Solving WiRES-X ISP Connection Problems

Category: WiRES-X
May 6, 2023

If you want to set up an HRI-200 on Starlink, AT&T, or use you phone as a hotspot, there's a problem. You need to open incoming ports and that can't be done in many cases. The answer is to use a VPN to tunnel past your ISP to the raw Internet. One solution for some carriers is to use the PDN mode which does not require incoming ports to be open. But that may still not work.

The other problem is we're running out of IPv4 space. New ISPs, such as Starlink, don't have a lot of IPv4 addresses. IPv6 solves this problem plus many others. Thus it's no problem for each ISP subscriber to have thousands of unique IPv6 addresses. Unfortunately the WiRES-X software DOES NOT support IPv4. At all. IPv6 will become more and more dominant and this will just become a bigger problem.

If you set up a PDN (no HRI-200), a commercial VPN will work well. With a VPN, your IPv4 traffic will be sent in an IPv6 tunnel. At both ends, your node and the Internet, IPv4 addresses will be used. This works because PDN does not require any incoming ports to be open. It may be that Starlink provides this service automatically. Don't know.

If you use an HRI-200 then YOU NEED to open an incoming port. Most every commercial VPN does not permit assigning specific ports for incoming traffic. This is because they will share a single IPv4 address between dozens of subscribers. A couple of VPN providers do permit this. I have used Golden Frog's VyprVPN in the past for this purpose. VyprVPN is a "high end" VPN service and will cost you quite a bit more than free or low-cost

VPNs ($60/yr). You'll need to turn off the NAT firewall so make sure your exposed computer is well protected! This will give you complete, unfiltered access to the Internet – something you can't get with your ISP!

See https://www.vyprvpn.com/

A Really Nice Power Station

Category: Shopping
May 6, 2023
I've had one of the power stations for some time now. It has a really good MPPT converter that extracts every watt out of the solar panels. You can turn on the AC output while you have solar power coming in and it provides an efficient source of solar AC. Buying these components separately is almost the cost of the power station. Internally it has a 268 Wh Lithium Iron Phosphate battery which won't burn your house down and can supply thousands of cycles. It also provides USB and USB-C power output as well as 12 VDC. Although I haven't tested it, it should work as a UPS as well. It will provide AC output while it is plugged into AC and transfer to battery when the main input goes away. The display shows power input, output and remaining capacity. A bluetooth connection works well with my iPhone. An internal fan kicks in when high power is being used and sometimes during charging. It can charge at 150+ watts input AC or DC. For testing, I ran a water pump on the AC output. It consumed around 400 watts and the power station ran it just fine – which I wasn't expecting. After all, this is a pump, not a radio!

The negatives: The internal battery is 22V, so the 12V output is from a DC-DC converter and is limited to 10A. So when operating SOTA or POTA it’s best to keep HF power under 50 watts. Also the USB-C doesn’t seem to coordinate well with some devices, delivering less power than it should. All in all I think you get quite a bit for the money. The reason I’m bringing this up is that there is currently a $90 off coupon. So be sure to check the check box!!! Normally the “standard” coupon is $60.

Here’s the Amazon link: https://amzn.to/42nOG5c
You may also be interested in the DC power output cable as it uses an uncommon circular connector. (I put some Anderson Power Poles on mine.) Also Solar panels.

Fusion HT Battery Comparisons

Category: Power
May 6, 2023
See the attached file for supplemental information regarding the VX8, FT1, FT2, FT3, and FT5 series battery comparison discussed during the 13-Mar-2023 Fusion Technical Net. The discussion can be heard on the podcast Part One, Part Two.

Link to the high current (and cheaper) CD-41 replacement desktop charger: https://amzn.to/3G9fUCX

The file has been updated for the 3-Apr-2023 Fusion Technical Net.

HT Battery Evaluation Part ThreeDownload

FT70D High Power Problems

Category: Fusion,Troubleshooting
May 6, 2023
The other day I was working my Fusion repeater with my FT70D. Since I was “DX” I had the HT on high power. Although it looked like I was getting into the repeater just fine, I couldn’t enter the WiRES-X control mode. However when I switched to low power I WAS able to control the repeater.

What gives? Why could I control the repeater (node) on high power, but not on low power?

