



# Operating Procedures, Calling CQ & Your First HF Shack

**Back to Basics 12/08/17**

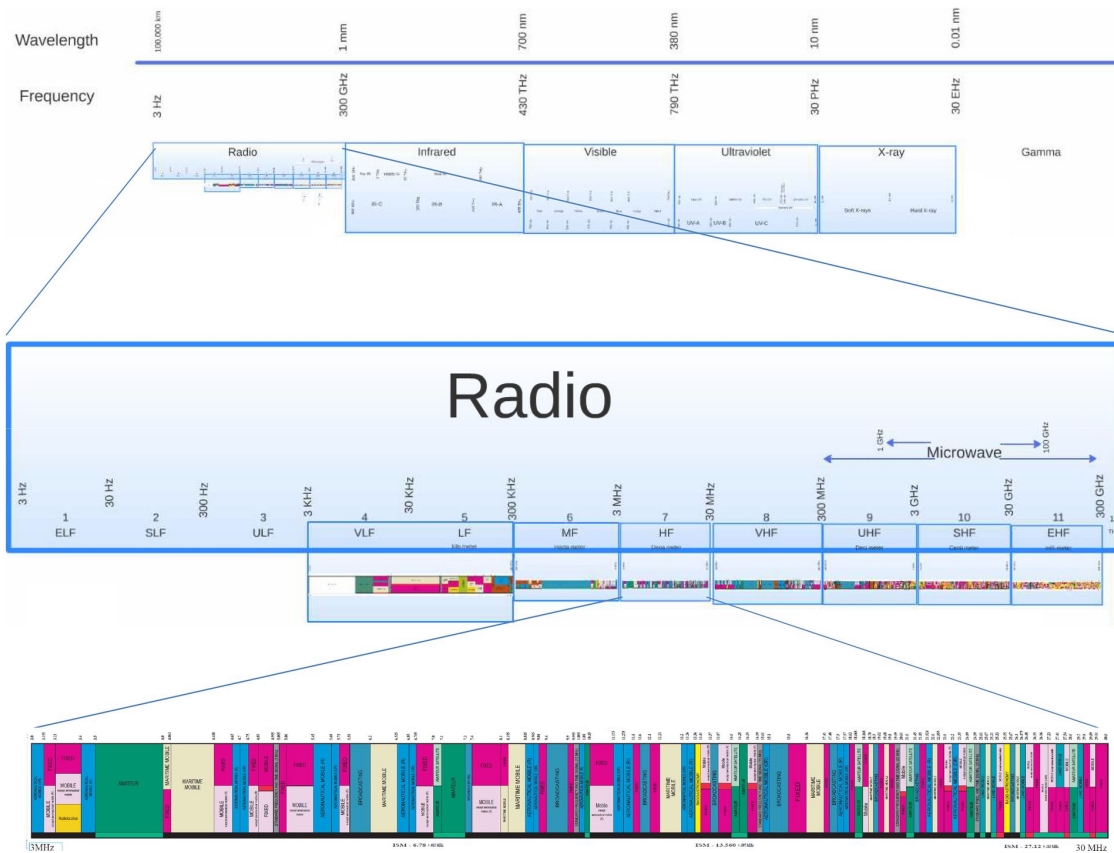
Kyle Krieg (NØKTK) - Sterling Coffey (NØSSC)

[www.nøktk.com](http://www.nøktk.com) - [www.nøssc.com](http://www.nøssc.com)

[kylekrieg@gmail.com](mailto:kylekrieg@gmail.com) - [nøssc@arri.net](mailto:nøssc@arri.net)



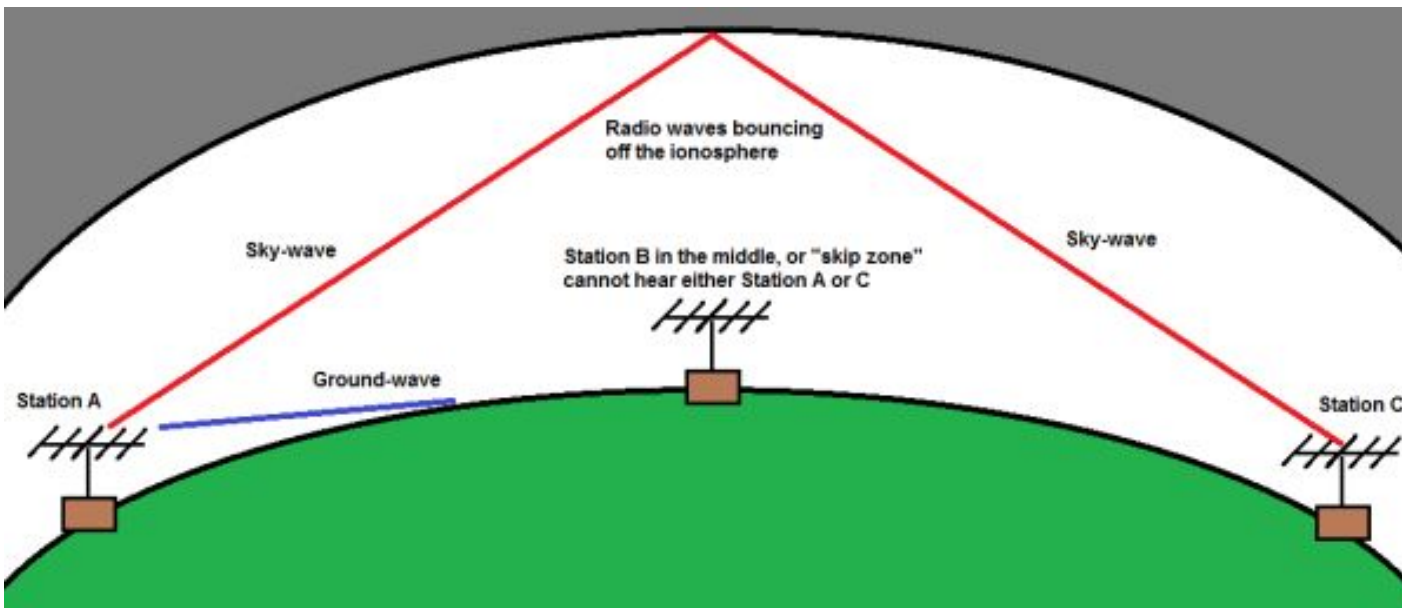
# HF Basics - What is HF?





