



# **Why 6 Meters? “Any time I went on that band I heard nothing...”**

- Open to all classes of license, T,G,E
- Can use same equipment you may already have
- Antennas are small at 9 foot for dipole, or use existing HF antennas!
- Gain Antennas or yagis are easy to homebrew.
- When the band is open, can make contacts with minimal equipment and power. **You Have to Know When to be ON!**
- Can be a challenge as propagation patterns can be unpredictable
- Learn some new modes FT8 or MSK144 for Meteor Scatter
- You can get awards such as ARRL VUCC - 100 grids confirmed

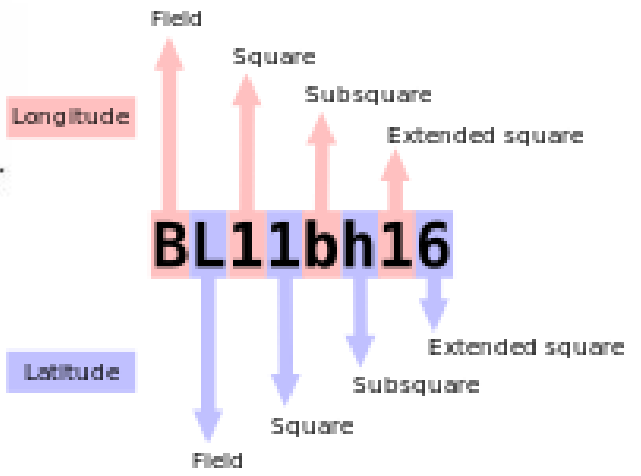
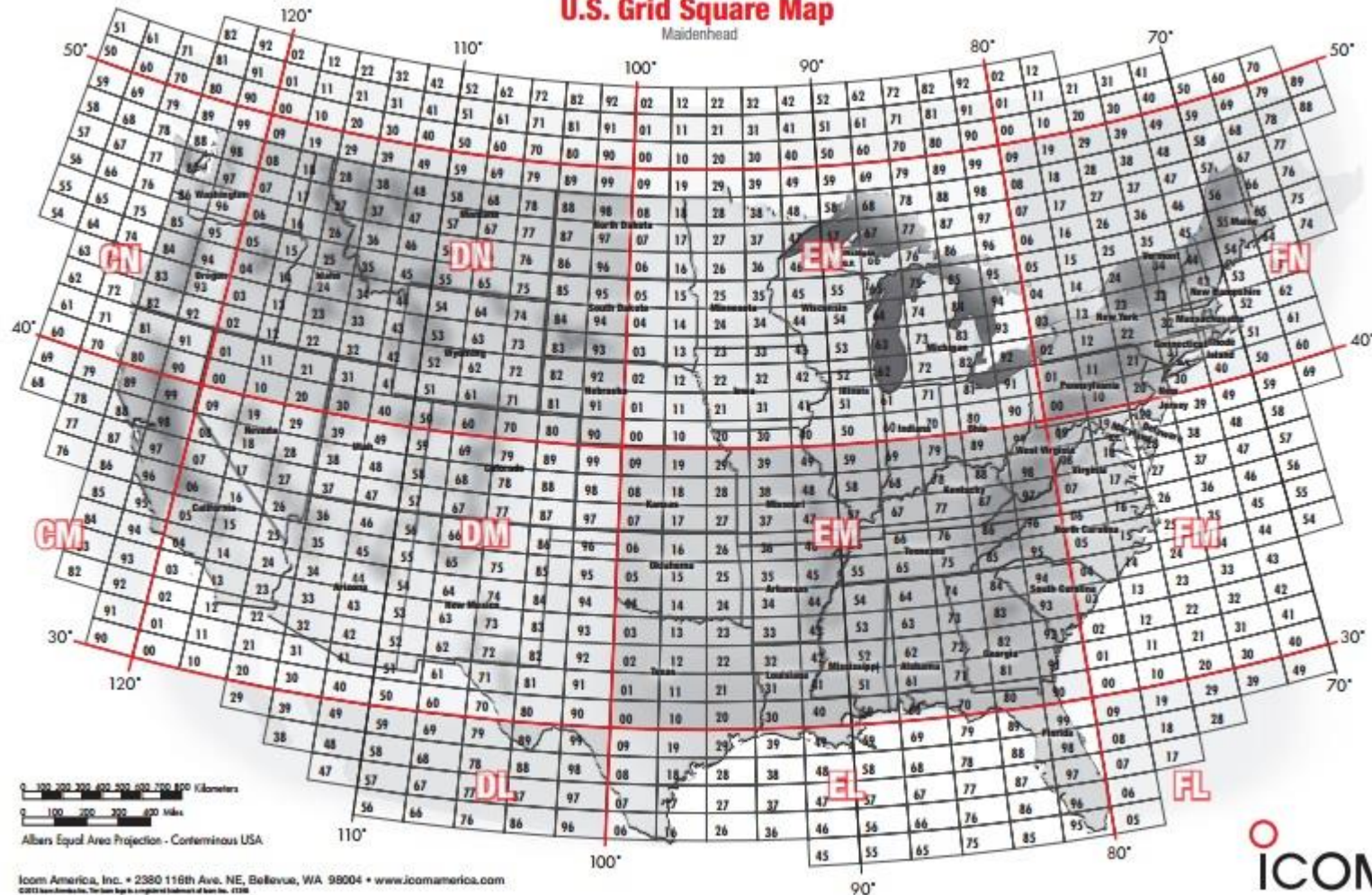
# What are those letters and numbers I hear sent instead of a signal report??

