



Getting into HF

Sponsored by the Spokane DX Association
Presented by Del Morissette (WA7AQH) & Mel Ming (N7GCO)

Why Get into HF, at all?

- You have an audience of thousands....people of all races, politics, creeds and languages waiting to contact you.
- Ragchewing... over great distances to foreign countries
- DXing using ionospheric refraction supplied by Nature. No third party wires, cell towers or repeater connections...often it is you and Mother Nature supplying the path
- Net participation...traffic...weather...folks with common interests. They also provide a gathering place in the event of emergencies.
- Awards collecting ...WAS, DXCC, WAC, WAZ, counting hunting, etc.
- Contests... either by yourself or with others using one or multiple transmitters.
- Transmitter hunts...even on 80M
- DIY construction and use of simple transmitters, antennas, shack accessories.
- Learning.
- Multiple modes...SSB phone, digital (FT8/FT4, RTTY, PSK,etc.), CW, SSTV

How does HF differ from VHF/UHF?

- Propagation of signals is affected heavily by the sun cycle
- Grounding and bonding become much more important
- Noise levels tend to be higher
- Coax losses are much lower
- Frequency accuracy and stability are more critical
- Signal fading is much more of a factor
- Signals that aren't clean have a bigger impact on other users
- And, probably most importantly, how do I convince my spouse that this is a good thing.



Equipment for Getting into HF?

1. Antenna

Mostly depends on where you live.

Recommendations and Suggestions:

- 1) If you have a large lot with tall trees, you can use a multiband dipole or inverted V (example Alpha Delta ALF-DX-CC 82'). It is quite easy to make a 20/40/80 meter dipole.
- 2) If you have a large lawn, you can use a vertical with at least 16 radials (examples Butternut HF9V or HF6V or Hustler 6BTV)
- 3) If you are in a HOA or condo, you might consider End Feed multiband antenna (example MyAntenna EFHW-8010) or a long wire with a broadband antenna tuner (Example Icom AH4). These can be almost invisible.
- 4) If you have the space, a 50 plus foot tower with antenna is excellent for HF.

NOTES:

1. You can find an experienced ham who has a quality antenna analyzer to help you tune your antenna. You don't need to buy one initially.
2. Don't think you can't get on HF because of your location. One ham in a CQ Magazine shared how he used his rain gutters as an antenna.
3. Bob Zavrel (W7SX) worked over 300 DX entities* using only wire antennas in trees.
4. Gary Swartout (K7GS) worked over 330 DX entities* from a small Spokane city lot.

*DX entities are distinct geographical locations that are recognized by ham radio organizations for awards

2. Radios

Things to consider:

- Bands: 6, 10, 12, 15, 18, 20, 30, 40, 60, 80, 160
- Filters
- DSP
- Internal Sound Card (For digital modes)
- Antenna Tuner
- USB Connection to computer
- SDR
- Waterfall Display
- Direct Sampling or SDR



Suggestions:

- 1) You can buy used radios, but most will not have a built in sound card.
- 2) On many older rigs, you cannot get replacement parts.
- 3) If you can afford it, the newer SDR radios have excellent receive features including waterfalls.

Recommendations:

Minimum: (\$500-600)

Icom 706 MKIIG (\$450-500, Icom 7000 (\$600), Yaesu FT 857 or Yaesu FT 891 (\$500-600). NOTE: None of these will have built in sound cards or contain SDR's.

Plus Signalink USB (\$150 for Unit and cable) Used for about \$75.

Recommended: (\$1,000)

1. If you already have a 2 meter/440 radio, we recommend the Icom 7300. It is an SDR radio with built in sound card (No need to buy separate sound card). It is an unbelievable value for what you get. You can buy one of these for under \$1,000 new.
2. If you don't have a 2 meter/440 radio, we recommend the Icom 7100. It has all bands and a built in Sound Card.

Higher level Possibilities: (\$3,000-6,000)

- Flex 6600
- Elecraft K3
- Icom 7610
- Yaesu FT 101D

3. Power Supply

Types:

- Linear
- Switching

Recommendations and suggestions:

- 1) A linear power supply of at least 30 amps.
Many VHF/UHF radios only put out 50 watts and need 15-20 amps. For HF, radios generally put out 100 watts, and you will need 25-30 amps for these radios. Mel likes "linear" and recommends the Astron Power Supplies with meters. They will last your lifetime. Can often get these used at a good price. One of the SDXA members



- recently purchased a 30 amp Astron on Ebay for \$100. For switching power supplies we recommend Samlex or Powerwerx.
- 2) Buy more “amps” than you think you will need, for it will power your entire station and accessories. If you have enough amps, you can power many station accessories and eliminate many noisy wall warts.
 - 3) Use Anderson Power Poles for all power connections. Many power supplies do not come with Anderson Power Poles, so you will need to add a jumper. When you are just getting started you can borrow a Power Pole crimper from someone or have us come over and help you get setup.
 - 4) Get a West Mountain Rig Runner for power distribution. We have found these to be more reliable than some other manufactories.