# HF Basics

## Sky wave propagation vs ground wave





## HF Basics - What is HF good for?

- Public service & disaster relief
- Awards (DXCC, WAS, County Hunting)
- Contesting
- Activating Parks on the Air, Summits on the Air, etc...
- Checking in or running net control for a nationwide net
- Ragchewing (lengthy conversations via HF)
- Operating via multiple modes - CW, SSB, Digital, SSBTV
- QRP (operating with 5W or less)
- WSPR (whisper) Beacon
- Propagation studies (eclipse HamSci)
- Winlink - sending email via the HF bands



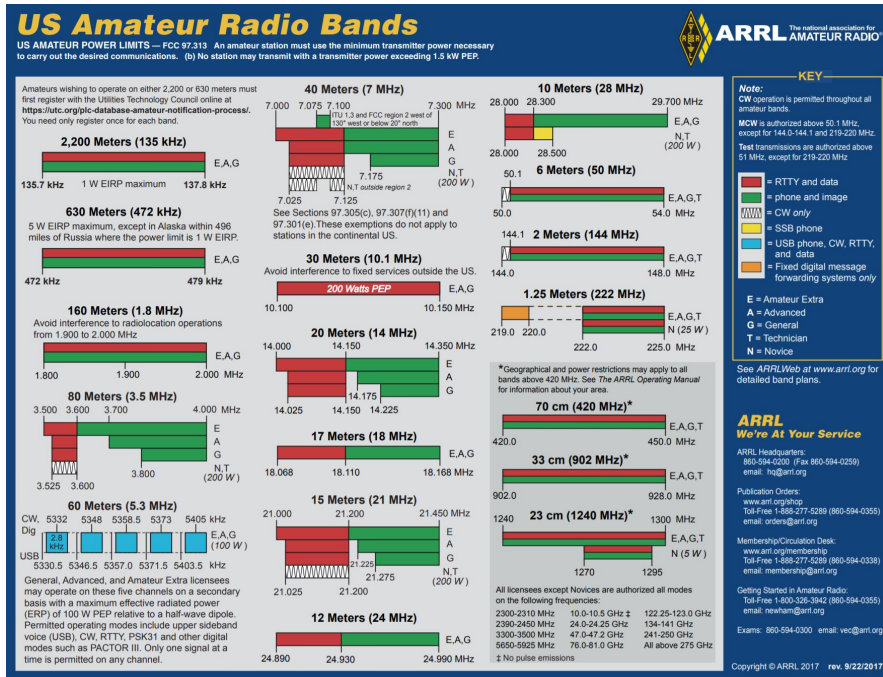
## HF Basics - HF vs VHF/UHF

- Mostly skywave for HF vs ground wave on FM
- HF is point to point where most VHF/UHF conversations are through repeaters
- Phonetics are used on HF, letters are mostly used on FM
- Faster data speeds happen on VHF/UHF vs HF
- Q signals are used on HF
- Hams log HF contacts, usually do not log repeater FM contacts while other modes may be logged
- Clarity on FM vs SSB can be noticeable



# HF Basics - Band Plans

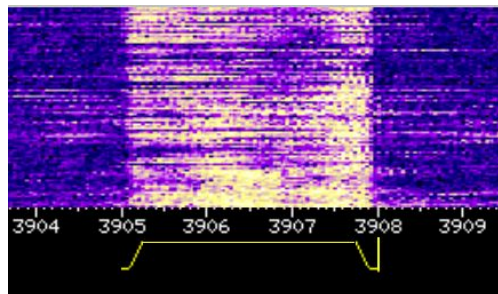
<http://www.arrl.org/graphical-frequency-allocations>



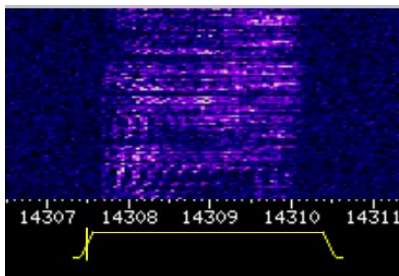
## HF Basics - Modes

Voice (3Khz bandwidth)

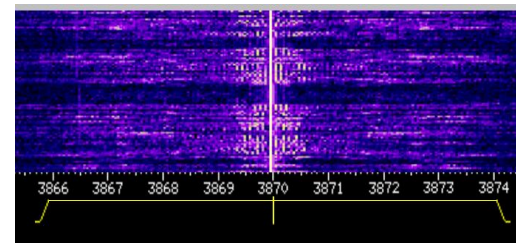
- LSB (lower sideband below 9Mhz: 160m, 80m, 40m)
- USB (upper sideband above 9Mhz: 30m, 20m & above)
- AM (typically used on 40m, 80m & 160m)



80m Lower SSB



20m Upper SSB



80m AM



# HF Basics - Modes

## CW (50Hz bandwidth)

- Can hear hundreds of signals inside CW portion of a HF band with no overlapping or interference.

