

Winlink 2000 Telpac Installation, Setup and Testing Instructions

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1.0 DESCRIPTION

Winlink 2000 Telpac stands for TELnet PACket gateway and is an enhancement of the previous experimental WL2K SMSNode. Telpac software provides streamlined setup to deliver full WL2K BBS capability to the wireless ham user using AX.25 packet in combination with WL2K's Telnet Servers. Telpac also supports connections to FBB or JNOS Telnet servers. Telpac is straightforward to install and run and requires a minimum of computer and radio equipment. The Telpac software runs independently from the normal Winlink MBO (PMBO) software on virtually any Windows 98 or later computer. Telpac is ideal for temporary emergency setup or unattended remote locations where it can deliver reliable wireless communication to the "last mile". The following graphic shows the major components of Telpac and how it interfaces the remote wireless ham to the existing WL2K system and the Internet.

WL2K's Telpac (TELnet PACket gateway)

Remote packet user

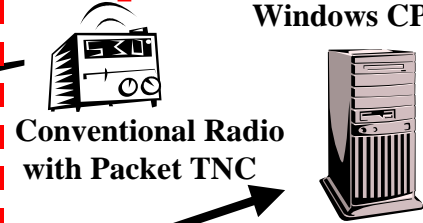
Simple terminal or FBB compatible
Packet Client (AirMail or Paclink)



AX.25 Packet Radio Link

Telpac

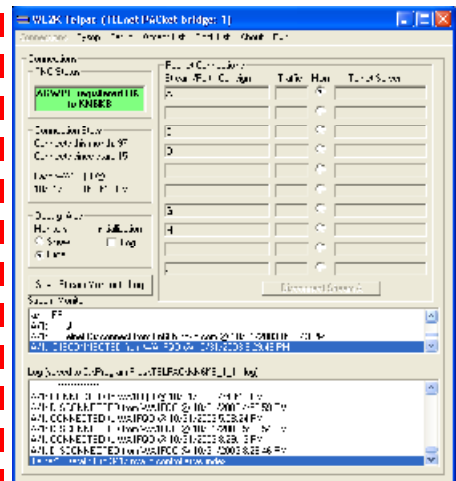
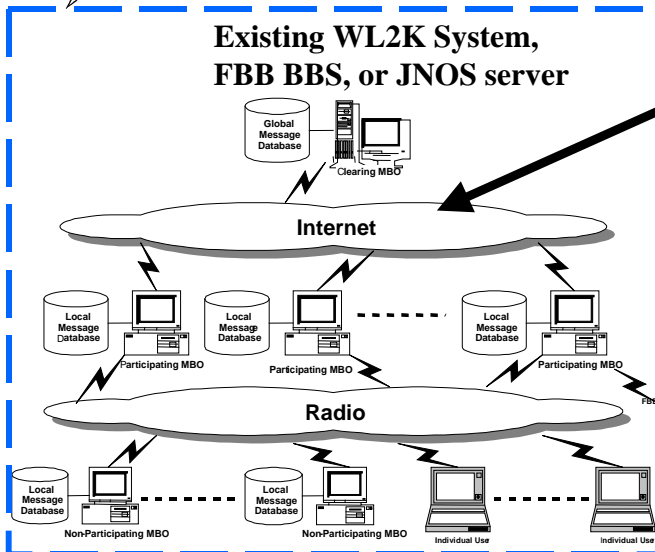
Windows CPU



Conventional Radio
with Packet TNC

Existing WL2K System,
FBB BBS, or JNOS server

Internet link
To a WL2K,
FBB, or JNOS
Telnet Server



1.1 INSTALLATION

Installation is straightforward. First download the Telpac.exe self extracting zip file which contains the install program and documentation (about 2.5 Meg). Go to <http://www.winlink.org/Client.htm>, scroll down to the section on Telpac and download the self extracting installation file. Run the file and put the zipped files into a temporary folder. There will be the following files:

Setup.exe, SETUP.LST and a Telpac.CAB file along with *this* installation document (Telpac_Install.doc and TELPAC_Install.pdf). Double click on the Setup.exe to begin installation. The default install path is C:\Program Files\Telpac but this can be changed during installation. The installation program will deposit all the required files in the default install path. Install Telpac by running the Setup.exe program now in the temporary directory. You can change the default installation path if desired. If you are updating there is no need to remove your old installation....your settings will not be lost.

1.2 TELPAC Gateway Registration

Registration of your Telpac gateway is strongly recommended. This will allow other users to locate your gateway and get important information about your gateway. Telpac now can automatically “check in” periodically to WL2K which keeps statistics on gateway activity. Real time Telpac status is available at <http://winlink.org/status/TelpacStatus.aspx> When you start Telpac since it has never been initialized before it will ask you to register the product. You *can* run the program without registration but you will get the “nag” pop up each time it is started so automated startup is not possible. Registration is free for amateur use. Simply go to <http://winlink.org/status/TelpacEx.aspx> , enter your station gateway call sign (including any –ssid desired). Most Telpac gateways select an SSID of –10 and this is recommended when possible. When you have completed the entry you will see the registration number in bold letters at the top of the page. This number can be entered at the nag prompt upon Telpac startup and will eliminate the nag permitting automatic/unattended operation. Your registration number can be used to register your call and any –ssid associated with your call. You can view the gateway details (and registration number) at any time by clicking “details” by your gateway call sign on the Telpac status page. If you need to edit or delete your gateway information you will need a password. You can get a password by going to <http://winlink.org/newmail/> and clicking register. This will allow you to create/change a password for a particular call sign. In WL2K if you have registered a Telpac gateway with a –ssid you must use that -ssid as part of the call sign. WL2K considers KN6KB and KN6KB-1 as *separate* users, each with their *own* password (the passwords may be the same). Your password can also be used to send/receive WL2K web mail from any web browser by going to <http://winlink.org/newmail/>

If you have followed these instructions and still have problem send an email to KN6KB@winlink.org or K4CJX@winlink.org with your call sign (including –ssid if used), name and E-mail address.

2 Selecting the Packet Engine or Direct Modem Control

Your first decision on setup is whether you will use the AGW Packet Engine to interface the TNC(s) to Telpac. This utility program written by George Rossopoulos SV2AGW elegantly interfaces all popular TNCs via TCP to the Telpac program. Experience has shown that although the installation is initially more involved this approach is recommend as it has the following advantages:

- More TNCs are supported including BayCom and Sound Card TNCs.

- Multiple streams supported more reliably with most modems.

- TNCs can be shared by other applications supporting AGWPE

- Multiple instances of Telpac can share the same TNC permitting one TNC to support WL2K, FBB and JNOS Telnet servers.

The program is available in two formats. Packet Engine Pro has a 30 day evaluation period and is \$49USD after that. The AGW Packet Engine is free for amateur use but is a little more difficult to set up and will not support the BayCom TNCs on some operating systems. Both can be downloaded from <http://www.elcom.gr/sv2agw> . Appendix A is a brief tutorial on how to install and setup AGWPE for use in Telpac. The following

instructions for Telpac setup with AGWPE assume you have installed and configured AGWPE and it is running on your machine (or a machine you can reach full time on your LAN or Internet). It is important to install and test the AGWPE to insure correct operation *BEFORE* attempting to install Telpac.

Alternatively you can control the TNC directly with the Telpac. This works well for the Kantronics modems but supporting multiple streams with simple TNC2 type modems is not possible without using AGWPE.

2.1 Setup for AGWPE or Packet Engine Pro (Recommended)

Once AGWPE or Packet Engine Pro has been installed, be sure to test it for proper operation using the AGWPE TERMINAL program as described in Appendices A and B. From there setup of Telpac is quite simple. Your computer must be enabled for TCP/IP protocol which is standard and probably already installed as part of your normal dial up Internet access or LAN. After registering or canceling the registration request the program will bring up the setup menu below. This is the menu you will get when you select AGWPE for the TNC type. (Other TNC types will give a slightly different setup shown later).

WL2K Telpac Setup Instance 1

Initialize Cancel Check TNC Comm AGWPE Ports

Node Call Sign Connection Timeout (min)

AGWPE

AGW ports Enabled: 3

Max Outstanding Frames Max Streams

Enable Logging

IP / Logon Info

IP

IP port

ID

PW

Telnet Hosts

Server Type

IP Connection	Host	Port	Password
default	kn6kb.no-ip.com	12001	WL2KTELNETCLIENT
default	k4cjk.no-ip.com	12001	WL2KTELNETCLIENT
default	n0ia.no-ip.com	12001	WL2KTELNETCLIENT

TNC Type: File Path

IP Connection Type

Full time

Dial Up

Auto Reporting

Interval (minutes) Enable Auto Checkin to Host

APRS Reporting

Enter the gateway call sign you wish to use for this Telpac instance (multiple instances can be used as described later). This should be the same base call as you registered but any –ssid from 1 – 15 is also acceptable. Most Telpac gateways standardize on a –10 for the ssid and this is recommended. AGWPE requires that all applications sharing the Packet Engine have a different call sign. You can use a –ssid to distinguish call signs if necessary. The field Max Outstanding Frames is used to meter the outbound flow to avoid channel hogging. Normally values of 1-3 are fine for busy to average channels. Higher numbers (6-10) can increase channel throughput at the expense of increased channel “hogging”. Default is 2. The AGW Packet engine will try and “chain” more frames to optimize throughput if Max Outstanding Frames is higher and it senses the channel is not too busy. If you have problems with AGWPE “overrunning” the TNC (see appendix E) try setting a Maxframe value of 1 for Telpac and in the Packet Engine setup. If AGWPE is running on the same computer as Telpac you can leave the ID and PW fields blank. An IP address of “localhost” will normally resolve to your local computer but try 127.0.0.1 if localhost does not work. AGWPE is usually set up with a default port of 8000 but if yours was not enter the IP Port number in the IP port field.

