MIAMI VALLEY P25
HAM RADIO NETWORK

SOUTHWEST OHIO

Version 3.6 User's Manual

Version 3 adds wide area roaming on a single channel without the need to select your closest repeater.

MIAMI VALLEY P25 HAM RADIO NETWORK

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Where is the MVP25 Ham Radio Network

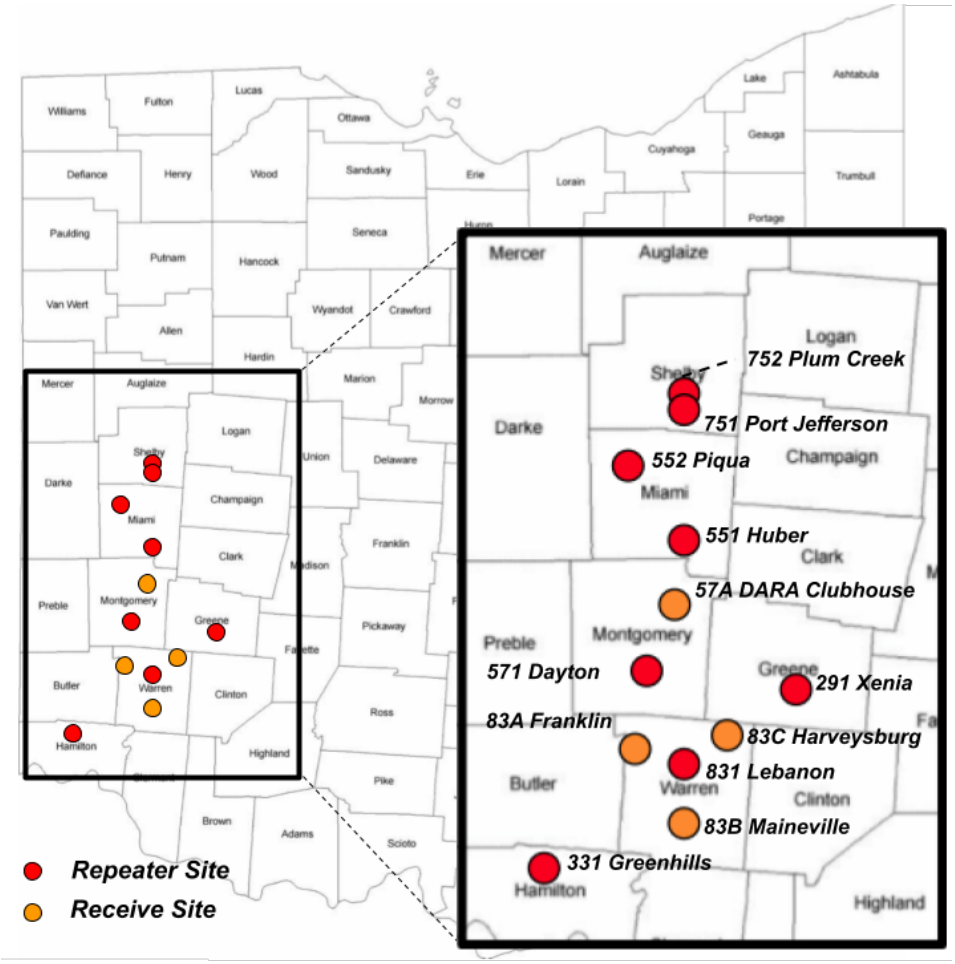
The MVP25 network is a group of UHF P25 repeater sites in southwest Ohio. There are active sites in Greene, Miami, Montgomery, Shelby, Warren and Hamilton counties.

There are small test sites operating with a very limited coverage in Columbus Ohio and Shelby County Ohio. Those sites operate as private test locations for learning and troubleshooting.

The map shows the active tower locations in the Miami valley region of Ohio. The Miami Valley is the land area surrounding the Great Miami River in southwest Ohio, USA, and includes the Little Miami, Mad, and Stillwater rivers as well. Geographically, it includes Dayton, Springfield, Middletown, Hamilton, and other communities. The name is derived from the Miami Indians.

MVP25 Ham Radio Network Officers, Owners, and Users

The MVP25 group is made up of four officers, repeater owners, and licensed Ham Radio users, who have come together to produce a professional P25 system in southwest Ohio. This system is open to registered amateur operators who are expected to embrace the standards set by the MVP25 group to ensure the highest operating standards of communication. Failure to abide by these standards will result in the user being de-listed in the system.



About the MVP25 Ham Radio Network

The MVP25 network is a solution to the busy digital networks of today. Digital repeater owners have tied their systems to state and worldwide networks. These state and worldwide networks have created an almost non-stop run of transmit activity originating from other regions or the globe. Repeaters tied to state and worldwide networks suffer from transmit overload and failure. The networks do not include the isolation required to promote a community of hams you may meet in person.

The MVP25 network provides an interconnected community of UHF P25 digital repeaters in southwest Ohio. This community of connected repeaters allows for a reliable shared regional talk path between all locations. You can talk to users on any repeater from any other repeater. Each site on the MVP25 network may also be utilized as a standalone repeater for local conversations.

The MVP25 digital network was built with the highest grade (public safety) Motorola, Cisco, Ric-M and other hardware. The network was developed in partnership with subject matter experts who are professionals in the fields of networking and public safety communications design and maintenance.

There is a robust secure network at the root of the MVP25 system. Sites have backup power and can operate independently of each other should a link failure occur. Most digital linked networks connect to cloud hosted reflectors. Cloud reflectors work well; however, they do not allow for all the radio system features available to P25 public safety radios. The MVP25 network does not use reflectors. All voice and data traffic on the MVP25 network is passed to each site via direct network connection. The passing of data is handled through dedicated purpose-built devices instead of software on a computer. The MVP25 network design allows for fast, reliable, and simultaneous delivery of voice to all sites.

