

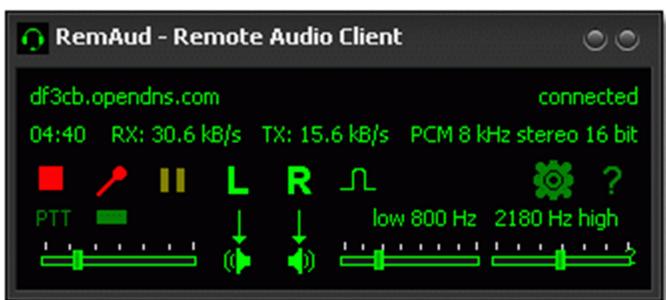
# REMAUD Stream Live Voice over IP

The Application REMAUD was written by Bernd Koch DF3CB and is considered copyright material.

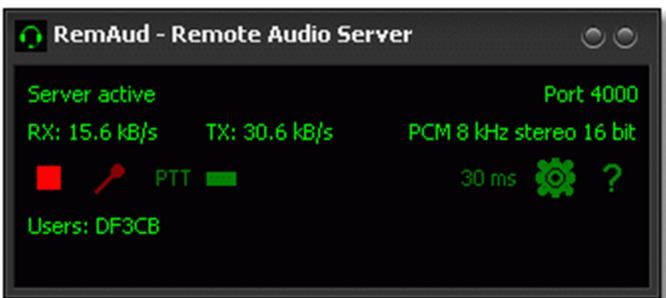
This basic user documentation was written by W3GAS with no intent beyond advising setup and use.

**RemAud** is a Voice over IP (VoIP) application primarily designed for two-way amateur radio remote control over the Internet. **RemAud** uses streaming-audio technology in a client/server architecture. It features high radio sound quality, (6 KHz) low latency, low bandwidth and very low CPU usage. **RemAud** uses the **TCP** protocol for an easy installation behind routers and firewalls. More than one user can connect to one server. Your radio audio is broadcasted to all connected users. However, **RemAud** was not intended to be a VOICE CHAT application.

*REMAUD is a shareware application donations are accepted. If you use this application on a regular basis may I suggest you offer a [donation](#).*



The REMAUD client.



The REMAUD server.

If you visit the REMAUD website, you will be introduced to the main page with a simple set of choices in TAB format across the top of the main page. The [DOWNLOAD](#) tab will take you to the DOWNLOAD page.

Here you will download the latest installer (release 1.9).

After you download the application, you may install it by simply clicking "RUN" and allow the installer to complete its business. This will not take long. You will see two new icons on your desktop.

Once the program is installed, both CLIENT and SERVER can be accessed and executed.

Before you execute you must read the document located under the [CONCEPT](#) tab on the REMAUD website. This "white paper" will give you the authors application concept and where REMAUD evolved from. Pay attention to the "latency"

paragraph.

**If I may**, oblige me as I add some additional input here...latency is an issue that frustrates many of us. We think real-time so we expect real-time analog results from a digital application. In most all cases that is not possible. The fastest computer on the planet cannot overcome latency. It exists because real time is an analog” function of the universe. The light you see from the Sun must travel 93 million miles before it reaches the Earth. It is not real time. In fact the light we see is actually about 8 minutes old.

So the idea that latency is a “strict” time elapsed issue, well that is not the truth. The reality of “latency” is a multi-level concept that includes time/distance and electrical signal conversion. That conversion is analog to digital and back to analog. Our ear can hear digital signals, but the ear cannot convert the data. We need an ADC device controlled by a processor that stores and retrieves the raw data. Then we need a DAC device to restore that data back to an audible signal our ear can hear and our brain can process. These devices are DIGITAL SIGNAL PROCESSORS and they consist of hardware and software.

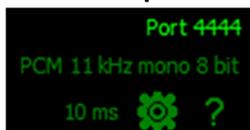
Such DSP devices work as fast as they are designed to go, but no matter, there is a certain amount of latency in the process.

**As we continue on**...we add another level of latency. We know that time and distance are a property of latency, but let us say the microphone circuit you are using is connected to an analog preamplifier and that device is input to the DSP device before it is sent to the WAN (wide area network). We will generate some LATENCY within REMAUD itself. If you have a standard multi-core processor with a basic amount of memory and an on board sound card, chances are your computer is adding to the result. REMAUD is a conversion process and the faster the CPU the faster the process is completed. That said, if we add a parallel processor to handle the SOUND, we will also speed up the process since the sound card is the ADC device that is going to sample your audio. The faster the device samples the audio, the faster the process. Now, lets us pass the RAW DATA to our IP address and send it to the ROUTER...if we do this as fast as possible, say 100 Mbps, we can speed up the process. If the ACCESS POINT ROUTER is connected to a HIGH SPEED service provider we can expect a faster process...but only if the ISP UPLOAD speed is at least 100 Mbps. Download speed is worthless during the STREAM process.