## Maidenhead Locator System

- Geographic coordinate system used by Hams
- Maidenhead Locator System adopted in the 80's
- **Fields:** divides the globe 324 “fields” [indicated by first pair]
- **Squares:** each of these squares represents 1° of latitude by 2° of longitude. 100 “squares” in each Field. [indicated by second pair]
- For Example: I am **EM78qw** – **EM** is the Field /**78** is the square /**qw** is the sub square. Another 2 characters can be added for precision.
- Usually only the first four characters of your grid square are used e.g. “my grid is EM78”

# U.S. Grid Square Map

Maidenhead



0 100 200 300 400 500 600 700 800 Kilometers

0 100 200 300 400 Miles

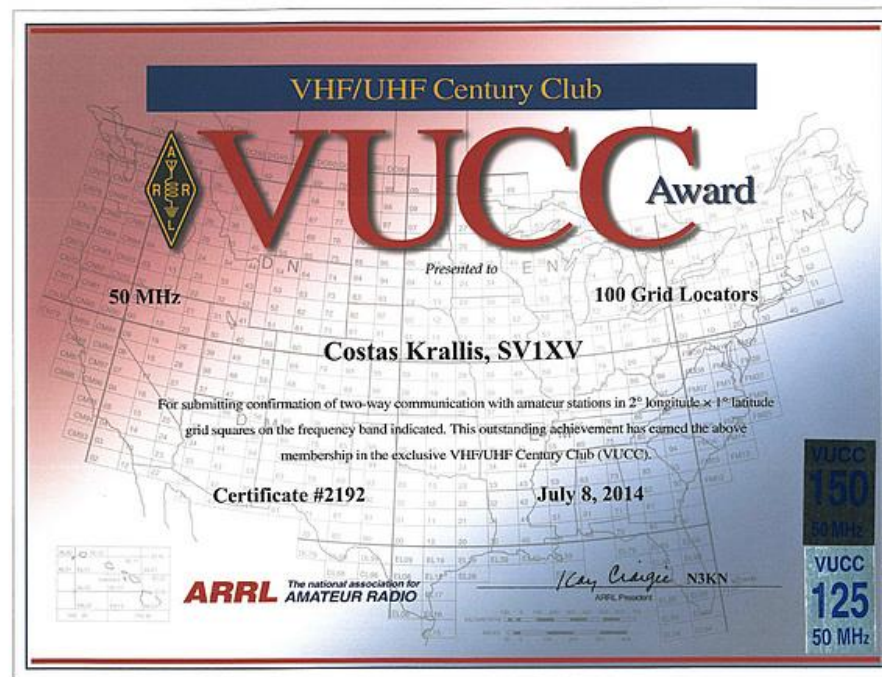
Albers Equal Area Projection - Conterminous USA

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# ARRL VUCC 50mhz

- Award for 100 grid squares confirmed.
- Good goal to work towards when learning about 6 Meters.