The MVP25 network is accessed from subscriber radios using RF. The network does not contain a public hotspot for connections. There is no access to the MMDVM accessible reflectors (worldwide, nationwide, etc.) through the MVP25 linked network. The use of linking hardware or software on the MVP25 system is strictly prohibited. Voice and data traffic is not permitted to be forwarded to or from reflectors or any other external sources.

Version 3 programming and compatibility with previous versions

Version 3 supports a simpler band plan than its previous version 2 counterpart. On the version 3 standard, each repeater is scanning all input channels on the MVP25 system. This means when you transmit on any frequency, any repeater within range to hear your transmission will send your voice to the comparator for analysis. The comparator will send the best audio to each repeater for retransmission. The comparator is constantly checking for the best audio. The audio source may change many times during your short QSO. All of this happens without the need for operator interaction.

The version 3 system is backwards compatible with all version 2 radios. Version 2 radios are enjoy the benefit of version 3 repeaters because of the voted receive audio. Any version 1 programmed radios must be reprogrammed. There are incompatible talkgroups on the version 1 radios which cause harmful interference to the MVP25 system.

Version 3 continues to use talkgroups 9371 named “MV Link” as well as talkgroup 8900 named “Simplex” from previous versions. These talkgroup continues to be accessed using NAC $4CE. These talkgroups are compatible with all previous versions of the MVP25 system.

Beginning with version 2 in May of 2023 repeater isolation via NAC control allows for independent use of each repeater in site (STE) local mode. Each repeater has talkgroup 9001 named “site”. This talkgroup is accessed using a NAC matching the repeater’s ID number (example: repeater site 571 Dayton uses NAC $571). When this talkgroup is used on this NAC the repeater will not send the transmission over the network to other sites. This allows for a repeater only QSO without impacting the availability of another repeater on the MVP25 network.

How do I get on the MVP25 Ham Radio Network?

Access to the MVP25 network requires a UHF radio capable of transmitting and receive P25. When selecting a radio, double check to be sure the radio frequency range includes the 440 MHz ham band.

Project 25 (P25 or APCO-25) is a suite of standards for interoperable digital two-way radio products. P25 was developed by public safety professionals in North America and has gained acceptance for public safety, security, public service, and commercial applications worldwide. P25 radios are a direct replacement for analog UHF (typically FM) radios, but add the ability to transfer data as well as voice, allowing for more natural implementations of text messaging. P25 radios are commonly implemented by dispatch organizations, such as police, fire, ambulance, and emergency rescue service, using vehicle-mounted radios combined with handheld walkie-talkie use.

Programming a Radio

The MVP25 network can be used by any P25 radio in the correct frequency range. There are several radios which are supported by the MVP25 user group. There is programming assistance available for supported radios. Most Motorola, EF Johnson, and Harris P25 radios are MVP25 user group supported. Many of the radios on the surplus market were purchased and used as analog radios and will require firmware updates to function at their full ability on P25.

The software and process for programming P25 radios is similar to DMR radio. It is necessary to set up frequencies, talk groups, and NAC for each “channel”. This guide includes the information necessary to join simplex and repeater channels in use on the MVP25 network.

The MVP25 user group is interested in meeting you and is happy to assist with programming, firmware updates and maintenance of supported radios during scheduled work sessions.

Supported Radios

Portable Radios

- BK KNG
- EF Johnson 5100es
- EF Johnson VP400, VP600, VP900, VP8000 (8000 is multiband)
- Harris P7100, P7300
- Harris Unity XG-100 Full Spectrum, M7100, M7200, M7300
- Kenwood NX Series (multi-protocol)
- Midland STP-404A
- Motorola XTS 3000 (age is making these radio more difficult to support than some others)
- Motorola XTS 2500 *(low split UHF or high split UHF with some limitations)*
- Motorola XTS 5000 *(low split UHF or high split UHF with some limitations)*
- Motorola APX (any model) *(low split UHF or high split UHF with some limitations)*
- Tait TP9100 (and several other models)
- Vertex Standard VX-P8xx and VX-P9xx)

Mobile Radios

- EF Johnson 5300 es
- Harris M7100
- Motorola Astro Spectra (age is making these radio more difficult to support than some others)
- Motorola XTL 1500 *(low split UHF or high split UHF with some limitations)*
- Motorola XTL 2500 *(low split UHF or high split UHF with some limitations)*
- Motorola XTL 5000 *(low split UHF or high split UHF with some limitations)*
- Harris Unity XG-100M Full Spectrum (program only)

Repeater use Guide

Talkgroups and Selective Squelch

The system is designed to use talkgroups to organize traffic into “channels”. You are required to use selective squelch and the appropriate talkgroup. Failure to use a talkgroup will result in your transmissions causing interference on the system as it will not be heard by other properly programmed radios. Without your talk group set to selective squelch you will hear all transmissions on the network even if they are not intended for the talkgroup you choose. This will result in confusion and leads to harmful interference on the system’s single talk path.

A list of approved talk groups for each repeater is listed in this document. The use of unapproved talkgroups on the system may result in termination of your privilege to use the system.

How to set selective squelch based on software type:

The correct setting for the MVP25 network (selective squelch) is not the default in most programming software. If you do not change this setting your radio will not filter on the talkgroup which is a requirement of the MVP25 P25 network.

CPS	Model	Menu Item	Selection
EJ Johnson PC Configure	EF Johnson 5100es	Receive Portion, uncheck digital squelch	Selective
Radio Personality Manager	Harris all models	Sq Mode	SEL
Astro Saber and XTS 3000 CPS	Motorola XTS 3000	Rx Unmute Rule	Selective Squelch
ASTRO 25 Portable CPS	Motorola XTS 2500	Rx Unmute Rule	Selective Squelch
ASTRO 25 Portable CPS	Motorola XTS 5000	Rx Unmute Rule	Selective Squelch
APX CPS	Motorola APX Anything	Rx Unmute Rule	Selective Squelch
ASTRO Spectra	Motorola Astro Spectra	Rx Unmute Rule	Selective Squelch
ASTRO 25 Mobile CPS	Motorola XTL 2500	Rx Unmute Rule	Selective Squelch
ASTRO 25 Mobile CPS	Motorola XTL 5000	Rx Unmute Rule	Selective Squelch

Talk paths

Whereas there are a handful of talk groups and private calls in use on the network there is one single talk path across the wide area network. P25 works in much the same way as the radio filtering in use by other digital modes (DMR, D-Star, etc.) and analog (CTCSS and DPL). It is important to keep this in mind when using the system. If you hear a QSO on one talk group which you do not want to participate in you can change to another talk group, however, that does not mean the talk path is immediately available. In most cases the use of multiple talk groups will not cause interference because radio transmissions are not a constant and most communications are short.

It is a requirement to use strapped talkgroups and filtering when programming. (A strapped talkgroup does not allow for talkgroup selection from the radio front panel.) There may at any time be traffic on the talk path which is not intended for your assigned talkgroup. Listening to this traffic will create confusion as you will not be able to change talk group and NAC to respond. Because the version 2 software filters on both talkgroup and NAC there is no longer support for talkgroup select. (Talkgroup select allows for talkgroup selection from the radio front panel.) It is necessary to program each talkgroup and NAC and to then utilize the scan feature when monitoring the radio system.

RECOMMENDED SYSTEM TEMPLATE

P25 radios are public safety grade and have a 16-channel selector knob with multiple zones. The MVP25 repeater channels and band plan is “name” based so where you place channels in your radio is entirely your decision. The zone templates below will utilize the A/B/C switch to select between banks and will be used by MVP25 programmers for those requiring assistance with their radios.

New with version 3 is a minimal installation. Most users of the system spend their time on the wide area MV Link talkgroup or the simplex UCOM1 channel. A minimal installation of just two channels is possible with version 3 because of the newly added roaming capability of the repeaters and the radio.

The use of # indicates a digital P25 channel.

MV Link (MVL) = system wide talkgroup
Site (STE) = repeater isolated talkgroup

CHANNEL NAME TEMPLATE

The following naming scheme for MVP25 has been developed to promote consistency in system programming and support.

Channel Name	
8	**12/14**
#UCOM1	UCOM1
MVLink 3	MV Link v3
I-Call	I-Call
STE xxx	STE xxx ABC
#UTACxP	#UTACx P25
UTAC1	UTAC1
MVL 3.x	MV Link v3.x
ICALL3.X	I-Call v3.x

Zone Name		
2/3	**8**	**12/14**
MV	MVP25	MVP25
FP	FPP	FPP
RP	RPTS	REPEATERS

Minimal Installation

The minimum install includes MV Link v3 and #UCOM1. These are the channels which will be used by most users.

CHAN	Zone	Channel
1	MVP25	UCOM1
2	MVP25	MV Link v3

Full Installation

The full install includes MV Link v3, #UCOM1 simplex and the 5 UTac channels which entered duplicate in both P25 and FM. This install allows for channel availability as well as simple simplex compatibility with non P25 users.

CHAN	MVP25 Full Install
1	MVP25 UCOM1
2	MVP25 MV Link v3
3	MVP25 I-Call
4	OPEN
5	OPEN
6	OPEN
7	UTAC 1 FM
8	UTAC 2 FM
9	UTAC 3 FM
10	UTAC 4 FM
11	UTAC 5 FM
12	#UTAC1 P25
13	#UTAC2 P25
14	#UTAC3 P25
15	#UTAC4 P25
16	#UTAC5 P25

ADVANCED INSTALL (VERSION 2 COMPATIBLE)

The advanced install of MV Link is used to set your radio to a specific repeater on MV Link. This is not the recommended mode of operation. Use of the individual repeater will steer the receive on your radio to only listed to the selected site, however the repeaters are scanning and listening to all site inputs. When you make this selection on your radio there is no impact to the routing of your transmitted signal.

Radios which do not support vote scan will use the advanced Install programming.

The advanced install programming includes the Site (STE) local channels. These channels are available on each repeater. The channels share a talk path with the MV Link channel, but they are not the same. The Site local channels stay at the repeater and do not transmit over the network. The site local channels and the MV Link channels will not talk to each other even when on the same repeater.

Whereas the site local channels are maintained on each repeater, they are not a part of the recommended install for subscriber radios. The usage of these channels has never been popular, and their inclusion has caused confusion for many users of the system.

CHAN	Bank A – MV Link, UTAC P25	Bank B – Site Local, UTAC FM	Bank C – UCOM 1
1	–#UCOM1	–#UCOM1	–#UCOM1
2	MVL #311 Greenhills	STE #311 Greenhills	–#UCOM1
3	MVL #291 Xenia	STE #291 Xenia	–#UCOM1
4	MVL #551 Huber	STE #551 Huber	–#UCOM1
5	MVL #552 Piqua	STE #552 Piqua	–#UCOM1
6	MVL #571 Dayton	STE #571 Dayton	–#UCOM1
7	MVL #751 Port Jefferson	STE #751 Port Jefferson	–#UCOM1
8	MVL #752 Plum Creek	STE #752 Plum Creek	–#UCOM1
9	MVL #831 Lebanon	STE #831 Lebanon	–#UCOM1
10	MVL OPEN	STE OPEN	–#UCOM1
11	MVL 70 CALL (446.0)	STE 70 CALL (446.0)	–#UCOM1
12	–#UTac1P (P25)	UTac1 (Analog)	–#UCOM1
13	-#Utac2P (P25)	UTac2 (Analog)	–#UCOM1
14	-#UTac3P (P25)	UTac3 (Analog)	–#UCOM1
15	-#UTac4P (P25)	UTac4 (Analog)	–#UCOM1
16	-#UTac5P (P25)	UTac5 (Analog)	–#UCOM1

P25 Simplex Frequencies (MVP25 STANDARD)

The # designator on a frequency indicates the frequency is digital. In the case of this document all # designators indicate digital P25 operation. The UTac channels listed below are P25 channels; however, they have a matching analog channel with a 118.8 CTCSS. It is recommended to program these frequencies in mixed mode receive so you can hear if the channel is in use in analog and switch to that mode if necessary. These simplex channels are available for local communication between users.

Name: --#UCOM1
Frequency: 440.9625
NAC: $4CE
talk group: 8900 (Simplex)

Name: --#UTac1
Frequency: 446.025
NAC: $4CE
talk group: 8900 (Simplex)

Name: --#UTac2
Frequency: 446.050
NAC: $4CE
talk group: 8900 (Simplex)

Name: --#UTac3
Frequency: 446.0750
NAC: $4CE
talk group: 8900 (Simplex)

Name: --#UTac4
Frequency: 446.100
NAC: $4CE
talk group: 8900 (Simplex)

Name: --#UTac5
Frequency: 446.125
NAC: $4CE
talk group: 8900 (Simplex)

Analog Simplex Frequencies (MVP25 ANALOG)

The below frequencies are recommended for programming. These are analog and allow for interoperability with analog users.

The National 70 cm calling frequency is included. Common courtesy on national calling frequencies is to establish a contact and then move to another frequency to allow others to establish their contacts. The UTac channels are available for any communication between users. It is recommended to add an analog zone to the radio and include these channels in that zone.

Name: 70-Calling
Frequency: 446.000
National Calling Frequency

Name: UTac1
Frequency: 446.025
CTCSS: 118.8

Name: UTac2
Frequency: 446.050
CTCSS: 118.8

Name: UTac3
Frequency: 446.0750
CTCSS: 118.8

Name: UTac4
Frequency: 446.100
CTCSS: 118.8

Name: UTac5
Frequency: 446.125
CTCSS: 118.8

Radio ID

Every radio on the network is required to have a radio ID which has been assigned by the website https://radioid.net. The ID is often referred to as a DMR radio ID. This website will generate a globally unique ID for free and assign it to your ham radio call sign. The ID is used between users to help know who is talking and by the system monitoring software which helps ensure the system is functioning properly.

Users must register their radio id on our website at http://www.miamivalleyp25.group. There is a link available to view registered users of the system at this same location. You may use this link to program your radio with the other users of the system.

Repeaters

The Miami Valley P25 group website contains a status dashboard of all sites.
Website: http://www.miamivalleyp25.group.

Site	Transmit Freq	Receive Freq	CH
311	443.8375	448.8375	1
291	444.0125	449.0125	2
551	443.7750	448.7750	3
552	444.7250	449.7250	4
571	443.4625	448.4625	5
751	442.4750	447.4750	6
752	443.9000	448.9000	7
831	443.1500	448.1500	8

Name: 311 Greenhills – Channel 1

Location: County-31 Hamilton, City-Greenhills (Mobilcomm on Sharon Rd)
Frequency: 443.8375 + (448.8375 transmit)

Site approved talk groups:
NAC/Network ID: 1230 DEC, 4CE HEX
9371 DEC, 249B HEX [MV Link] (Miami Valley Link) (system primary) (inhibit transmit on busy)

Advanced Install Only
NAC/Network ID: 785 DEC, 311 HEX
9001 DEC, 2329 HEX [Site] (single site repeat) (do not inhibit transmit on busy)

NAME: 291 XENIA (3.0 CAPABLE) – CHANNEL 2

Location: County-29 Greene, City-Xenia (DARA Hamvention Site)
Frequency: 444.0125 + (449.0125 transmit)

Site approved talk groups:
NAC/Network ID: 1230 DEC, 4CE HEX
9371 DEC, 249B HEX [MV Link] (Miami Valley Link) (system primary) (inhibit transmit on busy)

Advanced Install Only
NAC/Network ID: 657 DEC, 291 HEX
9001 DEC, 2329 HEX [Site] (single site repeat) (do not inhibit transmit on busy)

NAME: 551 HUBER (3.0 CAPABLE) – CHANNEL 3

Location: County-55 Miami, City-Tipp City
Frequency: 443.775+ (448.775 transmit)

Site approved talk groups:
NAC/Network ID: 1230 DEC, 4CE HEX
9371 DEC, 249B HEX [MV Link] (Miami Valley Link) (system primary) (inhibit transmit on busy)

Advanced Install Only
NAC/Network ID: 1361 DEC, 551 HEX
9001 DEC, 2329 HEX [Site] (single site repeat) (do not inhibit transmit on busy)

NAME: 552 PIQUA (3.0 CAPABLE) – CHANNEL 4

Location: County-55 Miami, City-Piqua
Frequency: 444.7250+ (449.7250 transmit)

Site approved talk groups:
NAC/Network ID: 1230 DEC, 4CE HEX
9371 DEC, 249B HEX [MV Link] (Miami Valley Link) (system primary) (inhibit transmit on busy)

Advanced Install Only
NAC/Network ID: 1362 DEC, 552 HEX
9001 DEC, 2329 HEX [Site] (single site repeat) (do not inhibit transmit on busy)

NAME: 571 DAYTON (3.0 CAPABLE) – CHANNEL 5

Location: County-57 Montgomery, City-Dayton (Primary system controller, high profile)
Frequency: 443.4625+ (448.4625 transmit)

Site approved talk groups:
NAC/Network ID: 1230 DEC, 4CE HEX
9371 DEC, 249B HEX [MV Link] (Miami Valley Link) (system primary) (inhibit transmit on busy)