Operation with a remote AGW Packet Engine is possible for the experienced user. Enter the remote IP (this must be a full time friendly or dotted IP address not dynamically assigned) in the IP text box. If you have set up AGWPE for login security you should enter the appropriate ID and Password in those fields.

The Connection Timeout is a mechanism that will automatically disconnect a connected station if there has been no response after the preset time. Usually 5 minutes is good for AGWPE installations. Direct serial modem control may require values of 10-20 minutes to transmit large files since the TNC buffer may obscure actual packet transmission.

The Max Streams parameter determines how many simultaneous connections (from all ports) will be supported. This can be set from 0-10. A value of 0 will disable *all* inbound connections.

Checking the Enable Logging checkbox will enable the Telpac log that will log all connects by call letter and time. Logging will not include the Stream Monitor window of the main menu unless the Save Monitor to Log button is manually clicked.

KN6KB’s Telnet server parameters are defaulted as the primary Telnet host but any of the following WL2K Telnet Servers can be used. Check with the corresponding WL2K sysop (callsign@winlink.org) to make sure of his current connection IP, port and password and to inform him you will be using his station’s Telnet Server for your Telpac connection.

WL2K Telnet Server List as of Oct 2004

WL2K PMBO	Remote Host	Port	Password
K4CJX	k4cjx.no-ip.com	12001	WL2KTELNETCLIENT
AH6QK	ah6qk.no-ip.com	12001	WL2KTELNETCLIENT
IV3XHR	iv3n0ia.no-ip.com	12001	WL2KTELNETCLIENT

KA6IQA	6swan.dyndns.org	12001	WL2KTELNETCLIENT
KB6YNO	kb6yno.no-ip.com	12001	WL2KTELNETCLIENT
KN6KB	kn6kb.no-ip.com	12001	WL2KTELNETCLIENT
K4SET	k4set.no-ip.com	12001	WL2KTELNETCLIENT
K7AAE	k7aae.no-ip.com	12001	WL2KTELNETCLIENT
K6IXA	k6ixa.no-ip.com	12001	WL2KTELNETCLIENT
N0IA	n0ia.no-ip.com	12001	WL2KTELNETCLIENT
VE6KBS	ve6kbs.no-ip.com	12001	WL2KTELNETCLIENT
VE1YZ	velyz.no-ip.com	12001	WL2KTELNETCLIENT
WA2DXQ	wa2dxq.no-ip.com	12001	WL2KTELNETCLIENT
WB0TAX	208.254.214.102	12001	WL2KTELNETCLIENT
WD8DHF	wd8dhf.no-ip.com	12001	WL2KTELNETCLIENT
WG3G	wg3g.no-ip.com	12001	WL2KTELNETCLIENT
WX4J	wx4j.no-ip.com	12001	WL2KTELNETCLIENT
W7IJ	w7ij.no-ip.com	12001	WL2KTELNETCLIENT
W9GSS	w9gss.no-ip.com	12001	WL2KTELNETCLIENT
ZL1MA	zllma.no-ip.com	12001	WL2KTELNETCLIENT
ZL2UT	zllut.no-ip.com	12001	WL2KTELNETCLIENT

You can select a first and second backup Telnet Host from the above. If a connection cannot be made to the primary the backup Telnet Servers will be tried automatically.

Normally you can leave the IP connection pull selection to default and this will use the default IP connection. If a Telpac gateway is on a multi homed computer then the specific IP connection can be selected from the IP connection pull down selection. This is advanced operation and is how the wireless ID-1 (D-Star) or Wireless 802.11x links would be used with Telpac.

If you wish to operate Telpac with a Telnet server that is not WL2K select the server type (FBB or JNOS) from the Server Type combo box. If you select either FBB or JNOS the password field will not be visible. Both FBB and JNOS require a call sign specific password that must be entered (via keyboard or the senders automatic logon program) after connection is made.

The above menu is set up for a normal full time IP connection (DSL, Cable, LAN etc). If you are using a dialup IP connection you can use the example as shown in the setup menu below.

It is recommended you also check Enable Auto Check in and set a period (nominally 15-30 minutes for full time connections). When this option is checked Telpac will periodically log in briefly as the gateway call sign. This allows WL2K to capture stats and be able to show which Telpac gateways are active on the status web page. Recommend check in intervals are 15-30 minutes for a full time connection and 60-180 minutes for a dial up connection. Each auto check in session is logged and the last check in is shown on the main Telpac menu. If the sysop menu is being used and the sysop is logged in auto check in will be disabled.

Beginning with revision 1.1.1 automatic APRS reporting to the APRS server is also included. This is reported at the same interval as the Auto Check in. Check the APRS reporting check box and click the Set APRS parameters box to get the following menu.

The screenshot shows a dialog box titled "APRS Reporting" with a blue header. The main area is light beige and contains the following sections:

- Position:** Two radio buttons are present: "Grid Square" (unselected) and "Lat/Lon" (selected). The "Lat/Lon" section has two text input fields containing "2814.86N" and "08041.40W".
- Station Parameters:** A group box containing:
 - "Freq (MHz)" text box with "145.67".
 - "APRS Winlink ID" dropdown menu with "WL" selected.
 - "Baud Rate" text box with "1200".
 - "Range (miles)" dropdown menu with "10" selected.
- Alternate APRS Server:** A group box containing two text input fields labeled "Server name or IP address" and "Port", both of which are currently empty.

At the bottom of the dialog are two buttons: "Cancel Edits" and "Save to Registry".

Enter the parameters about your station to report to APRS. You can enter your position either by grid square (4 or 6 character) or NMEA compatible Lat/Lon as shown above. If you are not sure of your grid square find your Lat/Lon and use the grid square calculator at www.amsat.org/cgi-bin/gridconv. Using Lat Lon will be more accurate in showing your Telpac gateway position. Select the closest value for the estimated range of your station in miles. The APRS Winlink ID is used to insure your APRS object is unique. Normally leave it at "WL". If you are running multiple Telpac gateways using the *same base call sign* (not considering --ssids) you should select W1 –W9 so that each is unique. Normally you should leave the Alternate APRS server and port fields blank which will rotate through the default servers (firenet.us, clspco.firenet.us both on port 14580 or rotate.aprs.net on port 23) You can enter an alternate server and port number if desired which will be tried first using the default servers as backup. Information on APRS servers can be found at www.aprs2.net Generally port 14580 will pass the report through to the APRS-IS server. Click Save to Registry to save your APRS Reporting settings. You can test APRS reporting by clicking Test AutoReport on the main menu. This will (if enabled) log you on to the WL2K Telnet server then post your Telpac gateway position report with an APRS server. The log should indicate if the posts were successful. You should be able to see your APRS post a few seconds after posting at <http://findu.com/cgi-bin/symbol.cgi?icon=Wa> Check your position for accuracy....little errors like using E instead of W for Longitude will put you thousands of miles off!!!

Once all the appropriate fields are set up click Initialize on the setup menu. This will save the settings and attempt the TCPIP connection to the AGWPE. A successful initialization should bring up the main form and make a log entry indicating version number and registration of the gateway call sign with AGWPE or Packet Engine Pro.

After a successful initialization the only remaining task for Telpac setup is to enable the ports and change the port packet length if desired. AGWPE can be set up to run several ports including multi port TNCs, loop back ports etc. Not all of these may be appropriate for Telpac. Click the main menu Setup to get the setup menu. Then click AGWPE Ports to show the Port Info menu below.

Port	Enb	PacLen	Beacon	Port Info
1	<input checked="" type="checkbox"/>	128	10	KPC9612 On COM1: VHF 1200 on 145.09 1200 baud
2	<input type="checkbox"/>	128	off	KPC9612 On COM1: 9600 Not connected 9600 baud
3	<input checked="" type="checkbox"/>	128	off	LoopBack Port 19200 baud
4	<input type="checkbox"/>	128	off	KENWOOD TS2000 On COM6: TS2000 Packet 1200 baud

This menu will show available Ports from the Packet Engine by number (1-20). Each port will have a check box that must be checked to enable that port. The PacLen will default to 128 but can be set anywhere from 64 – 255 if desired. The beacon column will either say “off” or the number of minutes between the beacon intervals for that port as defined in the customization file AGWBeacons_1.txt as described below. The port Info field is as directly received from AGW Packet Engine via a Port Info request. **IMPORTANT NOTE:** If you change the AGW Packet Engine port configuration you may have to go back and enable the correct ports on this menu. If a port is unchecked it is still “registered” by AGWPE to the Telpac application but it will be ignored by Telpac and no connections from that port will be accepted. Including a loop back port is a recommended mechanism for testing using the AGW Terminal program.

2.1.1 CUSTOMIZATION for AGWPE

When using AGWPE the only customization required are two files:

The file banner_1.txt in your installation directory is a simple greeting banner that identifies *your* Telpac gateway. It is sent to the connecting station upon a new connect. Keep this file simple and short as shown in the example file Examplebanner_1.txt which you can modify with a simple text editor. You *must* name the file banner_n.txt where n is the instance number (1 if only running 1 instance). The connecting station will also see the remote Telnet Server’s logon banner.

