

HAM RADIO FOR NON-TECHIES

Operating Cheat Sheet

hamradiofornontechies.com

Revised September 2026

Verified against 47 CFR Part 97

WHERE YOU CAN TRANSMIT

United States amateur privileges by license class. **Morse code (CW) is authorized on every amateur frequency**, so the splits below tell you where **data** and **voice** are allowed. Novice and Advanced licenses are no longer issued and are not shown.

BAND	BAND LIMITS	TECHNICIAN	GENERAL	AMATEUR EXTRA
160 m	1.800 - 2.000	no privileges	1.800 - 2.000 phone and data	same as General
80 m	3.500 - 4.000	3.525 - 3.600 CW only, 200 W	3.525 - 3.600 data 3.800 - 4.000 phone	3.500 - 3.600 data 3.600 - 4.000 phone
60 m	see box below	no privileges	4 channels + 5351.5 - 5366.5 kHz USB phone, CW, data	same as General
40 m	7.000 - 7.300	7.025 - 7.125 CW only, 200 W	7.025 - 7.125 data 7.175 - 7.300 phone	7.000 - 7.125 data 7.125 - 7.300 phone
30 m	10.100 - 10.150	no privileges	10.100 - 10.150 CW and data only, 200 W No phone on this band, any class.	same as General
20 m	14.000 - 14.350	no privileges	14.025 - 14.150 data 14.225 - 14.350 phone	14.000 - 14.150 data 14.150 - 14.350 phone
17 m	18.068 - 18.168	no privileges	18.068 - 18.110 data 18.110 - 18.168 phone	same as General
15 m	21.000 - 21.450	21.025 - 21.200 CW only, 200 W	21.025 - 21.200 data 21.275 - 21.450 phone	21.000 - 21.200 data 21.200 - 21.450 phone
12 m	24.890 - 24.990	no privileges	24.890 - 24.930 data 24.930 - 24.990 phone	same as General
10 m	28.000 - 29.700	28.000 - 28.300 data 28.300 - 28.500 phone 200 W	28.000 - 28.300 data 28.300 - 29.700 phone	same as General
6 m	50 - 54	Full band, all modes	Full band, all modes	Full band, all modes
2 m	144 - 148	Full band, all modes	Full band, all modes	Full band, all modes
1.25 m	222 - 225	Full band, all modes	Full band, all modes	Full band, all modes
70 cm	420 - 450	Full band, all modes	Full band, all modes	Full band, all modes
33 cm	902 - 928	Full band, all modes	Full band, all modes	Full band, all modes
23 cm	1240 - 1300	Full band, all modes	Full band, all modes	Full band, all modes
630 m	472 - 479 kHz	no privileges	Full band, 5 W EIRP UTC notice required	same as General
2200 m	135.7 - 137.8 kHz	no privileges	Full band, 1 W EIRP UTC notice required	same as General

60 METERS IS NOT A NORMAL BAND

It is four fixed channels plus one narrow segment, and the rules changed on **February 13, 2026**. Charts printed before that date show five channels and are wrong. General class and above only.

WHAT	WHERE	POWER
Four channels	5332.0 5348.0 5373.0 5405.0 kHz	100 W ERP
One segment	5351.5 - 5366.5 kHz (tune anywhere)	9.15 W ERP

ERP is referenced to a half-wave dipole. Maximum bandwidth 2.8 kHz everywhere on the band. 5358.5 kHz was a 100 W channel and is not any more - it now sits inside the 9.15 W segment.

ANTENNA MATH

Length in feet, frequency f in MHz.

Full wavelength	984 / f
Half wave, free space	492 / f
Half wave, real wire	468 / f

468 is an empirical number, not physics - the true figure drifts with height above ground, wire diameter and anything nearby. **Cut long, then trim to resonance** with an analyzer at the antenna's final installed height.

POWER LIMITS

Everywhere, all classes	1500 W PEP
30 m (10.100 - 10.150)	200 W PEP
Technician on HF	200 W PEP
60 m channels	100 W ERP
60 m segment	9.15 W ERP

The first rule in Part 97 is not a number: **use the minimum power needed to make the contact**. Everything above is a ceiling, not a target.

THE FINE PRINT

- **CW is legal anywhere** in any amateur band. The splits above govern data and phone.
- **70 cm**: no transmitting 420 - 430 MHz north of Line A near the Canadian border. Amateurs are secondary.
- **33 cm** and **23 cm** are secondary allocations - accept interference, cause none. 33 cm is barred outright near White Sands.
- **630 m** and **2200 m** require notifying the Utilities Technology Council and waiting 30 days before your first transmission.
- **Image** and **RTTY** follow the phone and data segments respectively.

SETTING UP AND WORKING YOUR RADIO

Simplex means both stations transmit and receive on one frequency, radio to radio. **Duplex** means you transmit on one frequency and listen on another - that is how a repeater works, and the difference between the two is the **offset**.

