



US HAM Radio Frequencies

160M - 1.8 - 2 MHz	17M - 18.068 - 18.168 MHz
80M - 3.5 - 4 MHz	15M - 21 - 21.45 MHz
60M - 5MHz region	12M - 24.89 - 24.99 MHz
40M - 7.0 - 7.3MHz	10M - 28 - 29.7 MHz
30M - 10.1 - 10.15 MHz	2M - 144 - 148 MHz
20M - 14.0 - 14.35 MHz	70CM - 420 - 450 MHz

Frequency Formula

$$\lambda = 3.28 (300 / f)$$

λ = Wavelength in Feet
 f = Frequency in MHz

Antenna Length

$$l = 468 / f$$

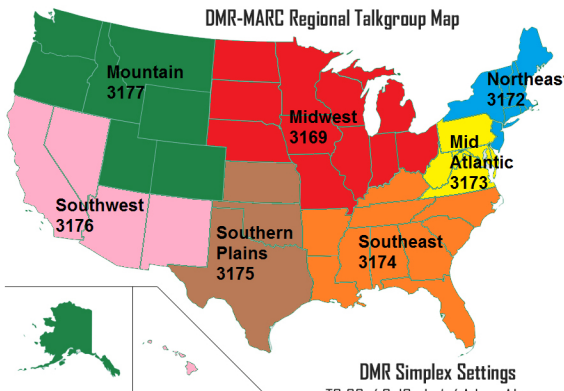
l = Length of Antenna in Feet
 f = Frequency in MHz
 Formula for 1/2 Wave Dipole

Digital Mobile Radio (DMR)

Common Talkgroups

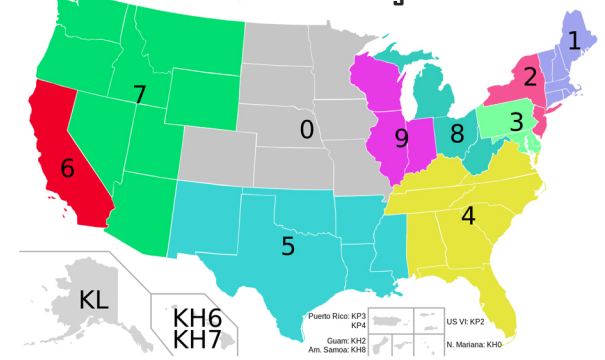
TGroup ID	Name
1	Worldwide
3	North America
113	English 1 (WW Conversations)
123	English 2 (WW Conversations)
310	TAC310 (US Conversations)
311	TAC311 (US Conversations)
3100	DCI Bridge
3169-3177	Regional Talkgroups (See Map)

DMR Simplex Frequencies
 441.000 MHz / 446.500 MHz
 433.450 MHz / 145.790 MHz
 145.510 MHz



DMR Simplex Settings
 TG 99 / ColCode 1 / Admit Always
 InCall Criteria: TX or Always

United States Callsign Areas



Automatic Packet Reporting System (APRS)

APRS Frequency Guide (VHF/UHF)

Name	Frequency	Voice Alert
United States, North America	144.3900	100.0
Argentina	144.3900	
Australia	145.1750	91.5
	439.1000	91.5
Europe, Finland, Ireland, Spain	144.8000	136.5
Japan	144.6400	
New Zealand	144.5750	
Norway	144.8000	123.0
Russia	144.8000	
France	144.8000	136.5
	432.5000	136.5
	439.7000	136.5
Netherlands	430.5125	
New Zealand	432.5750	
USA - Puget Sound, WA	441.1750	
USA - Kansas, Missouri	446.1750	
USA Nationwide Proposed	445.9250	

General Information

Default speed for APRS in VHF or UHF is 1200 baud except for Russia which is 9600 baud.

A given antenna installation and transmitter power will produce about 1/2 to 1/3 the RELIABLE range on APRS packet that it produces on FM voice.

APRS on HF

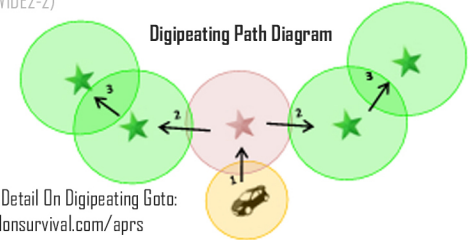
HF APRS uses Frequency Shift Keying (FSK) with a shift of 200Hz, at 300 bits per second. Due to the differences in audio tones used by various TNCs, the HF carrier frequency depends on the TNC.

Band	Mark Frequency	Space Frequency
40 Meters	7.034.400 kHz	7.034.200 kHz
30Meters	10.149.400 khz	10.149.200 kHz

Digipeating Paths and Operation

This example uses a path setting with three digipeater hops (WIDE1-1,WIDE2-2).

- 1) Mobile APRS Unit transmits APRS packet to his Home Fill-In Repeater (red star). At this point the WIDE 1-1 has been used (WIDE 1-1,WIDE 2-2).
- 2) The APRS packet is digipeated by the Fill-In and is received by two of the wide high-level digi's (green star). At this point one of the WIDE 2 hops is used (WIDE 1-1,WIDE2-1)
- 3) The APRS packet is digipeated again by the wide digipeaters, it is heard by another group of wide digi's. They will transmit the packet again. At this point the last WIDE 2 hop is used. Any other WIDE digi's who receive this packet will no longer repeat it. (WIDE 1-1,WIDE2-2)



For More Detail On Digipeating Goto:
<http://talonsurvival.com/aprs>

Simplex and Duplex Operation

USA Calling Channel Frequencies (FM)

Band	Frequency	Tone
2 Meter	146.520 MHz	None
70 Centimeter	446.000 MHz	None
6 Meter	52.525 MHz	None
33 Centimeter	906.500 MHz	None
23 Centimeter	1294.500 MHz	None

Calling Channel Etiquette

Calling Frequencies are for making initial contact. Once you make contact with another operator, move off of the channel to another frequency to keep it open for others..

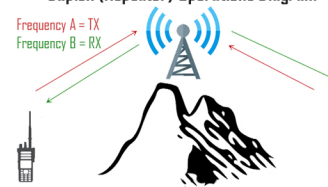
Standard Repeater Offsets

Use to program a radio to talk on a repeater when you only know the receive frequency.

Frequency	Offset
144-147 MHz	-0.600 MHz
147-148 MHz	+0.600 MHz
440-445 MHz	+5 MHz
447-450 MHz	-5 MHz

Example: A repeater with 146.640 MHz output (the receive frequency) would have a -.600 MHz standard offset. Meaning the transmit frequency to talk into the repeater is 146.040 MHz.

Duplex (Repeater) Operations Diagram



Simplex Operations Diagram

