

# Transitioning WWARA Repeaters to Narrowband

Kenny Richards, KU7M - Secretary WWARA

# What do Coordination Bodies do?

- Repeater coordination

Western Washington Amateur Relay Association  
**Certificate of Coordination**

Where as Scott Honaker, N7SS has agreed to abide by the Bylaws and Coordination procedures of the WWARA and has requested Coordinated usage of: 443.725 MHz transmit and 448.725 MHz receive, the WWARA grants coordination status to the following described station:

Station	Station Location	Latitude	Longitude	Primary Geographic Area
WA7DEM	Mountlake Terrace	47.7976°	-122.3124°	SHCHOMSH

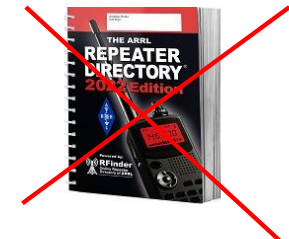
The following Tracking Number has been assigned to this coordination 5152

Station Coordination Holder:	Station Technical Data:	Station Access:
Scott Honaker 14014 89th Ave Se Shobham, WA, 98296	Height above Sea Level: 510 FT Antenna Height above Ground: 160 FT Antenna Aperture: OMNI Antenna Gain: 8 db Transmit ERP: 240 Watts	

It is the Station Coordination holder's responsibility to keep the WWARA informed of the status of this station at least once every five years, including any address changes of the coordinated holder. This coordination is for the above-revolved system only and expires on the date shown. Any change in any of the information listed must be presented to the WWARA for approval before being implemented.

Date of Original Coordination	Granted By:	Coordination Expiration
Oct 18th 2007	<i>[Signature]</i> Frank A. Walle, NMDR, Chairman	May 18th 2021

- Publish Repeater Listings



- Publish Local VHF/UHF Band Plans



# Typical WWARA Coordination Process

- Repeater owner chooses repeater pair
- Installs repeater
- Testing period (typically 3-6 months)
- Review of coordination
  - Reviewed by bandchair, BoD and Public Comment period
- Absent any concerns, coordination is issued
- Renewal period is 5 years

*Required for any 'significant change'*

# Band Plans

VHF/UHF band plans managed by coordination bodies

- Oregon Radio Relay Council
  - [www.orrc.org](http://www.orrc.org)
  - Local Band Plans available
- Western Washington Amateur Relay Association
  - [www.wwara.org](http://www.wwara.org)
- Inland Empire Coordination Council (EWA/Idaho)
  - [idcc.online](http://idcc.online)
- British Columbia Amateur Radio Coordination Council
  - [www.bcarcc.org](http://www.bcarcc.org)

# Band Plans



WWARA

Western Washington Amateur Relay Association

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Coordination Policies

WWARA Band Plan

WWARA ByLaws

WWARA Crossband Considerations

WWARA Repeater Etiquette

Using Tones and DCS for Squelch Control

Narrowband FAQ

Narrowband Plan

2m Narrowband Visualization

2m Band Plan

70cm Band Plan

33cm Band Plan

5cm Band Plan

...m band plan published before December 2020, just in a

The WWARA is modernizing how the band plans are published. While the format is very easier to understand format. Because of the size of the document, a [PDF version is also](#)

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## WWARA 2m Band Usage

Band Segment	Existing (Wide)	Revised (Narrow)	Use	Notes
144.0000 - 144.3000			<b>Weak Signal</b>	
144.0000 - 144.0500			EME (CW)	
144.0500 - 144.1000			General CW and Weak Sig	
144.1000 - 144.2000			EME and Weak Signal SSB	
144.2000 - 144.2750			General SSB Operation	
144.2750 - 144.3000			Propagation Beacons	
144.3000 - 144.5000			<b>New OSCAR subband (Sat</b>	
144.5000 - 144.6000			<b>FM Repeater/Linear Tran</b>	
				Recommended
				Hz spacing between repeater channels
	144.5100	144.5000	FM Repeater/Linear Trans	
		144.5125	FM Repeater/Linear Trans	
	144.5300	144.5250	FM Repeater/Linear Trans	Shared Non-Protected Repeater Pair
		144.5375	FM Repeater/Linear Trans	
	144.5500	144.5500	FM Repeater/Linear Trans	
		144.5625	FM Repeater/Linear Trans	
	144.5700	144.5750	FM Repeater/Linear Trans	
			FM Repeater/Linear Trans	