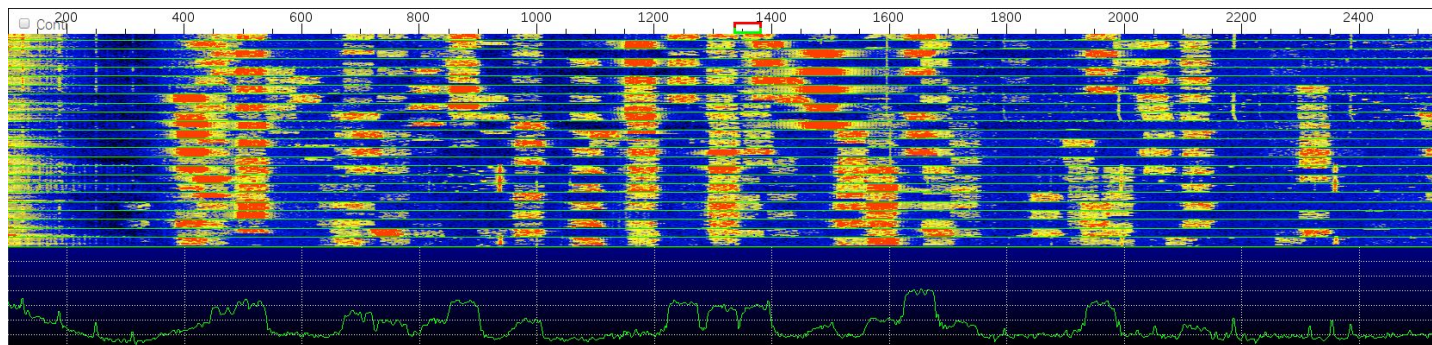




# HF Basics - Modes

Digital (USB is always used)

- PSK31
- RTTY
- JT65 & JT9
- FT8





# HF Basics - Q Signals & Lingo

Q-Signals are 3 letter combinations used to represent common phrases or sentences for CW operators but many Q-signals have become acceptable for phone operation.

QRL - frequency in use?  
QRM - signal interference  
QRP - low powered  
QRT - stop transmitting  
QRZ - who's calling?  
QSL - do you acknowledge?  
QSY - change frequency

QTH - location  
QSB - signal is fading  
73 - best regards  
88 - loves & kisses  
YL - female operator  
XYL - ham's wife  
OM - male operator



# HF Basics - Lingo

**Birdie** - a signal produced inside a radio that can be heard without an antenna

**CQ** - “seek you.” Said when soliciting a contact.

**DX** - distant contact For HF, typically another country.

**LID** - a poor operator

**Bug** - mechanical keyer for CW

**Grid Square** - grid squares 70m x 100m in US (EM48sp is MoBAP)

**WAS** - Worked All States

**DXCC** - DX Century Club: Worked 100 Countries

**Zulu** - UTC time

**WARC bands** - bands set aside for no contesting activities - 30m, 17m, 12m

**DXpedition** - hams travel to remote places to give other hams a chance to add that entity to their DXCC list

**Stroke** - /region, /portable or /mobile. N0KTK/9 (Zero call operating in 9 land)



## HF Basics - Calling CQ

- 1) Pick a frequency in your operating privileges
- 2) Listen for activity
- 3) Ask if the frequency is in use (3 times) with your call
- 4) Listen for responses
- 5) Call CQ many times (15 seconds)

CQ CQ CQ, this is N0KTK, November Zero Kilo Tango  
Kilo 40 meters calling CQ CQ CQ on 40 meters N0KTK  
calling CQ and standing by.



# HF Basics - Calling CQ DX

DX means “distant station” outside of the States



- 1) Pick a frequency in your operating privileges
- 2) Listen for activity
- 3) Ask if the frequency is in use (3 times) with your call
- 4) Listen for responses
- 5) Call “CQ DX” many times (15 seconds)

CQ DX CQ DX CQ DX, this is N0KTK, November Zero Kilo  
Tango Kilo on 40 meters calling CQ DX CQ DX CQ DX, N0KTK  
40 meters calling CQ DX and standing by.



# HF Basics - Calling CQ





## HF Basics - Answering a CQ

- 1) Tune around the band to spot someone calling CQ
- 2) Make sure you're operating within your privileges
- 3) Once the station stops calling CQ, send your WHOLE call sign with phonetics once.
- 4) If the station does not answer your call, wait for the calling station to CQ again or call <station call> QRZ?

Typically quick conversations consist of name, location (sometimes grid square), signal report, station info (rig, power, antenna) and weather.



# HF Basics - Signal Reports

## - The RST System

### Readability

- 1--Unreadable
- 2--Barely readable, occasional words distinguishable.
- 3--Readable with considerable difficulty.
- 4--Readable with practically no difficulty.
- 5--Perfectly readable.

