



Sound Card Packet

[Translations of this site](#)

by [Ralph Milnes, KC2RLM](#)

last updated: **06/23/2008** [What's new on the site?](#)

Information on this site is also [available in PDF files](#) (English only)

Most recent AGWPE
version is:

2004.1108 Nov. 8, 2004
(also labeled as version
2005.127)

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This amateur radio web site explains how to use the AGWPE utility program to send and receive packet -- a digital data mode -- using the **sound card** or sound chip of your PC instead of a traditional TNC or radio modem. (TNC = Terminal Node Controller, a hardware device that codes and decodes packet signals.)

The site offers:

- instructions for configuring AGWPE, Windows, and some compatible packet programs
- advice about building or buying a sound card-to-radio interface
- troubleshooting advice

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Overview

The key to sound card packet is a **free** program called **AGWPE**. AGWPE was written by George Rossopoulos, SV2AGW, and is an acronym for "SV2AGW's Packet Engine". It was originally created as a TNC management utility and has many super features of value to TNC users, however, this web site deals primarily with AGWPE's ability to encode and decode packet tones using your **computer's sound card**. AGWPE is the only program that can do this, other than **MixW** ,

[Flexnet32](#) and [MultiPSK](#). AGWPE is particularly valuable since it can act as a "host" program for several good packet "client" programs that do not have sound card packet capabilities of their own but have been written to take advantage of AGWPE.

Advantages of AGWPE: Why use a sound card instead of a real TNC? First of all, it can be much cheaper. You only need a sound card interface, which is a set of cables to connect your sound card to your radio. Interfaces can be made for a few dollars or purchased for as little as \$30-40 US, while the cheapest external TNC costs at least 100 US. And if you use the stereo qualities of the sound card to simulate two TNCs, you could be saving the cost of two TNCs! Other good reasons are that an interface is lighter and less bulky than a TNC and an interface usually requires no external power; a TNC will need some power source.

Another reason is that according to the program author, George SV2AGW, the AGWPE soundcard modem gives better results than a TNC . George says the 300 baud HF modem is so sensitive that it decodes packets you cannot hear; the 1200 baud modem can decode packets even with S3 or less signal strength; and the 9600 baud modem is better than the original G3RUH.

Limitations: To be fair, other users claim they get better results with a TNC; that TNCs are easier to setup; and that TNCs usually have built-in [watch-dog timers](#) to prevent continuous transmitting in the event of an error.

Note that most packet programs will *not* work with AGWPE. Only [compatible programs](#) that have been specifically written to take advantage of AGWPE's host services will work, but there are several good ones.

Hardware Requirements: AGWPE will run in Windows 95, 98, ME, XP, 2000 and [Vista](#). It will *not* run in plain old DOS or Windows 3.1. Some users have been able to run it on NT 4.0.

The sound card features of AGWPE should work with most 16 or 32-bit sound cards (and integrated main board sound chips), although it will not run on all cards (see [compatible sound cards](#)). You should also have the most up-to-date drivers for your sound card.

Generally any Pentium II or newer processor will work with AGWPE. Some users have even used it on a 486, but other users have found it will not run satisfactorily on a Pentium I without MMX. See [More About AGWPE](#) for more information about processor requirements.

Feature Highlights: The sound card option in AGWPE will allow you to:

- Use "on air" baud rates of 300 (HF), 1200, 2400, and 9600. (See

the [Baud Rates and Modes](#) page for additional info about 300 baud SSB operations and 9600 FSK operations.)

- Use the stereo (2 channel) feature of your sound card to [connect to two radios](#) on different frequencies at the same time using just one sound card.
- [Install additional sound cards](#) that can be used exclusively for sound card packet. Your first sound card can then be used by Windows and other sound-producing programs and devices, such as your CD player.
- Use a [Sound Card Tuning Aid](#) feature for accurately tuning signals, particularly on HF, and for setting the correct RX (receive) audio volume.
- [Access AGWPE remotely](#) over a network or the internet!

Setup Steps: Getting AGWPE to work correctly can be tricky, since you will need the radio-to-computer interface with 3 wires and some circuitry, **plus** you'll need to configure three different programs correctly -- Windows, AGWPE, and your packet application. Hence, this web site. (Note that the AGWPE [Help](#) file included with the program is becoming out of date; in some cases it is wrong.)

There are 6 basic steps in getting AGWPE and your sound card to handle packet. These steps are discussed in 6 different sections on this site:

1. Build or buy a radio-to-soundcard interface -- one wire each for RX, TX, and PTT.
2. Install and configure the AGWPE program.
3. Configure your sound card's mixer (audio) settings
4. Configure Windows, if necessary, for TCP/IP use
5. Set up client applications to work with AGWPE
6. Troubleshoot problems - but hopefully this won't be necessary.

If you get hung up, you can [e-mail me, KC2RLM](#). I'll try to answer your questions, but I won't pretend to be the complete AGWPE sound card expert. I am more of a technical writer than a technician. In fact, if you find any errors or omissions on these pages, please [let me know](#). For the best troubleshooting help, I suggest you [subscribe to a special AGWPE Yahoo Group email list](#) to ask for help from other AGWPE users and even the author, George, SV2AGW.

Packet Engine Pro: In June 2003, George SV2AGW released a new program, [Packet Engine Pro](#), based on his original, freeware AGWPE program. The 'Pro' version:

- runs more efficiently
- has an improved interface
- has a setup 'Wizard' that simplifies new sound card (and TNC) configuration
- has several new features, such as Radio Port Sharing and alternative KAM-style tones for HF packet

In addition, the following features will work in PE Pro on Windows XP/2000 systems, but they will not work in AGWPE on a Windows XP/2000 system (they work OK in AGWPE on a Win95/98/ME system):

- PTT can also be controlled with the parallel port in addition to the serial port
- YAM modems are supported
- BayCom/BayPac modems are supported, but only if your computer has legacy serial ports, i.e. non-ACPI compliant serial ports (ACPI is a power management/saving protocol)

[Feature comparison chart for PE Pro and AGWPE](#)

The Pro version costs \$49 US after a free 30 day trial period, and it will work with any program that works with the AGWPE freeware version.

I encourage you to consider the Pro version because:

- it is easier to use and more powerful
- it has features that are not found in AGWPE and may never be added to AGWPE
- your fee supports SV2AGW's programming efforts

You can download the Pro version from the

[AGW Programs page](#)

This web site provides support for the freeware version, AGWPE, but aspects of it may also be helpful for Pro users.

Download This Web Site in PDF files (English Only ... sorry)

You can get all the pages of this "Sound Card Packet" web site in an Adobe Acrobat PDF file. **[Go to the PDF File List page](#)** to select what you need.

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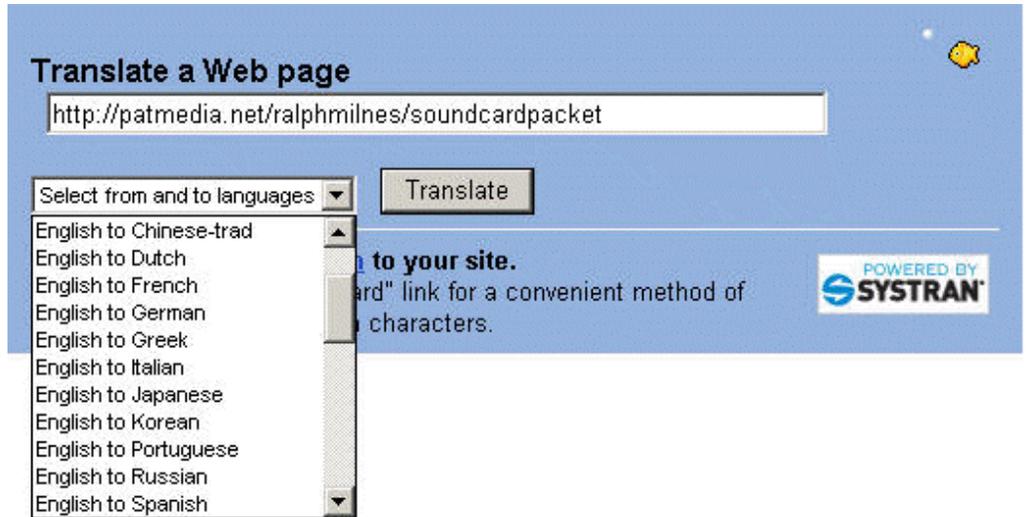
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Translations of this Web Site

- AltaVista has a computerized robot to translate English to other languages, however, it may not provide a very accurate translation. Still, it may provide some general sense of the English. Go to the [AltaVista web site](#) and where it says "Translate a Web page", paste in this URL: <http://patmedia.net/ralphmilnes/soundcardpacket>



- To get a more accurate translation, another option is to ask someone to translate key text for you. Below is a list of volunteers who can translate to other languages.

Français	Traduction de ce site Web en français par Thierry F6BXM: http://f6bxm.free.fr/carte%20son/
Portuguese:	Para mais informações acerca das placas de som e do site contactem por favor: José Bonanca CT1AOS -- jbct1aos@netcabo.pt <-- para o email substitua # com @

If you would be willing to act as a translator, please [email me](#).



Sound Card Packet

You can contact the owner of this web site, Ralph Milnes KC2RLM, at

kc2rlm@arrl.net

Note that the address above is simply a graphic picture and not a text file or hyperlink. You will need to type this address into you email address field. You can not paste it because it is not text.

Text email addresses were removed from this site to try to prevent them from being harvested by spammers.



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What's New on this Site?

Some users have asked that I identify changes to the site to help them determine if anything new is pertinent to them, either on the site or in the PDF file. Note that I'm constantly making minor changes to the site's pages -- correcting typographical errors, re-writing paragraphs to make them more understandable, adding new solutions for problems, etc. So you may see a "last revised" date on a page that does not match the first date below. Note that this list includes only *significant* changes; I continually make minor changes, e.g. URL updates, spelling errors, etc. Also note that the PDF file may not have the most recent minor changes.

- **October 2007** - Finally published updated PDF files (8) that capture the website for printing.
- **July 2007** - Comment about AGWPE and Vista on home page; minor changes
- **September 2004**
 1. Major editing and reorganization of website
 2. Major overhaul of the "[Problems?](#)" pages on troubleshooting
 3. Added and corrected information about [9600 baud operations](#)
 4. Numerous minor deletions, additions and corrections
 5. Added information about configuring the [TCP/IP Over Radio](#) feature
 6. Added "[Tips and Tricks](#)" and info on "[Traffic Parameters](#)"
 7. Added page about interfacing [MixW](#) with AGPWE.
 8. Added option to download parts of [PDF file or complete site in HTML format](#)
 9. Changed primary web site host to former mirror site; not using QSL because of chronic slowness
- **1 June 2004**
Added info on [configuring XASTIR for AGWPE](#)
- **19 November 2003**
Changed URL of mirror site; changed email address for author.
- **6 August 2003**
 1. Changed the page formatting so pages will better fill the screen and the left margin menu doesn't wrap on resolutions

greater than 800x600 (I hope).

2. Minor changes in the "AGWPE on a Network" page

- **3 June 2003**

1. Added info on running AGWPE with [HamScope](#) and [Radio Mobile Deluxe](#).

2. Added information about AGWPE Pro version.

3. Updated the PDF file.

- **13 April 2003**

1. New version of AGWPE released 2003.308

2. Additional cable interface vendors added

3. New troubleshooting fixes added

- **25 Nov 2002**

Changed web site to reflect changes in Version 2002.1120:

1. On AGWPE's [Sound Card Modem/TNC Setup](#) window:

- a. Added switch to stop full duplex use on sound cards

- b. Added switch to change sound card receive sensitivity

2. On AGWPE's Sound Card Tuning window, new [Set Volume](#) button

leads to new [Sound Card Volume Settings](#) window to:

- a. set TX and RX volume of sound card directly (without going

- to Window's Sound Card Volume Control program)

- b. set RX input source (jack) and mute other sources

- c. tell AGWPE to restore previous volume settings on exit

- **7 Oct 2002**

1. Added page explaining [how to interface with AGWPE over a network](#).

- **30 Sept 2002**

1. Added new European vendor of pre-assembled sound card interfaces

2. Revised the instructions for the Windows 95 Winsock2 update.

- **17 Sept2002**

1. Revised the schematic for the PTT circuit: Added "shunt" diode path to protect IC from reverse voltage.

2. Added link to small program written by Roger G4IDE which resets COM port lines to "low" (no voltage) if Windows' incorrectly sets them "high" (with voltage) at startup.

3. Some "problem & solution" additions to the Trouble Shooting sections.

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The file you download is a "zip" file. You need a "zip" program to unzip it. (Windows XP has a built in unzip program or un-compressor.

If you need to download a PDF file reader, [go to the Adobe Acrobat Reader Site](#).

Use the table below to select what you need:

Chapter	File Name	Zip Size KBs	Unzip Size Kb	Updated
Introduction	Intro.zip	123	189	27 Oct 2007
1. Interfaces	Chap1.zip	189	309	27 Oct 2007
2. AGWPE Set Up	Chap2.zip	162	219	27 Oct 2007
3. Sound Card Setup	Chap3.zip	209	274	27 Oct 2007
4. Windows™ Setup	Chap4.zip	32	64	27 Oct 2007
5. Troubleshooting	Chap5.zip	109	203	27 Oct 2007
6. Using AGWPE (Modes, Networking, TOR)	Chap6.zip	430	622	27 Oct 2007
7. Application Setup (WinPack, WinAPR, etc.)	Chap7.zip	514	1328	27 Oct 2007

[PE Pro PDF Help zip file](#)

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AGW Program Downloads

You can download SV2AGW's programs from either this website or SV2AGW's web site. While this site tries to maintain the most current version, SV2AGW's site will surely have the most recent version.

Program	Description	From This Site	SV2AGW's site	Date
AGWPE	The basic, no fee AGW Packet Engine	agwpe2004_1108.zip	AGWPE.zip	23FEB2005
TCP Over Radio Drivers	Drivers for TCP Over Radio feature. us \$28 to run more than 45 minutes at a time	tcpip.zip	TCPIP Over Radio	10SEP2004
PE Pro -- initial installation version	The advanced Packet Engine Pro version for us\$49 after 30 day trial	pepro_setup.zip	pepro_setup.zip	14MAY2007
PE Pro -- version to update previous versions	Update to PE Pro	pepro_update.zip	pepro_update.zip	14MAY2007
PE Pro Help	Help file in .html written by KC2RLM	peprohelp.zip	pehelp.zip	10SEP2004

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AGWTermTCP	A packet terminal program to send and receive	<u>agwtermTcp.zip</u>	<u>AGWTermtcp.zip</u>	14FEB2002
AGWMonitor	A packet terminal program to receive only	<u>AGWMonitor_new.zip</u>	<u>AGWMonitor.zip</u>	20APR2005
AGUIDigi for APRS	Provides digipeater functions; has advanced APRS features such as WIDEn-n	<u>agwuidigi.zip</u>	<u>agwuidigi.zipi</u>	11OCT2006
TF2AGW	LU7DID's program to link AGWPE to F6FBB (versions prior to 7.01b)	<u>tf2agw18.zip</u>	From LU7DID's site: <u>tf2agw18.zip</u>	

For other SV2AGW programs, such as AGWTracker or AGWCluster, go to:

<http://www.sv2agw.com/downloads/default.htm>



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More About AGWPE

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Other AGWPE features

Hardware requirements (processor, RAM, etc)

Compatible Sound Cards

Compatible Packet Programs

Baud Rates and Operating Modes

Background

This web site discusses only the **sound card features** of AGWPE. AGWPE was originally written as a multi-TNC management utility. Before AGWPE came along, a packet device such as a TNC (Terminal Node Controller) or radio modem could only be used by one program at a time. Likewise, a packet program could only use one packet device at a time. AGWPE changed all that. AGWPE lets AGWPE-compatible programs access multiple packet **devices** at one time, and lets a packet device be shared by multiple **programs** at one time.

AGWPE performs its magic by placing TNCs in KISS mode and then taking over responsibility for handling most of the logic functions built into the TNC. The TNC is left to handle just tone modulation/demodulation, or modem, functions.

AGWPE also works with radio modems, such as the YAM and Baycom, which do not have the logic functions of a TNC and must rely on the logic functions of a computer control program such as AGWPE. The program author, George SV2AGW, eventually realized that a computer sound card could emulate all the functions of a radio modem, so he added the logic in AGWPE that allows a sound card to act as a radio modem.

For AGWPE to work with packet programs, the program must have an option to use AGWPE as a TNC manager, i.e. the program becomes a client of AGWPE, the host. Many program authors have added this option to their programs because AGWPE relieves them of the need to write all the programming code that would be needed to control many different packet devices. It's much easier to let AGWPE do it!

To use AGWPE and its TNC management services, authors only need add a simple link to AGWPE using either the Windows DDE Manager (Dynamic Data Exchange) or, better yet, the Windows TCP/IP Socket interface, which permits **network** access to AGWPE. (If you are a program authors: see [open development information](#)).

Note that when a packet program is using AGWPE's host mode, any settings that may be in the packet program to control a TNC or radio modem are usually no longer functional since AGWPE has take over control of the device.

Other AGWPE Features

To learn more about AGWPE's super capabilities, I suggest you read the info pages at the [AGWPE web site](#) and the program's integrated [Help](#) files ([Help](#) is on the AGWPE popup menu). Then explore the program's various menu options. For example, you'll discover that:

- AGWPE can automatically launch your packet programs after it loads. From the AGWPE menu select [Startup Programs](#)
- AGWPE will automatically [adjust TNC/sound card timing parameters](#) as it senses packet traffic on the frequency (although you can over-ride this). From the AGWPE menu select [Properties](#) and then the [TNC Commands tab](#).
- You can [use a network or the internet to tie into the feed from a remote TNC running under AGWPE](#) providing your packet program can link to the remote computer and AGWPE using TCP/IP protocols.
- There is a special ["TCP/IP Over Radio" feature](#) which allows you to use packet radio to create a wireless TCP/IP network to exchange email, surf the

web, etc. For example, with this feature a station with internet access could provide internet access to a station that doesn't have it. **Note:** there is a licensing fee for this feature, however. If you are interested in this feature, consider purchasing [Packet Engine Pro](#), which includes a TCP/IP over Radio license.

- AGWPE can direct specific packets to specific AGW-written programs. For example BBS packets can be directed to the AGWTerm program, while DX cluster packets can be directed to the AGWcluster program. The secret ? Using a different callsign SSID in each program, e.g. KC2RLM-2 for AGWTerm and KC2RLM-3 for AGWClusters.)
- You can [access and control AGWPE from a remote computer](#) on your network or even over the internet.

AGWPE Hardware Requirements

It's impossible to give a definite minimum requirements for running AGWPE. There are many variables that have an effect on operations including processor speed and type, RAM, video card, sound card, sound card drivers, etc.

George SV2AGW, the program author, wrote once that generally a Pentium II or newer processor should work without problems. Older, less capable processors may or may not work.

Here's a posting from one user successfully running AGWPE on a 486 66 MHz computer with Windows 95 and 28 MB of RAM:

"For 1200 baud AFSK digital signal processing (DSP) algorithms (i.e. packet) you do **not** need a lot of CPU power. If you're into real time video processing, yes, but in general a 486/66 is plenty for the DSP algorithms used in packet radio. Thomas Sailer who developed the algorithms considers a 486/66 as a minimum.

Also, keep in mind that even at a 44KHz sampling rate and at 16-bit resolution, you only need 88Kb to store 1 second of audio. The applications that we are talking about do not store huge amount of data, so a lot of RAM is not necessary for these applications. The only reason you might want to consider more RAM is to keep Windows running at a reasonable speed, leave more processing resources for user space algorithms, and prevent your packet applications from being swapped out to the swap file on the hard drive."

The real problem is how Windows handles resources, and how the drivers are being accessed by the applications. George mentions this on his web site. At this time I have AGWPE running on a small 486/66/28Mb/Win95 with no problem. I can surf the net and start other applications with no problem. WinAPRS and AGWPE keep humming."

And paraphrasing Stephen: "I run AGWPE very nicely on a mere classic Pentium 166 with MMX. If I put a P200 chip without MMX in the same machine, it won't run AGWPE reliably. Ham sound card programs are one of the few real-world applications where MMX actually does make a difference. In nearly every case, the presence or absence of MMX is the critical processor "horsepower" threshold that determines whether a sound card application will run or not. By the way, all Pentiums after the original "Pentium with MMX", in other words, all P-II, P-III, and P4 processors, incorporate the MMX instruction set as a matter of course."

Note that Win95 has been a problem for George, and even Microsoft has now stopped supporting it. So, if you haven't upgraded, you might want to consider it. Future versions of AGWPE may not be compatible.

Compatible Sound Cards

AGWPE will work with most 16-bit or better sound cards, but not all. For more information, see the [Sound Cards](#) page on this site.

Compatible Programs

AGWPE will work with dozens of Windows programs, but not DOS, UNIX or Mac programs (at least none that I know of). On the [Compatible Packet Programs](#) page on this site, there is a partial listing of programs that will link to AGWPE. For some of those programs, there is also an AGWPE configuration help page on this site. Just click on the "yes" next to a program's name.

Baud Rates and Operating Modes

AGWPE handles baud rates of 300 (HF), 1200, 2400, and 9600. The [Baud Rates and Operating Modes](#) has additional advice about operating at those baud rates.

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Interface (Computer-to-Radio Cables)

Getting Started

To connect your radio to the sound card, you'll need an interface consisting of three (3) cables, one each to handle the RX (receiver audio), TX (transmit audio), and PTT (transmit) functions. If you want to use your sound card with **2** radios, you'll need a more complicated interface. See [cable2radio.htm](#)

The basic AGWPE radio-to-computer interface is the same as one as would be used for other sound card digital programs such as [PSK31](#) or Slow Scan TV. So, if you already have such an interface, you probably can just use that for AGWPE. (**Note:** This may not always be true. For example, the standard RASCAL interface for a Kenwood TS-2000 will work for the Main band but not the Sub Band. That's because there are different RX pins for each band on the radio's ACC jack.)

You can either [build your own interface](#) or you can also purchase [kits and pre-assembled interfaces](#).

Note for 9600 baud operations: kits or pre-assembled interfaces usually have isolation transformers on the TX and RX audio lines that do not have the correct frequency response range for 9600 baud FSK operations.

Actually, I know of no isolation transformers that will work. So for 9600 baud operations, you may be better building your own interface and omit the isolation transformers, understanding the risk involved in directly coupling two devices that may be at different voltage potentials, i.e. ground loop noise and conceivably damage to your radio or computer.

If you build your own:

- Make sure you build the interface long enough to reach from

your radio to your computer sound card jacks, especially for fixed position radios and computers! .. yet as short as possible to reduce the chance of picking up stray RF (radio frequencies) or EMI (Electro Magnetic Interference).

- Be sure to use cables with a shield in them to help prevent stray RF from entering the cables.
- Use isolation transformers in the Receive (RX) and Transmit (TX) Audio cables (except for 9600 baud packet) and an opto-coupler/photo-transistor in the PTT cable to break the ground path between the radio and computer.
- At least two of the cables will need small circuits. You'll find other variations at [WM2U's PSK31 site](#). Circuit components should be readily available at local electronics store or online. For example, you'll find some very attractive prices for components at [Buck's online store](#).

Going beyond my simple circuits, you'll find instructions for home-brewing the "Cadillac of sound card interfaces" in the March 2002 QST, p 31. Bob Lewis describes how to build an interface for ICOM HF rigs with many deluxe features.

Special Tip: If you want the flexibility of easily switching your interface between different radios, you might be interested in this [cable construction trick](#).

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Kits and Pre-assembled Interfaces

If you don't want to build your own computer-to-radio interface, you can purchase a pre-assembled interface .. or buy a kit with all the necessary parts.

I haven't used interfaces from all the sources listed below, so I won't vouch for any of them. The list is merely a service for those who are shopping.:

- **Bux CommCo™** (Buck Rogers, K4ABT) sells the **RASCALGLX** kit which has all the parts and cables you'll need to make a well-designed interface. The price was around US\$30 for a kit the last time I checked and includes shipping to US addresses (extra for non-US). The kits use isolation components on each line...a very nifty extra. It would be difficult to purchase all the components on your own for such a price! One nice feature is the ability to quickly change the GLX-to-radio cable. One comes free (you pick your radio model) but you can order cables for additional radios for \$15.

Buxcomm also sells completely assembled GLX RASCAL interfaces for about US\$39.

- **Tigertronics** sells the **Signalink™**. This pre-assembled interface features an auto-PTT circuit, so you don't need to use a COM or LPT port for a PTT activation signal, a feature that might be of particular value to anyone who needs those ports for other devices or whose computer has only USB ports! It does require some external power to operate [6.75 - 15 VDC @ 10 ma (max)], but you may be able to get this from the mike connection on some radios; otherwise from another DC power source, such as a cigarette lighter jack. **Note:** in Configuring Signalink for AGWPE, use the **regular setup procedures** on this site, but for COM/LPT port selection in the properties configuration, select a non-existent LPT port, e.g. LPT3. There is no need to have AGWPE tie-up a RS232 port in Windows when AGWPE and Signalink aren't using one. (AGWPE won't let you select a non-existent COM port.)
- **West Mountain Radio** has several models of pre-assembled interfaces. The RigBlaster (Std, Plus and Pro models) let you

keep both your microphone and sound card connections attached to the radio's microphone jack. The Nomic (No Mike) doesn't have that feature, but it is smaller in size, less expensive, and doesn't require a power connection. See [West Mountain Radio's web page](#) for additional information and current pricing.

- **MixW RigExpert** - (two versions) is a **USB** Soundcard Transceiver Interface! <http://www.mixw.net/>
- **MFJ** also sells a pre-assembled interface in two models: the [1275](#) (round connector) and [1275M](#) (modular connector).
- **MicroKeyer** - "a powerful All-In-One multi-mode **USB** interface for CW, SSB, AM, FM, and digital modes (RTTY, PSK31, SSTV, APRS, PACKET, EchoLink and many others)." <http://www.microham.com/mk.html>
- **Donner's** - Interfaces for about \$40 plus shipping <http://home.att.net/~n8st/>
- **VA3TO Echolink Interface** - http://home.cogeco.ca/~hduff/Echo_Main.htm
Sells both kits and assembled kits.
- **WB2REM-G4CDY** All Mode Interfaces - <http://www.wb2rem.com/>
- **KK7UQ's "Altoids" box interface kit**: http://kk7uq.com/html/model_ii.htm. Includes a way to attenuate RX audio from the radio which might be helpful to users who are forced to use the MIC jack for input (MIC input is often too sensitive for full audio from the radio).

Also,

- **GD16 MI** from G. Dierking <http://www.gdierking.de/gd16mie/>
- **DIGI-1** From WIMO http://www.wimo.de/s90_e.htm
- **ISOTERM-MULTI CON** from G3LIV <http://www.melvin2.freemove.co.uk/>
- Several from **ASTRORADIO** (España): <http://www.astroradio.com/t/tenda/301001.html> <http://www.astroradio.com/t/tenda/302007.html>
<http://www.astroradio.com/t/tenda/302000.html>

Please [contact me](#) if you know of other sources for kits or pre-

assembled interfaces.

Last Updated: 08/11/2008

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Receive (RX) Audio Cable

Radio RX Audio to Sound Card "Line In" or Microphone Jack

This page has advice for those building their own interface. The RX audio cable connects the radio's Microphone jack or data jack or speaker jack to the sound card's LINE IN or MIC jack.

On the sound card, the typical color coding of the jacks is::

- LINE IN = Blue
- MIC in = Pink

At the radio, it is best to use the packet or data jack if one exists. Otherwise use the microphone jack or speaker jack.

Does your radio have a 6-pin mini-DIN data jack? Then you might want to [read this page about such jacks.](#)

At the sound card, you want to use the LINE IN jack. It is normally a good match to a typical radio's RX audio voltage. If you need to use the sound card's more sensitive MIC jack, [see the MIC schematic below](#) for more information including a schematic that adds in a voltage divider circuit. You may also have success using the Volume Control program (instead of the divider circuit) to limit RX audio into the MIC jack (requires some fine adjustments), but the divider circuit will make it easier to regulate.

In the RX audio cable, I strongly recommend the use of an **in-line transformer** to break the ground path between the radio and computer grounds for two reasons:

- to eliminate any potential ground loop hum on the signal,
- and more importantly, to reduce the risk of any damage to the computer or radio from any difference in voltage potential

Note that the simple RX cables that may come with some commercial interfaces, for example, the Rigblaster Plus and Nomic (and maybe other models), do not have isolation transformers. These simply cables are generally shielded but do not have any additional circuitry or transformers, so you may want to build a cable that does have the transformers.

I see that Buxcomm now offers a simple add-on isolation line if you don't want to build your own. You simply plug in the Buxcomm isolation cable between your sound card and your audio in and your audio out lines. The item part is called a ISOL8R and you can order it for \$9.97 (\$17.97 for 2) at <http://www.packetradio.com/>

If you're curious, there's an interesting discussion of proper connections of shields and grounding at: http://www.epanorama.net/documents/groundloop/cable_shielding.html

See also Buck's page at <http://www.buxcomm.com/pdfzips/hum-and-noise-solutions.pdf>

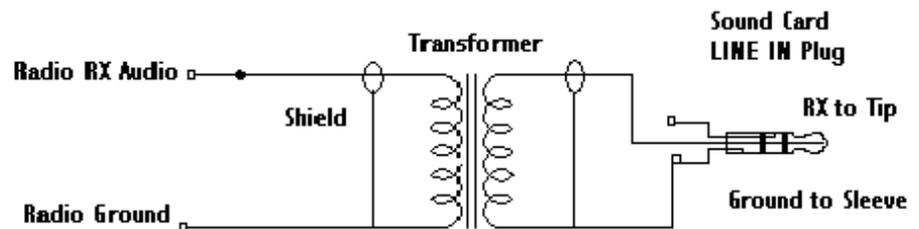
Note for 9600 baud packet: There's a general consensus that that the RX and TX audio lines in your interface must **NOT** have audio isolation transformers for 9600 operations. Generally, small, inexpensive audio or power transformers do not have the correct frequency response range. For example, the typical 1:1 600 ohm audio line transformer has a 300 Hz to 5 kHz frequency response range which is not low enough. Until someone [sends me an isolation circuit](#) with suitable components (I wish you would!), take these precautions when running without isolation transformers:

- make sure the computer and the transceiver's power supply are connected to the same AC power circuit (i.e. sharing the same ground).
- connect/disconnect the sound card interface to the transceiver or computer only when both devices are unplugged from the AC power circuit.

You should also use shielded cable to reduce the risk of any RFI (Radio Frequency Interference) getting on the RX signal.

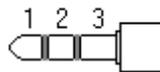
Here's the schematic for an isolated RX cable:

Receive Audio to Sound Card LINE IN Jack



To build your RX cable:

- **Cable material:** Use a cable with a single insulated wire and a braided shield. Small coaxial cable like RG-174U should work well; even RG-58U would work. The shield can act as ground line if you are using a transformer. If you aren't using a transformer, attach the shield at the radio ground only, and not at the computer/sound card ground.
- **Sound card connector:** You will need a plug that will fit the sound card LINE IN/Microphone jack, probably a 1/8" (3.5mm) **stereo** 3 conductor male mini-plug (e.g. Radio Shack part #274-284). Do not use a mono 2 conductor plug.



1. Left channel +
2. Right channel +
3. Left and right channel -

- **Radio connector:**

If you need your radio's "pinout" information, you'll probably find it at <http://www.cqham.ru/tnc2rad.htm> or [Buck's packet site](#) (on Buck's site, go to the page for TNC-to-radio cables and find your radio. Click on the "Add to Cart" button for the cable for your radio and this will reveal a schematic of the radio's pin out information.)

Remember that in addition to the RX line, you will also need to attach the **TX** and **PTT** lines to the radio, so all three inputs could be sharing the same plug.

- **Mobiles or Base Radios:** You can use either the microphone connection or preferably the radio's special "data" plug jack, if it has one. Or you can use the speaker jacks.

For Receive (RX) audio it's best to use the pin on the radio's data jack, since it provides a constant audio output level and -- usually -- no squelch (AGWPE needs to hear an un-

squelched signal) . If you use the radio's microphone or speaker jack instead, remember the audio output level will be affected by both the radio's "volume" and "squelch" settings and not having these set correctly is often a source of problems for AGWPE.

- **Handhelds:** Most HTs have a 'Speaker' jack that requires a 1/8" (3.5mm) mono (2 conductor) mini-plug. If your radio's user manual says to use a stereo plug instead of a mono plug, be sure you do.

Check either [Buck's packet site](#) for pin-out information or <http://www.cqham.ru/tnc2rad.htm>

- **9600 baud use:** The newer 9600-ready radios often have a data jack that has a special "9600 baud receive" pin or a combination "9600/1200 receive pin" that is different from the 1200 receive.

- **Transformer:** The type of transformer is determined by the source of the RX audio. If you take it from the radio's microphone or data jack, you'll use a 600 to 600 Ohm (1:1) transformer. If you take it from the radio's speaker jack (8 Ohm impedance), you'll need a 1000:8 transformer. (No isolation transformers for 9600 baud operations.)

Note for 9600 baud users: see notes at top of page. Generally, you should **NOT** use isolation transformers for 9600 baud operations.

Sources: Isolation or audio transformers can be obtained from most electronics parts stores, for example, Radio Shack #273-1374 for a 1:1 or #273-1380 for a 1000:8. Peter PE1MHO/G7ECN says another source for 1:1 transformers is an old internal telephone modem that a computer store might be glad to give you.

Attaching the transformer: Be sure you use the proper lead wires on the audio transformer as identified by any accompanying schematic for the transformer or by using an Ohm meter to determine the leads for the same coil (windings) of the transformer. Note that if the transformer has 6 leads, two will be center tap wires that won't be used. (Don't cut them until you know you have the 4 other leads correctly wired.)

One lead from the **primary** coil of the transformer will connect to the **center conductor (tip)** of the **sound card** plug. The other lead from the **primary** coil will connect to the sleeve (outer conductor) of the **sound card** plug. In this circuit, it doesn't matter which lead connects to the tip and which connects to the sleeve, so long as they are from the same coil. (If you are using a 1000:8 transformer, it is important to connect the 1000 Ohm primary coil of the transformer to the sound card and not the radio.)

On the **secondary** coil of the transformer, one lead will attach to the RX pin of the **radio**. The other lead will attach to **radio** ground. Again, it doesn't matter which of the connects to the radio RX and which to radio ground, so long as they are from the same coil. (Again, if you are using a 1000:8 transformer, it is important to connect the 8 Ohm secondary coil of the transformer to the radio and not the sound card.)

- The **middle conductor (ring)** of the sound card plug should be left **unwired**, unless you are [building a RX cable for a second radio](#).
- When you're done, tape a "Line In" (label on the sound card end of the RX audio cable so that you don't confuse it with the TX "Line Out" cable.

Circuits without an isolation transformer:

You will find other schematics (at various web sites and even in [AGWPE Help](#)) that do not use isolation transformers. The danger with any circuit directly connecting the computer and radio is that the devices could develop different ground potentials which could lead to damage to the devices. This risk is inherent for both a dual wire connection (RX-to-RX and Ground-to-Ground) or a single wire connection (RX-to-RX, no common ground wire). Either method provides a route for current that could develop because of different potentials. For this same reason, never connect the shield of a wire to both both devices; ground it only to one device.

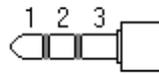
If you're curious, there's an interesting discussion of proper connections of shields and grounding at: http://www.epanorama.net/documents/groundloop/cable_shielding.html

Also visit

RX Audio to the "Microphone" jack on your sound card

If you want or need to use the sound card's Microphone jack instead of the LINE IN jack, then you will probably need to add an attenuation circuit on the RX audio line so that you do not overdrive the sound card. The exact attenuation will depend on the maximum output voltage of your radio RX line **and** the maximum input voltage on the MIC jack of your sound card. (The Sound Blaster card I have has a maximum of 200 mVpp on the Microphone jack, where the Line In jack has a maximum of 2 Vp-p. Other cards accept a maximum of 100 mV.)

Warning: On most sound cards, the Microphone (MIC) jack **does not** allow stereo input, i.e. a left and right channel. Typically, the ring in the MIC jack is used to provide a +5 bias voltage to power electret microphones. It is **not** used for stereo (right channel) input. For that reason, you can't use MIC input if you want to interface one sound card to two radios.



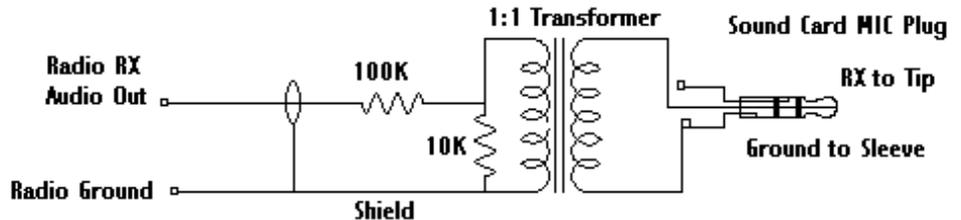
1. Signal input
2. +5v
3. 0v

3.5mm plug

If you do use the MIC jack, it is better to use a stereo plug instead of a mono plug. Just leave the ring unwired. A mono plug can be used, but it will short circuit the ring (+5V) to the sleeve (0V), although the card's circuitry is designed to cope with this -- a resistor severely limits current flow.

Here's a schematic for a 10:1 attenuation circuit that should work fairly well in many microphone jack setups. The 1:1 audio transformer provides an electrical separation of the computer from the radio and may be especially important on cables used in microphone jacks and laptops.

Receive Audio to Sound Card MIC Jack with 10:1 Attenuation



When you are done, tape a "MIC" label on the sound card end of this RX audio cable so you don't confuse it with the TX "Line out" cable.

I see that Buxcomm now offers a simple add-on attenuator line if you don't want to build your own. You simply plug in the Buxcomm attenuator cable between your sound card and your radio's speaker line. The item is called a 40DBPAD and you can order it for \$7.95 at <http://www.buxcomm.com/humsolving.htm> (look at the very bottom of the page).

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Transmit (TX) Audio Cable

Sound Card "Line Out" to Radio TX Audio

This page has advice for those building their own interface.

The TX audio cable can be a little more complicated than the RX audio cable. Normally, the TX audio cable must have a circuit to attenuate the voltage leaving the sound card's LINE OUT jack, otherwise the radio's transmit circuit will be overdriven.

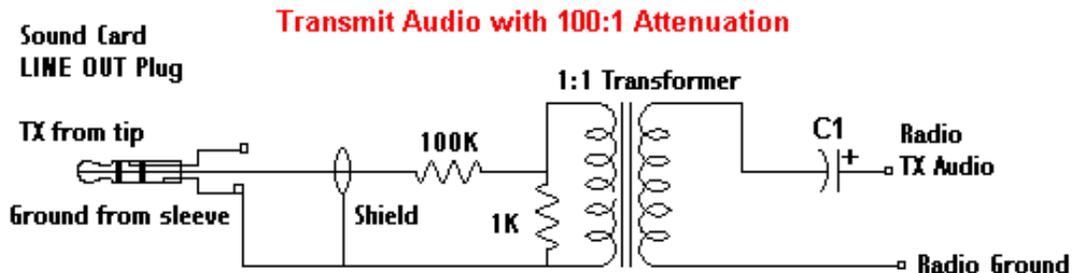
Note: Use the LINE OUT jack, **do not use the SPEAKER jack** (which is found on some older sound cards). If your card or laptop only has a HEADPHONE jack, it can be used, but you will need to lower the sound card's TX audio volume. Quality will usually not be quite as good as a LINE OUT.

On the sound card, the typical color coding of the LINE OUT jack is **light green**

The exact attenuation will depend on both your radio and sound card. An approximation is a 100:1 attenuation (40 dB) which will reduce the sound card output level (max. 2 Volt_{p-p}) down to the level your radio normally would expect for microphone (20 -40 millivolt_{p-p}). For example, a 50:1 attenuation works better for me, since I use my my radio's data jack which has a maximum input voltage of 40 mV_{p-p}.

Don't Overdrive Your Radio! If a sound card (or a TNC) overdrives a radio's input circuit (i.e. it is too loud), the radio may distort the true packet tones as it tries to limit the signal to a maximum deviation of approx. 5 kHz. The attenuation circuit described on this page attempts to prevent such overdriving and distortion. Interestingly, a 1200 baud packet station that is properly adjusted with 3.25 kHz of deviation (+/- .25) should sound softer than channel noise!

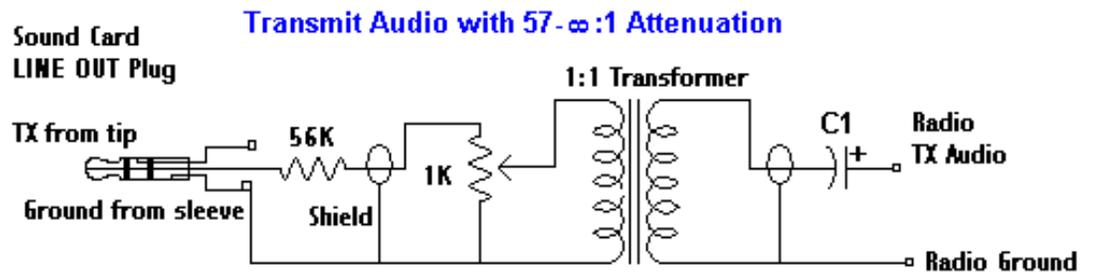
Here's a schematic for the attenuation circuit:



C1 = optional capacitor blocks DC voltage; may be required for radios sharing TX and PTT lines, e.g. hand held radios

Option #1: Instead of the two resistors, you could use a 4K7 (4.7K) Ohm variable resistor (potentiometer/pot). The pot would actually give you more control over the attenuation, although a pot is bulkier.

Option #2: Or here's a schematic of a circuit that combines a pot with a fixed resistor to give the pot a less delicate range of settings and make is easier to adjust:

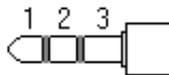


C1 = optional capacitor blocks DC voltage; may be required for radios sharing TX and PTT lines, e.g. hand held radios

To build your TX cable:

- **Sound card connector:** You will need a plug that will fit the sound card LINE OUT jack, probably a 1/8" (3.5mm) **stereo** 3 conductor male mini-plug (e.g. Radio Shack part #274-284 -- pkg. of 2). Do not use a mono plug 2 conductor plug.

Note: The **middle conductor (ring)** of the sound card plug (right channel) should be left **unwired**, unless you are **building a TX cable for a second radio**



1. Left channel +
2. Right channel +
3. Left and right channel -

- **Radio connector:**
 - If you need your radio's "pinout" information, you'll probably find it at <http://www.cqham.ru/tnc2rad.htm> or [Buck's packet site](#) (on Buck's site, go to the page for TNC-to-radio cables and find your radio. Click on the "Add to Cart" button for the cable for your radio and this will reveal a schematic of the radio's pin out information.)

Does your radio have a 6-pin mini-DIN data jack?
Then you might want to [read this page about such jacks.](#)

- **Mobiles or Base Radios:** You can use either the microphone connection or preferably the radio's special "data" jack, if it has one. You'll be using the same connector as the one used for your PTT and RX line, unless you're using the speaker jack for RX audio).

Handhelds: TX audio will go to the radio Microphone jack, which usually require a 3/32" (2.5mm) stereo (3 conductor) or mono (2 conductor) sub-mini plug. If your radio's user manual says to use a stereo plug instead of a mono plug, be sure you do. You'll also be feeding your PTT line into this plug.

Check your radio's instruction manual or either of the web sites mentioned above for pin-out information and any **resistor and/or capacitor that may be required for the PTT and TX lines of your radio.**

- **HF Band Use:** Some radios may use different TX audio pins for HF and VHF/UHF. The ICOM 706 is one. Consult your radio's user manual for pin out instructions. This can be the solution if your interface transmits correctly for HF digital modes such as PSK31 but won't transmit audio on VHF/UHF, or vice versa
- **9600 baud use:** The newer 9600-ready radios might have a data jack pin for "9600 baud transmit", although many have both 1200 and 9600 on the same pin. The radios will however most probably have a menu choice for "data speed" that affects the radio's input voltage sensitivity, i.e. the menu selection may amplify or attenuate the TX audio. (Check your radio's user manual.) For example, the "9600" choice allows the pin to accept full 2V maximum, where "1200" accepts only approximately 40mV maximum. That means, to get things right, you will have to experiment with the:
 - radio's menu setting (1200 or 9600)
 - the sound card's playback volume setting
 - any voltage divider circuit or potentiometer that is in the TX audio line to get the right match.
- **Cable material:** Use a cable with a single insulated wire and a braided shield. Small coaxial cable like RG-174U should work well; even RG-58U would work.
- **Capacitor:** The value of capacitor C1, if used, is often specified in the radio's user manual in the section on MIC/Speaker accessory plug wiring. [The value will depend on the input type of the radio... resistive, capacitive, or direct coupling. Resistive will require a higher value cap (4 to 10 uF), while capacitive a bit less. Direct I/O are best coupled at 1 uF, as RF might become a problem if they go too high in capacitance.]
- **Transformers:** 1:1 audio transformer can be obtained from either parts stores (for example, Radio Shack #273-1374) or Peter PE1MHO/G7ECN suggests another source is old internal telephone modems that a computer store might be glad to give you.

Note for 9600 baud packet: There's a general consensus that that the RX and TX audio lines in your interface must **NOT** have audio isolation transformers for 9600 operations. In general, the available small and inexpensive audio or power transformers do not have the correct frequency response range. For example, Radio Shack's #273-1374 600 ohm 1:1 audio line transformer has a 300 Hz to 5 kHz frequency response range which is not low enough.

Until someone **sends me an isolation circuit** with suitable components (please!), take these precautions when running without isolation:

- make sure the computer and and the transceiver's power supply are connected to the same AC power circuit (i.e. sharing the same 110/220 V ground).
- connect/disconnect the sound card interface to the transceiver or computer only when **both** the transceiver and computer are unplugged from the AC power circuit.

Attaching the transformer: Be sure you use the proper lead wires on the audio transformer as identified by any accompanying schematic for the transformer or by using an Ohm meter to determine the leads for the same coil (windings) of the transformer. Note that if the transformer has 6 leads, two will be center tap wires that won't be used. (Don't cut them until you know you have the 4 other leads correctly wired.)

One lead from the **primary** coil of the transformer will connect to the **center conductor (tip)** of the **sound card** LINE OUT plug by way of the pot/voltage divider circuit. The other lead from the **primary** coil will connect to the sleeve (outer conductor) of the **sound card** LINE OUT plug. In this circuit, it doesn't matter which transformer lead connects to the sound card LINE OUT and which connects to sound card ground, so long as they are from the same coil/winding of the transformer.

On the **secondary** coil of the transformer, one lead will attach to the TX pin of the **radio**. The other lead will attach to **radio** ground. Again, it doesn't matter which of the connects to the radio TX and which to radio ground, so long as they are from the same coil/winding of the transformer.

I see that Buxcomm now offers a simple add-on isolation cable if you don't want to build your own. You simply plug in the Buxcomm isolation cable between your sound card and your audio in and your audio out lines. The item is called a ISOL8R and you can order it for \$9.97 (\$17.97 for 2) at <http://www.buxparts.com/humsolving.htm>

- When you're done, tape a "Line Out " label on the sound card end of the TX audio cable so that you don't confuse the RX and TX cables.

Handheld Radios: Did you know?

Most handheld radios use the **microphone jack** to feed **both** the TX audio signal (AC) and the PTT signal (DC) into the radio.

To make sure the TX audio signal goes into the radio and not back out the PTT line, **a resistor is often put in the PTT line** (AC will follow the path of least resistance).

And to make sure DC power doesn't go back up the TX audio line to ground, **a capacitor is often put in the TX audio line** (capacitors block the DC but allow AC to pass). If your handheld radio goes into constant PTT when the plug is put in its MIC jack, the lack of the capacitor is often the answer. (Note that the schematic above includes such a capacitor for just that reason. It's a good precaution to take to block any DC on the TX line.)

These components still need to be used in AGWPE cables for handheld radios.



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PTT (Push to Talk/Transmit) Cable

This page has advice for hams building their own interface.

AGWPE will generate the transmit audio, but you also need a way to open the radio's PTT circuit so that the audio can be transmitted. AGWPE and other sound card programs provide for this by sending a signal to a RS232 pin that can activate a simple hardware circuit to open your radio's PTT circuit. AGWPE uses these RS232 pins:

- the serial (COM) port's RTS pin (#7) and
- the parallel (LPT) port's Data Bit 0 and 1 pin (pins #2 and #3)

Note for Windows XP and 2000 users: The parallel port will **not** work for PTT control in Windows XP or 2000 using AGWPE. Only Windows 95, 98, and ME users can use the parallel port in AGWPE. Windows XP or 2000 users need to use [Packet Engine Pro](#) instead of AGWPE if they want to use the LPT port for PTT control.

Update: there may be [a possible work-around for LPT port use in Windows XP/2000 systems](#)

For those home-brewing a PTT cable, this gives you several options:

1. [Build a cable with an isolated 'gate' circuit](#) that opens the radio's PTT circuit when it receives a signal from the serial or parallel port. Use the cable above with a [serial-to-USB port adapter](#) connected to the computer's USB port instead of the serial port.
2. [Build a TX audio-activated circuit](#) to trigger the PTT, no COM or LPT port needed.

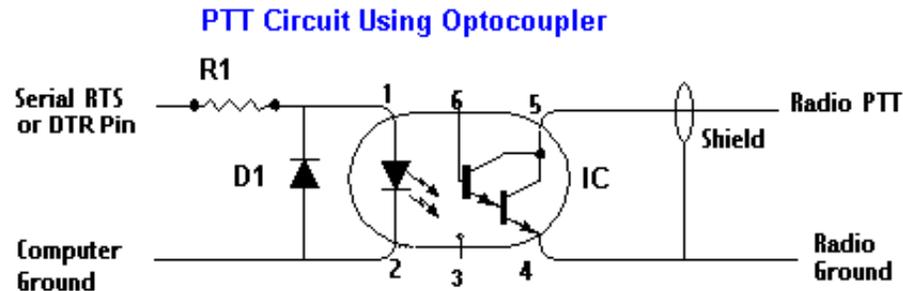
Trying to operate packet using the radio's VOX is likely to be very unsatisfactory because the VOX probably won't key up fast enough. Unlike PSK31, RTTY, MFSK, etc where you key up and stay keyed for extended periods, packet normally uses very short bursts that require that the radio key up fast (i.e. ideally 50-100 ms or less) ...and then un-key fast at the end of the data burst. Even if it did, another problem is the need to guard against room/computer noises if the VOX also opens the microphone. For this reason, experienced sound card users don't use the radio VOX method even for non-packet sound card modes .

A. Building A Cable With An Isolated Gate Circuit

Note: Because a sound card has two audio channels, it is possible to interface two (2) radios to a single sound card. This page describes how to make a cable to control the PTT for a single (1) radio. See the [Interfacing 2 Radios to 1 Soundcard page](#) for a dual PTT cable.

You may find other variations of the circuit below, most commonly one using a simple transistor (in fact, there's one in the AGWPE 'Help' file). While these circuits will work, they do create a direct ground connection between the computer and radio, and thus create a risk of radio/computer damage in the event of different voltage potentials between the two components. For that reason, **I don't recommend them.**

Instead, I recommend an isolated 'gate' circuit. Here's a schematic for a single port (one Radio) AGWPE setup which uses a phototransistor (optocoupler) as the gate:

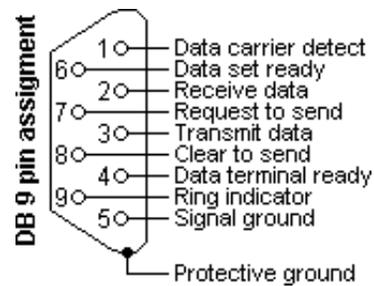


- R1** = Resistor, e.g. 1K2, to reduce voltage on the IC pin 1
- IC** = Integrated Circuit; this sketch shows an IC, such as a 4N33 or PS2603 Optocoupler, which uses a Darlington pair transistor.
(Note: to identify pin #1, look for a small embossed circle on the top of the IC above pin 1; or looking into the notch in one side of the IC with the pins down, pin #1 is to the right of the notch.)
- D1** = Diode, e.g. IN4001, would shunt any potential reverse voltage that might damage the sensitive diode/emitter in the IC.
(Note: the band printed on the diode marks the cathode end, which attaches to the Serial Port/IC Pin 1 line in the sketch above. The opposite/anode end attaches to Ground.)

The ideal components for your circuit may vary because of your radio's requirements. For example, you might be able to use a different type of IC, such as a 4N25 or PS2601, but that may require a different value for R1.

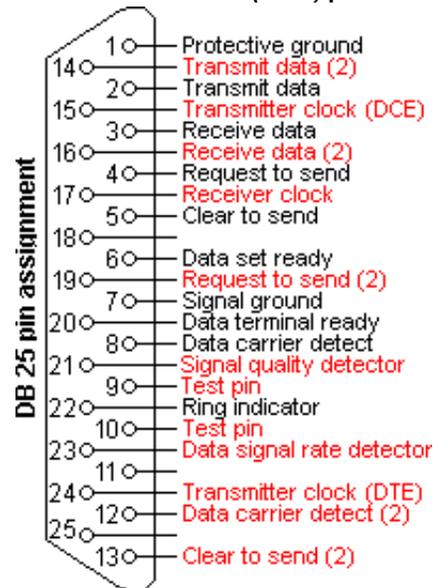
If you plan to build your own interface, [Bux CommCo](#) can provide advice on components for your radio ([Bux CommCo components](#)). You might also want to consider a Bux CommCo's [RASCAL kit](#) . It will have all the right components for your radio for a good price.

- Other U.S. outlets for parts include , [Radio Shack](#), [Digikey](#), and [Newark Electronics](#).
- Use a cable with a single insulated wire and a braided shield. Attach the shield on each side of the optocoupler to either the radio or computer ground, but **do not connect the grounds together**.
- If you have a **DB9 Serial** port (COM), use **RTS (Request To Send) pin # 7** for PTT control on a one radio cable. **Ground** will be **pin #5**

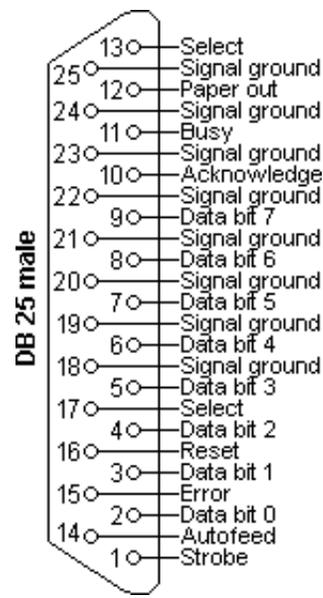


Do not use the #4 DTR (Data Terminal Ready) pin for single port PTT control despite what the AGWPE [Help](#) file or AGWPE web site may say. The DTR pin is used by AGWPE only if you [interface a second radio](#) and use AGWPE's [Dual Port](#) feature to control PTT on a radio attached to AGWPE port #2. DTR will not be triggered if AGWPE is set to use only a single port/radio.

- If your serial port uses a **DB25 COM** connection (rarer), use RTS pin 4 for PTT control and pin 7 for ground. Note this is the pin-out for a **DB25 serial (COM)** port not a **DB25 parallel (LTP)** port.



- If you want to use the parallel port (**DB25 LTP**) for PTT control instead of the serial port, use LTP pins 2 or 3 for the PTT line and any pin 18 thru 25 for the **GROUND**.



- Check <http://www.cqham.ru/tnc2rad.htm> or [Buck's packet site](#) for radio pin outs and the location of the PTT pin. (On Buck's site, go to the page for TNC to radio cables and find your radio. Click on the "Add to Cart" button for the cable for your radio and this will reveal a schematic of the radio's pin out information.)
- To test your completed circuit, hook up the cable to your radio and then use a 9 volt battery to simulate the computer signal. Connect the positive + side of the battery to the signal pin in the COM/LTP connector and the negative • side of the battery to the ground pin in the connector.
- **Note on handheld radios:** Most handheld radios use the microphone jack to feed **both** the TX audio signal (AC) and the PTT signal (DC) into the radio. To make sure the TX audio signal (AC) goes into the radio and not back out the PTT line, **you will need to include a resistor in the PTT line between the radio's PTT pin (#5 in the schematic above) and the IC.** An AC signal will follow the path of least resistance and stay off the PTT line. See your handheld's user manual for the needed resistor values and circuit information. (In addition to the resistor, **HTs often require a capacitor on the TX audio line** to block DC voltage on the PTT line from getting on to the TX audio line. See the [Transmit Audio Cable page on this site.](#))
- **A Special Trick:** To make it easy to use **either the serial port or printer port**, Bill, WB6JAR, came up with this clever design: run a short 2 wire "pigtail" cable from the cable's serial DB9 connector to a parallel DB25 connector.
 - Connect the serial's pin 7 (RTS) to the parallel's pin 2 or 3
 - Connect the serial's pin 5 (GND) to the parallel's pin 18 or 19-25

Only connect one connector to the computer at a time.