Advanced Install Only
NAC/Network ID: 1393 DEC, 571 HEX
9001 DEC, 2329 HEX [Site] (single site repeat) (do not inhibit transmit on busy)

NAME: 751 PORT JEFFERSON (2.0 CAPABLE) – CHANNEL 6

Location: County-75 Shelby, City-Port Jefferson
Frequency: 442.475+ (447.475 transmit)

Site approved talk groups:
NAC/Network ID: 1230 DEC, 4CE HEX
9371 DEC, 249B HEX [MV Link] (Miami Valley Link) (system primary) (inhibit transmit on busy)

Advanced Install Only
NAC/Network ID: 1873 DEC, 751 HEX
9001 DEC, 2329 HEX [Site] (single site repeat) (do not inhibit transmit on busy)

NAME: 752 PLUM CREEK (2.0 CAPABLE) – CHANNEL 7

Location: County-75 Shelby, City-Sidney
Frequency: 443.900+ (448.900 transmit)

Site approved talk groups:
NAC/Network ID: 1230 DEC, 4CE HEX
9371 DEC, 249B HEX [MV Link] (Miami Valley Link) (system primary) (inhibit transmit on busy)

Advanced Install Only
NAC/Network ID: 1873 DEC, 752 HEX
9001 DEC, 2329 HEX [Site] (single site repeat) (do not inhibit transmit on busy)

NAME: 831 LEBANON (3.0 CAPABLE) – CHANNEL 8

Location: County-83 Warren, City-Lebanon
Frequency: 443.150+ (448.150 transmit)

Site approved talk groups:
NAC/Network ID: 1230 DEC, 4CE HEX
9371 DEC, 249B HEX [MV Link] (Miami Valley Link) (system primary) (inhibit transmit on busy)

Advanced Install Only
NAC/Network ID: 2097 DEC, 831 HEX
9001 DEC, 2329 HEX [Site] (single site repeat) (do not inhibit transmit on busy)

PROGRAMMING SUMMARY GUIDE VERSION 3 ROAMING

The allow the use of vote scan on your radio. The vote scan function on your radio will monitor all the MVP25 repeaters for the best signal and automatically select the correct repeater channel. This auto selection allows version 3 radios to use a single Miami Valley Link channel to roam anywhere in the Miami Valley P25 repeater coverage area.

VOTE SCAN SETTINGS

Use the following settings to ensure vote scan functions properly on your radio.

- Vote Scan: Enabled
- Transmit Steering (TX) enabled if available.
    - If Tx steering is not enabled then please use the input frequency of Channel 2, 291 Xenia.
    - This frequency is approximately central to all MVP25 repeater receiver frequencies and works well on all repeater sites.
    - Frequency: 449.0125
- Start all voting scan lists with Channel 2, 291 Xenia, frequency 449.0125.
- Voting Threshold: -70 RSSI
    - This setting tells the radio to continue looking for a better repeater as long as the RSSI is worse than -70.
- RSSI Delay Time: 0 ms
    - This is the amount of time the radio waits before searching for better repeater signals.
    - Moved this to 0 ms in version 3.1 – experience is showing when signals strength is low it takes over to lock on the signal, this additional delay is noticeable.
- Show strongest voted channel: optional
    - This will show the voted channel on your display.
    - This information can be interesting to look at, but it does not impact the function of the radio.

Vote Scan Examples

We do not have the ability to show how to program each radio. Below is a handful of vote scan examples from the most commonly used radios for the MV Link talk group.

Motorola Astro Spectra (XTS 3000)

Vote scan for the Motorola Spectra radios is programmed through a scan list. Create a new scan list.

Scan Type: Voting Scan
Designated Voice TX Member: Talkback

Enter each repeater channel into the personalities with the required settings for standard use of the system.
Select the scan list you setup for voting on the scan tab.
Activated automatic scan on the scan tab.

Populate your zone. When you do this the vote scan members must be listed in a zone. We can hide these "unused" channels by placing them above channel 16.

CHAN	Name	Notes
1	MV #UCOM 1	
2	MV # Link v3	Populate the default starting point, channel 2, 291 Xenia here. This radio does not support transmit steering, all transmissions for MV Link are on this frequency.
3	MV OPEN	Individual Call (Talkgroup 0) is not supported on this radio.
4	MV STE091HAM	Hamilton site local
5	MV STE291XEN	Xenia site local
6	MV STE551HUB	Huber site local
7	MV STE552PIQ	Piqua site local
8	MV STE571DAY	Dayton site local
9	MV STE751PTJ	Port Jefferson site local
10	MV STE752PCR	Plum Creek site local
11	MV STE 831LEB	Lebanon site local
12	MV #UTAC 1	UTAC 1 – P25
13	MV #UTAC 2	UTAC 2 – P25
14	MV #UTAC 3	UTAC 3 – P25
15	MV #UTAC 4	UTAC 4 – P25
16	MV #UTAC 5	UTAC 5 – P25
17	MV # Link v3	MV Link channel 1
18	MV # Link v3	MV Link channel 3
19	MV # Link v3	MV Link channel 4
20	MV # Link v3	MV Link channel 5
21	MV # Link v3	MV Link channel 6
22	MV # Link v3	MV Link channel 7
23	MV # Link v3	MV Link channel 8

NOTICE: In version 3.1 we moved Channel 2 into the start position for Tx Steering, this is to help alleviate potential conflicts in repeater coordination.

MOTOROLA ASTRO (XTS 5000)

Vote scan for the Motorola Astro radios is programmed through the channel personality. You do not use a special scan list for this feature on this radio. Below are personality settings relevant to vote scan.