# What Frequencies?

# What Modes?

Beacons	50.060-50.080 mhz
CW	50.090 mhz
national calling freq	50.125mhz
ssb qsos	50.100-200 mhz
dx calling frequency	50.110 mhz
ft8	50.313 mhz
jt65	50.310 mhz
msk144	50.260 mhz

Mode	QSO Count	%
6M CW	82	23%
6M Data	169	48%
6M PH	99	28%
<b>Grand Total</b>	<b>350</b>	<b>100.00%</b>

## **SIX METER FREQUENCIES**

**50.06-50.09 Beacons**

**50.0-50.1 CW**

**50.090 CW Calling Freq**

**50.06 QRP CW Calling Freq**

**50.7 RTTY Calling Frequency**

**50.100 to 50.130 DX Window (USB)**

**50.110 DX Calling Frequency (USB) Usually Non-USA Stations Call Here.**

**50.115 DXpeditions Frequently operate CW and SSB here**

**50.125 USA National SSB Simplex Frequency (USB) Lots Of USA Hams Call Here For Local and Across Country**

**50.1-50.6 Weak Signal, AM**

**50.260 is the WSJT Meteor Scatter calling frequency in the USA**

**50.270 FSK Meteorscatter**

**50.300 FM Simplex Calling Frequency (West Coast)**

**50.385 USB PSK31**

**50.4 National AM Simplex Frequency**

**50.885 QRP SSB Calling Freq**

**51.910 FM Internet Linking**

**52.525 National FM Simplex Calling Frequency\***

**6 Meter Simplex Frequencies:**

**--51.500 51.520 51.540 51.560 51.580 51.600 52.490 52.510 52.525\* 52.540 52.550 52.570  
52.590**

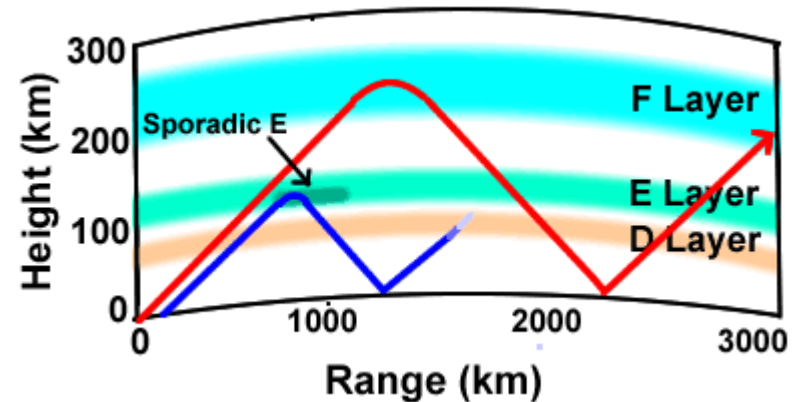
# Most Common 6m Propagation Types

- E-sporadic “Es” – Bulk of your activity will most likely be this!
- Tropo/Tropospheric Ducting
- Auroral
- Back Scatter
- Meteor Scatter
  
- Others: Auroral-Es/EME/F2/TEP –Transequatorial, etc...



# Sporadic E Propagation – a.k.a Es

- What is Sporadic E?
- Sporadic-E (also known as Es) propagation is probably familiar to many low-band operators as the summertime "short skip" on 10 meters. It is also responsible for most of the long-distance (out to 1200mi) contacts on the 6-meter band.
- Ionospheric E-layer reflection caused by small patches of unusually dense ionization. These sporadic E-layer "clouds" appear unpredictably, but they are most common over the US and southern Canada during the daylight hours of late spring and summer.
- May thru August peaking in June July
- Supports single hops or multihops
- Unknown Cause
- Long Distance Comm past 1,200mi has various theories

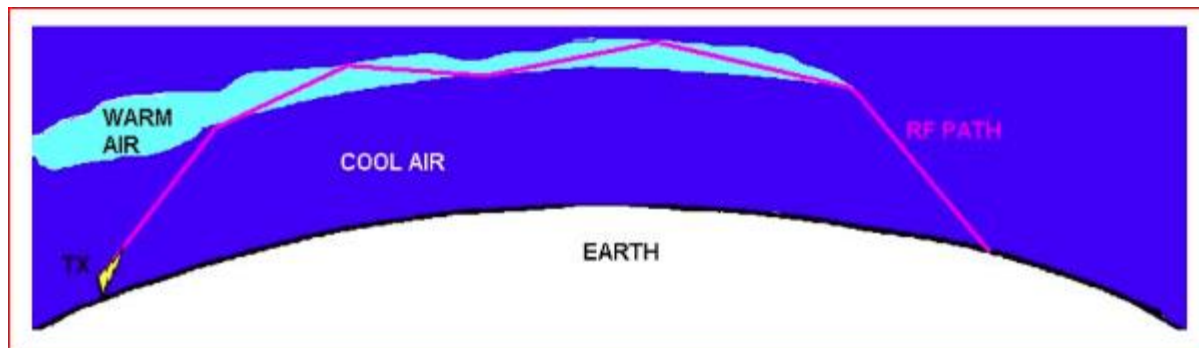


# Tropospheric Ducting aka “Tropo”

Temperature Inversions in the Troposphere (up to about 10km) cause refractions of Radio waves. Layers of opposing warm and cool air create a “ducting” effect.