B. Serial-to-USB Adapters

It's becoming easier to find a fairly inexpensive serial-to-USB adapters. In fact some computers now come with USB ports but no serial port. If this is your case or if you prefer to make use of the USB port to leave your serial and parallel ports free for non-AGWPE purposes, a serial-to-USB adapter may work for you.

To use a serial-to-USB adapter:

- first install the adapter driver
- then go to the Windows **Device Manager** (**Start: Settings; Control Panel: System**) and click on the + next to **Ports** to expand the list and see which COM port the adapter is using
- **change your AGWPE Port setting** to use the adapter's COM port
- plug your serial port PTT cable into the USB adaptor

Stephen Smith WA8LMF wrote this in the UI-View Yahoo list about USB-to-Serial adapters:

These devices vary wildly in how faithfully they emulate a "real" serial port. This is influenced by both the hardware (chipset that the device is based on) and the software drivers provided. Some are fine for simple three-wire TXD/RXD/COMMON serial hookups (i.e. like connecting a TH-D7) but won't work if the device or software requires handshaking using the RTS/CTS/DTR control lines. Some work for normal serial port data-flow-control usage of the handshake lines, but fail when the handshake lines are used in unusual ways. This includes ham applications such as soundcard interfaces where the handshake lines are set independently of the actual data flow on TXD (for transceiver PTT, RTTY FSK keying, RX squelch detect, CW keying, etc.)

The reliability of these devices is also sometimes influenced by the brand of chipset used to implement the USB port inside your computer, and the version and patch level of Windows you are using. All in all, a very hit-and-miss proposition.

BOTTOM LINE: You may have to try several different brands or models of these devices (and ALWAYS check for the most recent drivers on the vendor's website -- the drivers on the included CD-ROM are almost certainly several revisions out of date!) to find one that works with your particular version of Windows and with your particular application.

There have been consistently favorable comments on multiple ham mailing lists (including this one) about the Edgeport devices. My personal experience is that serial-to-USB cables based on the FDTI chip set and drivers seem to work well. (I've had a USD \$15 no-name generic based on the FDTI chipset connecting my D700 to a laptop in the car work flawlessly for over 150,000 KM This includes the last few days in Colorado when the temperature hit -15C...) The Belkin serial-to-USB devices consistently get complaints.

I had mixed results with two such adapters. The first adapter I bought, a Belkin for about US\$30, would not work on either my desktop or laptop. The RTS pin was always left "high" and triggering the radio's PTT line. Belkin may not have been at fault; it may have been a problem with my computer hardware or my version of Windows (XP). Belkin may have corrected the problem since then.

I then bought an **IOGear adapter (GUC232A)** (apparently made by ATEN International Co.) for about \$30 US. It works fine on my desktop using Windows XP.

Some users have reported problem with other USB adapters working but changing COM port assignments on each computer boot-up.

So, it's possible such an adapter may work on your computer, but you may have to experiment with different brands.

Here some other possible serial-to-SB adapter choices:

- <http://pfranc.com/usb/usb.shtml>
- <http://www.buxcomm.com/> (try search for USB2SC)

C. TX Audio-activated Circuit

It's also possible to open the PTT by using a special circuit that opens the PTT when it "hears" tones on the TX audio line, without any COM, LPT or USB port connection .

Stephen Smith's, WA8LMF, [Tone Keyer web page](#) describes how to make such a device. If you need your COM or LPT ports for other devices, you should look into this creative solution.

Another option to avoid using a COM or LPT port is the [Tigertronics Signalink pre-assembled unit](#) which also uses a TX audio tone-activated PTT circuit.

Watchdog Timer: Most TNCs have a timer that prevents continuous transmission in the event of some TNC or software failure. This "watchdog" timer stops transmission that last more than 2 or 3 minutes. With AGWPE's sound card, you don't have such a timer, so here is a [page describing how to build a watchdog timer circuit](#) for your PTT cable.

[Two radio modification to the PTT cable](#)

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Interfacing to Two (2) Radios to One (1) Soundcard

AGWPE can use one sound card to interface with **TWO** different radios at the same time. It does this by using the left and right stereo channels of the sound card, in effect making the sound card a "dual port" TNC (see the [AGWPE: 2 Radio Setup](#) page on this site for more information about configuring AGWPE for this feature.)

This means you can have 2 different packet programs running, each one sending and receiving data with a different radio on a different frequency. If you use WinAPRS, UI-View, or APRSplus, you could have one radio tuned to the local APRS frequency and the other to the local DX cluster frequency or to an HF APRS frequency.

To run a second radio with the sound card, you'll need to use:

- for PTT control, the **DTR** pin on the COM port or pins 8 or 9 on the LPT port
- for TX and RX audio, the **ring** of your stereo sound card jacks

Note this dual radio feature will not work if use the **Microphone jack** of the sound card (for RX audio), since that jack typically has **mono only input** and not stereo. You must use the LINE IN jack if you want to interface to two radios.

Here's the pin and plug assignments for "dual port" sound card use:

AGWPE Port	Card Channel	Stereo Plug	PTT Pin	DB9 serial pin #	GND	DB25 serial pin #	GND	DB25 Parallel* pin #	GND
1	Left	Tip	RTS	7	5	4	7	2 or 3	18-25 (any)
2	Right	Ring	DTR	4	5	20	7	8 or 9	18-25 (any)

NOTE 1: Do not use the computer ground pin unless:

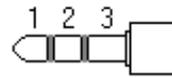
- You are wiring the shield to the computer ground instead of the radio ground (don't wire to both!); or
- You are using an isolation transformer and need to wire one side to computer ground.

NOTE 2: If you are running Windows XP/2000/NT, you **can not use the LPT/parallel/printer** port for PTT control. You must use the serial port. The parallel port option will work only with Windows 95, 98 and ME in AGWPE. If you use Windows XP, and want to use the parallel port for PTT control, you can purchase [Packet Engine Pro](#).

1. RX and TX Audio Cables

The [RX Audio Cable](#) and [TX Audio Cable](#) pages of this site describe how to make cables for a radio which would use the **left** channel of the sound card and Port 1 in AGWPE. Such cables uses the **tip** of the stereo TX and RX plugs and the **RTS** pin on the serial/parallel port plug for PTT control. If you already have a set of cables, they are probably wired in this manner.

If you want to use a second radio with the sound card, you would attach a second audio cables to the **ring** of the stereo plugs (the **right** channel of the card or port 2 in AGWPE).



1. Left channel +
2. Right channel +
3. Left and right channel -

Here are two different approaches for the audio cables:

- **Cheaper but harder -- wire it yourself:** Using the cable schematics on the [RX Audio Cable](#) and [TX Audio Cable](#) pages, add a second cable (single wire shielded) to each sound card plug. The single insulated wire will run from the unused **ring** (middle conductor) of the sound card plug to the proper pins (RX or TX) on radio #2. The shielding should attach to the ground on the radio but NOT attach to the ground on the computer.

You'll need to make this alteration for **both** the RX and TX Audio plugs. You'll also need to add a separate attenuation circuit (see [TX Audio Cable](#)) for the second TX audio cable.

- **Easier but a little more expensive -- buy two "Y" adapters (Bill's, WB2JAR, idea):** Rather than try to squeeze the wires from both radios into the same sound card plug, use a "Y" adapter. The "Y" plugs into the sound card jack and will accept two sets of audio cables, one for each radio, into the arms of the 'Y'.



Separates left and right-channel signals. Has a 3.5mm stereo phone plug & two 3.5mm mono phone jacks.

Bill suggests Radio Shack part #274-375 (\$3.59 each) which even does the channel separation for you! Of course, you'll need 2 of these adapters -- one for the sound card's LINE IN jack (RX audio) and one for the sound card's LINE OUT jack (TX audio).

These adapters accept simple **mono** plugs into their jacks. No need for stereo/3 line cables and no need to worry about "tip" or "ring" assignments. The adapter handles that.

The **silver** plated jack on the 'Y' is used for the cable coming from **radio #1**. It's wired to the **tip** of the adapter's stereo plug and provides the connection to the **left** channel of the sound card (AGWPE Port 1).

The **gold** plated jack on the 'Y' is for the cable coming from **radio #2**. It's wired to the **ring** of the adapter's stereo plug and provides the connection to the **right** channel of the sound card (AGWPE Port 2).

If you come up with still another method for the audio cables, [let me know](#).

2. PTT Cable

To control the PTT on the second radio, you'll need to add a wire that will run from the **DTR** pin of the serial or printer port to the radio and includes a second PTT circuit (see [PTT Control cable page](#)).

You might try one of these methods:

- **A. Wire both PTT cables into the same DB25 (or DB9?) connector.** Here's a diagram that Bill, WB6JAR, created for a DB25 for the printer port. (I don't know if you could shoehorn all of this into a DB9 for the serial port.) To simplify the soldering, he broke off some of the pins going out of the DB25 (that would normally plug into the computer) and used the resulting stubs inside the DB25 as solder points. The downside of 2 cables into one DB connector is that, if you want to use just one radio, the PTT cable for the second radio will always be attached to the DB25 and this might be cumbersome.

Click on the graphic for a larger view. If you do, use your browser's BACK button to return to this page.



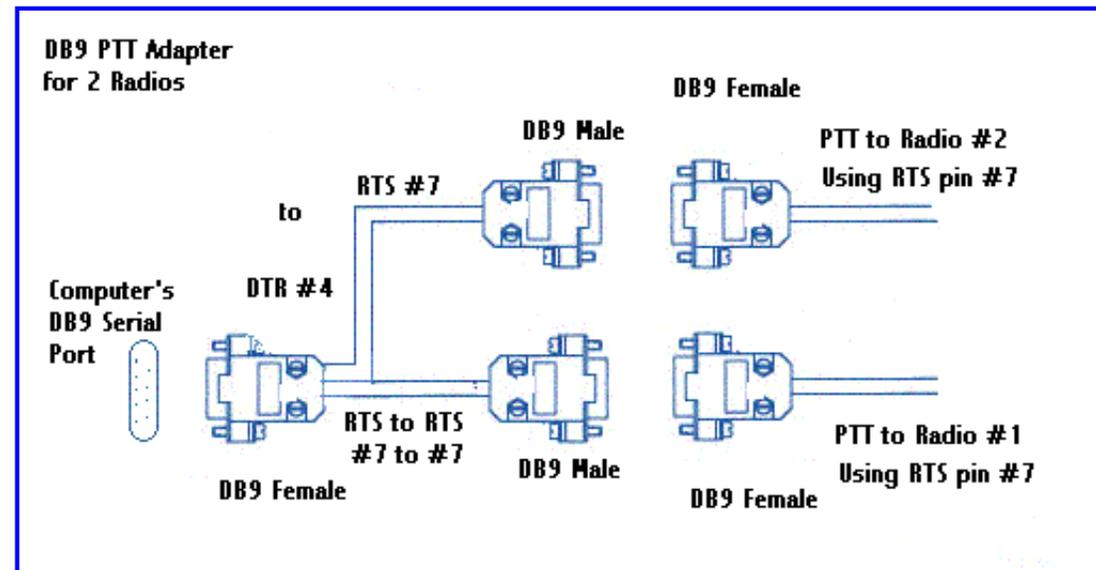
[Click to enlarge](#)

- **B. Make a two cable adapter from DB9 plugs.** This "Y" arrangement allows you to split the RTS and DTR signals to different DB9 male plugs. You can then plug [standard PTT control cables with DB9 female jacks](#) into the DB9 males plugs. (Could also work with the LPT port.)

Solder the DTR wire to the RTS pin in the DB9 male for radio #2. This allows you to use either radio's PTT control cable on either male plug, since both male plugs will be sending the PTT signal on pin #7, even though radio #2 is really getting its signal from the DTR pin on the computer.

This "Y" arrangement also lets you easily remove the second PTT cable if you're not using it.

Hint: Put a label on each DB9 to specify if it is for radio port 1 or 2.



Don't forget to [change AGWPE's settings to a "dual port"](#)

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Download and Install AGWPE

1. Download the AGWPE Program

- The AGWPE web site is <http://www.sv2agw.com/ham/agwpe.htm>
- You can [download the AGWPE program](#) from the [AGW Programs](#) page on this site. It has download links to get the file from SV2AGW's website or directly from this website.

The AGWPE setup file comes in "zip" format. If you need an unzip program, [visit the WinZip site](#) for the latest copy of WinZip.

2. Install AGWPE

Note: To remove a prior version of AGWPE from your system, simply delete the files in the AGWPE folder or, even simpler, delete the folder. You can not use the Windows' "Add or Remove Programs" routine in the Control Panel, since AGWPE is not "installed" in Windows like most other programs.

Another option is to rename the older version's folder rather than remove it.

- 1. AGWPE does not use the typical Windows "Add or Remove Programs" install routine from the Control Panel ([Start> Settings> Control Panel> Add or Remove Programs](#)).

Instead, simply extract the zipped files into a new folder. I always create a new folder for each version of AGWPE that I download, since each version of the program uses the same file names and I don't want to mix files from different versions.

Language files: You do not need to unzip the alternate language files into the AGWPE folder if you plan to use the default language of English. (For more information on alternate language files see the [Tips and Tricks page](#).)

- 2. Note that the main AGWPE program is called [AGW Packet Engine.exe](#). You may want to create a Windows shortcut to this file on your desktop. You can also add a link to [AGW Packet Engine.exe](#) on your Windows [Start Menu](#) by dragging and dropping a copy of the AGWPE shortcut icon onto the Windows [Start](#) button on the Task Bar at the bottom of your screen.

Do I need to install special drivers for using the parallel port to control PTTI?

Not any more. Earlier versions of AGWPE **did require** special parallel drivers, but they are **no longer necessary**. For the most recent versions of AGWPE, e.g. since version 2001.38, it is **not necessary** to download or use the drivers.zip file from the AGWPE site **despite** what the AGWPE program [Help](#) file or the [AGWPE web site](#) may say.

Next step:

[Basic Setup for AGWPE \(1 sound card & one 1 radio\)](#) or

Setup AGWPE for 2 radios or

Setup AGWPE for 2 sound cards

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- [Configuring the Radio Port Properties](#)
- [Configuring the Sound Card](#)

AGWPE uses the concept of **Radio Ports** to define how it will interface with a radio. An AGWPE radio port is created for each TNC, radio modem or sound card channel that AGWPE will manage. This page will show you how to setup an AGWPE **sound card** radio port in just a few minutes. Note that to complete your configuration, you will need to decide which RS-232 port (COM or LPT) you plan to use for PTT control, in other words, where your PTT cable will connect to the computer. Usually this is an unused COM port. See [PTT Cable](#) for more information.

Before starting AGWPE, always close:

- any programs that might be using the *serial or parallel port* you plan to use for PTT control
- any programs that might be accessing the *sound card*

a. Navigating in AGWPE

When you start the **AGW Packet Engine.exe** program for the first time, you will be greeted with a **Packet Engine** banner all in gold and a Software License Agreement which you must accept. The banner will disappear in a few seconds or you can click on it once to speed things up. At this point, you will discover that AGWPE does not put an open Window on your desktop, nor will there be a button on the bottom Task Bar of your screen. Instead, all you will find is the

AGWPE tower icon  on your Windows System Tray at the bottom right of your

screen. This icon is your only access to AGWPE when it is running! To help you find it, a yellow pop-up 'balloon' message points to the icon when AGWPE starts.

To change any of AGWPE's configurations, left or right click on the **AGWPE icon**  to bring up AGWPE's pop-up menu:



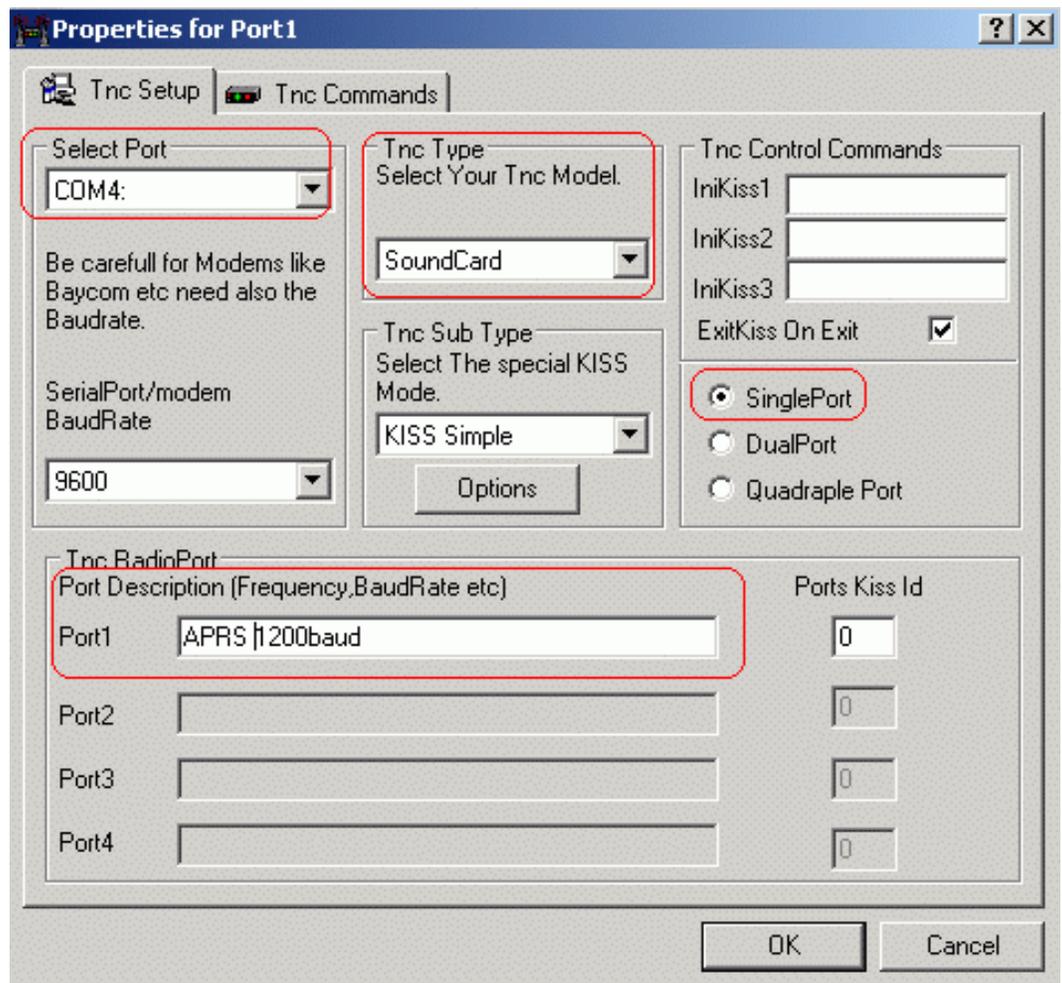
Note: The Sound Card Tuning Aid option on the menu will be grayed out until you create and configure a "radio port" as described below.



b. Create and Configure an AGWPE Radio Port

The first step in working with AGWPE is to create and configure a radio port for a sound card channel and its associated radio. From the AGWPE menu, select **Properties**. A blank **RadioPort Selection** window will open. Press the **New Port** button on the right. A message window will appear: **A New TncPort File Has Been Created**. Click **OK** to close the message and move on.

The **Properties for Port 1** window should now appear. Remember that AGWPE also can manage TNCs and radio modems, so some of the fields on this screen will not pertain to sound cards. The field outlined in red will be the key fields for a sound card radio port. Follow the step below in filling out the fields:



1. Make the following selections first on this screen (i.e. **TNC Setup** tab):

Select Port	enter the port where you will attach your PTT cable , e.g. COM1 or LPT1 ; see notes below *
TNC Radioport: Port Description	you can overwrite the current description for Port 1 and enter a description of your own choice, e.g. lcom 1200 Packet

* **Notes about Port selections (COM & LPT):**

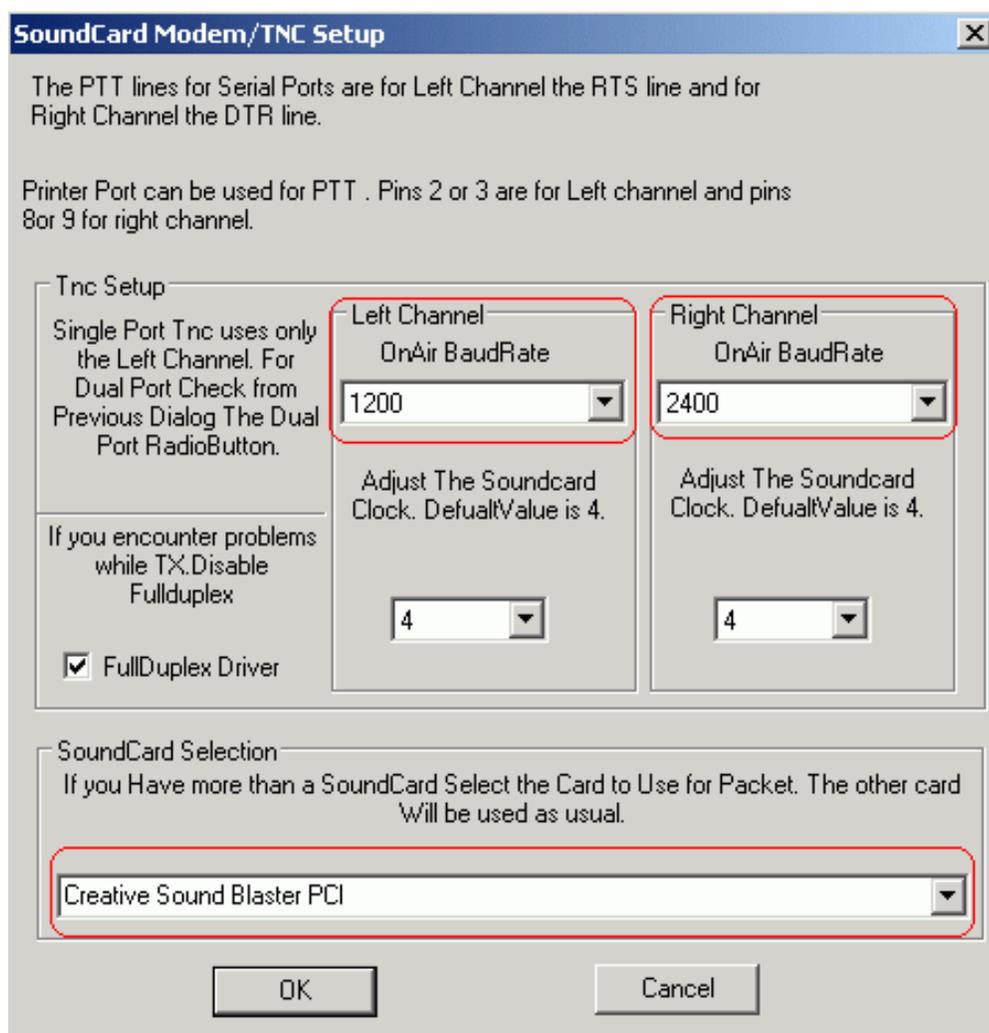
- **To select a parallel port** scroll to the bottom of the port list
- **If you are setting up a receive-only installation** or using a Signalink interface or other audio-controlled PTT interface and don't want to tie up a real port for a PTT line you won't be using, the AGW software **will accept non-existent parallel port** assignments, but not non-existent serial ports.

2. You can leave all other selections at their defaults, including **Serial Port/ Modem Baud Rate**, which is not used for sound cards.

3. Now go to the **TNC Type** field in the top middle of the screen and use the pull down list to select **"Sound Card"**.

c. Settings on the Sound Card Setup screen:

When you select **"Sound Card"** for your **TNC Type** (or if press the **Options** button in the middle of the **TNC setup** window, underneath **TNC subtype**), the program will bring up the **SoundCard Modem/TNC Setup** window which looks like this:



1. **Baud Rates:** Note that your sound card is capable of supporting two radio ports using its left and right audio channels. If you are only using one radio, it will be Port 1 on the left channel. Set the left channel baud rate for the rate you plan to use, i.e. **300** baud for HF SSB work; or **1200, 2400, 4800, or 9600** for VHF/UHF work.

Assuming that you will **not** be using the right channel for a second radio connection, set the

right channel rate for a baud rate **different from** the one you have chose for the left channel. This may prevent the possibility of future problems. (If you will be connecting to 2 radios, see [Configuring AGWPE for 2 Radios.](#))

2. **Sound Card Selection:** Use the pull down menu to select the sound card device you will be using with AGWPE. You may see other choices, such as a telephone modem (don't use) or another another card if you have two.

3. For now leave the other fields at their defaults:

- **Full Duplex Driver:** The **Full Duplex Driver** box should be checked. Most recent sound cards are full-duplex capable. If you later encounter transmitting problems, you may need to un-check the **Full Duplex Driver** box. This is likely to apply only to older sound cards; see [Problems with Connections](#) for more about this.
- **Sound Card Clock:** This setting is used if you have problems receiving distant stations; see the [Problems with Receiving](#) page for more information, but for now leave the setting at 4, the default.

Now press the **OK** button to return to the **Properties for Port1** window **but do not close it yet.**

4. Note that, by default, AGWPE has created two sound card radio ports. To avoid future operating problems, **change** the setting from **Dual Port** to **SinglePort** in the **TNC Control Commands** section of the **Properties for Port1** window. (Doesn't apply if you really will be [connecting to 2 Radio](#)).

For a simple, first time installation, all other selections can remain "as is" (use the default selections), including those in the **Tnc Commands** tab window in the **Properties for Port1** window and any other selections on the AGWPE menu.

5. Now press the **OK** button at the bottom of the **Properties for Port1** window. You should get a popup message telling you to restart the program, so click on the **Packet Engine** icon 

once again and select 'Exit'. Now restart AGWPE. The **Packet Engine** icon  should once again appear, but in addition you should now see a **TNC icon**  next to it. This new icon represents your new sound card Radio Port.

d. Editing a Port's Properties

If you want to change a setting in the Radio Port's configuration, click on the AGWPE icon to call up the menu, select **Properties**, and then click on the radio port you want to change. Then click **OK** and edit the fields in the **Properties for Portx** window.

e. Problems?

- Any time you have trouble starting or configuring AGWPE, it is often best to close AGWPE and delete all **port*.ini** files and the **agwpe.ini** file in your AGWPE directory/ folder. Then restart and re-configure AGWPE from the very beginning.
- If you don't see this **TNC icon** , you probably have a conflict with another program or device:
 - Make sure that the COM or LPT port you have select in AGWPE is not already dedicated to another device, for example, an internal modem or printer) or has been "captured" by another program (for example, your Palm Pilot's "Hot Sync Manager". You'll have to resolve any conflicts by either closing the other program, disabling the device, or selecting another port for AGWPE's PTT control.

- Make sure that no other program is running and using the the sound card.

For further help in resolving [port conflicts](#), go to the [Problems with Program Behavior](#) page on this site.

[Configure AGWPE for one sound card and 2 radios](#)
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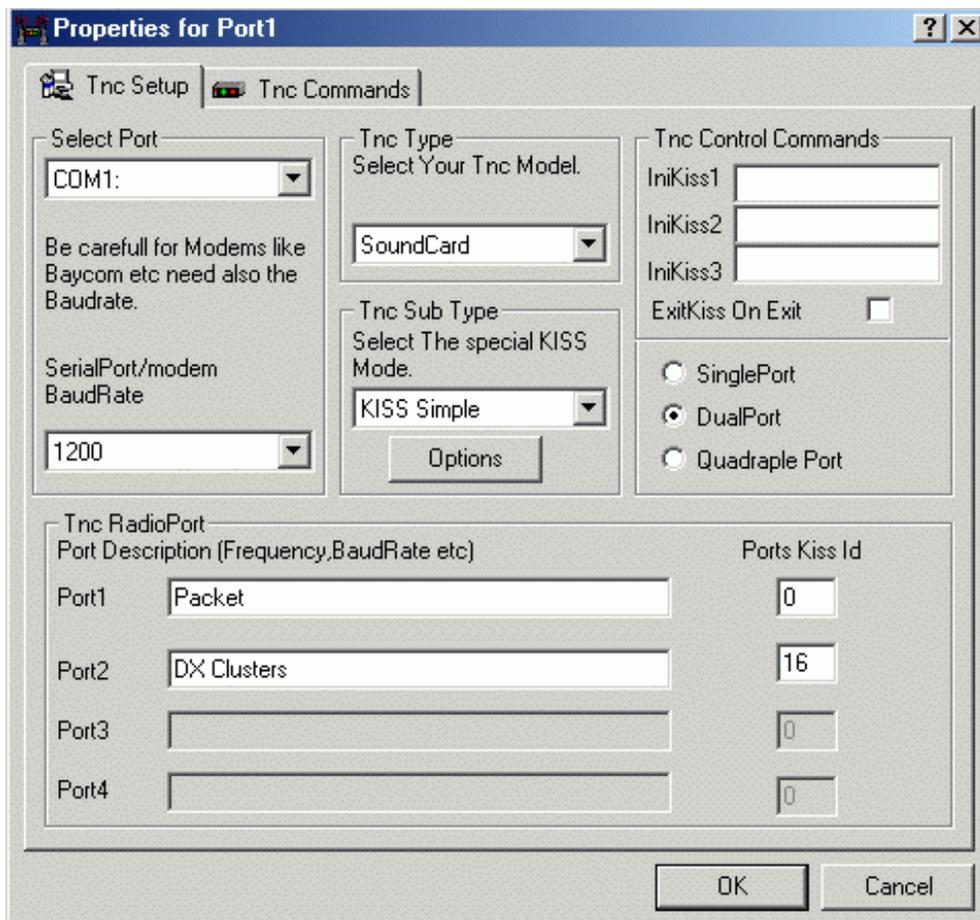
Configuring AGWPE for Two Radios on One Sound Card

AGWPE is able to use the stereo capabilities of the sound card to **interface with two radios simultaneously!** One possible use of this would be to listen to the DX Cluster frequency on one radio while operating an APRS or other packet communication frequency (including HF) on the other radio.

To make the appropriate cables, see [the 2 Radios Cable page](#).

To handle the second radio, you'll need to configure AGWPE as if it were "dual port" TNC:

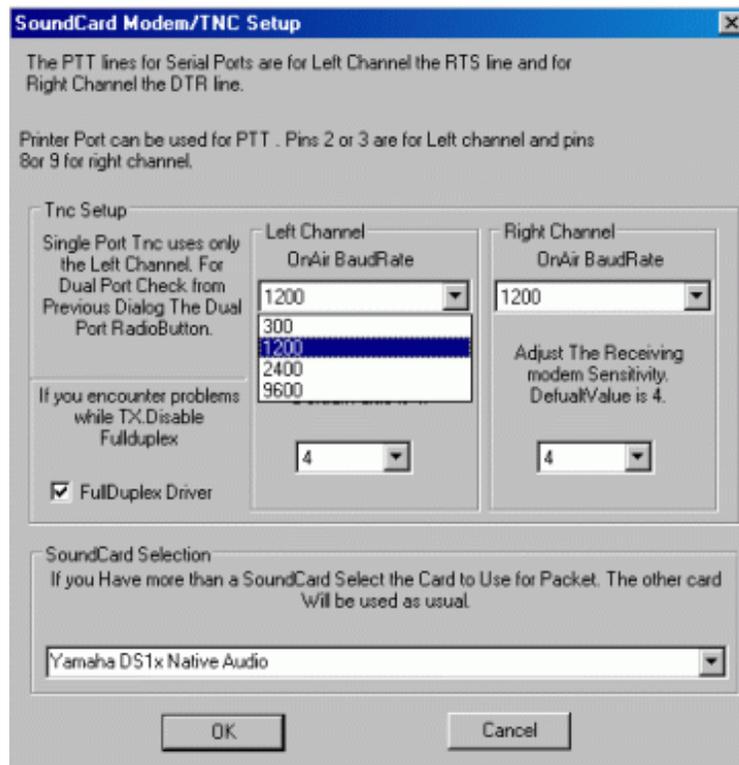
- Click on the **Packet Engine** icon  in the System Tray at the bottom of your screen to bring up AGWPE's pop up menu.
- Click on **Properties** and then, with **Port 1** highlighted, click on **OK**.
- When the Properties box opens make these changes:
 - Click on the **DualPort** choice in the far right column of the window.
 - The **Port2** field at the bottom of the window should now be active (turns from gray to white). In this field, type in a name of your choice for Port 2, e.g. the name of the radio and/or frequency and/or application. You can also edit Port1's name at this time if you want.



Port Description (Frequency,BaudRate etc)	Ports Kiss Id
Port1 Packet	0
Port2 DX Clusters	16
Port3	0
Port4	0

[Click to enlarge](#)

- **Set the Baud Rate:** Under the **TNC Sub Type**, click on the **Options** button to bring up the **SoundCard Modem/TNC Setup** window that lets you change the "on air" baud rate for each channel. Here's an example:



By default, the "on air" rate is set at 1200 for both channels.

Note About PTT control: In earlier versions of AGWPE which did not have the two radio option, AGWPE used *both* the RTS and DTR pins on the COM or LPT port for PTT control. You could wire your PTT cable for either.

Current versions of AGWPE don't do this. If you select **SinglePort**, only the RTS pin will be used; the DTR pin isn't used. If you select, **DualPort**, the RTS pin will be used for the radio on port 1 (the left channel) and the DTR pin will be used for the radio on port 2 (the right channel).

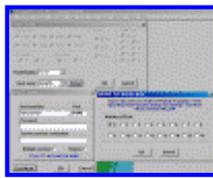
How Do You tell your applications which AGWPE port/radio to use?

In **WinPack**, for example, when you issue the connect command, put the port number between the connect command and the target station's callsign, for example:

C 2 KC2RLM

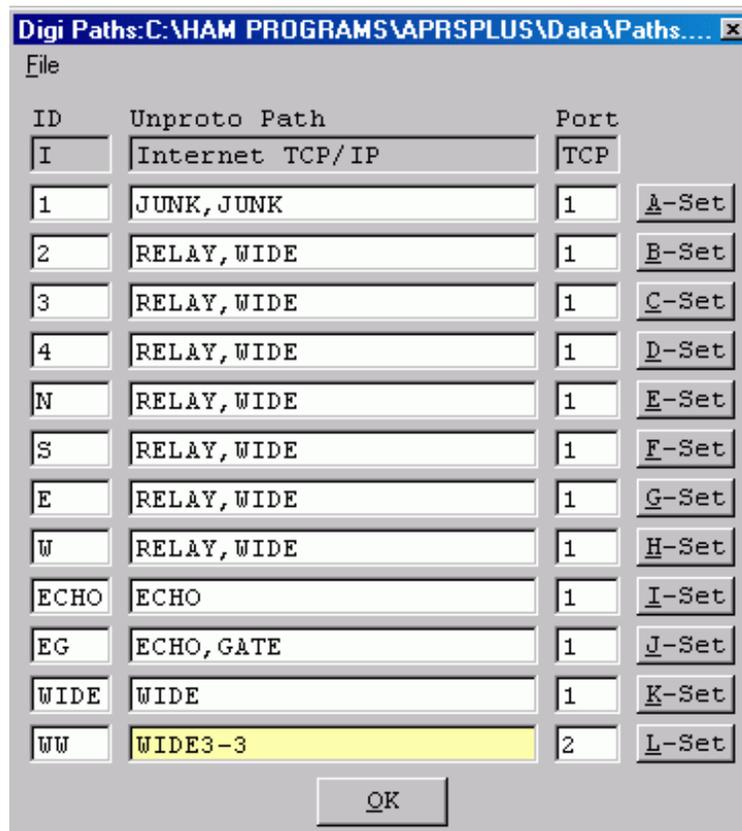
In **UI-View**, go to the **Setup** menu and then **Station Setup**. UI-View *transmits* on the ports you specify under **Unproto Ports**. For example, if you only enter **1**, then UI-View will only transmit your station beacon through AGWPE port 1. To specify multiple ports, enter e.g. **1,2**.

UI-View *receives* by default on all ports. To change that, go to the **Setup** menu and then **Comms Setup**. When you select a host mode of **AGWPE**, a **Setup** button will appear to the right of **AGWPE**. Press that button that to bring up the **AGWPE Setup** window. Then press the **Ports Mask** button to bring up the **AGWPE Port Mask Monitor** window. Check or uncheck ports to control which AGWPE ports UI-View will receive on.



WinAPRS has a special way of handling it. See the [WinAPRS setup page](#).

In APRSplus, use the **Commands: Unproto Paths** menu option (or Ctrl+Shift+U) to call up a list of UI paths. By default the TCP port for all path choices is set to 1, ie AGWPE port 1. To use AGWPE port 2, pick an unused line and change the TPC port to 2; also edit the path to one of your choice. Now press the **Set** button to the right of the port you want to use. **It will then be highlighted in yellow**. Press the **OK** button.



Problems in setting up two ports in AGWPE? If you have any unusual difficulties in changing from single port to dual port operation, it may just be easier to:

- exit from AGWPE
- delete **all** `port*.ini` files and the `agwpe.ini` file in the AGWPE directory/folder
- restart and re-configure AGWPE from the very beginning-- it doesn't take long.

Possible Problems with Stereo Channels and 2 Ports/Radios

- Some users have reported the RX audio from one channel may somehow "spill over" on to the other channel. The only reported solution is to reduce the radio's RX volume on the originating channel/port, so that it is just loud enough for AGWPE to decode -- watch the green blinking pixel in the modem icon.
- George SV2AGW says there may be a problem running AGWPE in 2 port sound card mode if your soundcard is not full-duplex capable. Most cards are, but if yours is not, then while one channel transmits, the other channel will stop receiving.

If you want to check if your soundcard is full-duplex:

1. Run AGWPE (using the soundcard as a TNC, of course)
2. Run the Windows **Sound Recorder** program:
[Start/http://www.kc2rlm.info/programs/Accessories/Entertainment](http://www.kc2rlm.info/programs/Accessories/Entertainment)
3. Press the **record** button.

If your soundcard works in full-duplex mode it will start recording. If it does not, you will get a pop-up message warning you that your soundcard is in use by another program, i.e. AGWPE.

Last Updated: 08/11/2008



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Using a Second (or more) Sound Card with AGWPE

Recent AGWPE versions let you use unlimited **additional** sound cards in your computer. This allows you to use one sound card for Windows and other programs and devices, such as a CD player, while your second sound card can be dedicated to AGWPE. In fact, you can install a third sound card (or more!) for more AGWPE packet ports. (Your only limitation will be the number of available card slots and PTT signaling ports -- COM, LPT or USB -- in your computer.)

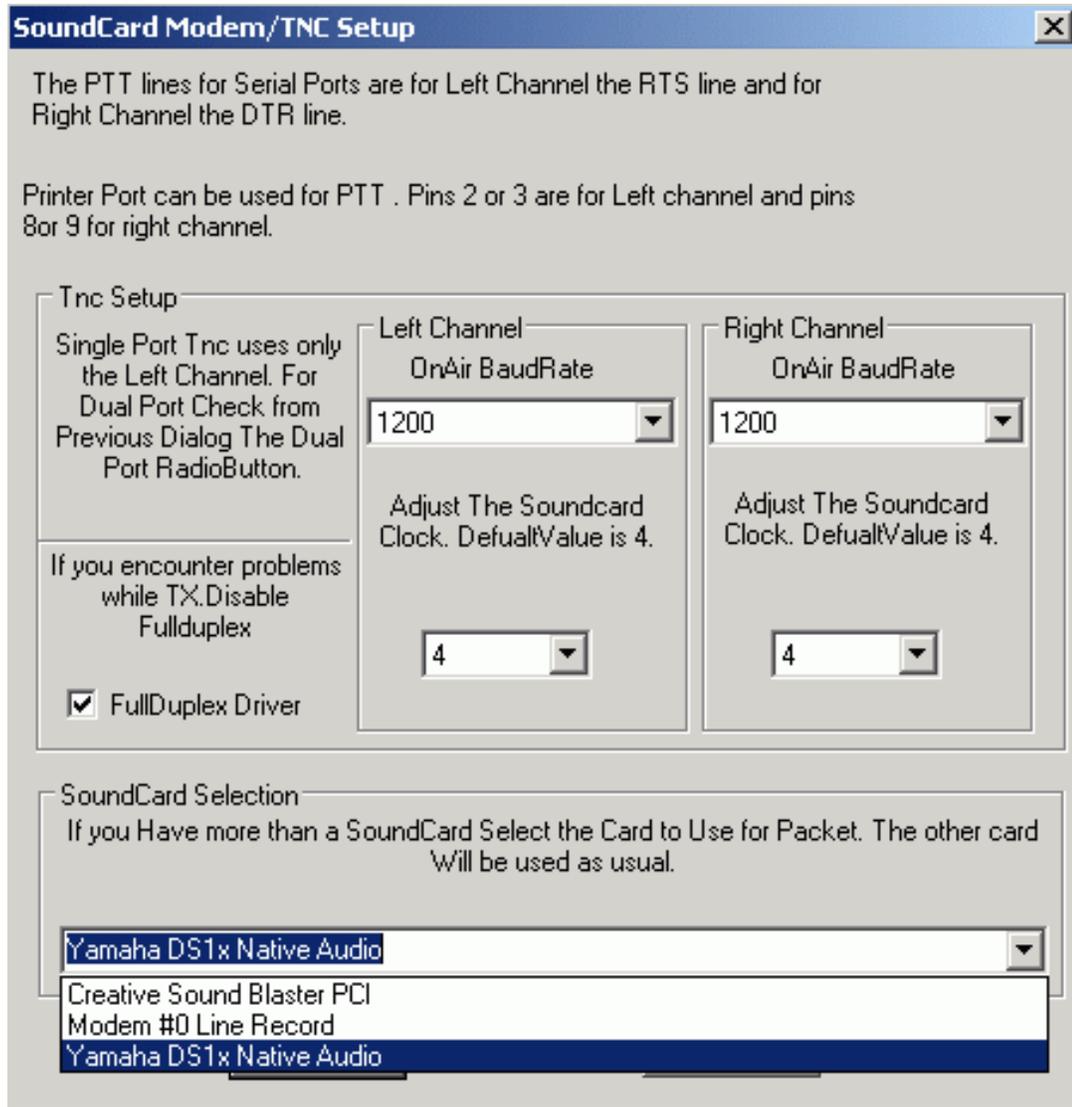
Additional sound cards are usually not hard to come by. You can often pull one out of an older/discarded computer. Or you can obtain a new card for very little money (\$30 USD or less). External cards that plug into a USB port are also available. Generally speaking, modern day inexpensive sound cards will have adequate quality for AGWPE use. [For more information about compatible sound cards see [this page](#).]

Ideally your additional sound card will be "plug-and-play" and Windows will automatically recognize it after you install it and reboot. Otherwise you will need to use the Windows **Control Panel** option, "**Add New Hardware**", to tell Windows about the sound card and install the appropriate drivers.

After the additional sound card is installed in Windows, AGWPE will automatically recognize it.

So which card should you use for AGWPE? Most other programs will insist on using the card designated as the **default** card (usually the first card installed). These programs do not have ability of selecting alternative cards. So, to avoid conflicts, set AGWPE to use a **non-default** card. You can determine which sound card is the default card by temporarily attaching speakers to the LINE OUT jacks on each sound card. Play some Windows sounds or a CD to see which sound card is being used. That one will be the **default** card.]

To select the sound card you want AGWPE to use for sound card packet, call up AGWPE's main menu, select **Properties** and then, with **Port 1** highlighted, click on **OK**. The **Properties for Port1** box will then open. Under the **TNC Sub Type** choice field there is an **Options** button. Click on the **Options** button to bring up the **SoundCard Modem/TNC Setup** window. At the bottom of this window is a **Sound Card Selection** dialogue box where you can select the sound card you want AGWPE to use. Click on the down arrow to the right of the box to see your choices.



Typically the first sound card listed in the AGWPE Sound Card list is the Windows **default** card and it is usually the original or first card installed in the computer. You want to use a **non-default** card for AGWPE. In the example above, the **Creative Sound Blaster PCI** is the **default** card. So you'd want to use the non-default card for AGWPE, in this case the **Yamaha DS1xNative Audio**.

Caution: AGWPE may also report other devices that are not sound cards, such as telephone modems as in line 2 in the screen shot above: **Modem #0 Line Record**. If you select a non-sound card device, AGWPE will give this error message: " Your Sound Card Drivers can not Support the Wave Format" and will not run.

How to specify the Windows Default Sound Card

If for some reason you want to change the card identified as the default sound card, follow these steps. (Example: You want to use the current default card for AGWPE and want other programs to use card #2. You need to make card #2 the default card.)

This procedure is essentially the same for Windows 98/ME/2000/XP:

- Open the Windows **Control Panel**
- Select **Sound and Multimedia** (or **Sounds and Audio Devices**)
- Select the **Audio** tab
- In the **Sound PlayBack** box, select the sound card that you wish to set as the Windows default card from the drop down list
- Repeat this in the **Sound Recording** box

Note: If you have more than one sound card in your system, you will have to select the AGWPE card in the **Mixer Device** field when you set the volume settings for the card. Normally the default card's volume settings are first shown, so you have to make the effort to change the **Mixer Device** field selection to select the AGWPE card.

Known and Possible Bugs

- AGWPE has a Volume Control Settings window where you can adjust the transmit and receive settings. Unfortunately, as of version 2004.1108/2005.127, the settings will only adjust the default card, which is probably not the one for AGWPE.
- One user has reported Windows lock-ups when trying to use 2 sound cards of the same manufacturer or the same drivers.

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Basic Sound Card Settings for AGWPE

For AGWPE to work, you need to set four basic sound card settings correctly:

- The **receive** audio **source**
- The **receive** audio **volume level**
- The **transmit** audio **source**
- The **transmit** audio **volume level**

You can adjust these sound card settings in two ways:

- **1. AGWPE's Sound Card Volume Settings screen**
 - **a. Receive Audio Settings**
 - **b. Transmit Audio Settings**
- **2. Windows' Volume Control Program**
 - **a. Transmit Audio Settings**
 - **b. Receive Audio Settings**

Other information on this page includes:

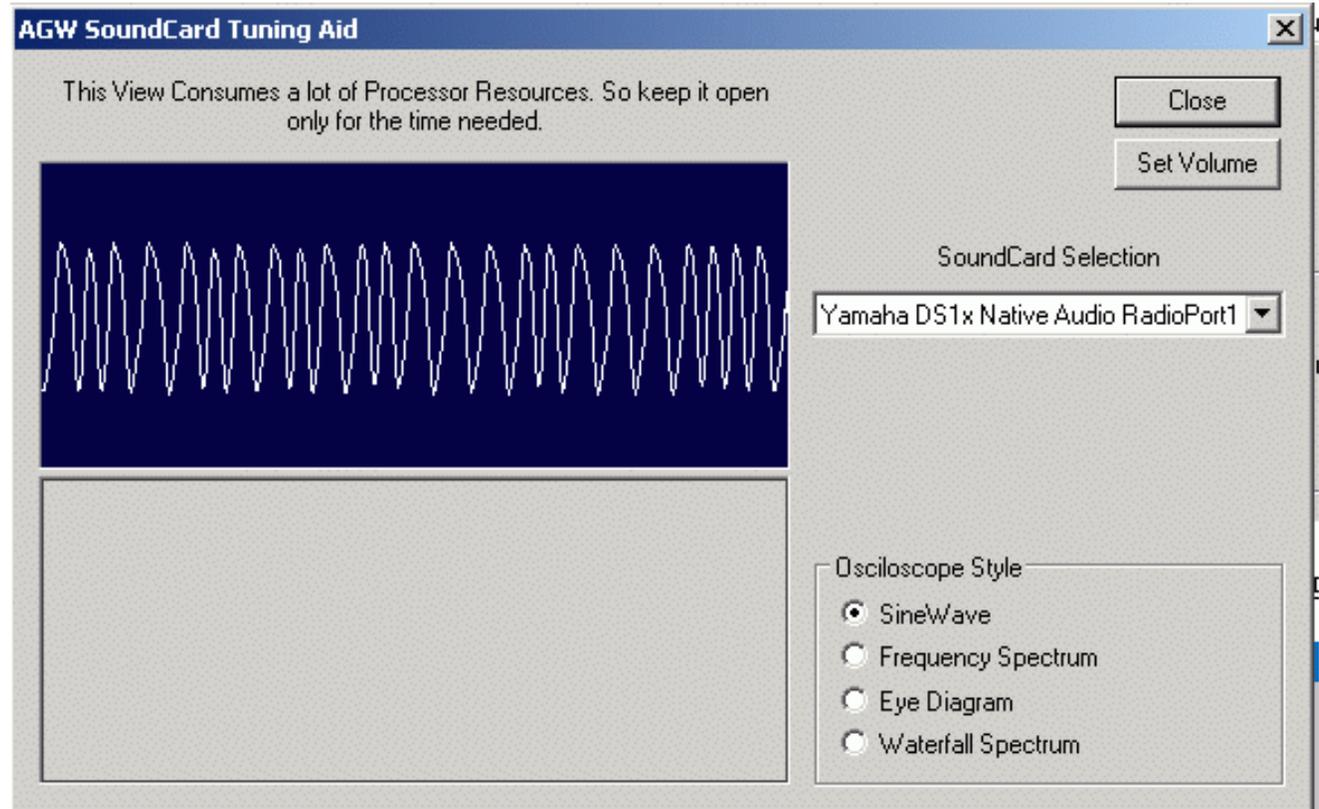
- **3. [Configuring Two Sound Cards](#)**
- **4. [Preserving Your Volume Settings \(QuickMix\)](#)**

There are some advanced sound card settings that **may** also affect you. These include "Speaker Type", "Hardware Acceleration", and "Sample Rate". These are discussed on the [Additional Settings](#) page of this web site.

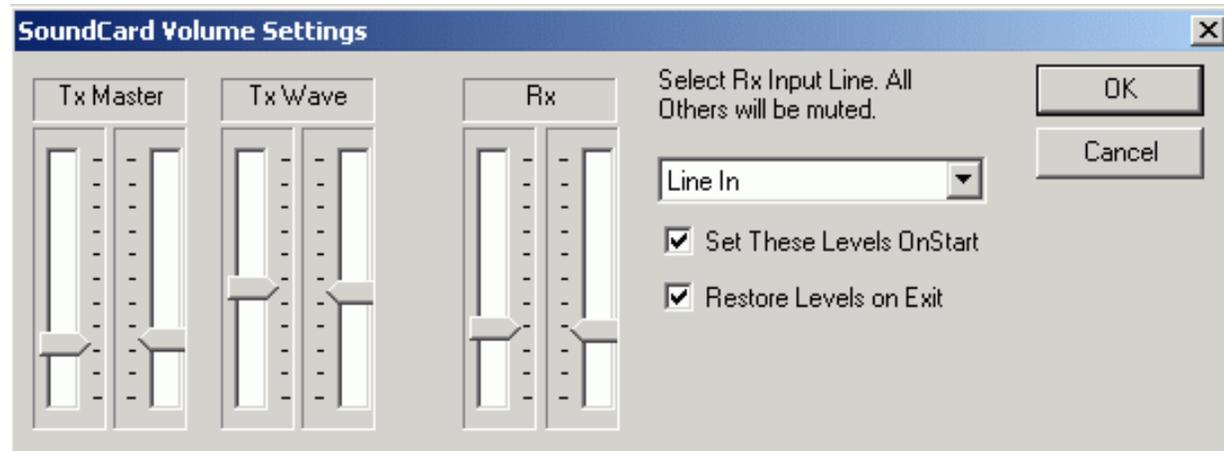
1. Using AGWPE to Adjust Basic Sound Card Settings

To set the volume controls from within AGWPE, right click the AGWPE tower icon  to bring up the AGWPE menu and then click on [Sound Card Tuning Aid](#). The Tuning Aid is a great way to adjust your RX (receive) volume. Note that the Tuning Aid screen window will remain on top of all other windows. You can drag it with the blue Title Bar if it gets in the way, but it's

handy to keep it displayed throughout the volume adjusting process:



Then in the AGWPE [Sound Card Tuning Aid](#) window, click on the [Set Volume](#) button to get to this window:



See the sections a. and b. below for more information about these controls:

Bug Report: There are still some problems with this AGWPE feature as of 2003.308:

- By default, this window assumes the LINE IN is the **RX Input Line**. If you are using LINE IN, then you will have no problems and can use the volume sliders to adjust your RX audio level.

The bug is that the window will **not** let you change the **RX Input Line** (audio source) as the pull down menu suggests. For example, if the sound card is now set to use the "LINE IN" jack as the audio source, then selecting "MIC" as the **RX Input Line** in this window will have no affect. The sound card (and AGWPE) will continue to use "LINE IN". You will be able to control the volume sliders for the source you select, e.g. MIC, but your input source will not change to MIC.

- If you have two sound cards in your system, AGWPE only controls the volume settings on the first sound card. If you are using a second sound card for AGWPE, then this window will have no affect on the settings for that second card.

If either of these problems affect you, then you need to use the [Windows' Volume Control Program \(see #2 below\)](#) to adjust the input source and/or the sound card being used. [See #2](#) below.

a. Receive Audio Settings (via AGWPE)

- **Receive Audio Volume:** The left **Rx** slider controls the receive volume (recording volume) of the left channel or port 1 of the sound card. The right column sliders control the right channel or port 2. (If you are using only one radio port in AGWPE, it will be the left slider).

I've had good success with the sliders set 1/3 up from the bottom. Be sure not to set them too low since it may stop all input (they don't have to be to the very bottom for audio input to be stopped). Use the sound card tuning aid's Sine Wave scope to see the results of your settings. The sine waves should fill about half the scope as in the Tuning Aid screen shot above. Use the volume slider to adjust the wave size. If you get the output from the radio's speaker jack, you can also adjust the radio volume. AGWPE is pretty tolerant of RX volume levels, but conceivably it is possible for the volume to be too loud or too soft.

If you don't see any waves, then your audio source setting is probably incorrect (see next paragraph) or, if you are using the radio's mike or speakers for RX audio, your radio's squelch is on; turn it off so you can hear the channel noise.

Visit the [Sound Card Tuning Aid page](#) for more information, including screen shots of signal problems.

- **Receive Audio Source:** See **Bug Report** above. The Rx Input Line (audio source) does not work as advertised in version 2003.3008. You need to use the [Windows' Volume Control Program \(see #2 below\)](#) to adjust your settings.

[When the bug is corrected, you will be able to select the source of your receive audio, either **Line** (meaning LINE IN) or **Microphone**, depending where your RX audio cable is plugged. As the screen says, other sources will be muted

and that's good.]

(If you opt to use the Microphone instead of the Line In for RX in, be sure that you **do not use the Microphone Boost option** of your sound card. See [Windows' Volume Control Program](#) below for [instructions on how to configure boost.](#))

- **Set/Restore Options:** If you use your sound card for programs other than AGWPE, the [Set These Levels on Start](#) and [Restore Levels on Exit](#) will be helpful. They allow you to set the volume especially for AGWPE and then return them to their previous settings when you exit AGWPE.

b. Transmit Audio Settings (via AGWPE)

- **Transmit Audio Volume:** The [Tx Master](#) sliders and two [Tx Wave](#) volume sliders work together: **Wave** means **Program**, in this case AGWPE and the packet tones it generates. The [Tx Master](#) sliders are a master control that will further adjust the [Wave](#) volume.

As with the RX sliders, the left column sliders (for both Master and Wave) control the left channel or port 1 of the sound card. The right column sliders control the right channel or port 2.

I've had good success with the sliders set 1/3 up from the bottom. Your setting will depend largely on how well the attenuation circuit in your TX audio cable matches the optimal microphone input level for your radio. See [How Much TX Volume?](#) below for some further advice.

It is essential that none of these two sliders be at the absolute bottom or near the bottom, as that may stop all output.

How Much TX Volume?

You can get a rough idea of your TX volume by temporarily plugging your computer speakers into the LINE IN jack. But that will not tell you how what your TX audio sounds like on the air. It would be better to listen to your transmitted audio with a second radio.

But the best way to check your transmit volume is with a deviation meter. The correct deviation is 3.75 kHz of deviation (+/- .25). But since most of us don't have a deviation meter, Jim K6CCC offered this alternate suggestion:

My standard advice for people who do not have access to a deviation meter is to set your path to digipeat through a single local digipeater (e.g. TEST VIA WIDE), then go into converse mode (UI mode) and transmit a single carriage return. Watch to see if your single packet gets digipeated by that one local digipeater. If it doesn't get digipeated on your first attempt, try several more times because it may not have gotten through because of a collision. **If it does not** get through after a few attempts, turn up the volume just to that point where it gets through reliably.

Conversely, if the packet **does** get digipeated, turn down the transmit audio level a little and try again. Keep doing this (turning down the volume) until your packet **does not** get digipeated reliably. Then turn it back up **just a little bit** and verify you can get the packet reliably digipeated.

It's FAR better to have your volume too low than too high!

When you are done, press OK to save your settings and then close the Tuning Aid window.