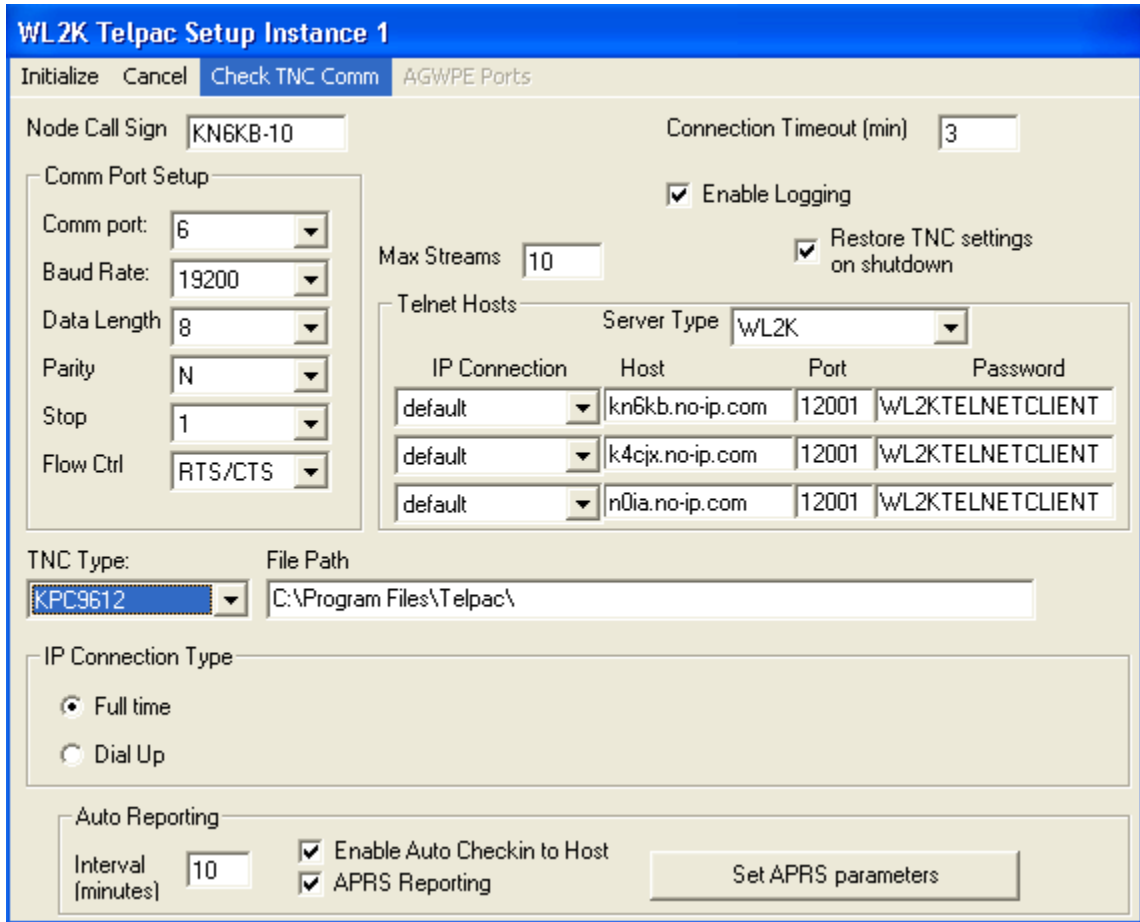
If you wish to beacon info about your Telpac gateway (recommended) you can set up another file AGWBeacons_n.txt (again where n is the instance number). This file defines the Beacon text, interval, destination and digipeater vias for each port you wish to have beacon. Beacons should not be over used but they do “announce” the presence of your Telpac gateway to all users listening in your area. The file ExampleAGWBeacons_1.txt in your installation directory can be used as a template to build your own custom beacon file. Note also since the port numbers are referenced in this file any re assignment of ports within the AGWPE may require this file to be updated. Be sure you save the file with the appropriate name. It *must* be AGWBeacons_n.txt where n is the instance number and saved in your working Telpac directory. See the section on setting up Beacons for APRS compatibility.

This completes all setup required for Telpac using the AGWPW. After clicking initialize, all settings will be saved in the registry and the next startup of Telpac will automatically initialize with those settings. If you have trouble look at the hints in Appendices A and B.

2.2 SETUP FOR DIRECT MODEM CONTROL

If this option is chosen instead of using AGWPE you will have to create a custom initialization file for your TNC. Once you have finished the Initial Telpac installation you are ready to customize the required TNC control file. In the installation directory you will find several TNC files with names like ExampleKPC3_1.aps, ExampleKAM_1.aps etc. These are example files and can be used as templates. You will have to edit the one of these that applies to the TNC you will use and save it as KPC3_1.aps or KAM_1.aps etc (without the preface “Example”). Use a simple text editor (as opposed to something like Word) and save the files as text files with the *exact* names shown. The call sign you have set up on the Setup menu will over ride any MYCall settings in the TNC or in the .aps file. If you are not sure about some parameters leave them as in the example file or ask a local Packet guru for help. The parameters for many TNCs are similar but not identical. These files have been basically tested but may not be optimum for your environment. They should work *as is* with simple modification for the beacon information lines. You can comment out a line (making it unprocessed) by starting it with a “;”. It is good practice to add comments (delimited with a “;”) to document any unusual settings for future reference. Multiple connection streams on TNC2 clones are not reliable so if a TNC clone is used the Max streams must be set to 1. If you need to operate a TNC2 clone with multiple streams use the AGW Packet Engine which controls the TNC in KISS mode. To operate in full BBS <> BBS modes with binary protocols (B1 or B2) will require a TNC capable of true binary operation. The Kantronics series of TNCs are recommended since they all share this capability as well as the desirable characteristic of running in Host mode and supporting multiple simultaneous connections. My experience is that most TNC problems can be avoided by using and properly configuring the TNC to use the AGW Packet Engine.

Now start the Telpac program by double clicking on the Telpac.exe file in your installation directory. Follow the registration and setup instructions as for the AGWPE setup above except for the Serial port setup data. If you select a TNC type other than “AGWPE” on the setup page you will see a menu similar to this:



Here the AGWPE setup frame is replaced by the Comm Port setup frame. Set the serial port parameters here. Parameters on the left are used to select the Comm port parameters, flow control mechanism and TNC Type. You should use hardware flow control RTS/CTS as it is required on most TNCs operating in binary mode. Some USB to Serial adaptors may have a problem with hardware flow control (The Belkin USB > Serial operating under Win 2000 or Win XP definitely has problems). A normal serial channel of the computer is recommended. If necessary flow control can be disabled (NONE) but this will likely cause problems in downloading large binary files. This should work on all modern TNCs and computer ports provided your serial connection cable has wires for RTS and CTS. Once all parameters are selected you can test the communications to the TNC using the Check TNC Comm menu item. If the baud rate and Comm port parameters are OK you should get a positive check. The check will work if the TNC is in any interface mode.

The other setup fields are similar to what was described in the AGWPE setup above. The differences are:

- 1) You have a check box option to restore the TNC to its initial settings (the settings upon entering the program). Check this if you need to leave the TNC unaltered on exit. Beginning with version 1.1.10 you also have the option of using a separate TNC restore file. This must have the same name as the .aps configuration file but with the extension .apr e.g. KPC3_1.apr . If the restore check box is checked and the proper .apr file is found that file of commands will be executed in place of the TNC settings saved in registry. This permits changing any TNC settings on exit of Telpac. The syntax of the .apr file is exactly the same as the .aps file.
- 2) The AGWPE Ports menu is disabled and the Check TNC Comm menu is enabled. This allows easy verification of serial port settings and communications with the TNC.
- 3) You should use a larger Connection Timeout value when sending large files. This is because the TNC does not provide explicit information on what packets have actually been *sent*. A value of 10-20 minutes should cover most practical file sizes.

In the IP Connection Type frame you must select whether you are using a full time (cable, DSL or LAN type) connection or a dial up connection for connecting to the WL2K Telnet Server via the Internet. The full time connection is recommend for minimal latency but a dial on demand mechanism is also available for dial up only connections.

If you select a dial up connection option a list box of your pre-setup phonebook entries, the disconnect button and the dial up timeout box will be visible. Your phone book entry should already be setup (for normal internet access) and should be configured to dial and log in to your ISP automatically. If you have multiple phone book entries select (highlight) the one you wish Telpac to use. The dial up timeout is the maximum number of seconds to wait for establishing a dial up link. A delay of longer than this will disconnect the user's packet port after a brief message.

You can initialize the TNC by clicking the Initialize menu item. This will take several seconds depending on the TNC and baud rate. An initialization form will show the progress and should close automatically if successful. If initialization fails try other communication parameters and make sure the TNC and computer are connected by a proper cable (Including RTS and CTS signals) and the TNC is set for the matching comm parameters. A successful initialization will result in the display of the main menu below. If you click Cancel on the menu it will show the following form but the TNC is not initialized and connections to the Telpac gateway *through the TNC* cannot be made. After a successful initialization the next time you start Telpac the TNC should initialize automatically. If you have difficulty with the TNC initialization or TNC restoration you can check the Initialization Log checkbox in the debug aids of the main menu so you can log all responses by the TNC to the .aps and .apr files. If you are unable to get the TNC to initialize and have trouble interpreting the responses from the Log file send me a copy of the log file and I may be able to help. (but remember I am a volunteer and I don't have every TNC ever made!).

Finally customize the banner file by modifying the file EXAMPLEbanner_1.txt in the installation directory. This file is your welcome sign-on banner and should include some ID and basic keyboard instruction. You can include your grid square as in the example but it is not required. DO NOT use any other brackets such as “{“ or “[“ in your sign-on banner file as they can confuse certain BBS formats. Try and keep your banner short...one or two lines is best. Save your modified banner file as banner_n.txt in your installation directory where n is the instance number (1 for simply one instance).

This completes the Setup and file customization for Direct Modem Control.

3 Setting Up Your Telpac Beacon For APRS Display Compatibility

Whether you use the AGWPE engine or use a Beacon text in your TNC.aps file it is desirable to “announce” your Telpac gateway in a consistent way that conveys important information about the gateway. If you are *not* using the Automatic APRS reporting described above the following is suggested by Bob Bruninga, WB4APR. This format beacon text is compatible with APRS and will display your Telpac node and info on the real time APRS or UI-View display.

```
!DDMM.hhNWDDMM.hhWaPHGphgd Telpac on 145.01MHz
```

Where:

- ! is the format identifier for an APRS position report
- DDmm.hhN is the latitude (N or S)
- the "W" as the separator between the LAT and LONG is the "W" letter which will be the overlay character on the symbol.
- DDDMM.hhW is the longitude (E or W)
- "a" is the unique APRS symbol we have chosen for this use. It is a blue diamond on a white background with a red ring around it and with the overlay "W" in the middle.
- PHG is a format flag for the following four "phgd" values as described below.