ASTRO Talkgroup Options

- Talkgroup checked
- Selection Type: Strapped
- Select correct Talkgroup List and Talkgroup ID for the Miami Valley Link Talkgroup: 9371

Scan

- Select your standard scan list
- Automatic Scan – Optional check
- Mixed vote Scan Enable – Checked
- Tx Steering – Checked

ASTRO

- Digital Modulation Type: C4FM
- Rx Unmute Rule: Selective Squelch

Frequency Options

CH	Option Name	Rx Frequency	Tx Frequency	Mixed Vote Scan Persistent Member
2	MV Link v3.2	444.0125	449.0125	Checked
1	MV Link v3.1	443.8375	448.8375	Checked
3	MV Link v3.3	443.7750	448.7750	Checked
4	MV Link v3.4	444.7250	449.7250	Checked
5	MV Link v3.5	443.4625	448.4625	Checked
6	MV Link v3.6	442.4750	447.4750	Checked
7	MV Link v3.7	443.9000	448.9000	Checked
8	MV Link v3.8	443.1500	448.1500	Checked

NOTICE: In version 3.1 we moved Channel 2 into the start position for Tx Steering, this is to help alleviate potential conflicts in repeater coordination.

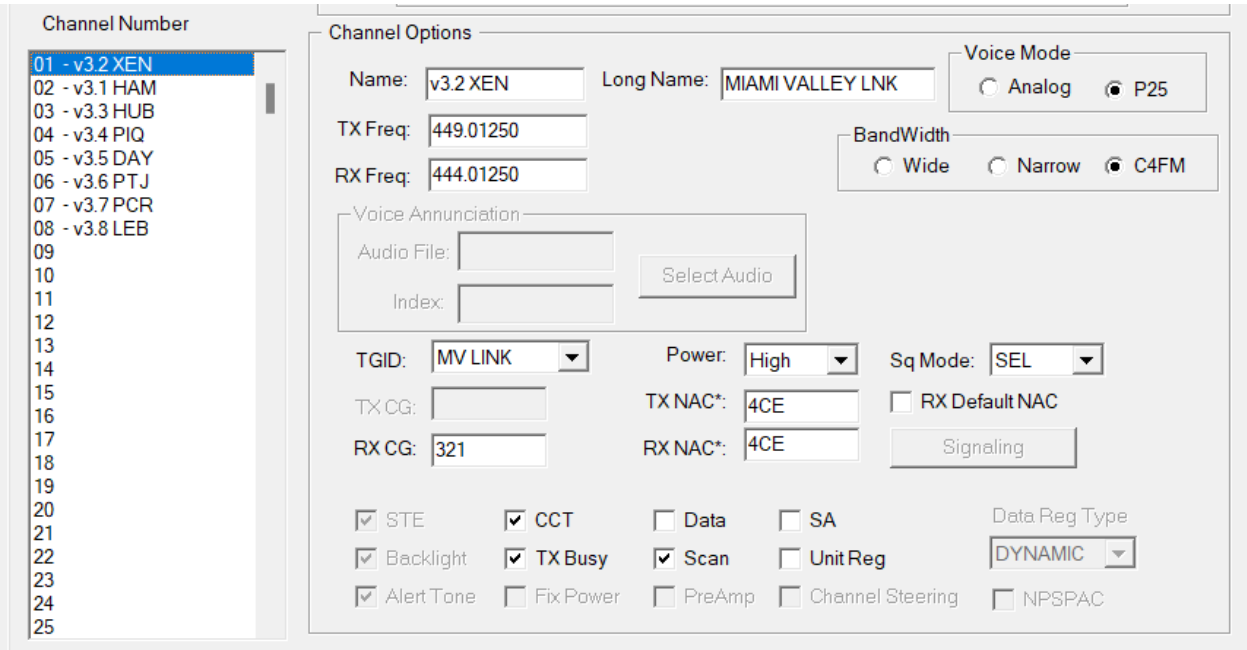
HARRIS XG 100

Vote scan for the Harris XG 100 radios is programmed through a P25 conventional frequency set.

Set Options:

Select your appropriate P25 group set
Vote Scan: Checked
Show strangest voted channel: Optional
Voting Threshold: 70
RSSI Delay Time: 0

Program each channel the same. The first channel should be channel 2.



Miami Valley Link
$=HEX

Ch #	Name	Frequency	Receive NAC / (D)PL	Transmit NAC / (D)PL	Talkgroup
1	MVL #UCOM1	440.9625	$4CE	$4CE	8900
2	MVL #311 Greenhills	443.8375	$4CE	$4CE	9371
3	MVL #291 Xenia	444.0125+	$4CE	$4CE	9371
4	MVL #551 Huber	443.7750+	$4CE	$4CE	9371
5	MVL #552 Piqua	444.7250+	$4CE	$4CE	9371
6	MVL #571 Dayton	443.4625+	$4CE	$4CE	9371
7	MVL #751 Port Jefferson	442.4750+	$4CE	$4CE	9371
8	MVL #752 Plum creek	443.9000+	$4CE	$4CE	9371
9	MVL #831 Lebanon	443.1500+	$4CE	$4CE	9371
10	MVL OPEN	---	---	---	---
11	MVL 70 CALL	446.0000	---	---	---
12	MVL #UTac1P	446.0250	$4CE	$4CE	8900
13	MVL #UTac2P	446.0500	$4CE	$4CE	8900
14	MVL #Utac3P	446.0750	$4CE	$4CE	8900
15	MVL #UTac4P	446.1000	$4CE	$4CE	8900
16	MVL #UTac5P	446.1250	$4CE	$4CE	8900

