

Hudson Valley Digital Network | www.hvdn.org /presentations

Amateur Radio Repeater Digital Voice Mode Growth

About Hudson Valley Digital Network (HVDN)

Subpart A—General Provisions

§ 97.1 Basis and purpose.

The rules and regulations in this part are designed to provide an amateur radio service having a fundamental purpose as expressed in the following principles:

(a) Recognition and enhancement of the value of the amateur service to the public as a voluntary noncommercial communication service, particularly with respect to providing emergency communications.

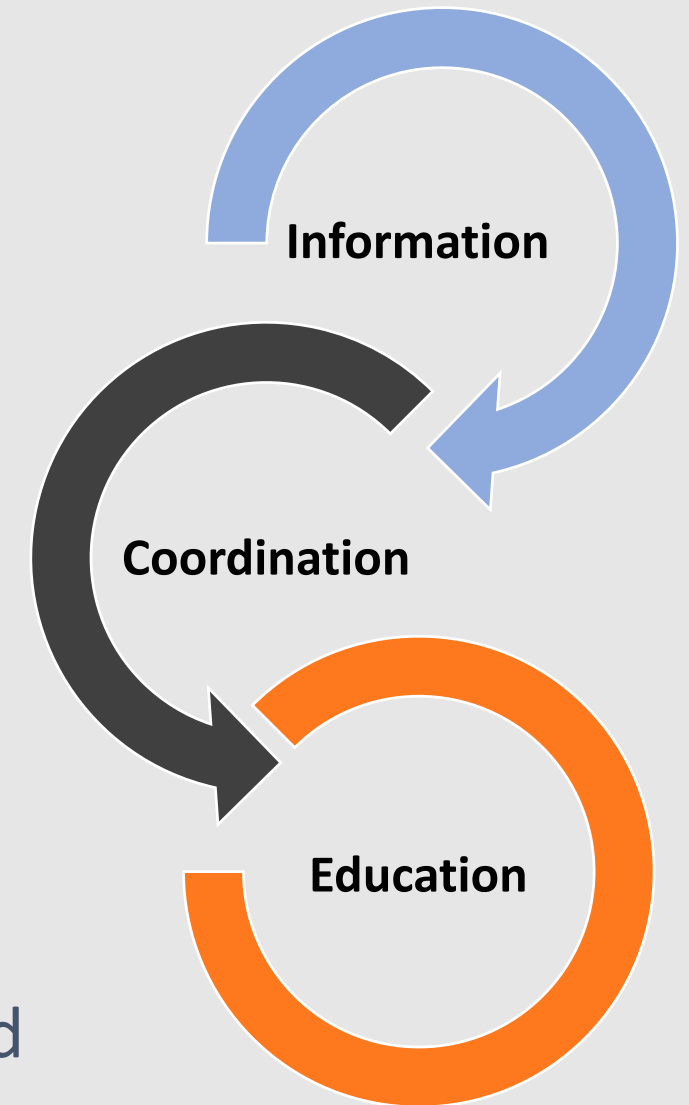
(b) Continuation and extension of the amateur's proven ability to contribute to the advancement of the radio art.

(c) Encouragement and improvement of the amateur service through rules which provide for advancing skills in both the communication and technical phases of the art.

(d) Expansion of the existing reservoir within the amateur radio service of trained operators, technicians, and electronics experts.

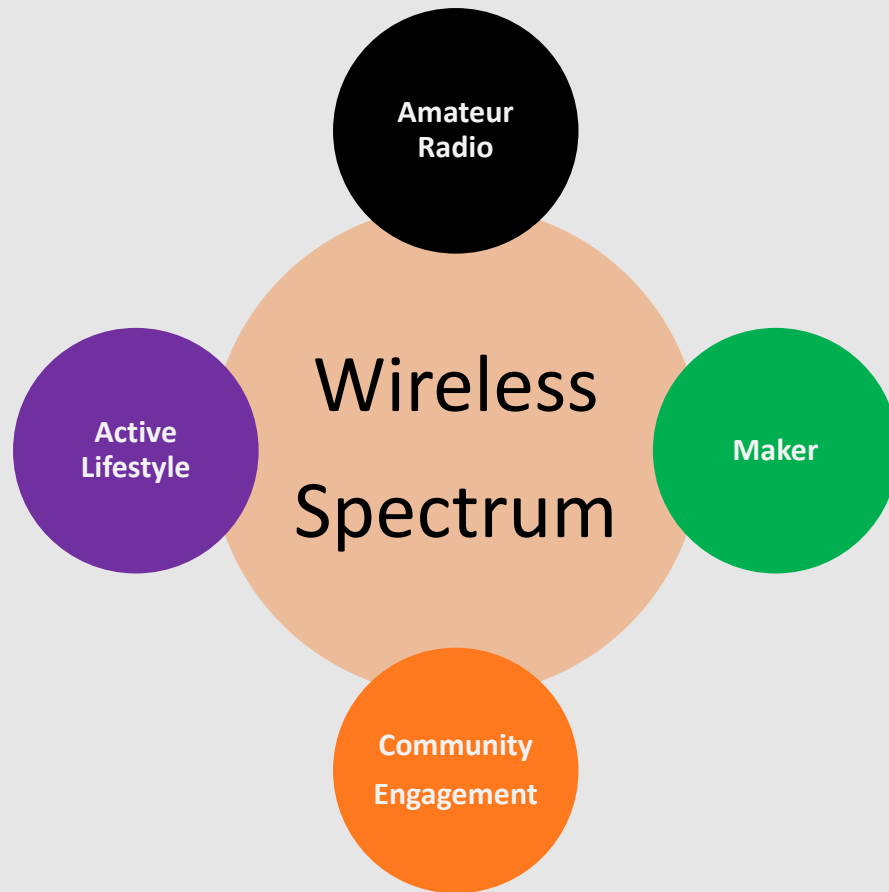
(e) Continuation and extension of the amateur's unique ability to enhance international goodwill.

- HVDN founded 2017
- Uphold FCC Part 97.1
- 3 pillar approach
- Deliberate modern & future focus
- Club call sign N2HVD
- Digital meets physical world



Convergence

When HVDN says “**convergence**” what does that mean?



WWW.HVDN.ORG/PRESENTATIONS

The “Biography” Slide....



Steve Bossert

K2GOG, Co-Founder HVVDN

Name:	Steve Bossert
First “radio moment”:	7 Years Old
Amateur Radio License Since:	1998 (22 Years Ago)
Hobby Funding Source:	Informa PLC
Top 3 Hobby Interests:	Hiking, SATCOM, Travel, etc
Fun Fact About Me:	Buried a “skunked” tent. Forgot to remove wristwatch.

Presentation Overview

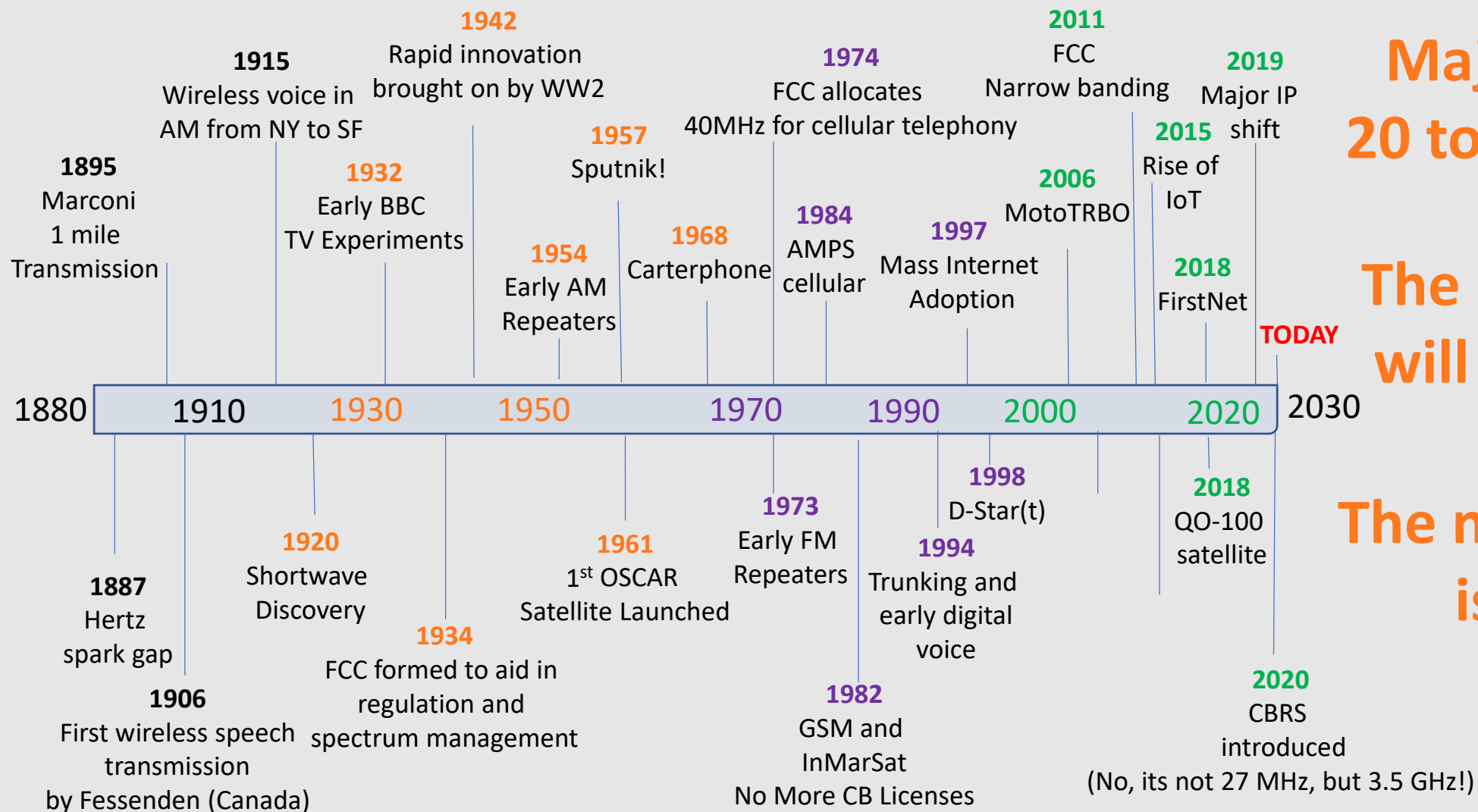
- What is digital voice?
- Partial Indicator: Digital Voice Repeaters
- Hotspots: Driver of true digital voice growth
- What is available: Radios & Hotspots
- Status: Digital Voice in the Hudson Valley
- Why the Hudson Valley is behind....
- How our region can grow thanks to digital voice