**The Internet protocols** we use to stream include TCP where reliability is required...UDP where speed is a factor. VOIP uses the UDP protocol. In easier to understand terms UDP (User Datagram) the header is smaller than TCP (transmission control) and error checking is not priority...there will be one packet, if you don't get that packet...tough shit!! But it gets the job done...it will stream VOIP as fast as possible. Again...fast is irrelevant. From your ACCESS POINT to your ISP, add upload time to the distribution system, or UPLINK ROUTER, perhaps up to a satellite and back to ground base, back to the ISP and back to your ACCESS POINT, the local MODEM/ROUTER and to your NIC interface. Remember, this all has to be processed through your FIREWALL and PORT FORWARD settings must be configured properly.

Ok...done...now you understand, but if you don't get it, there is a lot of information on the Internet to help you along...especially if you are not familiar with the PORT FORWARD process.

### Let us set up REMAUD...



Let us start by “double clicking” on the SERVER APPLICATION. If the FIREWALL warning appears you must prepare the FIREWALL to give REMAUD client access to the program. Set the FIREWALL to allow access to “public” networks.

The dialogue box appears...click on the “configuration” button; just left of the “?” mark. This will bring up the “Settings” panel. In the SERVER MENU, set the port you intend to use to stream your audio. I chose 4444.

Set the Auto Start server "on". Now the REMOTE USERS settings from the menu. Create a common password "ABC12345abc". Use at least 10 characters. Set the USER NAMES. Remember to add your name to the list. Yes, you can create "nicks" for these login scripts.

Now check to see that your audio device is set properly...use the default LINE IN and SPEAKERS out. Do not concern your settings for CODECS or BUFFERS at this time. You should see the RED SERVER ACTIVE indicator..."no users connected". You can let the server run now.



Now "double click" on the CLIENT...*I suggest you use another computer to run the CLIENT TESTS.*

The dialogue box appears...click on the "settings" button. In the GENERAL MENU set the "Audio Server Playback" "on". Now click the REMOTE CONNECTION menu. You want to establish a "Remote Connection". To do this, "click" NEW HOST. Now give the HOST a name. Set the DDNS or the GLOBAL IP of the SERVER. You will also set the HOST PORT (4444). You will now set the USER NAME and the PASSWORD you created for the SERVER. The other MENU items can be left alone for now. You will now click the PLAY BUTTON .

Looking at the SERVER dialogue box you should see the connection and you should hear the AUDIO from the SERVER. This is audio that has been input at your SOUND CARD LINE IN.

*You are basically set to go, but you must set your router PORT FORWARD address to allow the computer to stream the VOIP.*

**Setting the router:** Go into the PORT FORWARD section of your router. Set the local IP of your computer to establish a connection. If you set the COMPUTER to 192.168.1.150, then look for that device in your router network device panel. If it is not there, you must go back into NETWORK PROPERTIES and set the IPV4 address properties correctly.

Obtain an IP address automatically

Use the following IP address:

IP address:	192 . 168 . 1 . 200
Subnet mask:	255 . 255 . 255 . 0
Default gateway:	192 . 168 . 1 . 1

This would include local IP, subnet mask, default gateway.

Look carefully at the IPV4 properties to the left. These are the basic settings for a static IP setup on your computer. Always use this setup when possible and be sure to give each computer a different IP Address, but always 192.168.1.nnn...

In your router PORT FORWARD settings...give that local IP your blessing...set it to forward UDP/TCP (both) protocols. DESTINATION PORT = 4444, LISTEN BOTH -> ANY PORT -> 4444. See your router manual PORT FORWARD instructions on setting the perimeters for your hardware

If all has gone well...you should see the connection made to the server and hear audio. You can look at the [DOCUMENTATION](#) tab on the REMAUD website, however this will not help you if you have PORT FORWARD issues. However the documentation page on the website will help you better understand the full functions of REM AUD, both the CLIENT and the SERVER. <http://df3cb.com/remaud/documentation/>

**To check your FORWARD SETTINGS start here:** <https://portforward.com/>

There is a wealth of information here...

NOTES: