



# 50MHZ AND UP

Basic Frequency Selection and Emergency Use

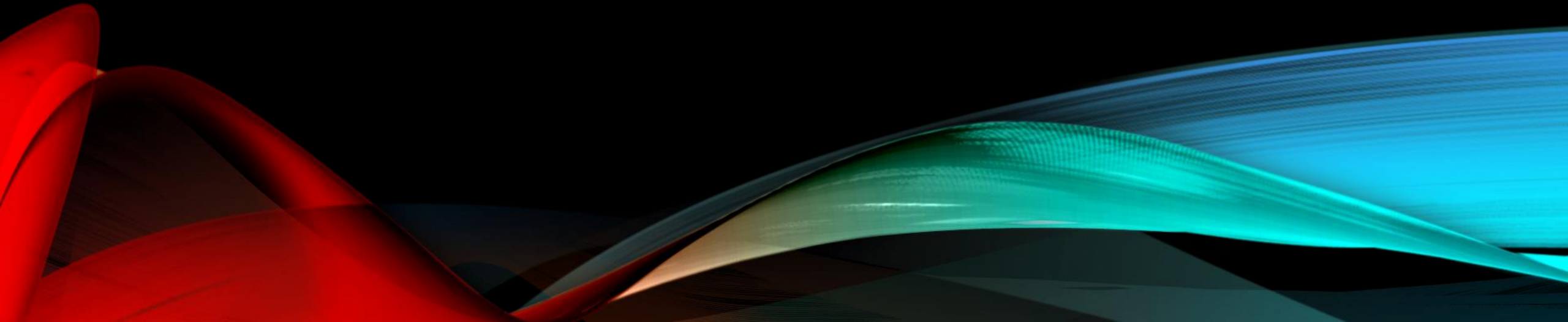


# OVERVIEW

- Where's 50MHz and Why Are We Talking About It?
- Band Plans
- Choosing Frequencies
- Practical Hints
- Emergency Use and the Wilderness Protocol

# WHERE'S 50MHZ?

And why are we talking about it?



# THE ELECTROMAGNETIC SPECTRUM

- Frequency goes up, wavelength goes down
- Wavelength expressed in meters
- Frequency expressed in Hertz
  - 1 Hz (Hertz) = 1 cycle per second
  - 1 MHz (megahertz) = 1 million cycles per second
- Note colored stripes of visible light!
- Ham bands
  - From 160 meters (1.8 MHz) at the “bottom”
  - All the way up to 23 cm (1240MHz) and beyond
  - 50MHz and up = VHF, UHF, and beyond

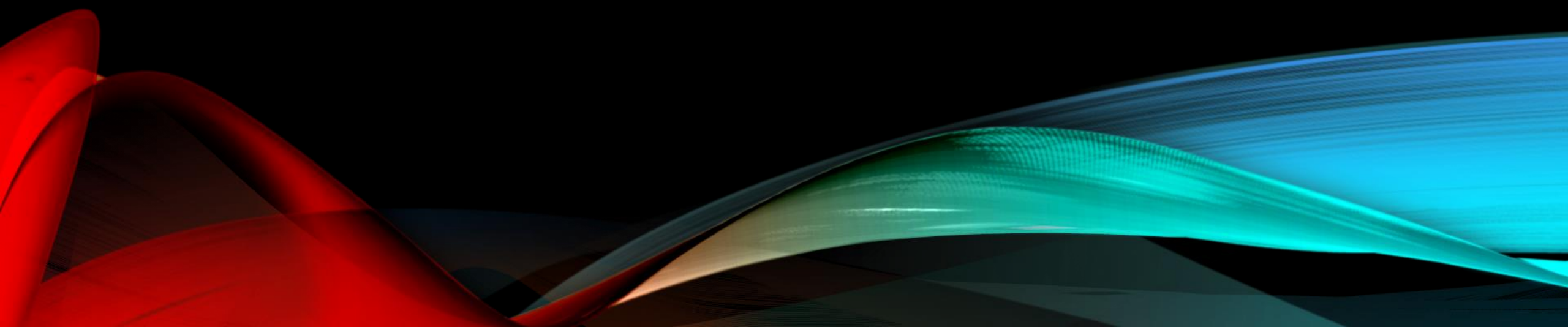
CLASS	FREQUENCY	WAVELENGTH	ENERGY
Y	300 EHz	1 pm	1.24 MeV
HX	30 EHz	10 pm	124 keV
SX	3 EHz	100 pm	12.4 keV
SX	300 PHz	1 nm	1.24 keV
EUV	30 PHz	10 nm	124 eV
NUV	3 PHz	100 nm	12.4 eV
NIR	300 THz	1 μm	1.24 eV
MIR	30 THz	10 μm	124 meV
FIR	3 THz	100 μm	12.4 meV
EHF	300 GHz	1 mm	1.24 meV
SHF	30 GHz	1 cm	124 μeV
UHF	3 GHz	1 dm	12.4 μeV
VHF	300 MHz	1 m	1.24 μeV
HF	30 MHz	10 m	124 neV
MF	3 MHz	100 m	12.4 neV
LF	300 kHz	1 km	1.24 neV
VLF	30 kHz	10 km	124 peV
VF/ULF	3 kHz	100 km	12.4 peV
SLF	300 Hz	1 Mm	1.24 peV
ELF	30 Hz	10 Mm	124 feV
ELF	3 Hz	100 Mm	12.4 feV