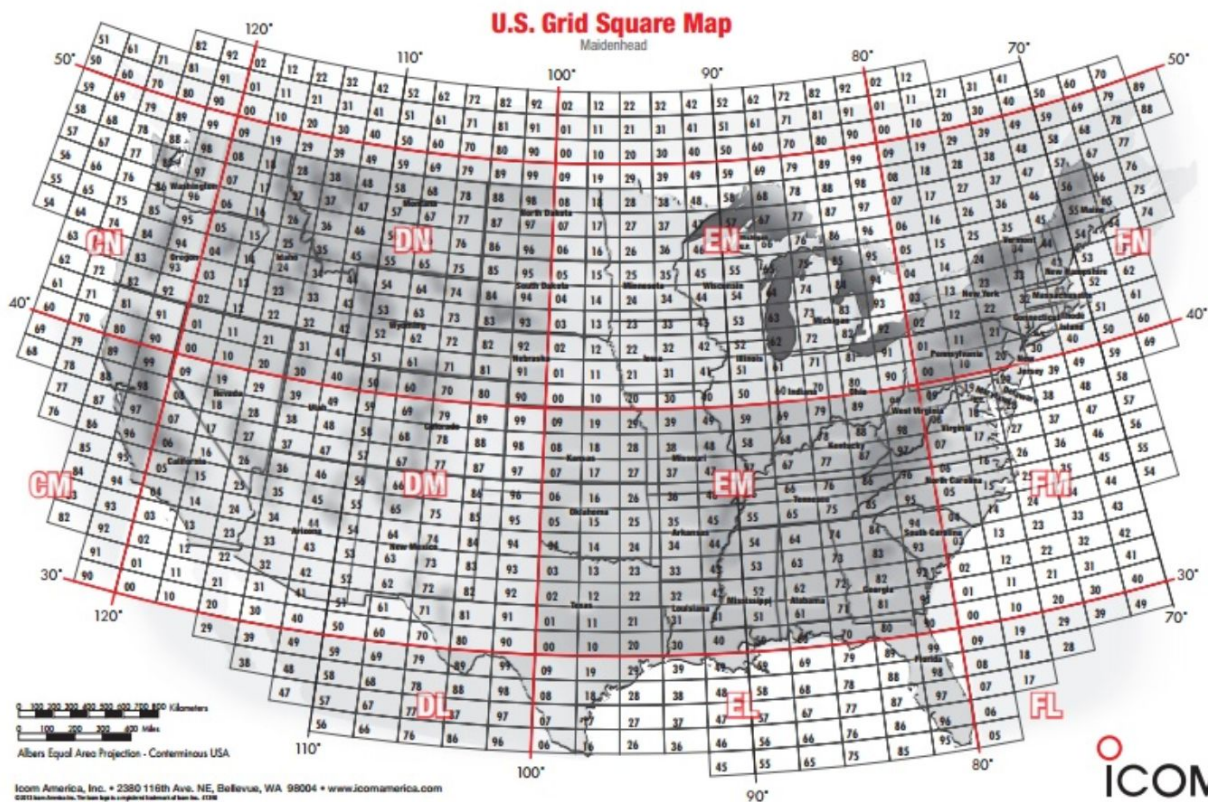
### Signal Strength

- 1--Faint signals, barely perceptible.
- 2--Very weak signals.
- 3--Weak signals.
- 4--Fair signals.
- 5--Fairly good signals.
- 6--Good signals.
- 7--Moderately strong signals.
- 8--Strong signals.
- 9--Extremely strong signals.





# HF Basics - Grid Squares





# HF Basics - Logging Software

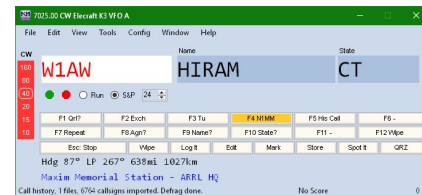
Most hams log and QSL contacts, but it isn't required.

## Free

1. Log4OM - confusing startup, but straightforward
2. CQRLog - Linux logger
3. N1MM+ - contesting, highly configurable and integrated
4. Spreadsheets or Paper
5. DXKeeper (DXSuite) - highly configurable, can be confusing

## Paid

1. N3FJP - \$25/life simple interface, \$9 for contest logging
2. HRDLog - \$75 a year for support and upgrades





# HF Basics - QSL'ing



## QSLing

- Via US Mail direct, via QSL bureau or online
- To acknowledge receipt
- Hams exchange postcards containing contact QSO info
  - Used to confirm awards like WAS, DXCC, etc
  - Most hams display QSL cards as wallpaper
- Online QSLing
  - LoTW (Logbook of The World): ARRL sanctioned, approved for rewards. Integrated into most logging software
  - EQSL
  - QRZ
  - Clublog



# HF Basics - Cluster, Nets and Contesting

[www.dxwatch.com](http://www.dxwatch.com)

[www.dxsummit.fi](http://www.dxsummit.fi)

[www.dxheat.com](http://www.dxheat.com)

[www.n1yz.com/HFNET\\_LIST.HTM](http://www.n1yz.com/HFNET_LIST.HTM)

[www.contestcalendar.com](http://www.contestcalendar.com)



# HF Basics - Things to Consider

- How much space do you have for your operating position?
- How much space outside or in your attic do you have for an antenna?
- Do you have any homeowners association issues on your property?
- Do you have any trees or support structures for antennas?





# HF Basics - Buying a Transceiver

Do not start out with a QRP rig (low power rig)!!!! 100W!

Start USED! Get on the air with a cheap rig. Get to know the bands and characteristics of HF. Listen! See what you can hear!

Attend a hamfest, look at some rigs, get to know the big radio manufacturers (Kenwood, Icom and Yaesu). Ask an elmer!

Do your research on the web! Find reviews on Google! YouTube is your friend! YouTube has tons of reviews!



# HF Basics - Buying a Transceiver

Buying a transceiver from a ham is more reliable than purchasing from a stranger, as you have some basic info about them (their call)! Buy local at a hamfest! The classifieds will be cheaper than big box dealers. Look on social media for deals.

## Ham to Ham

<http://www.ebay.com>

<http://www.eham.net>

<http://swap.qth.net>

## Dealers & Big Box

<https://www.mtcradio.com/used-gear/>

<https://www.hamradio.com/used.cfm>

FB - <https://www.facebook.com/groups/311023165750518/about/>

# HF Basics - Good First Transceivers



**YAESU FT-450**



**ICOM IC-718**



**ICOM IC-7200**



**ICOM IC-725/735**



**Kenwood TS-430/450**



**Kenwood TS-2000**





# HF Basics - Power Supplies

Any 12v DC 20 to 25amp power supply will do for your first PS. Switching PS tend to be cheaper than linear PS, but it doesn't matter which one. Switching PS are lighter. Start USED!!!!

