

OMNI-VII - One Plug Interface Lessons Learned Revision 1.000



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Preface

This document is designed to consolidate several lessons learned when trying to use the OMNI-VII in remote mode with the OMNI-VII One Plug computer program. Given that the source code for the One Plug program is made public under the GNU Public License, this document will only cover using the One Plug program made by Ten-Tec, Inc.

There are several topic areas covered by this document, and is meant to be a supplement to the UDP588 Users Guide. All of the cases identified in this document are based on steps taken at customer's locations. Some were done in order to resolve an issue. Some were done to improve the audio quality.

Can't get clear audio reception when RIPing, it stutters

There are several things that can cause audio stutter. Radio Over IP (RIP) is a real-time communications method. This means that it doesn't follow the same methodology as Windows Media Player or other "media players". Typical Media Players buffer the data far enough in advance, that hiccups in the World Wide Web (WWW) aren't that noticeable. In a real-time environment, such as when two hams are sending CW, this "delay" would not be tolerable. Therefore RIP has only very minimal buffering as is required to buffer up the audio, send it across the Ethernet, and a receive buffer on the other side, to decode for playing on a sound card. Any glitches that occur in real-time, due to a loaded Local Area Network (LAN), or your own computer trying to access the Internet may affect the quality of RIPing.

The same approach that is followed by VNC and SKYPE for having "real-time" communications is followed by the One Plug / OMNI-VII setup. Hams have run comparison tests to show that the audio sent and received by both methods is comparable in timing and quality. The "stutters" may not occur at the exact same times, but they do occur as frequently in one method as the other.

There are several things that can be done that can help reduce this stuttering effect, and those are listed below:

First, Make sure you are running the latest software available

Make sure that you are always running the latest revision of both the One Plug GUI and the firmware for the OMNI-VII itself. Improvements in both the One Plug program and the OMNI-VII firmware have been made between versions 1.001 through 1.008 that have improved the quality of the remote audio.

Test the "setup" with a cross-over cable right next to the OMNI-VII

The very first thing to do is control the OMNI-VII with One Plug locally using a cross-over Ethernet cable. It will help test the "setup" much better than if the OMNI-VII is operated remotely. It will build a firm grip of understanding the OMNI-VII and what it is doing before being hundreds of miles away.

Doing this will help in understanding controls and settings for different modes. For example, it will help you determine if you need to leave the computer's Mic Boost setting on or off. It will let you learn how the remote CW system really works, when to use the PC Sidetone versus the OMNI-VII Sidetone. The benefit of having a Mic vs. Line Input selection on a "remote" OMNI-VII so that you can use "Mic-Gain" for a gain setting you want to use in one operating instance, and a "Line Gain" for a gain setting you want to use in another operating instance.

The most important things that this will resolve are resource contention issues one may have with the computer you want to run One Plug on. Most customers immediately respond back, "Well, my computer

ain't got no problems, its perfect, runs smooth and fast". Just because you don't see any issues downloading web pages and viewing "media player" videos, doesn't mean your computer will handle real time communication as is required in the One Plug OMNI-VII setup. A lot of Windows programs today are actually started automatically in the startup of Windows. Adobe Reader, AOL Dialer, Windows Speech Processing, etc., there are dozens that load up, and many of them utilize resources that slow down any type of Internet connection. This will happen even though you aren't connected to the Internet.

If you connect a crossover cable directly between the computer and the OMNI-VII then you should never see packet error counts and PC drop counts above 5%. Most customers so far have found these to be less than 1% when connected with a crossover cable, and then usually identical numbers when connected to their LAN. If you do see errors above 5% or so, then you have an issue to resolve. You can do this test without even having the OMNI-VII set up for real over the air reception or transmission. Just set it beside the computer, connect the crossover cable directly, then run One Plug and start RIPing. If you want to really hear some audio, then connect an antenna and tune around to an AM broadcast station, and listen for the stuttering effect. When error rates are less than 5%, it is very seldom that you will notice any stuttering at all.

If you are getting error rates above 5%, then watch the rate at which the errors are coming in. If the number of errors seems to be increasing steadily, then you may have a problem with the physical Ethernet crossover cable you are using. Check the cable and connections. Cable quality will also affect the Ethernet connection. Use a high quality Ethernet cable.