SELECTING YOUR PHGD CODE VALUES

PHG Code:	0	1	2	3	4	5	6	7	8	9	Units
Power:	0	1	4	9	16	25	36	49	64	81	Watts
Height:	10	20	40	80	160	320	640	1280	2560	5120	feet
Gain:	0	1	2	3	4	5	6	7	8	9	dB
Directivity:	omni	45	90	135	180	225	270	315	360	empty	degrees

Height is the Height Above Average Terrain (the height of your station's antenna as it relates to the average height of the terrain...this is not ASL or altitude above sea level)

3.1 Example APRS Compatible Beacon using AGWPE

This is an example of a beacon file for AGWPE port 1.

```
1 BTEXT !2814.10NW08040.25WaPGH7260 Telpac on 145.55MHz
1 EVERY 10; Beacon port number 1 every 10 minutes
1 TO APWL2K; Destination of APWL2K
1 VIA RELAY; Using this Digi RELAY
```

The above will beacon to APWL2K via RELAY every 10 minutes the Telpac gateway call sign KN6KB-10 at 28 Deg 14.10 Min N, 80 deg, 40.25 min W With the APRS “a” icon (Winlink) from a transmitter with 49 watts, 40 ft Ant height, 6 dB gain, omni directional. For the Telpac station to *also* operate as a digi you must also setup and run another AGWPE application such as AGWDigi or Digiplex.

3.2 Example APRS Compatible Beacon using a KPC3.aps file for direct TNC control.

```
BEACON EVERY 10 ; Beacon every 10 minutes
BTEXT !2814.10NW08040.25WapGH7260 Telpac on 145.55MHz
MYALIAS RELAY; Enables you to digipeat with alias of RELAY
DIGIPEAT ON; Enable digipeating with alias RELAY
UNPROTO APWL2K VIA RELAY; Destination and path for beacon
```

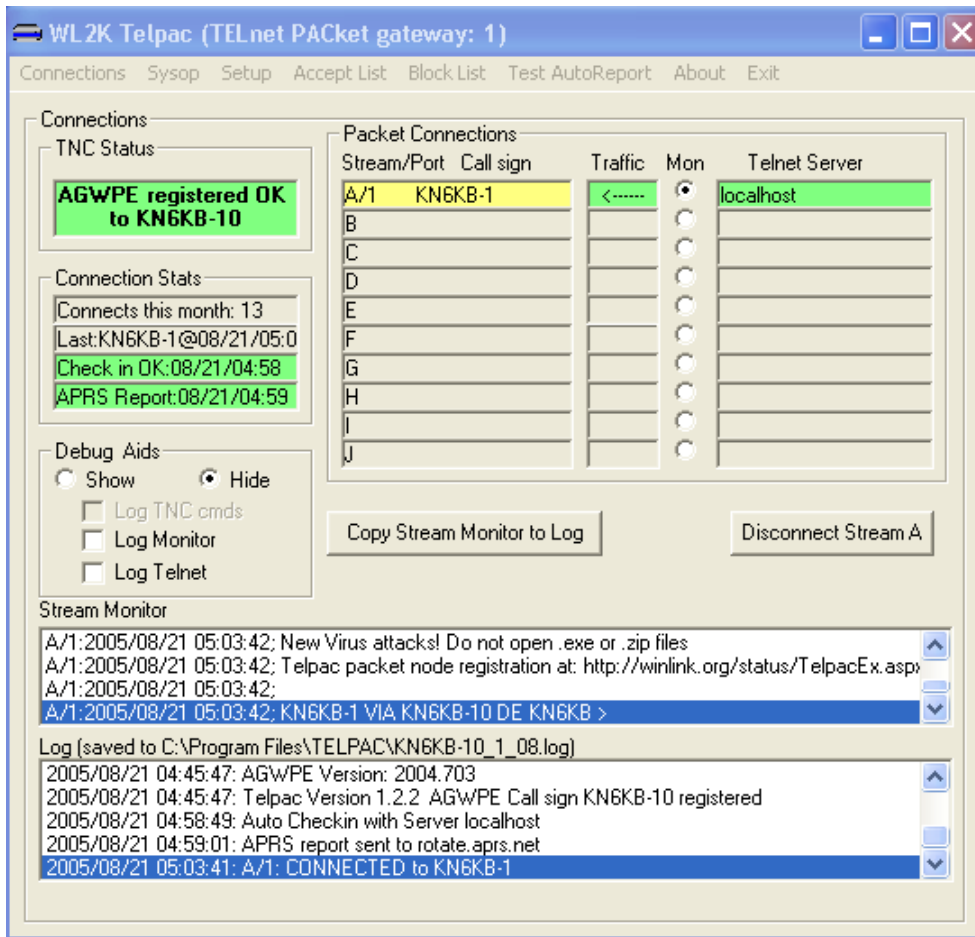
The above will beacon to CQ via RELAY every 10 minutes the Telpac gateway call sign KN6KB-10 at 28 Deg 14.10 Min N, 80 deg, 40.25 min W
With the APRS “a” icon (Winlink) from a transmitter with 49 watts, 40 ft Ant height, 6 dB gain, omni directional. The Telpac station will also operate as a digipeaters with alias RELAY.

Local conventions may use other unproto destinations e.g. “CQ” vs APWL2K and other digis (e.g. the Local LAN digi instead of “RELAY”). The above suggestions should work in most cases but consult someone familiar with your local Packet LAN and APRS operation if in doubt.

4 STARTING Telpac

You can start the Telpac program by using the Windows Start, Programs, Telpac or by double clicking the Telpac Icon in the installation directory. You can of course put short cuts to start the program on your desktop or startup directories. If you are using AGW Packet Engine the recommend way is to have the Packet Engine start Telpac automatically after the Packet Engine has initialized.

The following menu is the normal operating menu. It shows the TNC Status and comm port and all active connections to the Telpac gateway. The right side shows all the connections (Up to 10 depending on your settings for Max Streams) . When a connection is active it’s Stream (A-J), Port number (1-20) and call sign of the connecting station is shown and the background becomes yellow. The traffic indicator shows the direction by arrow and color of the last packet sent to or received by the connected station. For each stream there is a “radio style” selector button for monitoring. When selected, new traffic for that stream will be shown in the monitor window. If the monitor radio style button is selected on an active link the manual disconnect button will be enabled. This allows a sysop to force a disconnect after answering YES to the confirmation request . The left most character in the monitor window shows the stream (A-J) and will be capitalized for data originating from the Telpac gateway and lower case for data originating from the remote connected station. The second number is the port number (1-20). The right hand column identifies the active Telnet server being used for each connection. Normally these would be the primary server unless the primary were not available or has reached its maximum number of connections.



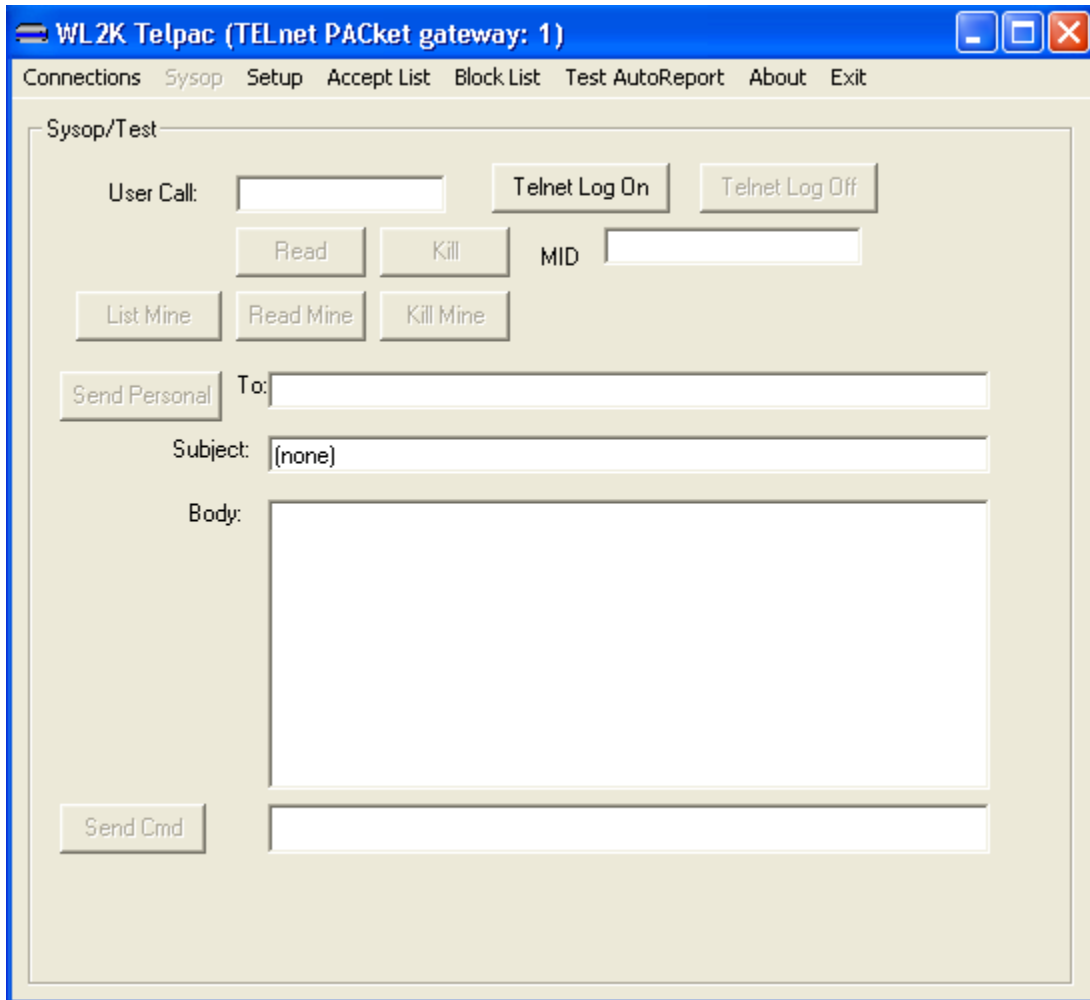
The radio buttons in the Debug Aids frame show or hide the telnet monitor window. There is one telnet monitor window for each connection. If using AGWPE this also enables or disables the AGWPE monitor window. These are primarily for debugging and are normally kept hidden. You may want to operate with them visible for a while to get a better idea of how the system works. The Telnet monitor for the Sysop is never hidden. If you are having a problem with TNC initialization you can check the Initialization Log option in this frame. This will add the command sent to the TNC and the TNC response to the log that may be helpful in debugging your .aps file.