# Limited 2m Simplex Channels

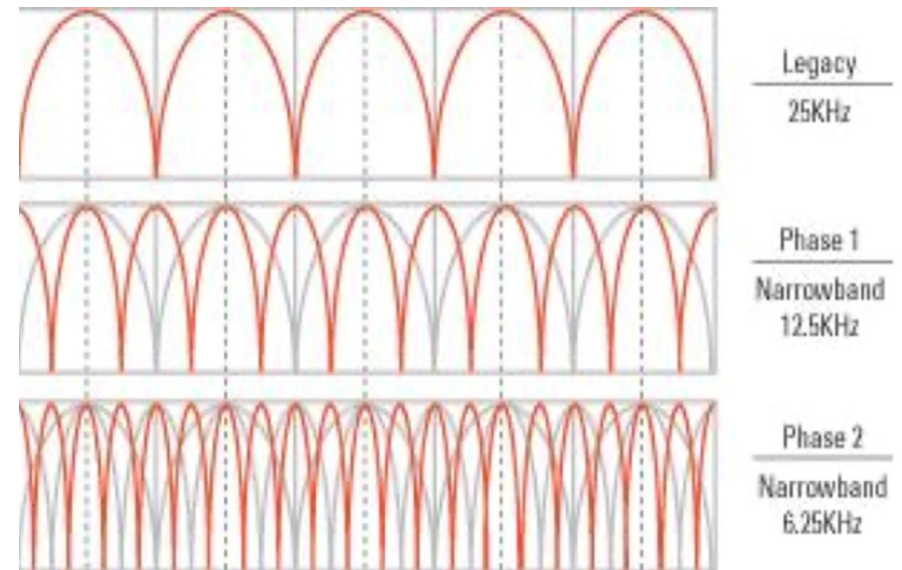
- WWARA recommends some simplex narrowband
- 2m has two designated simplex ranges
  - 146.520-146.580 (4 channels)
  - 147.520-147.600 (5 channels)
- 146MHz range has simplex call channel
  - 146.520 and adjacent channels remain wide
- 147MHz frequencies can be narrowbanded
  - The five channels become eight
  - Tone encode is recommended

# Repeater Timeline

- 1970s - Shift from AM to analog FM repeaters
- 1976 - WWARA was formed
- 1980s - WWARA moved 2m from 30kHz to 20kHz spacing
- 1989 - Project 25 started (P25 digital solution)
- 1997 - FCC requires narrowband in land mobile radios
- 2005 - Icom introduced first DSTAR system (first open ham radio digital solution)
- 2007 - First DMR solutions released (commercial radio solution, adapted to ham radio)
- 2011 - WWARA designates 10 narrowband 2m channels
- 2013 - FCC requires all commercial stations to go narrowband (12.5kHz)
- 2013 - Yaesu announces System Fusion
- 2016 - WWARA designates 8 narrowband 70cm channels
- 2022 - WWARA approved narrowband 2m/70cm band plan

# Definitions

- **Wide Band Analog FM**
  - 20/25 kHz channel spacing
  - 5 kHz deviation, 16K0F3E
- **Narrowband Analog FM**
  - 12.5 kHz channel spacing
  - 2.5 kHz deviation, 11K2F3E
- **Narrowband Digital**
  - 9K80D7W (P25), 9K36F7W (Fusion), 7K60FXW (DMR), etc.
- **Ultra-Narrowband**
  - 6.25 kHz channel spacing
  - 4K00F1W (NXDN), 6K00F7W (DSTAR), 5K00J3E (ACSSB)