New - ~\$75 - \$300

Used - ~\$2 per amp (20amp = \$40) based on age





## HF Basics - Coax

The general rule for coax is : **buy the best coax you can afford.** RG-8x is good starting point. RG-8 and RG-213 are better. LMR-400 is the best. If soldering your own ends, good quality connectors will last you a lifetime. Buy 50Ohm! Coax can cost \$.25 per foot all the way to \$1 per foot based on attenuation dB.

Coax Cable Signal Loss (Attenuation) in dB per 100ft*								
Loss*	RG-174	RG-58	RG-8X	RG-213	RG-6	RG-11	RF-9914	RF-9913
1MHz	1.9dB	0.4dB	0.5dB	0.2dB	0.2dB	0.2dB	0.3dB	0.2dB
10MHz	3.3dB	1.4dB	1.0dB	0.6dB	0.6dB	0.4dB	0.5dB	0.4dB
50MHz	6.6dB	3.3dB	2.5dB	1.6dB	1.4dB	1.0dB	1.1dB	0.9dB



# HF Basics - Antenna Tuners

Antenna tuners make non-resonant antennas look resonate to your transceiver. On newer rigs antenna tuners are built in or an option when purchasing new. External tuners can be used to bypass an internal tuner. LDG and MFJ make good tuners.

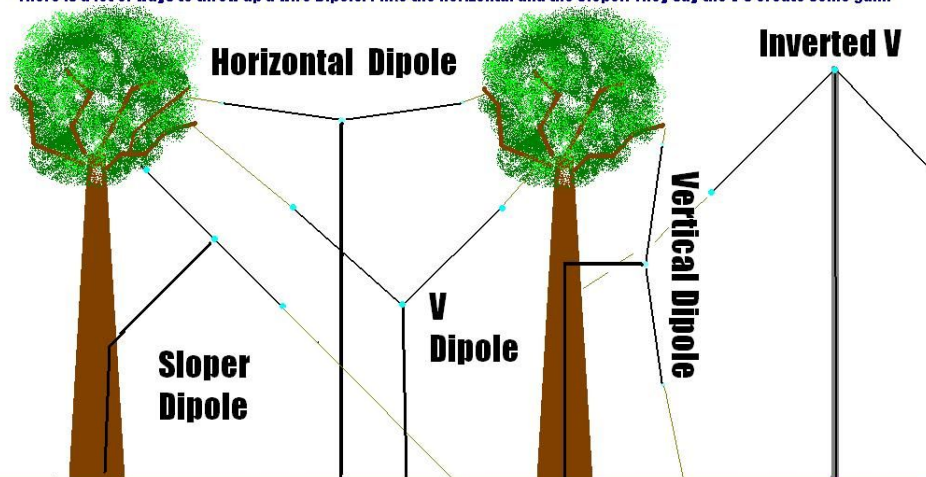
Used tuners ~\$50 to \$100 based on features.



# HF Basics - Antennas (best)

- Build a dipole with 1:1 current or voltage balun (it's easy!!!)
  - If you have trees 20ft tall and 30ft apart, install a dipole!
- Fan dipoles can get you on many bands without a tuner

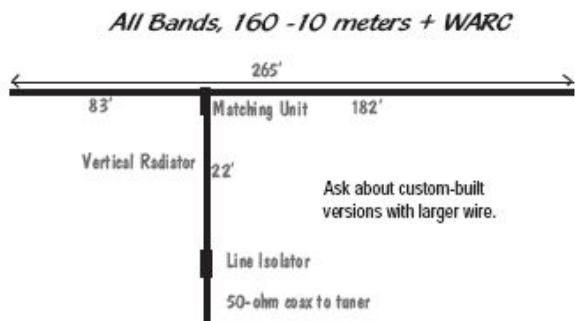
There is a lot of ways to throw up a wire Dipole. I like the horizontal and the Sloper. They say the V's create some gain!



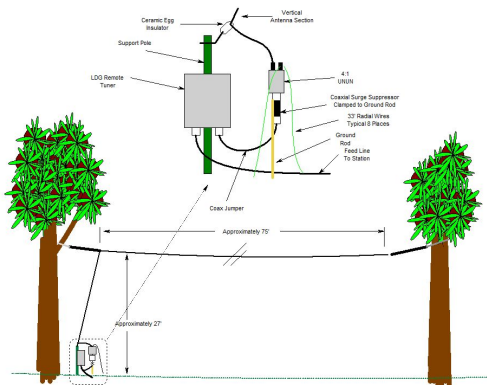
Remember that Dipoles are not the best for local talking. But they kick butt on the DX signals. They also get less static. Just like all antennas the higher in the air you can get them the better. Thats why wires are fun.