2. Using Windows' Volume Control Program to Adjust Sound Card Settings

It's also possible to set the volume control settings with the [Windows' Volume Control](#) program, but the AGWPE method above in #1 is much easier. However, there may be some settings, such as Microphone Boost, that can only be controlled by [Windows' Volume Control](#) program and not AGWPE. The sections below discuss how to configure [Windows' Volume Control](#) for :

- [Tx source and audio](#) (outgoing packet tones)
- [Rx source and audio](#) (incoming packet tones)

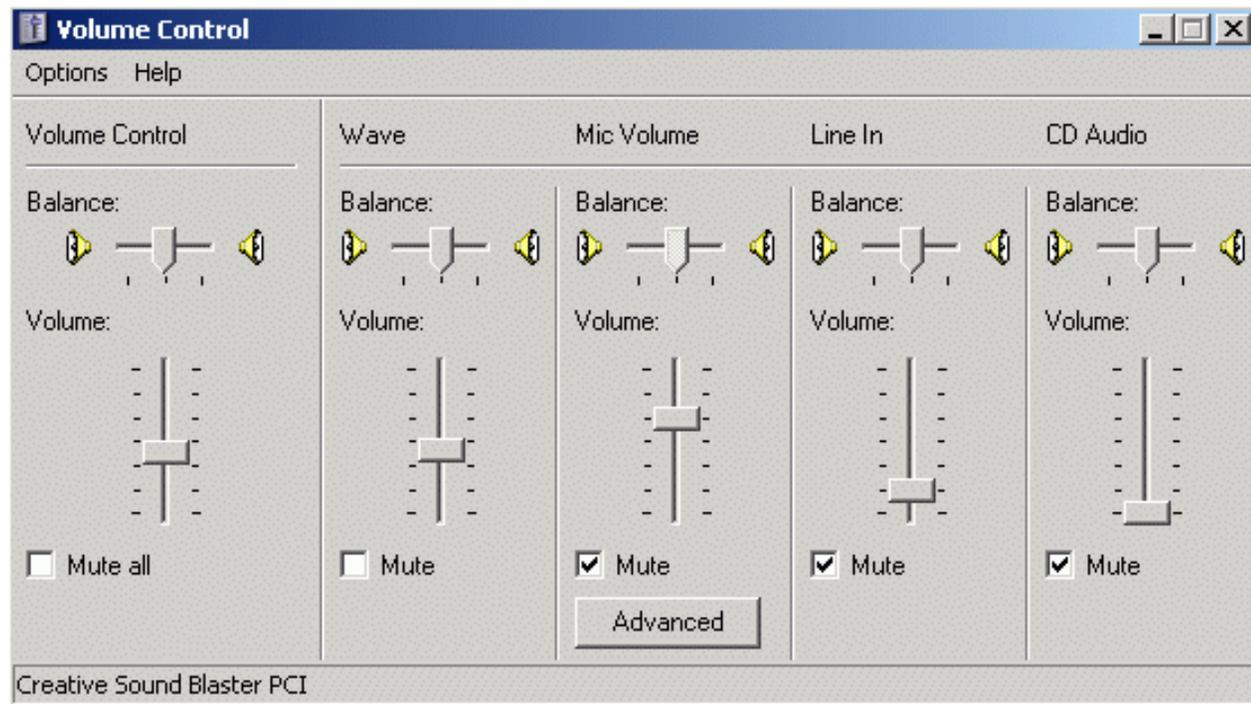
- [two or more sound cards](#)
- [preserving your volume control settings](#)

To start, you should see the volume control icon  in the system tray on the lower right of your screen. If you don't, follow the directions on the [sound settings page](#) to display it.

a. Transmit Audio Settings (via Windows)

To set the source and volume level of your **outgoing** packet tones:

- Left click twice very quickly on the [Volume Control icon](#)  (or go to the [Control Panel](#) and [Sounds: Audio](#)). The [Volume Control](#) window should open . It initially displays settings for just the **Playback** or **TX** audio (sound card-to-radio). Here is what that window looks like in my system; it may be somewhat different in your system because of the sound card type:

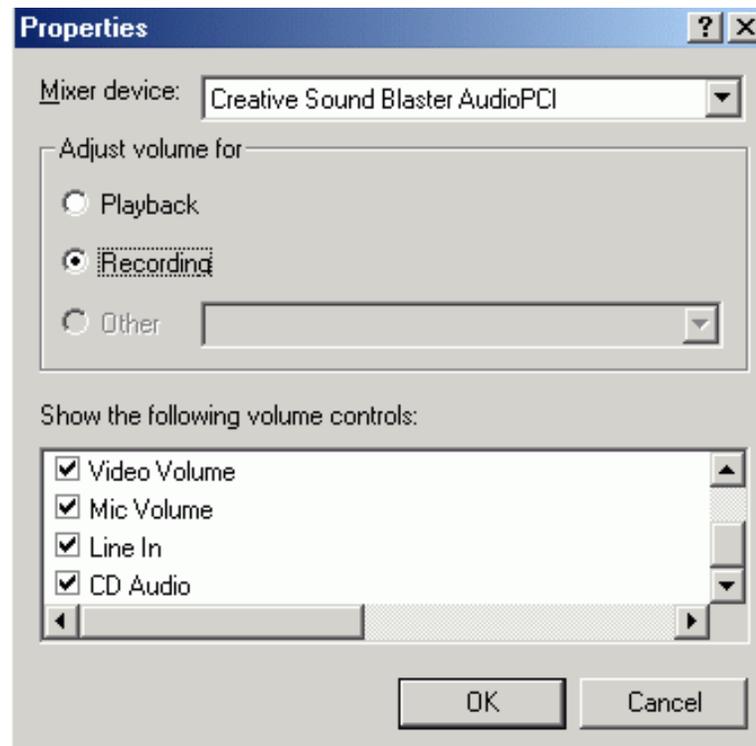


- The settings of importance on this window are:
 - The left most **Volume Control** volume slider and the **Wave** volume slider work together. Consider **Wave** to mean **Program**, in this case AGWPE, which is creating the outgoing packet tones. The **Volume Control** slider is a master control that will further adjust the **Wave** volume.
 - I've had good success with both sliders set 1/3 up from the bottom. Your setting will depend largely on how well the attenuation circuit in your TX audio cable matches the optimal microphone input of your radio. See [How Much TX Volume?](#) below for some further advice.
 - It's essential that neither of these two sliders be at the absolute bottom or near the bottom, and it's essential that the **Mute** boxes are **not checked**.
 - Leave all **Balance** sliders in the middle. They are for stereo channel control and setting the slider to the wrong side could mute outgoing sounds to one of the two possible sound card channels/radioports.
 - I mute all other audio output sources (Mic, Line In and CD) so that only AGWPE (wave) outputs sound to the radio and not other sources.

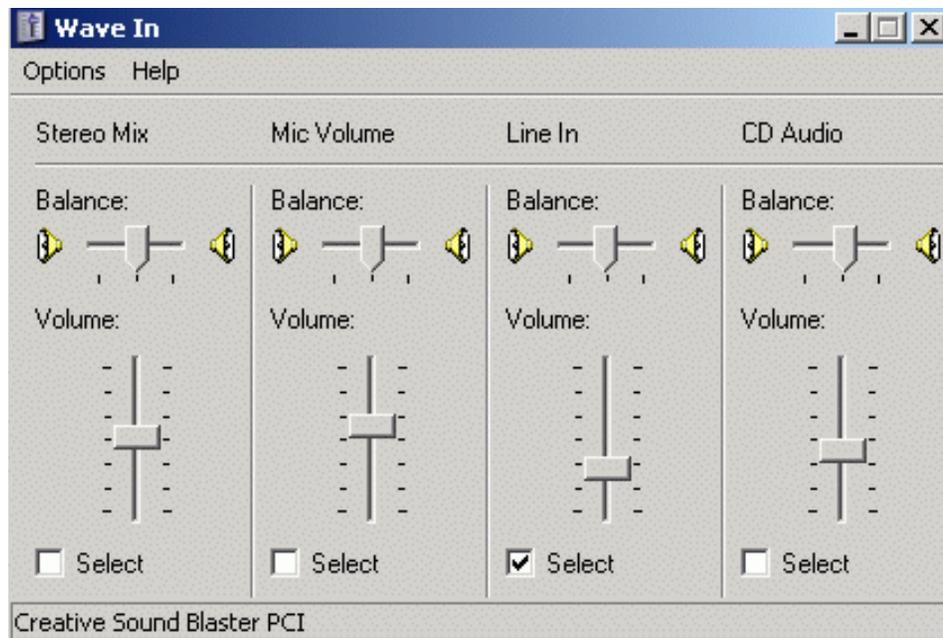
b. Receive Audio Settings (via Windows)

To set the source and volume level of your **receive or RX** audio is a bit more difficult to find. These settings are found in a **different Volume Control sub-window**, the **Recording Control** window, whereas the outgoing sounds (see A. above) are set in the **Playback** window. **This is very important**. Many people do not realize this **Recording** window exists. Failure to get the recording settings correct results in problems receiving packets. To get to the Recording Window:

- From the **Playback Volume Control** window shown above, select the **Options** menu choice, then **Properties**.
- Click on the **Recording** radio button to bring up the list of volume controls. Make sure that there's a check mark next to the jack where you plugged in your **radio RX audio** cable -- either **Line In** (preferably) or **Microphone**. Here's what this window looks like on my system.



- When you're done, click on the **OK** button.
- You should now see the **Recording Control** window (or the **Wave In** window as it is called in my system). Since I use the **Line In** jack for Radio RX audio, here's what my settings look like. Notice the **Select** check mark under **Line In**:



- Click the **Select** box for the jack where you will plug in your **radio RX audio** cable, either the **Line In** (preferably) or **Microphone**.
- Set the volume slider about **1/3** up (soft). This should work for you, but note that AGWPE can probably handle any setting other than "off/quiet". See [How Much RX Volume?](#) below for some further advice.
- Leave the balance slider in the middle.
- After you've made your choices, click the 'X' in the top right corner of the window to close the window and the Volume Control program. Your settings will be saved automatically.

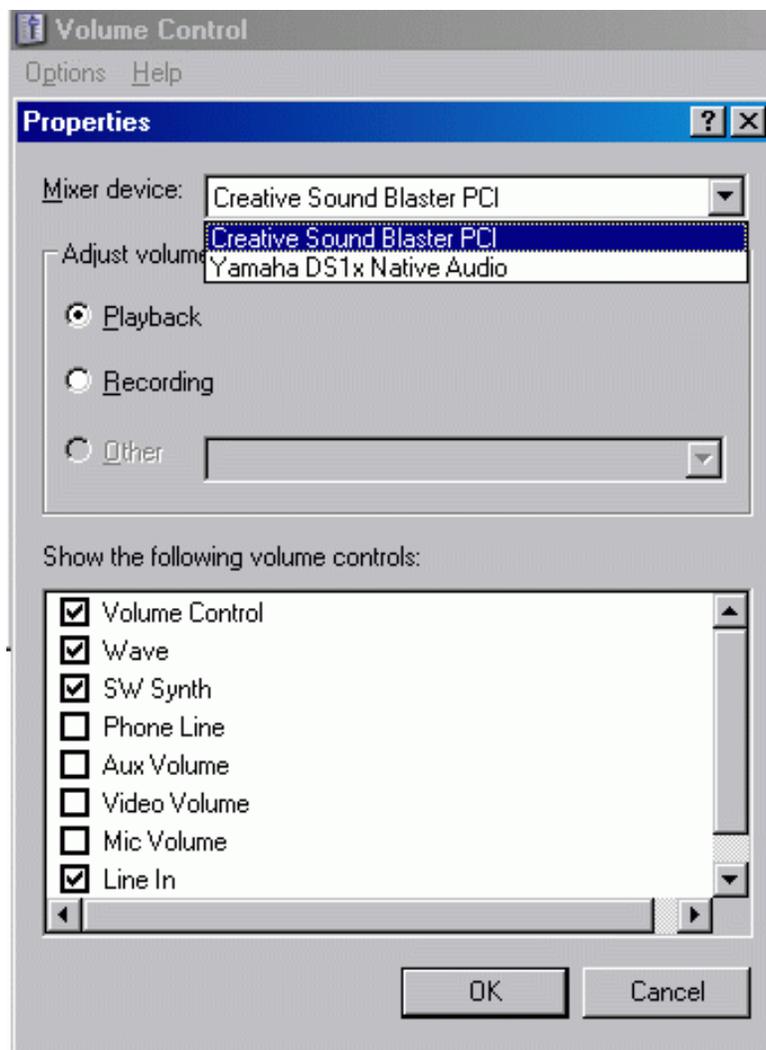
Microphone Boost: If you opt to use the Microphone instead of the Line In for RX in, **do not use the Microphone Boost option** if it is offered by your system. I found this option by clicking on the **Advanced** button found under the **Microphone** slider in the **Recording Control** window. The "boost" feature typically adds a 20 dB increase in audio volume and is designed to amplify the weak signal from a computer electret microphone. The audio from your radio is normally already too high for input into the MIC jack (that is why you are advised to add an attenuation circuit to the RX cable). So using the boost feature can make the problem worse.



3. Configuring the Volume Control program for a Second (or more) Sound Card

If you have two or more sound cards installed, you will need to set the playback and record settings for the additional cards (those used by AGWPE). Here's how to do it:

- Left click twice very quickly on the **Volume Control icon**  in the System Tray. The **Volume Control** window should open.
- Select the **Options** menu choice, then **Properties** to bring up the **Properties Window**.
- At the top of the **Properties** window, you'll see a **Mixer Device** field. Click on the down arrow ▼ to the right of the field to call up a list of mixer devices.



☞ Click to enlarge

- Click on the second sound card to select it. Then after making sure the **Playback** button below it is selected, press the **OK** button. This will return you to the Volume Control **playback** sliders for the **second** card (the sound card's name will be in the lower left of the window). Make your settings as you did [above in Transmit Audio Settings](#).
- When your done with the playback settings for the second card, select the **Options** menu choice again and then **Properties** to bring up the **Properties** Window again.
- Once again click on the down arrow ▼to the right of the **Mixer Device** field to call up a list of mixer devices.
- Click on the second sound card again to select it. This time make sure the **Recording** button is selected and press the **OK** button. This will bring you to the Volume Control **recording** sliders for the second sound card . Make your settings as you did [above in Receive Audio Settings](#).

4. Preserving your volume control settings

When most systems reboot, the volume control settings will remain as they were when you shut down. This is more likely if you use the [Set and Restore Options](#) in AGWPE's [SoundCard Volume Settings](#) screen, [see Receive Audio Settings above](#).

However in some sound cards/systems, when Windows reboots, your Volume Control settings may automatically be reset to a default that is something other than you want. This happened to me with one sound card. Even though I would chose [Line In](#) as my desired 'audio in' recording source, as soon as I rebooted, [Microphone](#) became the recording audio source! I'm not sure why this was happening -- perhaps it was the sound card mixer program.

Or your ideal AGWPE settings may be changed by another program that subsequently uses the sound card.

You have two main options if this is happening to you:

1. Each time you run AGWPE after a Windows boot/reboot, re-configure the Volume Control [Recording Control](#) properties as above.
2. Use a utility program that, on startup, automatically sets the Volume Control settings the way you want them. I used a small (260 kb) freeware utility called [QuickMix](#) to do this. You can [download the program from the Quick Mix web site](#).

Using QuickMix

1. Install QuickMix by running the QuickMixIn.exe program that you downloaded.
2. Set the Windows Volume Controls the way you want.
3. Run the QuickMix program and 'save' the Volume Control settings to a AGWPE.QMX file in the directory of your choice.
4. Then you can run QuickMix (or just click on the .QMX file) to restore your AGWPE settings.

If you want to have this .QMX file automatically load at boot-up, put a shortcut to this .QMX file in your Windows startup folder. For me, that would be:

[C:\WINDOWS\Start Menu\Programs\StartUp](#)

In Windows Explorer, go to this directory and, from the Menu bar, select [File](#), then [New](#), then [Shortcut](#), and then [Browse](#) to the AGWPE.QMX file you want. (Make sure you set the Browse directory window to show [All Files](#), not Programs.)

5. Now whenever you start Windows, it will automatically read the AGWPE.QMX file, load and run QuickMix, reset the Volume Controls, and then close QuickMix.

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Additional Sound Card Settings for AGWPE

Related Multimedia Properties

[Displaying the Volume Control Icon](#)

[Turning Off Window's Sounds](#)

This page has additional sound card/multi-media properties that may help in operating AGWPE successfully. (See the [Sound Card Settings page](#) on this site for basic sound card settings.)

1. Related Multimedia Properties

Three additional Windows multi-media properties can affect AGWPE performance:

- **Speaker Type** - affects TX audio; generally, **Desktop Stereo Speakers** should be selected
- **Hardware Acceleration** - can affect both TX and RX audio; generally, the highest rate the computer can handle should be selected but if AGWPE is having packet decoding or connection problems, set it to a lower speed.
- **Sample Rate Conversion Quality** -- affects both TX and RX audio; generally, the highest rate the computer can handle should be selected

These settings are usually made from the same general area in version of windows.

- **Windows 95:** There is little to set in the **Multimedia Properties** window. I'm not sure if the Recording **Preferred quality** or **CD Quality** setting makes a difference. Click on the **Apply** button (if not gray-ed out) and then the **OK** button to close the window.
- **Windows 98/ME:** Go to **Start: Settings: Control Panel** and select **Multimedia (98)** or **Sounds and Multimedia (ME)**. With the default **Audio** tab showing:
 - Click first on the **Advanced Properties** button under the **Playback: Preferred Device**. On the resulting **Speaker** tab, select **Desktop Stereo Speakers** (or lap top mono, maybe). According to George SV2AGW, anything else will distort the TX sound.
 - Then click on the **Performance** tab next to the Speakers tab. **Hardware Acceleration** should be set to **Full**, at least at first to see if your computer can handle it. If AGWPE is having packet decoding or connection problems, you can try setting it to a lower speed.



- Below the Hardware acceleration settings is the **Sample Rate Conversion Quality** setting. Set this to **Best**. Then click **OK** to close the Playback Advanced Properties.
 - Back on the **Audio** tab, click on the **Advanced Properties** button under **Recording: Preferred Device**. On the **Performance** tab, once again set the **Hardware Acceleration** one stop before **Full**, at least at first to see if your computer can handle it. If AGWPE is having packet decoding or connection problems, set it to a lower speed. And set **Sample Rate Conversion Quality** to **Best**. Then click **OK** to close the Sound Recording Advanced Properties.
 - Back on the **Multimedia Properties** window, click on the **Apply** button (if not gray-ed out) and then the **OK** button.
 - On the **Audio** tab, click on the **Advanced** button for **(Sound) Playback**
 - Click **OK** to save the settings and leave the **Sounds** settings.
- **Windows XP:** Most of the default settings should be as described below but you should check them. Go to **Start: Settings: Control Panel** and select **Sound and Audio Devices**. On the **Audio** tab, press the **Advanced** button under **Sound Playback**
 - On the resulting **Speaker** tab, select **Desktop Stereo Speakers**, even if this is a lap top.
 - Then click on the **Performance** tab next to the **Speakers** tab.
 - **Hardware Acceleration** should be set to **Full**, at least at first to see if your computer can handle it. If AGWPE is having packet decoding or connection problems, you can try setting it to a lower speed.

- **Sample Rate Conversion Quality** must be set to **Best**.
- Then click **OK** to close the **Playback Advanced Properties** and return to the **Sound and Audio Devices: Audio** tab.click on the **Apply** button (if not grayed out) and then the **OK** button.
- **Windows 2000**: the default hardware acceleration and sample rate conversion sliders are in the middle position. Follow the general instruction for XP above and move these to the right for best performance.

2. Displaying the Volume Control Icon

If this icon is not currently in your Windows System Tray (bottom far right of your screen), you may want to add it. It lets you quickly access the Windows volume and audio source settings of the sound card, including some that can not be controlled by AGWPE's SoundCard Volume Settings screen.

- In Windows 98 it's , **Start: Settings: Control Panel: Multimedia: Audio** tab and check **Show volume control on the taskbar**.
- In Windows ME it's: **Start: Settings: Control Panel: Sounds and Multimedia: Sounds** tab; **Sound Volume** box and check **Show volume control on the taskbar**.
- In XP, it's **Start: Control Panel: Sounds and Audio Devices: Volume** tab and check **Place volume icon in the taskbar**.
- I'm not sure how it's done in Windows 95, but it's probably very similar to Win 98.

3. Turning Off Window's Sounds

On some computers you may have conflicts between a program and Windows itself over the use of the sound card. (A typical crash message is "an application **caused an invalid page fault in module WINMM.DLL**"). To avoid this, try turning off Windows' sounds.

- In Windows 98 it's: **Start: Settings: Control Panel: Sounds: Schemes** field = **No Sounds**
- In Windows ME it's: **Start: Settings: Control Panel: Sounds: Sound Events: Scheme** = **No Sounds**.
- In XP, it's **Start: Control Panel: Sounds and Audio Devices: Sounds** tab: **Sound Scheme** field = **No Sounds**.
- I'm not sure how it's done in Windows 95, but it's probably very similar to Win 98.



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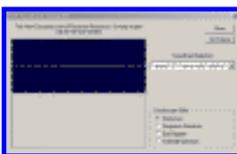
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Sound Card Tuning Aid

The **Sound Card Tuning Aid** screen is accessible from the AGWPE menu and can be used to "see" the quality of received signals and, for HF packet particularly, help in tuning the radio to the correct frequency. At least one oscilloscope will appear on the left side of the screen. A second scope below the first only appears if you have selected **Dual Port** use of the sound card on the **Properties screen**.

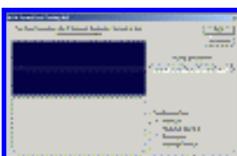
This page gives describes the Tuning Aid and gives some examples of good and bad signals as seen on the tuning aid's oscilloscope.

The first screen shot below shows the Tuning Aid page with the sine wave view selected. Only one oscilloscope is visible since the sound card is running in **Single Port** mode. In **Dual Port** mode, another scope would appear beneath the first. Note the sine wave in the scope. This is what a quiet 1200 baud packet channel looks like. The only undulation in the wave is due to noise. It verifies the audio connection to the sound card and radio is working.



<-- Click for larger image

In contrast, if the sine wave was perfectly flat (or nearly so), as below, then you know you have no audio input from the sound card, either because of a problem with the audio feed from the radio or incorrect sound card volume settings (source or volume):



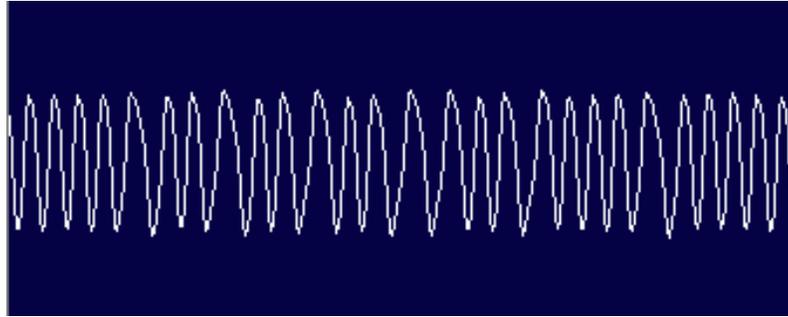
<-- Click for larger image

Oscilloscope Styles

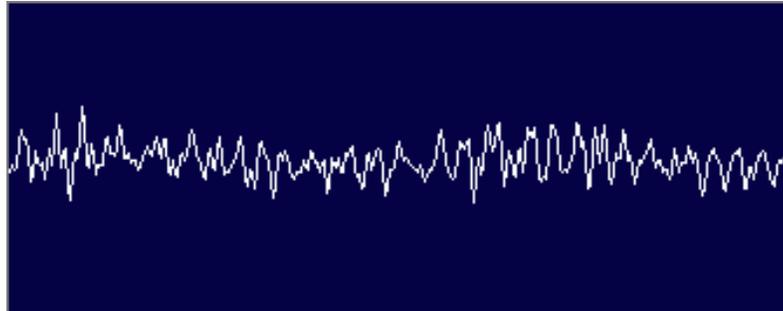
There are four (4) display styles available for the Oscilloscope. The first two are generally the most useful.

1. Sine Wave - shows strength of the signal (audio volume) and the quality of the signal. A signal with good strength will have waves that fill about 1/2 of the screen (relative distance between the peaks and valleys of the wave). You can use the **Volume Control settings** for RX audio to adjust them.

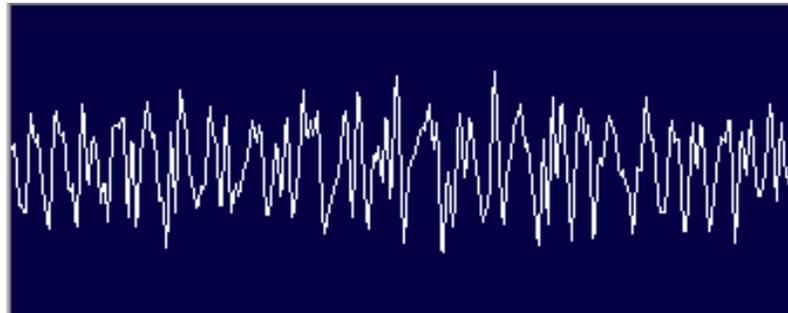
Signal samples for 1200 baud:



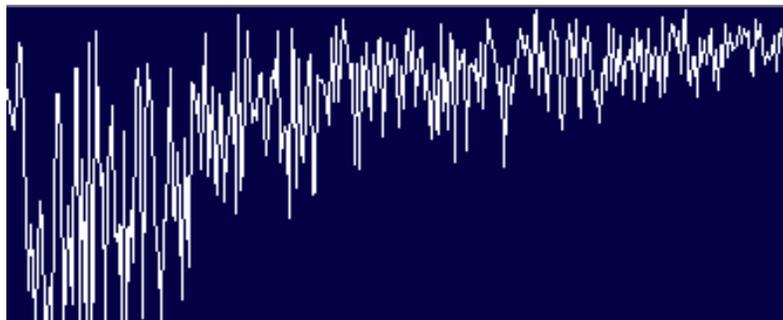
Sample of a good signal; packet decoded.



Too weak or distant; packet was not decoded

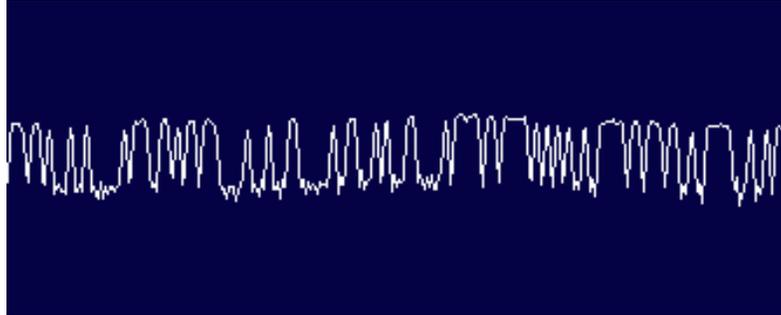


Collision of packets; packet was not decoded



This is from a Yaesu FT209 transceiver with bass boost activated. The boost creates incorrect pre-emphasis: the low tone is emphasized, not the high tone. These packets can only be decoded about 80% of the time. The sending station must turn off the radio's bass boost option to correct this.

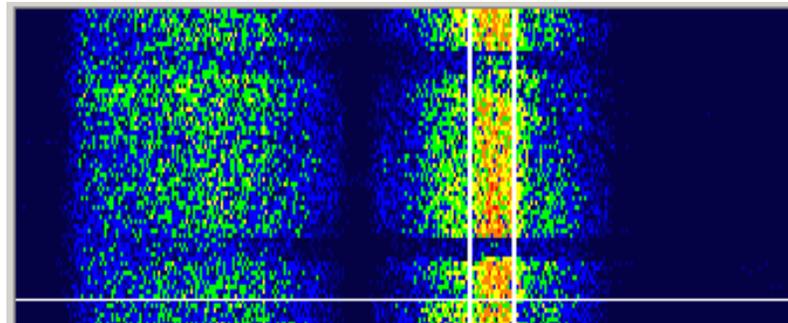
Below, a 9600 baud signal sample:



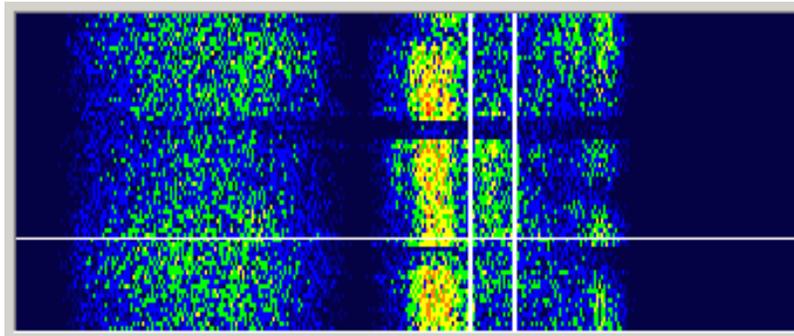
This is a generally good signal that was decoded, but you can see small sparks caused by some "bug" at either the transmitting station or receiving radio or sound card.

2. Waterfall - This is a frequency spectrum display that shows activity in the audio pass band over the last few seconds. Received signals create color streaks which will 'fall' down the display as time progresses. Relative signal strength is indicated by the colors, which are -- weakest to strongest -- blue, green, yellow, red. Black indicates no signal.

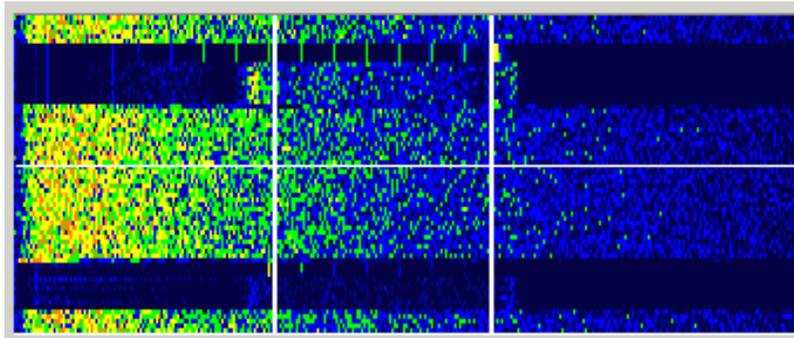
The waterfall should be centered between the two vertical white lines. For AFSK (UHF/VHF), it should center automatically. For HF operations (FSK), adjust the radio's receive frequency to center the waterfall. Centering is critical for accurate decoding of HF packets. The strongest signal (yellow/red color streak) must lie between those two lines, as this next screen shot illustrates:



The screen shot below shows an HF radio that needs tuning. The yellow area showing packet activity is below the tuned frequency marked by the two vertical lines:



This sample below is a waterfall display showing two 1200 baud packets. The packets have black areas to their left and right of the two vertical white lines.



The upper packet has fair modulation and was decoded. Also, note in the black area above the packet that there are small green vertical lines. This is the result of TXDelay, i. e. a short interval of carrier with no modulation.

The bottom packet has very low modulation (little color; similar to a carrier with no modulation), but the packet was still decoded.

3. Eye - is really a scatter diagram. The closer together the scattered points, the better the signal.

4. Frequency - a real-time display of where signals are being heard along a frequency scale. The TWO white vertical lines are centered around the dialed frequency, and the majority of signal peaks and valleys should fall between the left line (lower tone) and the right line (upper tone). If they don't, you'll need to change the radio's dialed frequency to center the signal between the white lines.

Set Volume Button

Pressing this button takes you to the [sound card Volume Settings window](#) where you can adjust TX audio levels, RX audio levels, and the RX input source jack.

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Windows: Enabling the TCP/IP Protocol

AGWPE can use either the DDE or the Window's **Winsock TCP/IP Application Interface** to communicate with packet applications. Except for WinPack and a few other programs using the DDE link exclusively, most programs use the TCP/IP interface. For the TCP/IP interface to work, TCP/IP must be enabled in **both** Windows and AGWPE:

- **1. Activating the TCP/IP protocol in Windows :** If you use the internet, then the TCP/IP protocol has been activated in Windows, either through the installation of a network interface card or Windows' Dial-Up Networking (DUN).

If you are not sure if it is installed, see the [Testing the TCP/IP Setup in Windows](#) box just below.

If it is not installed, install Windows' Dial-Up Networking (DUN) component: from the **Control Panel**, select **Add/Remove Programs**. Then click on the **Windows Setup** tab and then select (one click) **Communications**. Now press the **Details** button and then click on/check mark **Dial Up Networking**. Press the **OK** button twice. (You then may be prompted for your original Windows installation disks for the required files.)

Now, with the **Dialup Adapter** installed, install the **TCP/IP** protocol. Select **Control Panel** again, then **Network**. Now select **Add**, then double click on **Protocol**, then **Microsoft**, then **TCP/IP**, then **OK**.

2. Enabling TCP/IP in AGWPE: AGWPE's **TCP/IP Application Interface** should be "enabled" in AGWPE automatically; it's the default condition in a new AGWPE installation. But to check it:

- open the AGWPE menu, click on **Setup Interfaces**, and then on **Winsock Interface** tab
- make sure there is a check mark in the box next to **Enable**

Winsock TCP/IP Application Interface.

3. Firewall & Router Settings: Many computer users now have either a firewall program or a firewall within their network router/wireless access point. These may restrict TCP/IP access to or from AGWPE.

If you have problems with an application connecting to AGWPE, test the firewall by temporarily turning it off. If your application program can now connect to AGWPE, then when you restart the firewall you will need to configure the firewall to permit AGWPE and your application to access the network. Please consult your firewall program's HELP for information about how to do this.

If you are trying to access an instance of AGWPE running on another computer on the network, please see the [AGWPE on a Network](#) page on this website for additional information.

Testing the TCP/IP Setup in Windows

This tests both the AGWPE IP address and AGWPE port address.

You need to find either the Windows' TELNET.EXE or HyperTerminal program to run this test. I have Windows XP which has only a basic, hard-to-configure TELNET program, so I used HyperTerminal.

First, start AGWPE. Click on the Packet Engine icon on the system tray to bring up the AGWPE menu. On the menu, click on [Setup Interfaces](#). Make sure [Enable Winsock TCP/IP Application Interface](#) is checked and the TCP port is 8000. Click [OK](#) to close the menu.

Then, click again on the AGWPE icon and then click on [About](#). Notice that the last two lines should say "[SocksAPIServer Active](#)" and "[SocksAPIConnections 0](#)".

Now open HyperTerminal or TelNet.

Using HyperTerminal:

a. Start [HyperTerminal](#). On some systems, it may be found by using the START menu: [Programs: Accessories: Communication](#). Otherwise locate it by doing a Windows file

search.

b. From the HyperTerminal menu bar, select **File**, then **New Connection**. For the **New Connection Name**, enter a name of your choice, such as **LocalHost 8000**

c. On the resulting configuration dialogue window titled "**Connect To**", go the bottom field labeled "**Connect using**" and use the drop down menu list to select "**TCP/IP (WinSock)**".

d. On the resulting dialogue window (also titled "**Connect To:**"):

- For Host Address: enter either **localhost** or **127.0.0.1** , if AGWPE is located on the same computer; otherwise enter the network address of the computer where AGWPE is running.
- For Port Number: enter the AGWPE default port number **8000** , unless a different port was selected in the AGWPE menu (Setup Interfaces: WinSock Interface)
- then press **OK**.

e. If HyperTerminal can connect to AGWPE, you will see "**Connected**" in the lower left of the HyperTerminal window. You can also confirm this in AGWPE: Click on the AGWPE icon for AGWPE menu, and select **About**. The About screen should now say "**SocksAPIConnections 1**".

If HyperTerminal can't connect to AGWPE, you will get an error message from HyperTerminal saying "Unable to connect to (IP Address Port Number)..." This means you need to re-check the configuration steps at the top of this page.

Using TELNET

1. Start AGWPE. Click on the Packet Engine icon on the system tray. On the menu, click on **Setup Interfaces**. Make sure **Enable Winsock TCP/IP Application Interface** is checked and the TCP port is 8000. Click **OK** to close the menu.

2. Click again on the AGWPE icon and then click on **About**. The last two lines should say "**SocksAPIServer Active**" and "**SocksAPIConnections 0**".

For Windows XP users:

a. from the Start button, select run and then enter "cmd" and

press the OK button.

b. At the DOS command prompt, enter **telnet 127.0.0.1 8000**. If the connection is successful, the DOS box's title bar will change to **Telnet 127.0.0.1**. If the connection to that port was unsuccessful, the Telnet window would report the "**Connect failed**".

c. If the connection was successful, click the Packet Engine icon again, and select **About**. It should now say "**SocksAPIConnections 1**" indicating that the TCP/IP connection to AGWPE is working.

d. Close the Telnet window and the **About** window should then say "**SocksAPIConnections 0**".

I'm not sure exactly how Telnet works on other versions of Windows, but this method was reported to me for Windows 95. This won't work for Windows XP:

a. Run the Win95 Telnet program, TELNET.EXE. It's usually in the main Windows folder (or perhaps Windows/System32).

b. From the menu, select **Connect, Remote System**; then Host Name: , Port: **8000** (type 8000 over the menu choices); Term Type: **VT100**

c. If the program title bar changes from **Telnet - [None]** to **Telnet - 127.0.0.1**, then everything is fine. TCP/IP is working in Windows. If instead you get a message "**Could not open a connection to 127.0.0.1**", then there's something wrong with your Windows TCP/IP set-up. Review the steps at the top of this page.

d. Click the Packet Engine icon again, and select **About**. It should now say "**SocksAPIConnections 1**". TCP/IP is working in AGWPE.

e. Go back to In Telnet. Select **Connect**, then **Disconnect**, and close the program. Another check on **SocksAPIConnections** in AGWPE should show 0."

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Update Windows

A. Windows 95, 98 and 2000 Users

- You will need the most recent version of the Window's "Common Controls". If you've installed Internet Explorer (IE) version 5.0 or later, then the controls should be installed.

If you haven't upgraded to IE 5.0 or later -- or want to check that the controls are installed -- search for sites that offer "Comctl32.dll". [Here's one site.](#)

- Also, make sure you have the most recent drivers for your sound card. You will need to visit the sound card manufacturer's web site to verify this.

B. Windows 95 Users only

- You must have the Winsock 2 update installed, otherwise the TCP/IP interface will not work correctly with AGWPE. Here's the correct order to do that (I hope):
 - First make sure you have the [Dial-Up Networking \(DUN\) and the TCP/IP Protocol installed in Windows.](#)
 - Download and install the [DUN 1.3 Performance & Security upgrade.](#)
 - Download and install the [Winsock 2 update](#) from the Microsoft web site.
 - Then go to the Microsoft web site to download and install the [DUN 1.3 Networking and Winsock2 Year 2000 Update](#)

If you have any problems or get an error message during this process, [see the Winsock 2 update release notes](#) for information about what went wrong and how to correct it.

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Problems with Program Behavior

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Note: Please make sure you are using the [latest version of AGWPE](#) before troubleshooting problems. Your problem may have been fixed by the most recent version of AGWPE!

As you troubleshoot receive problems, remember that AGWPE provides you with a some visual aids:

- If AGWPE loads successfully, you will see the AGWPE tower icon  at the bottom right of your screen in the Windows System Tray.
- If a "radioport" has been successfully configured, you should see the AGWPE modem icon  next to the tower icon. There will be one modem icon for each working radioport. A green pixel in the modem icon will flash once if AGWPE successfully decodes a packet. A red pixel in the modem icon will flash once if AGWPE has sent a packet to the soundcard and radio for transmission.

1. General Program Problems

General Troubleshooting Hint: Any time you have trouble with a configuration setting in AGWPE, it may be best to just start fresh: close AGWPE and delete any [port*.ini](#) files and the [agwpe.ini](#) in your AGWPE directory/folder. Then restart and re-configure AGWPE from the very beginning. It doesn't take much time.

- **When I try to start AGWPE, I get an error message that says "Can not find WS2_32.dll"**

Sounds like you're running Windows 95. You need the Winsock

2 Update from Microsoft. See the [Windows update page](#) on this site for the full solution.

- I'm running Windows 98 SE. After I configure AGWPE for my sound card and restart AGWPE, I get Windows' blue crash screen saying "A fatal exception 0E has occurred at (some address) in VXD KMIXER. The current application will be terminated."

You have a problem with your sound card driver and the KMIXER.SYS, Windows' audio mixer kernel. Windows 98 used VXD drivers in its original version but then switched to WDM drivers in SE (Second Edition). I suspect there's a problem with Windows calling the incorrect driver file. You might try totally uninstalling the card and drivers from Windows and then, when it restarts, point it to the new WDM drivers. On the other hand, some users have found success, with the opposite, counter-intuitive strategy -- uninstall the newer WDM drivers and install the VXD drivers.

Warren sent me his solution that is, essentially, to install the latest drivers for his sound card:

"Here is my solution to the Win98SE problem with the VXD and WDM issue with AGWPE. My problem was the VXD KMIXER(06) fatal error

My environment: Win98SE All Windows updates done Pentium 533MHz 512MB Ram Chipset Via Pro133 82C693A and 82C686A (Southbridge). Sound is integrated on the mother board and is AC'97 v2.1 CODEC in the 82C686A Southbridge chip.

When first checked, the drivers being used for the sound chip were:

VIAudio.sys 4.10.3104 MMDevldr 4.10.1998

A visit to the VIA site gave a later driver package. The file downloaded was Vinyl_AudioCodec_V570a.zip

(This also produces another volume controls interface, called Vinyl Deck, that gives an easier volume interface than the Windows one.)

Even though I read the suggestion about forcing Win98SE to take the VXD driver, I decided to just let the new driver

package run and install WDM as it should. This proved successful and AGWPE does not now produce the VXD error.

The drivers are now: Vinyl AC'97 Codec Combo Driver (WDM) 10.10.2004

So it looks like a fix by using the latest sound drivers and these more modern drivers seem to take care of the use of VXD / WDM in different Win98/98SE editions."

- The AGWPE banner comes up, but then I get an error message that says:
"Your SoundCard Driver cannot Support the Wave Format".

One of two things maybe wrong:

- Most likely AGWPE is configured to use a device other than a sound card, most commonly, a **telephone modem**. To fix this, go to the **Sound Card Modem /TNC Setup** window, and select a sound card in the **Sound Card Selection** field.
 - Your sound card driver really can not support the wave format. Make sure you have the most recent version of the driver for your version of Windows.
- AGWPE tries to start but then a "**Copyright Violation**" box appears. I click "OK", but the program then closes.

The **AGWPE.SYS** file is missing from your AGWPE folder. You can reinstall the entire program from the zip file or just the **AGWPE.SYS** file. (The AGWPE.SYS file has the date of the program, so don't use the AGWPE.SYS file from another version. It will display the wrong version date when you start the program.)

- AGWPE starts and runs but first I get a message that says:
"**AGWTCPIP.SYS Not Found! TCPIP Over Radio will be IDLE!**"

You have turned on AGWPE's special "**TCP/IP Over Radio**" (**TOR**) feature but have not installed the special TOR software adapter. If you really meant to use this feature, see the **TOR pages** on this web site for information about installing the adapter. Most people do not need or use this feature. It is NOT needed for normal packet functions or to interface with your applications (applications use the **TCP/IP Application Interface** to connect to AGWPE, not **TCP/IP Over Radio**).

To turn **TOR** off and stop the message, go to the AGWPE menu (click on the AGWPE tower icon) and select **TCP/IP Over Radio Setup**. In the resulting window select "**Thank's NO TCP/IP**".

- I can run AGWPE and my packet program on my laptop for about 30 (or 15 or 60) minutes and then it just crashes.

Turn off the computer's energy saving mode.

- When I drag my mouse over AGWPE's modems icon in the system tray, a message pops up telling me how the port is configured and how many frames (packets) I have received and sent. But even when I haven't sent any frames, as time goes on, AGWPE says that I have been sending more and more frames. Is that normal?

It is normal. In its default mode, AGWPE calculates the "best" traffic parameters (slot/persist, resptime, etc.), every 2 minutes and these recalculated values get reported as sent frames even though nothing is actually transmitted by the radio. Don't worry. AGWPE is not keying up your radio and transmitting on its own.

- AGWPE loads but then my system just freezes. I need to power off to reboot.

One user said that new sound card drivers fixed the problem.

- AGWPE starts but then gives a message that "**Packet Engine Pro Shuts Down Abnormally, It Is Strong Recommended to restart your Computer**".

or

AGWPE is behaving very strangely, particularly my radioport configuration.

or

AGWPE won't start and locks my system.

In the AGWPE folder, delete the AGWPE.ini file and all port?.ini (port0.ini, port1.ini, etc.) files and then restart and reconfigure AGWPE.

The problem may have developed when you configured a radioport to use a COM or LPT port that was already claimed by another program or device; or the TNC was not plugged into the COM or LPT port; or you may have tried to delete and add a port without restarting the program after deleting one port and trying to add another.

- I'm running Windows 95 and when I start AGWPE, the AGWPE tower icon appears in the Task Bar *not* the System Tray. If I right click on the icon, I get the usual AGWPE menu, but "Setup Interfaces" does nothing; the popup menu just closes. I can't seem to make AGWPE do anything.

or

I fill in the new port information, close the program and restart

it, but the port shows "IDLE" and I can't open the [Properties](#) window for that port by clicking on [OK](#).

You need to update the Windows "common controls" file, COMCTL32.DLL file. See the [Windows update page](#) on this site for the full solution.

- **AGWPE closed and the Packet Engine icon**  **disappeared, but the modem icon**  **remained on the System Tray!**

This may happen if AGWPE is closed down unexpectedly. Usually restarting AGWPE will correct it, although a reboot may be necessary. If AGWPE fails to start (you may get a "[Fatal Exception Error](#)" message), go to the AGWPE folder/directory and delete all files ending in [.ini](#); then restart and reconfigure AGWPE.

- **Modem Icon Never Appears:** The modem icon  won't appear until you configure an AGWPE port and then closed and restarted AGWPE. If the modem icon  doesn't appear then:
 - Double check the properties for the AGWPE port to make sure you have done it correctly. Use the [Port Settings](#) information on this site for guidance.
 - Look for possible port conflicts with the PTT port you have selected. See next section:

Port Conflicts

It's possible that some other device is affecting the COM/LPT port you have chosen for PTT control. For example, one user forgot that he had an unused physical adapter "installed" in Windows that was conflicting with the PTT port. Another user reported a conflict with the Palm HotSync Manager, which loads on startup and puts the COM RTS pin high; Windows didn't report that the COM port was being used by the Palm device driver, but it was. Another user had both the COM port and an infrared port assigned to the same IRQ. Another user suggested that, if your XP machine is running an NVIDIA graphics adapter, some of its drivers are reported to tie up COM1 for no reason -- so disable Nview 2.0.

It may be difficult to identify port conflicts, since AGWPE may start and run despite the conflict, i.e. no error message. Conflicts may arise either from a

device, such as a printer, or from a program that uses the same port.

Try this first: temporarily force AGWPE to a port where there CAN'T be a conflict with another program. Reset the **Serial or LPT Port** in **AGWPE's properties window** to a **non-existent parallel port**, perhaps LPT 3 (scroll down past all the COM options to the LPT options).

If AGWPE now receives packets and your other program now works, then you know you did indeed have a port conflict. Fix the conflict (see below) and then change the AGWPE PTT port settings back to a real port, i.e. not the non-existent one.

To search for a device that might be causing the problem, first go to the **Start menu** and then **Settings: Control Panel: System**. On the **"Device Manager** tab, select **"View devices by Connection"** and double click on **"Computer"**. This should tell you which devices are using each IRQ. Look for a conflict with your chosen AGWPE PTT physical port (COMx, LPTx) and some other device.

If there is a device conflict, you'll need to either reset the port used by the conflicting device (could be hard) or tell AGWPE to use a different PTT port (might be easier). To change the port AGWPE uses, move the PTT cable to a different physical COM or LPT port. Then make the corresponding change in the **Port Properties** in AGWPE.

If only one device is assigned to each COMx and LPTx port "serial port IRQ", then there is no conflicting *device*, so there is probably a conflicting *program* which is using the port. Either:

- reconfigure the conflicting program to use another port
- just close the offending program before working with AGWPE
- change the PTT port in AGWPE (see paragraph above).

2. Linking to Client Applications

- I am having trouble configuring my client application to link to

AGWPE.

There may be instructions in the [Help](#) section of your client application; or you can try the [Application Setup](#) page on this website.

If you're having trouble getting a particular application to work with AGWPE, first make sure AGWPE works with [AGW Terminal Program](#). If AGWTerm won't work with AGWPE, then you have a problem with AGWPE that needs to be resolved first.

- I see the little **green** pixel flashing on the TNC icon  so it appears AGWPE is receiving packets, but the packets don't seem to be getting from AGWPE to my packet program; my program isn't showing any packet activity.

or

When I try to run a client application, I get an error message from the client indicating the IP connection was refused.

Check for these problems:

- Make sure AGWPE's [TCP/IP Application Interface](#) is active: from the AGWPE menu select [Setup Interfaces](#) . On the [Winsock & HTTP Interface Setup](#) screen; [Winsock Interface tab](#), enable the [Winsock TCP/IP Application Interface](#) with a checkmark. Also make sure the [TCP](#) field is set [8000](#).
- Any application linking to AGWPE with the TCP/IP Application Interface should have a corresponding field to specify AGWPE's TCP port number (8000, by default); see the [Application Setup](#) page for advice about selected programs. The application should also have a field to specify the IP Address of the computer where AGWPE is running. That address will be "127.0.0.1" or "localhost" if AGWPE is on the same computer as the application. Read the application's [Help](#) section or see [AGWPE on a Network](#) for advice when AGWPE is on a different computer.
- Make sure the application is listening to the correct AGWPE radio ports. The application may be linked to AGWPE but not linked to all of AGWPE's radio ports. For example, some programs, such as UI-View, allow you to block access to specific AGWPE radio ports (UI-View calls it "masking"). Read the application's [Help](#) section or see the [Application Setup](#) page for advice about selected programs.
- Make sure the TCP/IP Protocol is installed on your computer. If you use the internet successfully, then it is. If you don't have either the Window's Dialup adapter or a network card installed on your computer, then the protocol may not be installed. To correct this, just

create a Dialup connection (see Windows' [Help](#) for advice; you can use a dummy telephone number for the connection).

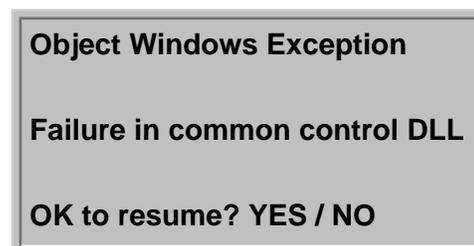
If you still have a problem, make sure the "Internet Protocol (TCP/IP)" is installed for the Dialup connection or the network adapter. Normally it is installed by default and active, but it may have been deleted somehow (see the [Windows: Enabling the TCP/IP Protocol page](#) for advice).

- **If you have a firewall program and/or router running**, turn off the firewall temporarily to see if this fixes the problem. If it does, configure the firewall and/or router so that AGWPE can communicate with other programs via AGWPE's TCP/IP Application Interface port (default is 8000).
 - Try changing the default TCP Port from 8000 to some other number, say 8100. Make the change in both AGWPE and in your client program.
- **My packet program suddenly closed and I got this error message from Windows:**

(The Application) caused an invalid page fault in module WINMM.DLL

You probably have a Windows sound scheme in effect and there was a conflict over use of the sound card. To prevent this from happening, set the Windows' [Sound scheme](#) to **No Sounds**. See the [Window Sound Settings page](#) on this site for further advice.

- **I seem to have the AGWPE program working fine. My problem is when I run certain packet programs, such as RXClust or AGWTerm, a box opens saying:**



This is a Windows 95, 98, and ME problem. Be sure you have the latest [COMCTL32.DLL](#) Windows file by [downloading and applying a patch](#) from Microsoft called [50comupd.exe](#). Or by installing the most recent edition of Internet Explorer.

- I have two applications sharing an AGWPE sound card radio port. But Application A is not seeing packets sent by Application B and vice versa.

It is a feature of AGWPE that the received frames it sends to an application do not include frames transmitted by other applications using the same instance of AGWPE. So if you have this:



Then, using KISS frames, App A will not see the original frames transmitted by App B.

If you do want App A to see App B's transmission, then a work-around is to configure a loop-back port in AGWPE. Then transmit the beacons from your application(s) to the RF radioport **and** to the loop-back port, and configure your application(s) to "listen" on both the RF radioport and the loop-back port so they can hear what the other program asked AGWPE to send.

3. Extra Packets Seen

- If your packet application displays duplicates of every received packet, reasons can be:
 - the second sound card radioport is active in AGWPE even though it is not being used. To correct this, select **Single Port** (not Dual Port) on the **Properties screen**
 - you are using a mono plug instead of a stereo plug for the LINE IN jack
- If your packet application displays packets that are from another frequency:
 - you are probably running two radio ports from the sound card (left and right channels) and audio from one radio port is being heard on the other port. The reason for this is not clear. The best known solution is to reduce the RX audio input on each radioport to the minimum needed to decode packets using the **volume control settings**.

If your problem is not resolved by the problem solving pages on this website, join the AGWPE Yahoo Group to ask a question or search the archives for previous postings that may relate to your problem: <http://>

www.egroups.com/group/SV2AGW

Troubleshooting page on this web site:

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Problems with Receiving

As you troubleshoot receive problems, remember that AGWPE provides you with a some visual aids:

- The [Sound Card Tuning Aid screen](#) is accessible from the AGWPE menu. It can be used to "see" the quality of received signals and, for HF packet particularly, help in tuning the radio to the correct frequency. Go to the [Tuning Aid page](#) to see examples of how good and packet signals should look.
- If AGWPE successfully decodes a packet on a radioport, then the **green** light on that radioport's modem icon will flash once



Note: Please make sure you are using the [latest version of AGWPE](#) before troubleshooting problems. Your problem may have been fixed in the most recent version of AGWPE!

1. [No Sine Wave in Oscilloscope](#)
2. [Oscilloscope Activity But No Decoding](#)

1. No Sine Wave in Oscilloscope

Tune to a busy packet channel and select the Sine Wave oscilloscope mode in the [Sound Card Tuning Aid](#). If you do not see sine wave activity, look for a reason at one of five places along the RX audio path:

- [a. Radio/antenna](#)
- [b. AGWPE's radioport settings](#)
- [c. Volume Control settings](#)
- [d. RX audio cable](#)
- [e. Sound card or driver](#)

a. Radio/antenna

First confirm that audio signals -- preferably packets! -- are being received at the radio. Disconnect the sound card interface temporarily and see if you can hear packets from the radio's speaker and/or see the radio's 'S' bars or the 'Busy' indicator light up.

- If you don't see or hear packet activity:
 - is the squelch too high? Since AGWPE prefers no squelch for **transmitting**, it's best to leave the squelch off (even though AGWPE will still **receive** with the squelch on, providing the squelch is not set too high).
 - is tone squelch (CTCSS and DTSS) turned off?
 - if dual VFOs, is the correct VFO/band selected?
 - is the antenna connected?
 - is the radio tuned to the right frequency?
 - is the mode set for FM and not accidentally in CW, SSB or another mode?
 - can you hear packets by using a different antenna (more gain)? or by moving the antenna to another location (higher, away from possible EMI interference)?
 - can you hear packets using a different radio with a different antenna? with a different radio but the same antenna?
- If you can't hear packets from the radio's speaker (internal or external):
 - Is the speaker volume knob set too low? Low speaker volume would only affect sound card receiving if your interface's RX cable connects to the radio's external speaker or microphone jack, not a data jack.
 - If your interface's RX audio connects to the radio's external speaker jack, is that radio jack known to work with speakers? Plug in a different speaker or use a meter to test the jack.

b. Radioport settings

Check the following in the [Properties settings](#) for the sound card:

- Make sure you have selected the correct sound card device
- Make sure you have selected the correct packet baud rate for the radioport channel

c. Volume Control settings

Use the [Volume Control screen](#) to check your sound card settings:

- If you happen to have more than one sound card (i.e. mixer device), make sure you are working with **Recording** settings for the **correct sound card**. (Program Bug: if you have more than one sound card, AGWPE's Volume Control Screen can be used to set the first card but not a second card. To control the

second card, you will need to use the [Windows Volume Control Program](#).)

- Make sure you are working with the Volume Control [Recording](#) settings, not the [Playback](#) settings.
- Make sure you have selected the correct input jack -- LINE IN or MIC -- where your RX interface cable is attached.
- Make sure the vertical volume sliders for the selected input jack is not at or near the bottom (about 1/3 up is fine). If you see Balance sliders, make sure they are centered.
- If there are still no signals, try selecting the other input source -- [Microphone](#) or [Line In](#). You may have the plug in the wrong jack. If this was the problem, move the plug back to the correct jack and reset the input source.

d. RX audio cable

See the [RX audio cable page](#) for wiring schematics and other hints.

- Is the RX cable plugged in completely at the sound card jack? Make sure you haven't used the wrong sound card jack or haven't confused the RX cable with the TX or PTT cable. (Hint: put labels on the ends of all cables.)
If you are using two sound cards, is the RX cable plugged into the right one?
- Are you using a stereo jack at the sound card plug? You should use a stereo plug for most sound cards.
- You can not interface two radios to the sound card using the microphone jack. The Microphone jack on sound cards is not stereo capable, so you will probably only receive audio from the port 1 (left channel) radio. Use the LINE IN jack instead ([see Rx audio page](#)).
- Test the cable:
 - Unplug it from the sound card jack and plugging it into a speaker (if the speaker has a plug and not a jack, use clips leads or an in-line coupler to join the two plugs). If you hear RX audio in the speaker, the RX cable is OK, or
 - Use a multi-meter:
 - test for continuity and short circuits. Check your solder connections if you find a problem.
 - Is the RX audio line wired to the tip of the stereo plug? The ring of the stereo plug should be unwired, unless you are interfacing to two radios. The sleeve should be wired to the sound card ground.