# WHY 50MHZ AND UP?

- “50MHz and up” – some generalizations
  - Typically shorter range communications < 200 miles
  - Shorter wavelengths = more portable equipment and antennas
  - Many modes are used, but FM is very common
  - Accessible to all amateur operators; where many get started
- Ham bands above 50MHz
  - 6 meters (50-54 MHz)
  - 2 meters (144-148 MHz) ← first band for many
  - 1.25 meters (222-225 MHz)
  - 70 centimeters (420-450 MHz)
  - Etc.

# BAND PLANS

Can't I just choose a frequency and start talking?



# BAND PLANS: WHAT AND WHY?

- Defines which frequencies are used for what purposes
- Typically applied to a specific area or locale
  - Basic plans are statewide, designating frequency ranges
  - More local plans (county or city) often designate specific frequencies
- Following them is a “best practice”
  - Reduces interference to others
  - Helps others not interfere with you

# OREGON 2 METER BAND PLAN

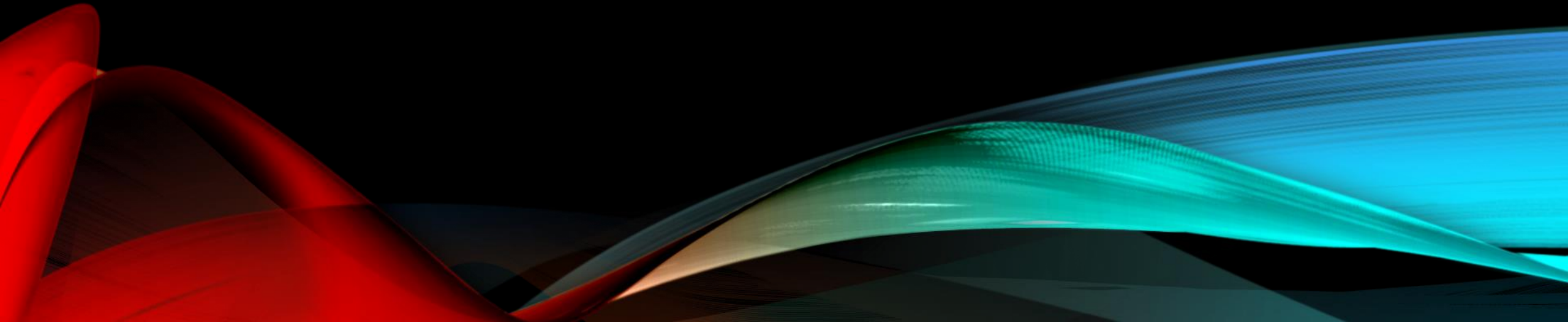
Frequency	Range	Allocated	Usage	Comments
144.01	144.05	40	EME (CW)	Un-Coordinated by ORRC See ARRL Band Plan
144.06	144.10	40	CW/Weak Signal	Un-Coordinated by ORRC See ARRL Band Plan
144.11	144.20	90	EME/Weak SSB	Un-Coordinated by ORRC See ARRL Band Plan
144.20	144.20	20	SSB Calling Freq	Un-Coordinated by ORRC See ARRL Band Plan
144.21	144.28	70	General SSB	Un-Coordinated by ORRC See ARRL Band Plan
144.28	144.30	20	Propogation beacons	Un-Coordinated by ORRC See ARRL Band Plan
144.31	144.38	70	OSCAR Subband	Un-Coordinated by ORRC See ARRL Band Plan
144.39	144.39	20	APRS	Single Use National Designation
144.40	144.50	10	OSCAR Subband	Un-Coordinated by ORRC See ARRL Band Plan
144.51	144.63	120	Repeater Inputs	20Khz Spacing +600 Khz Offset
144.65	144.65	20	Repeater Input	20Khz Spacing +600 Khz Offset (Statewide Test Pair)
144.67	144.89	220	Repeater Inputs	20Khz Spacing +600 Khz Offset
144.91	145.09	180	Packet	10.0 Khz channels Diversity Spaced
145.11	145.23	120	Repeater Outputs	20Khz Spacing +600 Khz Offset
145.25	145.25	20	Repeater Output	20Khz Spacing -600 Khz Offset (Statewide Test Pair)
145.27	145.49	220	Repeater Outputs	20Khz Spacing -600 Khz Offset
145.51	145.99	480	Misc & Experimental	Un-Coordinated by ORRC See ARRL Band Plan
146.00	146.00	20	Simplex Repeater	20Khz Spacing Zero Offset
146.02	146.40	380	Repeater Inputs	20Khz Spacing +600 Khz Offset
146.42	146.60	180	Simplex	20 kHz channels
146.62	146.98	360	Repeater Outputs	20 khz spacing -600 Khz Offset
147.00	147.00	20	Repeater Output	20 kHz spacing -600/+600 khz Offset
147.02	147.38	360	Repeater Outputs	20 kHz spacing +600 khz Offset
147.40	147.58	180	Simplex	20 kHz channels
147.60	147.98	380	Repeater Inputs	20kHz spacing -600 Khz Offset