Presentation Goal

To help understand through **fact-based** detail, what drives the **growth of digital voice** adoption and where we can make better decisions **in the Hudson Valley** and beyond to grow the relevance of amateur radio for another 100 years.

Brief ~~136~~ 140-year history of wireless technology



Major change in 20 to 30-year cycles

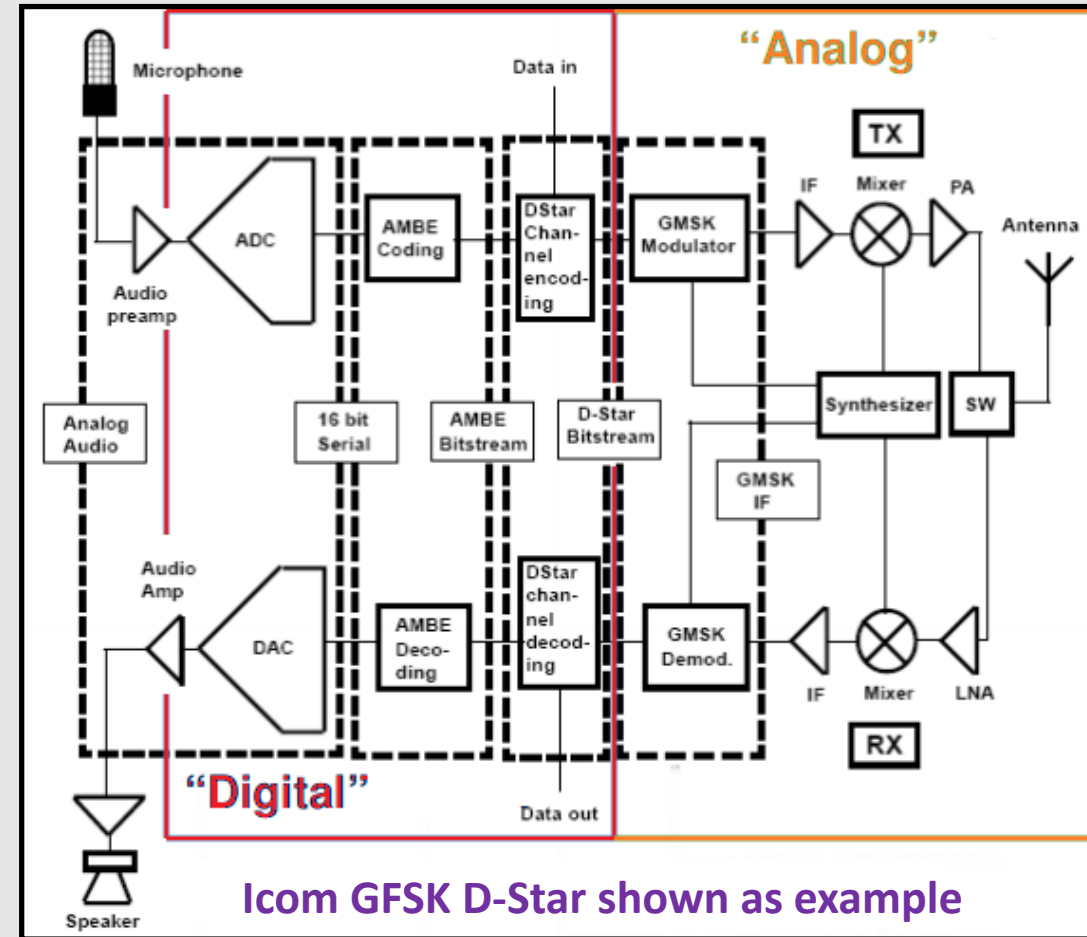
The next 10 years will be exciting...

The next 12 months is critical....

What is digital voice?

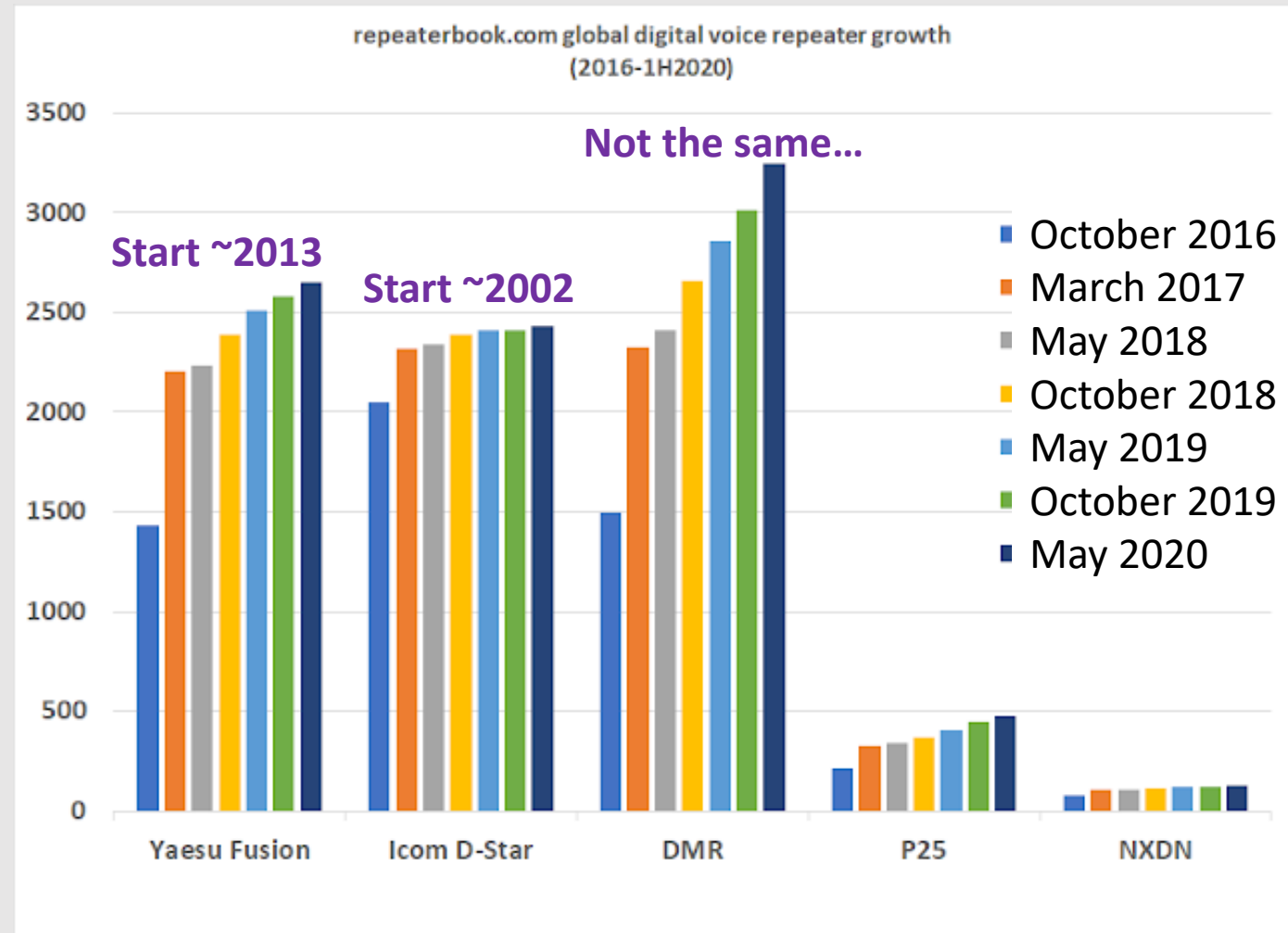
JUST THE BASICS....