- Is the RX line securely soldered to the correct pin in the radio plug?
 - If the RX cable has an in-line isolation transformer, make sure it is a 1:1 transformer, unless you are using the radio's external speaker for RX audio. If you are using the external speaker, then you should be using a 1000:8 transformer and the 1000 Ohm primary coil of the transformer should be wired to the sound card side, not the radio side.
- Try using another cable without a transformer.

e. Sound card or driver

- Does the sound card work with other Windows' sound generating programs? If not, in the Windows **Control Panel** under **Sounds/Multimedia**, make sure the sound card is installed and there are no conflicts with other devices.
- Sound card suddenly stops working after a few minutes and always about the same number of minutes: This probably a power management issue; your computer or laptop is going into power saving mode and is turning off the sound card.
- Driver: Make sure you have the latest driver for your version of Windows. You can the latest version from the sound card/ chipset manufacturer's website (better source than the computer manufacturer).
- Card: **Some cards may not work with AGWPE** even with the correct driver. (Read the section on **Compatible Sound Cards** on the **More About AGWPE** page on this site.)

If the problem appears to be your sound card, consider replacing the card or adding another. New cards are fairly inexpensive or you may find a "used" sound card at a hamfest/ computer show or in a discarded computer. PCMCIA and USB sound cards are also available. A second sound card dedicated only to ham programs may actually be very useful. Your first card then be used for Windows and other programs.

Note: If receiving works for a while but then stops, your computer's power management settings may be turning off the sound card.

2. Oscilloscope Activity But No Decoding

If AGWPE is receiving signals but is not decoding them, look at these possibilities:

- [f. Recording volume settings](#)
- [g. AGWPE settings](#)
- [h. Poor Signal quality](#)
- [i. Interference](#)
- [j. Sound card or driver](#)
- [k. Radio Settings](#)

f. "Recording" Volume Settings

AGWPE is very tolerant of RX audio volume levels, but your volume settings may still be too loud or too soft.

- **Too soft/muted:** try raising the receive [volume sliders](#) until you see more deflection (peaks and valleys) in the [Tuning Aid's](#) Sine Wave. If the sliders don't change the wave significantly, try turning up the volume at the radio.
If the RX audio from the radio is still too low:
 - make sure you are pulling audio from the correct radio pin/plug. Some radios have different RX audio pins/plugs for different modes or packet baud rates. Make sure you are using the one for your packet baud rate. (Example: the Yaesu FT-847 has a Data In/Out stereo plug jack for HF modes and a 6 pin mini-DIN jack for packet. Audio from the HF jack will be too weak for packet. If you buy a sound card interface, you may get only the Data In/Out plug and not the 6-pin mini-DIN plug.)
 - remove any attenuation circuit you may have in the RX line
 - try plugging the RX audio line into the MIC jack instead of the LINE IN
 - install an audio pre-amplifier in the RX line.
- **Too loud:** If the sine pattern has very thick and tall waves (nearly fill the scope top to bottom), try lowering the volume settings. (If the sliders don't change the wave, try turning down the volume at the radio.)
- **MIC input:** If you are using Microphone input, note that most sound cards expect a maximum input voltage on the microphone line of about 200 mV, which is much less than most radio's maximum output, e.g. 500 mV. For this reason, you should probably use a voltage [attenuation circuit in a microphone RX cable](#). The ideal attenuation will depend on the sound card's input and radio's output specifications. You can try to use the volume sliders to find an ideal spot, but the setting is likely to be very delicate without the attenuation circuit.

In addition, check that your are **not** using the Microphone

Boost or the 20dB option on our sound card, if available. This option is not found in the AGWPE Volume settings, but it may be found as a button in the [Windows' Recording Volume Setting](#) window under the [Microphone](#) slider (you may need to use the [Option: Advanced](#) menu option to have it display). This option will increase the MIC input by 100 times, which could distort your packet even more.

g. AGWPE Settings

- Baud Rate: Make sure you have selected the correct packet baud rate in the [Sound Card Setup screen](#)
- Ports: If you are only using one port, set AGWPE for [Single Port](#) (not Dual Port) on the [Properties screen](#)

h. Poor Signal quality:

- **1200 baud packet:** To successfully decode a packet, you need about an S3 signal at minimum.
- **9600 baud packet:** To successfully decode a packet, you need nearly an S9 signal. (see [9600 Packet Operations](#) on the Baud Rates and Modes page. for additional advice about 9600 baud packet operations.)
- **300 baud packet (HF SSB):** Use the [Sound Card Tuning Aid's Waterfall Scope](#) to accurately tune the signal. (see [HF Packet Operations](#) on the Baud Rates and Modes page. for additional advice about HF packet operations.
- Are you tuned to the correct frequency exactly?
- Is the mode set for FM and not accidentally in CW, SSB or another mode?
- Do you have tone squelch on? Do you have manual squelch on? Is the radio's squelch set too high and blocking many signals. (The squelch should not be operating when using AGWPE. When it transmits, AGWPE needs to hear the frequency at all times.)
- Packet collisions -- two or more transmitting stations send packets at the same time, making both unintelligible. This is a common problem on busy frequencies, e.g. APRS. No real solution is available although network members could experiment with traffic reduction and collision avoidance schemes and settings, such as slotting.
- The other station's packets are too distant, faint, or noisy:
 - Increase your radio knob's volume control if the radio knob controls RX audio volume; or increase your [RX](#)

Volume Setting for **LINE IN** (or MIC, if you are using that).

- Poor radio signal path: You may be experiencing multipath refraction/ reflection problems (signal waves arriving out of phase) or a Fresnel null (part of the signal wave is blocked) because of the antenna's poor position. Try moving your antenna.
 - Use a better antenna (more height, more gain, more separation from noise or interference sources).
 - Ask the other station to increase power.
 - Ask the other station to try a different antenna or a different antenna location.
 - Consider an antenna feed-line problem at your station if there is any other evidence of weakened signals, e.g. moving the antenna doesn't help and you experience low audio and static on your RX signal compared to the signal someone nearby is receiving.
- The packets the other station is sending are poorly formed:
 - The sending station sent the packet without sufficient TX delay. Its radio didn't have sufficient time to power up or switch from receive to transmit. As a result, the beginning of the packet was lost. Ask the sending station to increase TX delay in his station's TNC or sound card.
 - The sending station's TNC or sound card was overdriving the radio (sending packet tones that were too loud) and his radio had to "clip" the signal (reduce the deviation). This results in poorly formed packets at the receiving end (low tone is louder than high tone). Ask the sending station to reduce his station's TNC drive level.
 - Some radios offer a bass boost function that will distort a packet signal. Make sure the sending station is not using this feature.
 - Are you using the MIC jack on the sound card instead of the LINE In jack? Then you probably should have an attenuation circuit in the RX cable. See the [RX audio cable Help page](#) for such a circuit.
 - Note that distorted packet signals simply cannot be decoded. For example, if you have mountains (or tall buildings) near you, then signals may be reflected by the mountains (or buildings) and result in multipath (or phase) errors. You can try using a small beam antenna to overcome the problem. Align the antenna with the boom parallel to the mountains.

i. Interference

Signal interference from EMI, RFI, and ground loops can distort received packet signals so much that they can not be decoded. Radios such as the Yaesu FT-290 are known for being susceptible to computer

noise interference. And computer (laptop) noise can get into radios (particularly HTs) and antenna if they are too close to the computer.

- **Power noise:** Especially on laptops, noise can enter the sound card from the power supply. Try disconnecting the power supply and run on battery only. If your radio is connected to a poor quality power supply or if it's connected to a battery charged by a poor quality power supply, you may also have problems. See <http://www.buxhamparts.com/humsolving.html>

- **EMI, electro-magnetic interference**, can come from any nearby AC-powered source, such as your monitor. Turn off the monitor temporarily and then turn it on to see if your packet program recorded any signal when it was off. You may be able to reduce EMI if you:
 - change the monitor scan rates or screen size or combinations of both in:
Windows Desktop > Right Click > Setting Tab > Monitor
----- etc....
 - replace outdated or incorrect monitor driver software
 - place a ferrite snap-on core on the monitor cable, close to the computer and another close to the monitor
 - re-locate either the device or your interface cables
 - use shielded interface cables
 - use ferrite cores (split or toroids) on the interface cables.
 - use shielding on the radiating device
 - move mag-mount or HT antennas away from the computer

- **RFI, radio frequency interference**, can be reduced if you:
 - limit the length of your interface cable
 - use interface cables **with** shielding
 - use ferrite cores (split or toroids) on cables.

- **Ground loops** can result when DC current flows between your computer and your radio. Normally, DC current should not flow between the devices, but it will if there is a voltage potential difference between the devices. Unfortunately, a sound card interface can become that link.

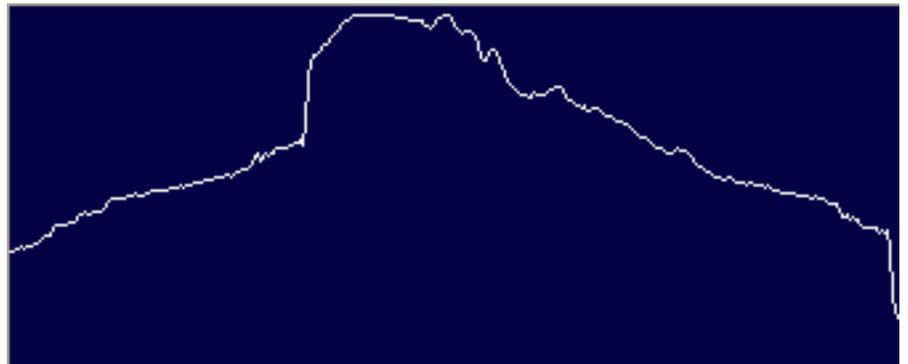
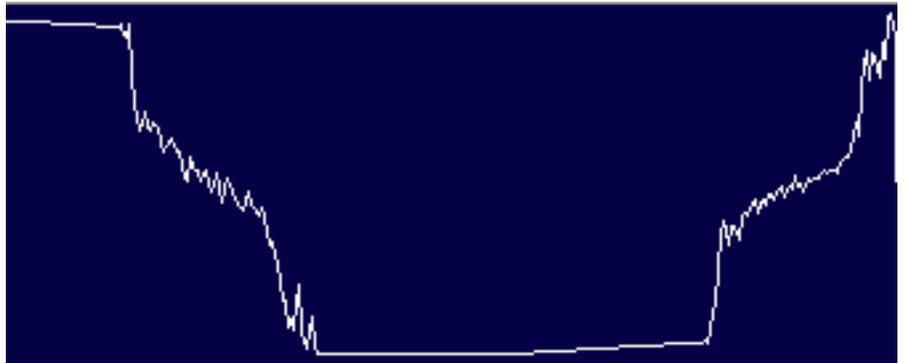
If you have your computer and radio plugged in to a different branch of the AC wiring in your house, you may have problems. Plug your computer in to the same AC outlet strip as your radio, so they share the same electrical ground.

To break the ground loop, you should use isolation transformers on your RX and TX audio cables, plus a phototransistor, or optocoupler, in the PTT line (a simple transistor in the PTT line does not provide isolation). You must isolate all three connecting cables.

Note that some manufactured interfaces may not provide isolation on all three cables (For example, the West Mountain NOMIC does not provide isolation for a RX cable). You can verify if the interface does by visual inspection: look for a small transformer in audio line circuit; or ask the manufacturer.

I see that Buxcomm now offers a simple add-on audio isolation cable if you don't want to build your own. You simply plug in the Buxcomm isolation cable between your sound card jacks and your audio in and your audio out lines. The item is called a ISOL8R and you can order it for \$9.97 (\$17.97 for 2) at <http://www.buxhamparts.com/humsolving.html>

Below are screen shots from the [Tuning Aid's](#) Sine Wave scope showing a ground loop:



EMI or RFI on Your Receive Audio Cable?

You can use the [Sound Card Tuning Aid](#) to "see" if you have interference or some other problem affecting your RX audio cable. Here is a way to hear it:

- Temporarily plug your computer speakers into LINE OUT jack of the soundcard.
- Open AGWPE's [Soundcard Volume Settings screen](#)
- If you can't hear the radio's RX audio in your computer speakers, increase the RX volume sliders'
- When you do hear RX radio audio, tune to a quiet frequency and lower the RX volume slider to its minimum (you may need to also turn down the radio's speaker volume dial if you get RX audio from the radio's mic or speaker jack.)
- Now increase the TX Playback volume (WAVE & TX Master) to maximum.
- You should hear no radio signals or radio noise. If you hear any Hummmmmm or Hissssssss it should be very, very slight. If it very distinct, you probably have a RFI, EMI or ground loop problem with your RX audio cable. Just to be sure, compare the sounds from your computer speakers with the sounds from your radio's speaker to see if the sounds are the same as the radio's (no problem) or unique.

j. Sound Card or Driver

- You can try adjusting the [sound card clock](#) from the [Sound Card Modem Setup screen](#). Sound cards have a reference "clock" that oscillates at approximately 11025 Hz. The exact speed usually varies for each person's sound card. The clock setting in AGWPE can be used to better match AGWPE to the actual sound card clock speed.

All TNCs try to adjust their receiving clock (a software component) to match the bit rate they receive and thus follow the clock changes of the receiving signal. The AGWPE soundcard modem does the same using the soundcard clock. In certain cards, that clock may be very wrong (fast or slow). The clock setting value you can change in AGWPE tries to adjust the sound card clock using software inside AGWPE's modem code. It doesn't change anything in the sound card.

AGWPE's default clock setting is "4", which is no adjustment. Using trial-and-error, you can try to find a setting that is better. (I do not know in absolute terms how much change in Hz there is for each setting; or even if "2" is slower or or faster than "4".)

For your experimentation:

- after you select a new clock setting, you must restart AGWPE. Clock setting changes are NOT immediate.
- it's best to test reception of a weak station (less than S8)

Interestingly, you may find the perfect setting for some stations may change with the seasons, if the hardware in those stations are outdoors and exposed to heat fluctuations.

- If AGWPE appears to be receiving good quality packet signals that are not being decoded, then you may have an incompatible sound card. (This seems to be more prevalent with integrated, "on board" sound "cards".)
See "e." above.

k. Radio Settings

- If your radio has signal processing settings, turn them off. For example, some Yaesus have a "bass boost" function. Others radios such as the ICOM IC-706MKIIG, have a "DSP" setting. These settings should be turned off/disabled.
- Make sure you are using the correct RX data output source on the radio. For example, on a Yaesu FT-8500, AGWPE can not decode 1200 bps through the data port , only through the speaker-out jack. The "problem" with the data port is that it has no de-emphasis circuitry and so the packet tones are skewed by at least 6 dB. (To fix that, "You would need to add the right value capacitor." Sorry I can't help much beyond that.)
- Hand-held radio often have a "battery saver" or "power saver" setting that turns off the radio's receiver circuit for a few seconds or parts of a second. If that setting is on, you may be

missing the first part of packets.

If your problem is not resolved by the problem solving pages on this website, join the AGWPE Yahoo Group to ask a question or search the archives for previous postings that may relate to your problem: <http://www.egroups.com/group/SV2AGW>

Troubleshooting page on this web site:

[Program Behavior](#)

Receiving

[Transmitting](#)

[Connections](#)

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Sound Card Packet

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Problems with Transmitting

As you troubleshoot transmit problems, remember that AGWPE provides you this visual aid:

- If AGWPE receives a packet transmission request from a client application and then successfully passes that packet to the sound card and radio for transmission, the **red** light in the transmitting radioport's modem icon will flash once  and your radio should transmit.

To Force a Transmission through AGWPE, use the [AGWTerminal \(TCPIP version\)](#) program to send a **QRA** packet: From AGWTerm tool bar, press the "Tower & Question mark" button, and then select the radioport you want to test.

Note: Please make sure you are using the [latest version of AGWPE](#) before troubleshooting problems. Your problem may have been fixed in the most recent version of AGWPE!

1. [Radio Doesn't transmit](#)
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1. Radio Doesn't Transmit

- **A. No Red Light Seen:** My application program sent a packet, but I do **not** see the **red** light in the AGWPE modem icon indicating it has transmitted the packet to the radio.
 - Make sure the radio's is **ON** and the squelch is fully open at all times. AGWPE needs to hear the frequency noise level at all times -- no squelching! -- otherwise it may not transmit.
 - Make sure you application program is correctly linked

to AGWPE. See the [Program Behavior page about Linking to Client Programs](#).

- Make sure the application program really is requesting a packet transmission. For example, a terminal program will not send anything if it is linked to AGWPE in COMMAND mode (unless you use the CONNECT or DISCONNECT commands). Try a CONNECT command if you are not yet connected or go to CONVERSE mode (K) if you are connected.
- **B. Red Light is Seen:** I saw the red light blink in the AGWPE modem icon, but the radio isn't transmitting.
 - Double check that the PTT cable is connected tightly to the appropriate COM (or LPT) port. Make sure you do not have a loose connection.
 - It may be that the physical COM or LPT port where your PTT cable is connected isn't really the port you think it is: e.g. you think it's COM1, but your mouse or internal modem is on COM1, so your PTT is really plugged into COM2 . Try changing the port for **PTT Control** in the [Port Properties](#) or move the PTT cable to another COM or LPT port.
 - Is there a problem with your PTT cable and circuit? You can test it by using a 9 volt battery to apply voltage to the cable's RTS/DTR pin (in the DB9 or DB25 connector) and then using a voltmeter to test for voltage on the radio end of the cable or, if the cable is connected to the radio, look to see if the radio is transmitting.
 - Your application program may be configured for the wrong AGWPE radioport. If you need instructions for changing the radioport, look in the Help section of the client application; or you can try the [Application Setup](#) page.
 - Are you using the parallel port (LPT) for PTT control and running Windows XP or 2000? This can't be done with AGWPE and those versions of Windows. For those versions, your only choice is to purchase [Packet Engine Pro](#). (Windows XP and 2000 use a port addressing scheme that is different than the scheme used in Win 95, 98, and ME, which do let AGWPE use the LPT port for PTT control.) Alternatively, you can use the following PTT signaling methods instead of the LPT if you have Windows XP/2000:
 - use a serial (COM) port
 - use a USB port by obtaining a USB-to-Serial

Port (COM) adapter

- use a TX audio tone keyer that uses detected audio to trip the PTT circuit

These are all described on the [PTT cable page](#).

- Are you using the parallel port (LPT) with Windows 98SE/ ME? It should work but, if it doesn't, some users have success configuring the LPT1 port to a "legacy" I/O address, i.e. IRQ 7 and address 0378-037F. To do this, go into Settings, Control Panel, System, Device Manager, Ports, Printer Port and select the Resources tab. Configure manually to the above settings and reboot. Check that there are no conflicts with other devices.
- Is your PTT cable wired to the correct pin at the computer's RS-232 port (COM or LPT)? AGWPE sends the PTT signal **to the RTS pin only** if you have chosen **Single Port** in the **Port Properties** window. It does **not** also send it to the **DTR** pin, as some other sound card programs do or as earlier versions of AGWPE did. If AGWPE is set for **Dual Port** then the radioport 1 radio (left channel) will use the **RTS** pin, while radioport 2 (right channel) will use the **DTR**. See the [PTT Cable page](#) for wiring schematics. Possibly so some manufactured interfaces may have wired the PTT cable to the **DTR** pin only and not the RTS.
- Occasionally there is a problem with the physical port. You can use a voltmeter to test the COM/LPT port pin. There should be DC voltage on the pin when the red pixel in the AGWPE modem icon lights.

Note: When Windows boots, it tests all COM and LPT ports by momentarily putting a signal on the port pins (Windows XP does it 5 times). If you have your PTT cable connected and your radio "on" when Windows boots, then the radio PTT will activate for a few short bursts during the boot sequence. This is a good indication that your PTT cable is working correctly.

- Many new transceivers, e.g. Yaesu 8100, won't transmit if the TX audio level is too high. Use the [Volume Settings screen](#) to lower the **TX Master** and/or **TX Wave** volume. Or adjust the potentiometer on the line, if there is one.
- Some radios may use different TX audio pins for HF and VHF/UHF. The ICOM 706 is one. Consult your radio's user manual for pin out instructions. This can be the solution if your interface works correctly for HF digital modes such as PSK31, but won't work for VHF/UHF

packet, or vice versa.

- If AGWPE seems to run fine for a set time (15, 30 minutes) and then stops transmitting, your computer's power management scheme may be turning off the COM/LPT port that controls PTT.
- I'm using a commercial sound card interface (in this case a RASCAL GLX). I can transmit once, but I can't transmit again unless I reboot. I'm running Win2k Pro, SP4 (but may be a problem with other Windows versions).

Many commercial interfaces are wired to allow PTT control by either the RTS or DTR line of the COM port. It may be that a small amount of negative voltage (-V) on the DRT line was canceling the positive voltage +V on RTS line.

To fix this, you will need to disconnect the wire in the interface that connects the DTR line to the PTT circuit. Use just the RTS line for AGWPE in single port mode.

2. Radio Locks in Transmit mode

- First try closing and restarting the packet application and AGWPE; or try rebooting.
- If you are using a hand held radio:
 - Remember that, in addition to the usual PTT circuit components, you will still need all the PTT components recommended by the radio manufacturer for MIC and Speaker jack data use. Many handhelds need a capacitor on the TX audio line between the radio and the PTT gate circuit (as well as a resistor on the PTT line). Without that capacitor, the PTT circuit may be active at all times.
 - If the manufacturer says to use a stereo plug for the radio's MIC jack, don't use a mono plug!
- You may have a wiring problem in the PTT cable. Double check the wiring, components, and circuit routing:
 - the PTT line from the radio must not touch the shield or ground before it gets to the transistor or optocoupler.
 - the PTT line must be wired to the correct pin on the transistor or optocoupler. See [PTT Cable](#) for a schematic. If the PTT **closes** when AGWPE transmits, then you most likely have the transistor or optocoupler wiring inverted. (You can test your cable and circuit by using a 9 volt battery to simulate the computer RTS line: plug the PTT cable into the radio and on the computer end of the cable, apply the positive side of

the battery to the #7 pin (RTS) pin and the negative side to the #5 pin (Ground). This should close the transistor/optocoupler gate and the radio should transmit.)

- Windows can start up leaving the COM port handshaking lines "high" (with voltage) instead of "low" as it should. This seems to be limited to sound card interfaces that are wired to use the DTR line to key the transmitter (many commercial interfaces are wired to use either the RTS or DTR line for PTT keying). This has been reported happening with Windows ME and XP; also in other versions of Windows when using a USB-to-Serial Port Adapter.

For Windows ME: Look first on the Microsoft web site for a Windows fix; see <http://support.microsoft.com/default.aspx?scid=kb;en-us;285894>).

Or Roger Barker, G4IDE/SK, wrote a free 20 kb utility, [HSOFF](#), that can be used to reset the handshaking lines of a COM port if they are left "high". HSOFF come in a zip file that includes a .TXT file of instructions. (Note that the program needs the Microsoft runtime libraries MSVBVM60.DLL and MSCOMM32.OCX to run. These libraries are installed if you install [UI-View32](#); and they are also available at some web sites -- do a web search to find them.)

For Windows XP: Although I couldn't find verification of this problem on the Microsoft web site, it have been said that when Windows XP boots up, it too may leave the DTR (Data Terminal Ready) line of the serial port in a HIGH state. The supposed fix for this is problem is to go to the [Device Manager](#) within Windows XP and remove all of the Communication Ports, or COM ports, as listed under "Ports (COM & LPT)". After doing that, re-boot Windows XP and it will re-install all of the drivers for these ports.

- It's possible that some other device is affecting the COM/LPT port you have chosen for PTT control. For example, one user forgot that he had an unused adapter "installed" in Windows that was conflicting with the PTT port. Another user reported a conflict with the Palm HotSync Manager, which loads on startup and puts the COM RTS pin high; Windows didn't report that the COM port was being used by the Palm device driver, but it was. Still another user had both the COM port and an infrared port assigned to the same IRQ. Another user suggested that, if your XP machine is running an NVIDIA graphics adapter, some of its drivers are reported to tie up COM1 for no reason -- so disable Nview 2.0.
- Try disabling the [Full Duplex](#) mode of the card. On the [Sound Card Setup screen](#), un- check [Full Duplex](#).

- On older/slower computers, the default sound card sampling rate may be too high for the computer to process. You can try using the Windows **Control Panel** to adjust the soundcard hardware acceleration and sample rate quality until you find an optimum setting (For example, in Windows XP, you get there by clicking on **Sound and Audio Devices**, then click on the **Audio** tab. Under **Sound Playback**, click on the **Advanced** button then click on the **Performance** tab.)

3. Intermittent Transmissions

- Sometimes AGWPE will not transmit immediately if AGWPE's automatic timing features are in effect. AGWPE monitors the frequency and uses "slotting" to send your packet when the frequency is not likely to be busy. So, AGWPE is holding the packet for a few seconds before transmitting it.

If this delay really bothers you, you can override this feature by setting the timing parameters yourself. Call up the **Properties** screen for the radioport, click on the the **Tnc Commands** tab, select **Let me Control Parameters**. , and then change the **Persist** and **Slot** parameters. But remember that AGWPE usually does a very good job of adjusting the timing to match traffic conditions on the frequency. You may make matters worse by controlling them yourself. For example, you may not be as prompt to change parameters when frequency traffic changes.

Another reason for a transmit delay is if the sound card is busy processing other sounds from Windows or your application programs. For example, UI-View has an option to announce received callsigns and this slows everything down. Usually there is an option to turn these sounds off in the application, as there is for Windows' sound schemes.

- **Problem:** I can send and receive a few packets, but pretty soon transmitting stops, especially if I try to send packets too rapidly. This clears up if I close and restart AGWPE and the packet application, but it just happens again.

*

Solution: This seems to happen mostly on computers with older processors. It's possible your computer isn't keeping up with the quick switching that is taking place between the sound card and AGWPE. The computer may have missed a "hand shaking" data segment from AGWPE, so it's waiting for a signal from AGWPE that will never come again. This may mean you need a faster processor or perhaps a sound card driver upgrade to run AGWPE, although you can try to cut the processor load by shutting down other programs and background tasks. Also, see the paragraph above about interruptions of the packet stream.

- **Note:** If transmitting works for a while but then stops, your

computer's power management settings may be turning off the sound card and/or the serial ports.

4. No audio or poor audio on Transmit

How does my transmit audio sound?

The surest test of your transmitted audio is to use a second radio to listen to the audio transmitted by your first radio. A hand held radio is great for this. Or ask a nearby friend to listen. You should be hearing packets signals from your station that sound similar to the packets you hear from other stations (although perhaps a bit louder and with less noise).

Remember that your audio signal must pass through four (4) devices that could modify it:

- the sound card's mixer,
- the interface cable,
- the radio and
- your transmission system, i.e. antenna and feed line.

For example, you can test the audio coming from the sound card mixer by temporarily putting your computer speakers back into the LINE OUT jack. This will give you a fairly good indication of whether you have good volume level settings, but it isn't how your final audio will sound.

Your interface's TX cable has an attenuation circuit or potentiometer that could reduce the audio significantly -- or maybe not enough. As a result, your radio may be receiving audio that is too weak or too loud.

Even your radio may have audio modification circuits in it. Some VHF radios have a "bass boost" option (should be off), and HF radios have speech compression settings (should be off), drive settings (should be turned all the way up) and microphone gain settings (should be left at normal).

And of course your transmission system -- feed line and antenna -- could attenuate your signals.

So the best way to test your audio is to listen to how it sounds on another radio.

If you might have a problem with your TX audio:

- Re-check AGWPE's volume settings for Playback (TX audio). Make sure the **TX Master** and **TX Wave** settings are **not muted** and that none of the four sliders is too close to the bottom of the scale (remember that sliders 1 and 3 control the transmit audio for radioport 1, while sliders 2 and 4 control audio for radioport 2).
- The attenuation circuit in your TX cable may be over/under attenuating your TX audio. If you have a variable resistor (pot) in the attenuation circuit, try adjusting it.

Adjusting Your Transmit Audio Level

With TNCs and sound cards you want a transmit audio level that is decodable but not too high. One of the biggest reasons for poor packet performance is **too much audio**. If you do not have access to a deviation meter to set the level (you want about 3 KHz of deviation), use a local digipeater and "trial-and-error" to get the lowest audio level that works reliably.

Use a program that can send unconnected packets or a beacon (AGWTerm can send a beacon; UISS can send unconnected packets). Set the beacon PATH to relay through the digipeater (e.g. TEST VIA LOCALDIGI), then go into converse mode and transmit a single carriage return. Watch to see if your single packet gets digipeated by that one local digipeater. If it doesn't get through, try several more times because it may not have gotten through because of a collision.

If it does get through, turn down the transmit audio level a little and try again. Keep turning down the audio until your packet reliable **DOES NOT** get digipeated ... and then turn it back up just a little bit until it does once again.

Remember, in packet, soft is better than loud.

- Are the TX Audio cables connected tightly to the **LINEOUT** jack on the sound card of a desktop computer (or the headphones jack on a laptop?)
- Make sure you are using a stereo plug (has 2 bands below the

tip) for the **LINE OUT** (TX audio) jack. If you use a mono cable (has 1 band below the tip) you may get only half the audio volume on transmit or you may even short out one channel of the sound card.

- Re-check the soldering and component placement in the **TX cable**.
- EMI or RFI: The strong magnetic fields in your monitor may be distorting the signal, or there may be electro-magnetic interference (EMI) from your computer or other nearby devices, or there may be radio frequency interference (RFI):
 - Use a shielded audio cable. Connect the shield to either the sound card ground or the radio's ground but not both.
 - Try using ferrite chokes on the audio cable
 - If your antenna is near your computer, move it further away
- If you have unusual sounds in your transmitted audio or experience delays before AGWPE transmits a packet, it may be that your sound card is getting input from sources other than AGWPE:
 - Turn off any sound schemes for Windows.
 - Turn off any sounds that might be generated by your packet applications, for example voice announcements in UI-View.
- Some radios offer a bass boost function that will distort a packet signal. Make sure you are not using this feature.
- HF: Speech compression should probably be off for digital modes and the Drive adjustment should be turned all the way up (use the **Volume settings** to control transmit power output). Microphone Gain should be set to normal.
- **If you hear interruptions, or stuttering, of the packet stream**, it may be because:
 - your sound card is not fully capable of full duplex operations (sending and receiving). This is mostly a factor on older 16-bit sound cards. To turn off Full Duplex, go to the AGWPE Port properties' **Sound Card Setup screen** and uncheck the **Full Duplex** box.
 - your computer/or driver is not fast enough. In that case, **set the Port Properties** for **Single Port** use and use only the left channel. Also, set your VGA card accelerator a click below full level and adjust the soundcard hardware acceleration and sample rate quality until you find an optimum setting (these sound card settings are made through the Window Control Panel. For example, in Windows XP, you get there by clicking on **Sound and Audio Devices**, then click on the **Audio** tab. Under **Sound Playback**, click on the **Advanced** button then click on the **Performance** tab.)

Listen! ---> Sample Wav files: one with **no stuttering** in packet and one **with stuttering**.

- If you hear other noises mixed in with your packets, our sound card is getting input from sources other than AGWPE, such as you CD player or another application:
 - Go to the **Volume Control program** and mute other input sources for playback, e.g. CD or microphone.
 - **Turn off any sound schemes for Windows.**
 - Turn off any sound generated by you applications (varies by program; see the program's Help file for possible advice).

If your problem is not resolved by the problem solving pages on this website, join the AGWPE Yahoo Group to ask a question or search the archives for previous postings that may relate to your problem: **<http://www.egroups.com/group/SV2AGW>**

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Problems with Packet Connections

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A. Connections not made

First, make sure you don't have an underlying problem [receiving](#) or [transmitting](#).

- **I can see on my radio that the PTT has been opened and the radio is transmitting, but I can't connect with another station.**
 - Are you tuned to the right frequency? Are you operating in duplex mode and transmitting on the offset frequency
 - Does one of the stations have **tone** squelch turned on?
 - Consult the [No Audio or Poor Audio section of the Problems with Transmitting page](#).
- **It looks like the other station heard my connections request and is responding since the radio is receiving packets, but AGWPE is not decoding the packets.**
 - Consult the [Problems with Receiving page](#).
- **I'm having difficulty connecting at 9600 baud.**

Read the [9600 baud section of the Baud Rates and Modes page](#) for a discussion of the difficulties or operating 9600 baud packet. Problems could be: your radio is not 9600 capable without modification; incorrect radio settings; using audio transformers in the audio cables; and poor signal quality.
- **I having difficulty connecting on HF at 300 baud.**

Use the Sound Card Tuning Aid to help tune your radio to the correct frequency. Also read the [300 baud section of the Baud Rates and Modes page](#) for a discussion of the difficulties or operating 300 baud packet.

B. Connections not maintained

- **When I connect, the other station (a BBS) immediately disconnects me.**

You probably have **Dual Port** selected in the [port properties screen](#) and probably have the same baud selected for both ports. Try changing the second port's baud rate to something other than the first. Better yet, if you are not using the second port, select **Single Port**, close AGWPE, delete the [port1.ini](#) file from the AGWPE folder (retain [port0.ini](#), do not delete it) and restart AGWPE.

If you are using the second port (to run two different radios from the same sound card) and want to use the same baud rate on both channels, the only known solution is to reduce the receive (RX) audio volume in both channels to the minimum needed to decode packets reliably (find this setting through trial-and-error.) You can do this with the [volume control recording sliders](#), but it may help to reduce the volume using a [voltage attenuator circuit in the RX audio line](#); or if you are pulling the audio from the radio's speaker jack, turn down the radio's volume control.

What seems to be happening is that there is not adequate audio channel separation, i.e. cross-talk, in the sound card, so AGWPE hears both radio ports. In the scenario above, port 1 asks for a connection and the BBS sends a connect confirmation. Because of cross-talk, AGWPE hears this on both port 1 and 2. Realizing this is a problem, AGWPE sends a disconnect request, which the BBS accepts and that is the message you see.

- **I can send and receive a few packets, but pretty soon transmitting stops, especially if I try to send packets too rapidly. This clears up if I close and restart AGWPE and my packet application, but then it just happens again.**

It may be that your computer isn't keeping up with the quick switching that is taking place between the sound card and AGWPE. The computer may have missed a "hand shaking" data segment from AGWPE, so it's waiting for a signal from AGWPE that will never come again. This may mean you need a faster processor (or perhaps a sound card driver upgrade) to run AGWPE, although you can try to cut the processor load by shutting down other programs and background tasks. ([George, SV2AGW, talks about this problem on his web site.](#))

C. Slow Exchanges

- **The other station doesn't seem to hear all my transmission, so my station is sending many repeats.**

Try disabling the **Full Duplex** mode of the card. On the **Sound Card Setup screen**, **un-check Full Duplex**. Some sound cards (usually older ones) have only one 16-bit and one 8-bit channel, so they can not handle both receive and transmit (i.e. full duplex) at 16-bit rates. They compensate by moving one function -- usually transmit -- to the 8-bit channel where the audio signal is not as good. By un-checking Full Duplex, you force the card to alternate between receive and transmit, but it will always use the 16-bit channel.

Is Your Sound Card Full Duplex Capable?

Can your sound card send and receive simultaneously? In Windows, you can test for full-duplex capability by launching two copies of Sound Recorder. You'll find Sound Recorder from the Start button: **Programs > Accessories > Entertainment > Sound recorder**

Repeat the process to launch two copies of the program. You can test for full duplex by playing a file on one Windows Sound Recorder and, while that file is playing, making a recording with the Sound Recorder.

Another way to test is with an AGWPE debugging log. AGWPE asks soundcard drivers if they have Full Duplex capabilities. To see the results of this query:

- Open the agwpe.ini file in Notepad and edit the file to add these lines:
[DEBUG]
TRACE=3
- When AGWPE restarts it will create an **agwpe.log** file. If you open that file with notepad, you should find a **SOUND CARD: FULLDUPLEX** line that says either YES or NO, which is the result of AGWPE's query of the card.

D. Diagnosing Exchange Problems by Packet Type

The following suggestions are based on observations which can be made by running AGWTerm: (download from the [AGW Programs](#) page on this site).

When you use AGWTerm to make a connection with another station, you can monitor ALL packets in the exchange by selecting **Window: Unproto Channel** from the AGWTerm menu. This will let you see supervisory packets not normally seen in AGWTerm's "receive" window. The type of packet -- SABM, UA, I, RR, REJ -- is identified immediately after the target or VIA station's callsign in the packet, for example here is an RR packet: **1:Fm KC2RLM To SV2AGW <RR P/F R1 >**

Remember to leave the **Unproto channel** window and switch back to the **Channel 1** window to resume your exchange with the other station. You can not send from the Unproto channel window.

- **I'm receiving many REJ packets.**

Increase your **TXDelay** parameter on the **TNC commands** tab of the **Properties for Portx** screen.

- **I'm sending many REJ packets.**

Ask the other station to increase his **TXDelay**.

- **I'm seeing a RR packet from the other station, then a RR packet from my station, and then this repeats again and again.**

The other station is not hearing your acknowledgement of a packet it just sent you. Increase you transmitted audio (Wave "playback" in the sound card volume control) or improve you transmitted signal (higher power, better antenna).

- **I'm receiving many RR packets in the same transmission.**

Increase your **FRACK** parameter on the **TNC commands** tab of the **Properties for Portx** screen. Consider letting AGWPE resume controlling the parameter.

- **I'm sending many RR packets (R1, R2, R3, etc.) in the same transmission.**

Increase your **RESPTIME** parameter on the **TNC commands** tab of the **Properties for Portx** screen . Consider letting AGWPE resume controlling the parameter.

- **After receiving a burst of data, AGWPE usually responds, for example, with "RR R3", "RR R4", "RR R5", all in ONE burst. But with this one BBS, AGWPE frequently responds with a short**

break between "RR R3" and "RR R4". During the break, AGWPE releases the PTT and that results in the BBS sending more data. This new data causes a collision with AGWPE's transmission of "RR R4", and the whole packet exchange slows down dramatically. Why does AGWPE insert that break?

This problem usually results when the sender -- the BBS in this case -- isn't using the AX.25 ver. 2 protocol and has a PACLEN of less than 255 characters. This creates a timing problem in the acknowledgement of packets.

Since you are seeing multiple "RR"s, this means you are probably setting the timing parameters yourself and not letting AGWPE control the timing (AGWPE would probably only send one "RR"). **Increase** the value of the **RespTime** until the problem goes away. Or select let the AGWPE "program adjust parameters"

If your problem is not resolved by the problem solving pages on this website, join the AGWPE Yahoo Group to ask a question or search the archives for previous postings that may relate to your problem: <http://www.egroups.com/group/SV2AGW>

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Using AGWPE: Over a Network

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It is possible to run AGWPE on one computer in a network and have it send packets to and from applications on *other* computers on the network. The usual application is a home/local network, but you can even configure AGWPE to work with computers anywhere on the internet!

Note: This exchange will work only if your application program uses the TCP/IP interface to interface with AGWPE. Programs such as WinPack don't use the TCP/IP interface. They use the DDE interface, so they can not do this. (UI-View can be configured to use either the TCP/IP or DDE interface to link to AGWPE.)

A work-around for WinPack users: purchase the **PE Pro** version for both the local and remote sites and use PE Pro's **radio port sharing** feature. With this feature, instances of PE Pro can share radio ports and thus the radios and TNCs on those ports. So, WinPack could link to an instance of PE Pro running on the same computer and that instance of PE Pro could then link to an instance of PE Pro running on a remote computer that has been configured to "share" its radio ports.)

First, some definitions:

- **host** - the computer running AGWPE
- **server** - a device or application that can exchange data with other devices or applications. When AGWPE is configured to send and receive data over a network to other applications, it is acting as a **server** application.
- **client** - any computer / application wishing to access the AGWPE server.
- **IP Address** - a number with three dots in it, for example

192.168.0.1 or 169.254.0.1, which is assigned to each computer connected to a network. IP Addresses are needed to route data across networks running TCP/IP protocols (which most local networks and the Internet run).

- **port number** - an extension of the IP address. TCP ports are simply number codes used by the Windows TCP/IP protocol to associate any TCP/IP data exchanges with a particular program (or service) running on the computer. (They are not physical ports on the computer.)

Second, a caution: This page will not be able to discuss all possible network configurations. You will need to adapt this basic explanation to match the specifics of your ISP (Internet Service Provider), your network hardware, and any installed network software, including Windows network configurations.

To start, make sure you have AGWPE running successfully on the host and that your network connection is running correctly.

1. Obtain the **IP Address** of the **host** computer where AGWPE is running.

Your host computer will have three IP addresses of importance:

- a **local address** of 127.0.0.1 or "local host", which means "this computer". This is the address you would use to connect to AGWPE if the client application is running on the **same computer** as AGWPE.
- a **private IP address** such as 192.168.x.x. This is the address someone would use to connect to AGWPE if the client application is running on a **different computer** but on the **same local area network**, e.g. your home network.
- a **public IP address** which is assigned by your Internet Service Provider. This is the address someone would use to connect to AGWPE if the client application is running on a **remote computer on a different network or over the internet**.

A. Learning the **private IP address** of a computer on your home network :

- Windows 95/98/ME: from the Windows' **Start** button, select **Run**, then in the **Open** box, enter **winipcfg** and press **OK**. In the resulting window, note the **IP Address**. Press **OK** to exit.
- Windows XP/NT: from the Windows' **Start** button, select **Run**, then enter **CMD** to bring up a DOS window and prompt. Enter **ipconfig** and in the resulting window, make a note of the **IP**

Address. Then enter **Exit** to close the DOS window.

Note: A computer's IP address may change every boot-up if Windows is set to obtain an address automatically from the network router each time it starts. This is called dynamic addressing. You can also assign an unchanging "static" IP address to the computer (see Windows' **Help** for advice on how to do this: search for "static address" or "specific IP address"). This may be useful if you use AGWPE regularly on a private network.

B. Learning the **public IP address of a computer as it is identified on the internet:**

Note that if your subscription is for a **dynamic** IP address, your public IP address can change each time you connect to the ISP. This can be a problem for others trying to connect to you; they would have to ask you for your current public IP address. If you don't want to pay for a **static** (unchanging) IP address, you can subscribe to a "dynamic DNS" service that will automatically link your clients to your current dynamic IP ([see Dynamic DNS Service](#) below)

- If you are connected **directly** to a broadband (DSL, cable, etc.) modem, use the method described just above in "A." to learn your public IP address.
- If your connection is through a router or gateway, your router or gateway can tell you the IP address assigned to it by the ISP. For example, I can use my browser to access my wireless gateway/router. I enter the *gateway's* IP address as specified in the User Manual (default is often 192.168.0.1). The gateway then displays a screen that shows the public IP address assigned to my network by my ISP.
- Another way to learn you public IP address is to send an email to yourself. Look for your IP address in the headers* of the email you receive back. Look for the **bottom-most** header line that begins with "Received:" (there may be several "Received:" lines.). For example:

Received: from **296-999-999-64**.c6-0.hlb-ubr1a.hlb-ubr.cable.etn.com ([**296.999.999.64**] helo=DellDesktop.etn.com)

This line shows where the email originated -- your computer. The numbers in blue above would indicate your IP address. (Numbers above are not real; IP address segments are never higher than 255.)

* Revealing Email Headers: In Outlook Express, right click on the message in your inbox and select **Properties**, then **Details**. In Eudora, open the message, then click on the **Blah Blah Blah** icon to show all headers. For other readers, do a Help search on the word "headers" to learn how to display them.

2. Configure AGWPE on the *host* computer to act as a *server*:

- Start AGWPE and call up the AGWPE menu (right click on AGWPE System tray icon )
- Select **Setup Interfaces**. This brings up the **Winsock and HTTP Interface Setup** window and the **WinSock Interface** tab.
- Make sure the **Enable Winsock TCP/IP Application Interface** is checked (default setting) and, in the **Setup** section, note the **TCP Port** number. Leave the port number at the default of **8000** unless you have other software running in your computer that also uses that port (this would be unusual). If another application is using that port, you can configure AGWPE to use a different port number.
- Now click on the **WinSock Interface Security** tab.



<-- Click to enlarge

Note the three **enable/disable** connection options at the top of the screen. These options control which **clients** can access AGWPE on the *host* computer and whether or not they need to use a LOGIN name and PASSWORD to gain access.

For example, the second choice specifies that:

- clients on your local area network (LAN) can use the host's AGWPE server **without** a LOGIN name or PASSWORD, **but**
- clients outside of the LAN can use AGWPE only **with** a LOGIN and PASSWORD that matches an entry in the **User Setup** list at the bottom of the **WinSock Interface Security** screen. (Use the **New User** button next to the list to add LOGIN and PASSWORD for other users.)

Note: If you are thinking of controlling access by using LOGIN name and PASSWORD, be aware that **most** AGWPE-compatible programs are **not** able to send a LOGIN and PASSWORD, so they wouldn't be able to get access to AGWPE over a network. Even AGW's programs don't have this provision! In fact, as of March 2005, I believe that only UI-View and PacLink have such a provision.

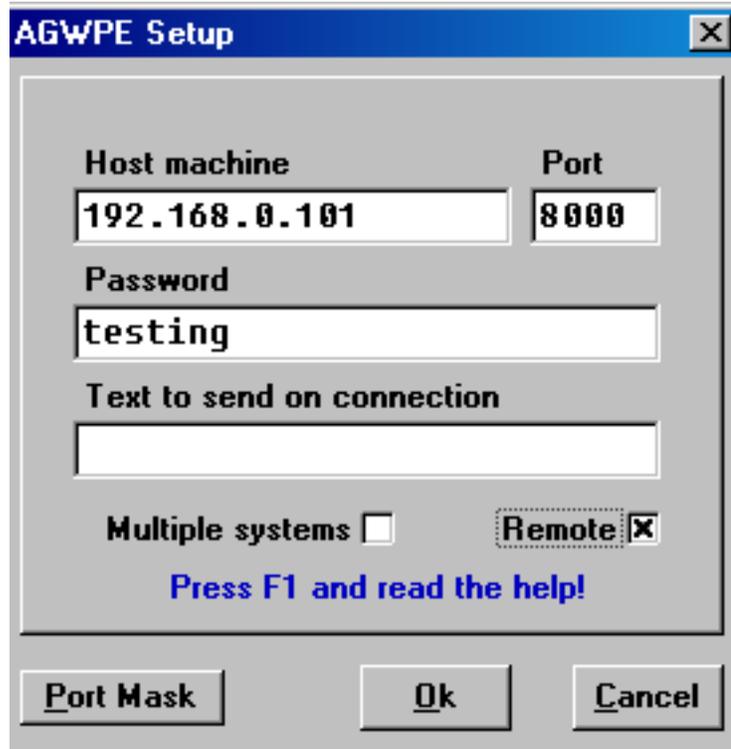
- Press the **OK** button to save the changes. AGWPE will now act as a **server**.

For a way to test your TCP/IP connection to AGWPE, see the [TCP/IP Settings](#) page on this website

3. Configure your packet application on the **client** computer so it can find the **host** computer and the **AGWPE server** on the network.

Only applications that connect to AGWPE with the TCP/IP protocol can be configured to do this. Those that use the DDE protocol to link to AGWPE cannot, for example, WinPack. As examples, here's how to do it for 4 applications that can, [UI-View](#), [WinAPRS](#), [APRSplus](#) and [AGWTerm](#).

- **a. UI-View:** From UI-View's top menu bar, select **Setup>Comms Setup**. In the **Comms Setup** window, for **Host Mode** select **AGWPE**. When you do, a **Setup** button will appear next to the AGWPE field. Press that button to reveal the **AGWPE Setup** window.



Please -- as the screen note suggests -- press **F1** to read the [Help](#) file. Roger, G4IDE, the program author, has some terrific additional information in the file.

- For the **Host Machine**, fill in the IP address of the *host* computer running AGWPE which you identified in [#1. above](#).
- The **Port** number should be 8000 unless you elected a different port in [#2. above](#).
- The **Password** can be left blank unless you turned on security in AGWPE as described in [#2. above](#). If you did, enter the password. (**Note for UI-View users**: if AGWPE is using security, UI-View sends your *call sign* as the LOGIN name all in **upper case** letters, minus any SSID number, for example, KC2RLM-4 is sent as KC2RLM. Therefore, when you create a LOGIN name in AGWPE, it should be the callsign used in UI-View in upper case letters, minus any SSID.)
- The **Text to send on connection** can be left blank.
- Generally, the **Multiple Systems** check box can be left blank unless you want to connect to more than one remote instance of AGWPE. Press **F1** for more info about this feature.
- The **Remote** check box can be left blank unless the AGWPE host is not on your LAN. Again press **F1** for more information; also [see #4. below](#)).

- The **Port Mask** need not be changed. By default, no ports are masked, i.e. UI-View will use all AGWPE ports it finds. You would use this option only to limit the AGWPE ports that UI-View will use to get data. For example, if AGWPE Port 1 is on a VHF frequency and AGWPE Port 2 is on an HF frequency and you want only VHF data, you would use the Port Mask to limit data to just AGWPE port 1.
- **b. WinAPRS:** You first need to create a new .prt file in the PORTS folder under the main WINAPRS folder. It might be helpful to read the [basic WinAPRS/AGWPE configuration](#) page on this site for advice on how to do this.

The name of this file might be AGWPE_LAN.prt or something similar -- your choice. The file contents would similar to:

```
// Created by Me on 10/1/2002
NAME AGWPE on My LAN
TYPE TCP
PARSER AGWPE
HOST 192.168.0.101:8000
BAND VHF
PATH WIDE,WIDE2-2
AGWTNC 0
```

Remember that the field name -- the first word in each sentence (e.g. PARSER) is separated from the following word (e.g. AGWPE) by a **TAB character not a space**.

The key items in this file are:

NAME: Enter your choice of a port description. This is what will be displayed in WinAPRS.

HOST: Enter the IP address of the *host* computer (see [#1. above](#)) and the AGWPE server TCP port number (see [#2. above](#))

PATH: Enter the PATH you want AGWPE to use when it sends out a packet.

AGWTNC: Enter the AGWPE radio port you want to use. Use 0 for AGWPE port 1; 1 for AGWPE port 2; etc.

After this file is created and saved in the **PORTS** folder, restart WinAPRS. From WinAPRS's top menu, select **Settings**, then **Port List**. In the resulting **Port Definitions List** window, you should now see a port with the **NAME** you entered in .prt file. Click on that port and then click on the **Open** button at the top of the window to activate it. If everything works correctly, then the **Status**, **Open #** and **Comments** fields will **all** fill in, indicating that

WinAPRS has successfully found the AGWPE server (if the **Comments** field remains blank, there is a problem):



<-- Click to enlarge

Note that **WinAPRS has no way to send a LOGIN or PASSWORD to AGWPE**, so it will not work with AGWPE over a network if you have AGWPE set to check for passwords.

You can create additional .prt files to link to additional remote computers.

- **c. APRSplus:** The critical setting is in the KipSSPE program. Start that program and look for the **IP Address** field at the bottom of the screen. Enter the host's IP address (as determined in **#1. above**) in this field.

Note that **APRSplus has no way to send a LOGIN or PASSWORD to AGWPE**, so it will not work with AGWPE over a network if you have AGWPE set to check for passwords.

- **d. AGWTerm:** First, please note that SV2AGW has created two versions of AGWTerm. If you want to run AGWTerm over a network, **you must use the TCP/IP version** (download [Agwtermtcp.zip](#) dated 14Feb2002 to find a AGWTerm.exe file dated 16Aug2001) .

In the folder where install AGWTerm, you will find a file called **AGWterm.ini** (this file is only created after you run AGWTerm for the first time). Use a text editor, such as Notepad, to open this .ini file. By default, AGWTerm creates an IP address entry (what it calls **SOCKSADR**) that assumes the AGWPE will be running on the same computer as AGWTerm, i.e. **localhost**. This is a alias for an IP Address of 127.0.0.1, which is a special IP address that means "this computer". It also assumes that you are using the default AGWPE server TCP port address (what it calls **SOCKSPORT**) of **8000** (see **#2. above**).

```
[Packet ]
SOCKSPORT=8000
SOCKSADR=localhost <-- change
"localhost" to IP address of host
```

example: 192.168.0.2 see **#1. above**

Note that **AGWTerm has no way to send a LOGIN or PASSWORD to AGWPE**, so AGWTerm **will not work** with AGWPE across a network **if** you have AGWPE set to check for passwords.

4. Allowing Remote Access beyond your Local Area Network:

- a. **Dynamic DNS Services:** If you want to let clients outside of your LAN access the AGWPE server, they will need to know the IP address assigned to your computer or network by your ISP (Internet Service Provider). If your subscription to your ISP is for a **dynamic** IP address, your public IP address can change each time you connect to the ISP. This can be a problem for others trying to connect to you; they would have to ask you for your current public IP address. If you don't want to pay for a **static** (unchanging) IP address, you can subscribe to a "dynamic DNS" service that will automatically link your clients to your current dynamic IP:
 - First, obtain a personal domain name (for about USD \$35/year).
Example: www.sv2agw.org
 - Then, find a dynamic DNS (domain name system) service that will match your domain name with your current dynamic IP network address. This is done by running a special utility from the service which periodically contacts the service over the internet to tell it the dynamic IP address your AGWPE computer has been assigned. Users then can just enter your personal domain name to connect to you; they need not worry about entering your actual network IP address. The dynamic DNS service will make the translation.

To find a dynamic service provider, do a web search for "dynamic DNS". Some offer free services or free services if you buy your domain name from them.
- b. **Firewalls and security considerations:** If your computer or local network has an open internet connection, you should be taking precautions to prevent unauthorized access to it. Gateways or routers may have an integrated firewall, or you can use a firewall program, such as Zone Alarm, McAfee Firewall, Norton Personal Firewall or even Windows XP's internal **Internet Connection Firewall**.

Note that firewalls will also prevent outside access to the AGWPE server, *unless* the firewalls are configured to permit an exception for the AGWPE server. You will need to read the documentation for your firewall to learn how to do this. For example, my router has a place where I can configure "Virtual

Servers" and another one that has "Port Forwarding". I specify the port I want to open (8000) and the IP address of the computer that will handle that port, which is the 192.168.x.x address of my AGWPE computer.

Explaining how to do this for each possible firewall or gateway is beyond the capabilities of this web site, but here are some considerations when allowing remote access:

- The firewall should limit remote access solely to the computer running AGWPE and solely to that computer's port 8000; do not allow access to other ports or other computers on your network.
- Remember that a remote user who achieves access to the AGWPE server can use it to both receive and *send* packets. In effect the remote user will gain control of the radio connected to AGWPE and will be able to initiate transmissions. In most countries, this has a serious implication -- you will be held accountable for *any* transmissions made by others using your radio.

For this reason, you may want to configure your firewall to limit incoming access from specific, trusted IP addresses. In addition, you should use the LOGIN / PASSWORD security feature in AGWPE (see [#2. above](#)), if the client's application can send them ... but remember most applications can not.



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AGWPE Sound Card Packet Modes

[1200 and 2400 baud \(VHF/UHF\)](#)

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[300 baud \(HF\)](#)

Interesting fact: The maximum potential packet baud rate for a sound card is approximately half the sound card's maximum sampling rate. Since most sound cards have a maximum sampling rate of 44100 Hz, the maximum packet baud rate they could support would be 22050. This is closest to the 19200 baud packet standard. The maximum rate currently provided by AGWPE's sound card feature is 9600 baud.

1200 and 2400 Baud (VHF/UHF)

The AGWPE sound card modem is capable of either 1200 or 2400 baud AFSK operations. 1200 baud is perhaps the most common rate used on VHF frequencies. It is more common than 2400 baud because of the far greater number of 1200 baud TNCs and radio modems. The 1200 baud sound card modem uses the standard tone pair of 1200 Hz and 2200 Hz.

The 2400 baud AGWPE modem is compatible with a TCM3105 modem chip modified with a 8Mhz crystal for the modem clock and uses a 2165 and 3970 Hz tone pair.

9600 Baud Operations (VHF/UHF)

9600 baud is frequently used on the UHF bands and uses Frequency Shift Keying (FSK) instead of the Audio Frequency Shift keying (AFSK) used for 1200 or 2400 baud mode. Because of this, and because of the very quick TX-to-RX switching times required, you need a radio that will handle 9600 baud packet correctly. Most radios do not!

For best results, you can use a radio designed especially for 9600 baud mode, e.g. PacComm's TEKK KS-900 (440 band, 2 watt) or KS-1000 (440 band, 5 watt) radio; or SYMEK's TNC2H.

Or you can also use one of the new multi-mode transceivers labeled as "9600 baud-capable", such as the Kenwood TM-V7 and D700; Yaesu FT-817; or the ICOM IC-275. A web page listing 9600-capable radios can be found at <http://www.sinister.com/radio/9600.html> , but I've heard conflicting reports about whether some new "9600 capable" radios really work well at 9600. (They will tend to drift, have long TX delays, or not be able to do long packets.) Let me know if you know of a type of radio that definitely works with 9600 baud.

The newer 9600-ready radios often have a data jack that has a special pin for 9600 receive and maybe one for 9600 transmit. Consult your User Manual to find out which pins these are and then attach your sound card interface wires -- TX audio and RX audio -- appropriately.

The radio will probably also have a special menu selection for a "9600" data mode which may regulate TX audio attenuation/amplification and RX/TX switching times. Typically, the "9600" mode adds attenuation to the TX line so that the radio can accept full sound card LINE OUT voltages, e.g. 500-2000 mV, rather than the approx. 40 mV maximum for "1200". If you select "9600", your **TX audio cable** may be better **without an attenuation circuit**. If your cable does have an attenuation circuit and it has a pot (potentiometer), turn the pot to reduce the attenuation. You may also need to **increase** the sound card's "playback" volume settings ... or wire the TX cable without an attenuation circuit.

Yaesu FT-847 Users: Some interesting notes on 9600 baud mode use can be found at <http://www.supercontrol.de/cat/ft847faq/digital.htm#9600bps>

Most users report that the RX and TX audio lines in your interface must **NOT** have audio isolation transformers for 9600 operations. Generally , small audio or power transformers do not have the correct frequency response. For example, Radio Shack's #273-1374 1:1 600 ohm audio line transformer has a 300 Hz

to 5 kHz frequency response range which is not low enough. Until someone [sends me an isolation circuit](#) with suitable components (please!), take these precautions if your interface cable does not have isolation:

- make sure the computer and the transceiver's power supply are connected to the same AC power circuit (i.e. sharing the same ground).
- connect/disconnect the sound card interface to the transceiver or computer only when both devices are unplugged from the AC power circuit.

Older transceivers would need modifications to work properly at 9600 baud. You **cannot** use the microphone jack to input TX audio on most radios; likewise you **cannot** use the speaker output for RX audio. For TX audio you must connect directly to the VCO, and for RX audio you must connect directly to the discriminator output. See these web sites for advice on radio modifications:

- TAPR: http://www.tapr.org/software_library.php?dir=/general/9600baud
http://www.tapr.org/pub_9600.html (non-ham radio mods)
- Sinister Radio: <http://www.sinister.com/radio/9600mods/>
- [Report by the ARRL on various radios](#)

Some notes about 9600 baud use:

- Successful 9600 packet operations may require a near full-scale S-meter reading. 9600 signals are far more susceptible than 1200 baud to multi-path conflicts, phase distortion, and noise. As a result, you may need 5 to 10 times the signal strength for it to work reliably compared to 1200 baud. Another way to look at it is that the usable range for 9600 will be far less than 1200 for the same antenna and transmit power. Note that if your 9600 packet exchange is slowed by signal problems and data repeat requests, 9600 operations won't be any faster than 1200 operations.
- Likewise, unless your radio has fairly fast RX-to-TX switching time (less than 50 ms) you won't gain much from 9600 use. The increase in baud rate will not make much difference if the radio has lengthy RX-to-TX switching delays.
- You will probably need to set the volume controls almost to the maximum
- Some soundcards do not have an adequate audio response range for 9600.
- What can you expect for an approximate maximum operating distance for 9600 baud at 440 MHz? Approx. 15 km / 10 miles @ 10 watts in urban areas with a good antenna and radio.
- For more on 9600 baud operations, see:
 - <http://www2.arrl.org/news/features/2007/02/26/1/>
 - [9600 Baud Packet Handbook by Mike Curtis, WD6WHR](#)
 - <http://www.amsat.org/amsat/articles/g3ruh/109.txt>
 - <http://members.gbonline.com/~kb9aln/wapr/wiscnet/part20.html>
 - <http://www.febo.com/packet/cheap-9k6/index.html>

300 baud (HF)

300 baud HF packet operations are quite different from 1200 baud VHF/UHF operations:

- frequency shift keying (FSK) on SSB is used instead of audio frequency shift keying (AFSK) on FM (UHF/VHF)
- tuning is more difficult - the incoming audio tones from the receiver have to match the frequencies AGWPE is expecting within 20 or 30 Hz (i.e. within 10-15% or so of the 200 Hz shift) in order to be reliably decoded. Since the receiver tuning directly affects the frequency of the recovered audio, this requires very precise manipulation of the receiver tuning knob. Since most modern HF rigs tune in synthesized steps of 10 Hz, that means nudging the knob barely one or two clicks either way from center is enough to completely kill reception. [The majority of hams still have problems tuning in an SSB signal so a voice sounds reasonably natural, and that requires "only" a tuning accuracy of 50-100 Hz, not 20-30 Hz!].

Note: this extreme sensitivity to frequency error means that any traditional analog VFO rig will be virtually unusable on a fixed HF frequency (such as for APRS), since they are unlikely to stay within 10 Hz for very long. For this reason, your radio should have a very stable VFO if you hope to stay exactly on frequency.

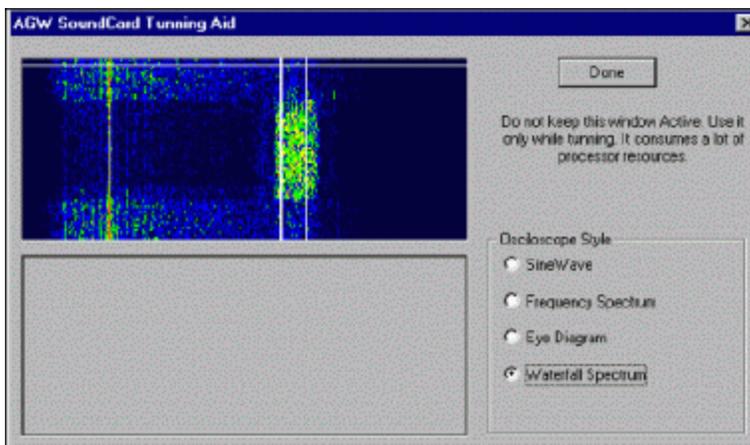
- signals are more easily affected by interference and propagation conditions and by low signal-to-noise ratios and spurious noise
- the tone shift is 200 Hz rather than the 1000 Hz used on 1200 baud packet
- digipeating is not generally used (3rd party traffic concerns)

Configuring AGWPE for 300 baud HF packet isn't much different than for 1200 or 9600. On the AGWPE [Properties for Port 1](#) window, push the [Options](#) button to call up a [Sound Card Modem/TNC Setup](#) window with baud choices for the left channel (port 1/radio1) and right channel (port 2/radio 2). Just select 300 baud for the left channel (see also the [AGWPE setup page](#)).

Processor Tip: George SV2AGW suggests that to save some processor resources, it's best to operate 300 baud in [Single Port](#) mode (see the [AGWPE setup page](#).)

For example, if you selected dual port, the Sound Card Tuning Aid window (see below) will show 2 active tuning windows and the program may run slow. To close (gray out) the lower window, change the AGWPE port properties to [Single Port](#). (Note: If you've messed around a lot with the AGWPE port configuration, it is a good idea to delete the AGWPE.INI file and all PORTx.INI files from the AGWPE directory and start again.)

To aid tuning, AGWPE includes a [Sound Card Tuning Aid](#). You can find it on the AGWPE pop-up menu accessible by clicking on the AGWPE tower icon in the System Tray. For HF tuning, select the [Waterfall Spectrum](#) style. Signals are represented by blues, greens, yellows, and reds (weaker to stronger) on a black background (black =no signal). Tune your transceiver so that the colorful portion of the screen scrolls down between the two vertical lines. To get good copy, the tone must be precisely centered between the two lines.



The sound volume (represented by the colors) in the [Waterfall Spectrum](#) can be adjusted by the TX audio volume. But it's better to use the [SineWave](#) style to see the volume of the incoming signals. The wave heights should only be 1/3 to 1/2 the screen. If necessary, adjust the [Line In](#) or Mic slider in the [Recording window of the Volume Control program](#).

Note: AGWPE emulates a PK-232 HF modem and uses tones of 2110Hz and 2310Hz for a center frequency of 2210 Hz (and the standard HF packet tone shift of 200 Hz). If you are accustomed to KAM tones of 1600Hz and 1800Hz, you'll need to adjust your radio tuning an additional 510 Hz (+510 Hz for Lower Side Band and -- 510 Hz for Upper Side Band).

The [Packet Engine Pro version](#) offers both the PK-232 tones and the KAM tones.

For some radios, the KAM tones may be a better choice since the PK232 tones (2110/2310) land right on the upper edge of the passband of the typical SSB filter, where they could experience differential phase shift and unequal amplitude output; i.e. severe distortion. In fact, the tones may not make it through the passband of many HF transceivers with sharp cutoff SSB filters. (For example, many "contest grade" SSB filters have a cutoff at 2100 or 2200 Hz.) On the other hand, the KAM 1600/1800 Hz tones land in the flat part of the pass band of any SSB rig and will be unaffected by the filter.

Note that on some HF rigs the passband tuning provided on RECEIVE allows you to shift the pass band to a higher band of audio frequencies, but it may not effect the TRANSMIT side. If so, your transmitted tones will still be affected by the filter and may be distorted or may not even be transmitted.

Another option for HF packet is the [MixW program](#), a \$50 shareware program. It has a few advantages over AGWPE, including easier tuning, unlimited user-selectable tone pairs, and different types of packet modems, such as, Q15X25. MixW can also link to AGWPE.

For more information, see the [MixW info page](#) on this web site.

PTT: If you are able to use your VOX key up on your HF rig, you will not need a separate PTT cable, although many users find VOX troublesome and prefer a hardwired PTT circuit and cable. If you use VOX, set the AGWPE PTT port (COM or LPT) to some unused port so you don't conflict or tie up a real port. Also remember that VOX is subject to other noises that it hears, such as [Windows sounds](#), program sounds, etc. It is probably best to turn those off if you run with VOX. Also, depending on your microphone setup, watch out for room noise, talking, etc.

HF Packet - LSB

Band	Suggested Frequencies* (channel centers = RF between the 2 tones)
80	3580-3635, priority at 3620-3635
40	7035-7050, priority at 7040-7050 and 7100-7120 with Americas
30	10.130-10.150, priority at 10.140-10.150
20	14.070-14.112, except 14.100 (beacons); priority at 14.095-14.0995
17	18.100-18.110, priority 18.104-18.110
15	21.070-21.125, priority 21.090-21.125
12	24.920-24.930, priority 24.925-24.930
10	28.070-28.189, priority 28.120-28.189

* AGWPE tones have a center frequency of 2210 Hz, so for LSB you would set your radio dial + 2210 Hz higher than the frequencies listed above. (For LSB, remember that the higher the frequency shift, the **lower** the resulting LSB frequency.)

- 20 Meters is the most active HF packet band.
- Look for APRS beacons at:
 - 7.035.5
 - 10.151.51 MHz LSB (North America)
 - 14.105.51 MHz LSB (Regions 1 & 2 only)
 - 18.102.5
 - 21.103.5 (Africa)
 - 29.250.5

These are the suppressed-carrier (radio dial) frequencies for AGWPE (and PK-232 TNCs) with a

+2210 Hz center frequency. Users of other TNCs may refer to these APRS dial frequencies as 510 Hz less than AGWPE's tones, for example 14.105.0 instead of 14.105.5.

Example for 30 Meters APRS using LSB

The radio dial frequency is listed first in blue. The actual transmit RF frequencies for the Mark and Space tones are in red:

$$10.151.51 - 2.310 = 10.149.200$$

$$10.151.51 - 2.110 = 10.149.400$$

Or if using USB, set the radio to 10.147.09:

$$10.147.09 + 2.110 = 10.149.200$$

$$10.147.09 + 2.310 = 10.149.400$$

Note that some HF radios with "DATA" or "FSK" modes automatically offset the indicated dial frequency to account for the difference between the suppressed carrier freq and the actual mark or space frequency, but they typically assume tones different than 2310/2100 tones used by AGWPE. You'll need to get the data mode offset from your user manual and then calculate the an adjustment offset for AGWPE.



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Remote Control of AGWPE with Your Web Browser

George SV2AGW has started to develop a web browser interface for AGWPE which lets you access AGWPE over a LAN or the internet. Using your browser (Internet Explorer, Opera, or Netscape), you can:

- change some AGWPE settings
- see radio channel activity

Here's how you do it:

1. First, make sure that you have an [http](#) folder (with files) in your main AGWPE folder. This should have been created when you installed AGWPE.

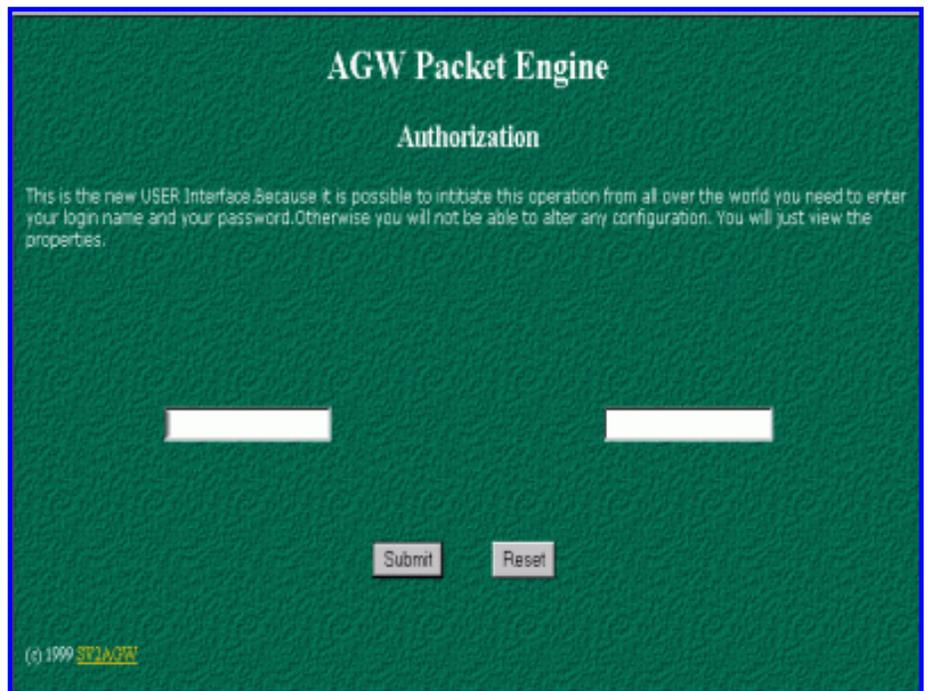


2. Second, start AGWPE. Then call up the AGWPE menu and select [Setup Interfaces](#). This brings up the [Winsock and HTTP Interface Setup](#) window.
 - Make sure the [Enable Winsock TCP/IP Application Interface](#) is checked.
 - Then click on the [HTTP Interface](#) tab (see picture below).
 - Checkmark [Enable the HTTP Interface](#).
 - Note the port number. The default of **80** should be fine. You would only need to change it if some other server or program in your computer was using port **80** and that would be unusual (for example, port 80 is normally the default TCP port for web browsers).
 - Optional: Under [Password](#), either leave the [LOGIN](#) and [PASSWORD](#) name defaults or enter new words of your choice. Use of a LOGIN name and PASSWORD are suggested in order to prevent others from changing your AGWPE settings.
 - Press the [OK](#) button to save the changes.



- 3. Call up the AGWPE pop-up window again and this time select Launch IBrowser; or with AGWPE running, launch your Internet browser.
 - If you are working from a remote computer, in the browser's address bar enter the IP address of the computer running AGWPE
 - If you are working from the same computer where AGWPE is running, enter <http://127.0.0.1:80> or <http://localhost:80>.

Possible Problem: 127.0.0.1 is an IP address that refers to your own machine. But if you are on a network/connected to a router and your computer has been assigned a different IP address, you may need to enter that address, e.g. 192.168.0.xxx via the address window in your browser.
- If everything is working correctly, you should now get a green textured "AGWPE web page" with login slots.



If you kept the defaults on the [HTTP Interface](#) page, you do not need to enter a **LOGIN** or **PASSWORD** providing you are accessing the AGWPE from the same computer, i.e. not accessing the AGWPE machine over a network.

- Your browser will then display a [AGW Packet Engine Main Menu](#) page.



<-- Click for larger picture

If you click on the [MONITOR](#) option, you should soon see incoming lines of packet data scrolling across your browser!

You can also call up a [MHEARD LIST](#) and even edit you AGWPE ports... but **not all the menu choices are working** (as of version 2003.308).

Trouble Shooting:

If you can't get your browser to display the AGWPE green web page:

- Check your AGWPE folder. You need to have a "HTTP" folder in it and it should have some files in it -- those files come with the original AGWPE zip file for all major releases, such as 2003.308. They usually are not included with beta release zip files.
- Make sure you have the HTTP Interface activated on port 80 -- see #2 above.
- Your firewall program (ZoneAlarm, etc.) may be blocking access to port 80. Temporarily turn off the program to test this. If everything then works, you will have to configure the program so it allows access to AGWPE's port 80.



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AGWPE's TCP/IP Over Radio Feature

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On Related Pages:

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Overview

AGWPE's special TCP/IP Over Radio (TOR) feature (**extra fee required**) lets you send and receive TCP/IP data using amateur radio. It is most frequently used as a way to relay email through a ham *station with* internet service to a ham radio *station without* internet service. For this to work, both stations must be running AGWPE ([see note below](#)).

Please note that the special TOR feature does NOT need to be activated for normal packet operations. And you can run TOR using AGWPE with TNCs and modems, not just sound card packet. I've added information about TOR to this "sound card packet" site because questions about TOR come up frequently.

With AGWPE's TOR feature you will be able to:

- act as an internet 'gateway' letting others use your computer to get on the internet
- get internet access as a 'client' by using a 'gateway' station!
- let other radio users access any FTP, SMTP, and POP servers you host on your computer
- access FTP, SMTP, and POP servers hosted at a distant station

Please note that:

- TOR does **NOT** have to be activated in AGWPE for normal packet operations. AGWPE does use the **TCP/IP application interface** to link to other programs and users, but this TCP/IP application interface should not be confused with **TCP/IP Over Radio (TOR)**. For this reason the TOR driver does not need to be installed for normal packet use.
- TOR is somewhat difficult to set up, especially for those with little or no experience with networking and TCP/IP
- For TOR to work, both the sending and receiving radio station must be running AGWPE with TOR ([see note below](#))
- You may use TOR for up to 45 minutes at a time without paying a fee. This gives you time to experiment. But to use TOR for longer than 45 minutes at a time, you must [register and pay a US\\$28 fee](#)
- This web site will not be able to give you very precise details about configuring applications other than AGWPE for TOR

How it works

A key TOR requirement is the installation of a special SV2AGW TOR network driver on both the sending and receiving station. This driver creates a virtual (software) network adapter that acts just like a physical network interface card (NIC) or the Windows dialup adapter. With your applications properly configured, TCP/IP data packets that normally go to the NIC or dialup-adapter are instead routed to the SV2AGW TOR adapter. The TOR adapter places the TCP/IP packets inside AX.25 packets, which are then sent to AGWPE to be transmitted by radio to another TOR-capable radio station. The TOR adapter at the receiving station removes the TCP/IP packets from the AX.25 packets and forwards them to the appropriate TCP/IP program.

Note: AGWPE's TOR feature should work in combination with other TCP/IP over radio systems, such as JNOS, Linux, and Flexnet, etc. You don't really need AGWPE on both ends of a AGWPE TCP/IP system. This web site, however, discusses only a pure AGWPE system where both stations are using AGWPE.

How Fast is TCP/IP over Packet?

TOR is only as fast as the "on air" baud rate of your TNC and radio (minimum 300 baud, maximum 9600 baud with AGWPE). For applications needing fast transfer rates, such as high-content web browsing or audio and video streaming, this rate will be much too slow. But for other applications where high transfer rates are not as important, such as email, ICQ, small file transfers, or simple web pages, this rate may be adequate.

To Pay and Register

AGWPE is free and you can use its TOR feature **without a fee for up to 45 minutes** at a time. But to run TOR for more than 45 minutes at a time, you will need a registration number that comes after paying a registration fee of \$28 US.

If you run AGWPE with TOR for more than 45 without a registration number, you will get this notice from AGWPE:



To pay and obtain a registration number go to this secure web site: <https://secure.bmtmicro.com/ECommerce-OnSite/00356/35601.html>

Please include the following information in your order:

1. your name
2. your callsign
3. the way you wish to receive your registration number (Email or Postal Address).
4. your phone number (in case of a problem)

If there is a problem or delay in receiving the registration number, you can email the AGWPE author, [George Rossopoulos SV2AGW](mailto:George.Rossopoulos@SV2AGW)

Note: The TCP/IP Over Radio (TOR) feature is available in both AGWPE and [Packet Engine Pro](#) (PE Pro) and TOR will work between a station running PE Pro and one running AGWPE.

PE Pro is the advanced version of AGWPE with many additional features. It costs \$49 US after a 30 day trial period. **The TOR feature is included free with PE Pro.** For that reason, if you plan on running TOR, you should consider purchasing PE Pro instead of purchasing just the TOR registration for AGWPE. For only \$21 US additional, you will get all the advanced features of PE Pro (see the [PE Pro page](#) for a listing).

Steps To Implement TOR

To run TOR, you must already have AGWPE working correctly and be able to conduct normal packet exchanges with the other TOR station. Listed below are the basic steps to then setup TOR. Links on this page will take you to other pages on this site with more details.

1. **Decide on IP address for each station in your TOR network.** If your network will be relatively simple and will not tie into other TCP/IP networks, you can pick your own IP addresses. Since Amateur Radio has been assigned the block of IP addresses beginning with "44.", you should begin your addresses with that (example: 44.1.1.1 and 44.1.1.2). If your network may be heard by or tie into other ham TCP/IP networks, you should instead obtain unique addresses from your [local TCP/IP coordinator](#). This will prevent the routing problems that could develop when two or more stations use the same IP address.

Note: Never use an IP address that begins with "192.168." for your SV2AGW IP address. This is the addressing scheme used on LANs and home networks. If you have another network adapter or wireless card in your computer and use a 192.168-type IP address for the SV2AGW adapter, Windows will probably not route to it correctly.

2. **Download and install the special TOR driver** to create the special SV2AGW "virtual" network adapter. See [TOR Virtual Adapter](#) for instructions for each version of Windows.
3. **Activate the TOR feature in AGWPE.** See [TOR AGWPE Settings](#) for further information.
4. **Configure Windows.** Some additions to Windows' IP Routing and ARP tables are needed to direct TCP/IP data to the virtual adapter, the correct radioport, and the correct station callsign. [See TOR Windows Settings.](#)

In addition, on any computer that will act as an **internet gateway** for other stations, you must:

5. **Configure Windows' Internet Connection Sharing feature** (or run a proxy server program). See [TOR Gateway Setup](#) for further information.

Note that you normally do not need to configure your TCP/IP client applications (browser, email reader) in any special way for TOR ([Additional notes on application setup](#))

Note: The [MixW program](#) is also reported to be able to send TCP/IP by packet. The MixW website says that a MixW user and an AGWPE TOR user should be able to communicate with each other using TCP/IP over radio.

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[Build a Watchdog Timer](#)

- **Selective Packet Routing:** For some of the AGWsoft client programs, such as AGWTerm or AGWDXCluster, the callsign and SSID you use in the program will be noted by AGWPE. If you use different SSIDs in each program, then AGWPE can route packets to the proper program.

As an example, let's say that you are running both a BBS program with a callsign of SV2AGW-1 and a DX Cluster program with a callsign of SV2AGW-12. AGWPE will know that packets to SV2AGW-1 must be directed to the BBS program and packets to SV2AGW-12 must be directed to the DX Cluster program. Neither program gets packets intended for the other.

- **Launch AGWPE-Dependent Applications Automatically:** Use AGWPE's auto start feature to automatically load application programs or utilities as soon as AGWPE is finished loading. For example, if you mostly use UI-View with AGWPE, you could add UI-View as an auto start client. Then when you start AGWPE, UI-View will launch immediately, too. The auto start feature is found on the AGWPE menu under **Startup Programs**. Configure the **StartUp Programs** window to start the applications you want.

Some users find that they need to include more of a delay when starting programs. Jim KB9MMC uses this solution:

"I use a program called Autostart Delayer. It's a free program, and it works well. I have it set so that the AGWPE starts first, then Autostart Delayer waits about 5 seconds to start up my other programs that run off of AGWPE (Telpac, Sally UI-View). You can find the program at: <http://www.r2.com.au/software.php?page=2&cat=5&catname=Network>

- **Use Alternate Languages:** AGWPE has language support for many languages other than English (the default). The alternate language files were created by other AGWPE users and they are included within the main AGWPE zip file, e.g. french.zip. (If you want to create an alternate language file for your language, see the instructions in AGWPE's [Help](#) file ([Help > Index> Multilingual Support.](#))

Note: Not all words in the AGWPE menus and dialog boxes will translate.

To use an alternate language file:

- 1. Unzip the language file of your choice, e.g. French.zip, into the AGWPE folder. The three unzipped files of importance that will appear are files ending in ".[.lng](#)", ".[.hlp](#)" and ".[.cnt](#)". So if you unzip the French.zip file you should see these new files: [1036.lng](#), [agwpe_f.hlp](#), and [agwpe_f.cnt](#) (the [.lng](#) file has menu and dialog translations, the [.hlp](#) file is the translation of the AGWPE '[Help](#)' file, and the [.cnt](#) file is the table of contents for the help file).
- 2. Open the agwpe.ini file in the AGWPE folder. You should see a line with Windows' [language code number](#), e.g.

LANGUAGE=1036

This is the code for the language you selected when you installed Windows (1032=Greek, 1033=English, 1036=French, 1044=Norwegian, etc.) **You you can not edit this number in AGWPE.ini** since AGWPE is programmed to get it from Windows.

- 3. When AGWPE starts, it looks to see if there is a [.lng](#) file that matches this language code. If the Windows language code is 1036 (French) and AGWPE finds a

1036.lng file (French) in the AGWPE folder, it will load the French language files. Otherwise, AGWPE will use the default language of English.

- 4. If you want to use a language in AGWPE that is different from the default Windows language, you will need to rename the AGWPE language files to match the default Windows language code. Let us assume 1033 (English) is the Windows language code and 1036 (French) is our desired language in AGWPE:
 - First, rename the **desired** ".lng" file, e.g. **1036.lng** (French) to match the Windows' language code specified in the **agwpe.ini** file, i.e. 1033 (English). So, to install the French files on an English machine -- we would rename **1036.lng** to be **1033.lng**.
 - Then rename the ".hlp" file you unzipped, e.g. **agwpe_f.hlp**, to be **agwpe.hlp**
 - Finally, rename the ".cnt" file you unzipped, e.g. **agwpe_f.cnt**, to be **agwpe.cnt**
- 5. When you restart AGWPE, it will use the replacement language files.
- **Use GMT time:** AGWPE can use either Local (Computer) time or GMT (Greenwich Mean Time or UTC) in reporting packets received. To change the time zone, you will need to edit the AGWPE.ini file: under the [TNC] section, add either **GMT=1** for the GMT time stamp or **GMT=0** (the default) for a local time stamp. If there is no entry, then it uses local time. Example of GMT time setting:

```
[TNC]  
GMT=1
```

- **Use Alternate AGWPE Configurations:** There may be times when you want to start AGWPE in a specific configuration, say for different TNCs or to auto start different programs. The easiest way to do this is to create duplicate AGWPE folders. Each folder will have the full program but different AGWPE configuration ".ini" files. Then use shortcuts that point to the AGWPE programs in the different folders. Use shortcut names that describe the configuration files, for example, "AGWPE PacLink" or "AGWPE ICOM 706" or "AGWPE Loopback".
- **Override AGWPE's Traffic Parameters:** Note that AGWPE automatically monitors frequency traffic and can adjust TNC timing parameters to match that traffic level. You can override this feature (see [TNC parameters screen](#)) but generally it

would be to your advantage to use this feature, since it relieves you of the chore of determining and implementing the best timing parameters.

- **Decipher Packet Headers:** If you really want to understand what is happening when you make a connection to another station, you need to be able to interpret the header information in the packets being exchanged. [AGWTerm and AGWMonitor](#) and other programs let you see them. The [Deciphering Packet Header page](#) on this website will help you interpret and understand them.
- **Use a Loop Back Port:** For off-air testing of two programs, create a loop back port. For instance, you could run both AGWTerminal and WinPack and use the loop back port to "connect" WinPack to AGWTerm.

To create a loop back port: from the AGWPE menu, select [Properties](#), then [New Port](#). In the new port's [Properties for Portx](#) screen, select a [TNC Type](#) of [LoopBack Port](#). Now connect both of your applications to that same AGWPE radio port and they can communicate with each other without going on the air.

Example: Say your loop back port is on AGWPE radio port #3. Start AGWTerm and WinPack, but make sure they are using different callsigns, e.g. KC2RLM-6 and KC2RLM-7. Then, on WinPack's command line enter this connection request: "C 3 XXXX" , where "3" is the loop back port and XXXX is the callsign you are using in the AGWTerm program. The two programs should now be connected to each other via the loop back port.

- **Build a Watchdog Timer:** Most TNCs have a timer that prevents continuous transmission in the event of some TNC or software failure. Typically such a watchdog timer stops transmission that last more than 2 or 3 minutes. With AGWPE's sound card, you don't have such a timer, so here is a [page describing how to build a watchdog timer circuit](#) for your PTT cable.

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Adjusting Traffic and Timing Parameters

On the **Properties** screen for each sound card radio port, there is a second tab entitled **TNC Commands**. Selecting that tab brings up a screen where you can edit various traffic flow parameters. By default, AGWPE automatically resets seven of the parameters every few minutes or, if you prefer, you can opt to manually set those seven parameters.

1. Program Adjusts Parameters

This default choice offers s a valuable feature: AGWPE monitors the packet traffic level and will automatically adjust all packet parameters every two minutes to match the traffic level AGWPE has detected.

You can read more about how the program adjusts these parameters by reading the AGWPE **Help** file: from the AGWPE menu, select **Help** and then in the **Contents**, select **How To .. Control TNC Parameters (SelfAdjust Parameters Algorithm)**.

For example, AGWPE uses 8 traffic levels based on the number of bytes AGWPE has heard in the last 2 minutes, where "1" is little or no traffic and "8" is full channel capacity (defined as 15,000 bytes/2 min). The MaxFrame, SlotTime, and Persistency parameters associated with each traffic level are embedded in the program, but you can override some or all of those values with additions to the AGWPE.INI file (read the AGWPE **Help** file).

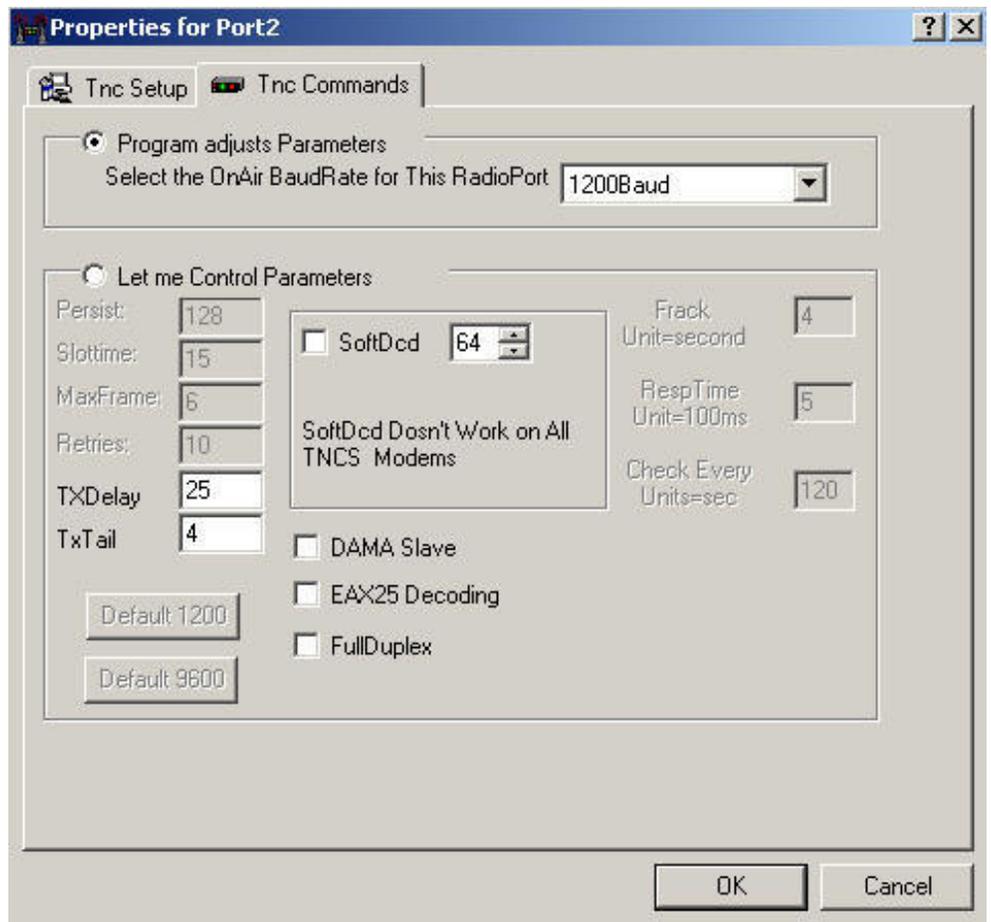
You can view the current traffic level and bytes during the last 2 minutes by going to the **TNCs Status** screen (accessible from the AGWPE menu). The TNCs Status screen will also show you the current MaxFrame, SlotTime, and Persistency values that AGWPE is using. (If you opt to adjust the traffic parameters yourself -- see section #2 below -- the TNCs Status screen will show the MaxFrame, SlotTime, and Persistency values you have selected, but the "traffic level" and "bytes/2 min" values will not be calculated.)



<-- Click for larger image

If you keep this default setting, seven of the parameters on this screen will be 'grayed-out' and inaccessible, as will the **Default 1200** and **Default 9600** buttons.

Note: The 'on air' baud rate field is not used by the program.



The parameters you can always adjust are:

- **TXDelay** - the time in 10ths of a millisecond between when the PTT circuit is activated and packet data is sent. This delay gives your radio's transmitter time to come up to full power and gives the receiving radio time to switch from 'transmit' to 'receive'. A minimum delay increases traffic flow, but too little delay may result in the loss of the beginning of the packet and thus retries and decreased traffic flow. The default is 35 for 1200 baud; 20 for 9600 baud. Older radios may need a bit more; newer radios may need 15 or less.
- **TXTail** - the time in 10ths of milliseconds between the end of packet data and the closing of the PTT circuit. Only needed on some modems. Can be set to zero for most TNCs. Default is 4.
- **Soft DCD** - DCD is Data Carrier Detect. Some TNCs/modems must rely entirely on the radio's squelch to sense when there is a carrier/packet on the air (hardware DCD). If your radio does this, leave this unchecked. Other TNCs have software logic to detect when there is a carrier/packet in the noise, so you can leave the radio squelch open (software DCD). In fact, many TNCs are designed to run open squelch and use soft DCD automatically. Still other TNCs/modems let you choose which method to use. Check mark this box this if you want software DCD. The relative signal-to-noise threshold amount to the right can be changed. The default is 64.
- **DAMA Slave** - check this if you are working with DAMA stations. It will put the port in DAMA mode when it detects that the station you have connected to is a DAMA node or BBS (DAMA Master). DAMA is common only in Germany/Europe. DAMA replaces SlotTime and Persist timing.
- **EAX25 Decoding** - if there another station is operating in EAX25 mode, then checking this box will allow you to monitor its traffic correctly. EAX25 is not a standard protocol and many stations don't support it. Incorrectly activating EAX25 decoding could result in problems.
- **Full Duplex** - default is OFF, which means AGWPE uses the DCD signal to determine when the frequency is clear and when to acknowledge packets. When turned ON, AGWPE ignores the DCD signal and sends acknowledgements immediately; may be useful in split frequency operations such as through satellites or when doing loop-back tests, but only if both stations are operating full duplex.

Note: This field does not control the Full/Half Duplex setting of the sound card. That setting is made on the [Sound Card Setup screen](#)

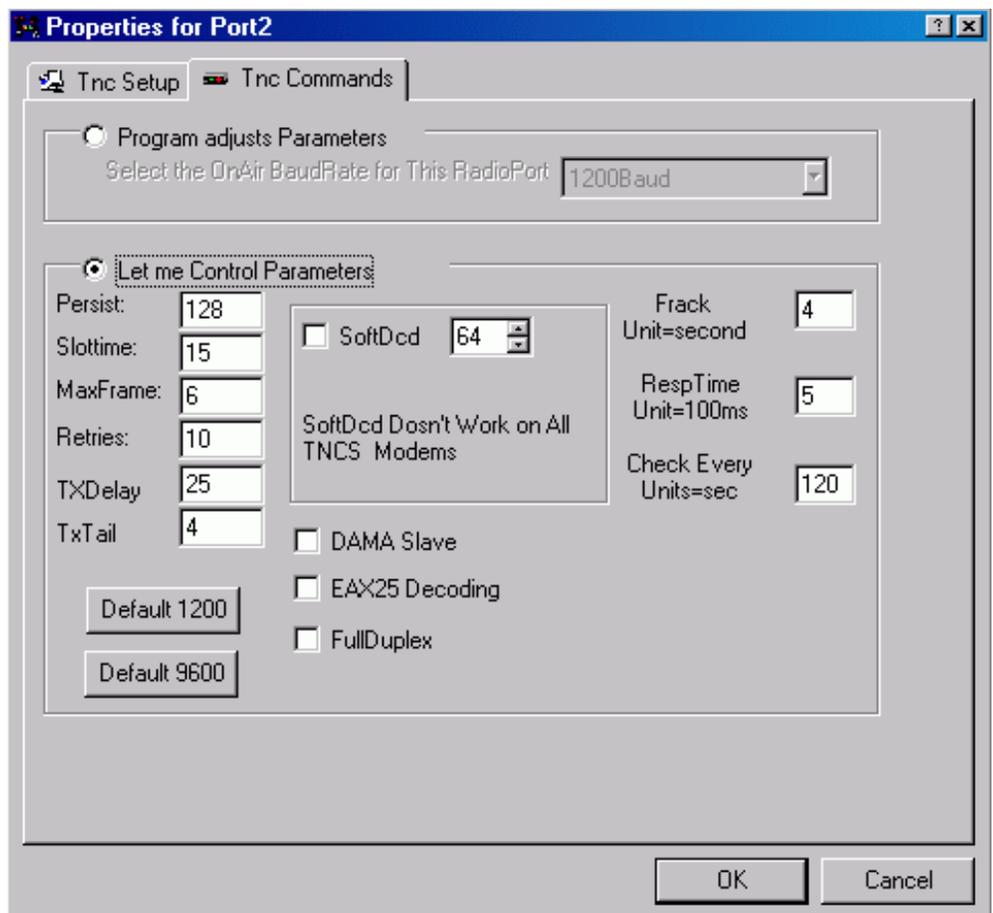
Note: **PacLen**, the number of characters to place in each packet, is determined by your application program, not AGWPE. AGWPE can send up to 255 characters per packet. If traffic is light (collision risk is low), you can send more characters per packet and exchanges will be quicker. If traffic is heavy, use less characters per packet because shorter packets will have a better chance of getting through without collision. This means the need for retries will be less and exchanges will be quicker in heavy traffic situations.

2. Let me adjust Parameters

This choice lets you change seven additional parameters: **Persist**, **SlotTime**, **MaxFrame**, **Retries**, **Frack**, **RespTime**, and **Check Every** (see [Parameters](#) information below). In addition, the **Default 1200** and **Default 9600** buttons become active.

You should only make this choice if the program is not handling the timing parameters to your satisfaction and you understand channel traffic and the affect of each parameter. Remember that AGWPE can adjust the parameters automatically as traffic levels change, something that would be difficult to do manually.

The screen will look like this (default values for all fields are shown):



Here is more information about each of the parameters you can set only if you select "Let me Control Parameters":

- **Persist** - works with the SlotTime parameter to determine the frequency of transmissions. SlotTime sets the time between slots (transmission opportunities). Persist sets the odds (the number of times in 255) that AGWPE will actually transmit when a slot come up. Use lower Persist numbers during heavy traffic (so AGWPE misses some turns and lets other stations transmit). Try higher numbers if traffic is light (AGWPE will transmit at most slots). Persist can be from 1 to 255. Default is 128 (50%) for 1200 baud; 190 (75%) for 9600 baud.
- **SlotTime** - works with the Persist parameter to determine the frequency of transmissions. After detecting a clear channel, the SlotTime is the time in 10 milliseconds that AGWPE waits for the next slot (transmission opportunity). The Persist parameter sets the odds that a transmission will actually be made at that slot. Default is 10 for 1200 baud; 5 for 9600 baud.
- **MaxFrame**: the number of packets (frames) of unacknowledged packets that can be outstanding at one time. When MaxFrame is reached, AGWPE will stop sending packets and wait for an acknowledgement from the other station that ALL packets were received. If traffic is light, use a higher MaxFrame -- packets will get through more quickly. If traffic is heavy, use a lower value. Otherwise, a lost frame will result in a request from the receiving station to re-send ALL frames after the lost frame. This adds traffic to the channel. The maximum MaxFrame value is 7.
- **Retries**: if a packet is not acknowledged by the receiving station, AGWPE will re-send the packet up to the maximum number specified by Retries. After that, the connection with the other station is assumed to be broken and it is closed. Default is 10 for 1200 baud; 15 for 9600 baud.
- **Frack**: increment to wait for an acknowledgement from the other station before re-sending the packet. Allow more time if you have more VIA stations in your packet address path. Default is 10 for 1200 baud; 8 for 9600 baud.
- **RespTime**: the minimum delay to wait after a clear channel before sending an acknowledgement packet. This delay helps ensure all the sending station's frames have been sent. Increments of 100 milliseconds. Default is 5 for 1200 baud; 3 for 9600 baud. Increase this if your ACK packets may be colliding with the other station's last info packets.
- **Check Every**: the amount of time to wait after hearing nothing from a 'connected' station before sending a 'check' ("are you still there?") frame. Default is 180 (3 minutes) for 1200 baud; 120 (2 minutes) for 9600 baud.
- **Default 1200 Button** - will set all the parameters to AGWPE's default settings for 1200 baud 'on air' packet.
- **Default 9600 Button** - will set all the parameters to AGWPE's default settings for 9600 baud 'on air' packet.

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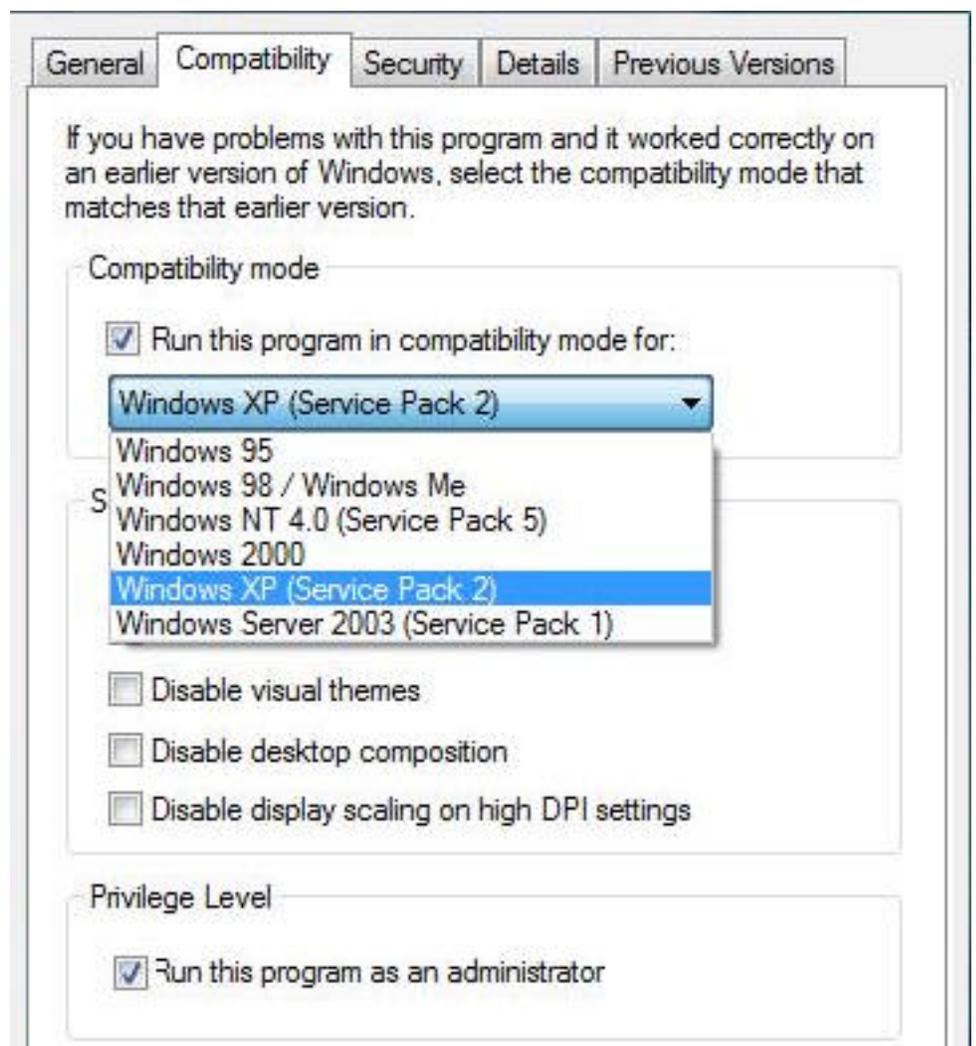
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AGWPE and Vista

AGWPE will run on the Microsoft **Vista** operating system but you may need to do the following if it doesn't run at first: go into the installation folder for AGWPE (and perhaps any of its client programs). Right click on the main program executable, e.g. AGW Packet Engine.exe

Then select the **Properties** option and then the **Compatibility** tab. Set the programs to run on **Windows XP (Service Pack 2)** mode and also check the Privilege Level option to **Run this program as an administrator**. By modifying the executable, you don't have to modify any shortcuts on the desktop or start menu for this to work.



Others have said that there are other bugs, particularly with the sound card mixer settings. Graeme VK3VGK found he needed to re-define the "default device" in Vista using this method:

1. Right click on speaker icon located on the Windows tool bar.
2. Select recording devices.
3. Slide scroll bar until you locate 'Line in at rear panel (Blue)' (assuming that this is the input you are using). Then right click on that input and choose 'set as Default Device'.

Randy K6YFE found that if you do not have something actually inserted into a sound card jack, VISTA may say "no audio device installed" under the recording tab. "When I inserted the patch cord into a MIC connection, VISTA then indicated a front MIC audio device and AGWPE works correctly."

Also, note that client packet programs that work with AGWPE may themselves not work in Vista at this point. If you have any suggestions to add, please [e-mail me, KC2RLM](#).

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MixW and AGWPE

AGWPE and AGWPE Pro are not the only programs that you can use for sound card packet. AGWPE was the first to provide host services to client applications and continues to be the best application for that need. Other sound card packet programs are [MixW](#) and Flexnet32.

I do not have any experience with Flexnet. The web site is at <http://dl0td.afthd.tu-darmstadt.de/~flexnet/index.html> . There is a Flexnet/32 to AGWPE linking program called [XGlue](#) ([XGlue Setup Guide](#)) if you want to couple the two programs. If someone wants to send me a layman's description of Flexnet/32 (its advantages and disadvantages and why you would want to run it), I would really appreciate it. The Flexnet website isn't very helpful to me.

MixW, however, does have some features of interest to packet users and even AGWPE users.

[MixW](#) (<http://mixw.net/>) is a \$50 multi-mode sound card program that includes 300 and 1200 baud packet. Some users feel MixW does a better job with 300 baud HF packet than AGWPE or Packet Engine Pro. But even if you use MixW for HF packet, you should still be able to link it to AGWPE via virtual serial ports (see below). This lets you continue to use AGWPE for its multi-program/multi-device management services while using MixW's HF packet engine.

Paraphrasing Stephen WA8LMF: "MixW far outperforms any hardware or software on noisy HF packet. It produces a waterfall display on HF packet that makes tuning extremely easy (similar to the PSK31 programs it evolved from). You can click on the center of the lingering waterfall display even AFTER the packet burst has ended to adjust the tuning and be ready for the next packet. (AGWPE has a waterfall display but you can't tune using the display. You must tune the radio and then wait for the next packet to see how the waterfall now aligns.) MixW is also far less cantankerous to configure than the AGW Packet Engine sound card modem.

On HF, the 300 baud 200-hz-shift mode is fully tunable to any arbitrary tone pair -- not just KAM or PK-232 pairs. Since the HF modem is tunable and not locked to any arbitrary tone pair, you can switch in a 500 Hz CW filter on SSB, and then make the HF tone pair fit whatever

audio band pass results. (The shape and position of the band pass of various SSB, RTTY and CW filters, and the effect of band pass tuning, shows dramatically in the waterfall display of background HF noise.) If anything, the main problem is that Mix is "too good"; the brick wall steep-skirted selectivity of the mark and space channel filters cause problems with the many users not exactly on frequency. However, if they ARE on frequency, it will FAR out-copy a KAM, PK232 or AGW.

At the click of a mouse, you can select almost a dozen different packet modems including the specialized ones used for satellite operations. If you want to try weird new baud rates and shifts, MixW will let you define your own combinations of baud rate and shift. If you REALLY want to turbo charge HF APRS, try the add-in Q15X25 modem which is an simultaneous multi-tone FSK system mated to standard X25 packet protocol that can deliver a reliable 1200 or 2400 baud throughput on HF in a 1 KHz bandwidth! At the input/output of the TNC emulator, it looks just like any other packet mode, just faster.

It also seems to work on a much larger variety of soundcard hardware than AGWPE, including many of the cheapie built-in-to-the-motherboard ones that won't work with AGWPE. The audio level adjustments are much less critical and easier to set. The only thing you lose is the ability to operate VHF and HF simultaneously."

MixW now has the capability of allowing client programs, including AGWPE, to connect to MixW using its "TNC Emulation" feature. In TNC Emulation mode, MixW appears as a TNC to a client packet program. MixW sends and receives packet data to one serial port, either actual or virtual, while the client application attaches to a different serial port, actual or virtual. If actual serial ports are used, a null modem cable is used to connect them (one port could even be on another computer). If **virtual** serial ports are used, they are automatically connected in software. In this way , UI-View or AGWPE can hook to MixW and use MixW's sound card packet modem!

To create the virtual serial ports, you'll need another add-on component, the MixW Serial Port Emulation Driver, downloadable from the MixW website at <http://mixw.net/related.htm#tncemu> . The software will install two virtual serial ports on your computer. You then assign MixW's "TNC emulation" feature to one of these virtual ports, and configure the client application to connect to the other.

Unfortunately, the MixW emulator only works on Win2000 or XP, but Windows 95/98/Me users can find a virtual serial port driver at <http://www.pearsoncomputing.net>

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UI-View 16 and UI-View 32 were written by Roger Barker, G4IDE/SK. Both are packet-based position plotting programs similar to other APRS software. Both can use AGWPE as a "host". You can download both at <http://www.apritch.myby.co.uk/uiv32.htm>

The basic UI-View program, also called UI-View 16, is a free ware program that has slightly less capabilities than UI-View 32 -- [see "UI-View 32 vs UI-View 16" below](#).

Since Roger's death in September 2004, registration for either program is free, however, in lieu of the former registration fee of £10 (about \$15 US), you are asked to make a suitable donation to a cancer organization of your choice. Registration gives you the right to send APRS position reports to the internet and to upgrade from UI-View 16 to UI-View32. To register, do not contact Roger's address as the program or his web site may suggest; instead use the URL below to find the name of someone who can issue you a registration number:

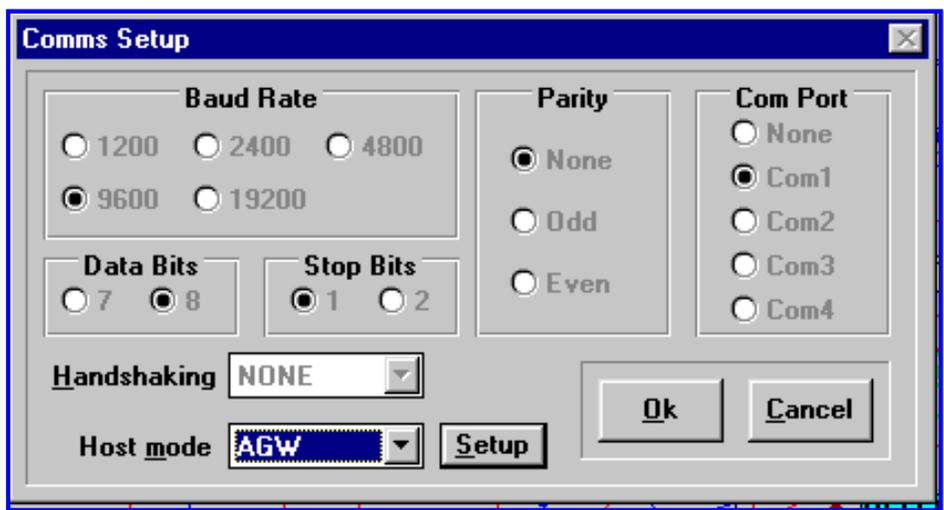
<http://www.apritch.myby.co.uk/uiv32.htm>

Simply state your request for a registration number in an email that includes your first and last name on one line, plus your callsign on another line.

Basic UI-View Setup

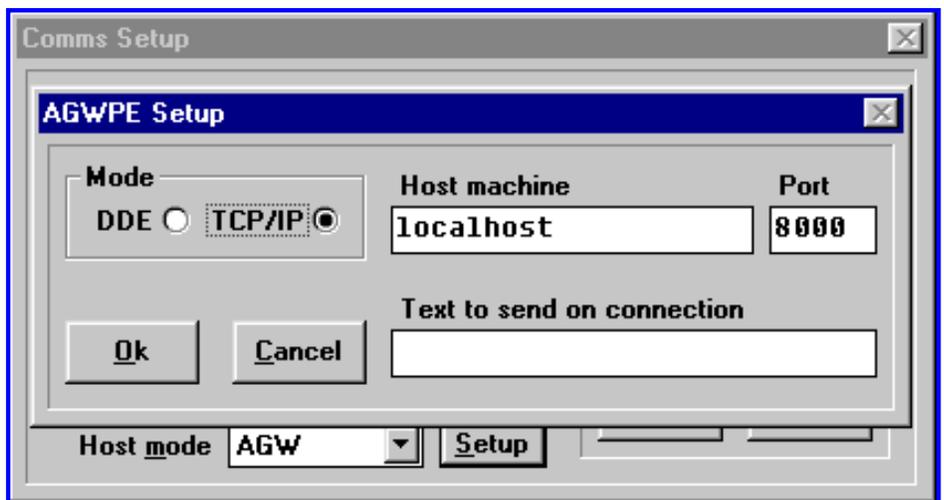
Here's how to configure UI-View to work with AGWPE -- it's really not hard. Roger did a great job in explaining it all in the UI-View [Help](#). (Next two screen shots are from UI-View 16.)

- With AGWPE running, start UI-View. First, if you only have one sound card in your system, disable sounds in UI-View, lest UI-View's use of the sound card interferes with AGWPE's use of the card. On UI-View's top menu bar, select "Options", then uncheck "Sounds Enabled".
- Next, on the top menu bar, select [Setup](#), then [Comms Setup](#). The resulting window should look like the graphic below. Set the [Host Mode](#) for [AGW](#). (UI-View has context sensitive [Help](#), so press F1 to call up help for this window.)



Then press the **Setup** button.

- UI-View 16: On the resulting **AGWPE Setup** window -- for UI-View 16 only -- for **mode**, you can select either **DDE** or **TCP/IP**. Press F1 again to call up a very informative UI-View Help dialogue about AGWPE.



Screen shot form UI-View 16

UI-View 16 will work in DDE mode just fine with AGWPE, but the advantage of using TCP/IP mode is that you could connect UI-View to an instance of AGWPE running on another PC accessible via a network or the internet.

For TCP/IP to work with UI-View 16:

- you must running AGWPE version 2000.15 or later
- you must have the Windows **Winsock 2 update** if you are running Windows 95 or Win98 OEM (it is automatically installed in Win 98SE, Win2000 and WinXP).
- AGWPE's Winsock TCP/IP interface must be enabled: On the AGWPE menu, click once on **Setup Interfaces**. On the resulting **WinSock Interface** tab, make sure the **Enable Winsock TCP/IP Application Interface** box is check marked . Click in the box to check/uncheck it. Note the TCP port on that screen -- the default is 8000.
- The TCP port specified in AGWPE (default is 8000) must be specified in UI-View's **AGWPE Setup** window (see screenshot above.)
- if you run a firewall program (such as Zone Alarm), then port 8000 must be open and accessible

You can also configure UI-View 16 to connect to an instance of AGWPE running on a different computer on your home network or any where on the internet. In that case, enter the IP address of the AGWPE computer in the "Host Machine" field, i.e. instead of "localhost". [See the AGWPE Over a Network page.](#)

After you have made your selection, press the **OK** button on both the **AGWPE Setup** and **Comms Setup** windows and UI-View should be working with AGWPE and receiving packets.

UI-View 32: After you press the **Setup** button, you will see the AGWPE Setup Screen (it's different from the one in UI-View 16):



This screen is similar to the one in UI-View 16 in that you must specify the port and IP address of the computer running AGWPE. Use 127.0.0.0 (or localhost) if AGWPE is running on the same computer machine as UI-View.