# VHF vs UHF Narrowbanding

- 70cm currently has 25kHz channels
  - Narrowbanding to 12.5kHz is straight forward
- 2m has 20kHz channels
  - 12.5kHz doesn't divide into 20kHz evenly
  - Users will have to move a little

Existing	New
	145.1000
145.1100	145.1125
145.1300	145.1250
	145.1375
145.1500	145.1500
	145.1625
145.1700	145.1750
	145.1875
145.1900	145.2000
	145.2125
145.2100	

Existing	New
146.6200	146.6250
146.6400	146.6375
	146.6500
146.6600	146.6625
	146.6750
146.6800	146.6875
	146.7000
146.7000	146.7125
	146.7250
146.7200	

Existing	New
147.0000	147.0000
	147.0125
147.0200	147.0250
	147.0375
147.0400	147.0500
	147.0625
147.0600	147.0750
	147.0875
147.0800	147.1000
	147.1125
147.1000	

# Narrowbanding Saves Lives

- No 'open' 2m pair in over a decade\* and for the first time in 2018, all WWARA 70cm pairs were full
- Commercial world shifted to narrowband in 2013
- Digital solutions in use already for repeaters
  - All digital solutions are narrowband
- WWARA Coordinations of new repeaters has increased 23% since 2013
  - Digital repeaters has increased 77% in the same time period
  - Hams want more repeaters, mostly narrowband digital

# WWARA Narrowband Proposal

- **May 2019 - Public proposal to narrowband VHF/UHF at WWARA**
  - Presentations at more than a dozen clubs and SeaPac
  - Provides band plan for 12.5 kHz channels for 2m and 440 bands
  - 2m pairs increase ~50%, 440 pairs increases ~100%
  - Currently 13% of 2m and 22% of 70cm systems already narrowband
  - 70% of new systems in 2024 are narrowband digital

# Narrowbanding Facts

- Provides more repeater pairs for new modes
  - There will be more new modes
- All (current) digital voice modes are narrowband
- Most new WWARA requests are digital voice systems
- Supported in all commercial gear since 1997
  - Most amateur gear supports narrowband after 2000
  - New wideband gear is hard to find
- Only the repeater may need to change, nothing else
  - No antennas, feedlines, entrance panels, duplexers, etc.

# Anticipated Issues

- Narrowband systems must be narrow on the output regardless of input signal
- Training users how to program narrow FM
- Potential loss of range on high altitude systems
- Coordinating moves of adjacent systems
- Tracking wide and narrow systems simultaneously
- Coordinating changes with adjacent regions

# WWARA Narrowband Plan

- In 2022 the new band plans were approved
  - Allows allocating narrowband pairs
- 2025 all new coordinations must be narrowband
  - The WWARA stops accepting applications for new wide band analog systems
  - Wideband FM systems can still be renewed
- 2030 no wideband systems can be renewed
  - No wide band systems will be renewed, need to convert to narrowband or lose coordination
- By 2035 all systems on 2m/70cm will be narrowband

# Join or Contact Us

- Join us and help shape the future
  - Decisions are made by those who show up
  - All licensed amateurs are welcome
  - Cost is minimal and meetings are quarterly
- WWARA - <https://www.wwara.org/>
  - Next WWARA meeting May 10, 2025 @ 10:00 AM

# WWARA Resources

- WWARA Repeater Listings
  - <https://www.wwara.org/coordinations/coordination-data-files/>
- WWARA Band Plans
  - <https://www.wwara.org/documents/band-plan/>
- WWARA Narrowband Plan
  - <https://www.wwara.org/documents/narrowband-plan/>
- Getting Coordinated with WWARA
  - <https://www.wwara.org/coordination-process/howto-get-coordinated/>
- WWARA Groups.io
  - <https://groups.io/g/wwara>