- The data is “digitized” audio from an A/D converter.
- Digital data modulating an RF carrier
- Then it is passed to a vocoder to compress the data and add error correction and allow for more data/intelligibility
- Additional digital data such as text messaging and location can be added to the payload.
- Signals are then transmitted or received.
- **FUN FACT #2:** Icom D-Star first available in 2003. (IC-V82, IC-2200)
- **FUN FACT #1:** Alinco had the first digital voice radio in 2002. (DJ-196, DJ-596)



Partial Indicator: Digital Voice Repeaters

- Started tracking in 2016 based on comments by another area club disputing what will become most popular on a **global scale**.
- Main excuse to **NOT** fund a digital voice repeater due to lack of data available.
- Even based on “**global adoption**” data, still a lack of decision, but shifting 2020 winds are blowing towards DMR finally based on:
 - Members that have DMR or Fusion radios.
 - Members that have DMR or Fusion radios and use with hotspots but talk across networks.
 - Members would like to talk locally using digital voice but not using global “talk group” resources always.

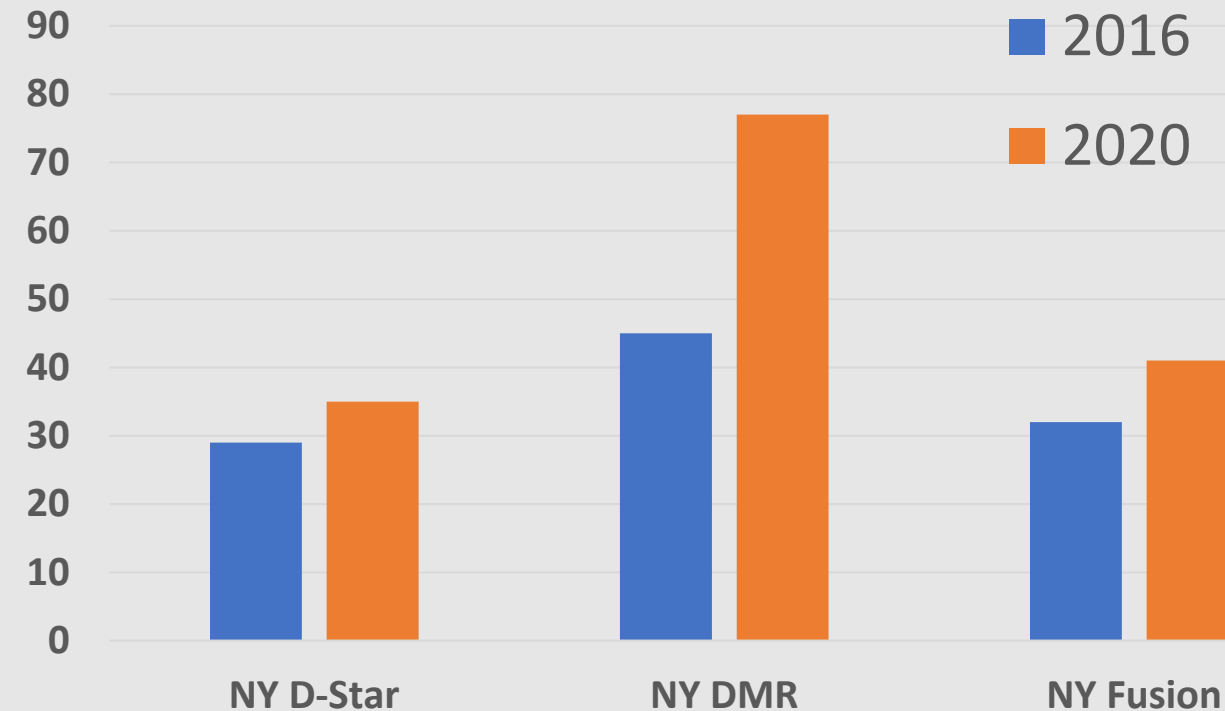


Partial Indicator: Digital Voice Repeaters

- Started tracking in 2016 based on comments by another area club disputing what will become most popular **locally**.
- Main excuse to **NOT** fund a digital voice repeater due to lack of data available plus “**SITE**” issues.
- Even based on “**local**” data, still a lack of decision, but shifting 2020 winds are blowing towards DMR finally based on:
 - ✓ Members that have DMR or Fusion radios
 - ✓ Members that use hotspots for Fusion, DMR or where they are linked together.
 - ✓ Members would like to talk locally using digital voice but not using global “talk group” resources always.

New York State Amateur Radio Digital Mode Repeaters

(As of October 9th of 2016 & 2020)

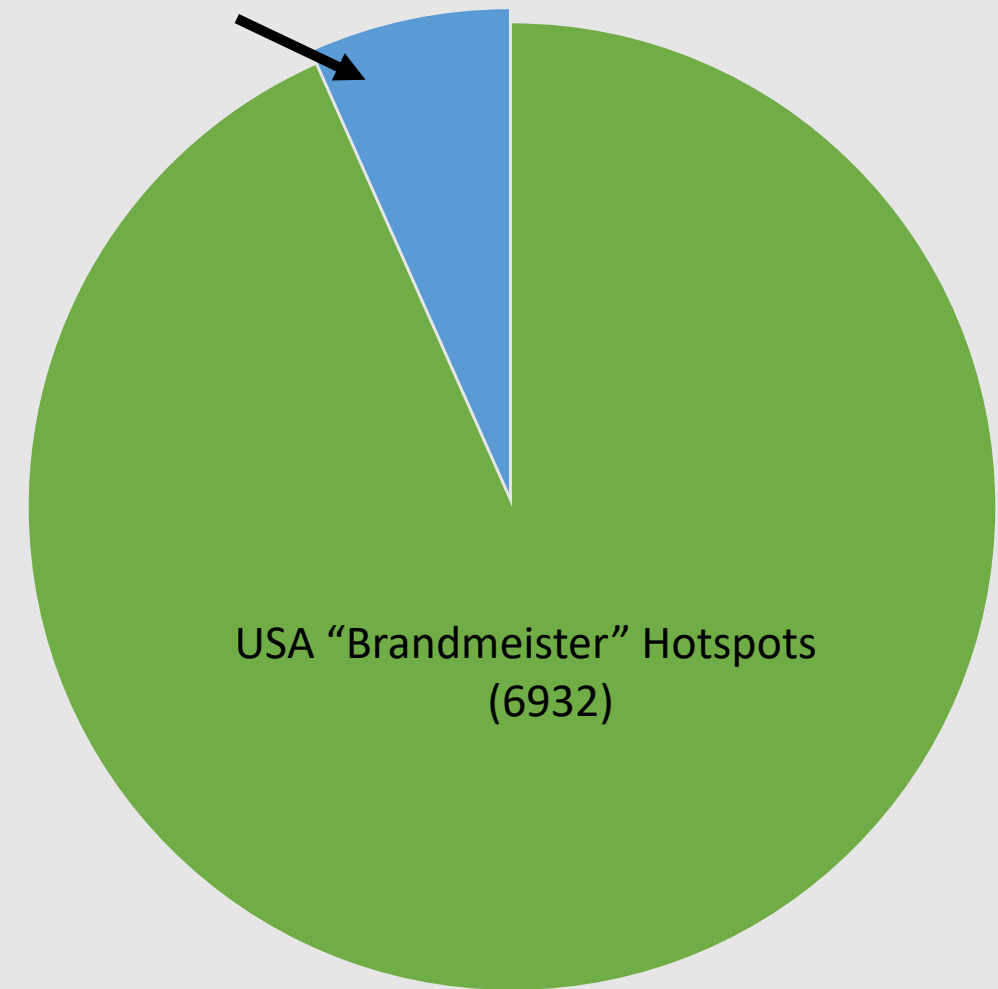


Hotspots: Driver of true digital voice growth

- Repeater are expensive and every user of digital voice has different tastes in who they want to talk or listen to.
- Brandmeister, MMDVM & Pi-Star changed digital voice for amateur radio forever regardless of DV mode!
- Users of hotspots can:
 - ✓ Talk to who ever they want, whenever they want.
 - ✓ Not have to feel discouraged by club politics or costs or location related to repeater costs and maintenance.
 - ✓ Take a hotspot with them should they travel or relocate and still stay in touch back home with minimal annoyances*.

**Annoyances defined as propagation, family or antenna height issues.*

USA "Brandmeister" Repeaters (495)



As of 2:00 PM October 9th, 2020

What is available: Radios & Hotspots

Current “On Market” Terminals as of 9/14/2016

Icom D-Star (6 Total, 2 Vendors)

- 1 Mobile/Base HF/VHF/UHF
- 2 Mobile VHF/UHF
- 1 Handheld VHF/220/UHF (Offered by Kenwood TH-D74)
- 1 Handheld VHF/UHF
- 1 Handheld UHF

DMR (48 Total, 9 Vendors*)

- 16 Handheld VHF or UHF
- 8 Mobile VHF or UHF
- Lots of rebadging!