Back at the house where my repeater is located, the problem still existed. I could use the WiRES-X control mode on low power but not on high power. Since I’m within 10 meters of the repeater, signal strength couldn’t be an issue.

Looking at the output spectrum of the FT70 revealed the problem. On high power there were some spurs that shouldn’t have been there. The spurs were much weaker on low power. Other radios didn’t exhibit the spurs. Click on the images to compare and see the details.


FT70D spectrum on low power

FT70D on High Power

Date and Time

Category: Date and Time
May 6, 2023

Link	Site	Notes
https://time.is/	Verify the time settting on your computer. Essestial for HF digital modes.	
http://www.thinkman.com/dimension4/	Tool to automatically and accurately set your computer time. Essential for digital modes.	
http://www.timebie.com/std/utc.php	Calculate time zones.	
https://www.timeanddate.com/	Outstanding and fun site for anything to do with dates and time.	

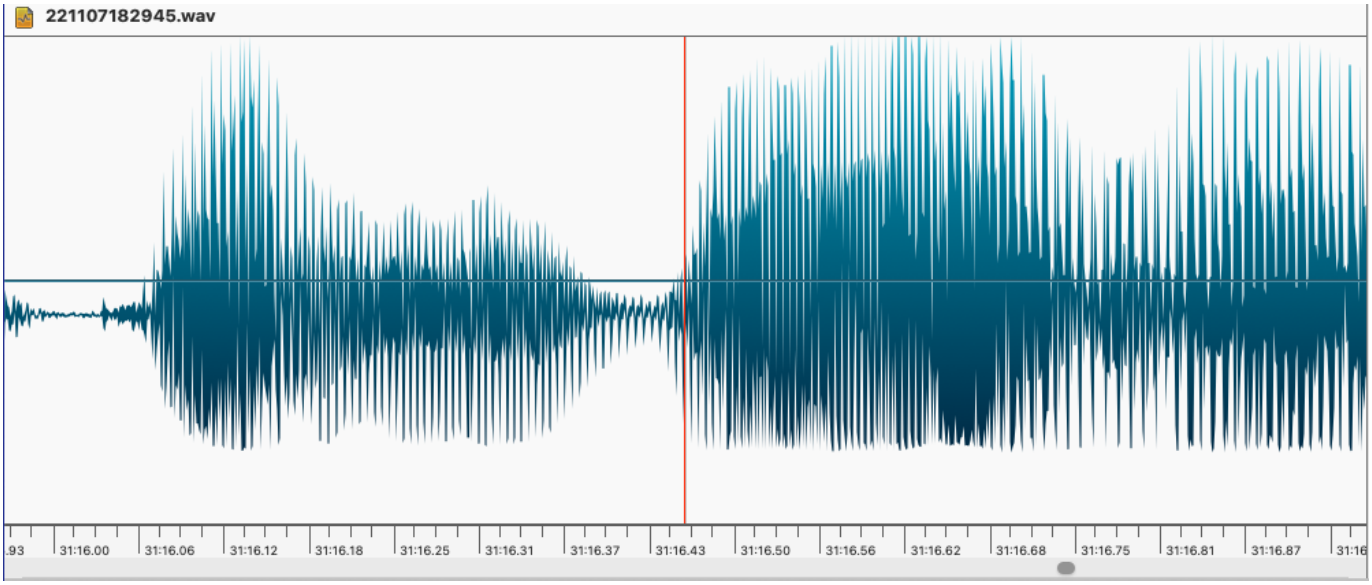
WSPR and FT8 Links

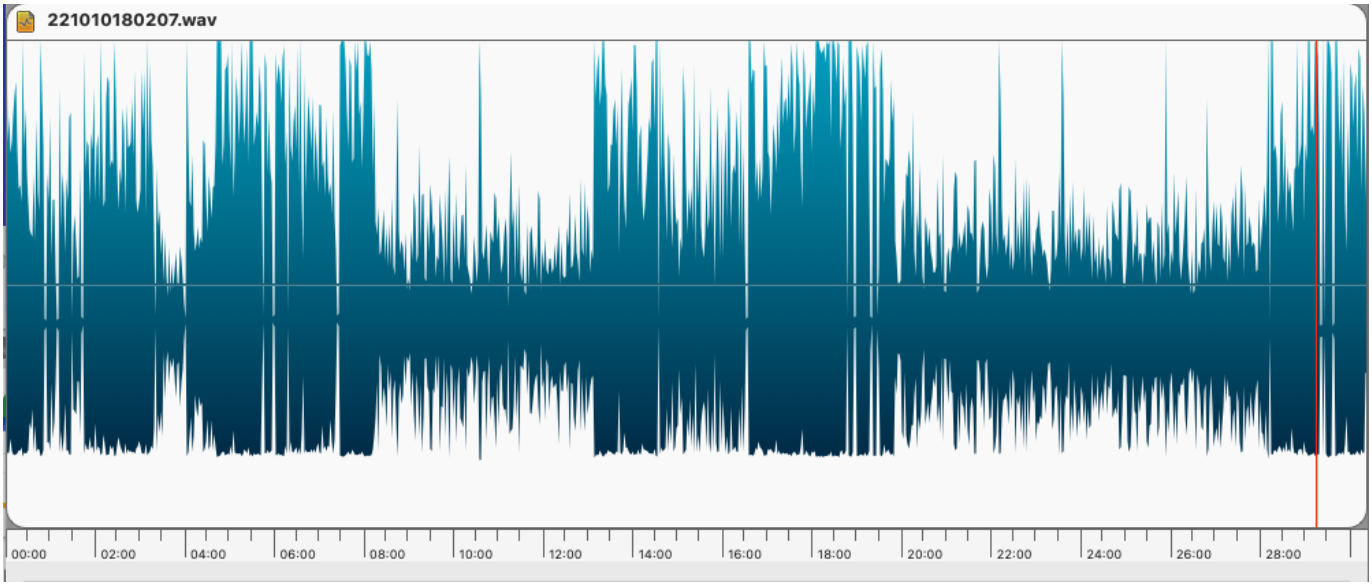
Category: HF Digital Modes
May 6, 2023

Site	Purpose	Notes
https://en.wikipedia.org/wiki/WSJT_(amateur_radio_software)	About the WSJT software	
https://en.wikipedia.org/wiki/Joseph_Hooton_Taylor_Jr.	About the Author	
http://physics.princeton.edu/pulsar/K1JT/wsjtx.html	Home Page	
https://en.wikipedia.org/wiki/WSJT_(amateur_radio_software)	Source Code	
http://physics.princeton.edu/pulsar/K1JT/Moonbounce_at_Arecibo.pdf	Running Moonbouce!	
http://www.g4ilo.com/wspr.html	Article	
http://www.qrp-labs.com/	WSPR kits and other cool stuff	