Connections and Disconnections (showing connection paths and local time) are always saved if logging has been enabled. The monitor window is *not* logged. If you wish to capture a particular monitor window to the log (for later analysis) click the “Save Stream Monitor to Log” button. A new log file is created every month and can be found in the installation directory.

The menu selections across the top are used to view other forms. We have already covered the setup form. Selecting Sysop will bring up the sysop command form.

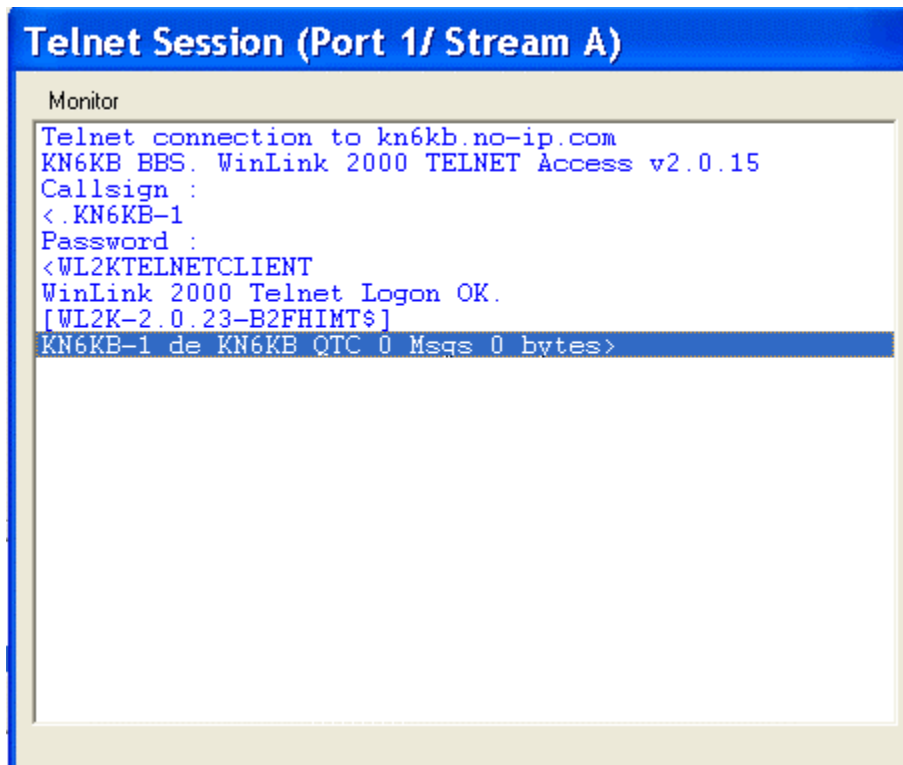
This following menu is used to allow the sysop to send and receive basic keyboard commands and can be used to send and receive simple messages to a WL2K, FBB or JNOS Telnet server as well as test the system. It is included for testing purposes and *not*

intended to be a full function Telnet terminal. The User Call text box is the call sign used to connect and send the request. Normally this would be your own call sign (with appropriate –SSID if required). For security there is limited capability if the user call is not equal to the Gateway call sign. Once a call sign is entered the Command buttons ListMine , and Read will be activated. Commands Read and Kill require the specific MID (Message ID) for the message being read or killed. Command button Read Mine will read all pending messages. Command button Kill Mine will ask first for confirmation and then mark all read messages delivered. For non WL2K Telnet servers these buttons are de activated and all communications is done via the command field at the bottom of the form.



To read a specific message, enter the Message ID (MID) *exactly* in the MID text box (case insensitive) and click R. All messages and replies can be read in the Telnet session monitor window below.

Note the Telnet Session window will show “sysop” or the Port and Stream ID of the connected packet channel.



When using a WL2K Telnet server to send a personal message to a user of WL2K or an Internet address enter the destination(s) in the To text box of the Sysop/Test frame above. These can be radio calls or Internet addresses. For multiple destinations separate each with a “;” or a “,”. Internet addresses *MUST* be preceded by “SMTP:” (case insensitive) to positively identify them from the similar syntax H routes used in packet.

For example the To address:

W4ABC;SMTP:JohnDoe@aol.com

Would address the message to:

Radio call: W4ABC (W4ABC must be known to the WL2K system!)

And Internet address: JohnDoe@aol.com

An important note about addresses! ...Close doesn't count! Incorrect addresses will result in a bounce message to you. To be delivered a call sign must be **known** to the system (that call sign is a registered user of WL2K). If you have questions about routing contact the author. If you send a message and receive a “bounce” reply stating the message could not be delivered it is probably due to one or more of the following:

- 1) *The radio user addresses is not registered with WL2K. Users **MUST** first connect to a WL2K Radio port (packet or Pactor) to be automatically registered.*
- 2) *The call sign or email address was misspelled. Close does not count! The letter “O” is not the same as the numeral “0”.*

- 3) *There was no “SMTP:” preceding the Internet email address. Be sure to include the colon.*
- 4) *There was no such Internet address or the syntax was incorrect.*

Continue filling in the Subject for the message and the message body. When ready to send click the SP button. The Telnet Server should reply in a few seconds with the MID and indicate acceptance. Normally Internet mail is delivered to the destination mail server in a few minutes. Mail to radio users will be available within a few minutes on other Telpac Gateways and for conventional WL2K PMBOs .

Functions SP (SendPersonal) and K (Kill) are not operational unless the User Call = the Telpac gateway call (ignoring any –ssids). This prevents accidentally marking a message read or sending a message as a different user. The List Mine, Read, Send Personal, and Kill buttons are all disabled on non WL2K Telnet Server connections. On FBB or JNOS Telnet servers the sysop menu only communicates through the Send Cmd text box. You can click either the button or use Enter to send a command from the Send Cmd text box.

If you are using the Sysop menu to connect to a FBB or JNOS Telnet server you will be required to enter a password and send commands appropriate for those servers. Normally the password required is unique for each call sign and H or HELP will give you a list of commands. This is an added feature of Telpac but please contact the Sysop of the Telnet server directly about details of the FBB or JNOS Telnet servers.

Clicking the Accept List Menu will bring up the following menu which allows limiting connections ONLY from specific calls.



Call signs can be added or deleted from the list that has no practical limit to size. The accept call sign will work for all –ssids of a call. E.g. W1ABC above will also allow connects by W1ABC-n where n is any legal ssid number. The accept list menu will *not* be enabled if there are *any* call signs entered in the Block List (below). The Accept and Block Lists are exclusive. An empty Accept List will accept connects from any call sign that is not in the Block List.

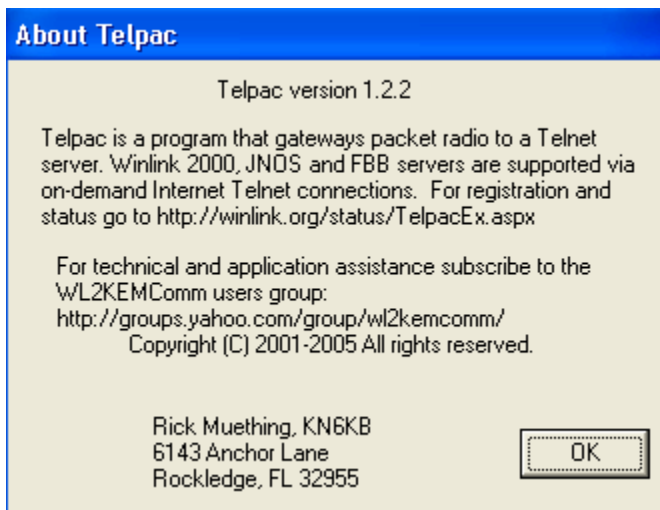
The Block List menu operates in a similar fashion but call signs on the list are blocked from connecting. The following is a typical block list entry.



Call signs on the Block List will also block any –ssid of a call. Note the Block list will not be enabled if there are *any* entries in the Accept List. An empty Block List will NOT block any call signs from connecting.

If a call sign is blocked from connecting by either the Accept or Block Lists a short message is sent to the connecting station indicating the Telpac gateway is not available and then a disconnect is issued after 5 seconds.

Clicking the About item on the main menu will bring up the following about box for the Telpac software which shows the version number and names of the authors of the software.



Finally the Exit menu entry will prompt for a confirmation before ending the program.

5 Special Considerations with Multi-port TNCs:

If you are not using AGWPE multi port TNCs may be used as either single or multiple ports. This normally requires setting the MAXUSERS parameters for the appropriate ports in the .aps file. Setting a MAXUSERS port to 0 will disable that port. Telpac will support a *total* number of connections identified by MaxStreams on the Setup menu provided you have appropriately set up MAXUSERS.

Example for a KPC9612 (two port TNC)

In the .aps file for the KPC9612

MAXUSERS 8/4 ; will set the max users for 8 on 1200 baud and 4 on 9600 baud

On the Telpac setup menu:

MaxStreams = 10

This will allow a maximum of 10 *total* connection streams which can contain no more than 8 1200 baud and 4 9600 baud connections.

6 Multiple Instances

Multiple instances of Telpac can be run on the same computer. This is done by including a parameter instance number with the launch of the Telpac program. If the program is launched without an instance parameter, number "1" is assumed. This can be seen in the above menus where "1" is displayed in the menu caption. For example from the run prompt, typing "Telpac.exe 2" will launch a second instance. You can also include the instance number in the Target line of a shortcut or for launching from the Packet Engine. For each separate instance you will have a completely independent setup (call sign, TNC parameters, log file, etc). Each instance must of course refer to a different Comm Port and TNC/radio when you are using direct modem control. Also each instance must have its own .aps file and own sign-on banner file. For example the filenames for a KAM TNC aps file for instance 2 would be KAM_2.aps. The sign-on banner for instance 2 would be the file banner_2.txt .

Running multiple instances with AGWPE is also possible but each instance must use a different gateway call sign so it can be independently register to the Packet Engine. Each Instance must also reference a different AGWBeacon file. You can use a – ssid to distinguish call signs in this case. Normally of course the AGW Packet Engine has access to all available TNCs so multiple instances using AGWPE should rarely be needed unless you are supporting multiple types of Telnet servers. Only one type of Telnet server (WL2K, FBB, or JNOS) can be supported with each instance.

Up to 10 instances can be running simultaneously if there is sufficient memory and horsepower in your computer. There is a protection mechanism to keep from running multiple copies of the *same* instance number.

7 Testing

Once all setup is completed you are ready for testing. Initially you can test using the Sysop/test frame to send a simple message and view any pending messages.

Testing on the air requires the ability to connect to the Telpac gateway via another packet station. If possible try this first without using intermediate digipeaters. The connection can be made in either a keyboard mode (with a simple terminal program at the remote packet station) or in BBS mode with a full FBB compatible BBS similar to AirMail, Paclink, WinPac or FBB. Once connected the remote station should receive the logon message from the Telnet server,

8 Keyboard Connections:

From the remote station typing H or HELP should send the help file of the Telnet server station. Typing I or INFO should send the information file. Other commands for WL2K Telnet servers are:

LM or LISTMINE list all the *unread* messages for the remote call.

R <mid> will read the specific message with ID mid from LM listing above.

K <mid> will mark the specific message read (not actually deleted).

SP address(es) will send a new message. The remote station will be prompted for subject and message body.

B, BYE, QRT, LOGOFF commands from the remote station will disconnect the link.

The link will be disconnected automatically from the Telpac gateway if the connection exceeds the timeout limit. Details of the commands are listed in appendix C.

9 BBS<>BBS Connections:

The real power and capability of Telpac is only realized in direct BBS<>BBS connections. This includes support for automatic forwarding and for compressed binary transmission and the advanced WL2K B2F protocol which allows attachments. The protocol uses the standard FBB compatible format where the actual protocol selected is negotiated based on the highest protocol mutually supported by both link participants. Normally connections using B2F protocol level (AirMail packet default) is desired since it permits the highest functionality. Appendix D shows some examples of simple BBS <> BBS forwarding via Telpac.

10 Logging

If logging is enabled (checked in setup form) all call signs, connects and disconnects are logged with date and local time for all streams. Logging occurs even if a stream is not selected for viewing in the monitor window. Actual message content or results from Keyboard commands are *not* logged. Log file names have a name that identifies the Gateway call sign, instance number and month. For example:

KN6KB_1_04.log is the name for Telpac gateway KN6KB Instance #1 for April. A new log is started every month and the previous month's log is left for the sysop to archive. Appendix D shows a typical log example.

11 Questions and Troubleshooting

The Telpac software has been tested by the author and several beta testers and there are over 700 successful installations but there are literally thousands of combinations of operating systems, TNCs, control files etc. Like any program there will be bugs and reporting them will help improve the reliability of the program for everyone. I can give you better support if you are using the latest version of Telpac (always available from the Winlink.org web site). To date the most problems have occurred when trying to use Win 95 and that operating system is not recommended. You *may* be able to get Win 95 to work if you have upgraded it to WinSock 2 upgrade for Windows 95; and Windows Common Control 5.0+ upgrade for Win 95/98/2000. If you have a problem be sure and completely describe your setup (Operating system, TNC etc) and identify which revision of Telpac you are running. If you are having a problem with TNC initialization check the LOG option in the debug aids and send a copy of your .aps file and your log file to the author. If there is something strange in a connection enable the monitor for that connection, click the Save Monitor to Log button and send the log file for analysis. If you get a run time error try and see if you can duplicate the conditions that cause the error and send the error report (the exact message in the error box or a screen capture of the error box). Send your questions and comments to rmuething@cfl.rr.com. Thanks for your interest and feedback. It is recommended you also consider subscribing to the WL2KEMComm user group at <http://groups.yahoo.com/group/wl2kemcomm/> where you can communicate with the author and other experienced Telpac users.

12 References:

You can learn about and join the WL2KEMComm users group by going to:

<http://groups.yahoo.com/group/wl2kemcomm/>

An overview and history of the Winlink 2000 system:

Winlink 2000...A Global Ham Message Transfer and Delivery Network;
Rick Muething, Vic Poor, Hans Kessler, and Steve Waterman. 19th ARRL and TAPR
Digital Communications Conference, Sept 2000.

<http://www.winlink.org/>

Telpac and Paclink – Streamlined AX.25 Packet Server and Client for a Full Service
Ham Radio Messaging Network; Rick Muething KN6KB and Vic Poor, W5SMM
22nd TAPR/ARRL Digital Communications Conference, Sept 2003

<http://winlink.org/News.htm>

TELPAC- Winlink 2000's New Telnet Packet Bridge; Rick Muething, KN6KB
QST Magazine Vol. 87 No. 10 October 2003

<http://winlink.org/News.htm>

Current Listing of WL2K Telpac gateways showing location and details of each gateway.

<http://www.winlink.org/status/TelpacEx.aspx>

Real time status display of all Telpac gateways that are auto reporting.

<http://winlink.org/status/TelpacStatus.aspx>

Real time map display of all Telpac gateways Auto reporting to the APRS system.

<http://findu.com/cgi-bin/symbol.cgi?icon=Wa>

Telpac and Paclink in Emergency communications. Links to other groups and
organizations using Telpac and Paclink in various emergency networks.

<http://winlink.org/Emergency.htm>

AirMail, a radio E-mail client program by Jim Corenman, KE6RK.

<http://www.airmail2000.com/>

The AGW Packet Engine by George Rossopoulos, SV2AGW

<http://www.raag.org/sv2agw/pepro.htm>

A good tutorial on using the Sound Card TNC with AGWPE by Ralph Milnes, KC2RLM

<http://www.patmedia.net/ralphmilnes/soundcardpacket/>

13 Appendix A. Basic Setup for AGWPE or Packet Engine Pro

Download the following files from the AGEPE web site

<http://www.elcom.gr/sv2agw> or <http://www.elcom.gr/sv2agw/pepro.htm>

Click the download label and download the following. Save to a temp directory.

AGWPE.zip This is the basic AGW Packet engine with documentation. You do NOT need the driver files or any other files to use this. This is the “free” version that will work fine with Telpac but is more difficult to set up than the PE Pro. Also this version will not support the Baycom modems on Win 2000 or Win XP where the PE Pro will

Or

pepro_setup.zip This is the professional version and is easier to setup and includes support for more modems. It can be used free for 30 days and is \$49USD after that for registration.

AGWTERMTCP.zip This is a simple terminal application that can be useful in testing and debugging. It is NOT required for actually running Telpac.

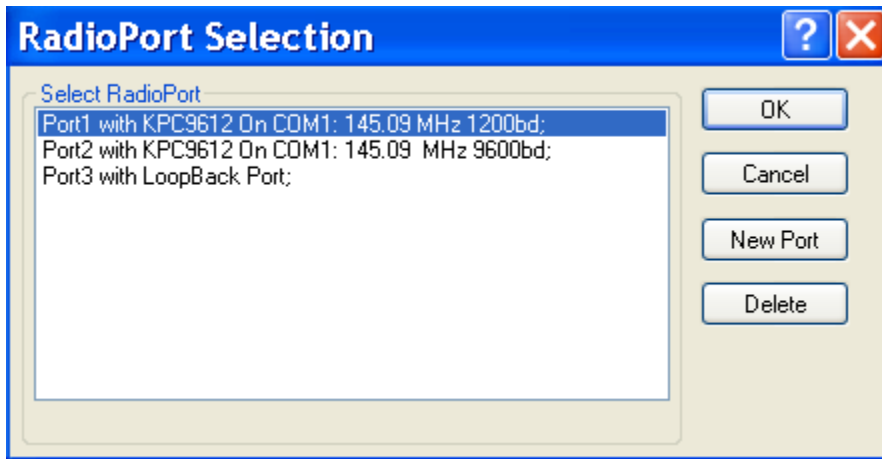
AGWMONITORTCP.zip This is a useful program that will monitor all port activity without interfering with any other AGWPE application. Again NOT required for actually running Telpac.

Extract the AGWPE.zip or pepo_setup.zip to a working directory. (e.g. C:\AGW). This will place all the required files in the working directory. For the PE Pro you will have to run the setup program to do the install.

