The W8MRC Wires-X Project

The Milford Amateur Radio Club,

Milford, Ohio




Introduction

- The leadership of W8MRC, in the spirit of Amateur Radio, has determined to incorporate the use of Wires-X and C4FM technology into the functionality of our existing 2m and 70cm repeaters. This is the documentation of the project from inception to implementation.

Goals

- To increase interest in ham radio in general and particularly in the Milford Amateur Radio Club.

- To offer new and exciting modes and functionality for our repeater to better serve the club and the local area.

- To appeal to new and younger hams in the area and broaden our public service capabilities.

Decision Tree for Wires-X Implementation

PRO

- Digital mode
- Exceptional clarity of voice transmissions
- Ability to send text, data and images
- Extended usable range due to digital processing
- Less power required to obtain a superior result

CON

- Requires specific equipment
- Requires internet connection
- Transmissions are not “in-the-clear”
- Learning curve for full optimization – may not be compatible with our current club demographic
- Full dedication of the repeater will preclude FM operation

Implementation Plan

STEP 1

Implement a proof-of-concept trial to determine:

a) Feasibility of Wires-X operation and identify problems, if any.
b) Local interest in Wires-X and C4FM as an operating mode for the repeater.

This will be accomplished by the acquisition of a Yaesu FTM300 or FTM400 radio and an HRI-200 controller which will be configured to access Wires-X on an over-the-air link.

The over-the-air link will be operated for a period of about 1-2 months to:

a) Provide time to get the initial learning curve under control.
b) Assess user interest and experiences with the system.
c) Inform the club of the progress and pitfalls, if any.
d) Gage local reaction and determine interest in the coverage area.

STEP 2

If the determination to continue the project is made, then selection, acquisition, and installation of the appropriate hardware for the incorporation of the Wires-X system into the existing repeater configuration will proceed.

a) Certain upgrades to the existing configuration would be necessary, a new rack and some hardware, before installation of any new equipment to support Wires-X.
b) Selection of a computer to control and log the operation of the Wires-X internet activity and a router to interface to the internet.
c) Other supporting equipment such as a monitor, cables, mouse, keyboard, etc.
d) Possible upgrades to the AC service in the repeater shack may be necessary.
e) Lastly, installation of an internet service to the repeater site.