In addition, UI-View 32 has additional options. As the screen suggests, press **F1** in UI-View to read the context-sensitive help about this screen and how to configure any advanced options you may need:

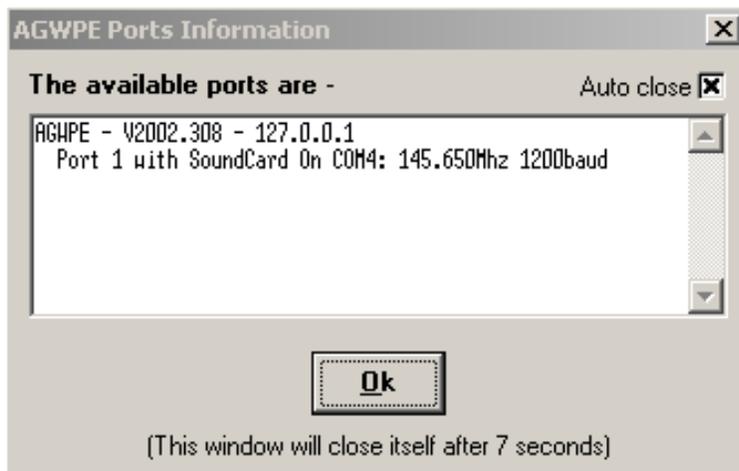
Password and **text to send on connection** - used to connect to an instance of AGWPE running on a different computer on the network or internet and that instance of AGWPE has implemented **user name and password security**. Note that UI-View uses your callsign as the "User Name", so AGWPE must have your callsign registered in its exceptions list.

Multiple Systems - used to connect to multiple instances of AGWPE; [see Multiple Systems Option below](#)

Remote - if you are connecting to an AGWPE instance outside of your local area network, i.e. over the internet, then please check this option so that any traffic you send via ports on that remote system will have "TCPIP*" inserted in the packet's unproto path. This is to make sure that you don't appear as "local" to those who can hear the AGWPE radios, when in fact your UI-View station is actually many miles from the AGWPE radios.

Port Mask - used if AGWPE is configured for multiple radio ports. The mask lets you specify which ports to use and not to use for **receiving** packets; see [Port Masks](#) below.

If UI-View links successfully to AGWPE, a UI-View window like that below should appear shortly after UI-View starts:



UI-View 32 Screen Shot

If UI-View has not linked successfully to AGWPE, you will see this message



UI-View 32 Screen Shot

This means UI-View can't find AGWPE. Recheck all your TCP/IP settings in UI-View (see above) or [in AGWPE](#):

Advanced UI-View 32 Options

1. Multiple Systems Option: Connecting to more than one instance of AGWPE

UI-View32 can connect to more than one instance of AGWPE. From the UI-View32 menu, select **Setup** and then **Comms Setup**, and then press the **Setup** button next to **Host Mode: AGWPE**. Check mark the **Multiple System choice** and you will now have tabs for 2 AGWPE systems to configure. (Press F1 for UI-View Help!) You can specify your own instance of AGWPE (running at 127.0.0.1, i.e. your computer) and a remote instance, or you can specify two remote instances.

If you want to connect to more than 2 systems, open the UIVIEW32.INI file and search for the [AGWPE] section. Under it, change the SYSTEM_COUNT= 2 parameter to the number of your choice (max. 16).

Roger Barker, the author of UI-View wrote:

"UI-View32 can simultaneously connect to more than one AGWPE system via TCP/IP. The default limits it to two systems (but that can be altered in UIVIEW32.INI). The ability to connect to multiple systems is entirely within UI-View32. It is not part of AGWPE, and you do not need to be running AGWPE locally in order to connect UI-View32 to one or more remote AGWPE systems.

The ports on the AGWPE systems will appear sequentially in UI-View32, so if

you connect to two systems, one with three ports and one with two, the ports in UI-View32 will number from one to five.

The ports behave exactly as if they are all on one AGWPE system. So, for instance, you can configure the UI-View32 digipeater to have ports on different AGWPE systems, which gives the possibility of having an APRS digi with ports in different parts of the world.

You lose no functionality by connecting to multiple systems, so whatever you can do with an AGWPE port on a single system, you can do exactly the same thing with a port when you are using multiple systems.

Two "gotchas" -----

1. When connecting to remote AGWPE systems, do not forget that AGWPE has "Winsock Interface Security".
2. UI-View32 uses AGWPE with KISS frames. It is a feature of AGWPE that the received KISS frames it sends to an application do **not include** frames transmitted by other applications using the **same** AGWPE system. So if you have this:

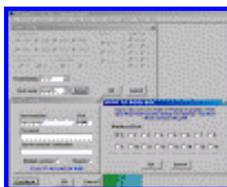
```
AppA -----|
              | AGWPE ----- radio(s) etc.
AppB -----|
```

Then, using KISS frames, AppA will not see frames transmitted by AppB. (Of course, with APRS, it will see them if they are digipeated by radio back to you by another station.)

If that is a problem, then an easy work-round is to configure a loop-back port in AGWPE, and transmit the beacons from your UI-View32 systems both on the RF port(s) and on the loop-back port."

2. Port Masks: Specifying which AGWPE radio ports to use to receive packets

By default, UI-View **receives*** packets from all AGWPE radio ports. To change that, go to the UI-View **Setup** menu and then **Comms Setup**. When you select a host mode of **AGWPE**, a **Setup** button will appear to the right of **AGWPE**. Press that button that to bring up the **AGWPE Setup** window. Then press the **Ports Mask** button to bring up the **AGWPE Port Mask Monitor** window. Check or uncheck ports to control which AGWPE ports UI-View will use to receive data.



<-- Click for larger image

* To control which AGWPE ports will **transmit** UI-View data, from the menu go to the **Setup: Stations Setup** window and the **Unproto port** field. For example to transmit only on the AGWPE port 1 radio (even if you have other ports/radios), enter **1** . To specify multiple ports, use a comma to list the ports, e.g. **1,2** Also, if you opt to use multiple port transmitting, also use the "beacon pause" feature

so your radios do not transmit at the same time: from the UI-View **Setup** menu select **Miscellaneous**.

Hint: you can use UI-View's digipeat function to relay HF packets onto the VHF frequency by configuring AGWPE for 2 sound card ports (one for VHF, one for HF) and making a **2 port - 2radio cable**. Then set up the digipeater function in UI-View to use the "Digi Routes" function: "1=2" , which means anything heard by UI-View on AGWPE port 1 would be digipeated on AGWPE port 2, and vice versa.

Note! To make sure VHF traffic is not routed to HF (HF can't handle the load!), either:

- configure the HF PTT port to an non-existent LPT or COM port (in AGWPE's **Properties for Portx** screen), so there is no PTT activation for the HF radio
- do not include a TX audio or PTT cable on the cable going to the HF radio; use only an RX audio cable.

UI-View 32 vs. UI-View 16

Other than for the fact that it is a true 32 bit app, the main advantages of UI-View 32 over UI-View 16 are:

1. The map refresh is faster than on the 16 bit version. On a K6-2/450, UI-View 32 will redraw at a rate of around 1,000 station icons a second.
2. UI-View 32 lets you connect to instances of AGWPE running on a different computer over the internet or a LAN.
3. With UI-View 32, you can opt to NOT connect to specific AGWPE radio ports. With UI-View 16 you have no option but to send and receive on all AGWPE radio ports.
4. UI-view 32 is an ActiveX server and provides a rich interface for external applications. Roger realized with his WinPack program that providing an open interface to encourage other software authors to write add-ons was a good idea in a ham radio application. UI-View32 takes the idea to a new level. If you have a look at these two sites, you can see some of the excellent add-ons that have been written for UI-View:

<http://welcome.to/uiview>

<http://www.qsl.net/g7jgq/uitool.htm>

An **unregistered** copy of UI-View 16 also has these further limitations:

- You cannot input an APRServe (APRS packets via internet) validation number. If you log on to APRServe, it will always send the default validation number of "-1". This doesn't stop you from using APRServe; it just means that no IGATEs will gate your traffic from the internet to radio.
- You cannot use UI-View as an IGATE.

The downside of UI-View32 compared to the 16 bit version is that:

- you have to register it, and
- it needs a more powerful PC; a P120 with 32Mb is probably the minimum.

If you upgrade to UI-View32: DON'T install UI-View32 on top of UI-View(16), or you'll finish up with a big mess. They are separate program and by default they install into separate directories. There is absolutely no problem with having them both installed on the same PC. You can put your registration in them both, and, if you use AGWPE, you can even run them both at the same time.

Of course, if you want to uninstall UI-View(16), you can, and it won't delete your maps, which you can move or copy into the UI-View32 program folder. (NOTE - make sure you uninstall, not manually delete.)

Problems:

- For UI-View 32 or the TCP/IP option in UI-View 16 to work with AGWPE:
 - You must be running AGWPE version 2000.15 or later
 - You must have the Windows [Winsock 2 update](#) if you are running Windows 95 or Win98 OEM (it is automatically installed in Win 98SE, Win2000 and WinXP).
 - AGWPE's Winsock TCP/IP interface must be enabled: On the AGWPE menu, click once on [Setup Interfaces](#). On the resulting [WinSock Interface](#) tab, make sure the [Enable Winsock TCP/IP Application Interface](#) box is check marked . Click in the box to check/uncheck it. Note the [TCP](#) port on that screen -- the default is [8000](#).
 - The TCP port specified in AGWPE (default is [8000](#)) must be specified in UI-View's [AGWPE Setup](#) window (see screenshot above.)
 - If you run a firewall program (such as Zone Alarm), then port 8000 must be open and accessible
 - If AGWPE is running on a different computer, you may need to enter a password to gain access to AGWPE, and [AGWPE must have your callsign and password entered in its WinSock Interface Security access list](#).
- **I have AGWPE running but when I try to start UI-View, I get this message: "An error occurred initializing AGWPE system 1. Address Family is not supported."**

The TCP/IP protocol is not installed on your computer. Create a Dialup Networking (DUN) Connection in Windows (use a dummy telephone number) and the TCP/IP protocol will be installed automatically.

- **I get the message "Connection is forcefully rejected".**

UI-View can't find AGWPE. One of the following things has happened:

1. AGWPE wasn't running when you started UI-View.
2. AGWPE doesn't have the Winsock interface enabled. From the AGWPE menu, select "[Setup Interfaces](#)" and on the default [WinSock Interface](#) tab, checkmark "[Enable Winsock TCP/IP Application Interface](#)".
3. UI-View's AGWPE Setup is incorrect. See the top of this page and make sure the port and IP address of the AGWPE computer are specified correctly.
4. You have a firewall that is blocking connections to the port and/or IP address of the AGWPE computer.

- **I'm running UI-View 16 and it works fine when I opt to use the DDE connection to AGWPE, but when I try the TCP/IP connection, I get the following error message: UI-View doesn't think your PC has TCP/IP installed. If it (TCP/IP) has (been installed), then**

please close down UI-View, rename the the WINSOCK.DLL in the UI-View directory to WINSOCK.NUL and restart UI-View.

As the message says, look for the WINSOCK.DLL file in your UI-View 16 folder and rename it (so UI-View can't find it).

- **I'm running UI-View 32 and I seem to be connected to AGWPE but I'm not getting any packet reports from AGWPE even though I have confirmed that AGWPE is receiving and decoding packets.**

Make sure the Port Mask settings are correct. You must checkmark each AGWPE radio port which UI-View will use to receive packets. By default, port 1 is checked, but you may have de-selected it. See [Port Masks](#) above.

- **UI-View decodes some APRS packets - - - and then it stops. If I reset the properties window in AGWPE or I restart UI-View, I see two station icons pop up - - - and then it stops again. Also, I notice the packet audio frequency spectrum shifts to the right third of the Sound Card Tuning Aid screen (!!!).**

If your computer only has one sound card, both AGWPE and UI-View are using it and the speech and sound options in UI-View are creating a conflict with AGWPE's use of the sound card. The solution is to disable all the sound/speech options in UI-View. You can do that in the final versions of UI-View by un-checking the **Sound Enabled** option on the UI-View **Options** menu. This lets you to turn off all UI-View sounds in one go. If you're using a version of UI-View without that option, then you should update to the final UI-View version!

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WinAPRS and AGWPE

Only WinAPRS versions 2.4.0 and above are able to use AGWPE.

New WinAPRS Users:

You can download the most recent version of the WinAPRS program (written by the Sproul Brothers, Mark, KB2ICI and Keith, W2UZ) at <http://aprs.rutgers.edu>

Installation and operating instructions are explained at the web site and come with the download. WinAPRS is shareware. You can run it without registering but with some limitations, most significantly the ability to save all your program settings (callsign, TNC, etc). Registration is \$60 and well worth it if you continue to use WinAPRS.

Experienced WinAPRS Users:

If you've been running WinAPRS (2.4.0 or higher) with a TNC and have WinAPRS set to automatically open the TNC port on startup, don't start AGWPE before starting WinAPRS.

WinAPRS will crash if it finds AGWPE using the COM port where WinAPRS expects to find a TNC attached! You can't correct this problem until AGWPE is shut down and WinAPRS is allowed to open normally.

When it does open, de-select any **Automatic Input** devices that are on the port which AGWPE will be using for PTT control:

- Using the WinAPRS menus, click on **Settings**, then **WinAPRS**.
- When the **WinAPRS Settings** window opens, under the far right **Automatic Input** section, uncheck any device that was using the port where you have now told AGWPE to find the PTT cable.

For example, if you had a VHF TNC on COM1 set for Automatic Input, but now have the AGWPE PTT cable on COM1, you need to **deselect** the **VHF TNC** (you can deselect a check-marked box by clicking on it). After it's deselected, click on the **OK** button to save the settings.

A. Configuring APRS for one AGWPE port / one Radio

- Start AGWPE.

- Start WinAPRS. First click on [Settings](#) in the menu bar, then on [Ports List](#).
- On the resulting [Ports Definition List](#) window, you should see a choice for [AGWPE on LOCAL](#). Click once to highlight that choice, then click on the [Open](#) button. If WinAPRS finds AGWPE, the [Status](#) field will indicate **ACTIVE** and the [Comment](#) field will show the AGWPE version, for example, **AGWPE V2001.38**



<-- Click for larger image

It's most important that you see the AGWPE version notice in the [Comment](#) field. If you don't, then WinAPRS wasn't able to connect with AGWPE, even if the [Status](#) field says 'ACTIVE'. This means that AGWPE isn't running or it isn't set right (for example, be sure the [WinSock Interface](#) option is checked on the AGWPE menu).

- If you have everything set right, then you should start to see packets at the bottom of the active WinAPRS window. If you don't see packets and your radio's "S" meter indicates it's receiving packets and the AGWPE modem icon's **green** pixel flashes , then something else is wrong and you'll need to go to [troubleshooting](#).
- **Note that, when using AGWPE, you can't change your packet PATH using the normal WinAPRS menus (Settings: TNC or Settings: Positions Report Rate).** Instead you must edit the [AGWPE_Local.Prt](#) file in your [WinAPRS\Ports](#) directory. The second to last line of this file will have a line that looks like this:

PATH WIDE,WIDE

You can change the PATH value to any path you'd like. Note that the space after PATH is **not created by the <space> key** but by the **<TAB>** key. Also note that any PATH changes will not become effective until you save to your .prt file and then restart WinAPRS.

- Problem with WinAPRS communicating with AGWPE? Make sure the [AGWPE_Local.prt](#) file is in your [WinAPRS\Ports](#) directory.
- You can also configure WinAPRS to connect to an instance of AGWPE running on a different computer on your home network or any where on the internet. [See the AGWPE Over a Network page.](#)

B. Configuring WinAPRS for two AGWPE ports / two Radios

WinAPRS is able to interface with two different AGWPE ports, and thus two different radios. For example, you could have one radio on the regular APRS frequency and another radio on the DX Packet Cluster frequency. (WinAPRS can then post both types of info, APRS packets and DX spots, to the WinAPRS maps!) Or you could have an HF radio to receive long distance APRS packets.

AGWPE has always been able to do this using TNCs, but now it can handle 2 ports/two radios using just the sound card; plus it can now handle 300 baud HF packet with the sound card.

Here's how to setup AGWPE and WinAPRS to use two sound card ports:

- First, you'll need to build [cables suitable for two ports/two radios](#)
- Next, [setup AGWPE for two ports/two radios](#)
- Now you need to create an additional [.prt file](#) in the [Ports](#) sub-directory of your [WinAPRS](#) directory. The new file will be very similar in content to the existing [AGWPE_Local.prt](#) file that is already in the [Ports](#) folder.

Make a copy of the current [AGWPE_Local.prt](#) file using a different name. Edit the file as below using a simple text editor such as Windows' [Notepad](#).

The new [.prt](#) file will be identical to the [AGWPE_Local.prt](#) file except for the following:

- [NAME line](#) - the descriptive name you pick; your choice
- [AGWTNC line](#) - AGWTNC # = [AGWPE port # minus 1](#), e.g. to use AGWPE Port 1, enter AGWTNC 0.

Also, please note that the "space" between the FIELD name (1st column) and the FIELD data (everything after the FIELD name) is created by the **TAB** key, not the space bars. For example, the second line in the file below would be typed:

[NAME](#)<TAB>[DXClusters](#)<space>[on](#)<space>[145.03](#)".

Here's what the second [.prt](#) file might look like:

```
// Created by WinAPRS on 2/2/2
NAME DXClusters on 145.03 <-- a new name for each port
TYPE TCP
PARSER AGWPE
HOST 127.0.0.1:8000
BAND VHF
PATH WIDE,WIDE <-- change UI path for this radio if you like
AGWTNC 1 <-- port # minus one; this is AGWPE port 2
```

Hint: You can also edit the NAME line of the original [AGWPE-Local.prt](#) file. You can change the name from "[AGWPE on Local](#)" to something like "[APRS on 144.39](#)" to help you better understand what each AGWPE port and radio is doing.

- Save the new [.prt](#) file.
- Re-start WinAPRS
- Click on [Settings](#)
- Click on [Ports List](#). You should now see an additional AGWPE port.
- Select and then **Open** the two (2) AGWPE ports one at a time:
 - >PORT #1 (AGWPE ON LOCAL)
 - >PORT #2 (DXClusters on 145.03)

WinAPRS should now be receiving packet data from both ports/radios/frequencies.

WinAPRS Hint: To better see DX cluster or HF packets, have WinAPRS display both a local map (state, region, US) and a world map :

- First, from the [Maps](#) menu, open both maps
- Then, click on the [Windows](#) menu option, then on [Tile](#).

Warning: There is a bug in WinAPRS related to transmitting and AGWPE ports. As of version 2.4.7, WinAPRS will transmit APRS beacons on both AGWPE ports/radios. Listeners on the Packet Cluster frequency might not appreciate this. If you intend to run WinAPRS on a DX Cluster frequencies, you might want to disable transmitting to the Packet Cluster frequency by unplugging the PTT cable to the DX Cluster radio.

C.Troubleshooting Problems

- **WinAPRS: I open AGWPE first, but then when I start WinAPRS, it causes a system crash.**

WinAPRS is probably configured to automatically open a TNC on startup. It crashes when it finds AGWPE using the COM port and not the TNC it expects to find! You can't correct this problem until you exit AGWPE and let WinAPRS open without AGWPE running. Then, in WinAPRS, deselect any **Automatic Input** devices that are on the port which AGWPE will be using for PTT control:

- Using the WinAPRS menus, click on **Settings**, then **WinAPRS**.
- When the **WinAPRS Settings** window opens, under the far right **Automatic Input** section, uncheck any device that was using the port where you have have the AGWPE's PTT cable attached. For example, if you once had a TNC on COM1, but now have the AGWPE PTT cable on COM1, you need to **deselect** the **VHF TNC** (you can deselect a check-marked box by clicking on it).
- After it's deselected, click on the **OK** button to save the settings.
- Then close WinAPRS, start AGWPE, and restart WinAPRS.

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WinPack and AGWPE

WinPack, written by Roger Barker, G4IDE/SK, is a great Windows-based packet terminal program. You can download it at <http://www.apritch.myby.co.uk/uiv32.htm> (or do a web search for other download sites).

Since Roger's death in September 2004, registration is now free, however, in lieu of the former registration fee of £10 (about \$15 US), you are asked to make a suitable donation to a cancer organization of your choice. Registration gives you the right to upgrade from UI-View 16 to UI-View32, the 32-bit version which has some **additional features**. To register, do not contact Roger's address as the program may suggest. Instead go here to find the name of someone who can issue you a registration number:

<http://www.apritch.myby.co.uk/uiv32.htm>

Simply state your request in an email that includes your first and last name on a separate line, plus your callsign on another line.

To configure WinPack to work with AGWPE:

- Start AGWPE before starting WinPack.
- On the WinPack menu, select **Options**; then **Comms Setup**.
- In the resulting **Comms Setup** window, there is a field for **Host Mode** in the lower right corner. Click on the options arrow and select **AGW** (see picture below). When done, click on the **OK** button.



If you will be using AGWPE as your only packet input source, then you don't need to worry about setting the normal TNC parameters such as baud rate, parity, etc. AGWPE handles all that! In fact, the TNC parameters on this screen will 'gray out' (become inaccessible) since there is no need for them when you use AGWPE host mode.

AGWPE should be running before you start WinPack in AGW mode or try to toggle to AGW host mode. If you start AGWPE after WinPack, WinPack won't recognize AGWPE -- unless you toggle WinPack's host mode to NONE and then back to AGW. (Or you can close WinPack, start AGWPE, and restart WinPack.)

For specific help about AGWPE, read the [Winpagw.txt](#) file located in the main WinPack directory. You'll also find more information in program [Help](#): select the [Help Contents](#) option from the [Help](#) menu and then, in the right index under [Fundamentals](#), click on the third item down, [Host Mode Support](#). On the resulting page, you should also look in the right index for additional topics about AGWPE and host modes in general.

Disable Sounds in WinPack

It's possible that the speech and sound options in WinPack could create a conflict with AGWPE's use of the sound card, so you should disable all the sound/speech options in WinPack (unless you're using two sound cards in the PC).

Using WinPack with Different AGWPE radio ports

When you issue the connect command, put the AGWPE port number between the connect command "C" and the target station's callsign, for example:

```
C 2 KC2RLM
```

If no port number is inserted, WinPack will connect to AGWPE port #1.

Known Problems & Limitations of WinPack

1. WinPack uses a Windows DDE protocol to link to AGWPE and not the TCP/IP protocol. As a result, you can not link WinPack to an instance of AGWPE running on a different computer.

(One workaround, albeit a bit expensive; purchase Packet Engine Pro (\$49 US) for both the WinPack computer and the distant computer. PE Pro's Radio Port Sharing feature will let the two instances exchange radio port data.)

2. WinPack is not able to send "unconnected"/<UI>/APRS-style packets.

3. If you execute the MHeard (MH) command in WinPack to request a list of stations heard, AGWPE will shut down if no stations have been heard. So enter the MH command only after AGWPE has successfully decoded a packet; or use the [AGWMonitor program](#) to check MHeard.

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AGWPE-compatible Programs

The chart below shows **some** of the programs and utilities that will work with AGWPE. In addition, the [AGWPE site](#) has information about a few other programs. Click on the "AGWPE configuration help" next to a program for additional help on this web site. Otherwise, visit the program's web site listed in the last column.

If you're having trouble getting a particular application to work with AGWPE, first make sure AGWPE works with the [AGW Terminal Program](#). If AGWTerm won't work with AGWPE, then you have a problem with AGWPE that needs to be resolved before it will work with the other program; see the [troubleshooting guide](#).

AGWPE-compatible Packet Program Categories:

- [AGWPE Interfaces](#)
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- [Digipeater](#)
- [DX Cluster](#)
- [Messaging](#)
- [Nodes \(BPQ32, Xnet\)](#)
- [Satellite](#)
- [Signal Path Predictions \(Radio Mobile Deluxe\)](#)
- [Terminal Programs](#)
- [TNC Emulation \(MixW\)](#)
- [Winlink Utilities](#)

Type	Name	Help configuring with AGWPE
AGWPE Interfaces	AXIP	link AGW Packet Engines and other applications together via TCP/IP see http://www.qsl.net/lu7did/ and http://www.qsl.net/lu7did/bin/axipdrv/axipdrv.txt See this page for Keith G1GXB's description of how to use AXIP to link to X-router
	KISS-Mode TNC Emulator	interface WiSP, JNOS or other KISS-mode programs and MixW to AGWPE see http://www.pearsoncomputing.net
	TelMgr	access AGWPE via a Telnet connection see http://www.qsl.net/lu7did/telmgr.htm
	XGluce	interface AGWPE to PC/Flexnet32 and thus to programs that work with Flexnet see http://www.qsl.net/lu7did/xglue.htm
APRS	AGWTracker	see Info: http://www.agwtracker.com/
	APRSPoint	see http://www.aprspoint.com
	APRSPlus	AGWPE configuration help

	OziAPRS; netAPRS	see http://www.radio-active.net.au/web/gpsaprs/oziaprs.html
	UI-View32	AGWPE configuration help
	WinAPRS	AGWPE configuration help
	XASTIR	AGWPE configuration help
BBS / PMS	AIZBBS 7.10	see http://www.spiros.gr/download.htm
	HamServ 2.65 a multi mode BBS/PMS	see http://www.gb7abc.net/hamserv.html
	FBB (Windows version)	AGWPE configuration help
Digipeater	AGWUIDigi	download from the AGW Programs page on this site.
	Digi_NED	see: http://www.qsl.net/digi_ned/
	Digiplex	see http://www.qsl.net/lu7did/digiplex.htm
DX Cluster	AGWCluster	see Info at http://www.sv2agw.com/ham/dxcluster.htm Download: http://www.sv2agw.com/downloads/default.htm
	RXClus	see http://www.hb9bza.net/rxclus/index.html
	IZ4AFW AGW Packet Engine Telnet Interface - DX Cluster support for Logger program	see http://www.qsl.net/iz4afw/english/sub-index.html
	UI-DX Bridge - Receive or relay internet DXCluster info on APRS	see http://www.apritch.myby.co.uk/uidx.htm
Messaging	UI-Instant Messenger	http://www.apritch.myby.co.uk/addon_agw.htm#uim

Nodes	BPQ32 - AX.25 NETROM-compatible node software for Windows	BPQ32 implements an interface to AGWPE via the BQPtoAGW.dll file included with the latest BPQ32 download. <u>Download 27 July 2008 Software Release</u> Installation info: <u>http://dxspots.com/BPQ32/410e_2008Jul27/BPQ32_Installation.htm</u> See: <u>http://groups.yahoo.com/group/BPQ32/</u> for possibly newer versions
	(X)Net	see <u>http://www.swiss-artg.ch/xnet/</u>
Satellite	PCSAT Telemetry Decoder	see <u>http://www.ui-view.com/</u>
	UISS - sends UI / APRS packets to satellite digipeaters	see <u>http://users.belgacom.net/hamradio/uiss.htm</u>
Signal Path Predictions (VHF/UHF)	Radio Mobile Deluxe - plots APRS stations on topographical map	<u>AGWPE configuration help</u>
Terminal Programs	AGWMonitor (Receive only)	<u>AGWPE configuration help</u>
	AGWTerm (Receive & transmit)	<u>AGWPE configuration help</u>
	HamScope	<u>AGWPE configuration help</u>
	NBF	see <u>http://www.hut.fi/~jtuomi/nbf_index.html</u>
	TSTH	<u>AGWPE configuration help</u>
	WinPack	<u>AGWPE configuration help</u>
	WinSTOP	see <u>http://www.winstop.de/en/winstopinfo.html</u>
	WinTNC	see <u>http://www.g7jjf.com/</u>

TNC Emulation	MixW - also has a sound card modem that AGWPE can access; good HF packet modem	<u>AGWPE configuration help</u>
Winlink Utilities	Paclink MP-	Utility to send e-mails to RMS stations using packet and AGWPE. The original version of Paclink (and Paclink Post Office) is no longer available. Paclink MP is currently in beta release and can be obtained by joining the Paclink MP e-mail group at http://groups.yahoo.com/group/PaclinkMP . The current version of the program (with documentation) is in the files section of the Group. Requires Microsoft .NET Framework 2.0
	Airmail to AGWPE Linker	<u>AGWPE with Airmail</u>
	RMS (Radio Mail Server) Packet	see http://www.winlink.org/software - for gateway stations that have an internet connection; you will need to apply for a key code. Gateways accept packet connections from Paclink MP or Airmail clients.

Last Updated: 08/11/2008

Watch Dog Timer Circuit

Date: Sun, 17 Nov 2002 21:36:14 +0000
From: Roger Barker G4IDE (now SK)
Subject: Re: UI-View and AGWPE

Someone asked

>I certainly would not leave a packet system unattended if it used a PTT
>arrangement that did not include a hardware watchdog timer - it's asking
>for trouble.

>

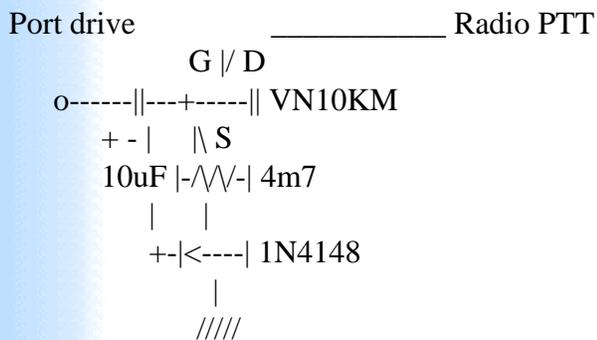
>Anyone got a circuit for a watchdog timer which I can build to use with my
>soundcard, please?

G8AMG,- one of the great UK packet "gurus", once sent the circuit below in
a packet bulletin.

Disclaimer - I have never tried it.

***** Paraphrasing G8AMG *****

Might I suggest that this device be a MOSFET, such as a VN10KM. These can be
driven by a capacitor and, using a high gate resistor to ground, will prevent
the MOSFET from staying switched on and screwing the channel AND your radio.



When the Port drive line (TTL) goes high, the uncharged capacitor presents 5V to
the MOSFET, which turns ON. However as the capacitor charges via the
4m7 resistor, the voltage on the gate reduces until the MOSFET turns off.
This is not a fast change, so the PTT circuit needs to be capable of
working with this slow switch-off. A logic gate (most radios today) or a
relay (older radios) both work.

The timing of the above is between 30 & 40 seconds, quite long enough for
ANY packet (even IP). I use 2m2 and 4.7uF on a 9600 packet link. This is
probably good enough for 1200, too.

Regular operation is allowed for by the diode which allows the capacitor to
discharge quickly once the port drive is removed. This does however mean
that the port drive needs to be TTL- compatible, in order to present a l

ow resistance ZERO state to ground. If you are concerned about damage to the port drive line, then include a 220 Ohm resistor in series with the port line.

Ideas gleaned from the 9600 tips &tricks list published by me in 1994.



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AGWPE and Sound Cards

AGWPE will work with most 16-bit and 32-bit sound "cards" and mother board-integrated sound chips, but not all. You are likely to have less problems with a newer PCI-bus sound card or a more advanced sound card.

Want to know more about the basics of sound cards?

Try these sites:

<http://computer.howstuffworks.com/sound-card.htm>

http://en.wikipedia.org/wiki/Sound_card

http://www.epanorama.net/links/pc_sound.html

This site does **not** maintain a list of sound cards that "will not work with AGWPE", mostly because it would be hard to say definitely that the card was the problem, as opposed to the card's driver, or interface, or signal, or interference, or operator problem. Reports of "receive" problems with some versions of on-board/integrated sound "cards" are, however, common. Generally speaking, laptops do not have high quality sound "cards". Many have poor SNR (signal-to-noise ratio) due to large amounts of background noise picked up from the hard drive, various buses, etc., and this makes reception and decoding of packet signal difficult. Transmitting is less of a problem.

George SV2AGW the program author has reported that some cards, such as the first versions of the SoundBlaster PCI128, have trouble with stereo channels, so you can only use them in AGWPE's **Single Port** sound card mode. He also found that the SoundBlaster SB16 inverts the channels during transmission -- if you send something to the left channel it will end up on the right channel.

Some older ISA cards are not **Full duplex**-capable and are

troublesome. **Full Duplex** means a card can playback while recording. Imagine this situation: AGWPE wants to transmit, so it uses the sound card to listen to the frequency, hears that it is clear and, using the slottime/persist algorithm, picks a time to start the transmission. In full duplex mode, the transmission would start immediately. But if the card is not full duplex-capable, AGWPE has to tell the soundcard to stop recording (listening) and then wait for the soundcard to playback. This is important for packet, since relatively quick RX-to-TX switching times are critical. Cards that are not Full Duplex-capable will usually have problems maintaining a connection with another station and may just stop working with AGWPE after a few hours. For more information about FULL DUPLEX testing, [visit the Problems with Packet Connections page](#)

Some users have reported their cards that will work with other sound card programs, such as MixW or Digipan, but not with AGWPE. George SV2AGW, the program author, says that one explanation may be that AGWPE uses the sound card in STEREO mode and at 22050 or 44100Khz sampling rates. Other programs use it only in MONO mode at a lower 11025 kHz sampling rate. The higher demands of AGWPE and packet may be too much for some cards/drivers/CPUs.

So, it's not uncommon to have a sound card problem, but most sound cards should be compatible with AGWPE.

Problems?

If you experience problems that may be related to your sound card, here are some suggestions:

1. Temporarily plug in your speakers to the LINE IN jack, so you hear your packets. If your computer/or driver is not fast enough, you will here interruptions or stuttering on the packet stream. In that case use only the left sound card channel in AGWPE. Also, set your VGA card accelerator a click below full level and adjust your soundcard sampling rate and quality until you find an optimum setting.

2. Make sure you have the most recent drivers of the card for your version of Windows. Those drivers should be on the card manufacturer's web site (as opposed to the computer manufacturer's site) or, for on-board sound "cards", contact the mother board manufacturer.

3. George SV2AGW also say that: "Another thing that you must have in mind is IRQ sharing. When your computer starts watch what IRQ assigns to Soundcard and if this IRQ is used by another device. If this is the case, adjust the IRQ from the BIOS and/or change the slot where your soundcard is located.

4. Other possible fixes reported by users are:

- upgrade to a newer version of Windows
- for Win98SE and later try the VXD drivers for Win95/98OEM instead of the WDM drivers [see 1 below](#)
- Remove conflicting devices or drivers that access the sound card or its IRQ setting, e.g. the Philips WebCam audio driver was reported to be a problem. Use the BIOS or Windows to change the IRQ settings or ...
- plug the card into a different slot on the computer [see 2 below](#)
- contact the sound card manufacturer directly and ask for a "raw" driver that might fix the problem. You can determine what soundcard chipset is being used in on-board, built-in sound "cards" with the Windows Control Panel Device Manager. You can then possibly go to the motherboard maker's website -- not the computer maker's -- and download a driver for that particular chip and your version of Windows. [see 3 below](#)

5. If the card still will not work, consider installing a second sound card. For desktops, you can purchase an inexpensive but compatible sound card for about \$30 US. Or look for "used" cards at hamfests, computer stores, and in discarded computers. There are also now USB sound cards, which may be an attractive option for a notebook computer. Note that Windows and AGWPE will support multiple sound cards, so you can continue using the original card for playing CDs, Windows' sounds, etc., while the second card can be used exclusively for AGWPE.

6. You can try using [MixW's TNC emulation mode](#) if your sound card will not work with AGWPE. If MixW works with the sound card, install the MixW virtual serial port emulation drivers mentioned on the [MixW's TNC emulation mode](#) page. Your application programs or AGWPE can then hook to one of the virtual serial ports and thus to MixW and its packet modems. So you could use MixW as the sound card modem and then use AGWPE's hosting services to share the MixW modem with multiple programs while it also manages any other "real" TNCs.

Remember, if your sound card won't work with AGWPE, it may not be AGWPE's fault. AGWPE uses Windows to do the actual hardware reading and writing in conjunction with the sound card's Windows device driver. In fact, it is the driver that has the hardware specific code in it, not Windows or AGWPE. With a well-written driver linking the sound card to Windows, a Windows program like AGWPE can operate under different versions of Windows and work with a wide range of sound cards without any sound card-specific program code.

Since AGWPE doesn't link to the card directly, there is no way to add a "fix" in AGWPE for your card. AGWPE expects a sound card to have basic features and behaviors. Most cards do. Those that don't are the problem. This is a bit of an oversimplification, but I hope you get the picture. (For more information from AGWPE's author, see this page: <http://www.sv2agw.com/ham/sc.htm>)

Some programs to test your sound card are:

- Right Mark Audio Analyzer http://audio.rightmark.org/index_new.shtml
- Sound Check <http://www.passmark.com/products/soundcheck.htm>

[I have not worked with these programs, so I can't advise you about how to perform card tests or what to test for. [Email me](#) if you come up with some simple instructions for using either program.]

Footnotes:

¹ Chris has advice for installing VXD drivers instead of WDM drivers in Win98SE/WinME:

"I will not take credit for this. These fixes came from this group, the net and from a little experimenting.

It seems that many of us are using sound cards with Windows operating systems of 98SE and beyond. I see that WIN95 and the WIN98 doesn't have as much problems as the others systems. I'm not sure about XP, but I do work with the other operating systems.

I tried this on 3 computers and ran 98SE, ME, 2000 on these computers to check the drivers. If you have Win98SE, ME or 2000 and are having receiving problems.... check and see what drivers you are running for the sound card. You may need to run the VXD drivers, and not the WDM type (used by 98SE and above). Here are the steps to find out what driver you have:

1: On the desktop, right-click the "My Computer" and select "properties"

2: Click on the "Device Manager" tab.

3: Scroll down until you see "Audio (or Sound), video and game controllers" and click the "+" sign to expand it if it isn't expanded already.

4: Look to see if the audio driver (usually the first one) states WDM in its name or any of its associated files.

- (a) If your files don't say anything, then click the the audio driver and select the "Properties" button.
- (b) On the new pop-up window select the tab "Drivers"
- (c) If this doesn't say WDM on anything (which is rare), then click the button "Driver File Details...".
- (d) If you have any drivers in the WINDOWS\SYSTEM32\DRIVERS directory, then assume they are WDM.

If you do have WDM drivers, you might try downloading and using the WIN95 drivers. These drivers are VXD type. You may have noticed that some of your drivers may say VXD, but that may not be the case as I found out.

You may be able to remove your existing drivers with an un-install program or my manually removing them. I recommend removing these files with the supplied un-install program if possible. Even with the uninstall program, you may have to remove the INF file in the WINDOWS\INF directory. You will need to know the INF file name.

Download the drivers for Windows 95 for your specific sound card. The reason I mention downloading is that most supplied sound card drivers on the disk/CD that came with the card are already out of date. Better to get the latest version. Remember WHERE you stored the driver. I recommend making a directory in your root drive called AUDIO and storing your driver file there on download. Then make sure you unzip, expand or whatever is required to that directory as well.

After you do this, it is recommended that you reboot the computer.

Once you do this, windows will boot up and state that it has found some new hardware or sound card. Tell windows WHERE you placed your driver, rather than having it search for the driver. If you let it search, it will load the WDM drivers and you will have to start all over again.

Hope this helps... Chris N0TTW"

² Ramon reported "My video card is an AGP card located in the AGP slot. Now it seems, that often (because of the lack of interrupt), the AGP card shares resources with PCI Slot 1, which is the PCI slot next to the AGP slot in many systems. I read somewhere, that the first thing to try is moving any card from PCI slot 1.

So I moved my second audio card (for PSK31) from slot 1 to slot 6. I booted the computer, and it looks already a lot more stable after about 18 hours uptime. Note, that this was pure "trial and error", and that I didn't confirm that the IRQ overlap was a problem. If you have a rewriting problem, you could try this and see if it helps."

3 The Via website says: install onboard sound drivers provided by (your) motherboard manufacturer in preference to these (generic) audio drivers. This is because of the ID process in the Microsoft certification guidelines. Microsoft require a four part ID for PnP device drivers. If VIA has not received the appropriate ID from motherboard manufacturers, then the drivers from this package will use the generic ID instead. In some instances users may receive an error message or may even not be able to install the drivers. If this occurs, please contact your motherboard manufacturer for updated AC97 drivers.

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AGWPE vs PE Professional (PE Pro)

Note: any client packet program that works with AGWPE will also work with PE Pro, and vice versa.

Feature	AGWPE	PE Pro
Cost	Free	us \$49 after 30 day trial period
Runs under Windows 98/ME/2000/XP/Vista	√	√
Works with most TNCs and radio modems	√	√
Allows a packet program to connect to multiple TNCs	√	√
Allows a TNC to connect to multiple packet programs	√	√
Automatic adjustment of TNC settings such as MaxFrame, Retries, SlotTime/Persist.	√	√
Manual control of TNC settings such as MaxFrame, Retries, SlotTime/Persist.	√	√
Can automatically start client packet programs	√	√
Client programs can connect over LAN or internet	√	√
More efficient CPU usage	no	√
Embedded monitoring of received packets	no (must use AGWMonitor)	√
TNC/sound card configuration wizard	no	√
Share your packet station with others (Radio Port Sharing)	no	√
Improved visual interface and navigation	no	√
Optional Windows XP/Vista visual theme	no	√

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More comprehensive 'Help' files	no	√
Program may be updated from time to time	not likely	√
Automatic update feature	no	√
TCP/IP over radio feature (for sending and receiving email by packet)	\$28 option	included
Support for other older devices: * Baycom serial port dummy modem * Picpar & BP96 9600b parallel port modem * OE5DXL 9600b serial port modem * DRSI ISA cards: all models * USCC ISA cards: all models * PetScc ISA card * OSCC ISA card	Win 98 or Win ME only (no XP or Vista)	Win 98 or Win ME
BayCom/BayPac modems in Windows XP/Vista, but only if computer has legacy serial ports, i.e. non-ACPI compliant serial ports	no	√
YAM modems in Windows XP/Vista	no	√
Sound Card Packet Features:		
Sound card can be used to emulate one or two TNCs/modems	√	√
Works with most recent-vintage sound cards or integrated sound chips	√	√
Works with USB sound cards including Signalink© USB	√	√
"On Air" baud rates of 300 (FSK), 1200 and 2400 (AFSK), and 9600 (FSK)	√	√
Works with supplemental sound cards, i.e. cards other than the default computer card/chip	√	√
300 baud: KAM-style (1600/1800) pair tones	√	√
300 baud: PK-232 (2110/2310) pair tones	no	√
Improved digital signal processing algorithm	no	√
Sound card PTT (transmit) control by serial port (COM)	√	√

Sound card PTT (transmit) control by printer port (LPT) in Windows 98/ME	√	√
Sound card PTT (transmit) control by printer port (LPT) in Windows XP/Vista	no	√
sound card timing 'Equalization' adjustment for better sound card performance	no	√

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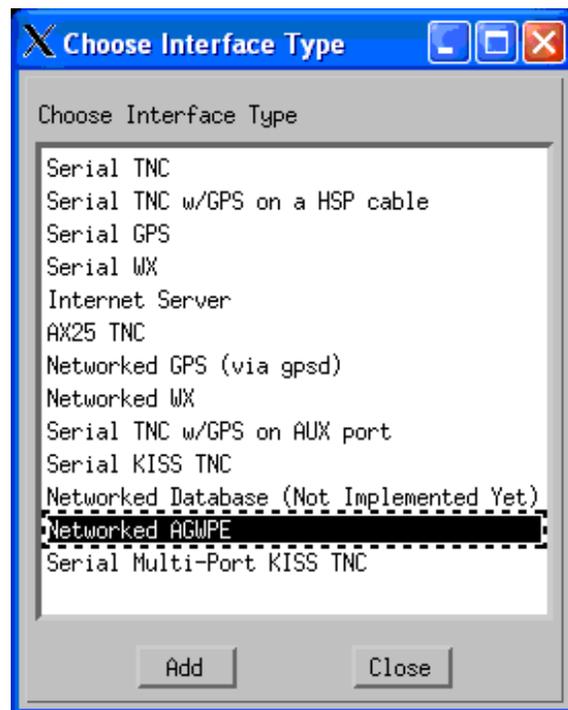
XASTIR and AGWPE

(X Amateur Station Tracking and Information Reporting)

XASTIR is program for receiving and plotting APRS position packets. XASTIR runs on Windows, MacOSX, Linux, FreeBSD, Solaris, and Lindows. It supports 124 map formats, several types of TNC's and weather stations, Festival speech synthesizer, AX.25 networking (Soundmodem/Baycom/SCC!) and seven languages! On Unix-like operating systems, you can run your weather station or GPS on a separate computer as well, which is good for those hams who are already short on serial ports. XASTIR is FREE and available at <http://www.xastir.org>

Wes Johnston KD4RDB kindly provided these instructions for configuring XASTIR to run with AGWPE:

1. Click on **INTERFACE -> PROPERTIES** to bring up the Installed Interfaces screen. At the bottom of that screen press **Add** to bring up the **Choose Interface Type** screen:



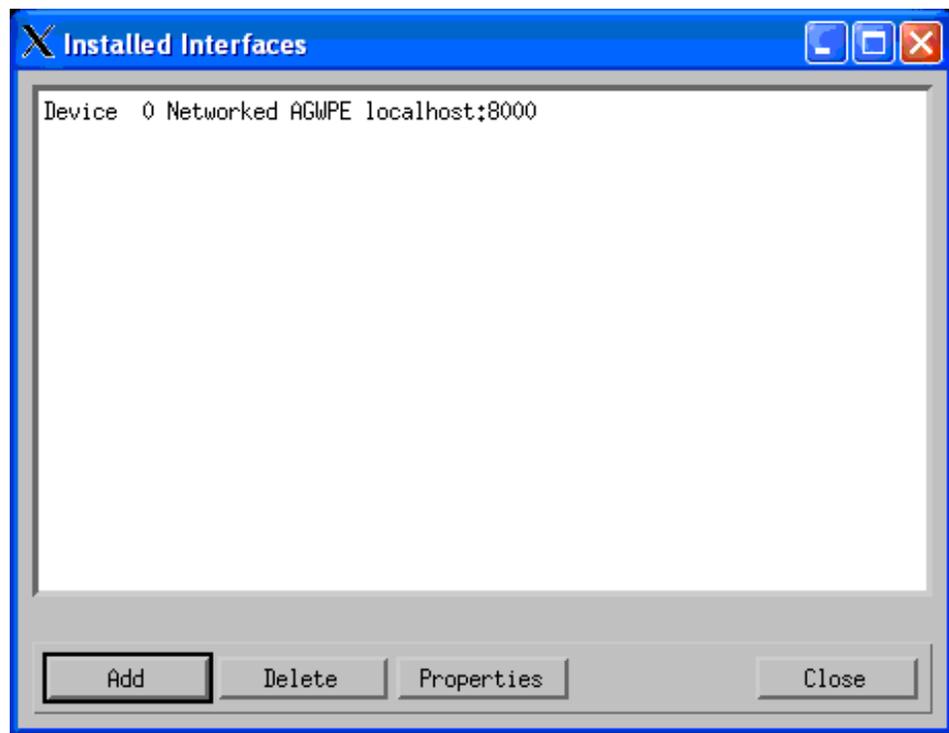
Select **Networked AGWPE** and press **Add**

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Enter the AGWPE Host information:

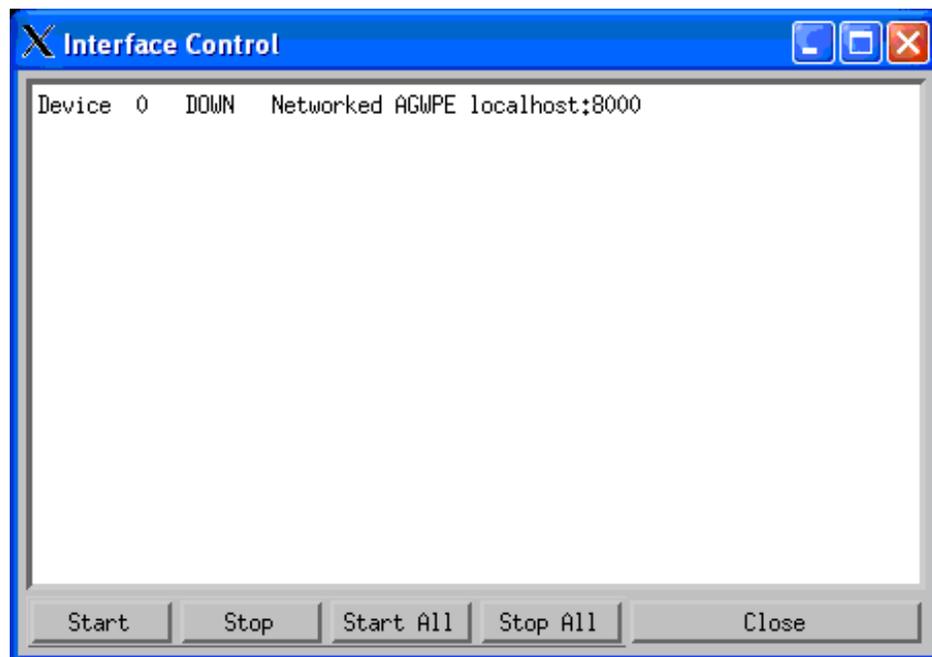
- **Host:** enter the IP address of the AGWPE computer. Use **LOCALHOST** or **127.0.0.1** if AGWPE is running on the same computer as XASTIR; otherwise enter the LAN or web IP address of a remote computer.
- **Port:** by default, AGWPE uses port number 8000. Use this unless you have changed the port number in the AGWPE setup ([see AGWPE over a network](#))
- **Pass-code:** optional; only needed if AGWPE was configured to require a user name and password to access port 8000 ([see AGWPE over a network](#))
- **Path:** Enter at least one APRS path (the example above uses a path with one WIDE)

Press **OK** and you should see the newly created interface as below.



Press **Close**

To activate the new interface, in the XASTIR main view, click on **INTERFACE -> START/STOP**



Select the **Networked AGWPE** interface and press **START**.



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HamScope and AGWPE

HamScope is a digital communications interface that supports many modes including PSK31, RTTY, MFSK16 and packet (both HF and VHF). To run packet, HamScope 'connects' to an AGWPE 'port'. AGWPE does all the communication with the sound card or TNC for HamScope. HamScope is simply the terminal program that lets you "see" what is being received and transmitted.

HamScope is different from most client applications in that it requires that the AGWPE files be located within the HamScope folder. They can't be in an AGWPE folder within the HamScope folder, and they can't be in a folder outside of the HamScope folder. The key AGWPE files -- [AGW Packet Engine.exe](#), [agwpe.sys](#), [agwpe.ini](#), [agwtcpip.sys](#), and all [port*.ini](#) files -- must reside with the other HamScope files in the HamScope folder. If you prefer, you could install AGWPE both in the HamScope folder (to work with HamScope) and in a second, separate folder (to work with other client programs.)

To make it work:

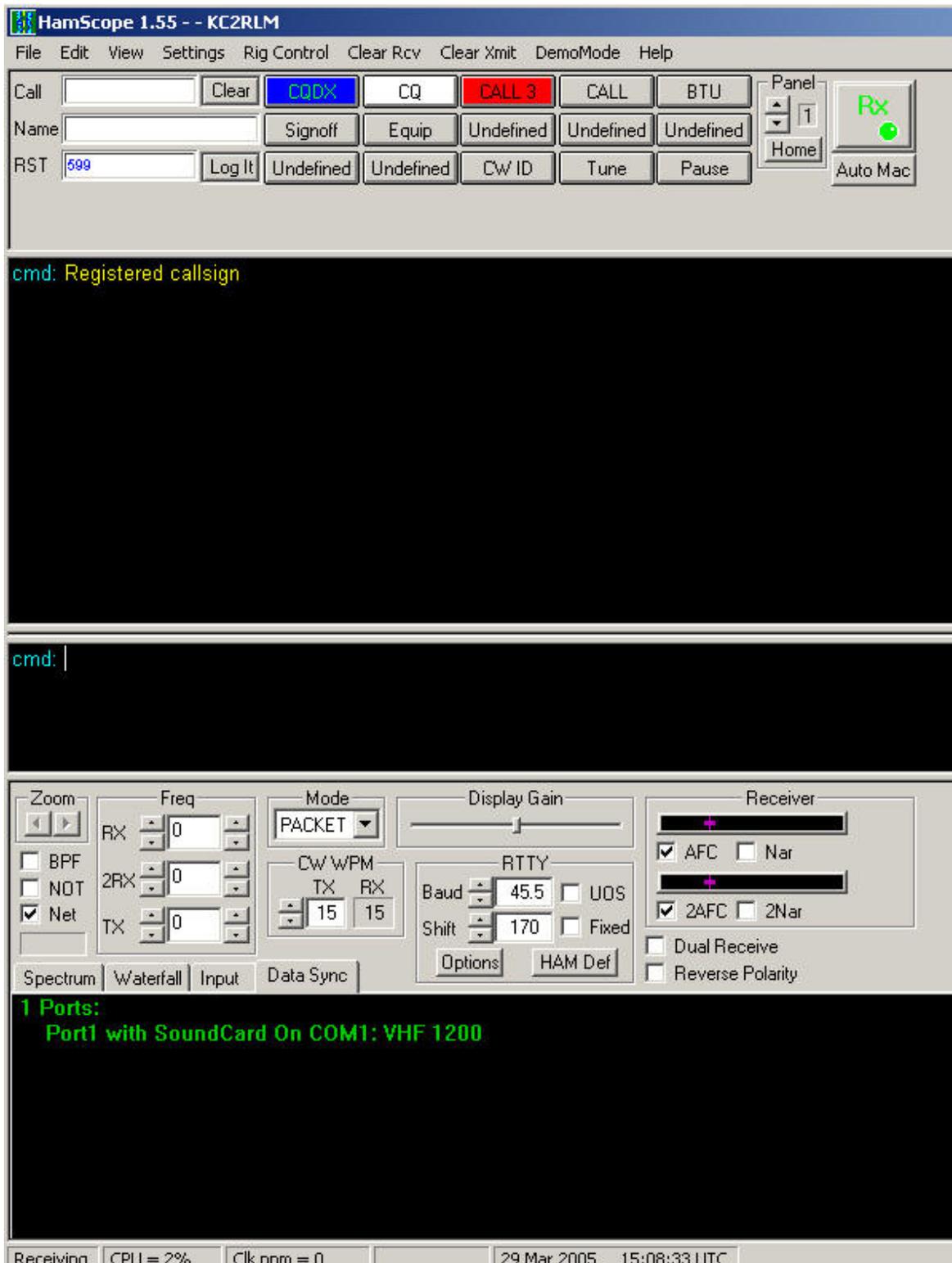
1. Download and install HamScope: <http://www.qsl.net/HamScope/>
2. Install the AGWPE files **in the HamScope directory**. Configure AGWPE and then test that it works with another program, such as AGWTerm.
3. In HamScope, from the **Setup** menu, select **General Setup** to bring up the **General Setup** screen. In the far right column enter the following:
 - For **AGWPE Address**, enter the IP address of the computer where AGWPE is running. The default is **127.0.0.1**, the IP address for the computer where HamScope is running. If AGWPE is running on a different computer, enter that computer's IP network address.
 - For **AGWPE Port**, select the AGWPE port that is controlling the sound card, but note that you would select **0** for the port AGWPE calls 1; or **1** for the port AGWPE calls 2.
 - Click on the **OK** button.

You do **not** need to change any other values on this screen, such as PTT Control Setup or Sound Card selection. Those values are only used for other modes, such as PSK31. Since AGWPE controls those values for packet, changing them in HamScope will have no effect.

4. Back on the main HamScope screen, on the bottom half of the screen there is a **Mode** field. Use the drop down list to select **Packet**. HamScope should then start AGWPE.

5. If HamScope successfully hooks to AGWPE:

- in HamScope's top receive window, the words '**Registered callsign**' will appear next to the **CMD:** prompt
- and at the bottom of the screen, in the Data Synch tab, you'll see information about the AGWPE port (the port description you entered in AGWPE).



To see the commands to which AGWPE responds: at the "cmd: " prompt in HamScope , type in [help](#) and press enter.

Note: HamScope **version 1.55** (28 March 2005) fixed a problem with AGWPE on faster computers. In earlier versions, HamScope would tell AGWPE to load, but then HamScope couldn't detect that AGWPE was functioning.

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Radio Mobile Deluxe and AGWPE

Radio Mobile Deluxe (RMD) is a program that predicts radio propagation and signal path quality over specific terrain using digital elevation maps. It is quite an amazing and powerful program.

One of its features allows you to capture and plot APRS packets on the elevation maps using AGWPE. You can then "see" how well APRS digipeaters, home stations, and mobile stations will "hear" other's packets.

You can download the RMD files at:

Français: <http://www.cplus.org/rmw/index.html>
English: <http://www.cplus.org/rmw/english1.html>

Note that RMD is difficult to setup and learn, and downloading digital elevation map data can be time consuming if you only have a dial-up internet connection. General instructions for program use are beyond the scope of this web page, but the specific setup for AGWPE is as follows:

1. Install and configure AGWPE and first test that AGWPE is working with **AGWTerm**.
2. Install and configure RMD. Create an RMD map for the APRS coverage area you wish to examine (see RMD's Help file).
3. From the RMD menu, select **Options**, then **APRS Options**. In the resulting **APRS Setup** window, do the following:
 - Enter a check mark for **Enable APRS**.
 - For **AGWpacket Host** enter the IP address of the computer where AGWPE is running. The default is **127.0.0.1**, a special IP address that means 'this computer', in other words the same computer where RMD is running. If AGWPE is running on a different computer, enter the AGWPE computer's IP network address.
 - For **Port**, use **8000**, the default IP port that AGWPE uses. (It would only be different if you changed the port number in

AGWPE's TCP/IP interface settings.)