Site Local
$=HEX

Ch #	Name	Frequency	Receive NAC / (D)PL	Transmit NAC / (D)PL	Talkgroup
1	STE #UCOM1	440.9625	$4CE	$4CE	8900
2	STE #311 Greenhills	443.8375	$311	$311	9001
3	STE #291 Xenia	444.0125+	$291	$291	9001
4	STE #551 Huber	443.7750+	$551	$551	9001
5	STE #552 Piqua	444.7250+	$552	$552	9001
6	STE #571 Dayton	443.4625+	$571	$571	9001
7	STE #751 Port Jefferson	442.4750+	$751	$751	9001
8	STE #752 Plum creek	443.9000+	$752	$752	9001
9	STE #831 Lebanon	443.1500+	$831	$831	9001
10	STE OPEN	---	---	--	---
11	STE 70 CALL	446.0000	---	---	---
12	STE UTac1	446.0250	118.8	118.8	---
13	STE UTac2	446.0500	118.8	118.8	---
14	STE Utac3	446.0750	118.8	118.8	---
15	STE UTac4	446.1000	118.8	118.8	---
16	STE UTac5	446.1250	118.8	118.8	---

Frequently Asked Questions (FAQ)

Is it necessary to use a talkgroup? The MVP25 network uses talkgroups the same as DMR. The purpose of the talkgroups is to allow for routing and filtering of radio traffic. By using talk groups we future proof our radio system for features which may be added in the future. Failing to use a talkgroup will cause your radio to be ignored by other properly programmed radios on the network. Your radio will also hear everything on the network and may cause you to respond to conversations for which you are not part of, create confusion to the hams who have correctly programmed their radios.

Why don't we use the default NAC of 293? The MVP25 radio system requires the use of talkgroups and NAC to route radio traffic to the correct destination. If we were to use the default NAC, we may have users program into our system without the full required knowledge to do so correctly. These users will hear our radio traffic but will not be able to communicate with us. They will continue to transmit, attempting to communicate and will tie up the system making it busy and unavailable for its intended use. The radio system is open to all amateur radio operators. The MVP25 system uses a AC different from defaults to ensure radios on the system are programmed with the use of our guide to ensure they are set up properly.

Why wouldn't I want to "monitor" all activity on the system? While the MVP25 network has multiple filtered methods of communicating there is still only one talk path. This is typical of many shared commercial systems leased by companies in many businesses including towing and transportation. These systems work because the radios are programmed to filter the communication on the repeater. On the MVP25 repeater there may be radio traffic from MV Link, Site, or private calls. If you are monitoring the system, you will hear radio traffic not intended for you and as a result you may transmit in response on the wrong group and tie up the system which will then cause interference. It is required to set your radio to filter properly and scan the talkgroups available.

Why do we set the radios to inhibit transmit on busy on MV Link (system primary) but not on Site (single site repeat)? The MV Link talkgroup propagates through the network to all repeater sites. This allows us to talk from any repeater to any repeater. When on this talkgroup your radio filters any other activity on the repeater. The Site (single site repeat) talk group is isolated to a single site. The site talkgroup is designed to override the MV Link talkgroup. This is to allow for local site priority. Example of where this is used: Joe is on the Huber site and Jim is on the Dayton site. They are talking to each other on MV Link. During this conversation Frank and Jeff are wishing to have a conversation on the Lebanon repeater using the single site talkgroup. Frank and Jeff can have this conversation concurrent with the conversation between Joe and Jim without either causing an interruption to the other.

Why not link the system to a larger network or the world? The intention of the MVP25 radio system is to connect the regio of Miami Valley in southwest Ohio. By keeping the network to SW Ohio, we can communicate across a regional distance with operators we know or would likely meet in person.

How do I become a user of the Miami Valley P25 system? The MVP25 group is made up of the 4 officers and the repeater owners who have built the MVP25 repeater system.

These officers and owners welcome and encourage all licensed amateurs to use the system. They ask that you comply with the programming provided in this document to ensure you have a pleasant operating experience and limit the possibility of causing interference to other users of the system.

Users wishing to participate in activities with other MVP25 system users are encouraged to meet at the Dayton Amateur Radio Association clubhouse on Thursday nights at 7pm. Please note that the "Thursday Night Group" often has presentations that are not directly related to P25 radio. Like use of the UHF band, the MVP25 group meetings are a secondary use of the clubhouse on Thursday nights. Please respect the presenters and attendees of these events. These meetings are a great way to get to know the local users and find help with programming and setup of P25 radios.

Do version 3 repeaters add benefits to legacy version 2 programmed radios? Yes, and they already are! The version 3 repeaters listen to the uplink for all the MV Link talkgroup channels. This means if you are somewhere between sites your uplink may come in on more than one repeater. The uplinks are then sent to the comparator which compares the audio of each uplink and votes the best signal before sending it to each site transmitter. This check happens many times each second and ensures your best audio is transmitted on the system.

A radio programmed to a version 3 template can simplify operating the radio by selecting the single Miami Valley Link channel to roam anywhere in the coverage area.

What if my version 3 programmed radio keeps moving to a channel, I know I am not nearby? Do I need to do something to make sure I can be heard when I transmit? All of the repeaters are listening to all of the channel input frequencies. It does not matter which channel your radio transmits. The closest repeater or repeaters will hear your signal. The radio will scan and vote to the best received audio when you unkey your microphone and listen for a response.

My radio has had a MV Link Roam group in it for a very long time, but this has never worked properly. What has changed? Can I use this roaming zone now that version 3 is active? The vote feature has always existed on the radios. The roam feature has never worked correctly for several reasons due to programming compatibility at both the repeaters and the radios. The repeaters have been programmed to support this feature and the parameters for subscriber radios are now published in this document. If there is a roam or vote zone already set up in your radio, then you should talk to your programmer and find out if this can be used without edits. The original vote scan zones and system which were used for the roaming zones were not set up with the correct parameters for our version 3 system.