http://wsprnet.org/drupal/	Montor WSPR signals around the world	
https://www.n1rwy.org/?p=157	Set up the FT-991 to run digital modes.	
Date and Time	Check here for tools to set your PC’s time. Essential for these modes.	

C4FM Audio Quality

Category: Fusion
May 6, 2023
Photos show the waveform capture from an FT5 during a MNWis net. Note that they are not symmetrical around zero. The 2nd image has more detail and you can see that the waveforms are not symmetrical. The clipping sound is heard when the audio level hits the limits even though it is still not at 100%. Odd.





Waveform of MNWis net

IMRS LAN Firmware Update

Category: IMRS
May 6, 2023
I don’t know why Yaesu doesn’t make this public, but they don’t. You can download version 1.44 of the IMRS LAN firmware. This solves some problems with LAN connections constantly dropping.

Listen to 10 C4FM with an HT

Category: Fusion
May 6, 2023
During the Monday Night Fusion Technical Net, a comment was made that it was possible to use an FT5D to receive C4FM on 29.250.

This started a conversation about other HT’s as well. Thanks to W4IOD, AD0MI, N0PXT, and N0OQL, we now have the definitive answer for most of the Yaesu Fusion radios.

Background

Using 29.250 for C4FM has become popular as 10 meter conditions have improved significantly. The Yaesu FT-991(A) is the only radio that is capable of Tx and Rx on 10 meters as well as operating in Group Mode (GM). When the band is open, you may see or hear C4FM traffic on this frequency.

One way to check 10 meter band conditions is to tune AM down to the CB frequencies near 27.195 MHz. If you hear a lot of racket, then 10 is probably open.

