WiRES-X Back to Basics

Getting used to the terminology:

WiRES-X: This is one of Yaesu's current methods of Internet linking. It is used primarily for linking Yaesu amateur digital radios.

System Fusion: Basically this refers to the ability of Yaesu's amateur digital radios to automatically switch between analog FM and digital FM use. You may select either, or automatic switching.

System Fusion vs. System Fusion II: System Fusion II simply refers to upgraded capabilities that came with software and firmware updates. All System Fusion radios with the latest firmware are System Fusion II compatible.

C4FM: C4FM refers to a type of modulation that is used by Yaesu in their amateur digital radios as well as by others. Yaesu has made their radios incompatible with other existing commercial digital platforms.

HOTSPOT: This can have two meanings where WiRES-X is concerned and knowing which one is being discussed is all-important. Firstly, hotspots such as Zumspot, MMDVM board, Pi Star, Open Spot, etc. are not Yaesu products and will not get you directly onto WiRES-X. They might get you indirectly onto WiRES-X if you find someone who has built a bridge to WiRES-X. Secondly, a 'hotspot' can refer to a device which allows your WiRES-X computer to connect to the Internet via cellular or WiFi. Seeing as WiRES-X is an Internet linking system, this second meaning is more appropriate to WiRES-X.

AMS or Automatic mode Select: This is the method by which your digital repeater or radio can automatically switch between analog and digital. Using AMS causes your device to match the incoming type of signal. If your device is a repeater in AMS, it will re-transmit in whatever mode it received. If your device is a handie-talkie or mobile in AMS mode, it will match the incoming mode and your next transmission will be in that mode as well. Obviously, you can change the settings to lock out AMS or to switch modes even if AMS changed modes.

NODE: This term can be confusing so we should get to it right away. A 'node' is basically the hardware necessary to establish an Internet terminal...terminal meaning a point at which to input and output information.

In the case of WiRES-X, our Internet linking system, a node will consist of a node radio or repeater, cables to a PC running WiRES-X software and an Internet connection. It may also consist of a Yaesu interface device called an HRI-200.

ROOM: A room differs from a node in a couple of ways. Whereas a node is tangible, a room is virtual. A room only exists where a node employing an HRI-200 exists. A room only exists where it is told to exist. The room will not exist without the supporting node.

NODES vs. ROOMS: A node may contact another node, or it may contact a room. Think of a node as an individual. A room cannot contact anything...it can only BE contacted. A room is a collection of nodes...a meeting place. A room can be empty however with no one in at it a given time. If every node in a room signs out, the room can still exist, waiting for the next nodes to come back in.

Rooms are not automatically established. You must take a few simple steps to establish one. You can dis-establish a room if you desire as well as limit who may join the room. The rules for entry could be digital vs. analog or it could simply be stations you chose. Connecting nodes can be blocked from a room or have their audio muted if they are causing a problem.

LISTSERVER: The listserver is one of a number of servers operated by Yaesu for the purpose of letting WiRES-X users know who is available for a contact. Even though a station (be it a room or node) is 'available', this does not mean they are listening to their radio at that moment. It simply means their node or room is online.

The listserver is like a phone book that is dynamic. It changes all the time according to who checks in and out. Your software 'checks in' when you turn it on with an active Internet connection. If the information sent by your node matches the Yaesu database, you are listed in the 'phone book'. If you turn your node off, you drop out of the phone book.

You will not be able to see the complete listserver 'lists' unless you are operating a node and can see the computer screen displaying the WiRES-X software. The listserver displays both active 'rooms' and active 'nodes'. This does not mean you cannot make use of the system unless in front of the computer, rather, it means you will either need to search for the right access codes, know them or have stored them in a memory for later access.

There is one alternative if you are not where you can see the WiRES-X PC software screen. You can go online and look up 'Yaesu WiRES-X Active Nodes List" or 'Yaesu WiRES-X Active Rooms List'. Limited information is available here, but it is better than nothing.

NODE NUMBERS/ROOM NUMBERS/DTMF ID's: To operate a node, you must first have registered with Yaesu. They will send you both a node number AND room number for every registration. It is only necessary to have one registration for every radio that will be operating in the WiRES-X system AT ONE TIME. That is, even if you have 50 digital radios, if you will never use more than one at a time, you will only need one registration. However, most stations get two or three. You may wish to have a fixed node at home and a mobile node that could be transmitting at the same time.