- More at [www.orrc.org](http://www.orrc.org)



# CHOOSING FREQUENCIES

Repeaters and Simplex



# FINDING REPEATERS

- Good bets from Fossil
  - Hood River 145.1500 Mt Defiance
  - Mitchell Stephenson Mountain 147.1800 (HiDARG)
  - Prineville Grizzly Mountain 147.3800
  - The Dalles 146.7400
  - Timberline 147.1200
  - Goldendale 146.9200
- <http://www.hidarg.org/Repeaters.html>
- <http://peakradioassociation.org/> (statewide repeater system)
- <http://www.repeaterbook.com/> (search here if you're traveling)
- The ARRL Repeater Book (for a paper copy)

Special thanks to Jerry KG7CXO for this info!

# NATIONAL SIMPLEX FREQUENCIES

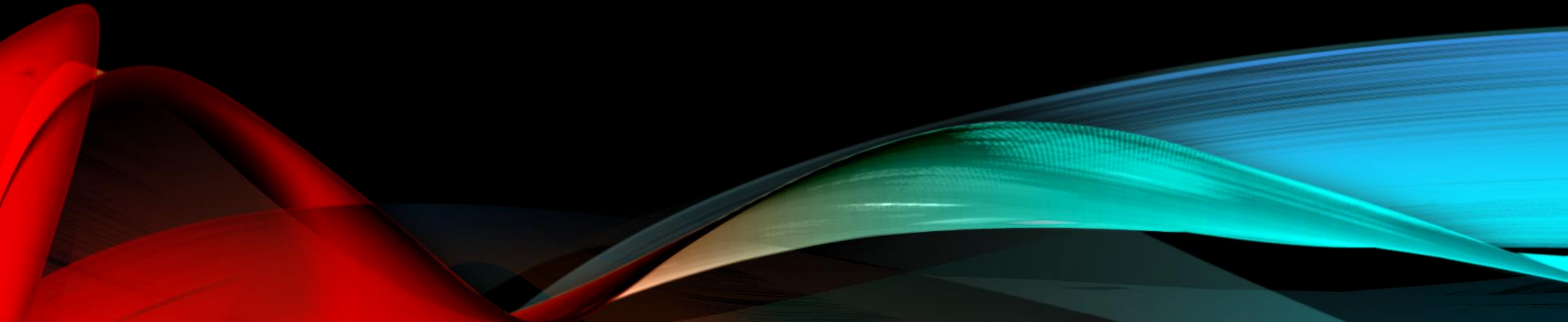
- Typically used by visitors, or in areas without repeater coverage
- Best practice: move off the frequency after establishing contact
- Mode is FM
- National Simplex Calling Frequency: **146.520 MHz** (2 meters)
- Other national calling frequencies:
  - 52.525 MHz (6 meters)
  - 223.500 MHz (1.25 meters)
  - 446.000 MHz (70 cm)