Yaesu Fusion (7 Total, 1 Vendor)

- 2 Mobile/Base HF/VHF/UHF
- 2 Mobile VHF/UHF
- 1 Mobile VHF
- 2 Handheld VHF/UHF

Current “On Market” Terminals as of 10/9/2020

Icom D-Star (7 Total, 2 Vendors)

- 3 Mobile/Base HF/VHF/UHF
- 2 Mobile VHF/UHF
- 1 Handheld VHF/220/UHF (Offered by Kenwood TH-D74)
- 1 Handheld VHF/UHF

DMR (31 Total, 11 Vendors*)

- 10 Handheld VHF or UHF
- 8 Handheld VHF/UHF
- 8 Mobile VHF or UHF
- 5 Mobile VHF/UHF

Yaesu Fusion (6 Total, 1 Vendor)

- 1 Mobile/Base HF/VHF/UHF
- 3 Mobile VHF/UHF
- 2 Handheld VHF/UHF

*Including ODMs

What is available: Radios & Hotspots

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DMR (48 Total)

- 16 Handheld VHF/UHF
- 8 Mobile VHF/UHF
- Lots of other

Yaesu Fusion

- 2 Mobile/Base HF/VHF/UHF
- 2 Mobile VHF/UHF
- 1 Mobile VHF
- 2 Handheld VHF/UHF

Current "On Market" Terminals as of 10/9/2020

Icom D-Star (7 Total, 2 Vendors)

- 3 Mobile/Base HF/VHF/UHF
- 2 Mobile VHF/UHF

Key Points:

1. Vendors are trying to find what form factors will be most popular.
2. Vendors are trying to find what features and spectrum combinations will appeal the most.
3. Vendors trying to figure out how not to cost erode too quickly.
4. We are the Guinea pigs!

- 1 Mobile/Base HF/VHF/UHF
- 3 Mobile VHF/UHF
- 2 Handheld VHF/UHF

*Including ODMs

wood TH-D74)

What is available: Radios & Hotspots

Icom (D-Star)

Yaesu (Fusion)

CSI (DMR)

Anytone (DMR)

TYT/ODM (DMR)



Includes HF



What is available: Radios & Hotspots

D-STAR



\$450



\$400

FUSION



\$350



\$170

DMR



\$230



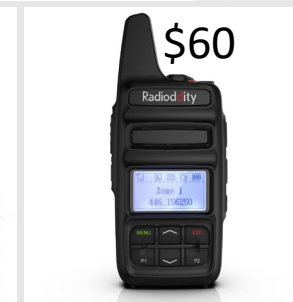
\$70



\$400 - \$999



\$160



\$60

+ MORE



\$200

What is available: Radios & Hotspots

Basic Hotspot
(~\$100)



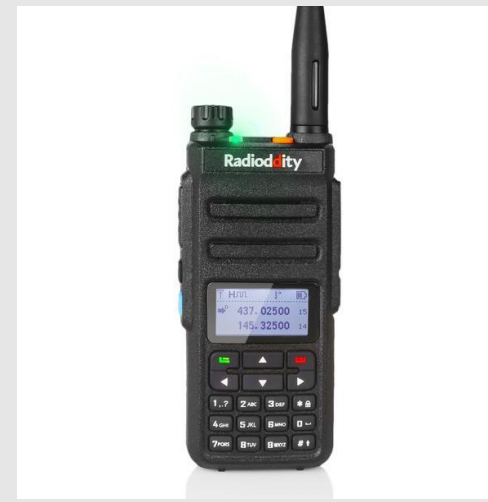
Advanced Hotspot
(~\$180)



Advanced DIY Hotspot
(~\$220)



OpenGD77 Hot Spot
(~\$70)



“Appliance Op”
Hotspot (~\$300)



Great to start with if you do not mind learning.

Supports “Dual Time Slot” and acts more like a repeater.

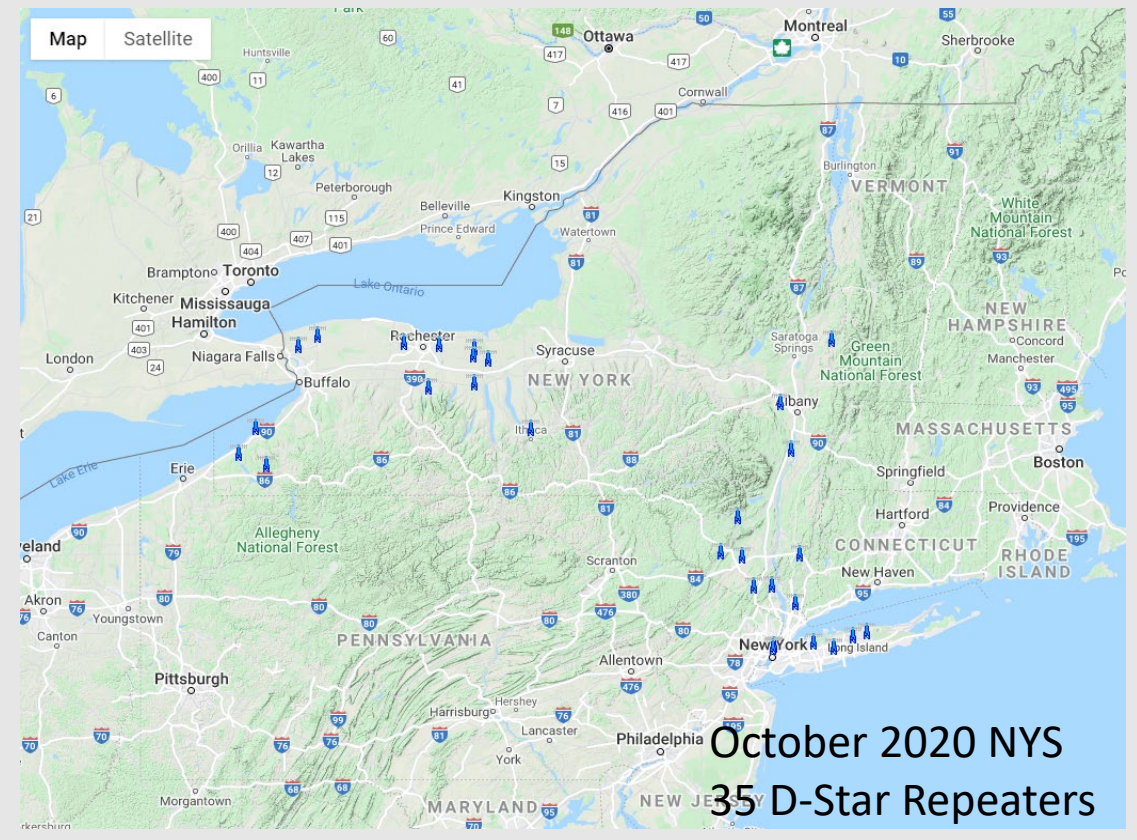
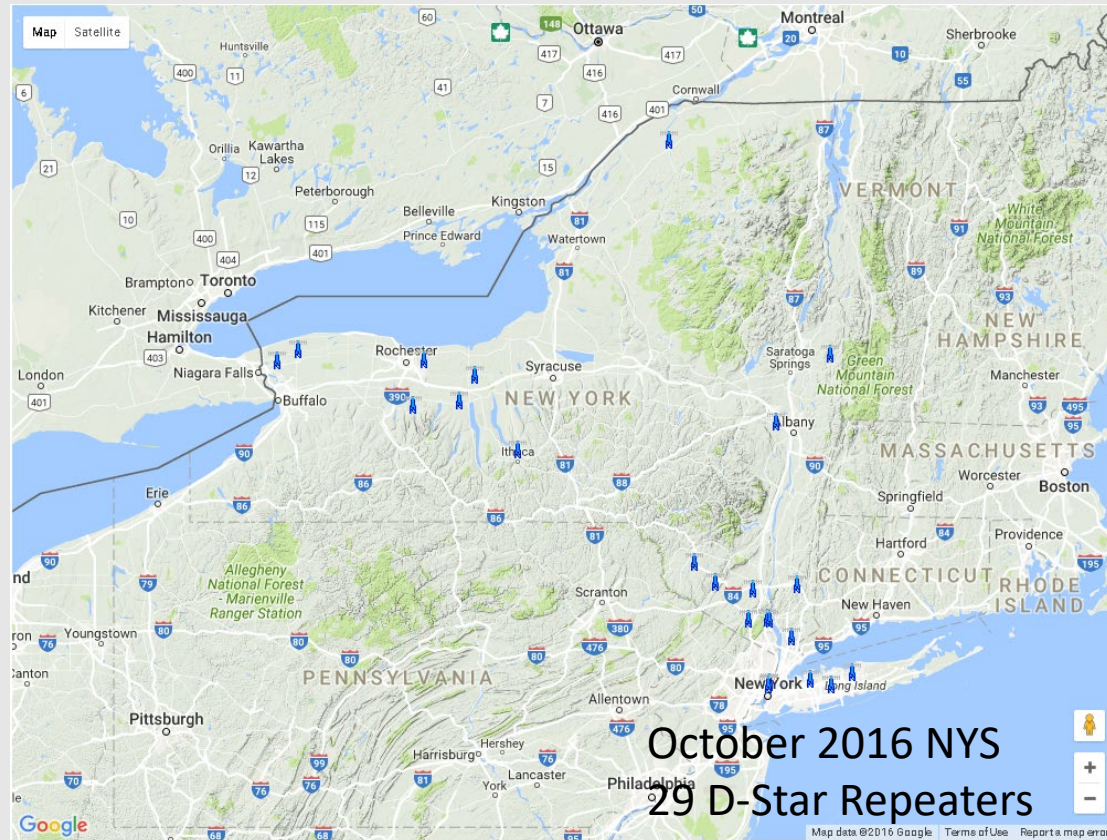
3rd party FW allows the radio with a USB cable to be used as a hotspot.

Hardware transcoding for the best voice quality

Worth the price?

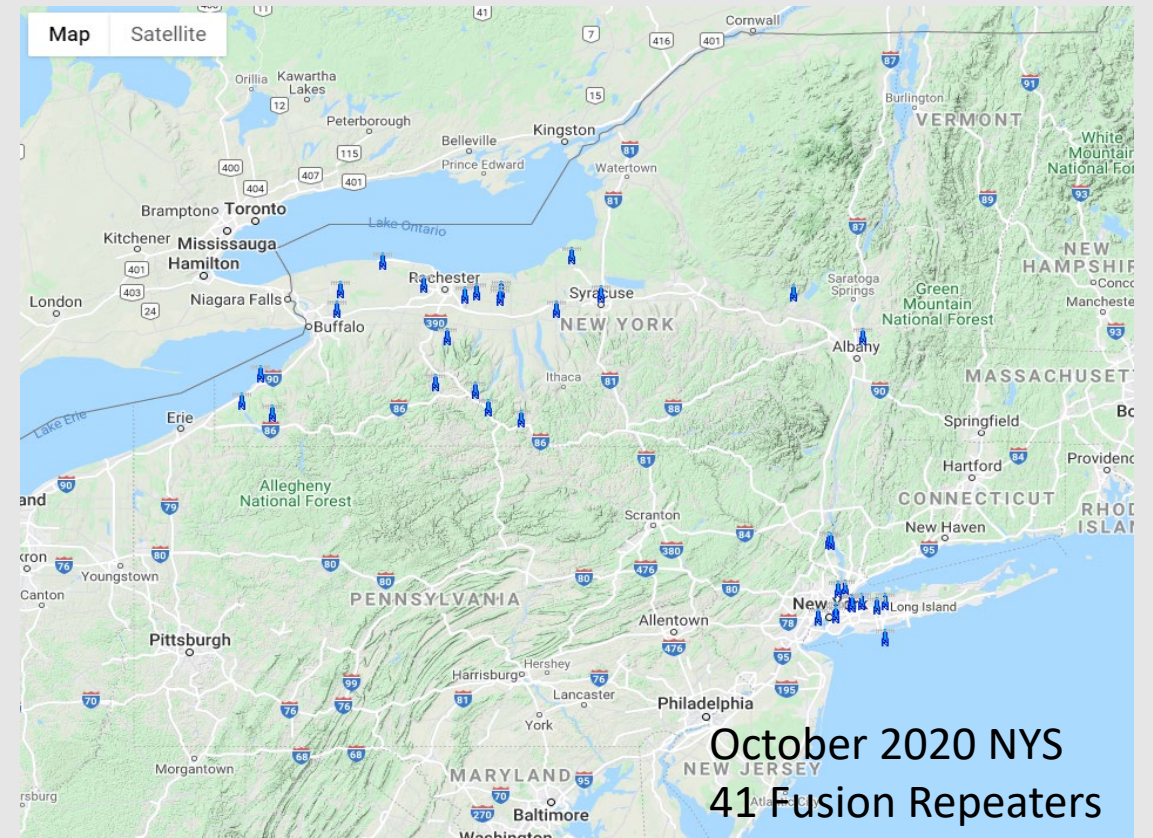
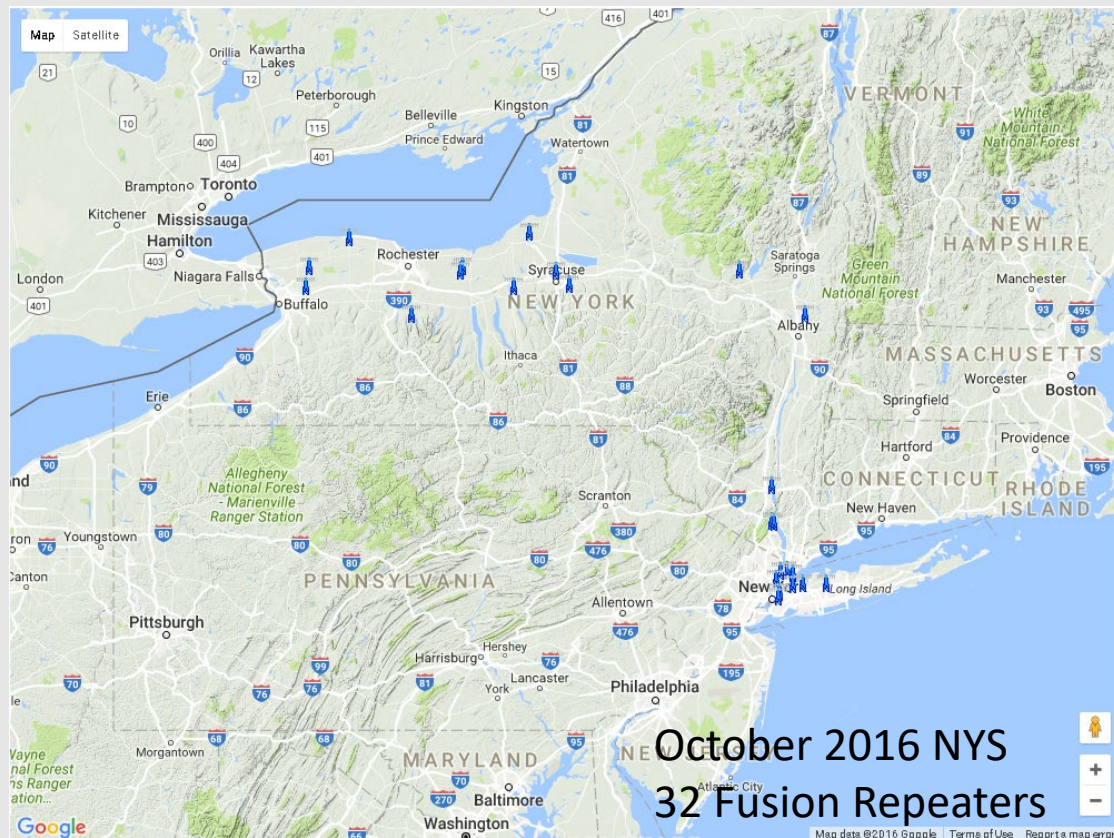
Status: Digital Voice in the Hudson Valley

New York State D-Star Repeater **21% growth** in 4 years.



