Setting up RadioSky Spectrograph (RSS) Software to Stream Data

There are several configurations of Modems and Routers – they may be separate boxes, or both located in a single box. They reside between the Wide Area Network (WAN), often called the Internet, and the Local area Network (LAN) – your home computers and other devices. This writeup will focus on separate units for the Router and Modem (Fig 1) but the principles apply to whatever configuration you may have. In any case you will need to access both the router and modem thru the web browser interface in your computer.
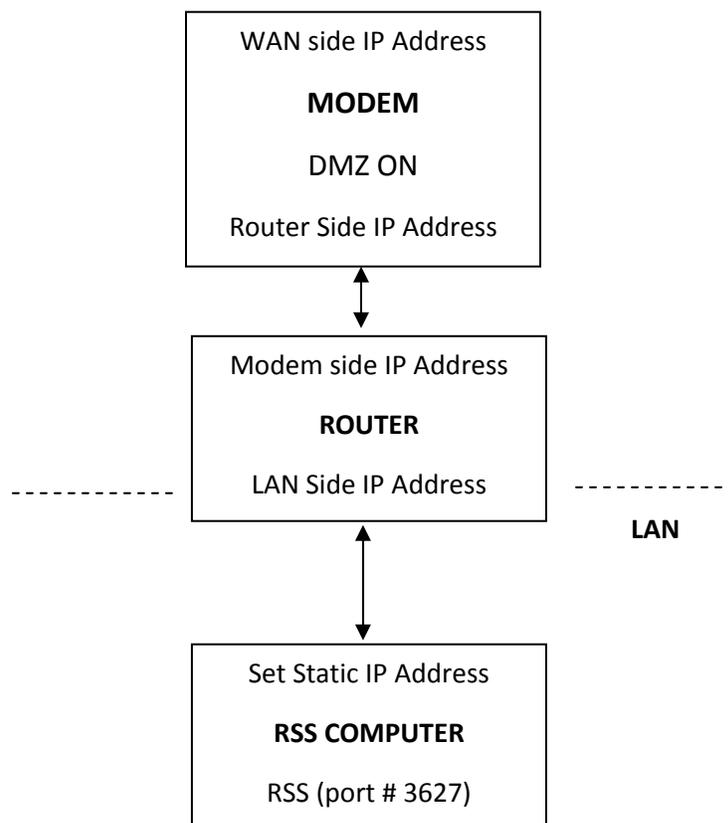
WAN side IP Address

MODEM

DMZ ON

Router Side IP Address

Modem side IP Address

ROUTER

LAN Side IP Address

LAN

Set Static IP Address

RSS COMPUTER

RSS (port # 3627)

Fig 1

The process of getting your FSX up and running and serving is almost as easy as A, B, C

A. Establish a static IP address on the RSS computer

B. Set router with the RSS computer static IP address and RSS program port number.

C. Set the modem to enable the DMZ feature for the router (this step may not be needed)

How many IP addresses do my modem and router have?

More than you probably think. Each device has two that we are concerned with. The router has a LAN side IP Address and a modem side IP address while the modem has a router side and a WAN side IP.

Static or Dynamic IP address for RSS?
IP addresses can be either static or dynamic. Dynamic IP addresses can change frequently.
To stream data from the RSS computer you need to establish a static IP address for that computer and then set up your router so that it has the correct LAN side IP address for your RSS computer and also the correct port number.

The procedures for doing this are similar but not identical for different Windows operating systems. Two examples are given – one for Windows XP, the other for Windows 10.

Can I have some computers with Static and some with Dynamic IP addresses together on the same LAN?

If you have several computers on your LAN it will not cause a problem to configure one (or more) with a static IP address while the other computers have a dynamic IP address. The other computers will still be serviced properly by the DHCP server in your router. The DHCP (Dynamic Host Configuration Protocol) server hands out dynamic IP addresses of its choosing to the various devices on the LAN. The router will accept a static IP address for one or more devices. For RSS to operate properly we need to assign a static IP to the RSS computer and in addition set up the Router with the port number associated with RSS (also called port forwarding).

How can I talk to my router?
From your computer, you need to access your router settings. Many routers use a LAN side IP address of 192.168.001.001, so this is the number you would type into your browser (Fig 2).
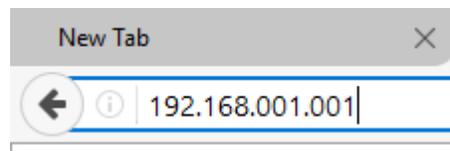

Fig 2

Most likely your router will ask you to log in with a username and password. Consult your owner's manual if necessary to complete this step. Once you are logged in your router should respond with, depending on make and model, a window that will permit you to make changes to the router itself.