The ‘A’ band must be used since the ‘B’ band on all radios cannot tune 10 meters.

Analysis

Note that none of these radios can transmit on 29.250. In addition if 29.250 works, then six meters will work as well.

The following radios cannot receive 29.250 MHz since they don’t tune down that low, bummer:

Mobile Radios: FTM-100, FTM-200, FTM-300, FTM-400, FTM-3200, FTM-3207, FTM-7250

HT’s: FT-70D

The following HT’s tune 29.250 and DECODE C4FM (show callsign and switch between DN/VW)* but do not provide audio:

FT-1D (US version), FT-2D, and maybe FT-3D

*Must be set to Rx DN or VW.

The following HT’s will receive C4FM on 29.250 but cannot engage GM. GM is handy for seeing the callsigns of stations that are beaconing.

FT-1D (Japan version) Interesting! Maybe the JP versions of other HT’s will do this as well.

The FT1D and FT2D can enter GM using the following process:

1. Enter 29.250 on the A side.
2. Enable both A and B if both sides are not enabled.
3. Switch to the B side.
4. Press the GM key.

The following HT’s can receive 29.250 and can enter GM. Note that they display the GM information but do not beacon:

FT-5D

Bottom line

The FT-5D has more C4FM capability since it allows reception wherever it tunes while other radios do not.

Node Cycling In and Out

Category: WiRES-X
May 6, 2023
This post addresses a WiRES-X node that constantly leaves and rejoins a room.

This type of problem is almost always the result of a networking issue. When certain networking problem occur the HRI-200 software will wack out (a technical term). Once the software has

been wacked out, it will continue to cycle in and out of whatever room it is connected to. Restarting the WiRES-X software usually solves the problem.

Router problems:
1. Turn off UPnP. It should never be used!!!!!!
2. Turn off all quality of service features like those to improve Xbox gaming or VoIP functions. (Yes I know we're using VoIP so you'd think it would help.)
3. In fact turn off everything you don't have to have.
4. Some routers are total crap and need to be rebooted every few weeks.
5. You're not using Wi-Fi are you? Wired is always better than wireless – we should know! Drop-outs in Wi-Fi can cause this issue.
6. Did I mention, turn off everything on the router you don't need?

ISP problems:
1. Something as simple as the ISP dropping your connection for a few minutes in the middle of the night when they're doing maintenance.
2. The ISP just doing a bad job of getting packets to you during prime evening Netflix viewing.
3. The ISP switching your IP address. (I think CenturyLink just does this for the fun of it.)

Computer:
1. Make sure Win10 doesn't put the USB interface to the HRI-200 to sleep. It really, really likes to do this. Just going to the obvious place in the control panel to turn this feature off doesn't really turn it off. See the documents on running Win 7/10 24x7x365 remotely in the Fusion Help section at HamOperator.com.
2. Make sure the computer isn't crap. Cheap computers may not have quite the reliable communication interfaces that we need.
3. Banish all RFI and ground loops. Make sure RF is not getting into the USB interface to the HRI-200. This can cause message errors and really screw things up.

4. Make sure you computer actually has enough power to run the HRI-200 reliably. Get one of those USB power thingies and make sure you have a solid 5VDC under load.

Over the air:
1. Bad data on the WiRES-X network can mess things up. This happens mostly with hotspots that are bridged into the WiRES-X room. On MNWis and a few other networks we've banished this problem by banishing FCS and running YSF server software that banishes bad data from hotspots. So if you have this problem in one room, say AmericaLink and not others, there may be nothing you can do.
2. Yaesu radios that are running really old firmware or have not had the firmware updated correctly (I.e., "I did the main CPU but I'll get around to the DSP later.")

Side note:
The port check should not be relied upon to definitely prove it's working or not working. The test is not exactly the same as actually communicating with the Yaesu list servers and the room server. So it can lie to you with false positives and false negatives. This is because the port check uses the Yaesu servers in Japan to perform the test, not the room server you're trying to connect to. Routing issues can cause one to work whilst the other doesn't.

You may also experience a similar problem if the Yaesu list servers are not able to keep up with the demand or if maintenance is being done. (When they do maintenance in the wee hours of the morning, that's right in the middle of the day for us.)