

Technical Standard

Standard Sound Card Packet Configuration

1. Introduction

To permit packet operation without an external Terminal Node Controller (TNC), software has been developed to allow personal computers (PC) equipped with a sound card to be used for packet communications. In an effort to provide a standard configuration that can be supported by Gwinnett Amateur Radio Emergency Service® (ARES®) personnel and to provide simplified installation instructions, this Technical Standard has been developed to provide a consistent configuration and installation procedure.

The original documentation is 169 pages long and provides comprehensive documentation that can be used to supplement these instructions. The location of this document is provided in the References Section.

2. Responsibilities

The Assistance Emergency Coordinator (AEC) for Digital Communications is responsible for this document and providing technical support to members installing the standard software configuration defined in this Technical Standard. The AEC for Digital Communications is also responsible for coordinating updates to this document as configuration improvements are made or as new software becomes available that enhances Gwinnett ARES® packet operations.

3. Related Publications

TS 2-2 Packet Parameter Configuration

4. Definition of Terms

AEC Assistant Emergency Coordinator

AGWPE SV2AGW Packet Engine

ARES® Amateur Radio Emergency Service® (ARES® and Amateur Radio Emergency Service® are registered service marks of the American Radio Relay League.)

PC Personal Computer

SSID Secondary Station Identification

TNC Terminal Node Controller

5. Standard

The software configuration uses software written by George Rossopoulos, SV2AGW, called AGWPE (AGW Packet Engine). The software has been in development and refined for some time and provides a stable operating environment.

5.1. Software Installation

The AGWPE software should be installed in a directory created by the user in their Program Files that they provide a unique name. It may be desirable to name the directory so it tells the version of AGWPE in the directory, i.e., AGWPE15204. You can then create a shortcut for the executable file that you can place on your desktop.

When starting AGWPE, a temporary display will appear on the display. This disappears after a moment. The running icon is displayed in the executing program display on the lower right of your display. To access various functions, click the icon that appears to be two radio towers with a modem in between.

5.2. Software Configuration

Make sure AGWPE is running before you start your terminal program. You can use the Startup Programs feature in AGWPE to start the terminal program if you desire. Click the AGWPE icon in the lower right portion of your display to access the various configuration options.

Be sure to configure AGWPE as follows:

- Under Properties, define the sound card interface. As currently structured, only port zero (0) is supported. This is listed as Port 1 in AGWPE Properties display. Under Tnc Setup you will Select Port the com port to be used for controlling the transmit function of your transceiver should be selected and under Tnc Type select Sound Card. You can then name the port under Tnc RadioPort and indicate zero (0) under Ports Kiss Id. Also, select Single Port. Default values can be used on the other parameters: BaudRate – 9600; Mode – KISS Simple; and ExitKISS On Exit checked. Under TNC Commands, you may need to adjust the TXDelay for your particular radio if the initial packet transmission occurs too quickly for the radio to enter transmit mode. A value of 100 is being used for optimum performance in the Gwinnett ARES® system.
- Under Setup Interfaces: verify that Enable Winsock TCP/IP Application Interface is checked and the default TCP port is 8000.
- Under SoundCard Modem/TCP Setup, uncheck FullDuplex Driver. Also make sure the OnAir BaudRate is set for 1200 and the default Soundcard Clock is set to four (4). Under SoundCard Selections, you should see the soundcard you are using indicated.

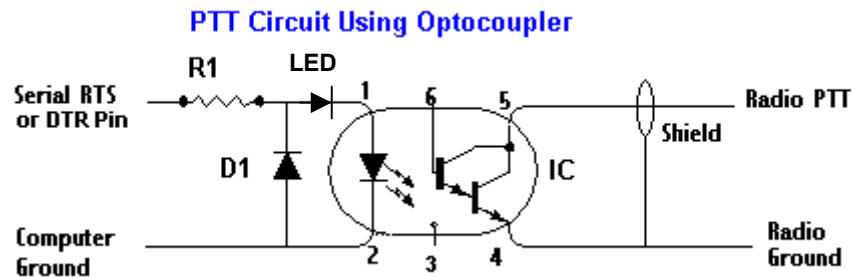
One feature available using AGWPE is being able to connect to those using AGWPE using the stations Alias. It is anticipated that during emergency operations, tactical callsigns will be assigned to each location. As long as these callsigns fit the criteria of being a maximum of six characters in length, plus the Secondary Station Identification (SSID) if desired, they can be used as callsigns.

The terminal program can be placed in the “Startup Programs” list of AGWPE so the terminal program automatically executes when AGWPE is started.