- Press the [Apply](#) button and close the window.

APRS station callsigns should begin to appear on the RMD map and then disappear when a new station is heard. After the positions of relaying digipeaters are also received, RMD will then display the station originating the packet, the digipeater(s) it was heard through, and signal path lines connecting all of them.

To "permanently" display an APRS station position, use the lower half of the [APRS Options](#) window to make an APRS station in the left column become an RMD network "unit": check mark an available unit name/number in the right column, then highlight the APRS unit in the left column and press the arrow key between the two columns.

You can also add the APRS stations into a RMD "network" if you want to further examine APRS coverage and the APRS digipeater network, but explaining how to do that is beyond the scope of this page. You'll have to work with and learn RMD.

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A Cable Construction Trick

I have several TNCs and several radios, and sometimes "mix-and-match" them. The problem is that I didn't want to make a unique cable for each radio/TNC combination. Instead I made just **one cable for each radio** which terminates in a **male** DB9 connector. And I made just **one cable for each TNC** which terminates in a **female** DB9.



Then, depending on which radio and TNC combination I want to use, I plug the DB9 connectors together.

The key is to establish a common wiring plan for the DB9 connectors, something like:

<u>Radios</u>	<u>TNC or Sound Card</u>
TX audio pin--> male DB9 pin 1	1 pin DB9 female <--- TX audio
PTT pin-----> male DB9 pin 2	pin
RX audio pin--> male DB9 pin 3	2 pin DB9 female <--- PTT pin
Ground pin----> male DB9 pin 5	3 pin DB9 female <--- RX audio
	pin
	5 pin DB9 female <--- Ground
	pin

For my **packet sound card cables**, I just adopted the TNC (DB9 female) scheme. I can now plug my sound card cables into *any* of my radio cables and run sound card packet on my mobile, base VHF, base HF or portable rigs! I don't need to build a separate sound card interface for each radio...just a separate radio connector.

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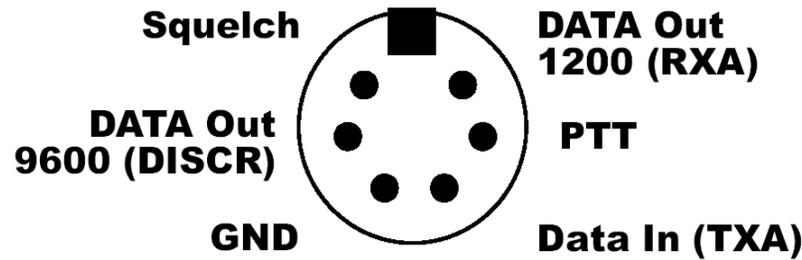
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The 6-pin Mini-DIN Data Connector

This is adapted from postings that [Stephen H. Smith WA8LMF](#) has made on various groups and mailing lists.

The 6-Pin Mini-DIN "DATA" or "PACKET" connector is an industry standard adopted by all the Japanese ham radio manufacturers. It is now superseding the various proprietary 7, 8 and 13-pin full-sized DIN connectors used by various manufacturers.



This diagram from Stephen's site at website at: <http://wa8lmf.net/miscinfo>

This connector is the perfect point to connect packet TNCs, soundcard interfaces, phone patches, IRLP/EchoLink controllers, APRS trackers, paging encoders, or any other device that needs access to the transmit and receive audio of a radio.

Note that this connector type is the same one used on PS/2 keyboard and mouse cables. A PS/2 keyboard extension cable or a KVM (Keyboard Video Mouse)-to-computer cable (has males plugs on both ends) is an excellent source of a plug-and-cable assembly that will mate with the jack on the radio, at a fraction of the cost of the optional manufacturer's cable assembly!

You might also have luck with a dead mouse or keyboard, but most mice do not have all pins wired through, since pins 2 and 6 are not required for mouse operation. And most keyboard cords only use 5 wires and a shell ground. The omitted wire on some is the 9600 disc out. (This means that many keyboard cables can be used for 1200 operation, but only a few "special" ones can be used for 9600 operation).

Note that you can buy the plug as a stand-alone product to make your own line, but the plug housing may not fit into the radio's jack nicely (the housing is too large).

Note that despite the misleading labels referring to **data** input and output, the jack only carries **audio**, not data. There is no actual RXD or TXD DATA in the sense of RS-232 or TTL-level streams of 1s and 0s anywhere on this connector.

On most radios with this a data jack, grounding the DIN-6 PTT line mutes the front panel MIC input to prevent extraneous shack noises from getting mixed with whatever you feed into the transmit audio input.

More About the Pins On This Connector

DATA OUT - there are **two** received data out pins which are really carrying RX audio. Both usually output audio at a level similar to what comes out of a speaker but at a fixed level unaffected by the volume control dial, e.g. 500 mV but check your User Manual:

- **1200:** this pin has de-emphasized¹ and squelched audio. This audio pin is sometimes labeled "RX Data 1200 Baud", RXA, RXD, or PR1. This is the audio most suitable for 1200 baud packet. (Side note: On multi-mode radios such as the Yaesu FT-817, Yaesu FT-100, and Icom 706, only the "1200 baud" output will be live on AM, SSB or CW, since the 9600 baud output is associated only with the discriminator of FM receivers.)
- **9600:** this pin has non-deemphasized¹, direct discriminator output most suitable for 9600 baud packet. This audio pin is sometimes labeled "RX Data 9600 Baud", DISCR, or PR9. For most radios, the discriminator output is always live regardless of squelch setting or PL mode.

The discriminator output is also perfectly usable for 1200 baud RX packet audio, although you may have to play around with a de-emphasis¹ network consisting of a capacitor and resistor to get the best results with TNCs that have been optimized for receiving de-emphasized audio. And of course the TNC must be capable of operating open squelch; i.e. have its own true DCD (Data Carrier Detection) to sense when the frequency is carrying data signals and it should not transmit.

¹ **Emphasis and de-emphasis:** To help overcome an inherent audio "hiss" on FM signals, all FM transceivers will emphasize, or increase in amplitude, the higher audio frequencies during transmit. On receive, they de-emphasize, or decrease in amplitude, the higher audio frequencies. This emphasis and corresponding de-emphasis produces normal sounding speech, but with less "hiss".

The key of course is that the sending radio must emphasize the high tones and the receiving radio must de-emphasize them. If one of the radios is not "doing its part", then the "high" packet tone (2200 Hz) will be at a different amplitude than the "low" packet tone (1200 Hz), and the receiving TNC or sound card may have trouble decoding the packet. This is the reason why the direct discriminator audio may need to be de-emphasized by a separate circuit for 1200 baud packet -- to make the amplitudes of the high and low packet tones more nearly equal.

DATA IN - sometimes misleadingly labeled "TX Data Input", "TXD" or "PKD". This is the pin for your transmitted audio. In some radios, a menu choice of "1200" or "9600" baud will determine how this audio input is processed:

- **1200:** will go into the same channel as the MIC input for 1200 baud packet, SSTV, EchoLink, AFSK RTTY, etc. This menu selection typically means that you should use low level input, e.g. 40 mV.
- **9600:** will be DC-coupled directly into the TX modulator for 9600 baud packet. This menu selection typically means you should use a higher level input, e.g. 500- 2000 mV.

Your menu selection will affect your card volume control settings and your cable attenuation circuit. For 1200 you should use lower volume/some attenuation and for 9600 you should use higher volume/no attenuation.

TX PTT is the normal ground-to-transmit line, just like that found on most MIC inputs (confusingly labeled "Standby" or "PKS" by Kenwood).

SQUELCH - is the receiver squelch status line. Normally "no signal/squelch-closed" equals 0 V, and "signal active/squelch open" equals 5 V. Your radio may label this pin as "SQC", "COR" (Carrier Operated Relay - an archaic term from the early days of FM repeaters), "COS" (Carrier Operated Switch), "CD" (Carrier Detect), "Activity" or "Busy".

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Workaround for LPT use in Win XP/2000

LU5EEE has reported a possible solution to the problem of not being able to use the LPT (printer) port for PTT control in AGWPE on Windows XP/2000 systems. His message was posted on the SV2AGW list and referred to Packet Engine Pro not AGWPE, but perhaps this work-around will work for AGWPE, too. If you try it, please [e-mail me, KC2RLM](#) with your results, positive or negative.

The work-around involves the installation of a program called Port Talk <http://www.beyondlogic.org/porttalk/porttalk.htm>

which can be downloaded at www.beyondlogic.org/porttalk/porttalk22.zip

I suggest you read the Port Talk web site and all documents in the .zip file for information about using Port Talk.

Basic advice from LU5EEE was to :

1. Unzip the PortTalk zip file into your AGWPE folder
2. Create a Windows shortcut that follows this example:

`"C:\Program Files\AGWSoft\AGWPE\AllowIo.exe" AGW Packet Engine.exe /a`

In the shortcut, you would of course substitute your actual path to the AGWPE folder and the allowio.exe file. Be sure to use parenthesis (" ") around the path/file name for allowio.exe. Do not put them around the two parameters, [AGW Packet Engine.exe](#) and [/a](#)

This shortcut will run the [AllowIO.exe](#) program that installs the Port Talk drivers. [AGW Packet Engine.exe](#) is the program we want to give port access permissions; and [/a](#) is a switch that means permit access to all serial and parallel ports (you can also specify specific ports by using the ports' hex addresses, e.g. instead of using the [/a](#) switch, you

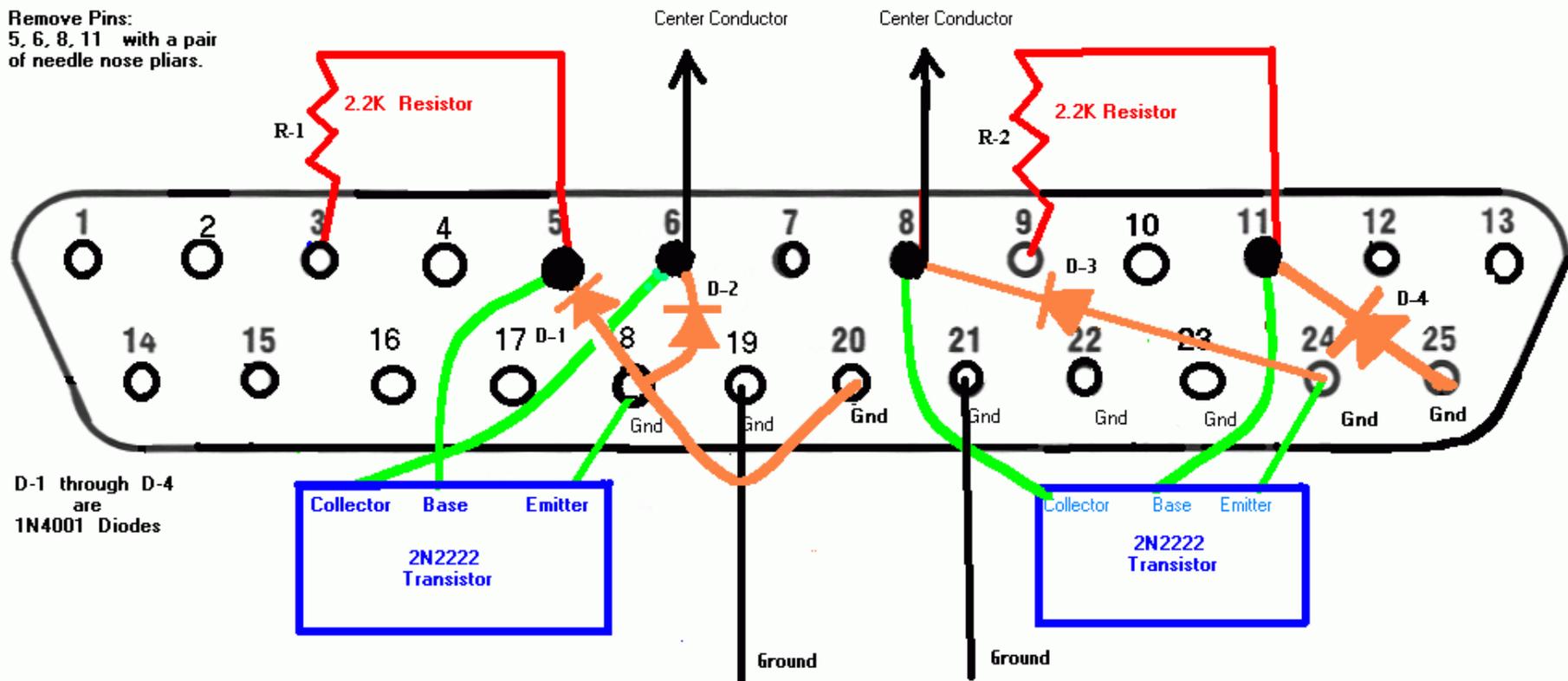
could substitute **0x378**, for example; read the Port Talk readme.txt file for more info).

3. Run this shortcut before starting AGWPE.

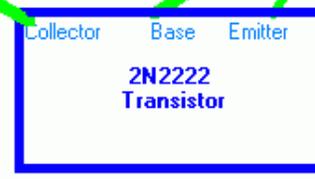
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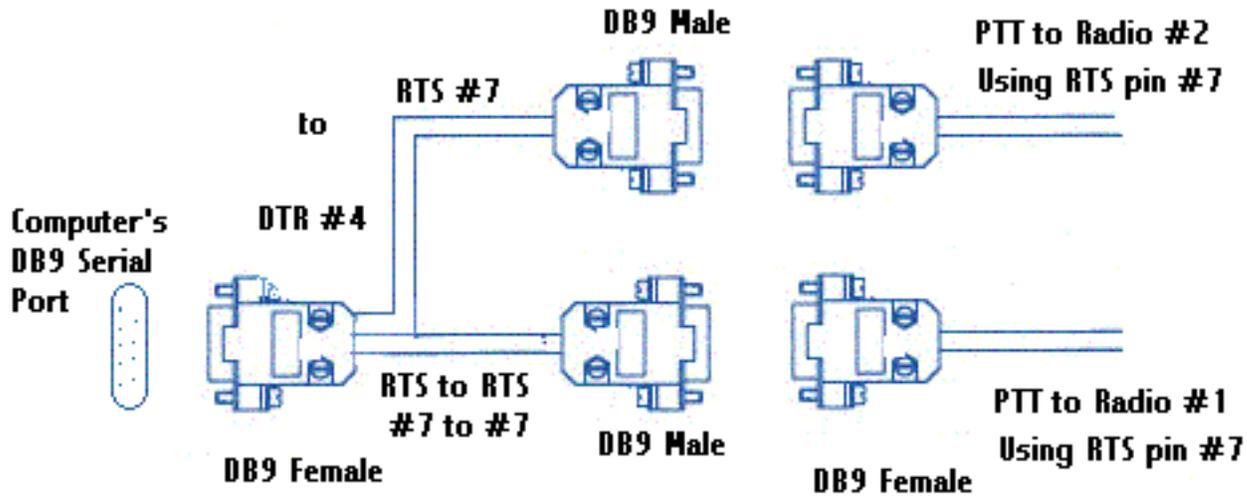
Remove Pins:
5, 6, 8, 11 with a pair
of needle nose pliers.



D-1 through D-4
are
1N4001 Diodes



DB9 PTT Adapter for 2 Radios



Comms Setup [X]

Baud Rate:
 1200 2400 4800 9600
 19k2 38k4 57k6 115k2

Data Bits: 7 8

Stop Bits: 1 2

Parity:
 None
 Odd
 Even

COM Port:
 None
 1 5
 2 6
 3 7
 4 8

Handshaking: NONE [v]

Host mode: AGWPE [v] **Setup** **Ok** **Cancel**

AGWPE Setup [X]

Host machine: localhost **Port:** 8000

Password: []

Text to send on connection: []

Multiple systems: **Remote:**

Press F1 and read the help!

Port Mask **Ok** **Cancel**

AGWPE Port Monitor Mask [X]

Check the ports you want UI-View32 to monitor. Ports that don't exist on your system are ignored. You must check at least one port.

Monitored Ports:

<input checked="" type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6	<input type="checkbox"/> 7	<input type="checkbox"/> 8
<input type="checkbox"/> 9	<input type="checkbox"/> 10	<input type="checkbox"/> 11	<input type="checkbox"/> 12	<input type="checkbox"/> 13	<input type="checkbox"/> 14	<input type="checkbox"/> 15	<input type="checkbox"/> 16

Ok **Cancel**

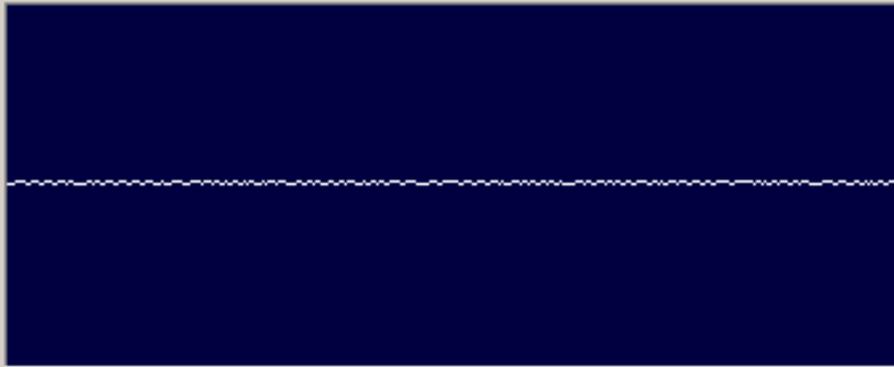




This View Consumes a lot of Processor Resources. So keep it open only for the time needed.

Close

Set Volume



SoundCard Selection

Yamaha DS1x Native Audio RadioPort1

Oscilloscope Style

- SineWave
- Frequency Spectrum
- Eye Diagram
- Waterfall Spectrum



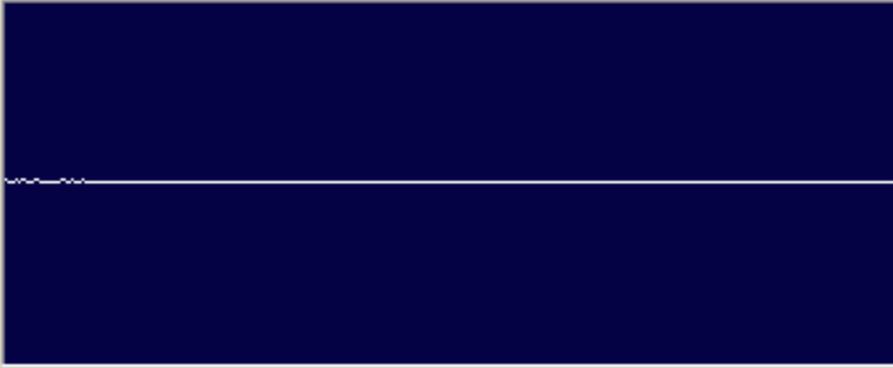
AGW SoundCard Tuning Aid



This View Consumes a lot of Processor Resources. So keep it open only for the time needed.

Close

Set Volume

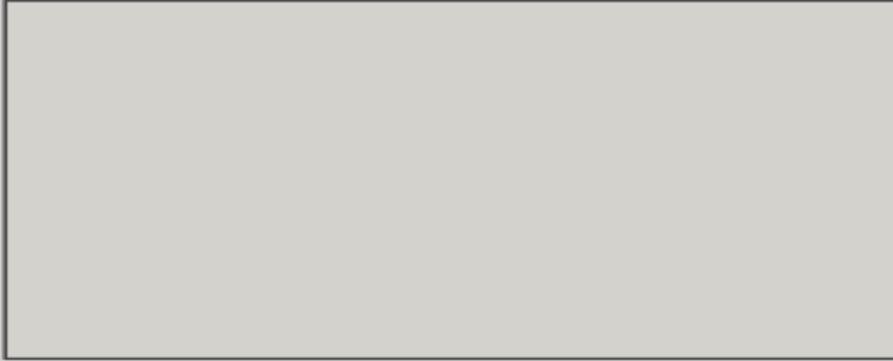


SoundCard Selection

Creative Sound Blaster PCI RadioPort1

Oscilloscope Style

- SineWave
- Frequency Spectrum
- Eye Diagram
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AGWPE's Suite of Companion Programs

George, SV2AGW, the AGWPE author, has written several packet programs that will work with AGWPE. You can download all of them from <http://www.sv2agw.com/downloads/default.htm>

These programs are perfect for testing or troubleshooting AGWPE, since they are practically guaranteed to work with AGWPE. Other than entering your personal info (e.g. callsign, etc), you don't need to make any special setting to interface with AGWPE; they should work 'as is' with AGWPE.

- **AGW MONITOR** - a program that simply displays **incoming** packets; it doesn't transmit.(go to the [AGW Programs](#) page to download it).

Hint 1: Even though this program doesn't transmit, it helps to enter your call sign. If you do, **any packets with your call sign can be displayed in a different color (default is green)**! That includes packets from any of your stations with a different SSID, any digipeated packets, etc.

- **AGW TERMINAL**- is a terminal program you can use to receive and send **packets**. It lets you "connect" to other stations, including a bulletin board (BBS). This is a good program for troubleshooting and testing AGWPE problems since it both receives and transmits.

Note: There are two versions of AGWTerm. The older version uses the Windows' DDE link to programs. The newer, better version uses the TCP/IP Interface to AGWPE and can be run over a network, where the older version can't. The newer program is called **AGWTermTCP** (go to the [AGW Programs](#) page to download it).

You can also configure AGWTerm (TCP/IP version) to connect to an instance of AGWPE running on a different computer on your home network or any where on the internet. [See the AGWPE Over a Network page.](#)

- **AGW CLUSTERS** - a program that collects and organizes incoming DX spots from a DX Packet Cluster frequency. [AGW Programs](#)
- **AGW UIDIGI** - one of the logic functions in a regular TNC is the ability to act as digipeater, i.e. relay packets for other stations. AGWPE does not have this function on its own -- and a TNC's ability to do this is lost when AGWPE puts the TNC in KISS mode. By running the AGWUIDigi APRS program, you can provide a digipeater function to your station while running other packet programs. In fact, AGWUIDigi has additional "smart" digipeating functions which are not found on most TNCs (go to the [AGW Programs](#) page to download it).
- **AGWTracker** - an APRS program (<http://www.sv2agw.com/downloads/default.htm>). This program is currently a \$49 shareware program with a free trial period.

Problems:

AGWTerm Closes Unexpectedly

- **I had just made a connection with another station when AGWTerm suddenly closed and I got this error message: *AGWTERM caused an invalid page fault in module WINMM.DLL***

You probably have a Windows sound scheme in effect. When you connected to the other station, Windows played the **DING.WAV** file. To prevent this from happening, set the Windows' **Sound scheme** to **No Sounds**. See the [Window Sound Settings page](#) on this site for further advice.

- **I am trying to run AGWTerm and I keep getting a "GDI File Read Failure". It also happens when I try to run AGWBBS and AGWFWD.**

All of these programs need a corresponding *.SYS file in the directory. For example, to run AGWTerm.exe, you must have the AGWTRM.sys file (not AGWTerm.sys) in the same directory. For AGWBBS and AGWFWD you need the agwbbs.sys file. The *.sys file is included with the main program file in the program's *.zip file. If necessary, you can re-download the zip file at

- **I've got AGWPE running and I can view the received packets using agwmon and AGWTERM, but I can't get AGWTERM to connect to anything. It acts like it's going to connect but the radio never transmits a packet. However, it *does* transmit a packet when I hit the "Ask QRA" button in the toolbar of**

AGWTERM.

There was a problem in some older versions of AGWPE. Make sure you are running the latest version of AGWPE to fix the problem.

- **I can't enter a long PATH in AGWTermTCP.**

This is program bug. Long PATH setting can't be entered on screen and are altered. Same is true if you enter path in *.ini file. For example, APRS,WIDE,WIDE goes out as "To APRS-9" according to AGWTermTCP.

- **I'm seeing two report of every packet in AGWTerm; one preceded by a 1: and one by a 2:.**

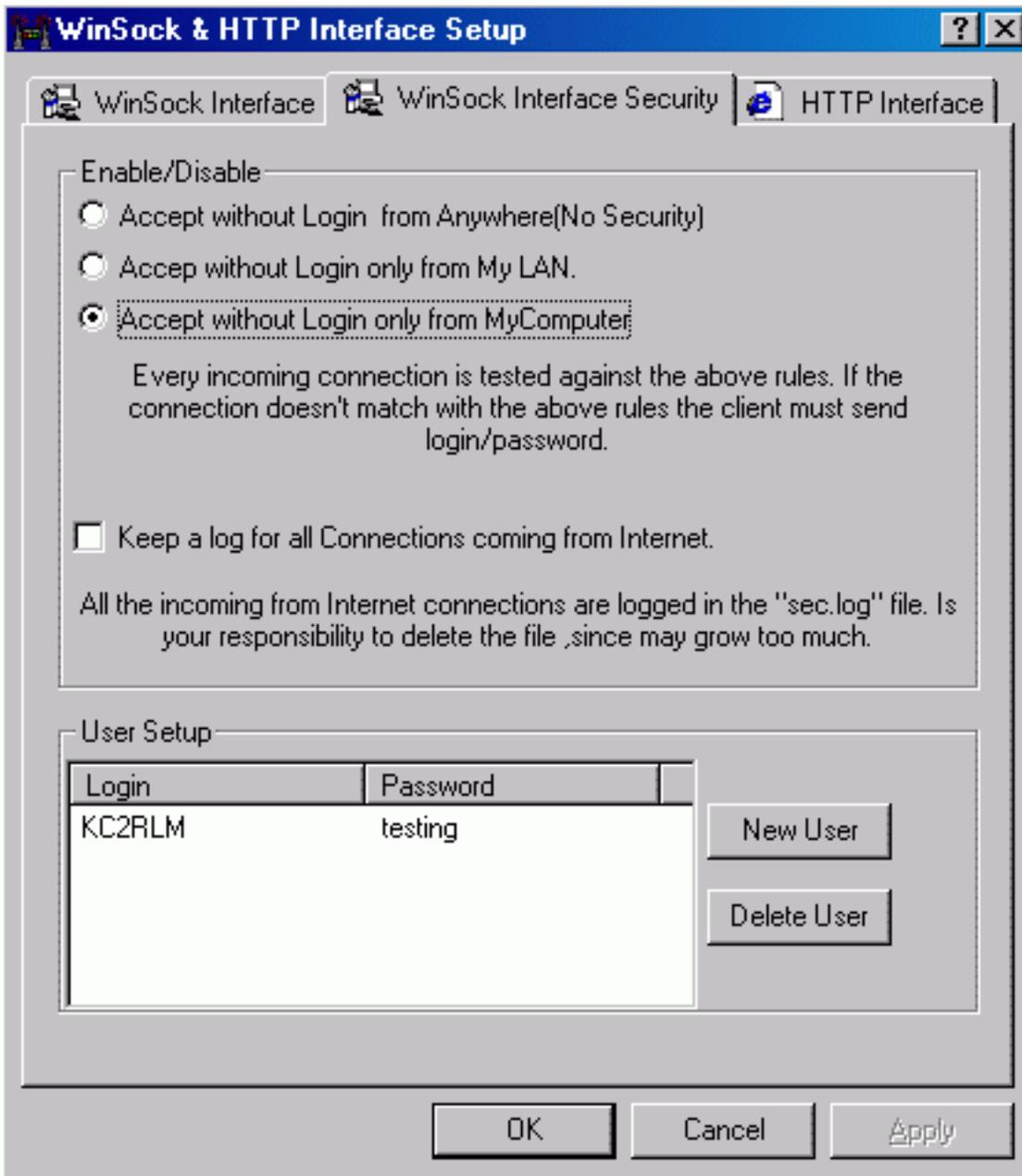
You have AGWPE set for **Dual Port** mode. Change it to **Single Port** and delete the appropriate port.ini file; for example, if it's port 2 that you want to delete, delete port1.ini (in other words, a number one less than the port number).

- **My AGWTerm has been working fine, but for some reason now when I click Properties, I get "agwterminal.exe has generated errors and will be closed by windows. I have reloaded it and it does the same thing!**

Delete the agwterm.ini file, then restart and reconfigure AGWTerm.

[Return to the "Compatible Programs" page](#)

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Port Definitions List

Open Close Close all

Name	Type	Parser	Band	Status	Open #	Comment
Standard UHF INC	SERIAL	APRS	UHF	--	--	
AGWPE Sound Card & COM1	TCP	AGWPE	UHF	--	--	
www.aprs.net:10151	TCP	APRS	TCP	--	--	
AGWPE on My Local Network	TCP	AGWPE	UHF	ACTIVE	1	AGWPE U2002.10

UP5WX-1>APRS,GATE,KB2EAR-1*,WIDE:!!0000005F031D041D27D10353-----011300

WinSock & HTTP Interface Setup [?] [X]

WinSock Interface | WinSock Interface Security | HTTP Interface

Enable/Disable
Enabling this Interface, you will have the ability to do Packet and configure Packet Engine .Using your WEB Browser. You may access Packet Engine either from this computer or from any other in a Network.

Enable the HTTP Interface

Setup Listen Port
Enter The TCP Port Where the Server Listens. Leave the default value if you don't have an Http server running. If you change this Port then you may access Packet Engine typing in your WEB Browser "http://xx.xx.xx.xx:TCPPort".
Where xxx is the Ip adress of the computer where agwpe runs.

TCP Port

Password
Login/Password is needed if you access Packet Engine from another computer.

Login Password

OK Cancel Apply

AGW Packet Engine

Authorization

This is the new USER Interface. Because it is possible to initiate this operation from all over the world you need to enter your login name and your password. Otherwise you will not be able to alter any configuration. You will just view the properties.

AGW Packet Engine

Main Menu

AGWPE

<u>New RadioPort</u>	<u>Edit RadioPort</u>	<u>TCPIP Over Radio</u>	<u>RadioPort Status</u>	<u>AX25 Status</u>	<u>General</u>
<u>Monitor</u>	<u>MHeard List</u>	<u>Connect(Terminal)</u>			

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Installing the TCP/IP Over Radio Virtual Adapter

A "TCP/IP Over Radio" / TOR Adapter is **not needed for normal packet use** of AGWPE. It should only be installed if you plan to use AGWPE's special **TCP/IP Over Radio feature** to send and receive TCP/IP information via packet radio. **Most users will not use this feature or need the TOR adapter installed.**

1. Downloading the Adapter

You can download a zip file with "TCP Over Radio" driver/adapter files for all versions of Windows from the [AGW Programs](#) page on this site.

The Sept. 10, 2004 version of the tcpip.zip file expands to the following files and folders:

Name	Modified	Size
agwtcp.INF	9/3/1999 5:29 PM	2,306
Agwtcpip.sys	7/17/2000 10:17 ...	27,472
ininet.txt	10/19/2000 4:10 ...	212
Oemsetup.inf	2/16/2000 6:53 PM	27,733
readme agwtcpip.txt	2/26/2000 9:33 AM	474
tcpip2000.zip	10/3/2000 6:14 PM	13,557
tcpipXP.zip	9/11/2004 8:11 PM	5,649

The tcpip2000.zip folder within tcpip.zip expands to the following files:

Name	Modified	Size
agwax25.inf	8/15/2000 6:36 PM	2,980
Agwax25.sys	9/13/2000 11:21 AM	8,023
Agwtcp2k.inf	8/7/2000 11:00 PM	1,893
Agwtcpip.sys	9/12/2000 10:59 PM	7,424
smdot.gif	2/10/2000 10:21 PM	72
tcpip2000.htm	10/3/2000 6:10 PM	5,592

The tcpipXP.zip folder within tcpip.zip expands to the following files:

Name	Modified	Size
AGWTCPIP.sys	9/19/2002 8:24 PM	24,320
AgwtcpXP.inf	9/10/2004 9:11 PM	2,008

Note: The 0 Sept. 2004 tcpipXP.zip file with a new agwtcpXP.inf fixes a problem with the SV2AGW adapter not displaying in "Network Connections" after Windows XP Service Pack 2 is installed. If you develop this problem after applying Service Pack 2, uninstall the current SV2AGW adapter from the Windows [Device Manager](#) and then re-install the adapter using the

new [agwtcpXP.inf](#) file.

2. Installing the SV2AGW TOR Virtual Adapter in Windows

After you follow the instructions below, you can check that the adapter was installed correctly by using the Windows [IPCONFIG.EXE](#) program: from the [Start](#) button, select [Run](#) and then enter [IPCONFIG](#). (For Windows XP, after [Run](#), enter [CMD](#), and then [IPCONFIG](#).)

Use the links below to find adapter installation instructions for your version of Windows:

[Windows 95](#)

[Windows 98](#)

[Windows ME](#)

[Windows 2000](#)

[Windows XP](#)

Installing the TOR Adapter in Windows 95

I haven't installed the adapter in Windows 95. There are instructions in the "Help" for AGWPE for this. I do not know how well they will work. In the Help INDEX, read all entries beginning with "DialUp", particularly "DialUp Setup". If you install it on Windows 95 and have any suggested improvements to the installation instructions, please tell me [KC2RLM](#).

Installing the TOR Adapter in Windows 98

1. Unzip the [tcpip.zip](#) file into an empty folder of your choice. Note the folder location.
2. Open the [Windows Control Panel](#) and double click [Network](#).
3. Press the [Add](#) button
4. Select [Adapter](#) and press the [Add](#) button
5. On the [Select Network Adapter](#) screen, press the [Have disk..](#) button and browse to the folder where you unzipped the [tcpip.zip](#) file. Highlight the [agwtcp.inf](#) file and press [OK](#)
6. Select the [SV2AGW TCP/IP Adapter](#) and press [OK](#).
7. After Windows copies the files, it may ask for the WIN98 CD-ROM and then copy more files
8. In the list of installed components you should have a new entry for [TCP/IP->SV2AGW TCP/IP Adapter](#). Highlight it and press [Properties](#).
9. On the [IP Address](#) tab specify:
[IP address](#): enter the amateur radio IP address you will use for your station. See Note ¹ below
[Subnet](#): enter [255.0.0.0](#)
10. On the [WINS](#) tab, check [disable](#)
11. On the [Gateway](#) tab:
New Gateway = add the amateur radio IP address of the distant station that you will use as a gateway; if you are the gateway, enter nothing
12. On the [DNS](#) tab, check mark [disable DNS](#).
13. On the [Bindings](#) tab, check [Client for Microsoft Networks](#)
14. Leave [NETBIOS disabled](#) and [Advanced blank](#)
15. Press [OK](#) repeatedly and restart your computer

Installing the TOR Adapter in Windows ME

I haven't installed the adapter in Windows ME but the instructions should be similar to [Windows 98 above](#). If you install it on Windows ME and have any suggested improvements to the

installation instructions, please tell me [KC2RLM](#).

Installing the TOR Adapter in Windows 2000

1. Unzip the [tcpip2000.zip](#) file (which is inside the [tcpip.zip](#) file) into an empty folder of your choice. The key files are [agwtcp2k.inf](#) and [agwtcpip.sys](#). Note the folder location.
2. Open the [Windows Control Panel](#) and select [Add/Remove Hardware](#).
3. Press [NEXT](#) and select "[Add/troubleshoot Device](#)". Press [Next](#) and wait while windows searches for devices.
4. Select the first item from the resulting list, [Add a new device](#), and press [Next](#).
5. Select [No, I want to select the hardware from a list](#) and press [Next](#).
6. Select from the resulting list [Network Adapters](#) and press [Next](#).
7. Press the [Have disk..](#) button and browse to the folder where you unzipped the [tcpip2000.zip](#) file.
8. Select the [AGWTCP2k.inf](#) file and press [OK](#) to return to the [Add hardware Wizard](#).
9. Select the [SV2AGW TCPIP Over Radio Ndis Driver](#) and press [Next](#). It will warn you about a digital signature. Ignore this by pressing [Yes](#). and then press [Finish](#).
10. Now from the [Control Panel](#) select [Network and Dial-up Connections](#).
11. You should have a new entry entitled [TCP/IP Over Radio adapter](#). Double click it and press [Properties](#).
12. Select the [TCP/IP](#) protocol and fill your:
 - * [IP Address](#): enter the amateur radio IP address you will use for your station. See Note [1](#) below
 - * [Gateway's IP Address](#): enter the IP amateur radio address of the distant station that you will use as a gateway; if you are the gateway, enter nothing.
 - * [DNS Name](#): enter the Gateway IP Address or leave blank
13. You have finished with the installation of the TCP Virtual Ethernet Card.
14. Now From the same [TCP/IP Over Radio adapter](#) properties dialog, press the [Install..](#) button.
15. Select [protocol](#) and press [Add...](#)
16. Again press [Have Disk..](#) and browse to the driver directory and select the [AGWax25.inf](#) file.
17. Select the [SV2AGW IP Over Radio Protocol](#) and press [OK](#). Now you have this new protocol checked on EVERY Adapter you have. This is harmless for the other adapters, but adds a bit overhead. So go to the properties page and for any other (non-SV2AGW) adapters, uncheck the "[SV2AGW IP Over Radio Protocol](#)".
18. Close all windows and restart your computer.

Installing the TOR Adapter in Windows XP

1. Unzip the [tcpipxp.zip](#) file (which is inside the [tcpip.zip](#) file) into an empty folder of your choice. The key files are [agwtcpXP.inf](#) and [agwtcpip.sys](#). Note the folder location.
2. Open the [Windows Control Panel](#) and select [Add Hardware](#).
3. On the [Add Hardware Wizard](#) screen, select [Next](#) and wait for Windows to search for hardware.
4. When the search is complete, select [Yes, I have already Connected the hardware](#) and then press [Next](#).
5. In the resulting [Installed Hardware](#) window, use the scroll button to go to the bottom of the list and select the last item, [Add a new hardware device](#), and press [Next](#).
6. On the next screen, select [Install the hardware that I manually select from a list \(Advanced\)](#) and then press [Next](#).
7. In the resulting [Common Hardware Types](#) window, use the scroll button to go to [Network Adapters](#) and press [Next](#).
8. On the resulting [Select Network Adapter](#) window, press the [Have disk..](#) button and on the next screen use the browse button to go to the folder where you unzipped the [tcpipxp.zip](#) file.
9. Select the [AgwtcpXP.inf](#) file and press [Open](#). You'll then see a [Install from Disk](#) window with the path to the folder where the file is located. Press [OK](#). On the next screen, select the [SV2AGW TCPIP Over Radio NDIS Driver](#) and press [Next](#).
10. You will get a screen saying The Wizard is ready to install your hardware. Press [Next](#).

11. The next screen will warn you that the hardware has not passed Windows logo testing. Press **Continue Anyway**.
12. Press **Finish** when the **Completing the Hardware Wizard** screen appears.
13. Now call up the **Windows Control Panel** and then select **Network Connections**. You should see a new Local Area Connection entry. [**Hint**: right click on this entry and select **rename**. Pick a new name for this connection, for example, **TCPIP Over Radio**, to help you recognize it more easily.]
14. Double left click on the entry and in the resulting **Status** window press **Properties**. On the **General** tab, under **This connection uses the following items**:, select the **Internet protocol (TCP/IP)** entry and then press **Properties**.
15. On the **General** tab, select **Use the following IP address**:
 - o **IP address**: enter the amateur radio IP address you will use for your station See **Note 1** below.
 - o **Subnet Mask**: accept the default **255.0.0.0**
 - o **Default Gateway**: enter the IP address of the remote gateway station; if you are the gateway, enter nothing.
 - o **DNS Server Addresses**: leave blank, otherwise enter the IP address of the distant gateway station.
 - o **Advanced**: for now, do not use. Only use this if you understand Windows networking and have a need to change the IP addressing, DNS, WINS, or Options parameters.
16. Press **OK** repeatedly to close all windows and restart your computer

1 IP address for each station in your TOR network. If your network will be relatively simple and will not tie into other TCP/IP networks, you can pick your own IP addresses. Since Amateur Radio has been assigned the block of IP addresses beginning with "44.", you should begin your addresses that way (example: 44.1.1.1 and 44.1.1.2). If your network may be heard by or tie into other ham TCP/IP networks, you should instead obtain unique addresses from your **local TCP/IP coordinator**. This will prevent the routing problems that could develop when two or more stations use the same IP address.

Note: Never use an IP address that begins with "192.168." for your SV2AGW IP address. This is the addressing scheme used on LANs and home networks. If you have another network adapter or wireless card in your computer and use a 192.168-type IP address for the SV2AGW adapter, Windows will probably not route to it correctly.

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Configuring Windows for TOR

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Windows has three internal tables which it uses to direct TCP/IP data to the correct network adapter and to the correct remote computer:

- The **ARP (Address Resolution Protocol) table** associates an IP address with the physical address, or a callsign, of a remote computer.
- The **IP Routing Table** directs TCP/IP packets to a particular gateway/network interface card in your computer.
- The **HOSTS Table** can be used to associate an IP address with its more commonly known domain name and vice versa.

The **ARP Table** entries are probably the most critical for TCP/IP over radio (TOR) clients and gateways, but entries in the other two tables can be useful in some situations.

Routing and ARP are somewhat complex subjects and complete explanations are beyond the scope of this [Help](#) section. If you want more information, do a web search for information about "IP Routing Table" and "understanding ARP table".

ARP Table

AGWPE's TOR feature uses Windows' ARP entries to associate a station's IP address with that station's ham radio callsign.

For example, let's assume the remote station you want to contact has an IP address of 44.1.1.8 and a callsign of SV2AGW-8. Let's say you want to send an email via SV2AGW-8's gateway. You've already told Window to use SV2AGW-8 as your internet gateway when you **configured the TOR adapter**, but the configuration process required you to use SV2AGW-8's IP address, 44.1.1.8, not his callsign. However, AGWPE can't send a packet to an IP address; it needs to send it to a ham radio callsign. To determine the callsign for 44.1.1.8. AGWPE will look in the Windows's ARP table to see if there is an entry that translates that IP address to a callsign.

The problem is that when Windows first boots up, the ARP table is always cleared and empty. Windows begins to rebuild a fresh table of **IP address=callsign** entries based on network exchanges it observes,

If AGWPE finds there is not yet an ARP entry for an IP address it needs, AGWPE sends out request packet to "QST" asking for the station using the destination IP address, 44.1.1.8, to respond with its ham callsign. If a response comes back (it might not!), the **IP address=callsign** entry is put in the Windows ARP table. From then on during that computer session, AGWPE knows which callsign to use when addressing packets to 44.1.1.8 .

To speed-up the ARP table re-building process, you can enter **IP address=callsign** information in the ARP table as part of the computer boot-up process or when you first start AGWPE. You can do that with a DOS batch file.

1. Determining the Correct ARP Entry Format for the Batch File

Each ARP entry includes an internet address and a hex physical address (call sign and radioport). In order to calculate the correct hex address for a station, use the free AGWsoft utility **AGWARP.EXE** You can download this in zip format from: the [AGW Programs](#) page on this site.

Unzip the utility and run it. It will ask you to:

1. Enter a callsign (for example SV2AGW-8)
2. Enter the AGWPE radioport to use to connect to that station (e.g. 2)
3. Enter the IP address used by that callsign (e.g. 44.1.1.8)

The utility will then return a hex physical address. For the example above it would be **ab:ac:0d:2c:44:86** . Finally it returns a closing message, such as "**Type now <ARP -s 41.1.1.8 ab:ac:0d:2c:44:86>**". Rather than typing that, write down everything in between the brackets **< >** and then press the **Return** key to close the utility. If you need physical addresses for any other stations, you will need to re-run the utility .

Note: The ARP entry can also be used to tell AGWPE to use particular radioport to contact this callsign. Normally AGWPE uses the default port that you specified on the [TOR configuration screen](#) under [Setup Routes](#). The ability to specify a different port can be useful if a contact should be made on alternative an radioport / frequency.

2. Create an ARP Entry Batch File

Open a DOS-prompt box (**Start: Run: CMD**) and type **EDIT ARPROUTE.BAT** (or another **.bat** name of your choice). If there is no existing file with that name, the edit program will create a new file named **ARPROUTE.BAT** with no data in it.

On a blank line in the edit window, enter an ARP entry, i.e. the information you wrote down from the AGWARP utility, except replace any colons (:) in

the physical IP address with dashes (-). For example:

```
ARP -s 41.1.1.8 ab-ac-0d-2c-44-86
```

If you have other ARP entries, add each on a separate line. When done, save the file to a folder of your choice, making note of the path. Test the file by double clicking on its icon and make sure no error messages occur.

You can also see the ARP table and your new entry by opening a DOS-prompt box (**Start: Run: CMD**) and at the DOS prompt enter: **ARP -a** [You can also manually enter ARP entries from the DOS prompt instead of a batch file.]

3. Add the Batch File to AGWPE's Auto Start Feature.

From the AGWPE's menu, select **Startup Programs**. Use the **ADD** button to navigate to and select the **ARPROUTE.BAT** file you created. Once entered into the auto start application list, the file will run each time AGWPE starts up and it will put your ARP entries into the Windows ARP table.

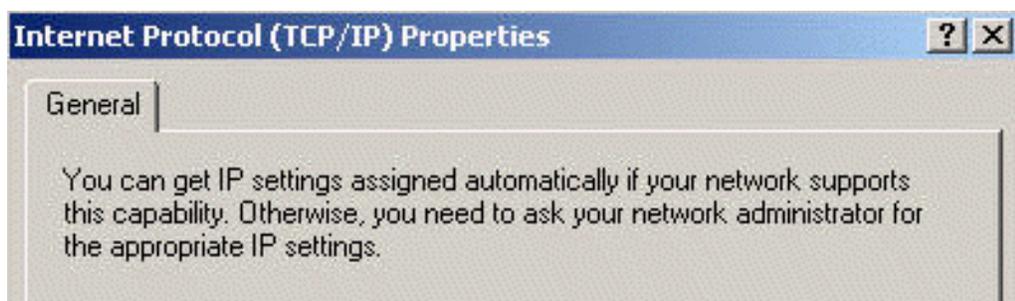
Alternatively, you could have it run each time Windows boots by placing it in the Startup Folder (**C:\Windows\Start Menu\Programs\Startup** in Windows 95, 98, or ME, or **C:\Documents and Settings\All Users\Start Menu\Programs\Startup** in Windows XP).

IP ROUTE Table

The **IP Routing Table** helps Windows decide which network adapter to use to send a TCP/IP packet. Its choices might be the SV2AGW TOR virtual adapter, the hardware network interface card (if one exists), or back to your own computer via a loop back port. For many users, no additions to the IP Routing table will be necessary, however, in some cases, **Routing Table** additions will help your TOR communications.

By default, Windows will build the Routing Table anew at each reboot. Its primary source of information is the **Internet Protocol (TCP/IP) property settings** of your network adapters, including the SV2AGW TOR adapter. The key information is the IP address assigned to the adapter. If you also have a hardware network card installed, Windows will make that IP address the **default gateway adapter**, but the IP address of your SV2AGW TOR adapter will create a special route for your ham radio network (those would be addresses that begin with 44, assuming you are using an IP address yourself that begins with 44).

For example, say your settings for the SV2AGW TOR adapter looked like this example ...



You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.

Obtain an IP address automatically

Use the following IP address:

IP address:	44 . 128 . 34 . 2
Subnet mask:	255 . 0 . 0 . 0
Default gateway:	44 . 128 . 64 . 1

Obtain DNS server address automatically

Use the following DNS server addresses:

Preferred DNS server:	. . .
Alternate DNS server:	. . .

Advanced...

OK

Cancel

An entry is automatically placed in the IP Routing table indicating that any IP packet with a destination IP addresses beginning with 44 should be routed to your SV2AGW TOR adapter at IP address 44.128.34.2 (and then onto your gateway station at 44.128.6.1).

Why 44? That's determined by the **subnet mask** values under the four octets (44, 128, 34, and 2) in the **IP Address**. A subnet mask value of 255 means "match all the binary digits of the octet above"; a value of 0 means "no need to match any of these digits". In our example, only the first octet, 44, has a subnet mask value of 255. The other octets have a mask value of 0. So the Routing table will contain an entry that says, in essence, send **all** destination IP addresses beginning with 44 to the 44.128.34.2 adapter.

[For addresses that don't begin with 44, Windows will use the **Routing Table** to determine the correct routing. For example, if you also have a network card in your computer, then the **Routing Table** will suggest that packets for all non-44 addresses should be routed to that network card and directly to the internet or wired network and not to the SV2AGW TOR adapter. (If you don't have a network card installed, then the **Routing Table** will send packets go to the SV2AGW TOR adapter.)]

Communicating with radio stations that don't use a "44" address

If your computer has both a network card and the TOR adapter installed **and** you will **contact stations using TOR that don't have an IP address beginning with 44**, then you should add them to the **Routing Table** so that packets are sent to them via the SV2AGW TOR adapter and not the network card. The easiest way to do this is to add those routes into the batch file created for ARP entries (see above, **Create an ARP Entry Batch File**) or create a batch file as above if one doesn't exist.

To add a route to the **IP Routing Table** using your ARP Entry Batch file, enter a new line that begins with ROUTE ADD followed by the full IP address of the remote station followed by the IP address chosen for your SV2AGW TOR adapter (your IP address), for example:

```
ROUTE ADD 133.275.12.6 44.128.34.2
```

This tells windows to route any IP packets addressed to 133.275.12.6 to the SV2AGW TOR adapter at 44.128.34.2. Of course you would replace the number in **green** with the address of your distant station and replace the number in **red** with your SV2AGW TOR adapter's address (your ham radio IP address).

To add a route without using a batch file, open a DOS-prompt box (**Start: Run: CMD**) and enter your ROUTE ADD sentence as above.

To see your complete **IP Route Table**, enter **ROUTE PRINT** at a DOS prompt (**Start: Run: CMD**)

HOSTS Table

The **HOSTS** file can be used to help translate an IP address to a name and vice versa. For example, if you had a **HOSTS** table entry that said 44.0.0.2 is the same as "My Web Page", you could enter "My Web Page" as a URL address in your browser and Windows would know to go to 44.0.0.2 to find it.

This same IP Address-Name translation can be performed by a domain name server, but the **HOSTS** files is especially useful when a domain name service (DNS) server is not available (common on many amateur radio networks) or when you want to use an easily remembered name in place of a hard to remember IP address or lengthy domain name.

Location of the **HOSTS** file on your computer:

Windows 98/Me	c:\windows hosts
Windows 2000/XP Pro	c:\winnt \system32 \drivers\etc hosts
Windows XP Home	c:\windows \system32 \drivers\etc host

Note: the **HOSTS** file has no extension to its name.

You can open the existing **HOSTS** file with a text editor. Instructions for adding entries to file are included in the file. [In some cases you may find only a **HOSTS.SAM** (sample) file and not a **HOSTS** file. If you do, make a copy of the **HOSTS.SAM** file calling it **HOSTS** (no extension).]

Usually the **HOSTS** file already has one entry in it: **127.0.0.1 localhost**

Any new entries would follow the same simple format: IP address, a space, name. For examples:

41.1.1.8 SV2AGW-8
41.1.1.8 mail.sv2agw.net

Ping Test

After you make your **HOST**, **ROUTE** and **ARP** entries, you can test them by using the Windows **PING** command. **PING** simply sends four packets to the destination station asking it to respond. **PING** then reports how long each response takes or, if no response is heard within a given length of time, **PING** reports the "request timed out".

To send the **PING** command, open a DOS-prompt window (**Start: Run: CMD**) and enter the command in this format:

```
PING <destination IP> <--- substitute actual IP address for  
<destination IP>
```

You can use the **-w** option on the ping command to increase the time **PING** waits for a response (default is 1 second). For example, to wait for each response for 5 seconds (5000 milliseconds), use **-w 5000**. e.g. **PING 44.0.0.1 -w 5000**

If you get a reply with a response time, then all Windows applications using TCP/IP, i.e. Internet Explorer, Outlook Express, will also be able to communicate with the **PING-ed** destination. If all four requests time out, then Windows is not hearing a response from the destination IP and it is useless to try any other TOR applications.

Diagnosing Routing Problems

Download and use the **AGWTerminal program** and watch the packets that AGWPE is sending when you execute the **PING** command. They should look like this:

```
2:Fm SV2AGW To SV2BBO <UI pid=CC Len=60 >[21:59:26]  
IP:len:60 44.0.0.2->44.0.0.1 ihl:20 ttl:128 prot ICMP  
ICMP:type Echo Request id:768 seq:7680  
abcdefghijklmnopqrstuvwabcdefghi
```

- If you don't see anything, then the **ROUTE table** is not configured to route packets to the SV2AGW TOR adapter for this destination IP address.
- If the packet is addressed to **QST** instead of the expected callsign, then the **ARP table** entry associating the destination IP address with the destination callsign is missing or incorrect. Add or correct it.
- If the number that begins the packet (e.g. 2:) is not the correct radioport for TOR, then the **ARP table** has a hex address with the wrong radioport. Rerun the **AGWARP.EXE** program to get the correct hex address.

If the **PING** command reports the the request timed out:

- The response time may have been too short. Increase it by using

PING's " -w " parameter described above.

- The radioport number may be incorrect so you are transmitting on the wrong frequency. Either the default radioport in [AGWPE's TOR settings](#) is incorrect; or the [ARP table](#) entry for this callsign has a hex address with the wrong radioport (rerun the AGWARP.EXE program and re-enter the correct hex address in the ARP table).
- You are using the wrong callsign and/or SSID number for the destination station.
- There may be a transmission problem at your station (no power, cables not connected to TNC or radio, etc); the other station simply can not hear your packets (poor signal); or the other station is not working properly or it is off the air. [In that case, try to successfully exchange a standard packet before trying a TOR packet exchange or PING test.]
- The other station can not respond to PING requests because its AGWPE configuration and/or its SV2AGW TOR adapter configuration is incorrect.
- A firewall program/router may be blocking access to the target computer. Make sure the firewall/router is set to allow PING responses.

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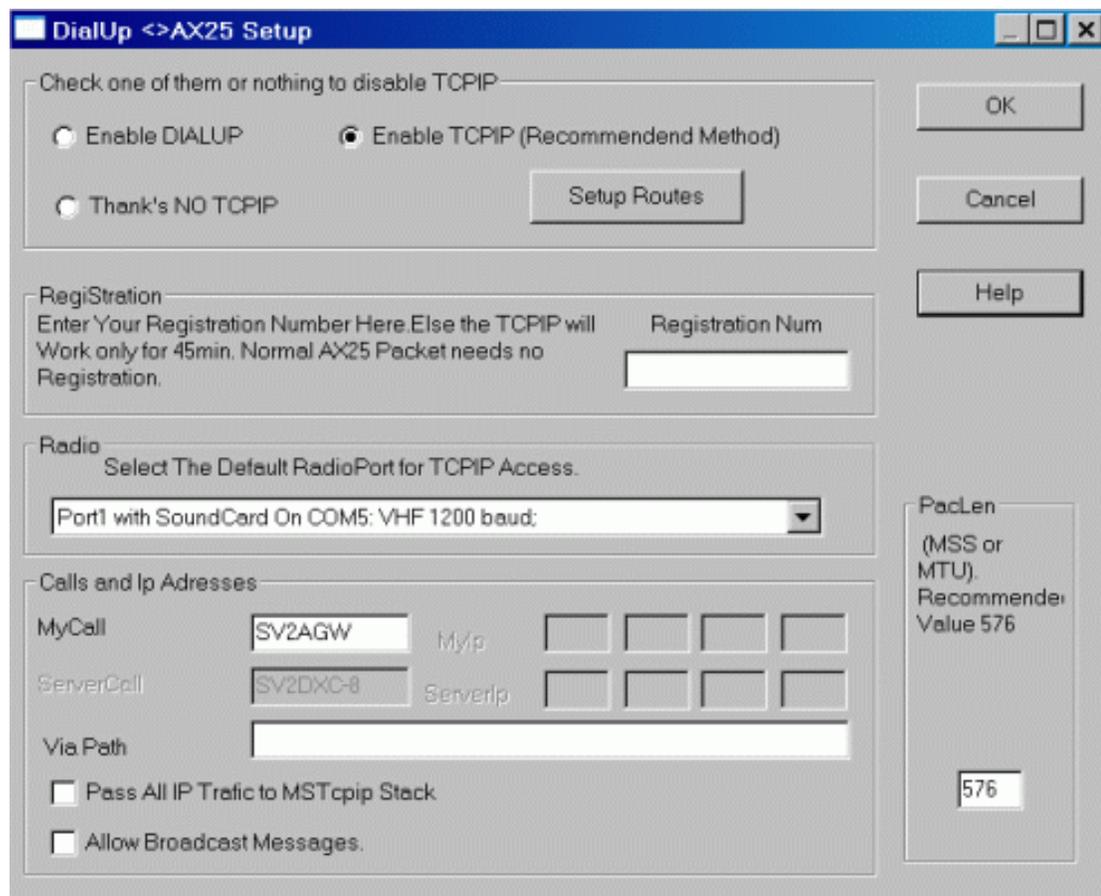
[Others](#)

Configuring AGWPE for TCP/IP Over Radio (TOR)

Note: Before configuring AGWPE for TOR, you must **install the SV2AGW virtual adapter** in Windows. If you don't, AGWPE will still work, but you will get this message every time you start AGWPE:



To configure AGWPE for TOR, right click on the AGWPE tower icon in the Windows Desktop System Tray to bring up the AGWPE menu. Then select **TCP/IP Over Radio Setup** to bring up the **Dialup <-> AX.25 Setup** window.



