

FUSION/WIRES-X DEMYSTIFIED

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During this Presentation

- This is an interactive presentation, feel free to ask questions as we go along.
- The Goal is to get you started using Fusion and Wires-X.
- I will also cover the differences between Wires-X and FCS/YSF Reflectors
- I will not cover:
 - Gm or Group Mode
 - Wires-X News or Emergency

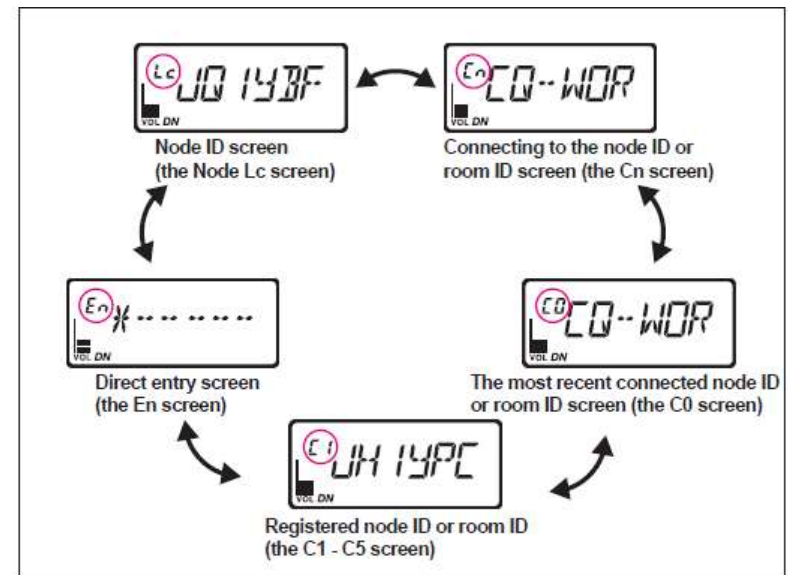
What is Fusion?

- Fusion is the over-the-air digital protocol developed by Yaesu
- Yaesu published the protocol for others to use
- Fusion works with Wires-X, but a Fusion Repeater may not have Wires-X access
- Fusion also works with a HotSpot on the YSF and FCS Reflector
- Current production Fusion Radios are:
 - The **FTM-200**, **FTM-300** and **FTM-500** Mobiles
 - The **FT-5** and **FT-70** Portables
 - The **FT-991A** HF/VHF/UHF
- Older but still functional Fusion Radios are:
 - The FTM-400, FTM-100, FTM-3200, FTM-3207 and FTM-7250 Mobiles
 - The FT-1, FT-2 and FT-3 Portables

Operating Fusion

- Your Call Sign is all that is programmed in the radio. (New Radios prompt for it)
- You must have a Valid Call Sign programmed in for Wires-X to work
- Fusion Modes
 - **AMS** - Auto Mode Select
 - Automatically switches from Analog to Fusion transmissions
 - Bar above DN, VW or FM to indicate it is on
 - **DN** – Digital Narrow Bandwidth Voice and Data
 - **VW** – Digital Wide Bandwidth Voice
- Access Control and Routing is set by **DG-ID**
 - Must set DG-ID for both TX and RX, DG-ID 00 is “accept all” (like carrier squelch)
 - Majority of Fusion Repeaters are DG-ID TX:00, RX:00 (Default radio setting)
 - See your radio’s manual for how to set DG-ID for your radio

Wires-X



What is Wires-X

- **W**ide-coverage **I**nternet **R**epeater **E**nhancement **S**ystem
- Evolution of Yaesu Wires Internet Linking: Wires (development, beta) > Wires II (Analog) > Wires-X (Supports cross mode between Digital(Fusion) & Analog)
- **U**sers do not have to be registered (Digital or Analog)
- **N**odes need to be registered by Yaesu in Japan, they assign node and room numbers.
- Computer interface for Node Radios or Repeaters is the **HRI-200**
- **Wires Rooms** – are like a reflector in D-Star, a Talk Group in DMR and a conference in Echolink
- Communications is **Peer to Peer** with routing info provided by Yaesu Japan

- HRI-200 is needed to host at Node and a Room



- Wires-X user interface varies by radio. FT-70D, FT-1D, FT-3200, FT-3207 and FT-7250 are very basic interface.