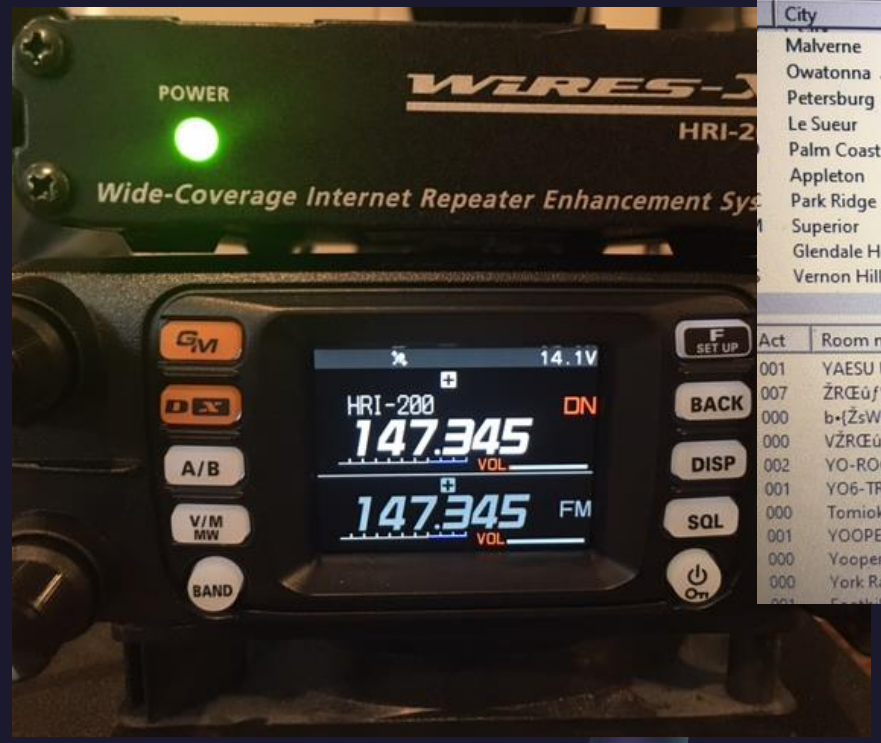
STEP 3

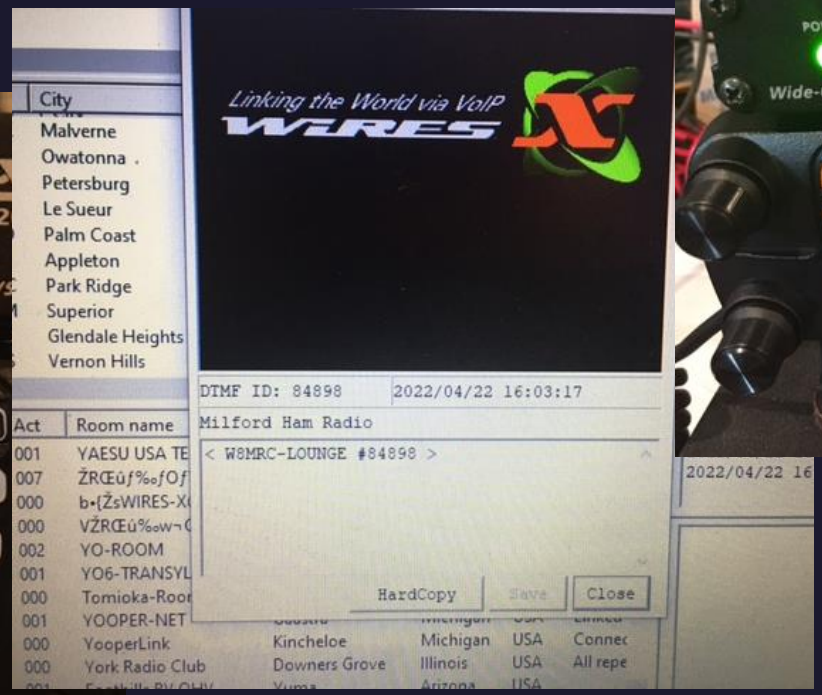
Ongoing review of the operation and effectiveness of the Wires-X system in enhancing user experience and public service capabilities.

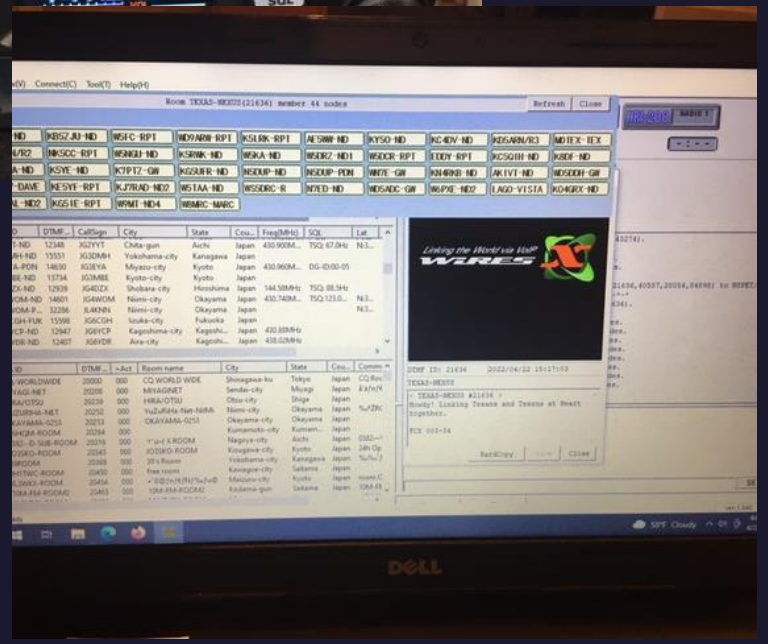
Yearly determination of the club's wish to continue the commitment to the Wires-X and/or C4FM technology.

Proof of Concept

Over-The-Air Link







First trials and Proof of Concept operation with the over-the-air link. This was accomplished using the 2m repeater as the 440MHz machine was being updated. The test lasted approximately 6 weeks and was very successful.

Installation

AFTER DECIDING TO PROCEED THE FOLLOWING STEPS WERE TAKEN:

- The rack and associated components were acquired.
- The computer and router were acquired.
- The internet connection was installed at the repeater site.
- The old rack was disassembled and removed from the shack.
- The new rack along with both the updated repeaters and the computer, interface and router were installed and testing began.
- Initial testing revealed some inconsistencies, but these were soon remedied, and the system is operating normally at this time.

The Crew

Wires-X Install Team (L to R)
John Keener KE8TEB, Raleigh Sizemore AB8KG, Ron Brooks AC8MA, Michael Stevens, James Pittman KE8UXP
and (not pictured) Dave Vest K8DV, John Cadwallader AD8DM

The Final Installation

The new rack containing the 2 repeaters with their Henry amps, duplexers, and power supplies and the computer, HRI-200, router and UPS to control the system attached to the UHF repeater.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