# HF Basics - Antennas (good)

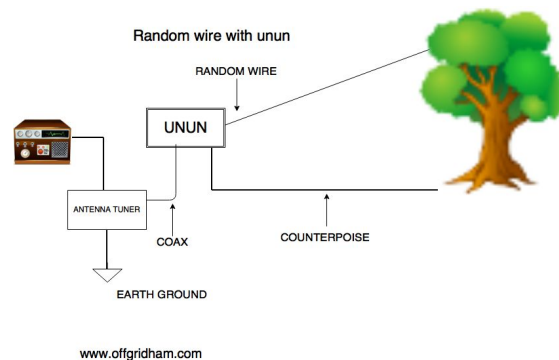
- Windoms work well at high elevations without a tuner
- End fed antennas can be used for stealth or small yards
- Random wires can be used with a good antenna tuner



**WINDOM ANTENNA**



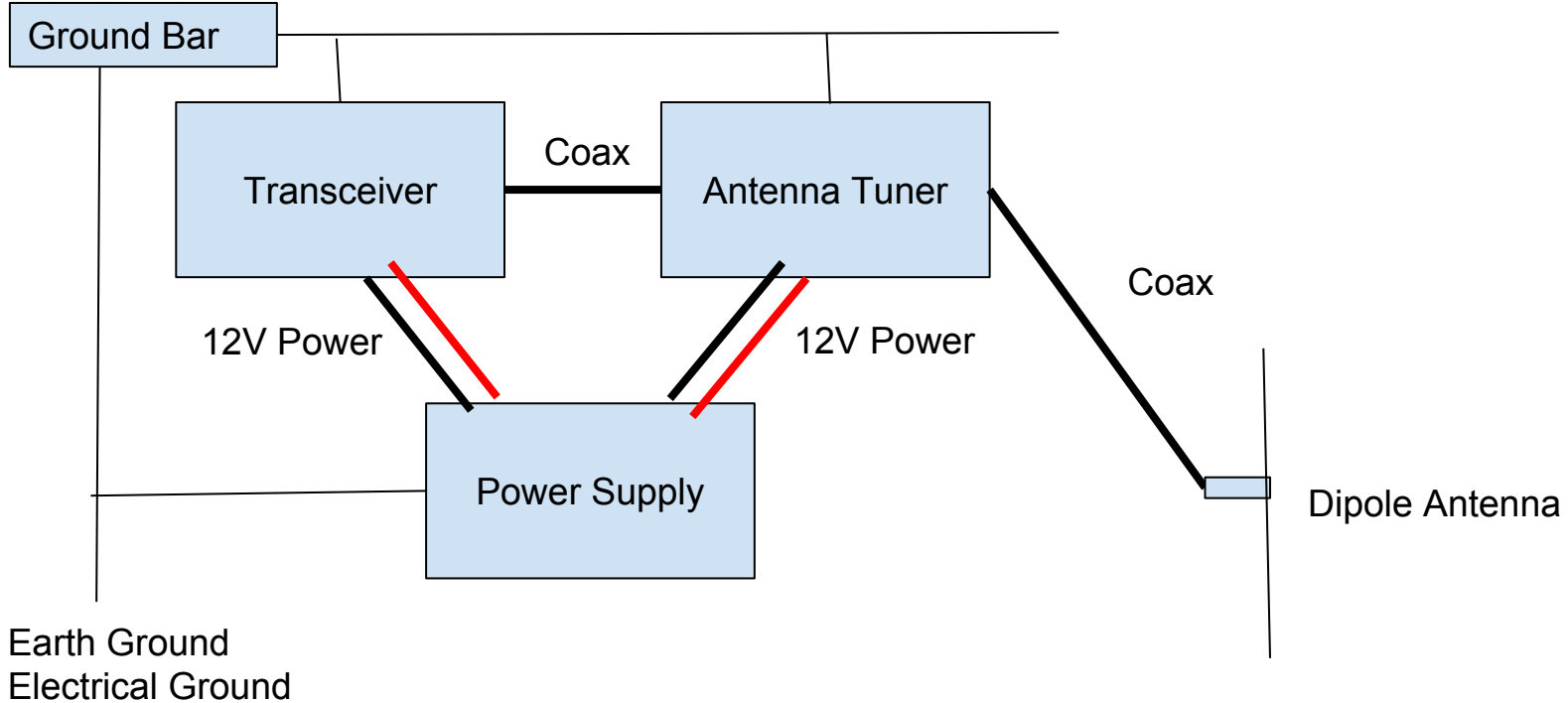
**END FED ANTENNA**



**RANDOM WIRE**



# HF Basics - Hooking Everything Up





# HF Basics - Demo Time!



# HF Basics - Misc Equipment



**MFJ Window Pass Through**



**Anderson Power Poles**



**AM Radio**



**Power Distribution**



**MFJ SWR Meter**



**50Ohm Dummy Load**





# HF Basics - Misc Equipment

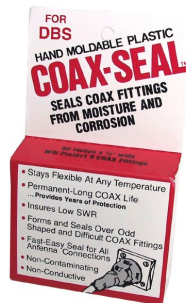
**SWR Meter** - MFJ/Rig Expert are good choices

**Coax Seal** - Sealing PL259 connections outside

**Clamp On Ferrites (Type 30 or 45)** - keeping RF out of your shack, place close to the antenna on the coax

**Multi-Meter** - Troubleshooting cable or balun issues

**Dummy Load** - 50ohm transistor that displates RF as heat





# HF Basics - WebSDR

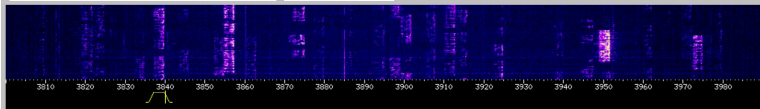
Welcome to the **KFS WebSDR** HF radio receiver system located 6 miles south of Half Moon Bay, California; maintained by Craig, W6DRZ, e-mail [w6drz@arrl.net](mailto:w6drz@arrl.net). A technical description, operating tips, propagation information, and a donation opportunity can all be found on the [ABOUT](#) page. More information on the worldwide WebSDR project can be found on [www.websdr.org](http://www.websdr.org).  
**Note:** On older browsers you need both *Java* and *JavaScript* enabled for this page to work properly. For a detailed discussion, click [here](#).