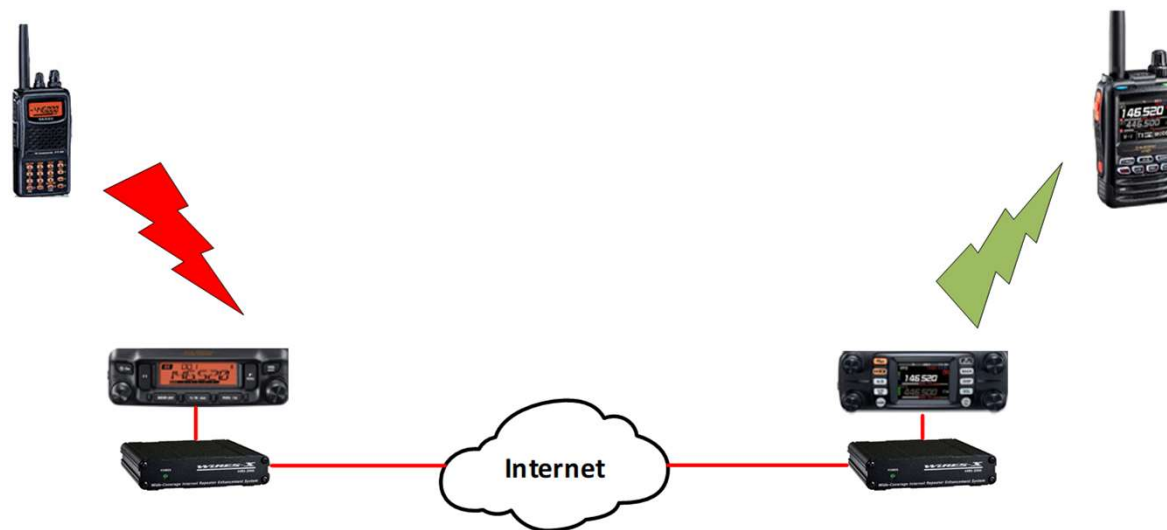
- The full featured radios such as the FT-2, FT-3, FT-5, FTM-400, FTM-300, FTM-200 and FTM-500 have a more advanced and consistent user interface.



Wires-X Terminology

- Node – Repeater or Transceiver connected to the Internet
 - Analog Node – A node that uses DTMF and analog audio on FM
 - Digital Node – A node that uses a Fusion transceiver or repeater for transmission of digital audio, text messages and images. It can also do DTMF and analog audio if configured.
- Room – Where multiple nodes connect
 - Open Room – anyone can connect
 - Closed Room – only registered nodes can connect
 - Digital Room – only digital nodes can connect
 - A room can be set for Digital Only, Analog Only or mixed Digital and Analog
- Node and Room IDs are 5-digit numbers
- If a node/repeater is already connected to a room, and you don't want to change it, you just PTT to talk on the room