The range of dynamic IP addresses

As a general guideline you want static IP addresses to lie outside the range of dynamic IP addresses being used by the DHCP server. This means you should determine (or set) the range of dynamic IP addresses in use by the DHCP server in the router and then make sure that the static IP address you choose for the RSS computer is not inside that range.

Write down the range of dynamic IP addresses and the static IP address you choose. You will need the static IP address later in this set-up.

Caveat: Avoid using a static IP address ending in .0 or .255 (most often not valid) and avoid using a static IP ending in .1 or .254 (commonly already in use by your router or gateway).

Note: IP addresses do not need leading zeroes in the "dotted quads." That is, 192.168.001.001 is equivalent to 192.168.1.1.

Dynamic IP Address range

Start _____ . _____._____ . _____

End _____ . _____._____ . _____

Static IP _____ . _____._____ . _____

OK – now you have selected it you are ready to set up the static IP address on the RSS computer. The procedures for doing this are similar but not identical for different Windows operating systems. Two examples are given – one for Windows XP, the other for Windows 10.

For Windows XP go to pages 4 & 5.

For Windows 10 go to pages 6-8.

A. (Windows XP), Establish a Fixed IP Address for the RSS Computer

Go to: Control Panel>Network Connections>Properties>Internet Properties (TCP/IP)

In the Local Area Connections Properties dialog box (Fig 3) select Internet Protocol (TCP/IP) and then Properties.

In the Internet Protocol Version 4 (TCP/IP) Properites window Select "Use the following IP address" and enter your chosen static IP address (Fig 3).
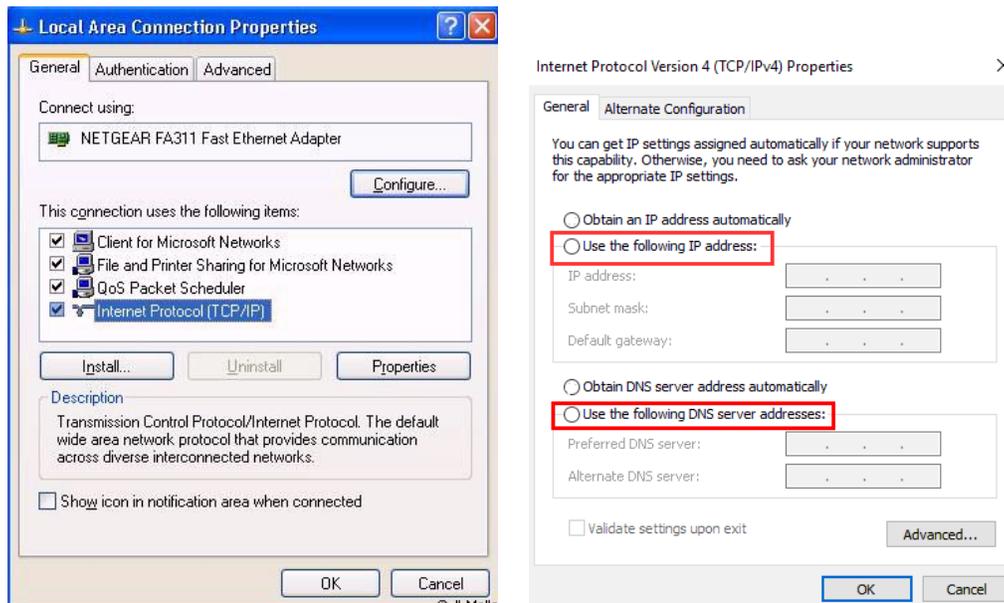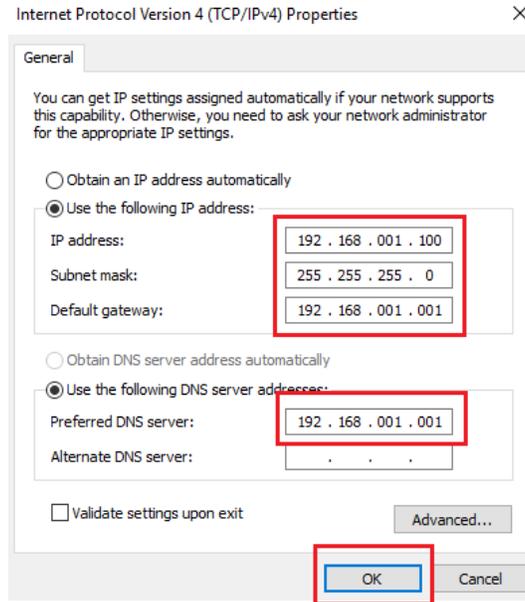

Fig 3

The Subnet mask should fill automatically.