# CHOOSING SIMPLEX FREQUENCIES

- Try to find the most local band plan
- Action item: we should define a 2 meter band plan for Wheeler County
- If there isn't a local band plan, use the state plan
- Apply the correct channel spacing
  - Oregon uses 20 kHz channel spacing: 146.520, 146.540, 146.560, 146.580, etc.
  - Counter-example: Northern California uses 15 kHz channel spacing

# PRACTICAL HINTS

Getting Started

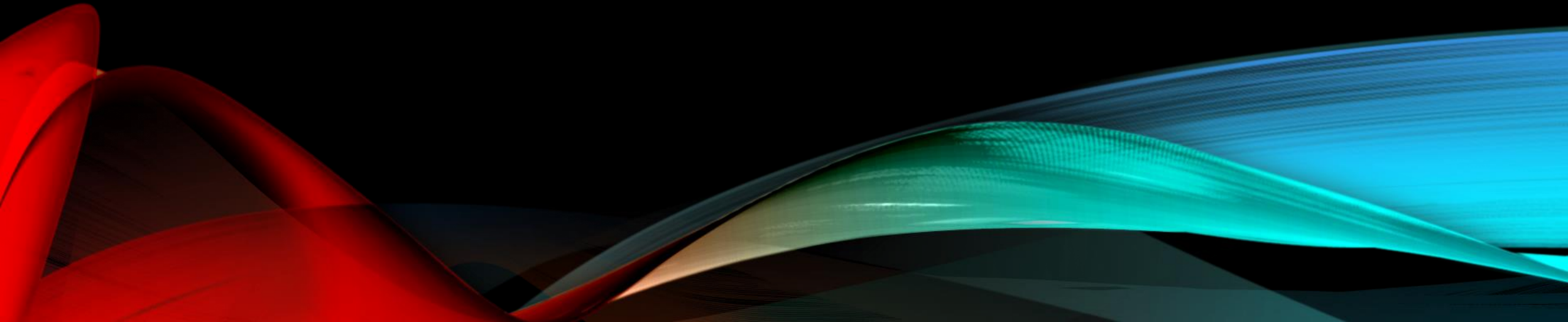


# WHERE DO I START?

- Start by listening!
- Listen on nearby repeaters and the National Simplex Frequencies for the band(s) you have equipment for
- Program these frequencies in, and scan them
- What repeaters can I reliably hear (and can hear me) from areas I frequent?
- What's the net schedule for those repeaters?
- Practice checking into nets, calling other group members
- Share your findings with this group
- If you need help, ask!

# EMERGENCY USE

Getting in touch when it really matters



# THE WILDERNESS PROTOCOL

- Essentially: *"The Wilderness protocol... calls for hams in the wilderness to announce their presence on, and to monitor, the national calling frequencies for five minutes beginning at the top of the hour, every three hours from 7 AM to 7 PM while in the back country."*\*
- Likely to be used in areas with no or spotty repeater coverage
- Hams unfamiliar with area repeaters may also use this
- Designed to aid stations with limited battery power (e.g. backpackers, stranded motorists)
- Intent is that *"A ham in a remote location may be able to relay emergency information through another wilderness ham who has better access to a repeater."*\*

\*From the ARRL ARES Emergency Resources Manual



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- Best practices
  - 2 meters is the primary band, but monitor others if you're capable
  - Monitor from 5 minutes before to 5 minutes after the hour
  - Announce your presence once or twice (simply say your callsign) during this time
  - Non-emergency use: wait until 4 minutes after the hour to make a call
  - Monitor during extended hours (7PM to 7AM) every three hours
  - Monitor every hour, or continuously

# GETTING HELP IN AN EMERGENCY

- Start with a local repeater
- If you don't know of one, use the National Simplex Frequency
- Begin with LiTZ (Long Tone Zero)
  - Hold down your talk button, and press the 0 key
  - Do this for about ten seconds
- “Break <your callsign>” can be used to break into an ongoing conversation
- Be able to describe
  - Where you are
  - What help is needed (especially what injuries there are)



# SUMMARY

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THANKS!