PKT Drops refers to packets that the PC never saw. Each packet has a counter, and each one should be 1 greater than the previous. When the PC software sees a packet count that is incorrect, it assumes that the packet never made it to the computer and was lost somewhere en-route. This could be due to the network card, or a host of other reasons. This could also be the case when you have a program that is trying to do a lot of network interfacing, such as searching for an update for Adobe, checking mail, etc.

PC Drops refers to packets that the PC did get, but didn't have enough time to process before the next one came in. Meaning that it didn't have time to transfer it from the Ethernet to the sound card. This usually means that something else is running that is eating up your computers CPU processing time, and the computer is getting behind in throughput of audio.

On the computer, check to see what other programs you are running at the same time as the One Plug program. Turn off anything you can. Including automatic updates during RIPing, because it eats up network time that will kill both One Plug and SKYPE interfaces. Also, turn off all other programs that automatically check the network, or are running anyway, email programs such as Thunderbird or Outlook periodically eat resources, etc. All of the above issues affect One Plug just as adversely as it would VNC and/or SKYPE.

Task Manager is good to find these, but unless you know what you are doing in Task Manager, don't attempt it.

Its a good thing to make sure you do the typical maintenance tasks on your computer that should be done weekly, such as defragging, using Ad-Aware or another such spy-ware program to look for and clean out advertisement loggers, keyboard loggers, spy-ware, etc. A 486-based computer running Windows 98SE runs with < 5% cumulative error counts when all the problem software is removed.

You can use programs like Stinger, SPYBOT, AD-AWARE, or AVG Anti-Spyware. Don't run them in the background/always checking. Only run them on demand once a week. Get the downloaded updates and run them, and you will likely find that each one detects SpyWare or Ad Trackers that eat up your networking performance.

A few Wide Area Network Changes that have helped

In some instances, it may be the fact that your local ISP just won't be able to support this type of real-time communication. An example is a satellite customer whose connection is super fast, but so unreliable that it drops packets quite a bit. Yet another satellite customer down the road using a different ISP has no problems at all.

Usually, there is something you can do to improve performance. One piece of advice! Check with your ISP, and let them know what you are doing, and they may suggest tweaks to your DSL or cable modem to make things more reliable. Tweaks known to make a difference include:

PPPOE

Enabling PPPOE was suggested to one customer and he now has fairly reliable communications. This setting resides in your DSL or cable modem. Do not do this yourself unless you know what you are doing. Ask your cable provider for assistance. Most are very willing to walk you through this over the phone. And in some instances, they will suggest a different setting.

Pings

Enabling Pings was suggested to another customer and he now has reliable communications. Most modems are set up to not answer pings. This is a security feature that will help prevent hackers from finding your modem, and if they can't find your modem, then they probably can't hack past it. It was suggested for this mode to enable PINGs on the modem. If you have only the OMNI-VII after it, then it probably doesn't hurt to enable it. It is not known why it actually decreased packet losses, but it did. Especially since none of the One Plug -> OMNI-VII protocol utilizes pings.

It is suggested that you don't do this by yourself unless you know what you are doing. Ask your ISP for assistance. Most are very willing to walk you through this over the phone. And in some instances, they will suggest a different setting.

Setup Problems, not Connection Problems

Sometimes you get great receive audio quality through RIPing, but your transmit quality isn't that great. You still get stuttering through transmit. Sometimes it is just a matter of you overdriving the input of the OMNI-VII through the remote side, causing the audio to get distorted, and with some DSP features, this will end up causing a stuttering effect.

This is the primary reason for first testing your setup with the PC using a crossover cable to the OMNI-VII. Issues like this can be worked out easier there, and the solution may be to simply lower the mic gain, or to turn off mic boost in the PC, or even to switch to a different mic.

One Plug Execution Problems

A few customers have pointed out problems that have prevented them from using the One Plug computer software on their computer. Here are some of those resolutions:

Improper version of DirectX – Error Code 429 related

If you get an error code 429, one possible solution is to re-install Direct X. The installation can be downloaded from Microsoft at:
<http://www.microsoft.com/windows/directx/default.msp>

This was found on a couple computers to resolve the error code 429 issue and a couple of other error codes. By re-installing DirectX, the computer's registry for DirectX was repaired, and also the working DirectX components were re-installed. Microsoft indicates that this error was usually attributed to a computer whose registry got corrupted and the DirectX keys or entries were changed.

Re-Registering SCRRUN

On some installations of VISTA and on some installations of XP, the Scripting run time libraries are not properly registered. To remedy this you need to re-register scrrun.dll.

This is done by the following:

- 1 – Click “START”
- 2 – Click “Run...”
- 3 – Type in regsvr32 scrrun.dll
- 4 – Click OK

You should see a popup message stating that “DllRegisterServer in scrrun.dll succeeded.”

This resolved an error on one XP computer and a different error on a VISTA computer.

Visual Basic Run-Time Libraries

On some installations of the Visual Basic Runtime Libraries are not installed or have been corrupted. For a Visual Basic program, this is like having an American Express card. Don't leave home without.

The Visual Basic Run Time Libraries can be found at Microsoft.

Re-Registering dao360.dll

On some installations of VISTA and on some installations of XP, the data access objects are not properly registered. To remedy this you need to re-register dao360.dll.

This is done by the following:

- 1 – Click “START”
- 2 – Click “Run...”
- 3 – Type in regsvr32 dao360.dll
- 4 – Click OK

You should see a popup message stating that “DllRegisterServer in scrrun.dll succeeded.”

Re-Install Windows

Most programs that you install on your computer will enter items into your registry, or they will add new components to the Windows operating system. When you uninstall them, sometimes they can remove files or registry entries that other programs may need. With continual adding and removing programs over the years, the registry or downloaded components can put windows into a state where items that One Plug needs are either damaged or are now missing. The only way to recover from this is to re-install Windows. It is highly recommended that you not do this, but if it is required, then I'm sure dozens of other programs will not work, or will not work properly, or be very slow. Actually, Microsoft suggests that you re-install windows once a year to clean out the registry of unused keys and to make sure that the Windows components are reloaded. They said the main reason for this is when people uninstall programs that they accidentally end up removing components that other programs still need. THIS SHOULD BE DONE AS A LAST RESORT!

Dynamic IP addresses

The main concern people have at the moment relates to how do they know what IP address to type into the One Plug program to connect to the OMNI-VII if they have a dynamic IP at the DSL modem/cable modem where the OMNI-VII is.

If there is also a computer already connected to the modem, then it is easy to find out.

If you have a shack with a DSL modem connected directly and only to the OMNI-VII, and the modem has a dynamic IP, how do you find out what it is?

At the moment, there isn't a simple solution to this. Unless like others, you buy a cheap laptop or computer and set it up with an IP monitor that tells you somehow, either via email or?? psychic? or?

We suggest you try the following:

1 - static IP, but make sure that you have the firewall set up in the modem properly.

Several that have done this already, and it is working fine for them. Not all ISPs provide this though, and some can get costly. But most are \$20 per month. To some, this is dimes, to others, well, it isn't cheap.

2 - get a cheap computer to monitor the IP

But this is expensive, right? Not as much as you think.

One person bought a used laptop from eBay for \$250 and now has it running a \$9.95 program from:

<http://www.guldendev.com/?display=dynamicipmonitor>

If the IP address changes, it emails him what the new address is. One user has it email his Blackberry when the IP changes. He always has his Blackberry with him and gets an email about this once every couple of days.

It can be done! A few of the current customers installations

One customer has his OMNI-VII at his shack, which is over 100 yards away from his home. He has a couple of wireless repeaters going up the hill from his house to his shack. In his home, he has a DSL modem, with a wireless router inside the home for his two children and wife to use to connect with their associated computers, and a wireless game port connect to a Playstation 2.

He uses a Pentium class notebook. He has done SSB while his son was playing an online game through his Playstation 2, and didn't notice any delays that were long enough to make the communications bad, and at no time were his packet errors above 5%. He was in Japan while his shack was in the U.S.

One customer uses it while he is traveling as a guitar player for a band. He has his rig in his cabin, and uses a laptop on the road. He has upgraded to a higher speed cable modem at the cabin, and enjoys the rigs CW capabilities.

One customer lives in Canada and utilizes a DSL modem, that connects to a router, that goes wireless to the rest of his house. He has a wireless receiver connected to the Ethernet port on his OMNI-VII. He has successfully had clean communications with the rig in multiple modes from home and while on the road in Canada and in the U.S.