Enter your router LAN side router IP address (probably 192.168.001.001) for the Default gateway.

Select "Use the following DNS server addresses" and again enter your router LAN side IP address as the Preferred DNS server

Skip to Section B, page 9.

A. (Windows 10), Establish a Fixed IP Address for the RSS Computer

In the **Control Panel** find the **Network feature** (Fig 4). Navigate your way to the "**Adapter Settings**" (the exact path may vary depending on the version of Win OS you are running)..
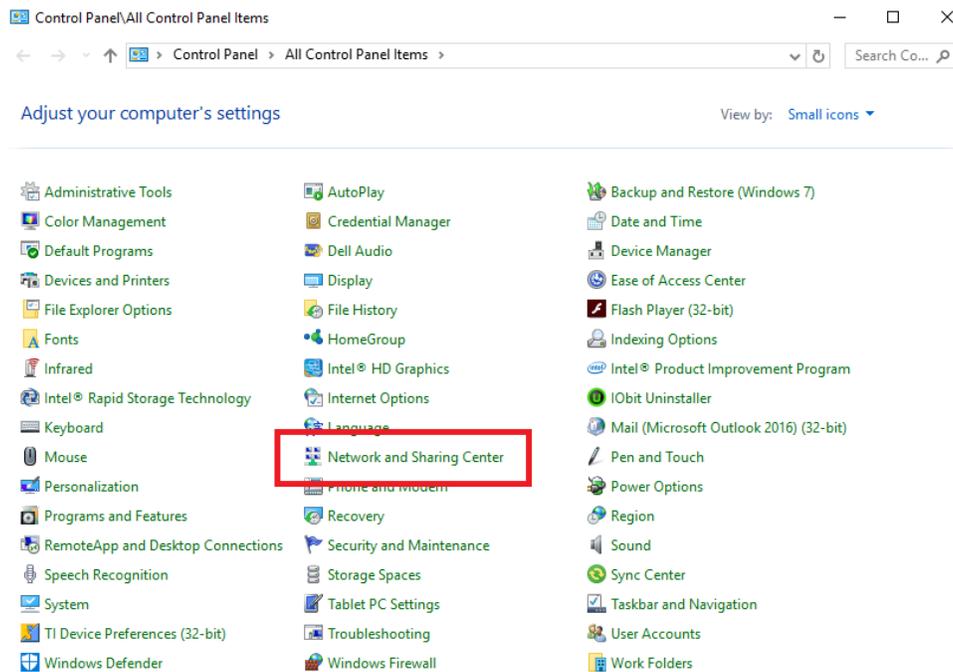

Fig 4

Locate the **Ethernet Properties** (Fig 5) dialogue box, and right click **Internet Protocol (TCP/IP)**. Again, depending on what WinOS you're running, the wording might be slightly different, but select the one that says TCP/IP. In Win 10 and possibly Win 8, **do NOT select the one that has Internet Protocol Version 6 (TCP/IP). Select <u>Internet Protocol Version 4</u> (TCP/IP) and press the Properties button.**
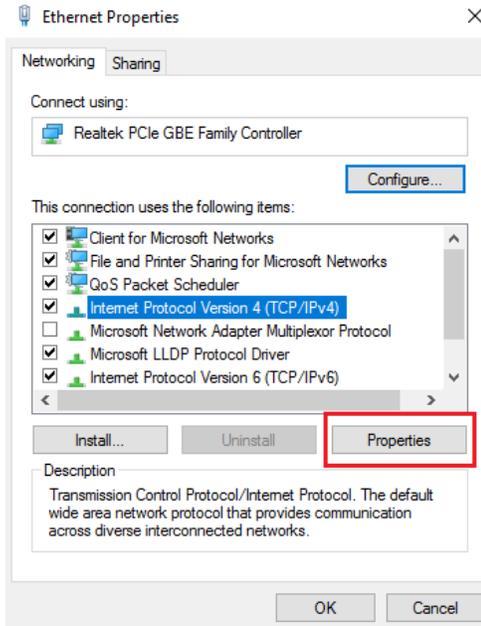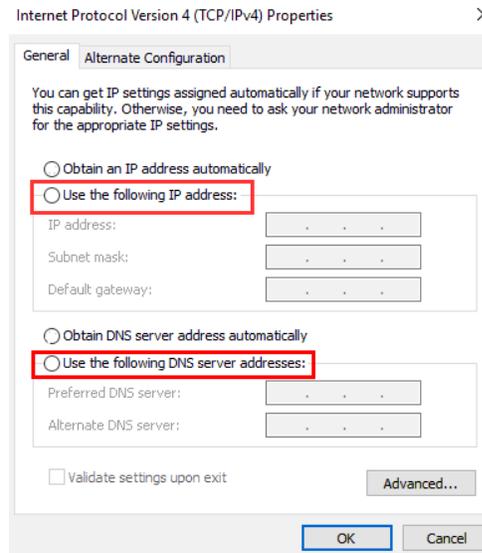

