of data to enable the carrier detection, allowing operation with un-squelched audio. Correct operation of SOFTWARE carrier detect is affected by proper equalization and the SWP parameter. If your RCV light flickers, this is an indication that you may need to adjust the equalization. (Equalization is set with an internal jumper.)

When CD is set to INTERNAL or SOFTWARE (port 1 only), the external carrier detect pin on the radio connector (if wired) can also be used to hold off the TNC from keying the radio.

☞ Hint: For one use of this function, see the APRS and GPS section of this manual.

See also: swp

```
CONLIST    [ON | OFF] [NONE | {+|-}callsign |
           callsign1,callsign2...]
```

default OFF NONE

CONLIST is used to determine which stations (callsigns) may use your station for ANY purpose, including digipeating.. When ON, the TNC will recognize only those packets received with a callsign that appears in the CONLIST's list of callsigns; and you will not be able to connect to any station that is not in the con- list. When OFF, the TNC will process all packets.

The maximum number of callsigns allowed in CONLIST is 10. Up to 10 callsigns may be entered at once, using the format shown after the command name, and the new list of from 1 to 10 callsigns will replace whatever list was there before. The CONLIST command can be used to add a single callsign (+callsign), so long as there is room for the new callsign on the list (if there is not, the TNC responds with "EH?" and returns you to the command prompt). Similarly, you can remove a single callsign (-callsign) from the list. And to remove all items from the current list, enter CONLIST NONE.

A callsign entered without a SSID will match any SSID of that callsign. To match a specific SSID only, enter the callsign with that SSID: for example, callsign-n, where n = 0-15.

```
FULLDUP    {ON | OFF | LOOPBACK}    *
```

* Multi-port command for KPC-9612 Plus and KPC-9612 only. Applies only to the VHF ports of the KAM Plus and KAM with Enhancement Board.

default OFF/OFF

When OFF (i.e., half duplex), the data carrier detect signal is used as a packet col- lision avoidance signal. When ON, the modem is run full duplex, and carrier de- tect does not inhibit transmission. The full duplex mode may be useful especially for satellite operations using duplex radio setups. Full duplex should not be used unless both you and the station you are communicating with have full duplex ca- pability. LOOPBACK is the same as half duplex (i.e., FULLDUP OFF) as far as protocol is concerned, but the receive circuit is still active; this allows you to con- nect a simple wire between the transmit and receive pins on the radio connector to verify operation of the modem circuitry.

O   INTFACE {TERMINAL|NEWUSER|BBS|KISS|XKISS|
                HOST|GPS|MODEM}

---

default NEWUSER

XKISS mode is not available for the KAM Plus or KAM with Enhancement Board.

When set to NEWUSER, the TNC will operate with a standard terminal or computer running a terminal emulation program with a limited command set available. When set to TERMINAL, the full command set of the TNC is available. When set to BBS, the TNC deletes certain messages (i.e. *** connect request, *** FRMR, etc.) for greater compatibility with full-service BBS programs such as WØRLI, WA7MBL, CBBS, etc.. When INTFACE is set to KISS mode of operation, users interact with the TNC using software that implements the KISS code specified by Phil Karn (for more information, see the KISS Operation section of this manual). When INTFACE is set to XKISS mode of operation, users interact with the G8BPQ extended KISS protocol (for more information, see the KISS Operation section of this manual). When INTFACE is set to HOST, the TNC will talk to the attached computer using the Kantronics HOST mode and users communicate with the TNC using "host mode" software (for more information, see the HOST Operation section of the "User's Guide" manual).

When INTFACE is set to GPS, the TNC will enter GPS mode upon power up. Data from the serial port will be parsed according to the GPSHEAD command, text will be placed into the LT buffers, and beacons will be transmitted according to the setting of the BLT commands.

When INTFACE is set to MODEM, the TNC mirrors at the RS-232 port what it receives at the radio port (for more information, see the "modem mode" in the Modes of Operation chapter).

To have the TNC exit GPS Mode, connect a PC or terminal to it and issue three <Ctrl+C> characters (see COMMAND for details).

For instructions on exiting KISS, XKISS, HOST and MODEM modes, see the appropriate sections of the "modes of operation" of this addendum and the "User's Guide" manual.

NOTE: After changing the setting of this command to KISS, XKISS, HOST, MODEM, or GPS, a soft reset is required for the new mode to take effect (see RESET for details).

```
LLIST    [ON | OFF] [NONE | {+|-}callsign |
          callsign1,callsign2...]
```

default OFF NONE

LLIST is used to determine which stations (callsigns) may NOT use your station for ANY purpose, including digipeating. When LLIST is ON, the TNC will NOT recognize those packets received with any callsign that appears in the LLIST's (lid) list of callsigns. In addition, when LLIST is ON, you will not be able to connect to any station that is on that list.

The maximum number of callsigns allowed in LLIST is 10. Up to 10 callsigns may be entered at once, using the format shown after the command name, and the new list of from 1 to 10 callsigns will replace whatever list was there before. The LLIST command can be used to add a single callsign (+callsign), so long as there is room for the new callsign on the list (if there is not, the TNC responds with "EH?" and returns you to the command prompt). Similarly, you can remove a single callsign (-callsign) from the list. And to remove all items from the current list, enter LLIST NONE.

A callsign entered without a SSID will match any SSID of that callsign. To match a specific SSID only, enter the callsign with that SSID: for example, callsign-n, where n = 0-15.

○ MHEARD   [SHORT | LONG | CLEAR]

immediate

This command causes display of a list of stations heard. An asterisk, *, indicates that the station was heard through a digipeater. The date/time the station was last heard is also displayed.

If the S option is used, i.e. MHEARD S, then only the callsigns of the stations heard will be displayed.

If the L option is selected, all callsigns contained in the received packet including the digipeater paths, are displayed. For example (on port 1):

```
NØGRG/1 > ID     10/16/88   14:31:30
     VIA TOP,KCI,WØXI
```

Here, your station heard NØGRG transmitting an ID packet. NØGRG was also using the digipeating path TOP, KCI, WØXI. If your station heard NØGRG via

one of these other stations, an asterisk would show by the call or alias of the last digipeater heard. When listed short, the asterisk would show beside NØGRG.

☞ Whenever PASSALL is ON, packets will not be checked for errors and no additions will be made to the MHEARD list.

If the C option is used, the list is cleared.

See also: daytime, passall

NDHEARD   [SHORT | LONG | CLEAR]

---

immediate

This command allows the operator to display a list of nodes whose ID packets have been heard by the TNC. The list includes KA-Nodes as well as K-Net,

K-Net, TheNet, NET/ROM and G8BPQ nodes are identified as:

        ALIAS   (CALLSIGN)

and Kantronics KA-Nodes will be identified as:

        MYNODE   (MYCALL)

An asterisk"*" indicates that the station was heard through a digipeater. The date/time the station was last heard is also displayed. If the S option is used, i.e. NDHEARD S, then only the callsigns of the stations heard will be displayed. If the L option is selected, all callsigns contained in the received packet are displayed (see MHEARD for display format). If the C option is used, the list of nodes is cleared.

See also: mynode

PHEARD   [CLEAR]

---

immediate

This command will display a list of the last 10 stations that have connected to your KPC-9612 Plus PBBS. The list will show the callsign of the connecting station and the last time they connected and disconnected.

To clear the PHEARD list of all current entries, enter PHEARD CLEAR.

See also: passall

O STATUS   [LONG]

immediate

Entry of the STATUS command will display the number of bytes available (i.e., free bytes) in the RS232 input buffer, the current I/O stream ,and any streams having a connected status.

Entering LONG will cause the TNC to display the status of all streams allowed by MAXUSERS, PBBS, NUMNODES, and MYREMOTE.

The current KA-NODE input and output (IO) stream is also indicated. A pound sign (#) indicates that there is unacknowledged data in the buffers for that stream. The number immediately following the # is the number of bytes outstanding. The number in parentheses is the number of packets not yet acknowledged.