## KFS WebSDR NEWS:

- (2 Jan) As of the New Year, this system has been renamed **KFS WebSDR** to better reflect its history and location.
- (27 Oct) Compact view of user display is now forced during the evening due to abuse.
- (6 Dec) Thanks to K6JEK, W6YDG, WW6D, AEA Inc, and K8OLS for their recent donations.

Please log in by typing your name or callsign here (it will be saved for later visits in a cookie):

View:  all bands  others slow  one band  blind Allow keyboard:



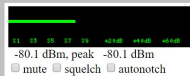
Frequency:  kHz

Band:  160  75  60  40cw  40ph  20

On trace by clicking dragging scrollwheel on the frequency scale.

### Memories:

(new)



-80.1 dBm, peak -80.1 dBm

mute  squeech  antonotch

Volume:

Audio recording:

Signal strength plot: none ▾

### Mode/Bandwidth:

2.80 kHz @ -6dB; 3.26 kHz @ -60dB.

### PassBand Tuning (PBT):

<< wider >> >>narrower<< << IF shift << >> IF shift >>  
<< low PBT >> low PBT high PBT << high PBT >>

Or drag the push-and edges on the frequency scale. PBT @ IF Shift code by W6arr WebSDR.

### Waterfall view:

Or zoom with scroll wheel.

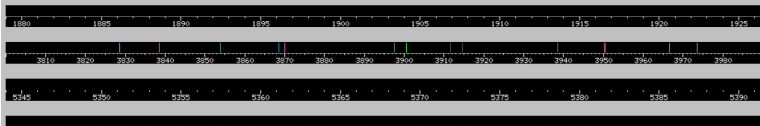
Speed: slow ▾

Size: medium ▾

View: waterfall ▾

Hide labels

The KFS WebSDR is currently being used by 40 user(s) simultaneously:  compactview



[www.websdr.org](http://www.websdr.org)



## HF Basics - Band Characteristics

The Amateur Radio HF bands have different characteristics based on day/night and summer/winter.

Not all characteristics apply all the time based on band openings, antenna type and height.

Know your band limits (Tech vs General vs Extra)

Let's look at some "general" HF band characteristics.

**The next slides are guidelines, not rules!!!!**



# HF Basics - Band Characteristics

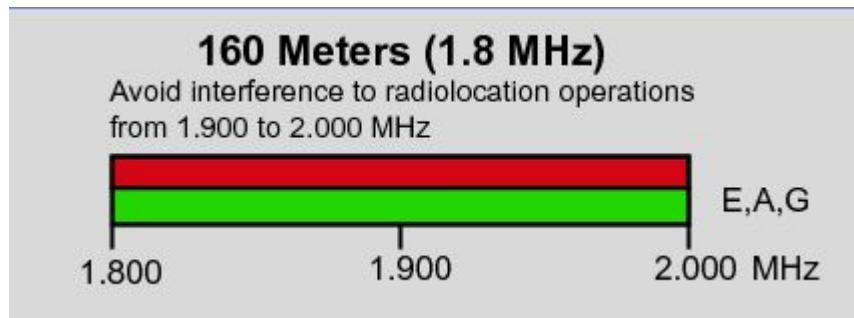
## 160m - Contest Band

Day : local (0 to 300 miles)

Night Summer : local

Night Winter : distant (+1000 miles)

Primarily an evening & night band, with the absence of lightning static crashes & good high antenna, you can talk to stations around the world.





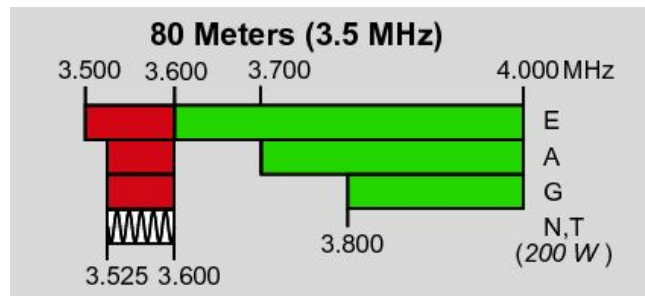
# HF Basics - Band Characteristics

## 75m/80m - Contest Band

Day : local (0 to 300 miles)

Night : local to distant depending on height of antenna

Lots of “local & regional” nets found on this band and “rag chewing” during evening & night hours. Can be noisy during summer months with static crashes. Good for in state QSO party contests or ARES nets because they are local.



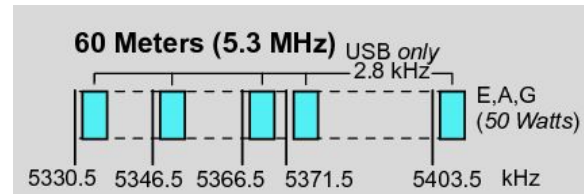


## HF Basics - Band Characteristics

**60m - 100W or less, worldwide band as of 2016,  
typically no contests on this band**

Day : local (0 to 300 miles)

Night : regional to distant (500 to 1000+ miles)



Cluster of 5 specific frequencies that amateur radio shares with the US Govt'. Amateur radio are secondary users.

No contest activity, acts like 80 and 40 meter bands.

Channel 5 (5405.0) is the defacto "DX channel".

