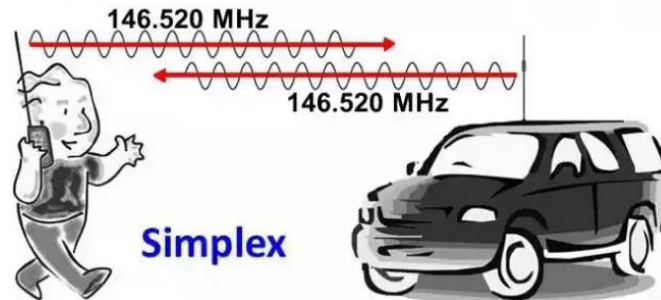


VHF/UHF Simplex *Overview*



CRHRC Tech Net #25
Dec. 1, 2025

Agenda

- Introduction
- Simplex vs. Duplex
- US Amateur Radio Bands
- US 2 Meter Band Plan
- VHF/UHF Simplex Examples
 - (FM) Frequency Modulation
 - (SSB) Single Sideband
 - Digital, Winlink
- Q&A

Simplex vs. Duplex

Transmit and
Receive on
Same
Frequency

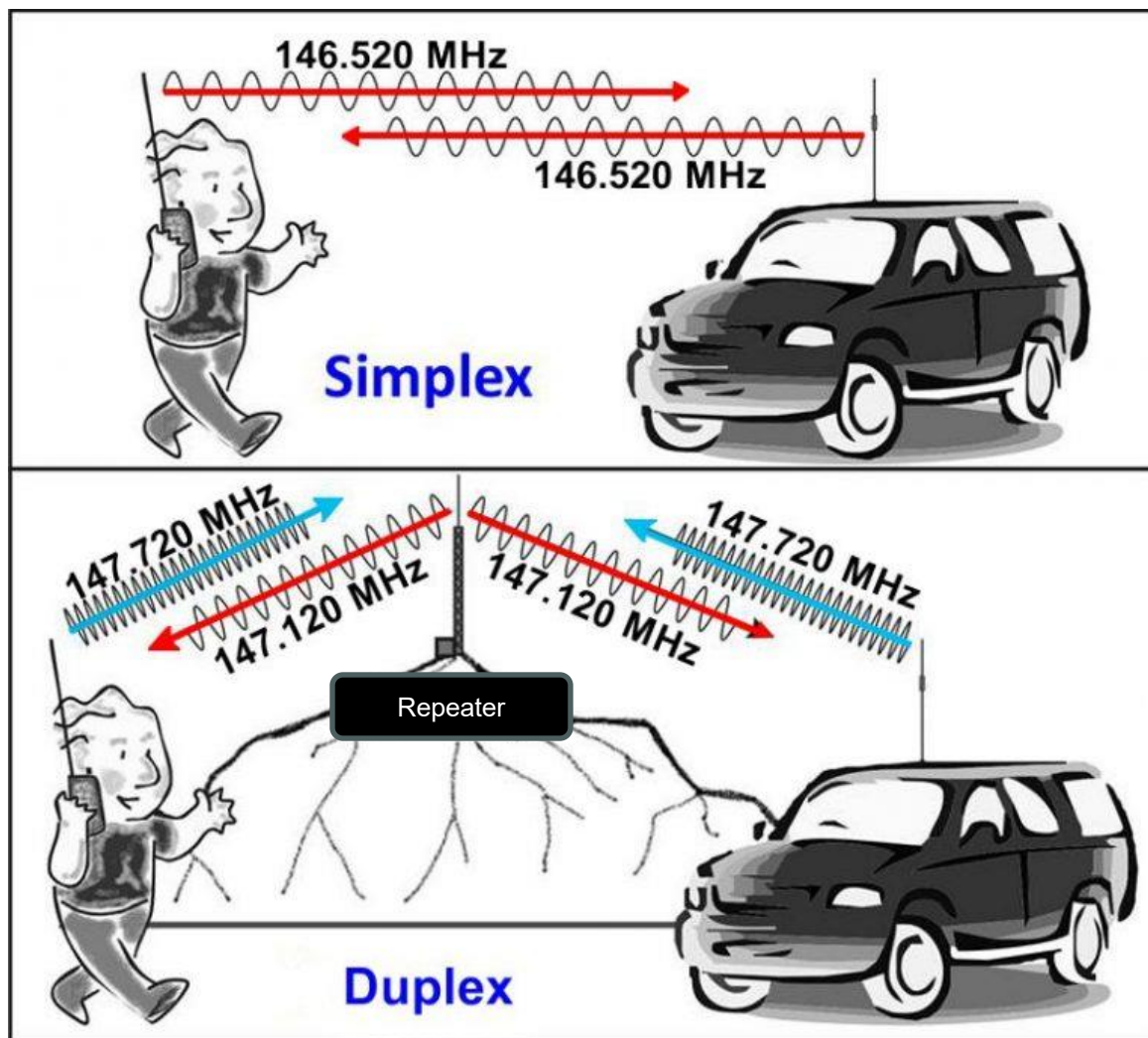
Everyone
Should Have
146.52 FM
Programmed!