Fig 5   **Fig 6**

In the Internet Protocol Version 4 (TCP/IP) Properties dialog box (Fig 6) , you will need to check the **Use the following IP address**. When you do, the grayed out boxes below it will become active and you will be able to insert numbers.
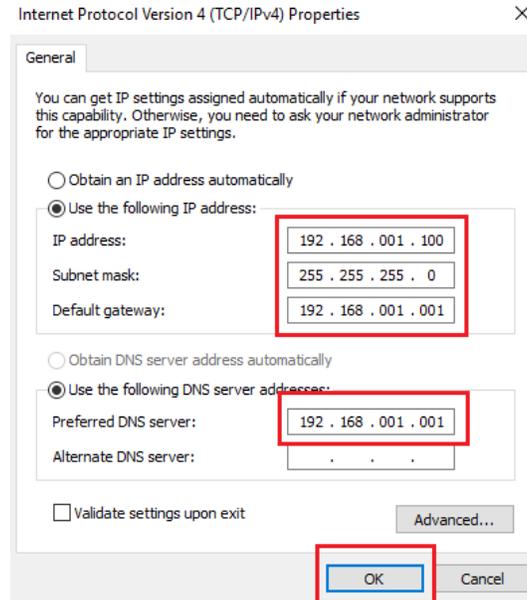
Fig 7

Enter the Static IP address you selected previously. (in this example 192.168.001.100 as seen in Fig 7.

Select "Use the following IP address" and enter your chosen IP address.
The Subnet mask should fill automatically.

Enter your router IP address (probably 192.168.001.001) for the Default gateway.

Select "Use the following DNS server addresses" and again enter your router LAN side IP address as the Preferred DNS server

Click OK and the window will close and you'll be back to the Ethernet Properties window. Close that window. You're done with this part. Your RSS computer static IP address is set.

B. Set Router With RSS Computer IP Address and RSS Program Port Number.

<u>By default, RSS is set to stream data on port 3627.</u> That's the port number you will enter in the router along with the associated static IP address.

Log into your router using your computer browser and navigate to the window called **<u>Port Range Forwarding</u>**. An example Linksys Port window is shown below (Fig 9). Various models will look different. Sometimes it will just be called **<u>Port Forwarding</u>**.
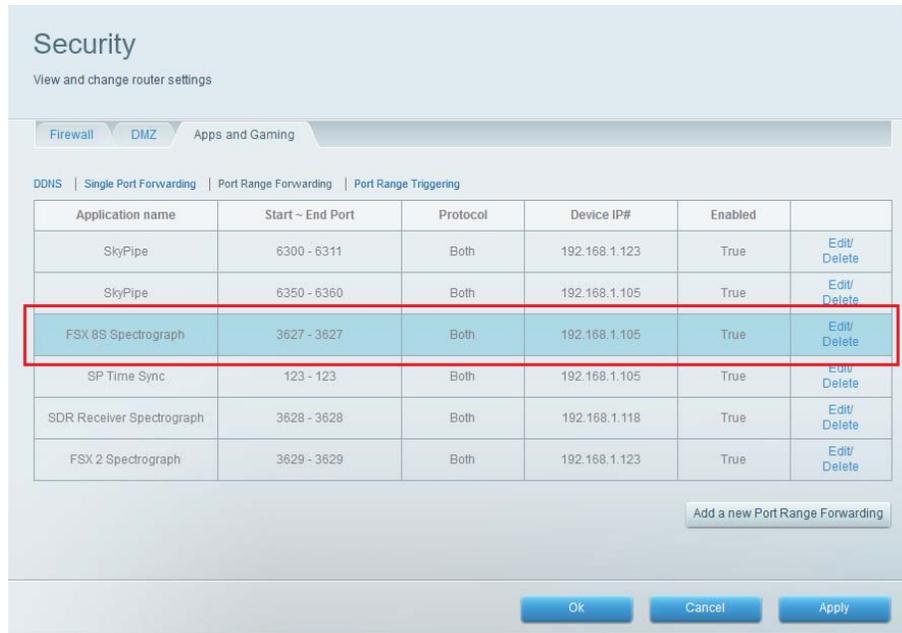
Fig 9