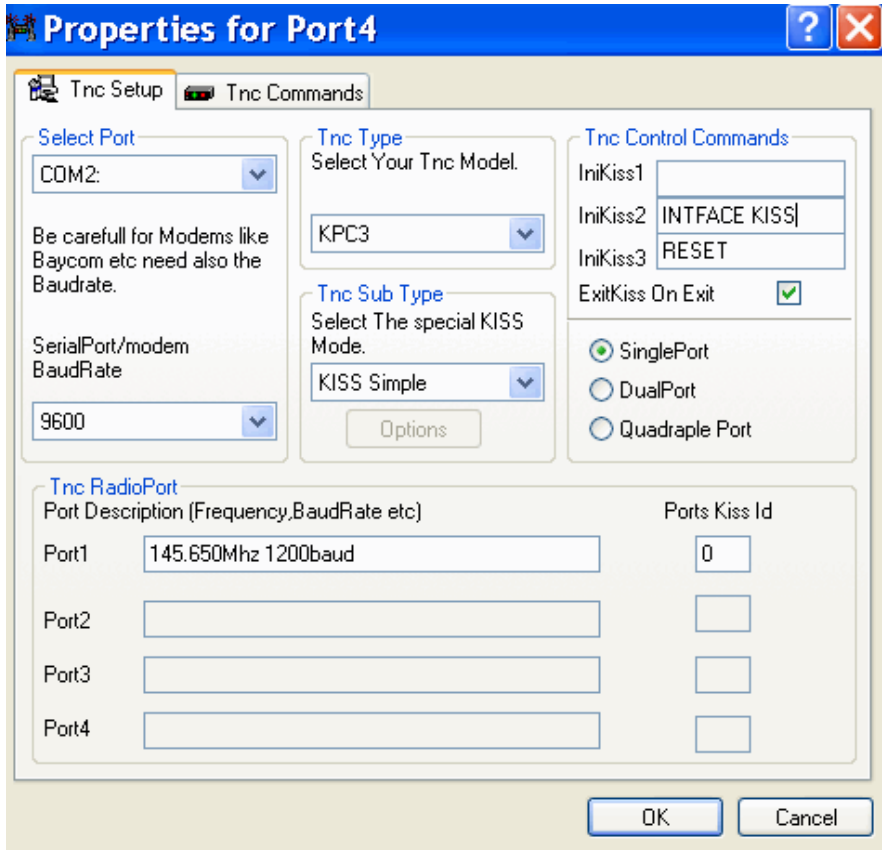
Likewise extract the terminal utility and monitor programs (recommended) to their own working directory.

You should know which type of TNCs you plan to use and which comm Ports are available before you setup AGWPE. You also must have TCPIP protocol enabled for your machine (though you do not actually need an external IP connection to run AGWPE.) It is also very helpful to have the TNC manuals to verify the commands to enter KISS mode.

Now start AGWPE.exe it should bring up the accept license and then initialize. You should see a small icon for AGWPE (towers with packet controller). Left or right click on it and select Properties. You will get a pop up like this (but initially it will have no ports). The screens for the Packet Engine Pro look slightly different but perform similar functions.



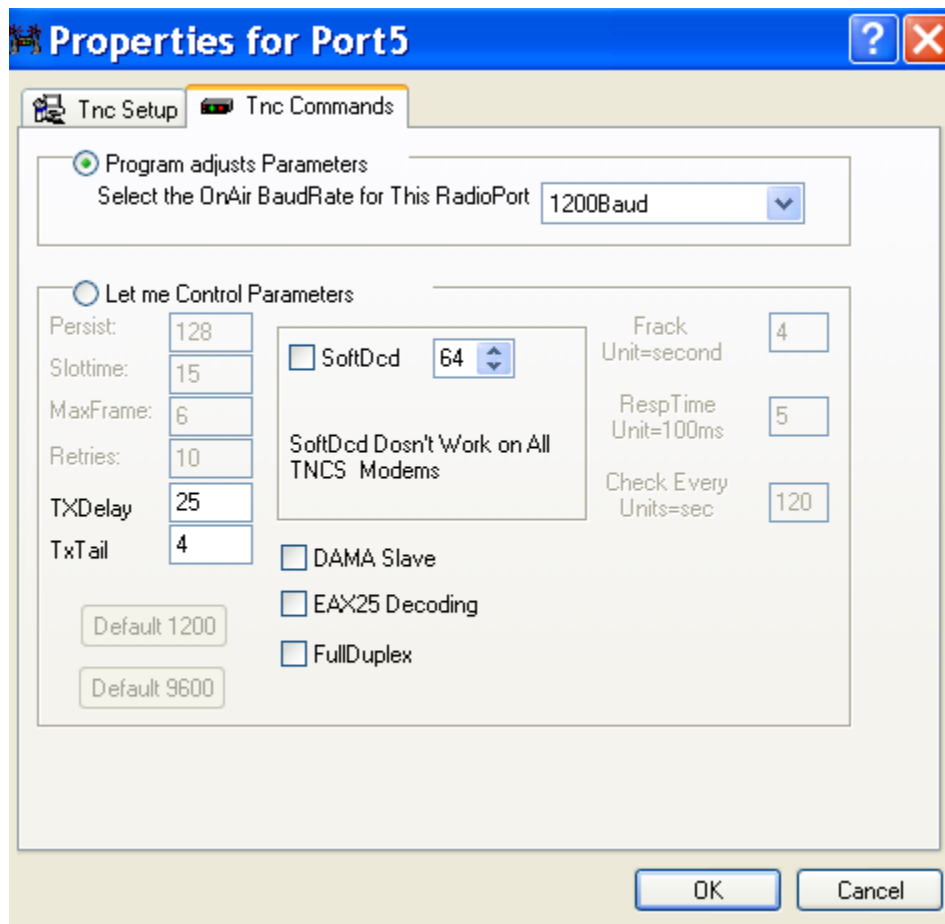
Select New Port. You will get a pop-up then click OK.
 The next menu will have two tabs as shown below. The first is the Tnc Setup tab:



Select the comport, baud rate, and TNC model. The program will default the settings for Tnc Sub Type, Tnc Controls, Single/dual port and TncRadio Port. You can change these if necessary. [Note the setup abovewhich I found works for the KPC3 is *DIFFERENT* in the IniKiss2 line from the default.....This may save you some time! I strongly suggest you consult your TNC manual on how to put the TNC into KISS mode and which (if any) variations of KISS are supported. Make sure the required KISS mode

entry sequence is correct in correct in IniKISS1, 2 and 3 in the menu above. I also suggest checking ExitKiss On Exit. Finally customize the Port Description for your setup (usually frequency and on-air baud rate). This is used by the Telpac program for port info.

The second tab is the TNC commands tab as shown below. This should default to the common setup parameters that should work for most radios and installations. You can change parameters here. Important note (again from experience!) if you are running your radio open squelch (software carrier detect) be sure and check the Soft Dcd checkbox. Some radios may require longer TXDelay or TxTail delays but many modern data radios will work with shorter delays yielding slightly higher throughput. If in doubt consult your radio and TNC manuals or ask a local packet Guru. Finally click OK. You will be prompted to restart the AGWPE. I recommend doing this after adding each new port. All that is needed for Telpac is one operating port but multiple ports can be used if desired. This completes the AGWPE basic setup.



14 Appendix B: Testing and debugging the AGWPE setup.

This is a very short tutorial on testing the AGWPE/TNC setup. You should also check the AGW web site and possible support groups for help.

Like all programs involving complicated software and hardware going in simple steps verifying each piece is usually better than trying everything new at once. You will find that setting up Telpac is much easier if you have already confirmed that the AGWPE is installed, running and communicating with the TNC. It is also very desirable to also verify that you can actually connect to another packet station and monitor packet activity via your Radio, TNC and AGW Packet Engine *before* trying to activate Telpac.

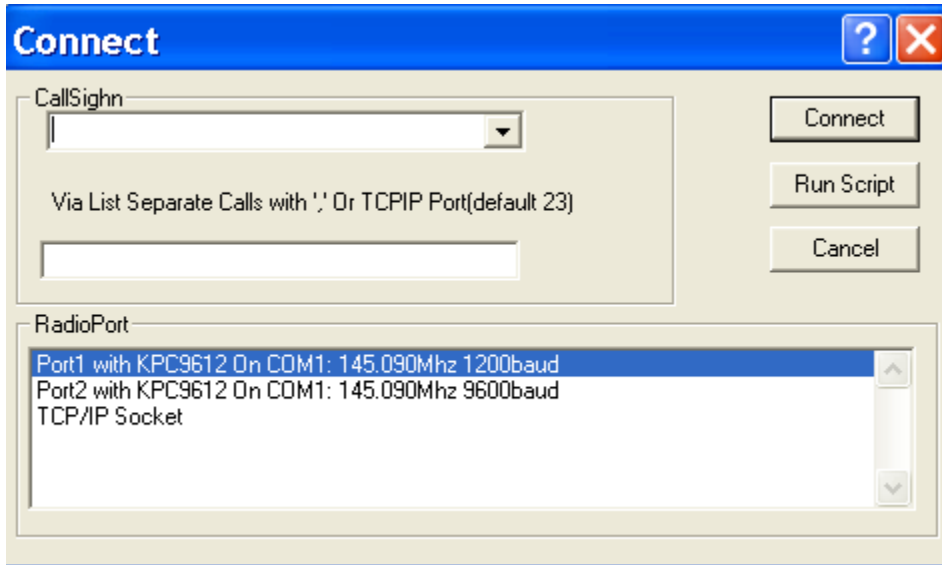
One way I found to do this that was helpful is to install the following utility application:

AGWTERMTCP.zip from the AGW web site. Make sure you get the TCP version of this since Telpac is also using a TCP connection to the AGW Packet engine.

There are some read me and help files associated with this application. Unzip them to working directories (e.g. AGWTerm) . This is really a quite simple to use program but it may be helpful to read the help and read me files.

The first test is just to insure the AGWPE is up and running and communicating with the application. First make sure your TNC is in a standard Terminal mode interface (not KISS or HOST mode and is set up for the fixed serial port baud rate you set up in the AGWPE port setup (see appendix A). Now start AGWPE.exe or Packet Engine Pro (after setting up as described in Appendix A). You should see the little AGW PE Icon and one or more TNC icons in your tray.