- Check [Enable TCPIP \(Recommended Method\)](#) - remember that if the [TOR adapter](#) has not been successfully installed, you will get an error message when you close this window. (The [Enable DIALUP](#) method is for Windows 95 and is not discussed on this website; it emulates a modem in Win95).
- [Setup Routes](#): Only used if you want exchange information with other TOR stations using a radioport different from the default radio port (see below). Even so, it would be better to use the [Windows ARP table](#) to specify a different radio port for a different callsign.
- [Registration](#): If you have paid for a number, enter it here (the number ties to your callsign). As the screen says, you don't need a number for normal AGWPE use and you don't need a number to run TOR for less than 45 minutes at a time. See [obtaining a registration number](#).
- [Radio](#): Use the drop down list to select the AGWPE port you wish to use for TOR. To avoid possible problems, **do not select "use all ports"**. If you do, you may get a message similar to this: THE SYSTEM DETECTED A CONFLICT AT ADDRESS IP 44.000.00.80 WITH THE SYSTEM THAT HAS THE HARDWARE ADDRESS 98:BB:BB:BB:BB:BB.
- [Calls and IP Address](#): Enter the callsign you will use for TOR. enter your callsign; add a SSID number if you wish, e.g. SV2AGW-4. The other fields you see to the right of this entry field will be grayed out for TOR (they appear only if you use the Windows 95 DIALUP method.)
- [VIA Path](#): Enter the callsign of any station/digipeater that may be needed to relay your packets. If more than one is needed, use a comma to separate the callsigns.
- [PacLen](#) (on the right): Enter the maximum length of the packets. AGWPE will break TCP/IP sentences larger than PacLen into additional packets into desired Paclen. Suggested values are **300** for 1200 baud and **576** for 9600 baud. (PacLen equates to MTU or MSS values in a wired network, for those of you familiar with these terms.) If your signal path is good and there is little traffic, you can try increasing the PacLen. Alternatively, decrease PacLen if your path or traffic is creating difficulties (slow downs). (Note: Windows may ignore your settings and pick its own.)
- [Pass All IP Traffic to MS TCPIP Stack](#): generally this should be left unchecked. If you check it, PE Pro will forward **all** received TCP/IP packets to Windows, including supervisory packets and packets not addressed to you. This is usually not necessary and may slow down your connection. You should only enable it if you understand the implications and have a good reason to use it, e.g. you are routing / digitpeating packets.
- [Allow Broadcast messages](#): Generally you will leave this unchecked. Broadcast messages are network management TCP/IP packets that Windows "broadcasts" over a network. They will result in very long packet transmissions. These are not necessary for TCP/IP Over Radio, unless you intend to allow others to access a shared folder on your hard drive.
- [Help](#):... was not working in ver. 2003.308

You must close and restart AGWPE for any changes you make to take effect.

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Configuring Your Computer as a TOR Gateway

An Example

- [Gateway Configuration using Internet Connection Sharing](#)
- [Alternative Configuration using a Proxy Server Program](#)

A "gateway" TCP/IP over Radio (TOR) station is one that has access to the internet and is willing to relay internet data by radio to and from client stations who do not have access to the internet.

Using a Gateway: An Example

Let's assume SV2BBO (a client station) does not have access to the internet, but a nearby station, SV2DFK, does have dialup access to the internet and is willing to act as SV2BBO's internet gateway. The stations already know that they can exchange standard AX.25 packets by radio.

Both stations have also configured their computers to use the TCP/IP Over Radio (TOR) feature:

- [TOR adapter](#) installed and configured with their respective
Note 1
amateur radio network IP address
- [AGWPE configured for TOR](#)
- [Windows network tables](#) updated

Note: AGWPE's TOR feature should work in combination with other TCP/IP over radio systems, such as JNOS, Linux, and Flexnet, etc. You don't really need AGWPE on both ends of a AGWPE TCP/IP system. On this web site, however, only a pure AGWPE system (both stations using AGWPE) is discussed. Setting up other TCP/IP systems is beyond the scope of this site.

In addition, SV2DFK (the gateway) has configured his Windows XP computer using the [Gateway Configuration instructions](#) below.

Now let us say that SV2BBO (the client) uses his browser, Internet

Explorer 6.0, to request the TAPR web site's home page at <http://www.tapr.org>. Windows automatically forwards this HTTP request to the SV2AGW TOR adapter on SV2BBO's computer, which encodes the request in an AX.25 packet which is sent to SV2DFK.

At SV2DFK's station, the packet from SV2BBO is first goes to the SV2AGW TOR adapter, where the HTTP data request is extracted. The data is then routed to SV2DFK's dialup adapter which establishes a connection with SV2DFK's internet service provider and forwards the HTTP request to www.tapr.org. The requested HTTP data from www.tapr.org is returned first to SV2DFK and then to SV2BBO using the process in reverse. This same process could also be used for any other internet TCP/IP service (FTP, SMTP, POP, etc.).

Note that this process is automatic and requires no intervention from the gateway, SV2DFK, after he has setup TOR correctly.

Note 1: IP address for each station in your TOR network. If your network will be relatively simple and will not tie into other TCP/IP networks, you can pick your own IP addresses. Since Amateur Radio has been assigned the block of IP addresses beginning with "44.", you should begin your addresses that way (example: 44.1.1.1 and 44.1.1.2). If your network may be heard by or tie into other ham radio TCP/IP networks, you should instead obtain unique addresses from your [local TCP/IP coordinator](#). This will prevent the routing problems that could develop when two or more stations use the same IP address.

Gateway Configuration Instructions

With TOR installed and configured, the gateway computer will have two network adapters:

- 1.) the SV2AGW TOR adapter for the radio network connection
- 2.) a network interface card (or dialup adapter) for the internet connection.

1. Configuring the SV2AGW TOR Adapter

The SV2AGW TOR adapter for a gateway computer should be configured as described in the [TOR driver](#) instructions, except the setting for your [Default Gateway](#) should be blank (no entry). To check or change it...

In Windows XP: use the [Windows Control Panel](#) to go to the [Settings: Network Connections](#) list. Click on the entry for the AGWPE TOR connection; it may be labeled [Local Area Connection](#) or [Local Area Connection 2](#)

(when you open it you should see "**Connect using: SV2AGW TCPIP Over Radio NDIS Driver**"). Click on the the **Properties** button and then click on **Internet Protocol (TCP/IP)**. **Remove** any IP Address entry next to **Default Gateway**.

In Windows 98: use the **Windows Control Panel** to go to **Network**. On the **Configuration** tab's component list, highlight the **TCP/IP->** entry for your network adapter and press the **Properties** button. Open the **Gateway** tab and **remove** any **Installed Gateways**.

2. Configuring Your Internet Connection Adapter

Assuming that your connection to your Internet Service Provider (ISP) has been working OK, don't make any changes in the settings for this adapter (network card or dialup) other than to enable **Internet Connection Sharing (ICS)**.

In Windows XP: Open the network connection you use for internet service (either **Dialup Connection** or your **network card/ Local Area Connection**) and then press its **Properties** button. Open the **Advanced** tab (at the top) and then check the box for **Internet Connection Sharing**. If it is not there, start the **Network Setup Wizard**: click **Start**, point to **Settings**, click **Control Panel**, and then double-click **Network Setup Wizard**.

(Note: If you are not using a hardware or software firewall on your internet connection, you may also want to check the **Internet Connection Firewall (ICF)**. ICF may do some good, but first try TOR without it. If TOR works OK, then try ICF.)

In Windows 98: Open **Internet Explorer** and from the menu select **Tools: Internet Options**. At the bottom of the window, below the **LAN Settings** button, press the **Sharing** button.

If you do not see a **Sharing** button, then ICS is not installed. To install it:

- From the **Windows' Control Panel** open **Add/ Remove Programs**. Select **Windows Settings** and then, from **Components List**, select **Internet Tools**. Press the **Details** button and make sure there is a checkmark next to **Internet Connection Sharing**. Press the **OK** button and then the **Apply** button. You will then be prompted to insert the Windows 98 CD-ROM. After ICS is installed, the **ICS Setup Wizard** runs automatically.

- Fill in the choices as follows:
 - In the **Internet Connection Sharing** window, select **Enable Internet Connection Sharing** and **Show Icon** (if you want)
 - For **Connect to the Internet using**, select the **network interface card** that you use to connect to your ISP or **Dial-Up Adapter** if you connect by telephone.
 - For **Connect to my home network using**, select the gateway's **SV2AGW TCP/IP adapter**.

Alternative To ICS: Use a Proxy Server Program in Windows 98/ME

If you can not get Windows' **Internet Connection Sharing** feature to work correctly in Win98/ME, use a proxy server program on the gateway. The proxy server will handle the data exchange between the TOR adapter and the dialup/network adapter. You should be able to find a shareware or freeware proxy server on the internet. SV2AGW has suggested HHPROXY, which is freeware. The proxy server program must be configured and running on the gateway computer when the client station wants access to the internet from the gateway.

1. Proxy Setup on the Gateway Computer

At the gateway station, the proxy server must be configured with the gateway's radio network IP address, a "port" to listen for requests from clients (example: 8080), and information about the gateway's internet access (dialup info or network card).

As an example, here's the key points in configuring the **HHPROXY** program (more info and examples are in the **HHPROXY** zip package; do a web search to find a download site):

1. Set the line Local Name to the radio network IP address of the station acting as the gateway station.
2. If you are using a dialup connection, use the examples to help you configure the line below for your setup:

Dial "T-Online" "" "" 0007777777770888888888#0001
ASK "" 180 194.25.2.129 3 30

If you are not using a dialup internet connection, put the word REM in front of that line.

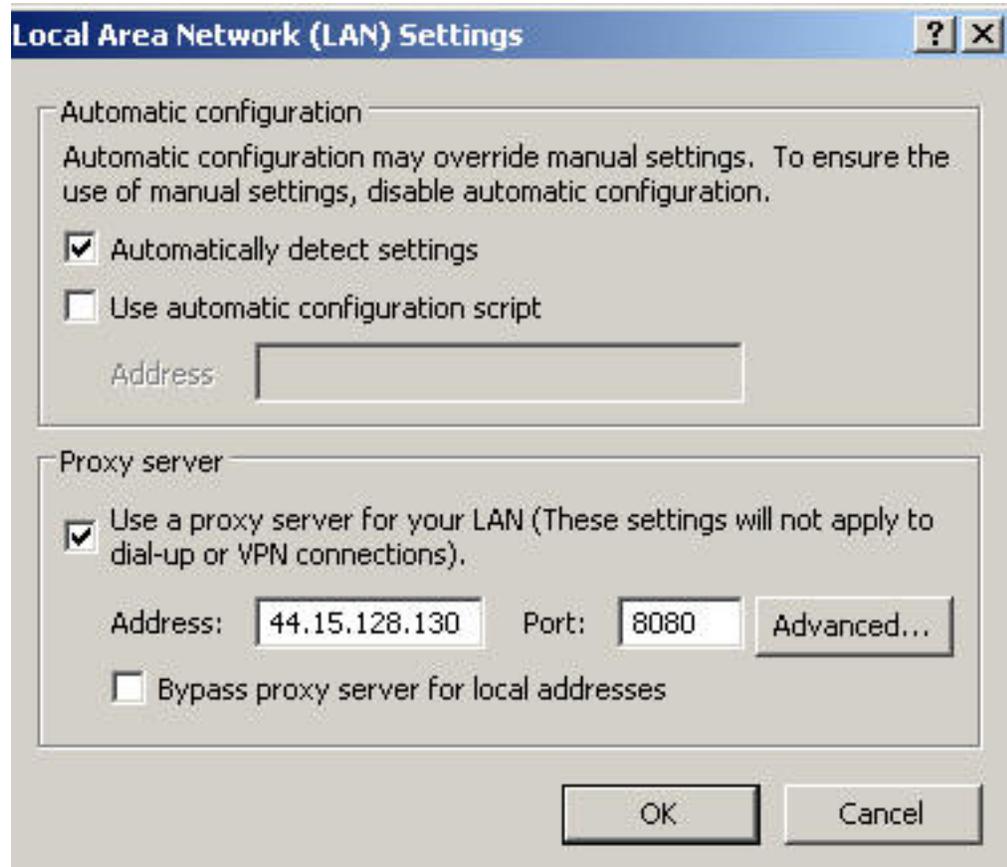
3. Configure all other protocols as in the sample configuration file.

2. Proxy Setup on the Client Computer

The client station must now be configured to use the gateway station's proxy server. In the client's Internet Explorer 6.0, select **Tools**, then **Internet Options**, then select the **Connections** tab.

Then check **Use a proxy server for your LAN** and then enter the **IP radio network address** for the gateway station and the **port number** on the gateway station where the proxy server program can be accessed. (Ask the gateway ham for these numbers.)

Sample Internet Explorer 6.0 screen shot on the client workstation:



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Configuring Your Applications for TOR

Generally, you should not need to modify any settings in your TCP/IP applications (browser, email program, etc) if you have configured the [Windows' IP ROUTE, HOSTS and ARP tables](#) correctly and have successfully run a [PING test](#) to the distant station.

If you experienced problems with an application not using the correct network, i.e. radio network vs. internet, look for a solution in the entries in your [Windows IP ROUTE, HOSTS and ARP tables](#).

For example, if you are trying to communicate with a mail server on the radio network, make sure that the email account setting in your email program either specifies the mail server's IP address (beginning with 44) or that there is an entry in the [HOSTS table](#) that translates the server's name, e.g. mail.SV2AGW.net, to an IP address, e.g. [44.0.0.6](#).

For all IP packets with addresses beginning with 44, Windows should send them to the SV2AGW TOR adapter. If it doesn't do that, then add a route in the [IP Route Table](#) linking the mail server's IP address, e.g. [44.0.0.6](#), with the SV2AGW TOR adapter, e.g. [44.0.0.2](#).

And finally make sure there is an [ARP table](#) entry that links the server's IP address, e.g. 44.0.0.6, with the server's correct packet callsign, e.g. SV2AGW-8. Without that entry, Windows will send a packet to "QST" asking for the station with that IP address to report back with its callsign.

If you use a gateway station and that station is running a proxy server program, then you may need to configure your internet programs for that. See the [Gate Setup](#) page for an example of how to do this in Internet Explorer.

[See also Diagnosing Routing Problems](#)

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Deciphering Packet Headers

AGWPE follows the [AX.25 protocol](#) that is the standard for ham radio packet, however, AGWPE does not use the standard TNC2 packet frame display status protocol, but a more comprehensive custom protocol developed by George SV2AGW.

If your terminal program (e.g. AGWterm) is set to display packet frame headers, you will see these status indicators and can follow what AGWPE is doing and how it is interacting with another station. This can sometimes be helpful in [diagnosing connection problems](#).

Listed below are the explanations for each type of packet frame header.

Note that within the packets, there may be these additional indicators:

PID is the "protocol identifier". **PID=F0** means the frame contains text -- "**F0**". If the frame contained TCP/IP data, the ID would be "**CC**". Other identifiers are used for NET/ROM, Flexnet, Apple Talk, etc.

P and **F** mean Poll and Final. The P and F "bits" are used to indicate when a reply or ack (acknowledgement) is desired. For example, when the sending station includes a P bit in the packet header, it means "respond immediately to this packet". If the P bit is missing, the destination station will wait for additional packets until one appears with the P bit and then acknowledge all of the packets at once. The sending station controls how many packets AGWPE will send without a P bit by setting the MAXframe parameter. For example, if MAXFrame is set to 5, four (4) packets will be sent without the P bit and the fifth will contain the P bit. The destination station will respond to the fifth packet with an ack that includes the F bit to indicate the last number of the packet frame sequence which is received.

Note that all packets frames sent are identified by number, the first number being 0 (zero) and the last being 7. After 7, the numbering sequence restarts at 0 (zero). The numbering system is used to track packets, so that each receiving station can compare how many packets were sent to it and how many it has received. If a packet is missing, the receiving station will request a re-transmission of numbered packets.

Examples of packet frame headers:

<UI pid=F0 Len=32> - an unconnected frame (e.g. beacon) sent to no station in particular but to everyone, i.e. . The **PID** is "F0" since it contains simple ASCII text. (UI frames are used in APRS.) **Len=32** means the packet contains 32 characters.

<SABM P> - a request from station A to station B for a connection. The **P** bit is used to request an immediate reply. (Set Asynchronous Balanced Mode)

<UA F > - the reply from station B to station A accepting the connection request. It is also used to accept a disconnection **<DISC>** request. The **F** is used to tell station A that all packets were received successfully. (If station B could not accept the request, it would send a **DM** frame; see below.)

<DISC P> - a request from either station to disconnect from the other.

<DM F > - a refusal to accept the original connection request, perhaps because another connection is in progress.

<I P R3 S0 pid=F0 Len=28 > - this is an information (**I**) packet containing data (text, etc). The **P** requests an immediate acknowledgment. If the **P** were absent, then the receiving station would delay its acknowledgement until it received a frame with a **P** in it. **R3** indicates that the station last received the other station's packet #2 and is ready to receive #3. **S0** indicates that this packet being sent is # 0 (zero). **Len=28** means the packet contains 28 characters.

<RR P/F R1 > - this is a "ready to receive" (RR) packet simply acknowledging receipt of packet #0 and ready to receive #1.

<REJ P/F R1 > - this is reject (**REJ**) packet meaning that the packet just received was out of sequence or a duplicate; ready to receive packet #1 instead.

[The **REJ** can also be sent by a TNC to indicate its buffer is full and it is not ready to receive (**NRN**)]. In addition, some AX.25 implementations, e.g. BPQ-DOS node, use a **REJ** packet instead of **P**; immediately after the last packet in a sequence (maxframe), a **REJ** is also sent to force an acknowledgement by the receiving station.

Another frame that is rarely seen is a **FRMR** (Frame Reject). It would be sent if the packet received had an invalid control field, an illegal data field, a data field that was too long, or other problem. In general, you will not see such a frame unless you are writing your own AX.25 code and testing it.

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TNCs Status



RadioPort	MaxFrame	Speed	Persist	Slottime	Traffic Level	Bytes/2min
1	6	1200Bauds	150	5	2	2438

This List Can be left open all the time. The list contents are updated every 2 minutes. This list has meaning only if the program uses auto selfadjust parameters. You can always monitor the channel traffic.

Close

Comms Setup

Baud Rate

- 1200
- 2400
- 4800
- 9600
- 19200

Parity

- None
- Odd
- Even

Com Port

- None
- Com1
- Com2
- Com3
- Com4

Data Bits

- 7
- 8

Stop Bits

- 1
- 2

Handshaking NONE

Host mode AGW

Setup

Ok

Cancel

Comms Setup

AGWPE Setup

Mode: DDE TCP/IP

Host machine: localhost

Port: 8000

Text to send on connection:

Ok Cancel

Host mode: AGW Setup

Port Definitions List

Open Close Close all

Name	Type	Parser	Band	Status	Open #	Comment
Standard UHF TNC	SERIAL	APRS	UHF	--	--	
AGWPE Sound Card & COM11	TCP	AGWPE	UHF	ACTIVE	1	AGWPE U2001.38
www.aprs.net:10151	TCP	APRS	TCP	--	--	





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Using AXIP to Link to Xrouter

Keith Ray G1GXB has graciously allowed me to post this on this site:

"The following is a description of how I interfaced AGW Packet Engine (or PE Pro) to Xrouter running on another computer over a LAN.

My operating set up is a Windows 98 SE Computer in the radio shack running both Xrouter and FBB (GB7SOU BBS) linked by a LAN to another computer indoors in the warm running Windows XP SP2, AGW Pro, and Winpack. I am assuming that you already have Xrouter up and running correctly with an Ethernet card.

1. Add both a Interface (if not already present) and Port for the link in the Xrouter Configuration file

```
INTERFACE=8  
TYPE=AXUDP  
MTU=256  
ENDINTERFACE
```

```
PORT=5  
ID=AXUDP link to PMS  
INTERFACENUM=8  
UDPLOCAL=93  
UDPREMOTE=93  
IPLINK=192.168.0.15 <-- replace with IP Address of  
Ethernet Card on other, non-Xrouter Computer  
MINQUAL=10  
FRACK=2000  
RESPTIME=200  
RFBAUDS=56000  
QUALITY=0 ; disable all L3/L4 on this port  
NODESINTERVAL=60  
CFLAGS=15 ; allow up/down links/stop L3RTT  
MAXHOPS=0 ; limits time domain horizon to 2 hops  
MAXTT=0 ; limits time domain horizon  
PROXY=GB7SOU,BBSSOU  
MHEARD=10  
SYSOP=1
```

ENDPORT

That's all for Xrouter. These parameters were supplied to me by Bryan GOSYR for my set up. I'm sorry but I can't supply any more info on this setup of Xrouter as I'm completely ignorant on that subject, but would gratefully receive any info on errors or omissions.

2. Run AGWPE/Pro and add a AXIP port.

3. Edit the AGWPE AXIP Port Parameters:

a. Select Port: Try COM8 (to match INTERFACE above?)

b. Serial Port/Modem Baud Rate: 9600

c. Select Your TNC Model: AXIP (External DII)

d. TNC Sub Type: KISS Simple

e. Port 1: Your Port Description

f. Port Kiss Id: 0

g. TNC Control Command: IniKiss2, @<your
callsign>.ini

4. Create a @<your callsign>.ini file with these contents:

[AXIPDRV]

DEST_ADDR=192.168.0.3 <-- replace with IP
Address of your Xrouter computer Ethernet Card
DEST_PORT=93
DEST_HOST=
CALLSIGN=g1gxb-11 <-- replace with your callsign
UDP_PORT=93
DEBUG=1

Place this .ini file in your AGWPE/Pro Directory

5. Restart AGWPE/Pro.

This is where I had problems. AGWPE came up with "Port Idle, Config error" error message. I was using the default Port in 3a. above, which is COM2. I tried all the ports until I got to COM8 when, Hay presto, up came the tick and Port Enabled!

Once you have obtained the Port Enabled everything is fine and AGW will interface with Winpack, Sally, and the AGW suite of programmes plus a lot of other fine programmes.

Unless you are the sysop of the BBS and it is interfacing with Xrouter as an application, you will have to get Xrouter to pipe the EX frames from the Port the BBS is EX on up the LAN link and then set Winpack up to use the BBS through a DigiNode. Cannot help you there I'm afraid.

Hope it helps.

Keith G1GXB email: mycallsign (at) keithray.f2s.co

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Last Updated: 06/23/2008



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APRSplus and KipSS/PE with AGWPE

APRSplus is another Windows-based program for receiving and plotting APRS position packets. It was written by Brent Hildebrand, KH2Z, and works in combination with Delorme's **Street Atlas** program (or **Map 'N Go**). APRSplus handles the APRS packet management and then generates icons that are placed on the Street Atlas maps.

Note: APRSplus only works with Street Atlas versions 4 through 9. It will not work with the Road Warrior Edition and Deluxe versions, including SA-2003 and SA-2004.

To make APRSplus work with AGWPE you also need Brent's free program, KipSS/PE, which will link the two programs using their respective TCP/IP interfaces. **Note that KipSS/PE only works with a registered version of APRSplus !** So, you'll need to send Brent the registration fee to get a registration code (info in APRSplus files) if you want to use APRSplus with AGWPE.

[Stephen Smith, WA8LMF](#), gets all the credit for working out all the instructions below for running APRSplus with AGWPE.

Quick Links for this page:

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Setting Up APRSplus and KipSS/PE to work with AGWPE

No changes are needed in your [cables](#), [windows setup](#), and [AGWPE program settings](#). They are the same as for other applications.

1. Install and configure [Delorme Street Atlas](#) and verify that it works normally.

2. Download and install APRSplus and KipSS/PE:

- **APRSplus** files can be found at the TAPR site: <ftp://www.tapr.org/aprssig/winstuff/aprsplus/>

The main APRSplus installation file usually has a name like APRSPLUS2xx.zip.

APRSplus documentation

- From the same TAPR directory also [download KipSS/PE](#) (don't confuse it with the similarly named KipSS.zip.) KipSS/PE is a middleware program that connects the TCP/IP interface of the AGW Packet Engine to the TCP/IP interface of APRSplus. In effect, KipSS/PE makes APRSplus "think" it is receiving data from from a TNC instead of a TCP/IP source or LAN. (APRSplus can do this in addition to connections from a "real" hardware TNC and/or Internet connections. Part of APRSplus' confusing complexity is its incredible versatility!)

Unzip **both** zip files into the same directory on your computer. After you do that, run the [Setup.exe](#) program in the directory to initialize and install APRSplus.

3. Configure KipSS/PE

- For future convenience, first create a Windows shortcut to [KipSS/PE.exe](#) on your desktop.
- Start AGWPE.
- Now start KipSS/PE. A dialogue window will open that looks similar to this:

KipSSpe

KipSS/PE

Exit ID Disconnect

PE Close Settings> 127.0.0.1:8000

Transmit Demo> TEST-1>APKISS,RELAY/1::ALL :This is a test for port 1 {1

Transmit Demo> TEST-2>APKISS,RELAY/2::ALL :This is a test for port 2 {2

Received Data

W6JPL-2>APRS/1:13403.08NN11815.40w#PHG5580/A=001100/JPLARC/Downtown LA

Transmitted Data

WA8LMF-15>APS199,WIDE2-2/1:>190312z[199Y0]Kenwood TM-211, Comet SB14 and KAM at home

Digipeat Functions

Do not Digipeat

Digipeat My Alias

Digi Local Wide

Digi All

IP Address

127.0.0.1

Close TCP/IP

Auto-Start

Allow Monitor-only connections

Connections

WA8LMF-15

Callsign

wa8lmf

Alias

RELAY

- Don't worry about the values in most of the fields. Just make the following changes:
 - At the bottom of the window, for the **IP Address** choose **127.0.0.1**.
 - (If you have a network address, you could perhaps also use that. Just make sure the address you enter in this field is same the address you enter in APRSplus (below).)
 - Insert your callsign into the **Callsign** box in the lower right corner.
 - Check the box for **Auto-Start** to open the TCP/IP connection to AGWPE automatically whenever KipSS/PE starts.
 - Now click on the **Open TCP/IP** button below the **IP Address** box.
 - Then, at the top of the window, click on the **Open** button to the left of **Settings>**.

After you press the buttons, they should say **Close TCP/IP** and **PE Close**, respectively, as in the picture above.

Is it working? At this point, you should be able to see packet data appearing in KipSS/PE's **Received Data** window whenever you hear packets bursts from the radio's speaker or see the radio's BUSY indicator/"S" meter light up or see the little green pixel in the AGWPE modem icon  in the System Tray.

Likewise, you can test transmitting by pressing one of the **Transmit** buttons and checking to see if your radio transmits. The info in the **Demo>** field should be duplicated in the **Transmitted Data** field and your radio should transmit.

KipSS/PE Program Notes: As you'll learn, the labels on the KipSS/PE button tops **do not indicate current status**, but instead show what the setting will change to when clicked, so **PE Close** on the button **means** it is currently in the **PE Open** state and

clicking on the button will close it.

Also note that some of the Windows controls for KipSS/PE program do not follow convention. For example, clicking the  button in the upper right corner of the window **does not** shut down the program. It only minimizes it into the system tray where the KipSS/PE icon ("KISS" in Morse code)  will appear. This is how you will probably want to run the program -- with the dialogue window closed and only the program icon showing in the system tray. To recall the KipSS/PE dialogue window, just click on the system tray icon .

To truly shut down the program, use the **menu bar** and select **Exit**. When you exit, all your settings will be saved, although **if you did not** check the "auto start" checkbox, the next time you start KipSS/PE you will have to press both buttons.

4. Configure APRSplus

Remember: You must obtain a registration number for APRSplus from Brent, KH2Z, before you can run APRSplus with KipSS/PE and AGWPE.

There are multitudes of setting screens and options in APRSplus, so I can't tell you how to configure APRSplus entirely on this page (see instead the unofficial [APRSplus documentation](#) web site). But here are the key settings for working with KipSS/PE and AGWPE:.

A. From the **menu bar** at the top of the main APRSplus screen, click on **Setup** . Make sure that the following settings are entered:

B. On the **Main Parameters** tab, insert a **callsign**, your **registration number** (include the dashes between numbers), and your latitude and longitude.

C. On the **Program** tab, check mark the **version** of Street Atlas you are using. If you don't, APRSplus won't be able to start Street Atlas automatically.

- On the **Internet** tab, the items in the bottom **Interlink** section should look like the following:



APRS Plus

APRS+Street Atlas Setup

File Edit Commands Points

Main Parameters | Profile | Sounds | Lists | Internet | Program | Data

Proxy Manual

Server

IP Address

Gate INC data stream to Internet

Gate Messages from Internet to Local RF Stations

Heard within 2 digipeater Hops

Heard within the last 8 Hours

Channel Filler Posits Only Path>

IGATE Path>

Substitution

InterLink

Link-1	<input type="text" value="7301"/>	<input type="text" value="127.0.0.1"/>	<input type="button" value="UDP-Close"/>	<input type="text" value="7301"/>	<input type="text" value="127.0.0.1"/>
Link-2	<input type="text" value="7302"/>	<input type="text" value="127.0.0.1"/>	<input type="checkbox"/> Open KipSS on startup		
Link-3	<input type="text" value="7303"/>	<input type="text" value="127.0.0.1"/>	<input type="button" value="KipSS-Close"/>	<input type="text" value="127.0.0.1:7301"/>	<input type="button" value="▼"/>

(If your PC has an IP address assigned to it by networking software or a cable modem or DSL, it may have a different IP address to the right of the **Link-1** and **UDP-Open** buttons. If so, that's OK; leave them as they are.)

-  Check the **Open KiSS on startup** if you want APRSplus to automatically open a connection to KipSS/PE when it starts. (Alternatively, you can leave it unchecked and start the connection manually in APRSplus by using the **Commands** menu option and selecting **KipSS Connect**.)
-  In the field to the right of the **KipSS-Open (Close)** button, enter **127.0.0.1:7301** (or the IP address you may have entered in the KipSS/PE field for **IP Address**).
-  Leave "as is" the values to the right of the **Link-1, - 2,-3 and UDP-Open (Close)** buttons. They are not important for KipSS/PE connections.
-  Save your setting by using the **File: Save** (or **Save As**) option in this window to save your **Setup.reg** file in APRSplus' **Data** folder.



Now click on the **KipSS** button until it says **KipSS-Close**. This will open the link to KipSS/PE.

Program Notes: As with KipSS/PE, the labels on the button tops are **not** "current status" indicators. Instead, the button shows what the setting **will change to** when the button is clicked; so when it says **KipSS-Close** on the button, it is currently in the **KipSS-Open** state and will close if you click on it.

- You can also configure APRSplus to connect to an instance of AGWPE running on a different computer on your home network or any where on the internet. [See the AGWPE Over a Network page.](#)

5. Getting it All to Work

To make it all work, first start the AGW Packet Engine, then KipSS/PE, and then APRSplus. After the three programs have started, you should see 4 icons in the **system tray** at the bottom of your screen:



The icon with two towers and the icon of a TNC are created by AGW. The icon showing a stack of dits and dahs (Morse code for KISS) is created by KipSS/PE. The inverted triangle is created by APRSplus.

Now, in APRSplus, choose **Commands** and then select **Start Street Atlas** to start Street Atlas. (You can also right click on the APRSplus system tray icon to call up the **Commands** menu.)

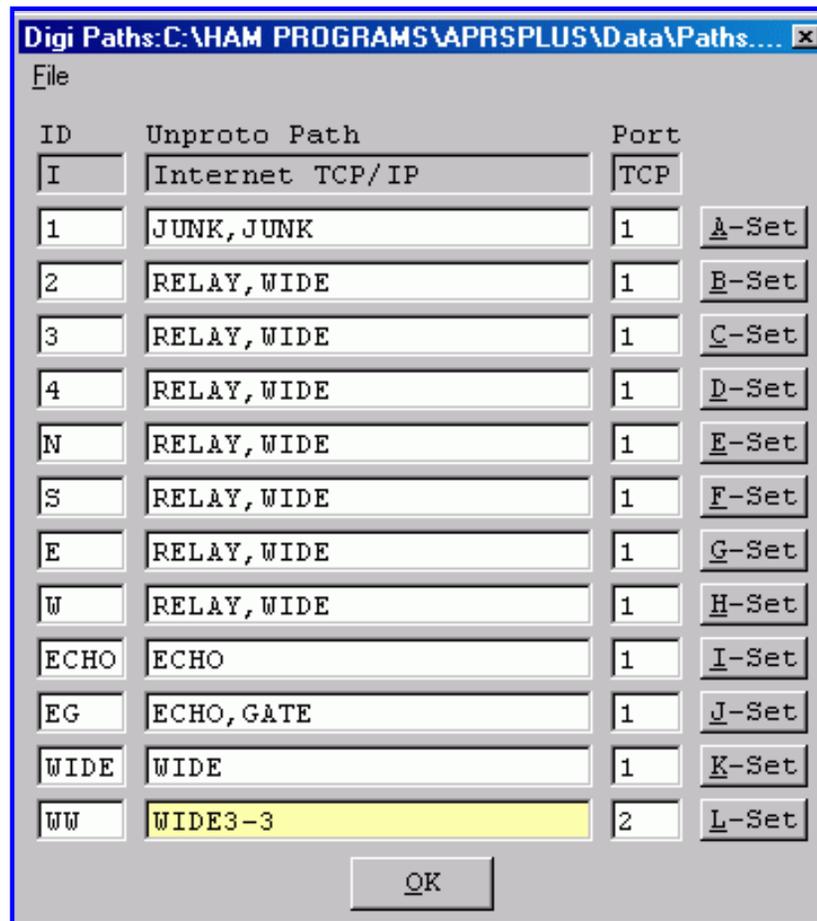
If you did not select the "auto start KipSS" function, use the **Commands** menu (Alt+C) to select **KipSS Connect**.

If your radio is on, the cables are attached, and the Volume Control settings are correct, you should start to see station icons in the APRSplus **Positions** window and then eventually in Street Atlas (depends on what timing interval you chose for writing the APRSplus overlay file to Street Atlas; see the **Maps** tab and the second field to the right of the **1- All Reports** field).

6. Settings for 2 Radios

Use the **Commands: Unproto Paths** menu option (or Ctrl + Shift + U) to call up a list of UI paths. By default the TCP port for all path choices is set to 1, i.e. AGWPE port 1/radio 1. To use AGWPE port 2/radio 2, pick an unused line and change the TCP port to 2; you can also edit the path to one of of your choice.

Now press the **Set** button to the right of the path and port you want to use. **That line will then be highlighted in yellow to indicate it is the active path/port.** Press the **OK** button.



7. Automate the Entire Startup Process via AGWPE

Want to get the AGWPE program to automatically start KipSS/PE and then APRSplus when AGWPE finishes loading? Here's how:

Locate the file [AGWPE.INI](#) in the AGWPE program directory.

Open the file in the Windows [Notepad](#) or any other ASCII editor and add the following paragraph to the bottom of the file:

```
[RUNPRG]
RUN0=C:\APRSplus\KipSS/PE.EXE
CMD0=0
RUN1=C:\APRSplus\APRSPLUS.EXE
CMD1=0
```

Note: Be sure to edit the file paths in the instructions above to match the drive and directory where you have installed the KipSS/PE and APRSplus programs.

Then save the file and close the editor. This automated process will begin the next time you start AGWPE.

8. Troubleshooting APRSplus specific problems:

- **To see if AGWPE and KipSS/PE are working together**, start AGWPE and then KipSS/PE (without starting APRSplus). Assuming that **AGWPE** is working correctly and receiving packets, you should see packet data appearing in KipSS/PE's **Received Data** window whenever you hear packets bursts from the radio's speaker or see the radio's BUSY indicator or "S" meter light up or see the little green pixel light up in the AGWPE icon  in the System Tray.
- **To see if APRSplus and KipSS/PE are working together**, transmit your status or position from APRSplus. Use the APRSplus **Send** menu option or **Ctrl-P** or **Ctrl-S**. Your position or status packet should then appear in the **Transmitted Data** field in **KipSS/PE**. (If they don't, go to the "transmit" troubleshooting hint below.)
- **To see if APRSplus and Street Atlas are working together**, temporarily use either an internet connection or TNC instead of AGWPE to receive packets and display them in Street Atlas. If you can't do that, at the very least, APRSplus should be able to "beacon" your position and icon and they should display in Street Atlas.
- **Firewall problem?** Remember that KipSS/PE will be using both IP port 8000 -- to talk to AGWPE -- and port 7301 -- to talk to APRSplus. (8000 is the default ports for AGWPE; you can change it in AGWPE. I think KipSS/PE's port link to APRSplus is hard coded as 7301 and can not be changed.)

If you encounter difficulties with the programs connecting to KipSS/PE, then your firewall program may be blocking access to one or both of these ports. You will need to configure the firewall program to allow open access to these ports. (How to do that is beyond the scope of this web site; consult the documentation for your firewall program.)

- **Problem: I can't Transmit from APRSplus. I tell APRSplus to send a packet and I can see that the packet made it to the "Transmitted Data" field in KipSS/PE, but the radio doesn't key up even though KipSS/PE is sending and receiving data from AGWPE and AGWPE is successfully transmitting data from other programs.**

Solution: The port settings for the Unproto Paths in APRSplus is wrong. It may be set to **0** or it may be set to an AGWPE port that is attached to a different radio. Pick a different UI path or change the path's port number:

In APRSplus, use the **Commands: Unproto Paths** menu option (or Ctrl+Shift+U) to call up a list of UI paths. Press the **Set** button to the right of a suitable path which uses the AGWPE port and radio that you want to use; or edit an existing entry to create a path of your choice and the AGWPE port of your choice and then press the **Set** button.

- Note that Windows **Systems Resources** are an issue for Win95/98/ME users running APRSplus. If your system resources get too low (below 25%?), you may encounter unexpected errors in APRSplus and your **Setup** values may become corrupted. You can check your current **System Resource** level by going to the Window's **Control Panel** and selecting **System** and then the **Performance** tab.

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WinFBB and AGWPE on Windows XP

WinFBB is F6FBB's popular packet Bulletin Board System (BBS) software for Windows. WinFBB is not capable of linking **directly** to AGWPE, but it can link to AGWPE using the TF2AGW utility written by Pedro LU7DID.

Art Bertheaume N9ZZK kindly provided these instructions for setting up everything in Windows XP. If you plan to install WinFBB, print out this page for reference since you will be rebooting at least once.

[F6FBB Software](#)

[F6FBB Doc's](#)

The installation procedure below pertains to running a F6FBB Bulliten Board on Windows XP only. Installation procedures differ with earlier versions of Windows. The installation calls for F6FBB, version E. Do not try to substitute other versions of F6FBB with these instructions. At the conclusion of this installation procedure, your BBS will have one RF port that will access your TNC via AGW. You must have AGW installed and running correctly. This procedure does not address AGW installation and configuration.

- I. To begin, your computer will need to be prepared by setting a PATH statement. Follow these steps to accomplish:
 - a. Open Windows Control Panel
 - b. Double click to open the "System" icon
 - c. Click on the "Advanced" tab
 - d. Click on the "Environmental Variables" button
 - e. Highlight "PATH" in the "System Variables" area. Once highlighted, click the "Edit" button
 - f. Very carefully, insert the following text at the end of the existing PATH statement. Note the leading semi-colon. It is needed to separate your existing PATH statement from the text you are adding.

```
;C:\FBB;C:\FBB\BIN;C:\FBB\SYSTEM;C:\FBB\SYSTEM\WP
```

- g. Click "OK" to save your changes and exit the Windows/System area

- II. Create a temporary download folder. Download the F6FBB 7.00e software into this file by visiting the download section at www.F6FBB.org or by clicking the links for direct access to the five needed files

- a. File download site in 3.5 disk format from F6FBB.org
[Disk 1](#) [Disk 2](#) [Disk 3](#) [Disk 4](#) [Disk 5](#)

or

- b. download from this Sound Card Packet web site:

[Disk 1](#) [Disk 2](#) [Disk 3](#) [Disk 4](#) [Disk 5](#)

- III. Create another temporary folder to unzip your download too. It is from within this folder you will begin the installation process.
 - a. Example: C:\FBBTEMP
- IV. Create a folder C:\FBB
- V. Unzip your downloaded files in numerical order into your C:\FBBTEMP folder. When extracting files contained on disk 5, you will be prompted to overwrite existing files. Please do so.
- VI. You are now ready to begin the installation process. Navigate to the C:\FBBTEMP folder. Locate the INSTALL.exe file and launch it. Do not launch the INSTALL32.exe at this time. You will be prompted to install the 32 bit components during installation.
- VII. During the installation process, you will be prompted to install the 32 bit operating components, please do so now. You will also be prompted to configure your BBS parameters. Click "YES" to begin the configuration process.
 - a. The first of eighteen set up screens address identity and location. You must use a unique Call sign/SSID combination that is not in use with AGW. It is also beneficial to set your H-route to reflect your geographical area. An example for Northwest Illinois would look like this: #NWIL.IL.USA.NOAM. If you have other operating BBS's in your area, consult with the Sysop for a recommended H-route setting.
 - b. Screen two and three can be left at their default values.
 - c. Screen four addresses Sysop call sign and name, self explanatory. Insert your call sign in the "SysOp msgs to" field. Leave the "WP msgs via" blank until you establish yourself into a forwarding network.
 - d. Screen five and six sets parameters for first time Users and Users that have registered with your BBS. To begin, leave all fields unticked.
 - e. Screen seven will address Sysop security for those users you have "flagged" as Sysops. Tick "SYS command allowed" and "Remote Sysop commands. Leave all other fields unticked.
 - f. The eighth screen address security privileges after successful entry of assigned password. The settings are at your discretion as to what privileges you will grant your co-sysops. You will have full Sysop privileges from the BBS console regardless of what you set these options to.
 - Refer to C:\FBB\System>Password.sys for details regarding passwords.
 - g. Screen nine address various administrative messages your BBS will produce. If you will be forwarding into an established network, you may wish to untick the bottom two fields.
 - h. Forwarding protocols are set in screen ten. Tick the top four fields. Ticking "Forwarding only from declared BBS" will keep unauthorized stations from forwarding into your BBS. If ticked, you must "flag" your forwarding partners as a BBS.

- i. Screen eleven addresses miscellaneous settings. Untick "Test mode". You might want to consider ticking the "Users must give information" option as well. Ticking that option forces users to provide information about themselves the first time they connect to your BBS. They will be prompted to provide their name, QTH, Zip code, and Home BBS information.
- j. Screen twelve, thirteen, and fourteen can be left at their default values at this time.
- k. Set your UTC offset in screen fifteen. Default values for the remaining fields are acceptable.
- l. Leave screen sixteen at default values.
- m. Screen seventeen will set your com port and interface. Cycle through all of the radio buttons for each com port and insure they are set to "none". Now tick the radio button for Com8. Check the radio button for the TFWIN interface. This sets a virtual com port for FBB to interface with AGW.
- n. The last screen to deal with is the Port configuration.
 - i. Tick Port 1
 - ii. Choose Com 8 from the drop down menu
 - iii. Choose MUX 0 from the drop down menu
 - iv. Set Nb ch to 8
 - v. Set Paclen to 236
 - vi. Set Max Blk to 10
 - vii. Set Maxframe to 7 or less
 - viii. Set FWd min to 0, (thats a zero)
 - ix. Set Nb Fwd to 1
 - x. Set Fwd per to 30
 - xi. Tick the WA8DED radio button
 - xii. Tick the User radio button
 - xiii. Ui List, Yapp, Gateway, and RD-Only are optional settings
- o. Save your configuration edits and exit, the installation process will continue.

- VIII. When the installation process is complete, navigate to C:\FBB\UTIL. Select all the files in the folder. copy all the files to C:\FBB\BIN.
- IX. While in the C:\FBB\BIN folder, right click on file "RunFBB32.exe and choose properties. Click on the compatilby tab. Tick the "Run this program in compatibility mode". Choose "Windows98"
- X. This completes the installation process of F6FBB. However, several files packaged with the original download of F6FBB are outdated and will need to be replaced. The files to be replaced:
 - o C_filt32.dll
 - o TFwin32.dll
- XI. A replacement C_Filt32.dll is available from the download secton at www.CX2SA.org, or by clicking this link:
 - o [C_Filt32.dll](#)
 Unzip this file directly to C:\FBB\BIN. Overwrite the existing copy of the file.

XII. Replacing TFWin32.dll is a bit more involved. You will need to create a temporary directory and download the TF2AGW package from LU7DID. You can access LU7DID's web page by clicking [HERE](#). Alternatively, you can download the package directly by clicking [HERE](#)

- a. After downloading and unzipping the package, move the TF2AGW.ini file into your C:\WINDOWS directory
- b. Copy TF2AGW.dll into your C:\FBB\BIN directory Now rename TW2AGW.dll to TFWin32.dll. You will be prompted to overwrite an existing copy of the file. Select "Yes" when prompted. Once the remaining is complete, COPY the new TFWin32.dll file to your C:\WINDOWS\System32 directory. When complete, you will have a copy of the file in C:\FBB\BIN and C:\Windows\System32.
- c. Creating TSTHWIN.prt and configuration
 - i. Create a folder C:\TSTHWIN
 - ii. Create a second folder inside of TSTHWIN, Name this folder "System. (ie:C:\TSTHWIN\System)
 - iii. Create a new text document in C:\TSTHWIN\System. Name this text file TSTHWIN.prt.
 - iv. Enter the following text in the newly created text file. If you intend on having more than one AGW port available to your F6FBB, edit the 3rd digit to reflect the number of ports you will be using.

```
# TYPE: 4=TF2AGW.DLL for AGWPE driver
# Port: Ignored, use 0
# NumInterface: Set the number of tnc running
under agwpe engine
#
# tfwin/tf2agw example : 4 0 1
#
#
4 0 1
```

This concludes the set up of your BBS. After a computer reboot, it will be ready to "go on the air". When your computer has finished rebooting, start AGW and then click Start/http://www.kc2rlm.info/programs/FBB for Windows/WinFBB32. With F6FBB being the active application on your desktop, hit your "F5" key. Doing so will open a monitor window. If the installation was successfully installed, you will see text and data flowing in the monitor window indicating such. Test your set up by opening the FBB gateway via the F9 key. Attempt to connect to any station and monitor your TNC. The TX LED should indicate that the TNC is transmitting.

You may wish to clean up files created during the installation process by deleting the C:\FBBTEMP folder and the folder that contains the zipped files at this time.

73 and good luck!!

Art, N9ZZK



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THTHWin and AGWPE

1. Download and install the [TSTHWIN](#) program into a [TSTHWIN](#) folder,

2. download a special AGWPE driver from this site:

<http://www.qsl.net/lu7did/bin/tf2agw/tf2agw18.zip>

3. In that zip file, you will find a [TF2AGW.HTM](#) file which says do the following:

- UnZip the distribution file [TF2AGWnn.ZIP](#) (nn=version) into a temporary directory of your choice, e.g. C:\TEMP
- Move the TF2AGW.DLL file from the temporary directory to the [C:\WINDOWS\SYSTEM](#) directory.
- Then copy the [TF2AGW.INI](#) to the [C:\Windows](#) folder.
- If necessary, edit the [TF2AGW.INI](#) file in the [C:\Windows](#) folder. Look for this entry:
[IP_ADDRESS=nnn.nnn.nnn.nnn](#) , where [nnn.nnn.nnn.nnn](#) is the IP Address of the machine where AGWPE is running. If AGWPE is running on the same machine as [TSTHWIN](#), leave the entry as [IP_ADDRESS=127.0.0.1](#) . Otherwise determine the AGWPE machine's IP address with the Windows's [WINIPCFG](#) utility and use that address.

4. From the TSTHWIN\EXAMPLE folder,

- copy the TSTHWIN.CFG file to the TSTHWIN \SYSTEM folder. Then edit the copy in TSTHWIN \SYSTEM folder: insert your callsign in place of any NOCALL entries that you see (I saw 2 places). (Note: There is much more you can/ should edit or delete to make TSTHWin work as you would like, but those changes are not important for running the program with AGWPE. See the TSTHWIN "help" file for more info.)
- copy the TSTHWIN.PRT file to the TSTHWIN \SYSTEM folder. Then edit the copy in TSTHWIN \SYSTEM folder (according to the instructions in the TSTHWIN 'Help' file), so that the the last line of the .PRT file reads:

4 0 1

where 4 is to use the TF2AGW.DLL driver; 0 is for TSTHWin to ignore the com port; and 1 is the number of AGWPE radioports you have (change if necessary for your situation).

Note: If you are running Win2000, the Windows directory referenced above becomes "C:\WINNT", not C:Windows. Also, rename two files :

TF2AGW.DLL to TFWIN32.DLL
TF2AGW.INI to TFWIN32.INI



Sound Card Packet

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AGWPE and Airmail

Airmail (<http://www.siriuscyber.net/ham/>) is a software program that is used in the WinLink amateur radio messaging system <http://www.winlink.org> to send messages via packet to the internet. (Airmail can also send messages to the internet using PACTOR III.)

Airmail by itself does not support AGWPE (at least not as of June 2008), but Brian Smith KG9OG has come up with additional software to enable Airmail to work with AGWPE (or PE Pro). An additional benefit of using this method is that you will be able to monitor all packet traffic on the frequency, using the AGWMonitor program with AGWPE (or the monitor function of the PE Pro software).

The following instructions apply to version 3.3.081 of Airmail working with AGWPE (or Packet Engine Pro) and Windows XP, 2000 and Vista 32-bit (Vista 64-bit is untested). They were written by Gary Harrison, N7XOO on January 9, 2008 and edited by Don Felgenhauer, K7BFL on April 29, 2008:

The purpose of this process is to enable the Airmail software “Packet Client” module to work with most any sound card device or TNC that can be placed in the KISS mode, providing your computer's CPU is quick enough for AGW and has enough buffer memory to handle the demands of Airmail.

This configuration requires the addition of two additional pieces of software, each approximately 3M in size. Both are freeware. The following assumes that you already have AGW working well on your computer.

1. Download, unzip, and install the “Airmail to Packet Engine” program (AMPE), AMPE162.zip. The link to the AMPE program (written by Brian Smith KG9OG) is <http://www.qsl.net/mararc/ampe.htm> (also available here on this Sound Card Packet web site but it may not be the most recent version)

After installing, read the excellent "Help" file and

look for the Startup Command string. An Example would be: C:\ampe\AMPE16.EXE MYCALL,1, TRUE,8000,8100 where MYCALL is the call you are using for AirMail, and "1" is the AGW Port you are using.

If a shortcut for AMPE is not on your desktop, create a shortcut on your desktop to AMPE16.EXE. Then edit that shortcut, by right clicking, selecting "Properties" and then on the "Shortcut" tab in the "Target" box add the information as above, substituting the call you are using in AirMail for MYCALL, click Apply and then Ok. (NOTE: Be sure to add a space after AMPE16.EXE before entering the first letter of MYCALL).

Another alternative... AGW Packet Engine or AGW Packet Engine Pro may also be used to define the Command String. Within AGW... Setup...AutoStart....ampe16.exe the Startup Command String would be "MYCALL,1, TRUE,8000,8100"

2. Download and install the Lantronix CPR (Com Port Redirector) version 3.1.0.4. The link to the Lantronix file is: <http://www.lantronix.com/ftp/redirector/3.1.0.4/red32bit.exe> (also available here on this Sound Card Packet web site).

Be sure to use the 3 version; the 4 version doesn't seem to work for this application. The purpose of this software is to enable you to create a "Virtual Com Port" on your computer (with a number that is not already being used), and to "re-direct" that Virtual Com Port to the actual Port number (1, 2, 3, etc) that you have previously configured as part of the AGW software. IGNORE all the install and setup error messages when installing on Vista 32-bit. The program will still install. Unblock ports in any Windows Firewall messages.

3. Reboot the computer.
4. Open the Lantronix Com Port Selector Program and click the "Com Setup" button Select a com port number that is not used by your computer. Click the Port settings box and check "Raw", click the "Add IP" button and enter

127.0.0.1 for Host and 8100 for Port. Click “OK” and then click “Save”. IGNORE any setup error messages when installing on Vista 32-bit.

5. **Reboot Again.** The Lantronix software will now be running in the background. Verify the existence of your new “Virtual Port” by looking at Control Panel.... System...Hardware...Device Manager....Ports. NOTE: For Vista 32bit, Device Manager will not show the Virtual Com Port, but it IS operational.
6. **Configure AirMail Packet Client** to use the virtual com port you set up in the Lantronix CPR and choose KAM+ for the TNC. You may not really be using a KAM+, but that's what is recommended for a choice. [The actual interface with your TNC is determined by the port settings in AGW.]
7. **Close AirMail and edit the Airmail.ini file** Backup your airmail.ini file; then do the following editing. Within the [Packet Client] section “comment out” lines by inserting a semi-colon at the beginning of these lines. See the Example below. Note that in this example COM12 is your “Virtual Port”; not the com port of the device you will actually use. All other settings remain the same, just add semi-colons starting with Tx Delay and ending with Packet Length.

```
[Packet Client]
DecoderType=KAM+
Port Settings=COM12:9600,N,8,1
Show Link Messages=1
;Tx Delay=600
;Persistence=64 ;
Slot Time=300
;Max Frames=2
;Frack Time=6000
;Max Tries=10
;Response Delay=2000
;Check Time=30000
;Radio Baud=1200
;Tx Level=500
;Packet Length=120
;Tx Delay 2=600
;Persistence 2=64
;Slot Time 2=300
;Max Frames 2=2
;Frack Time 2=6000
;Max Tries 2=10
;Response Delay 2=2000
;Check Time 2=30000
```

**;Radio Baud 2=1200
;Tx Level 2=500
;Packet Length 2=120**

Save and Close the airmail.ini file.

- 8. Start AGWPE, then AMPE, then AirMail; then start the AirMail Packet Client Module. You should see a pop-up message from the Lantronix Com Port Redirector, and then in the Packet Client window it should say "Packet initialized OK".**

You should now be up and running. When you click "Connect"; AirMail will be using the port and device you have configured in AGWPE (or AGW Packet Engine Pro).

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Last Updated: 08/11/2008

 **KipSSpe**

KipSS/PE x

Exit ID Disconnect

PE Close Settings> 127.0.0.1:8000

Transmit Demo> TEST-1>APKISS,RELAY/1::ALL :This is a test for port 1 {1

Transmit Demo> TEST-2>APKISS,RELAY/2::ALL :This is a test for port 2 {2

Received Data

W6JPL-2>APRS/1:!3403.08NN11815.40w#PHG5580/A=001100/JPLARC/Downtown LA

Transmitted Data

WA8LMF-15>APS199,WIDE2-2/1:>190312z[199Y0]Kenwood TM-211, Comet SB14 and KAM at home

Digipeat Functions <input type="radio"/> Do not Digipeat <input checked="" type="radio"/> Digipeat My Alias <input type="radio"/> Digi Local Wide <input type="radio"/> Digi All	IP Address	Connections	Callsign
	127.0.0.1	WA8LMF-15	wa8lmf
	Close TCP/IP <input checked="" type="checkbox"/> Auto-Start		Alias
	<input type="checkbox"/> Allow Monitor-only connections		RELAY



APRS Plus

APRS+Street Atlas Setup [-] [□] [X]

File Edit Commands Points

Main Parameters | Profile | Sounds | Lists | Internet | Program | Data

Proxy Manual

Server

IP Address

Gate INC data stream to Internet

Gate Messages from Internet to Local RF Stations

Heard within 2 digipeater Hops

Heard within the last 8 Hours

Channel Filler Posits Only Path>

IGATE Path>

Substitution

InterLink

Link-1	<input type="text" value="7301"/>	<input type="text" value="127.0.0.1"/>	<input type="button" value="UDP-Close"/>	<input type="text" value="7301"/>	<input type="text" value="127.0.0.1"/>
Link-2	<input type="text" value="7302"/>	<input type="text" value="127.0.0.1"/>	<input type="checkbox"/> Open KipSS on startup		
Link-3	<input type="text" value="7303"/>	<input type="text" value="127.0.0.1"/>	<input type="button" value="KipSS-Close"/>	<input type="text" value="127.0.0.1:7301"/>	<input type="button" value="▼"/>

APRS+Web Server

Port

URL

Reconnect on Program Startup

Start Web Server on Program Startup

Port 1 Closed Port 2 Closed

Digi Paths:C:\HAM PROGRAMS\APRSPLUS\Data\Paths... x

File

ID	Unproto Path	Port	
I	Internet TCP/IP	TCP	
1	JUNK, JUNK	1	A-Set
2	RELAY, WIDE	1	B-Set
3	RELAY, WIDE	1	C-Set
4	RELAY, WIDE	1	D-Set
N	RELAY, WIDE	1	E-Set
S	RELAY, WIDE	1	F-Set
E	RELAY, WIDE	1	G-Set
W	RELAY, WIDE	1	H-Set
ECHO	ECHO	1	I-Set
EG	ECHO, GATE	1	J-Set
WIDE	WIDE	1	K-Set
WW	WIDE3-3	2	L-Set

OK