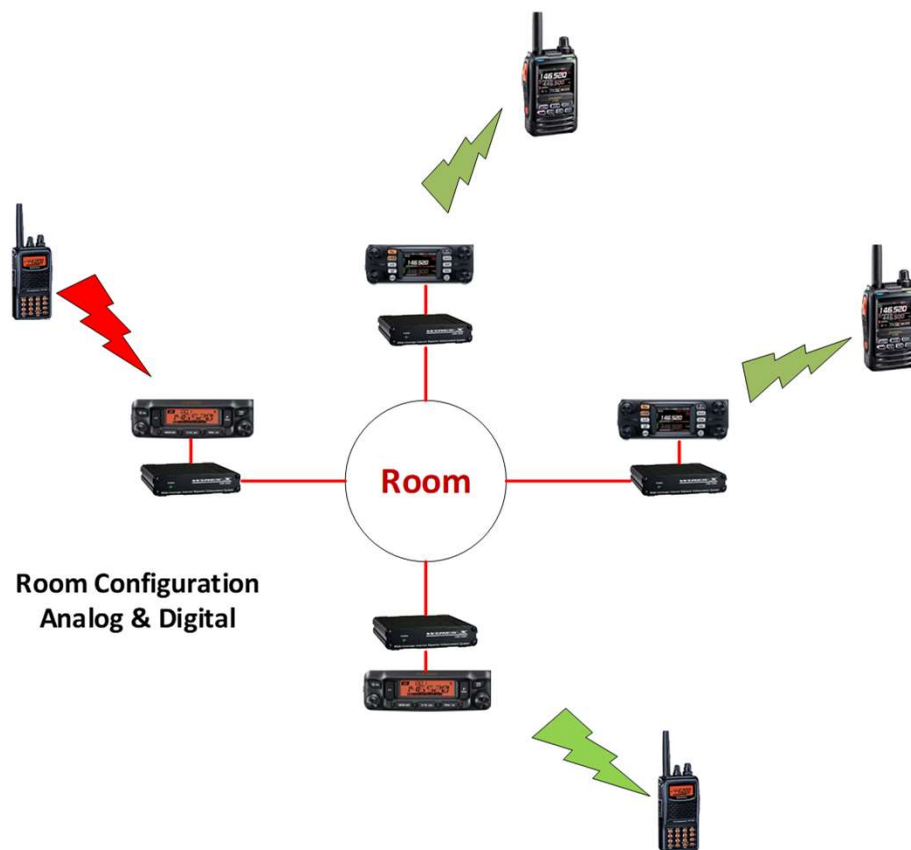
Wires-X Connections – Node to Node



Digital to Digital
Analog to Digital
Analog to Analog

Yaesu Servers in Japan
Provide Routing Information
only for connections

Wires-X Connections – Node to Room



Operating Wires-X (a high-level start)

- Wires-X works with A Band since most radios are Fusion only on A Band
- Starts with the **Dx** button or **X** button or **F+AMS** or ... (RTM for your radio)
- Press the Wires-X button (**X**, **Dx** or **F+AMS**) to connect to Wires-X
- If you are on a memory channel, the radio will switch to VFO on the memory channel frequency/offset
- Wires-X indicator will flash, and you will hear tones when connected (Think Adams Family)
- Once connected will see the call of the connected node and the currently connected room on the advance interface, Lc + node callsign on basic interface.
 - **Note:** If you do not see a connected room, the node is not connected to a room or has no internet service

Operating Wires-X – Basic Interface

- To connect to nodes and rooms, you need to know the 5-digit Node/Room ID
- FT-70DR press **Function** then **AMS** to enter Wires-X Mode
- Hear tones when connected
- Use channel knob to switch screens to **En**
- Use Keypad to key in Room or Node ID
- Press PTT or AMS to Connect Room/Node
- Press Band to disconnect Room/Node
- Press 1 though 5 to Save to Favorites
- Press Mode to exit Wires-X mode

Terminology

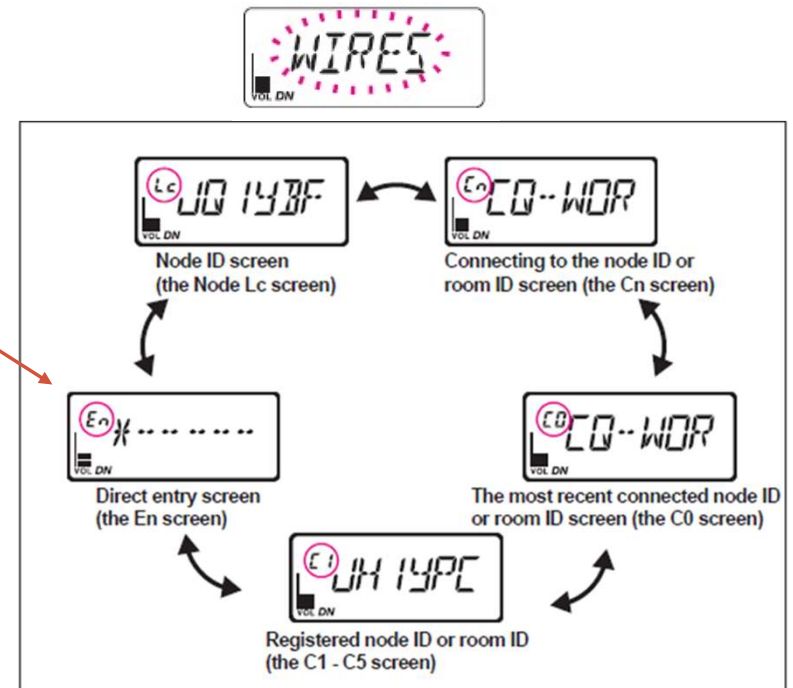
Lc – Node ID Screen

En – Screen for direct entry of the Node or Room ID for connecting

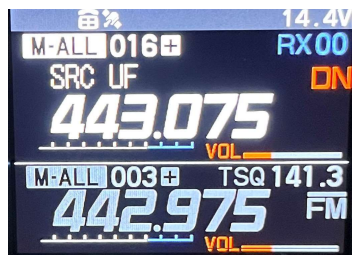
Cn – Connected Node ID or Room ID screen