Now start the AGWTerm.exe program. Click the file properties and set up your call and which packets you want to monitor. Now try and connect to a station. Click Actions, Connect and you should see a pop up similar to this:

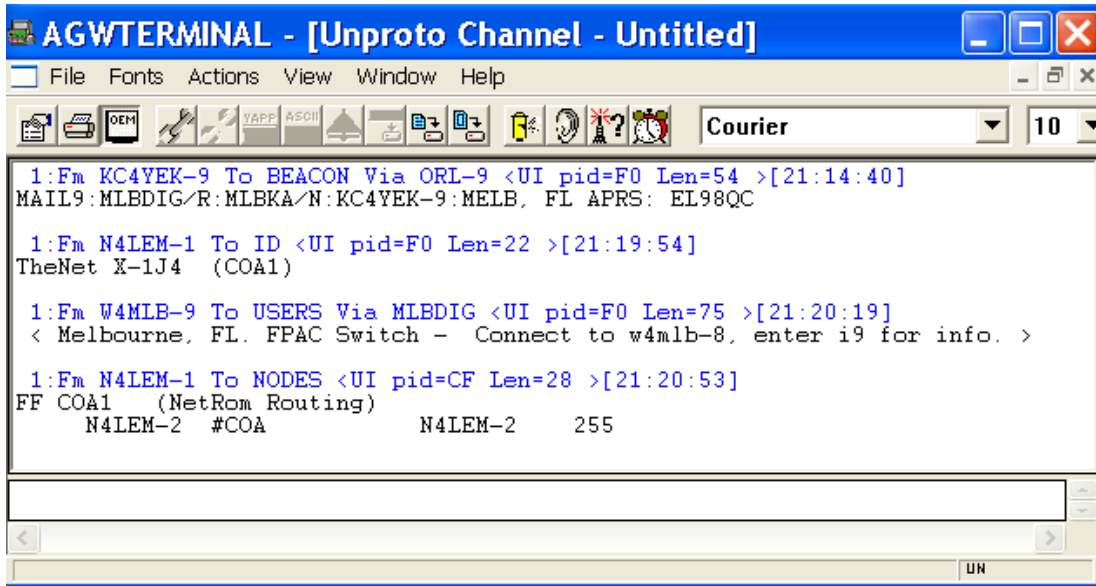


Select a port, (if multiple), enter a call sign and click connect. You should see the TNC key the radio and the radio should transmit the connect request. If possible try and connect to a local BBS or fellow ham. This will verify that the TNC, Radio, and AGW Packet engine are working properly. If you can't get the TNC to key the radio there is something wrong in your setup...probably setting up the KISS mode or an error in the serial port setup. Get this to work before trying anything else...it is fundamental! Experience suggests that most operating problems center around getting the TNC in KISS mode. If it doesn't transmit or monitor try using a dumb terminal and resetting the TNC to normal command mode before starting AGW PE. Also use your TNC's manual to check the commands and sequence for forcing the TNC to KISS mode and double check those in the AGWPE Tnc Commands menu.

If you get a connection to a local packet station and can exchange some keyboard data your are 90% of the way there!. You may experiment with the Mike gain and or the radio audio levels to get the most optimum copy. You may also want to experiment with other TNC parameters to optimize the TNC radio setup.

Once you establish that the TNC is actually talking with the Terminal application through the Packet Engine you can go ahead with the Telpac setup. Just make sure you use different call signs (or -ssid) for each application you are running at the same time.

The AGWTERMINAL or AGWMONITOR can be left running to monitor all the packet activity flowing through all the ports. Below is an example of some basic packet monitoring. Since the monitor program does not send data or make a connection there is no call sign "registered" to AGW PE and therefore no chance for a call sign conflict with Telpac or another application.



The screenshot shows a window titled "AGWTERMINAL - [Unproto Channel - Untitled]". The window has a menu bar with "File", "Fonts", "Actions", "View", "Window", and "Help". Below the menu bar is a toolbar with various icons for file operations and system functions. The main area of the window displays a list of messages in a terminal font (Courier). The messages are as follows:

```
1:Fm KC4YEK-9 To BEACON Via ORL-9 <UI pid=F0 Len=54 >[21:14:40]
MAIL9:MLBDIG/R:MLBKA/N:KC4YEK-9:MELB, FL APRS: EL98QC

1:Fm N4LEM-1 To ID <UI pid=F0 Len=22 >[21:19:54]
TheNet X-1J4 (COA1)

1:Fm W4MLB-9 To USERS Via MLBDIG <UI pid=F0 Len=75 >[21:20:19]
< Melbourne, FL. FPAC Switch - Connect to w4mlb-8, enter i9 for info. >

1:Fm N4LEM-1 To NODES <UI pid=CF Len=28 >[21:20:53]
FF COA1 (NetRom Routing)
  N4LEM-2 #COA          N4LEM-2    255
```

Finally (again from experience) once you have a working setup go into the AGWPE working directory and copy these files to a backup directory:

AGWPE.INI and PORT0.INI, PORT1.INI etc. If you later have a problem and get the AGWPE miss configured you can copy these files back to get you back to easily return to your working configuration.

15 Appendix C: Winlink 2000 Keyboard Command details

Keyboard commands (Pactor, Packet, Telnet Server, and Telpac) commands:

H or HELP gives you the station Help file

I or INFO gives you info about the system features and specifics about this WL2K station.

LM or LISTMINE lists all traffic *pending* for your call.
Shows MID, date, size, from and subject.

K or KILL <MID> e.g. K 1234_KN6KB Marks the pending message delivered.
Message may still be read for 3 days.

B, BYE, QRT, LOGOFF, or LOGOUT Forces a disconnect of the link.

The following commands available only via Packet, Telnet Server or Telpac connections (not HF)

R or READ <MID> e.g. R 1234_KN6KB Read the specified MID.
Only MIDs addressed *to* your call, bulletins, or *originated* by you may be read.
No attachments.

RM or READMINE will read all unread messages for the connected call sign.

SP or SENDPERSONAL <Destination(s)> Send a personal text message to the destination(s)

indicated. Destinations may be a Radio callsign or "SMTP:<email_address>"

Multiple destinations should be separated by ";" or "," e.g.

SP W4ABC;KC4YEK;SMTP:JohnDoe@aol.com

Important!!! Be sure to include the "SMTP:" to preface any normal E-mail address.

You will be prompted for a subject of the new message:

And then prompted for the message body:

For the message body enter any text. Use CR for multi-line. End with /EX on a separate line.

No attachments.

Acceptance of the message by the system will be confirmed.

If Winlink cannot deliver a message (addressing error, user not known, no BBS or Hroute tokens for forwarding) you will receive a bounce message.

16 Appendix D: Example log of FBB Level B2F forwarding

(most binary data deleted for improved readability)

```
1/A: CONNECTED to KN6KB-1 @ 1/6/2003 5:03:52 PM
1/A: KN6KB Winlink 2000 Telpac gateway. Rockledge, FL (EL98pf)
1/A: Type H for Help, I for Info
1/A: Telnet Connect to kn6kb.no-ip.com @ 1/6/2003 5:03:52 PM
1/A: Telnet Logon to kn6kb.no-ip.com OK!
1/A: [WL2K-2.0.23-B2FHIMT$]
1/A: KN6KB-1 de KN6KB QTC 1 Msg 466 bytes>
1/a: [AirMail-3.1.902-B2FHIM$]
1/a: ; KN6KB de KN6KB-1 (EL98oh) QTC: 1 139 127
1/a: FC EM 1697_KN6KB-1 139 127 0
1/a: F> E1
1/A: FS Y
1/a: REQUEST
.
.
.
1/a: % ;hBg\
1/a:
1/A: FC EM SMTP3711952 466 321 0
1/A: F> 22
1/a: FS Y
1/A: Test message
1/A:
.
.
.1/a: FF
1/A: FC EM 79998_KN6KB 1013 649 0
1/A: F> CB
1/a: FS Y
1/A: JHow to Download and Import a New PMBO Frequency List (CACHED:
NEW_FREQ)
1/A: |
1/A: 3 F)2 ( +6S
.
.
.
[] □B D劔 `(n| H Cd !$1 >Kzn%TJV9*)vKf eqh{Y_A BnOONayN}] Gou7 d
1/a: ; KN6KB de KN6KB-1
1/a: FF
1/A: FQ
1/A: Telnet Disconnect from kn6kb.no-ip.com @ 1/6/2003 5:05:03 PM
1/A: DISCONNECTED from @ 1/6/2003 5:05:04 PM
*****
```

17 Appendix E Using the AGW Packet Engine with Kenwood Built in TNCs.

Three of Kenwood's recent radios contain built in TNCs:

TS2000
D700
D7

Unfortunately these all use the same base TASCO TNC chip that is really intended for simple keyboard or APRS (unproto) operation. These TNCs have very limited buffers (on the order of 200 bytes) that restrict their use in applications requiring full function TNCs. However they *may* be able to be used with some restrictions using the AGW Packet engine (AGWPE or Packet Engine Pro). In general however these built in TNCs are NOT recommended and have proven not to be reliable in typical message environments.

The TS2000 and D700 have the same TNC. The D7 has a different (smaller) version.

To use with the Packet Engine select the radio type (PE Pro) or TNC2 (AGWPE) as the TNC type.

The command sequence for getting the TNC into KISS mode is:

KISS ON
RESTART

Once the TNC is set up on the Packet Engine Port go to properties dialog for the Kenwood tnc Radioport.

.Go to the second TAB [Tnc Commands]

.check the "Let me control Parameters"

Maxframe to 1

Set the Telpac packet length (AGWPE Ports Menu in Telpac to *no higher* than 128

This should probably allow the built in TNC to work with Telpac on 1200 baud. Operation is questionable at best on 9600 baud due to the very limited buffer and lack of flow control on the TNC.