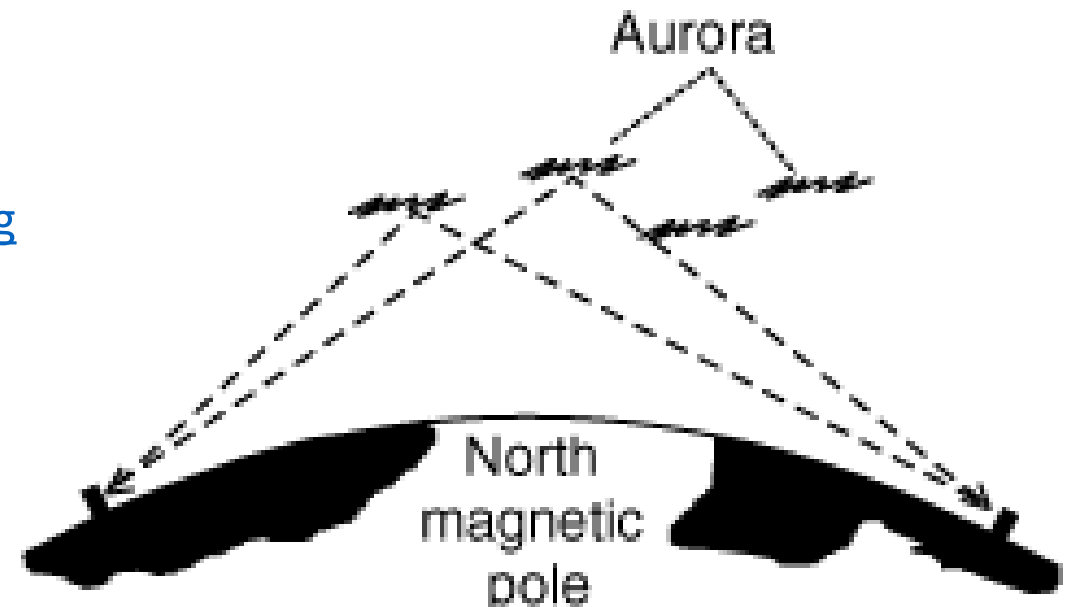
The Refractive Indices of the different temp layers causes signals to bounce thru “ducts”, typically 500mi or so, but can be longer distances. 2M FM also uses this propagation mode when open and can travel up to several hundred miles.

Can be along storm fronts, coastal areas, over bodies of water.. E.g. California to Hawaii. Certain areas of the world can have more predictable propagation paths.



# Auroral Propagation

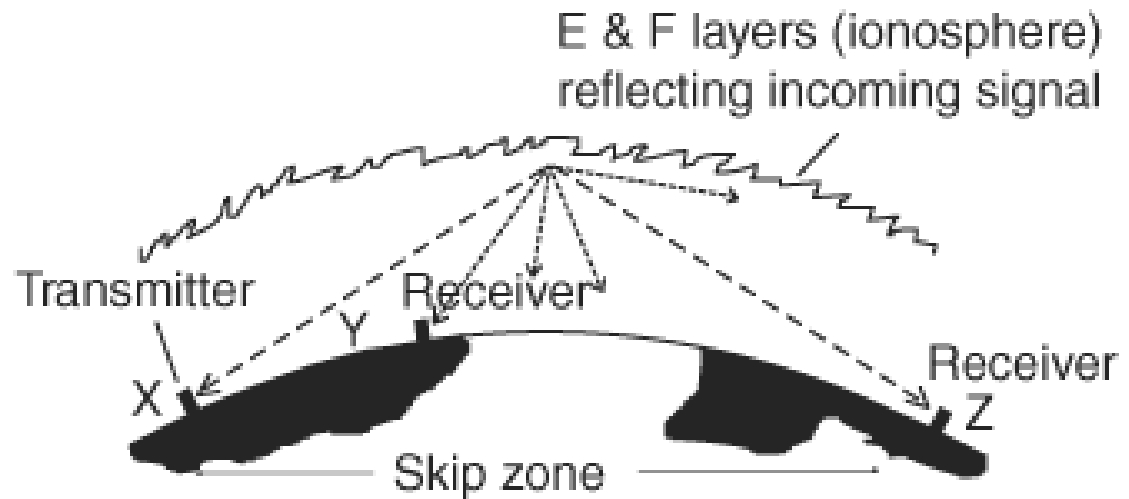
- Propagation where radio waves are reflected by Aurora Borealis. Aurora happens when solar wind affects areas over the north magnetic polar regions and causes ionization
- Mostly a Northern hemisphere prop type with distances up to 1400mi with no hops
- Signal may have fluttering and signature “Raspy” sounding modulation.
- If you have a steerable antenna, point it North.
- <https://www.youtube.com/watch?v=T80GMlhJNag>