4. Antenna Tuners

Must be able to handle the power output of the transceiver.

Some can only handle up to 10:1 SWR like the LDG.

Most are limited to 30-50% power on continuous/digital modes

Questions:

- 1) How wide a SWR will it handle?
- 2) How much power will it handle? SSB? Digital?
- 3) Is it automatic or manual?
- 4) Does it integrate with your transceiver?

5. Computer Related

We highly recommend having a dedicated computer to use with ham radio. Unless you only want to do CW and ragchew, you will need one.

1) Logging software

Recommendations and Suggestions:

- A popular general logging program that is free is “Logger32”
- Popular general logging programs that are easy to use, but cost include: N3FJP ACLog (\$25 for life) and Ham Radio Deluxe (initial cost plus yearly update fee)

Features of Logging programs:

- Rig control & communication with Transceiver
- Automatic uploads to LoTW & Club Log
- Easy to check for status on awards
- Integrated Spotting
- Record of confirmation
- Integration with QRZ



2) Contest Software

- For contests N1MM is the standard and it is free. Mel likes the contest software from N3FJP.

Features of Contesting Logging programs:

- Rig control & communication with Transceiver
- Integrated Spotting and show needed contacts
- Keeps track of Multipliers
- Keeps track of contact points
- Keeps track of time you are participating
- Shows any potential duplicated
- Performs Super Check Partial

3) Spotting programs

- Many, if not most, logging programs have it built in (Example N3FJP AC Log and Ham Radio Deluxe.
- There are web based spotting programs like DX Maps, DX Summit, and DX Watch.
- There are stand-alone spotting programs VE7CC and DXLabs Spot Collector.

4) Digital programs

- WSJT-X (FT8/FT4)
- Winlink
- Fldigi

Note: Most logging programs have built in spotting programs and uploading your contacts to LoTW and Club Log.

Logging Programs

AC Log by N3FJP (\$24.00 for lifetime -- \$49.99 for complete Contest and Logging)

<http://www.n3fjp.com/>

Logger32 by K4CY (Free)

<https://www.logger32.net/>

Log4OM by IW3HMH (Free)

<https://www.log4om.com/>

Winlog32 by G0CUZ (Free)

<http://www.winlog32.co.uk/>



Software Suites

DX Lab (Free) DX Keeper is the logging part of the suite.

<https://www.dxlabsuite.com/>

Ham Radio Deluxe (\$99.95 plus must buy every upgrade)

<https://www.hamradiodeluxe.com/>

Last Free Version of HRD

<https://www.egr.msu.edu/msuarc/software/ham-radio-deluxe/>

Contest Logger

N3FJP

<http://www.n3fjp.com/>

N1MM

<https://n1mmwp.hamdocs.com/>

Writelog

<https://writelog.com/>

Other Helpful Programs

FT8/FT4 Digital (Recommend using these three together)!

WSJT-X (For FT8 and FT4)

<https://physics.princeton.edu/pulsar/k1jt/wsjsx.html>

JTAlert (For connecting WSJT-X to your logging program)

<https://hamapps.com/>

PSKReporter (For showing you who is hearing you)

<https://pskreporter.info/pskmap.html>

Spotting Programs and Sites (Used for working DX)

CC User – VE7CC Cluster

<http://www.bcdxc.org/ve7cc/>

DX Monitor

<https://ve3sun.com/>

DX Summit (Web based)

<http://www.dxsummit.fi/#/>



DX Maps (Web based)

<https://www.dxmaps.com/spots/mapg.php>

DX Watch (Web Based)

<https://www.dxwatch.com/>

Sample Getting Started Packages:

1. Used (\$790.00)
 - Icom 706 MKIIG (\$500.00)
 - Signalink USB (\$75.00)
 - Power supply (\$75.00)
 - 100' RG8X (\$60.00) New ***
 - Homemade dipole (\$80.00)
2. Without built in sound card (\$1372.00)
 - Kit from DX Engineering
 - Yaesu FT-450D
 - Samlex 1235 Power Supply
 - Heil Sound PS6 Headset
 - Heil Sound adaptor cable
 - DX Engineering foot switch
 - 100' RG8X coax cable ***
 - Buckmaster DX-OCF Dipole Antenna
3. With built in sound card (\$1,518.00)
 - Icom 7300 (\$1,080.00)
 - Samlex 1235 Power Supply (\$136.00)
 - 100' RG8X Coax Cable (\$60.00) ***
 - Buckmaster DX-OCF Dipole Antenna (\$242.00)**
4. VHF/UHF/HF with built in Sound Card (\$1358.00)
 - Icom 7100 (\$920.00)
 - Samlex 1235 Power Supply (\$136.00)
 - 100' RG8X Coax Cable (\$60.00) ***
 - Buckmaster DX-OCF Dipole Antenna (\$242.00)**