Typically, 600
KHz (VHF) or 5
MHz (UHF)
Offset

Backup
Communication
*"When All Else
Fails"*

Typically,
Higher Power,
Antenna Gain
and Height

Typically,
Lower Power,
Antenna Gain
and Height



US Amateur Radio Bands

US Amateur Radio Bands

US AMATEUR POWER LIMITS — FCC 97.313 An amateur station must use the minimum transmitter power necessary to carry out the desired communications. (b) No station may transmit with a transmitter power exceeding 1.5 kW PEP.



KEY

Note:
CW operation is permitted throughout all amateur bands.
MCW is authorized above 50.1 MHz, except for 144.0-144.1 and 219-220 MHz.
Test transmissions are authorized above 51 MHz, except for 219-220 MHz

= RTTY and data
 = phone and image
 = CW only
 = SSB phone
 = USB phone, CW, RTTY, and data.
 = Fixed digital message forwarding systems only

E = Amateur Extra
A = Advanced
G = General
T = Technician
N = Novice

See www.arrl.org/band-plan for detailed band plans.

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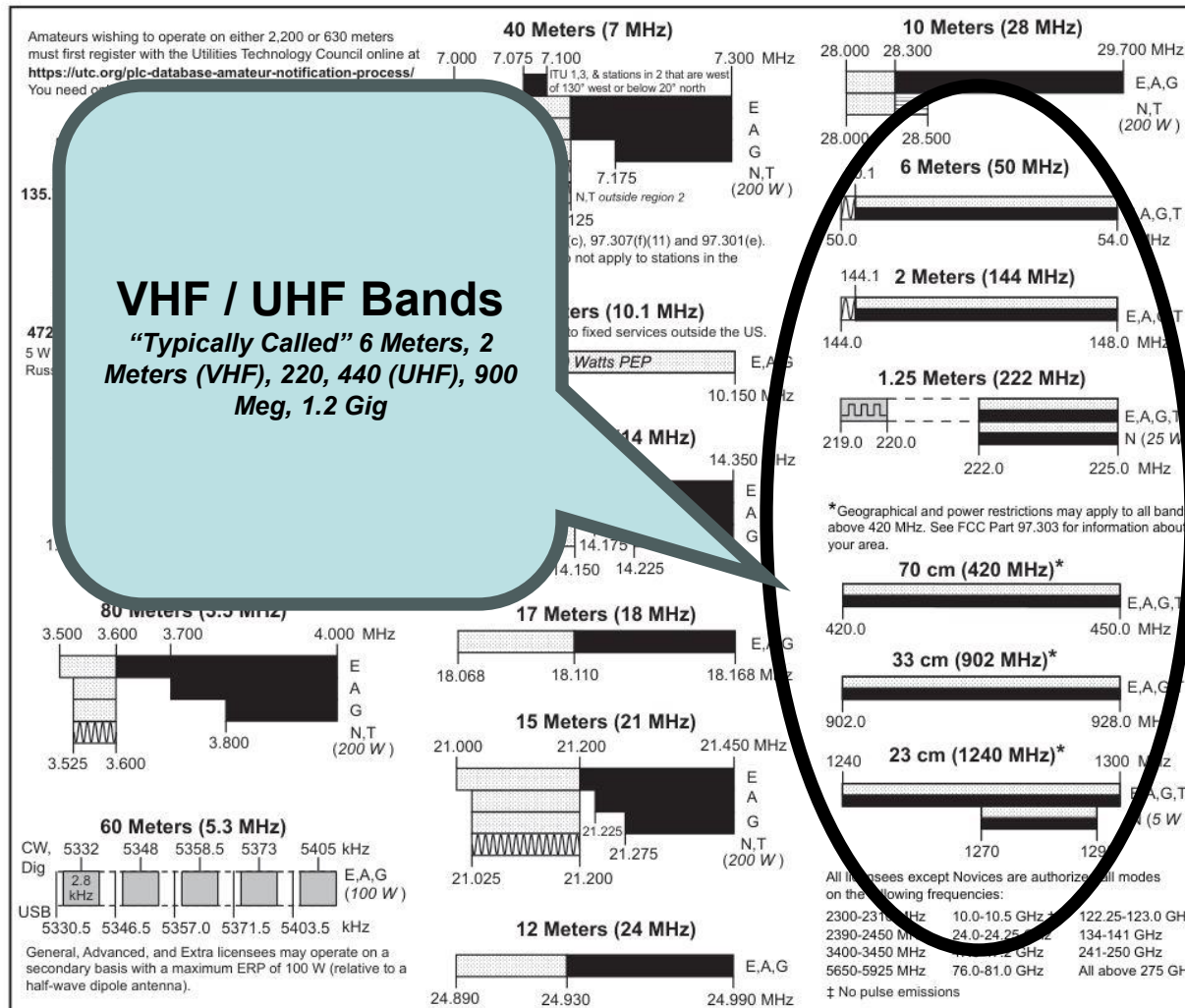
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2 Meter Band Plan