FM SIMPLEX CALLING FREQUENCIES

BAND	CALLING FREQUENCY	STONE
6 m	52.525 MHz	None
2 m	146.520 MHz	None
1.25 m	223.500 MHz	None
70 cm	446.000 MHz	None
33 cm	927.500 MHz	None
23 cm	1294.500 MHz	None

33 cm changed. The ARRL band plan designates 927.500. The older 906.500 is grandfathered and still used in some regions - but note 927.3 - 927.7 MHz is off limits entirely inside a box over Colorado and Wyoming.

Etiquette: a calling frequency is for making contact, not for having one. Once you have the other operator, agree on another frequency and move there so the channel stays open.

STANDARD REPEATER OFFSETS

Read the middle column as the repeater's **OUTPUT** - the frequency you hear it on. The offset is where your radio transmits.

BAND	REPEATER OUTPUT	OFFSET
10 m	29.610 - 29.700	-100 kHz
6 m	varies by region	-500 kHz, -1 or -1.7 MHz
2 m	145.20 - 145.50	-600 kHz
2 m	146.61 - 146.97	-600 kHz
2 m	147.00 - 147.39	+600 kHz
1.25 m	223.85 - 224.98	-1.6 MHz
70 cm	440 - 445	+5 MHz
70 cm	447 - 450	-5 MHz
23 cm	1282 - 1288	-12 MHz

Worked example. A repeater puts out 146.640. That falls in 146.61 - 146.97, so the offset is minus 600 kHz. You listen on 146.640 and transmit on 146.040. Most radios do this automatically once you enter the output frequency.

70 cm offsets are common practice, not an ARRL mandate - your regional coordinator has the last word. Many repeaters also need a CTCSS tone.

SOURCES

Where these numbers come from. Frequency segments and license class privileges: 47 CFR 97.301. Sixty meter channels and segment: 97.303(h). Where phone begins on each band: 97.305(c). Power limits: 97.313. Read them yourself at ecfr.gov. FM simplex calling frequencies and repeater offsets: the ARRL band plan at arrrl.org/band-plan. Talkgroups: the live BrandMeister database. APRS path guidance: blog.aprs.fi. **Band plans are voluntary; Part 97 is not.** Where a regional coordinator differs from this sheet, the coordinator wins.

DMR TALKGROUPS (BRANDMEISTER)

BrandMeister is the network almost every US repeater runs today. You need a DMR ID from radioid.net before any of this works.

TG	NAME	USE IT FOR
3100	USA Bridge	Nationwide calling - the important one
91	World-wide	Global calling
93	North America	Continental calling
310 / 311 / 312	TAC 310 / 311 / 312	Move a QSO off a calling channel
3101 - 3156	Your state	Alphabetical by state, 10 minute limit
3169 - 3177	Your region	See regional numbers below
9	Local	Traffic on your repeater or hotspot only
4000	Disconnect	Unlink the current dynamic talkgroup
9990	Parrot	Echo test - send as a PRIVATE call

US regional talkgroups (timeslot 2): 3169 Midwest • 3172 Northeast • 3173 Mid-Atlantic • 3174 Southeast • 3175 Southern Plains • 3176 Southwest • 3177 Mountain

Simplex: 446.500 and 145.510 / 145.790 are the safe choices. Set talkgroup **99 as a group call**, color code 1, timeslot 1, admit criteria Always. Both radios must match. **There is no national DMR calling frequency** - anyone who tells you otherwise is quoting a list, not a standard. Check with your local frequency coordinator before you settle on a simplex pair.

TAC 310, 311 and 312 are not calling channels and are not for nets. Do not park a hotspot on them.

APRS

1200 baud is the standard on VHF and UHF in the US. Voice Alert is a tone squelch trick: set CTCSS 100.0 on 144.390 and your radio stays quiet until another Voice Alert station is within simplex range.

REGION	FREQUENCY	VOICE ALERT
United States / North America	144.390	100.0 Hz
Europe and most of Region 1	144.800	136.5 Hz
Australia	145.175	91.5 Hz
New Zealand	144.575	-
Japan (1200 baud)	144.660	-
Russia	144.800	-

Digipeater path: use WIDE1-1,WIDE2-1. That is two hops. The first gets picked up by a local fill-in digipeater, the second by a wide-area one. Older guides show WIDE1-1,WIDE2-2 - that is three hops, and if everyone did it the channel would jam. More hops does not mean better coverage; it means more copies of your packet crowding everyone else.

APRS on HF: 30 meters carries the US activity. Tune **10.147.600 MHz USB** - that is the dial frequency you actually type in. It is 300 baud FSK with a 200 Hz shift, which puts the two tones on 10.149.200 and 10.149.400. There is no agreed US frequency on 40 meters.