5.3. Radio Interface

The preferred method of interfacing a computer using a sound card with the user’s radio includes complete isolation between the computer and radio. Simple, inexpensive circuits are presented in the following sections to provide this interface.

5.3.1. Transmitter Keying



D1 – 1N4001 or similar diode

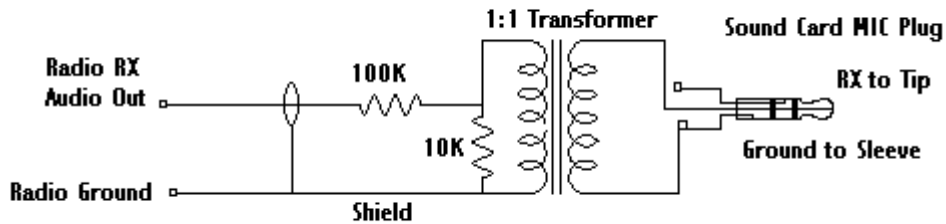
IC – 4N33 Darlington output optoisolator or similar

LED – general purpose LED to indicate transmit

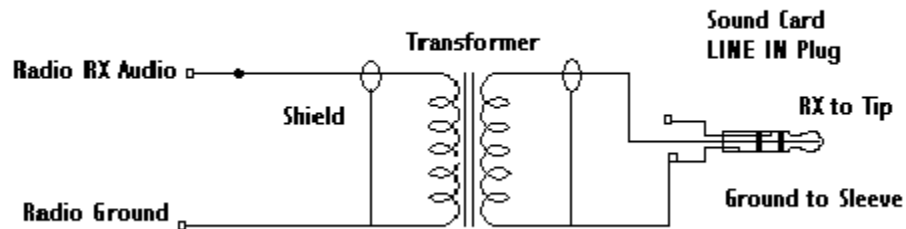
R1 – typically around 470Ω ¼ watt (verify using voltage levels on

5.3.2. Receive Audio

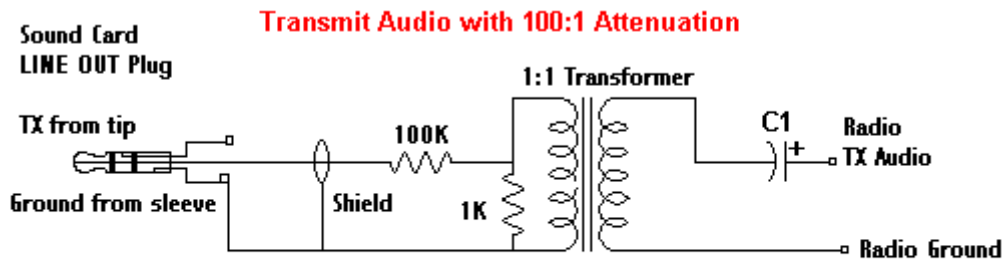
Receive Audio to Sound Card MIC Jack with 10:1 Attenuation



Receive Audio to Sound Card LINE IN Jack



5.3.3. Transmit Audio



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

C1's value can be a 2.2 – 4.7 ufd 35VDC electrolytic capacitor. If used for the transmit keying line, a resistor is placed between the Radio PTT output of the optoisolator and the Radio TX Audio of the transmit audio circuit. This may require some experimentation to determine the appropriate value.

5.4. Setting Audio Levels

Setting the audio levels between computer and radio are critical to proper operation when using AGWPE. An alignment procedure was developed by Steve Rowand, KC4COJ, and has been used successfully:

1. Transmit level is set very low, Sine Wave on Soundcard tuning aid on AGWPE set extremely low, only showing a few bumps. This may vary depending on the interface characteristics. (Being able to use a deviation meter to check transmit level is very helpful.)
2. Receive level on Sine Wave set quite high with no flat topping.
3. Turn any noise reduction (DSP) and/or automatic noise limiting OFF if features of radio.
4. Set the "Activity level" in the Packet Client to x3. (In low activity, messages should complete with the default values.)

5.5. References

Operators of a packet station should have the instruction manual for their packet station components available for reference.

Horzepa, Stan, WA1LOU, *Practical Packet Radio*, ARRL, 1995-1998

Milnes, Ralph, KC2RLM, *Sound Card Packet*,
<http://www.patmedia.net/ralphmilnes/soundcardpacket/>

6. Release Information

Stan Edwards. WA4DYD, Emergency Coordinator, is the author of this document. The AEC for Digital Communications will be responsible for maintaining this document.

The date of publication for this document is May 30, 2005, and is the initial release.