** Alternatives to Buckmaster DX-OCF Dipole Antenna

WIRE (Multiband)

- Home made trap dipole
- MyAntenna EFHW-8010-1K (8 Band) (\$170.00)
- WA2NAN True-Talk G5RV (\$100.00 on ebay)
- Alpha Delta DX-EE (\$160.00)

VERTICAL

- Hustler 6BTV Vertical (6 Band) (\$242.00) (Needs ground Radials)
- Butternut HF9V Vertical (9 band) (\$605.00) (Needs ground Radials)

LONG WIRE

- Icom AH-4 and long wire (all bands) (\$300.00) Can be loop, long wire, for vertical

TOWER

If you can put up a tower, a good basic start would be: (About \$1,000)

- Used Rohn 25 (35' plus) – (Rohn 45 is better)
- Used Tribander (3 bands) or new Hexbeam (5 or 6 band) or Cobweb
- Used Rotator

*** Alternatives to RG8X coax

100' DX Engineering 400 MAX (\$120.00)

This is usually a one-time purchase and it general pays to upgrade to 400 MAX if you can. Quality RG-8 or 213 work well also. Beware of LMR-400 (unless the flex version) unless it's a straight run without bends. Belden 9913 has a reputation for allowing water in the outer jacket which ruins the coax.

Much helpful information in the Spokane DX Association website: "SDXA.org"



AWARDS

Relatively Easy Awards

ARRL WAS (Worked All Stated)
IARU WAC (Worked all Continent)

ARRL DXCC Awards

DXCC is Amateur Radio's premier award that hams can earn by confirming on the air contacts with 100 entities.

SDXA #1 Honor Roll

To qualify you must have worked every entity on the current DXCC List. There are 340 current entities on The ARRL DXCC List.

SDXA Members with DXCC Honor Roll Achievement

The DXCC Honor Roll is earned by amateurs who submit confirmation for contacts reached within the numerical top 10 of the overall number of entities on the DXCC List.

As of 20 Feb 2020, there were 340 current entities on the list, with 331 being required for the Honor Roll.

SDXA DXCC Challenge

The DXCC Challenge Award is earned by working and confirming at least 1,000 DXCC band-points on any Amateur bands, 160 through 6 meters (except 60 meters).

SDXA Five Band DXCC (10, 15, 20, 40, & 80)

Five Band Award is for hams can earn by confirming on the air contacts with 100 entities on 10, 15, 20, 50 and 80 meter bands.

SDXA Triple

The Triple Play WAS (Worked All States) Award is available to all amateurs worldwide who must use Logbook of the World (LoTW) to confirm QSOs with each of the 50 states on voice, CW, and digital modes.



Other Stuff

- Grounding
- Lightning protection
- Antenna switches
- SWR and power meters
- Feedline/coax cable
- QSL Cards

Key Skills And Concepts For Dx

1. Use Official Phonetics only (See Appendix I)
2. Learn to work Split (See Appendix II)
3. Working a pileup
4. Working the Grey Line
5. Using QRZ to look up contacts

After the Workshop, Mel will send you the following PDF's:

1. Operating Practices (19 Pages)
2. DX Summit Guide (14 pages)
3. CC Users Guide (VE7CC) (20 pages)



APPENDIX I

ARRL Phonetic Alphabet

A—Alpha
B--Bravo
C--Charlie
D--Delta
E--Echo
F--Foxtrot
G--Golf
H--Hotel
I--India
J--Juliett
K--Kilo
L--Lima
M--Mike
N--November
O--Oscar
P--Papa
Q--Quebec
R--Romeo
S--Sierra
T--Tango
U--Uniform
V--Victor
W--Whiskey
X--X-ray
Y--Yankee
Z--Zulu



APPENDIX II

What is Split Operation in Ham Radio?

---Posted by OnAllBands on June 24, 2019

Split means transmitting on one frequency and listening on another. This helps everyone hear the DX station better so they can time their calls, follow instructions, and not create unnecessary interference. Expect the DXpedition to operate "split" while the pileups are medium to large, possibly up until the last few days of the operation.

A typical DXpedition might transmit on 14.195 MHz and specify they are listening "from 14.200 to 14.210." Your receiver should be set to receive on 14.195 MHz and transmit somewhere in the 14.2 to 14.21 range. This is typically done by using the VFO A and VFO B settings (VFO stands for variable-frequency oscillator). Most transceivers have a "SPLIT" button or menu item that alternates between the VFO on receive and transmit. The transceiver manual will have instructions on how to do this.

Practice setting your VFOs, say with a friend on the air, and get used to setting the VFO used for transmitting to different frequencies a few kHz away from the DX transmitting frequency. On CW (Morse code) and RTTY (radioteletype), the typical shift in frequency is 2-5 or 10 kHz. The DX station will send "UP" or something like "UP 2" after completing a contact.