These numbers are then used by your radio to establish contact with nodes or rooms. They can be input manually or saved into memory, or even searched for by a 'synced' radio.

SYNCED RADIO: This refers to a state of connection between a radio and a node whereby the radio can manipulate the node. The radio must be within a certain range so that commands are properly received. You may want to do this when your radio is a handheld or mobile and the node radio has the Internet connection. This method extends the range of the HT or mobile to reach anywhere the Internet reaches and beyond!

WiRES-X ACCESS: You do not necessarily need to be 'synced' with a node radio, or even HAVE a node radio to get on WiRES-X. You WILL need to be in range of a node radio and you WILL need the owner's permission if you wish to manipulate that node radio.

Once again, a node radio can be certain HT's, mobiles or even repeaters. Permission may be stated on a node owner's web page, on their electronic QSL card that shows up in the WiRES-X software or in the comments shown in the WiRES-X software interface. You might contact the owner by radio or other

means to inquire about permission to manipulate a node. PLEASE DO NOT ASSUME it is okay to manipulate a node. Many nodes/rooms are set up as virtual meeting places, sort of like repeaters. Imagine if you tried to call your local repeater and someone had moved it!

PORTABLE DIGITAL NODE: Here's where it gets interesting! In early 2019 Yaesu introduced the PDN or Portable Digital Node. That introduction revolutionized WiRES-X operation. The PDN eliminated the need not only for an HRI-200 (when just running a node), but it eliminated the need for a fixed or dynamic global IP address. This means that in addition to your node radio and your computer with WiRES-X PC software, you will only need an Internet connection. If you have a cellphone or jetpack that can Bluetooth or WiFi over to your computer, you can go mobile or portable with your node, hence the name PDN. Note that a PDN CANNOT support a room.

The confusion gets going really good when talking about PDN's because some terms are used over and over with different meanings. So let us start with this concept: THE PDN FUNCTION.

THE PDN FUNCTION: Essentially this means the use of a Portable Digital Node as opposed to the use of an HRI-200 with your node. The two have different requirements as well as having different capabilities. Within the PDN function are two modes known as PDN Mode and HRI Mode. Don't worry, it gets deeper.

Within both those two modes are what might be called 'sub-modes'. One is known as 'Direct Mode' and the other is known as 'Access Point Mode'. So, within the PDN FUNCTION (meaning you are using a PDN, not and HRI-200) you could be in PDN Mode/Direct Mode, PDN Mode/Access Point Mode, HRI Mode/Direct Mode or even HRI Mode/Access Point Mode. Got it?

Just to make it interesting, no HRI-200 is involved in the HRI Mode. It was suggested to me that the HRI Mode emulates the use of the HRI-200 and that's the best answer I've heard for calling it HRI Mode. Now, where do we go from here? Perhaps we should go from top down.

PDN MODE (within the PDN FUNCTION): The radios that are capable of PDN operation allow you to select either mode...PDN or HRI. The PDN side is generally used for digital-only operation. You will be able to contact digital rooms and nodes. Since a node can be analog or digital by virtue of its architecture or by selection of the owner, you need to know which you are attempting to contact. If the system will not allow you to connect, you will get a message letting you know. However, there's nothing like looking at the software interface as it gives you a clue right up front. Each room and node has an icon with it indicating its status as digital or analog.

HRI MODE (within the PDN FUNCTION): While it is called 'HRI', you cannot establish a room here. No rooms can be established within the PDN Function. In general, use of the HRI Mode allows you to connect to, talk to and hear analog stations. Some cabling is required to get the audio out through your radio instead of through the PC speakers. Now, to throw a monkey wrench into the works: On some radios, when you enter HRI Mode, the display says "WiRES-X". This leads to people calling it 'WiRES-X Mode'. The display of the words 'WiRES-X' I think is a bad choice since the manual clearly calls it "HRI Mode". Not only that, both PDN Mode and HRI Mode are part of WiRES-X, so why would we call just one of them 'WiRES-X'? Beats me!

DIGITAL vs. ANALOG: Before I get to Direct and Access Point Modes, I want to try to clear up a real mess. Why do we call certain stations 'analog' when they have clearly come across the digital medium

WV-LINK

C4FM Digital

PDN Node

FTM-100D
FTM-400XD
FT2D

Internet

WV-LINK
Wires-X Room
Analog and Digital

Node Station
W8XRW

Node Station

Node Station
WV8AR

Other Repeater

441.825
Digital Repeater