C0 – The most recent connected Node or Room ID screen

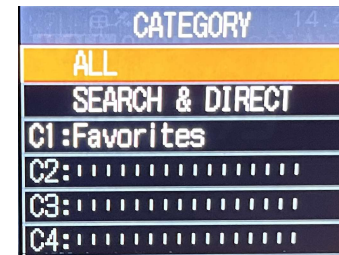
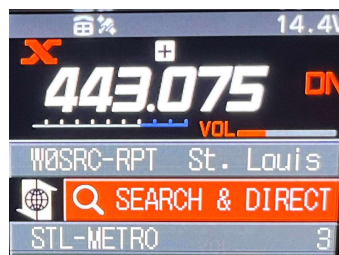
C1 – C5 – These are your **favorites** list. Rooms need to be **Registered**



Operating Wires-X – Advanced Interface



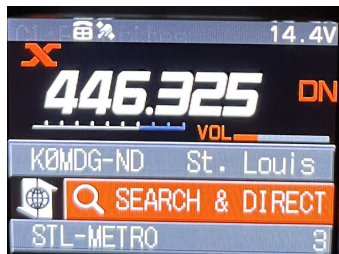
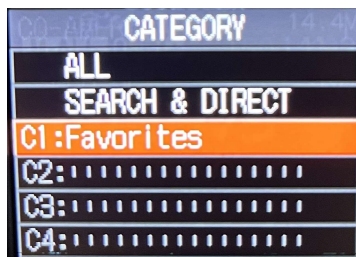
Hear
Tones



To Exit Wires-X, Press & Hold **Dx** Button
This will return you to **VFO** mode
Press **V/M** to go back to memory

To Disconnect a Node from another Node or Room
Press the **BAND** or ***** key (Radio Dependent)

Advanced Interface – Using Categories



To Exit, Press & Hold **Dx** Button
This will return you to **VFO** mode
Press **V/M** to go back to memory

What is PDN?

- **P**ersonal **D**igital **N**ode
- Uses Yaesu Fusion Radio and HRI software on a Windows PC to:
 - Create a Node with Wires-X network access using other Fusion radios
 - Use the radio as a Mic and Speaker to talk on Wires-X via the PC
 - Cannot host a room with a PDN
- Same as Icom's "Terminal Mode" and "Access Mode" for D-Star
- Two Modes
 - **PDN** mode which allows access to Digital Rooms only
 - **HRI** mode which allows access to all Rooms
- Does not require an HRI-200 Interface, just a Yaesu interface cable kit
- Works with FT-2D, FT-3D, FT-5D, FTM-100D, FTM-200D, FTM-300D, FTM-400D and FTM-500D. FT-70D and others will not work as a node radio. The FT-70D can be used to Access a PDN.

FCS and YSF Reflectors

- **FCS Reflectors** – centralized, 99 reflectors per server
- **YSF Reflectors** – de-centralized, anyone can stand one up
- YSF or FCS can't link directly to Wires-X, must create "Bridge" using hotspot and Yaesu Equipment
 - This is the way **FCS000391 STL-Metro** is connected to **Wires-X STL-Metro**
- Using Wires-X Pass Through, you can send Wires-X commands to link and unlink a Pi-Star hotspot with some exceptions (e.g. Yaseu Wires-X rooms)

Wires-X Node Numbers/FCS/YSF Reflectors of Interest

Wires-X

Room #	Room Name
43072	STL-Metro
28054	America-KC-Wide
21080	America-Link
21493	MNWis
21000	CQ-America

FCS/YSF Reflectors

Room #	Room Name
FCS00391	STL-Metro
YSF32453	America-KC-Wide
FCS00290	America-Link-WiresX
YSF21493	MNWis

Questions and PDN Demo