I was told I must key the microphone longer before I talk on version 3 than the legacy version 2 repeaters, why is this? Yes, this is accurate. The version 2 repeaters operated as independent repeaters which were linked to the other repeaters. With version 3 the repeaters have been programmed to do several things which take a little more time. With version 3 each repeater is scanning and listening to all 8 input channels of the system. This means there is a short delay in locking in on your transmission. This also means more than one repeater may hear your transmission. When this happens the audio from the additional repeater sources is analyzed, this takes a little more time. The system sends the best audio out to each repeater. This process is called voting, and the best voted audio could change many times each second.

REVISIONS

20220419.1.0

Original Published Document

20220421.1.1

Added supported Radios
Prepended $ to NAC to indicate HEX ($4CE) instead of (4CE).
Changed wording of “selective calling” to “selective squelch” to better fit industry standards.

20220424.1.2

Corrected 751 Port Jefferson frequencies

20220506.1.3

Added 70cm analog and UTac channels to the document.
Moved site template to the start of the programming section.

20220506b.1.4

Added active flag to 551 Huber site.

20220506c.1.5

Added frequency for 291 Xenia site

20220513.1.6

Changed Piqua frequency
Set Piqua to active on the network
Set Xenia to active on the network
-site has been setup and tested and will have an antenna connected within a few days
Updated display map to include correct site status.

20220526.1.7

Added Hexadecimal and Decimal values for NAC and Talkgroups.
Added descriptions to the site template.

20230108.2.0

MVP25 2.0 programming version is necessary due to infrastructure changes adding the ability to isolate NACs to single sites. MVP25 2.0 is backwards compatible with talkgroup 9371 MV Link and private call from version 1. No other function of or talkgroup of version 1 is available in version 2.

20230112.2.1

Corrected “Site” NAC from 751 to 752 on page 13 for Site 752 Plum Creek.

20230115.2.2

Added terminology “Network ID” to the document at the same location as NAC. This is to add compatibility to Motorola software terminology in newer CPS.

Added Radio ID section to explain that each radio should have an ID assigned and where to get this ID.

20230125.2.3

Corrected frequency for Site 751 Port Jefferson.
Corrected miscellaneous typos throughout the system.
Added information that talkgroup 8900 (simplex) is a holdover from the version 1 programming.
Added detail for how to set the selective squelch talkgroup filtering based on CPS.
Updated radio support list

20230907.2.4

Updated map image for clarity.
Definition of Miami Valley added to the document.
Updated language under ABOUT THE MVP25 HAM RADIO NETWORK for readability
Updated the last paragraph under ABOUT THE MVP25 HAM RADIO NETWORK for clarity around the systems access to radios using RF only.
Updated the documentation to include full adoption of version 2 programming under VERSION 2 PROGRAMMING AND COMPATIBILITY WITH VERSION 1
Added the need for firmware updates is likely necessary to PROGRAMMING A RADIO.
Minor updates for readability to TALKGROUPS AND SELECTIVE SQUELCH.
Minor updates for readability to NETWORK TALK PATHS.
Updated SITE TEMPLATE for current sites.
Added registration and requirement information to use a proper radio ID in the section RADIO ID.
Updates repeaters to current list under P25 REPEATERS

20240404.2.5

MVL changed to STE on the programming summary guide for all names for band B. This was a type / copy / paste error.
Page 1 – renamed document from programming to users
Page 2 – Grammatical adjustments
Page 3 – Grammatical adjustments
Page 4 – added Ric-M and other hardware
Page 5 – Grammatical adjustments
Page 5 – added additional Harris radios to support list
Page 9 – Grammatical adjustments
Page 13 – Grammatical adjustments
Page 3 – added paragraph: MVP25 Ham Radio Network Officers, Owners and Users
Page 6 – changed “failure to use selective squelch” to “failure to use a talkgroup”

20240424.3.0

Sentence structure and grammatical changes throughout the document.
Version 2 programming and compatibility section – complete rewrite for version 3 programming and compatibility changes.
Supported radios list updated
Recommended system template – updated description of channel names to include new version 3 features
Recommended system template – renamed version 2 – version 2 legacy
Recommended system template – added version 3 section
Changed programming summary guide section to programming guide version 2 legacy
Inserted programming summary guide section for version 3
Added version 3 information to FAQ
Added channel numbers to repeater list

20240430.3.1

Pages 15, 18 – moved RSSI delay to 0ms from 20ms
Pages 16, 17, 18 – Moved channel 2 into the starting point for radios instead of channel 7

20240513.3.2

Pages 15, 18 – Moved channel 2 into the starting point for radios instead of channel 7

20240828.3.3

Pages 15 – Corrected error which stated to use Plum Creek channel 7 for non-transmit steering radios. This has been changed to Channel 2, Xenia which is the correct channel to use for radios which do not support transmit steering.

20241014.3.4

Page 4 – Updated map to include receive sites.
Page 13 – Removed the Piqua offline note.

20241109.3.5

Page 4 – Removed Butler from active repeater sites.
Page 4 – Updated map to remove Hamilton site 91.
Page 5 – Updated wording in the version 3 description.
Page 9 – Updated version 3 template information to remove 091 Hamilton and utilize channel name standards.
Page 9 – Added channel naming template
Page 10 – Updated version 2 to remove 091 Hamilton
Page 12 – Updated to remove 091 Hamilton
Page 16 – Moved channel 1 to the end of the template sample and labeled as open.
Page 17 – Moved channel 1 to the end of the template, labeled and open and did not select as a transmit channel.
Page 19 – Removed Hamilton and set as open.

20251004.3.6

Page 4 – Added Greenhills to active repeater sites.
Page 4 – Updated map to include Greenhills site 311.
Page 10 – Updated version 2 to remove add Greenhills
Page 10 – Updated version 2 to advanced programming
Page 10 – adjusted minimal install to basic installation
Page 10 – Updated version 3 programming to remove site local channels
Page 13 – Updated to include 311 Greenhills
Page 16 – Returned channel 1 to the template sample.
Page 17 – Returned channel 1 to the template.