2 Meters (144-148 MHz)

144.00-144.05	EME (CW)
144.05-144.10	General CW and weak signals
144.10-144.20	EME and weak-signal SSB
144.200	National calling frequency
144.200-144.275	General SSB operation
144.275-144.300	Propagation beacons
144.30-144.50	New OSCAR subband
144.50-144.60	Linear translator inputs
144.60-144.90	FM repeater inputs
144.90-145.10	Weak signal and FM simplex (145.01,03,05,07,09 are widely used for packet)
145.10-145.20	Linear translator outputs
145.20-145.50	FM repeater outputs
145.50-145.80	Miscellaneous and experimental modes
145.80-146.00	OSCAR subband
146.01-146.37	Repeater inputs
146.40-146.58	Simplex
146.52	National Simplex Calling Frequency
146.61-146.97	Repeater outputs
147.00-147.39	Repeater outputs
147.42-147.57	Simplex
147.60-147.99	Repeater inputs

Notes: The frequency 146.40 MHz is used in some areas as a repeater input. This band plan has been proposed by the ARRL VHF-UHF Advisory Committee.

FM Simplex

Bill, N4HPG

- Simplex is like working HF for the most part
- FM Modulation, Capture Effect & Squelch
- VHF + subject to line-of-sight propagation
 - Radio horizon
 - Reflections
 - Dead spots
 - Height is might
- Antenna gain works in both directions
 - Maximize antennas (GP-9)
 - Minimize losses
 - More Power!

Single Sideband

Jim, AI5EG

- Upper Sideband (USB) is used. Usually, a fixed station at QTH.
- Longer distances are possible compared to FM simplex. 100-200+ miles are common. Over 1000 miles are possible during tropospheric events.
- Compared to FM simplex:
 - SSB modulation has much better weak signal performance
 - 2M SSB uses horizontal polarization – less ground loss
 - Many hams have high power transmitters with advanced antennas/arrays
 - Easier to hear them and they can hear you
- Propagation can be much farther than line of sight.
 - Commonly due to temperature inversions in the Troposphere. (Ducting)
- Check out <https://vhf.dxview.org/> for band conditions.
 - Map of real time propagation data from APRS-IS stations.
- What do you need to get started?
 1. A radio that operates 2M USB mode.
 2. Antenna, horizontally polarized: halo, yagi
- You are invited!
 - Jump on **144.200 MHz** or nearby most weekday mornings 7am-ish.
 - You may find club members Phil W5CPO, Monty K5KXF, Mario WO5O, Kelly AE5II, Jim AI5EG and other friendly hams around Texas, Louisiana, Arkansas.
- Houston Area: Activity is often heard on **144.210 MHz**
- 2M Band Plan for SSB:
 - 144.100-144.200 MHz EME & weak signal SSB
 - 144.200 MHz National calling frequency
 - 144.200-144.275 MHz General SSB operation

Digital, Winlink Mike, KB9MEQ

What is Winlink?

- Worldwide system for sending email via radio
- Provides a service, similar to email, from almost anywhere in the world
- Entirely supported and operated by amateur radio volunteers (Amateur Radio Safety Foundation)
- Started as “SailMail” providing support for sailors
- Winlink Express software for Windows computers is the preferred client application
- Adopted for contingency communication by many government agencies (Example: TDEM)
- Used by infrastructure-critical NGOs such as the International and American Red Cross, emergency response teams, etc.

Winlink Connection Modes

- Telnet - Non-radio connection through the internet
 - Good for training (no radio required)
 - Use if available. Quickest and easiest method to get a message through
- VHF/UHF Packet and Vara FM - Local connections, line of sight
 - 1200 baud - slower, but can use inexpensive TNCs or 9600 baud which are fast reliable but range limited
 - Vara FM - alternative to packet, potentially much greater throughput
- HF - Long distance connections, depends on propagation
 - Vara HF - “Poor man’s Pactor” Not as good as Pactor 4 but operates with a less expensive sound card
 - HF Pactor 1,2,3 and 4 - Fast and reliable but requires an expensive modem
 - All RF modes can be peer-to-peer and many can utilize digipeaters and RMS gateways to connect to the internet

Complete Winlink Station



Q&A