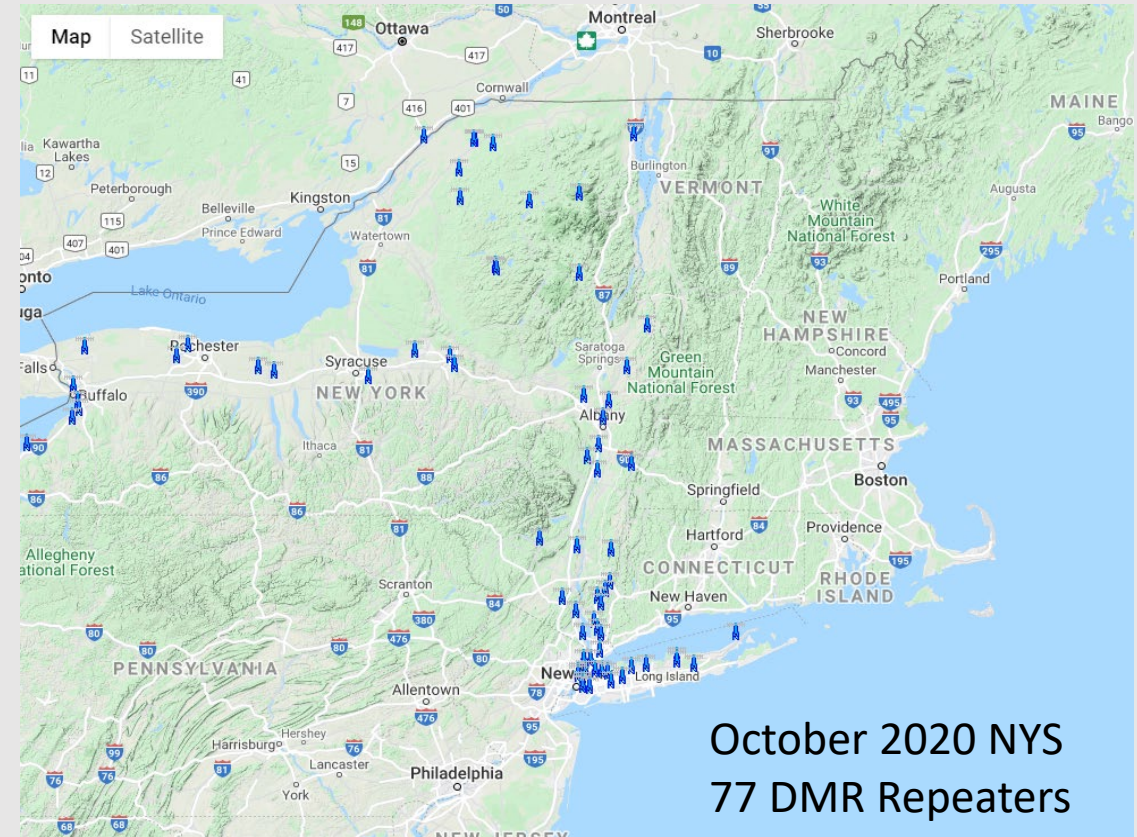
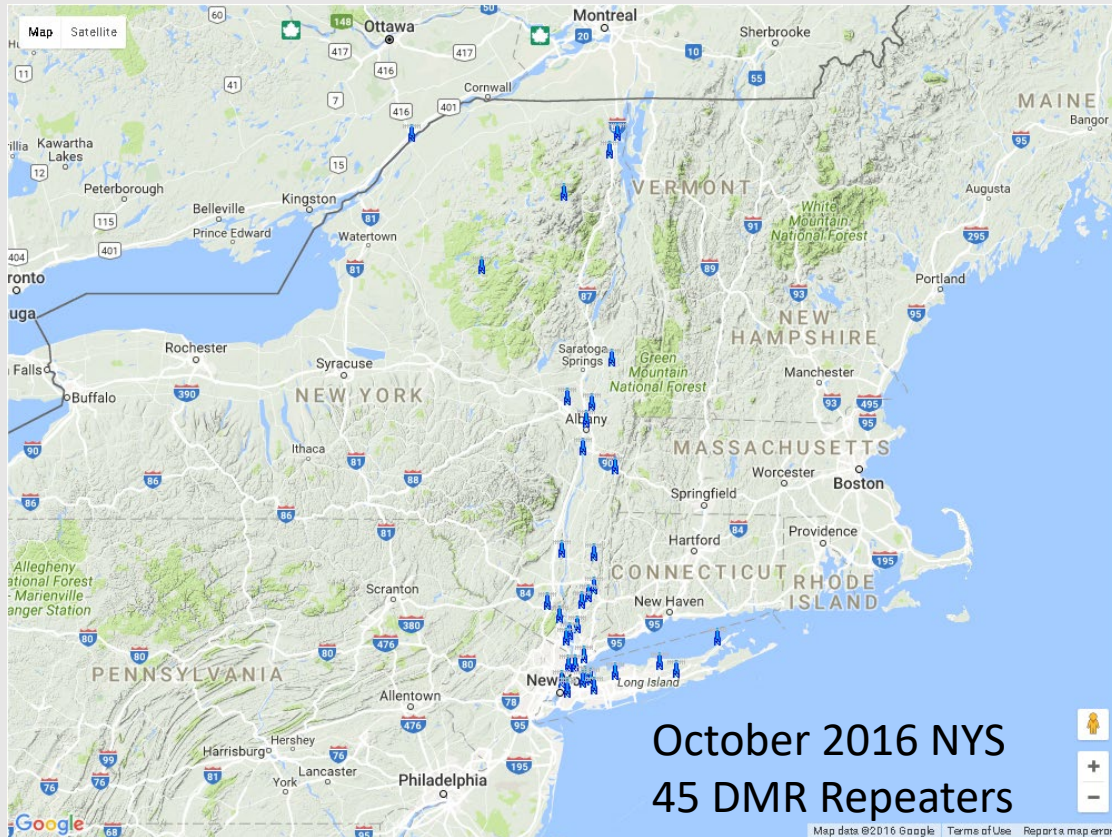
Status: Digital Voice in the Hudson Valley

New York State Fusion Repeater **34% growth** in 4 years.



Status: Digital Voice in the Hudson Valley

New York State DMR Repeater **71% growth** in 4 years.

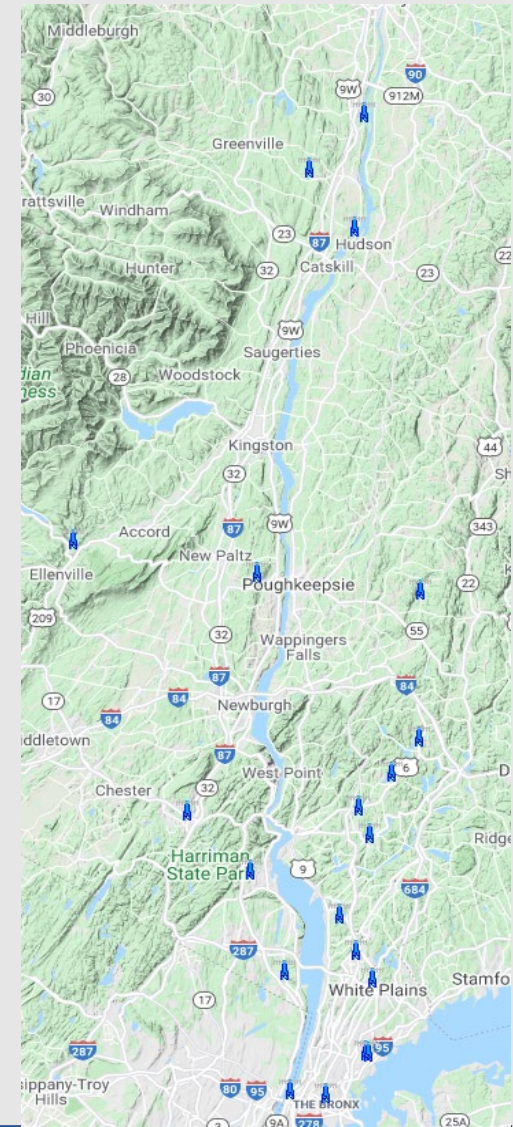


Why the Hudson Valley is behind....



The answer is.....

We need to **better coordinate** in our region and change how “repeater” infrastructure is funded, owned, **operated** and **thought about**.



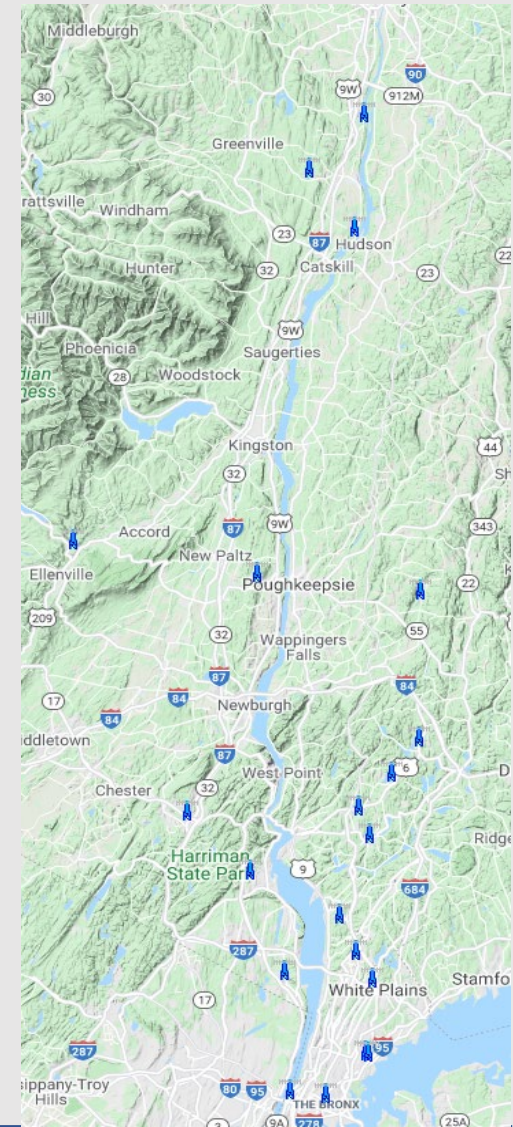
How our region can grow thanks to digital voice?