In this example, for the FSX-8S Spectrograph, the name has been typed in so settings are recognized as being associated with that spectrograph. For this make and model Linksys router, it's necessary to select **Edit**, then enter the information. **Start – End Port** will be the port RSS is set up for. In this case, **3627, entered as 3627-3267.**. **Protocol** will be **Both**. This might vary with the router. If there are two selections there rather than the word **Both**, select them both. Enter the **IP Address of your RSS computer. Whatever IP Address you entered in the Internet Protocol box earlier, you enter here**. If you entered **192.168.001.100** in that box you will enter **192.168.001.100 here.** (In this example, the user entered 192.168.001.105.) You will need to **Enable** this setting, telling the router that this port is now open for your RSS computer. When you are done, click **Apply**.

That's it. Back your way out of the router settings. Some have a **Sign Off** or some other way to X out of the router dialogue box.

C. Set Modem to enable its DMZ feature for the router. (optional – <u>if RSS doesn't serve properly after you finish step B then try this also</u>)

By default, most modems do not have the DMZ (demilitarized zone) feature enabled. You want to enable this feature in the modem for the modem side IP address of the router.

Log into the modem's control interface. (check the modem manual for how to do it)

Find the IP address of the router as seen by the modem (this will NOT be the same as the LAN side router IP address). Write this down – you will need it shortly.

MODEM side IP address in the router   _____ . _____._____ . _____

In the example (Fig 10) you see a Windstream modem interface.

Under Device Info, DMZ Host is listed under the heading of NAT.

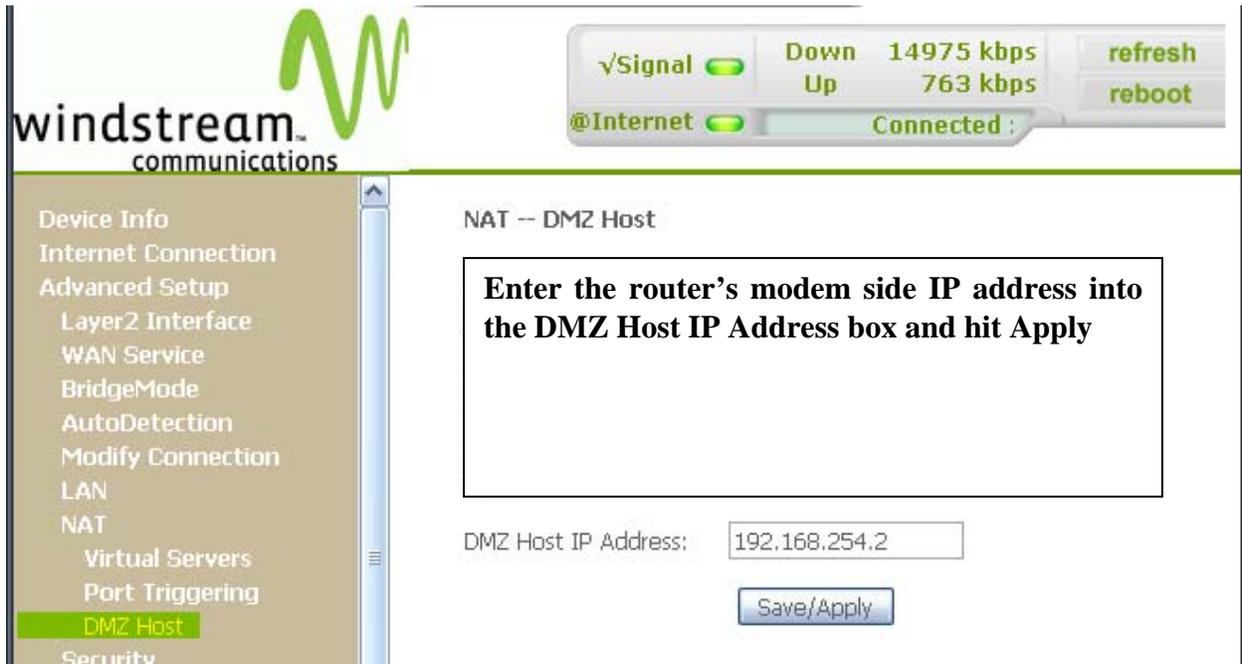Select DMZ Host. (What the heck is a host? In this context it is the router.)

Fig 10.

In this example, the router has an IP address of 192.168.254.2 as seen by the modem. Enabling the DMZ for this IP address forces the modem to pass all packets unfiltered to the router, which is exactly what we want.

At this point you should be able to begin streaming data with RSS.

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