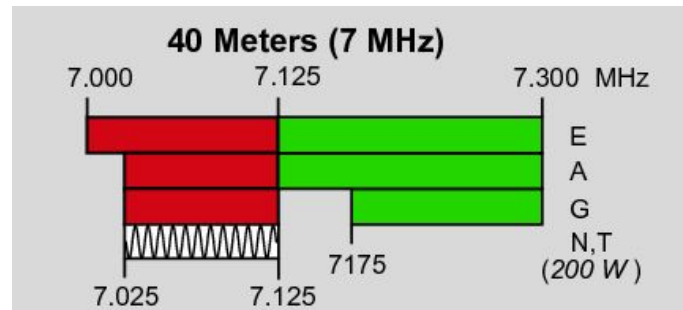


# HF Basics - Band Characteristics

## 40m - Contest Band - **Starter Band**

Day : regional (300 to 500 miles)

Night : distant (1000+ miles)



Depending on height of antenna, this band gets longer (goes further) as evening sets in. NVIS (near vertical incident skywave) as the antenna gets lower to the ground. Good for state QSO parties.

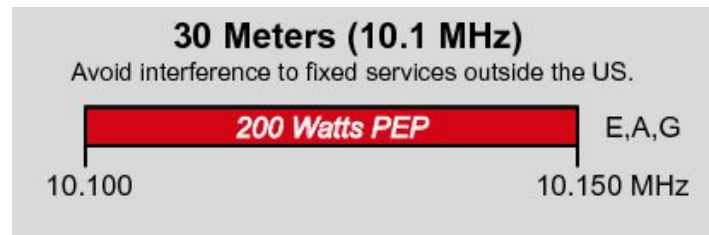


## HF Basics - Band Characteristics

**30m - 200W or less part of the WARC Bands (World Admin Radio Conf), no contests!**

Day : regional (300 to 500 miles)

Night : distant (1000+ miles)



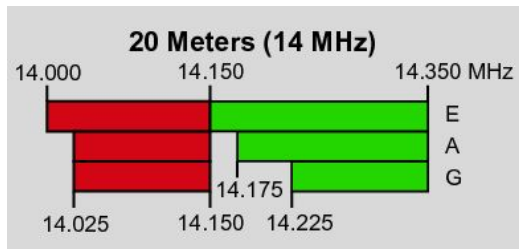
No contest band, acts like 80 and 40 meter bands. Must avoid interference to worldwide stations.





# HF Basics - Band Characteristics

## 20m - Contest Band - **Starter Band**



Day : regional to distant (500 to 1000+ miles)

Night : distant (1000+ miles)

The most popular band in amateur radio. Lots of DX contacts are made on 20m.  $\frac{1}{2}$  wave dipole above the ground is only 32 feet. Easy band to get a lot of contacts.

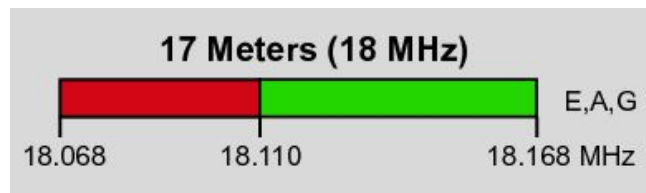


# HF Basics - Band Characteristics

## 17m - Contest Band

Day : regional (300 to 500 miles)

Night : distant (1000+ miles)



Very similar to 20m, very dependent on sunspots.



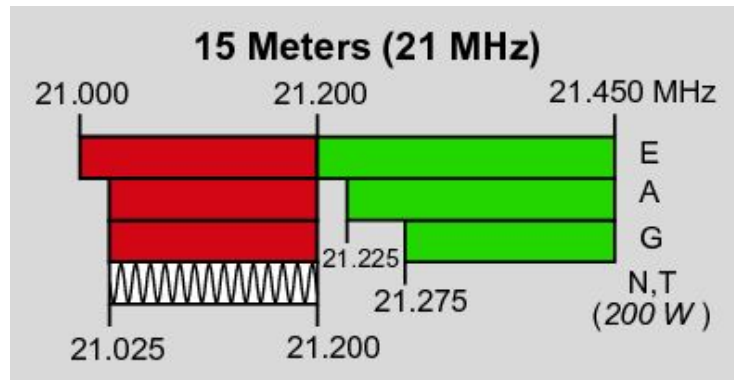
# HF Basics - Band Characteristics

## 15m - Contest Band

Day : regional (300 to 500 miles)

Night : distant (1000+ miles)

Acts like 20m but with less range.





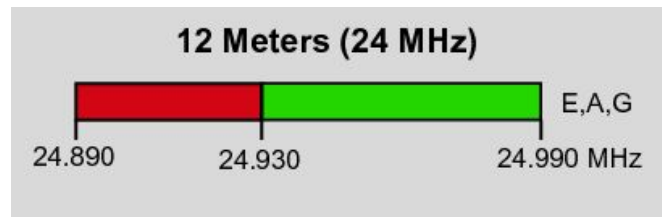
# HF Basics - Band Characteristics

## 12m - WARC Band

Day : regional (300 to 500 miles)

Night : distant (1000+ miles)

No contest band.





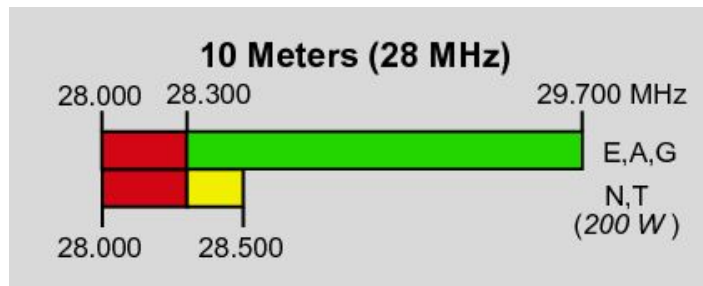
# HF Basics - Band Characteristics

## 10m - Contest Band

Day : regional (300 to 500 miles)

Night : distant (1000+ miles)

Depends on sunspot cycles, active during the summer months.





Questions!