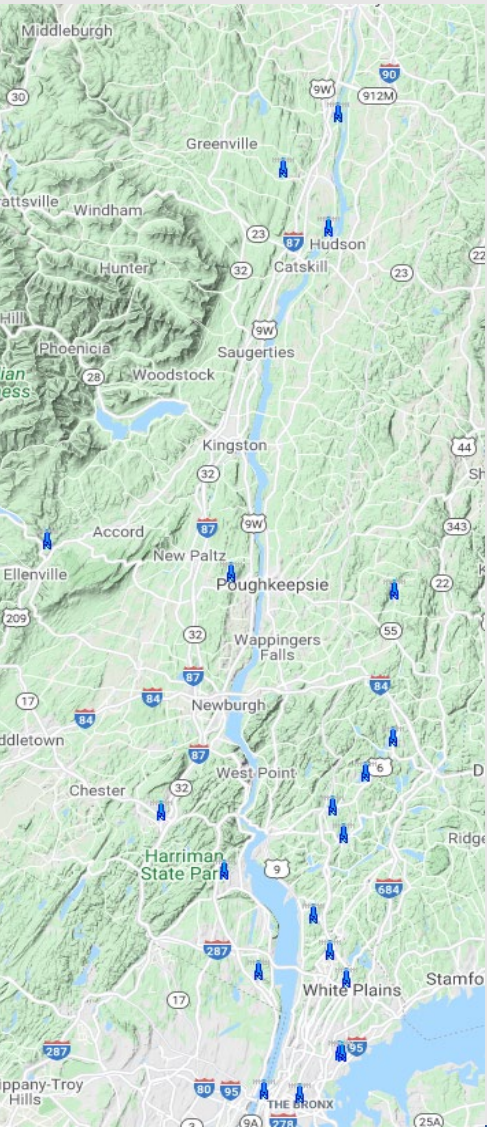
It is clear across New York State and the world that DMR is the prime choice to invest in.

Why? Four reasons:

#1: When properly installed, two discussions at same time on one frequency. TDMA permits this “dual slot” functionality.



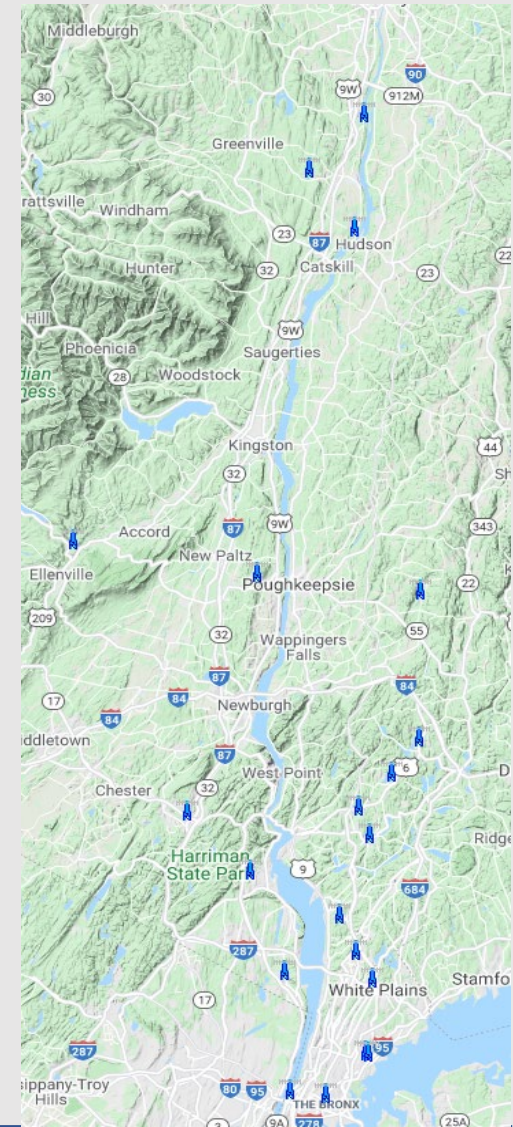
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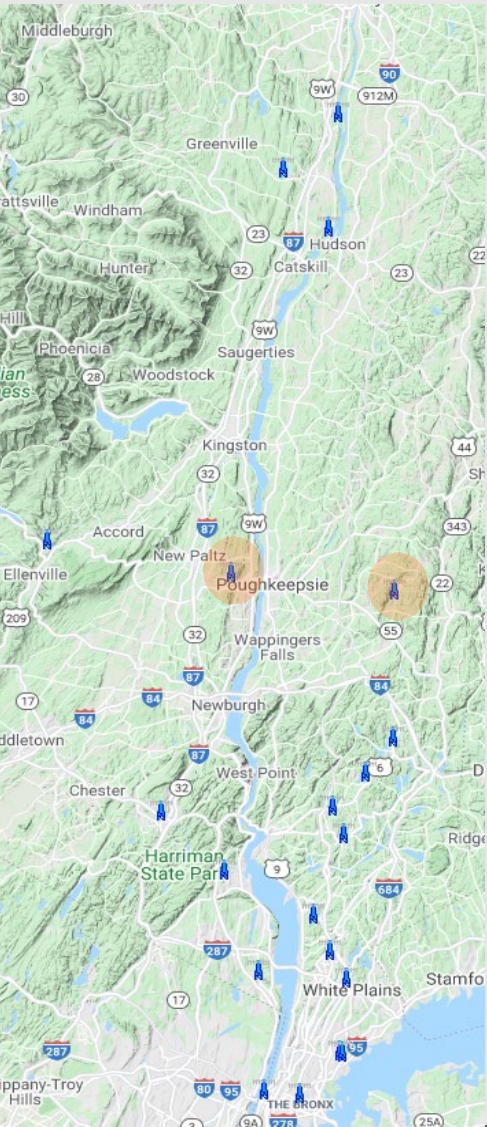
It is clear across New York State and the world that DMR is the prime choice to invest in.

Why? Four reasons:

#2: Equipment is easy to obtain for mobile, home or portable use and is backwards compatible with legacy FM to ease a “digital” transition. **Price is a non-issue at this point.**



How our region can grow thanks to digital voice?

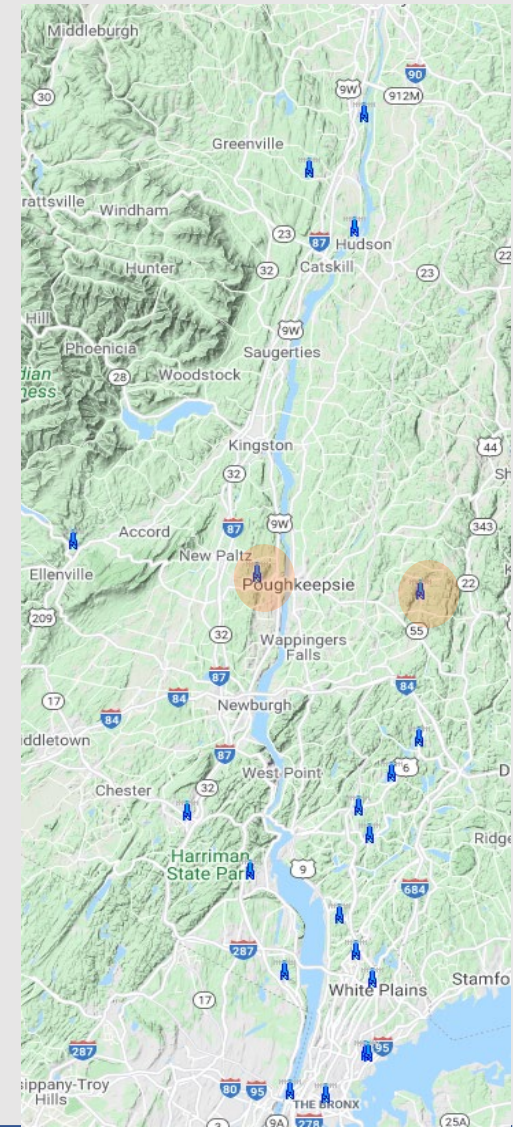


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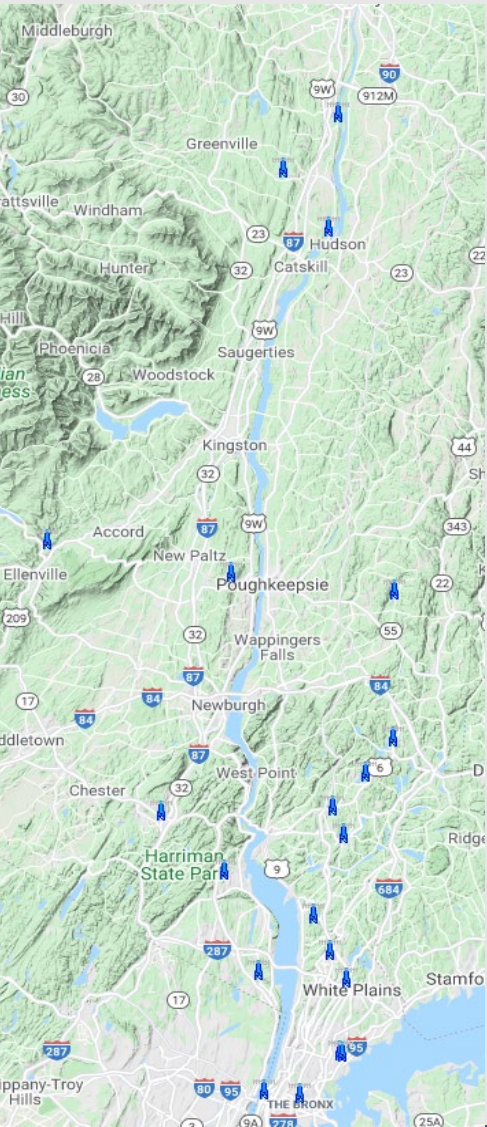
Why? Four reasons:

#3: Can be used offline for local users. Not every DMR repeater needs the “internet”.