The following is an example of a display (using STATUS LONG). A, B, C (i.e., MAXUSERS = 3) indicate the stream. "A" stream is connected to NØGRG and has 50 bytes in 2 packets that are unacknowledged. The current stream (IO) is the "B" stream, which is connected to NØKN. KBØNYK is connected on circuit "A" of the KA-Node. All other streams, node circuits, the BBS, and the remote access are disconnected. Appending "/P" to the callsign indicates that the connection is permanent (see CONPERM).

Example for single port TNC:

```
cmd:status long
FREE BYTES 1661
A   stream -   #50(2) CONNECTED to NØGRG
B   stream -   IO CONNECTED to NØKN/P
C   stream -      DISCONNECTED
BBS DISCONNECTED
REM DISCONNECTED
Ain    CONNECTED to KBØNYK
Aout DISCONNECTED
Bin  DISCONNECTED
Bout DISCONNECTED
```

The same example as above, modified for multi-port TNC:

```
cmd:status long
FREE BYTES 1661
A/1  stream -   #50(2) CONNECTED to NØGRG
B/1  stream -   IO CONNECTED to NØKN/P
C/1  stream -      DISCONNECTED
```

```
             A/2  stream -       DISCONNECTED
             B/2  stream -       DISCONNECTED
             C/2  stream -       DISCONNECTED
             BBS DISCONNECTED
             REM DISCONNECTED
             Ain /1    CONNECTED to KBØNYK
             Aout DISCONNECTED
             Bin  DISCONNECTED
             Bout DISCONNECTED
```

See also: conperm, maxusers, myremote, numnodes, pbbs, streamsw

---

STREAMSW   n   (n = $00 - $FF)

---

default $7C (|)

Note: KAM Plus and KAM with Enhancement Board TNCs retain their HF/VHF streamsw definitions (i.e., there is no change in this command for operation with these models).

This command selects the character to be used to signify that a new "stream" or connection channel is being addressed. To change streams you must type this streamswitch character followed immediately by the stream designator. The stream designator is an alphabetic character A through Z, or a through z, limited by the value of MAXUSERS.

If more than one port is active in the KPC-9612 Plus and you wish to change to a stream on another port, you need to insert the port number between the stream-switch character and the stream designator. For example, to switch from stream C of the 1200 baud port (port 1) to stream B of the 9600 port (port 2), use the character sequence "|2B".

☞ If STREAMSW is set to the dollar sign ($24) you will need to enter parameter values in decimal. Alternatively, precede the $ with the PASS character in order to enter hex numbers.

The character selected can be PASSed in the Convers Mode by using a special PASS character, and will always be passed as data in the Transparent Mode. If operating in the Transparent Mode and you wish to change streams, you must first return to the Command Mode.

See also: maxusers, pass, status

```
SUPLIST [ON|OFF] [NONE | {+|-}call | call1,call2,..]
        where call={callsign | {<|>}callsign |
        callsign{>|<>}callsign}
```

default OFF NONE

SUPLIST is used to determine which received packets will not be displayed, i.e. suppressed. When OFF or NONE, SUPLIST will not prevent the display of packets, even if it has callsigns in it's list.

The maximum number of callsigns allowed in SUPLIST is 10. Up to 10 callsigns may be entered at once, using the format shown after the command name, and the new list of from 1 to 10 callsigns will replace whatever list was there before. The SUPLIST command can be used to add a single callsign (+callsign), so long as there is room for the new callsign on the list (if there is not, the TNC responds with "EH?" and returns you to the command prompt). Similarly, you can remove a single callsign (-callsign) from the list. And to remove all items from the current list, enter SUPLIST NONE.

A callsign entered without a SSID will match any SSID of that callsign. To match a specific SSID only, enter the callsign with that SSID: for example, callsign-n, where n = 0-15.

Selective display is enabled when one or two callsigns are combined with a ">" and/or "<" character. For example, entering ">callsign" will disable display of packets TO that callsign (assuming SUPLIST is ON), entering "<callsign" will disable display of packets from the callsign, entering "callsign1>callsign2" will block display of packets from callsign1 to callsign2, and entering "callsign1<>callsign2" will block display of packets from callsign1 to callsign2 and vice versa.