Currently N2DXL and KC2OBW repeaters function this way and have great coverage, but little use.



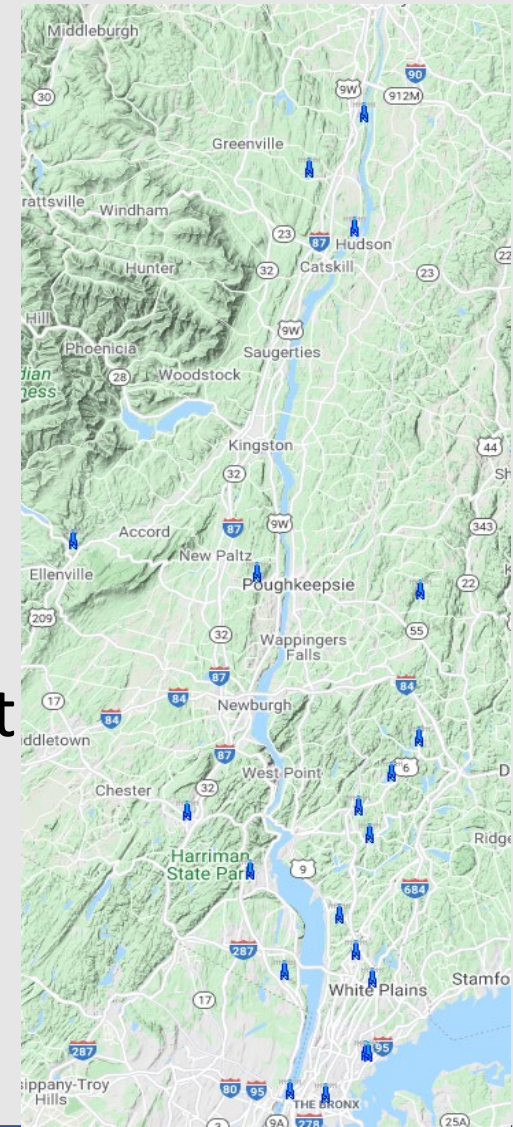
How our region can grow thanks to digital voice?



It is clear across New York State and the world that DMR is the prime choice to invest in.

Why? Four reasons:

#4: Sharing location and text messages to support different needs and uses will enhance our region and perception of digital voice value.



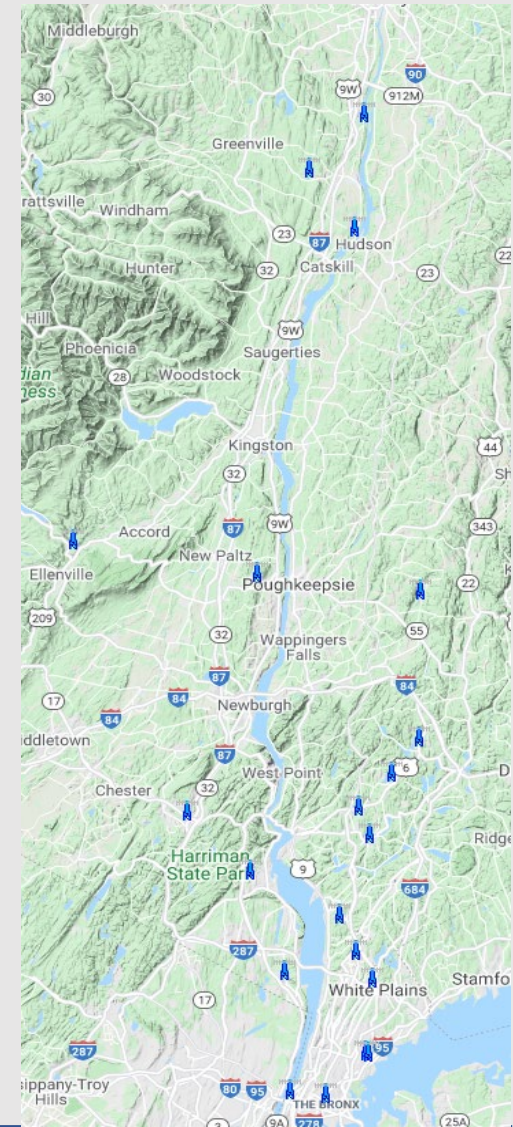
How our region can grow thanks to digital voice?



We are **NOT** really behind.....

Already, we have.....

- ✓ A dedicated DMR talk group called Mid-Hudson Valley found on TG 31368 via Brandmeister.
- ✓ A growing number of users thanks to OMARC.
- ✓ Many owners of DMR equipment to drive change.
- ✓ Clubs with unused/less used repeaters and sites.



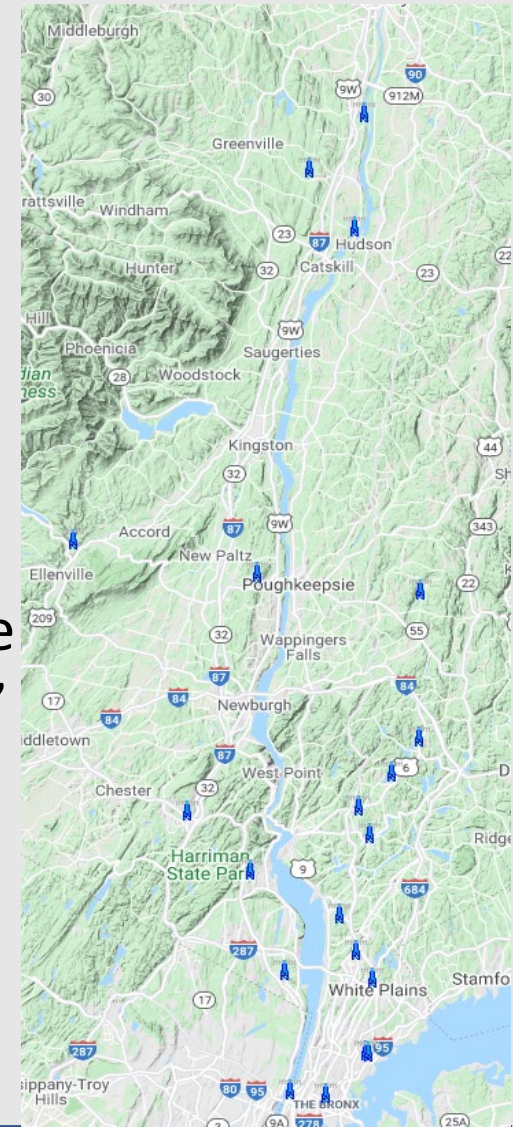
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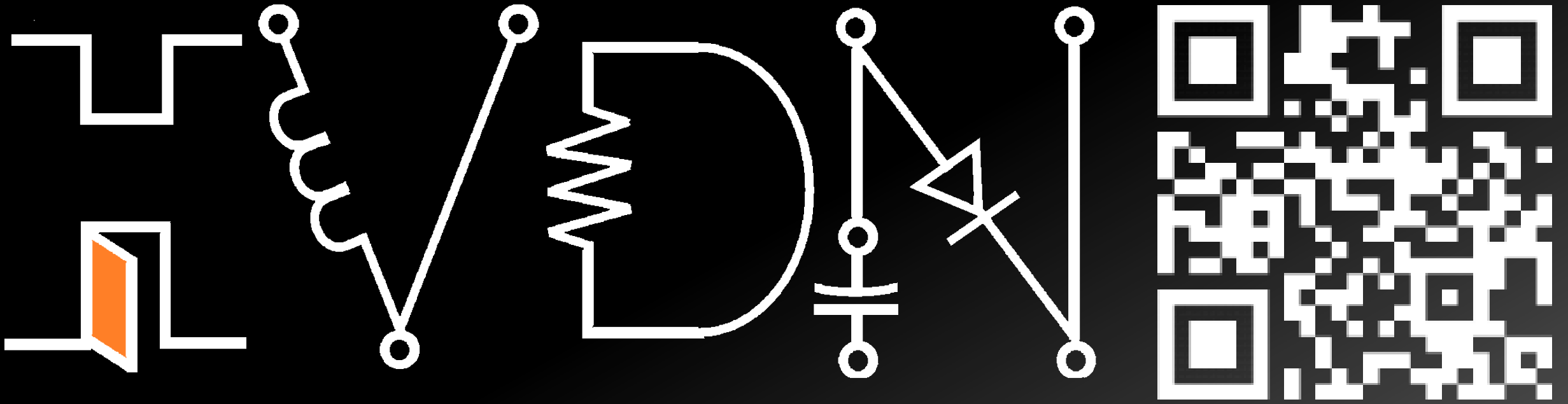


What do we do next?

Over the last **four** years, HVDN has quietly been raising awareness of amateur radio in other “converged” hobby areas who value what amateur radio can offer but we need **your** help.

- Can we find **open-minded leaders** in clubs who recognize the **convergence** of hobbies to **rethink** a “Hudson Valley” wide realistic DMR repeater network?
- By end of 2021 can we say we made progress?





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Amateur Radio Repeater Digital Voice Mode Growth