☞ Note that an entry of callsign1>callsign2 or callsign1<>callsign2 counts as 2 of the 10 allowed callsigns.

See also: monitor

New Commands

Version 8.2 adds the following new commands to the KPC-3, KPC-9612, KAM Plus, and KAM with Enhancement Board (as well as the digipeating commands documented in the previous command reference section):

```
BREAK {ON | OFF}
```

default OFF

If BREAK is ON, a break at the keyboard causes a return to Command Mode from Converse of Transparent Mode.

See also: COMMAND

```
MHEADER    {ON | OFF} *
```

* Multi-port command on multi-port devices

default ON/ON

When ON, the headers are displayed for all monitored packets.

When OFF, headers are not displayed and only data is output to the terminal. Since only I and UI frames have data, only these frames are displayed.

☞ To avoid confusion when MHEADER is OFF, use BUDLIST to restrict the monitored data.

See also: monitor,mcon,mbeacon,mall,suplist,budlist

```
PBLIST    [ON | OFF] [NONE | {+|-}callsign |
          callsign1,callsign2...].
```

default OFF NONE

The front panel of your TNC has a mail-status indicator that blinks when there is unread mail in your PBBS addressed to your callsign (MYCALL) or to your MYPBBS. And several PBBS commands (LISTMINE, READMINE, and KILLMINE) operate on mail addressed to your callsign (MYCALL) or to your MYPBBS.

PBLIST allows you to add up to ten more callsigns to the set of callsigns included as "mine" for use with the "mail" indicator and the PBBS commands (LISTMINE, READMINE, and KILLMINE). The PBLIST command has two parameters: one for creating, changing, or deleting the list of callsigns on the PBLIST and the other for turning ON or OFF the use of the callsigns on the current PBLIST.

☞ SSID's attached to callsigns are always ignored in the mailbox.

The maximum number of callsigns allowed in PBLIST is 10. Up to 10 callsigns may be entered at once, using the format shown after the command name, and the new list of from 1 to 10 callsigns will replace whatever list was there before. The PBLIST command can be used to add a single callsign (+callsign), so long as there is room for the new callsign on the list (if there is not, the TNC responds with "EH?" and returns you to the command prompt). Similarly, you can remove a single callsign (-callsign) from the list. And to remove all items from the current list, enter PBLIST NONE.

When you change PBLIST, the new list of callsigns takes effect immediately for use with the PBBS commands (LISTMINE, READMINE, and KILLMINE). But the new list will not be used with the mail-status indicator until after the next disconnect from the PBBS or the next reset.

When PBLIST is ON, the callsigns on the current PBLIST list are included as "mine" for use with the "mail" indicator and the PBBS commands (LISTMINE, READMINE, and KILLMINE). Your callsign (MYCALL) and your MYPBBS are also included as "mine" when PBLIST is ON.

When PBLIST is OFF, only your callsign (MYCALL) and your MYPBBS are included as "mine" for use with the "mail" indicator, the PBPERSON command, and the PBBS commands LISTMINE, READMINE, and KILLMINE.

☞ Hint: Some uses of PBLIST to give you additional use of your "mail" indicator (and the PBBS commands shown above) would be to include on PBLIST: (1) callsigns of family members who are also hams, (2) old callsigns that people might still be using for you, and/or (3) callsigns that are common errors in trying to reach you (e.g., replacing a "zero" with an "O" in your callsign).

This concludes the Version 8.2 Upgrade addendum, for the KPC-3 Plus, KPC-3, KPC-9612 Plus, KPC-9612, KAM Plus, and KAM with Extension Board. Please add this information to update the previous documentation for your TNC.

Kantronics

Version 8.2
Firmware Update for Kantronics TNCs

Kantronics
1202 E. 23rd Street,
Lawrence, Kansas 66046-5099

Orders/ Inquiries:
   (913) 842-7745
   FAX (913) 842-2031
   e-mail: sales@kantronics.com
   website: ·www.kantronics.com

Service / Technical Support:
   (913) 842-4476   (9-12 am, 2-5 pm Central Time, M-F)
   FAX   (913) 842-2021
   e-mail: service@kantronics.com