# Back Scatter

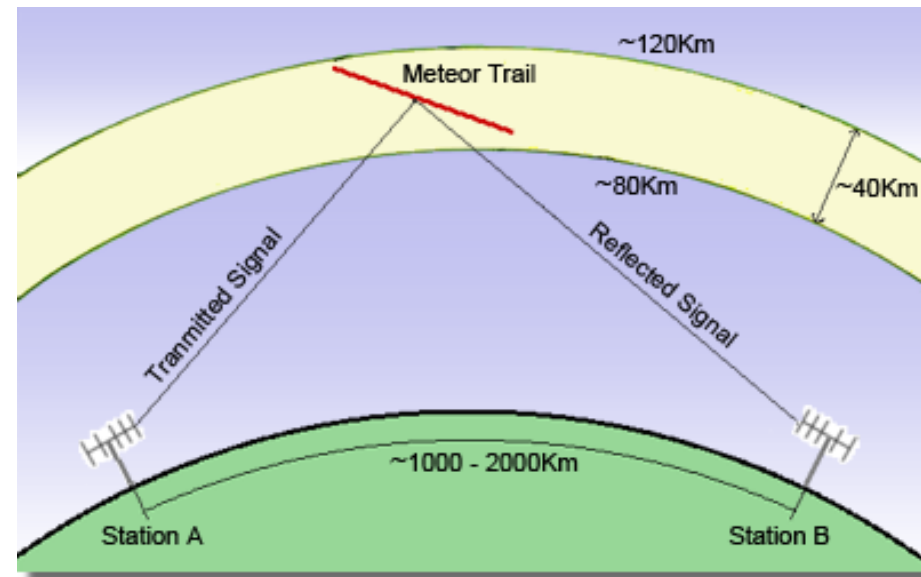
- Propagation where some radio waves are reflected back into the skip zone although signals are much weaker.
- “Cathedral like” and “Barrel-like” sounding quality to voice modulation
- Allows for communication in the skip zone.
- Directional antennas and power are helpful since the signal reflected back is much weaker.

<https://www.youtube.com/watch?v=EGs3YQGt-II>



# Meteor Scatter

- Propagation where radio waves are reflected ionization trails of meteors entering earth's atmosphere. Thousands of meteors a day enter our atmosphere.
- Trails of ionization last usually seconds or fractions of a second. Qsos tend to be in a very regimented pattern and may take many repeats to complete qso. Bounce is called a "ping" aka ping jockeys!
- Digital Modes such as MSK144 automates repeated attempts to finish QSO. **WSJTX** software has this mode. Range about 1200mi.
- Best at height of Meteor activity, example is in August with Perseids. 12AM to about dawn is optimal time. May thru Sept height of meteor season.
- <https://www.pingjockey.net/cgi-bin/pingtalk>
- Real time chat for Skeds
- Used on various bands 2M,6M,10M
- Used by Military "COMET", SNOTEL, NWS AK



# W4ALF STATS ON 6 Meters

Total Qsos 2015-2017	350	qsos
Furthest Contact PV8AZ*	2,912	miles
Countries Worked	8	
States Worked/Confirmed	38	
Unique Grids Worked	133	
Average miles for Qsos	731	
min Miles	1	
max Miles	2,915	

Mode	QSO Count	%
6M CW	82	23%
6M Data	169	48%
6M PH	99	28%
Grand Total	350	100.00%

## Countries Worked - 8 Total

United States  
Mexico  
Canada  
Cuba  
Bahamas  
Costa Rica  
US Virgin Islands  
Brazil

\*worked but unconfirmed...

Data Modes: JT65, FT8 and 1 RTTY

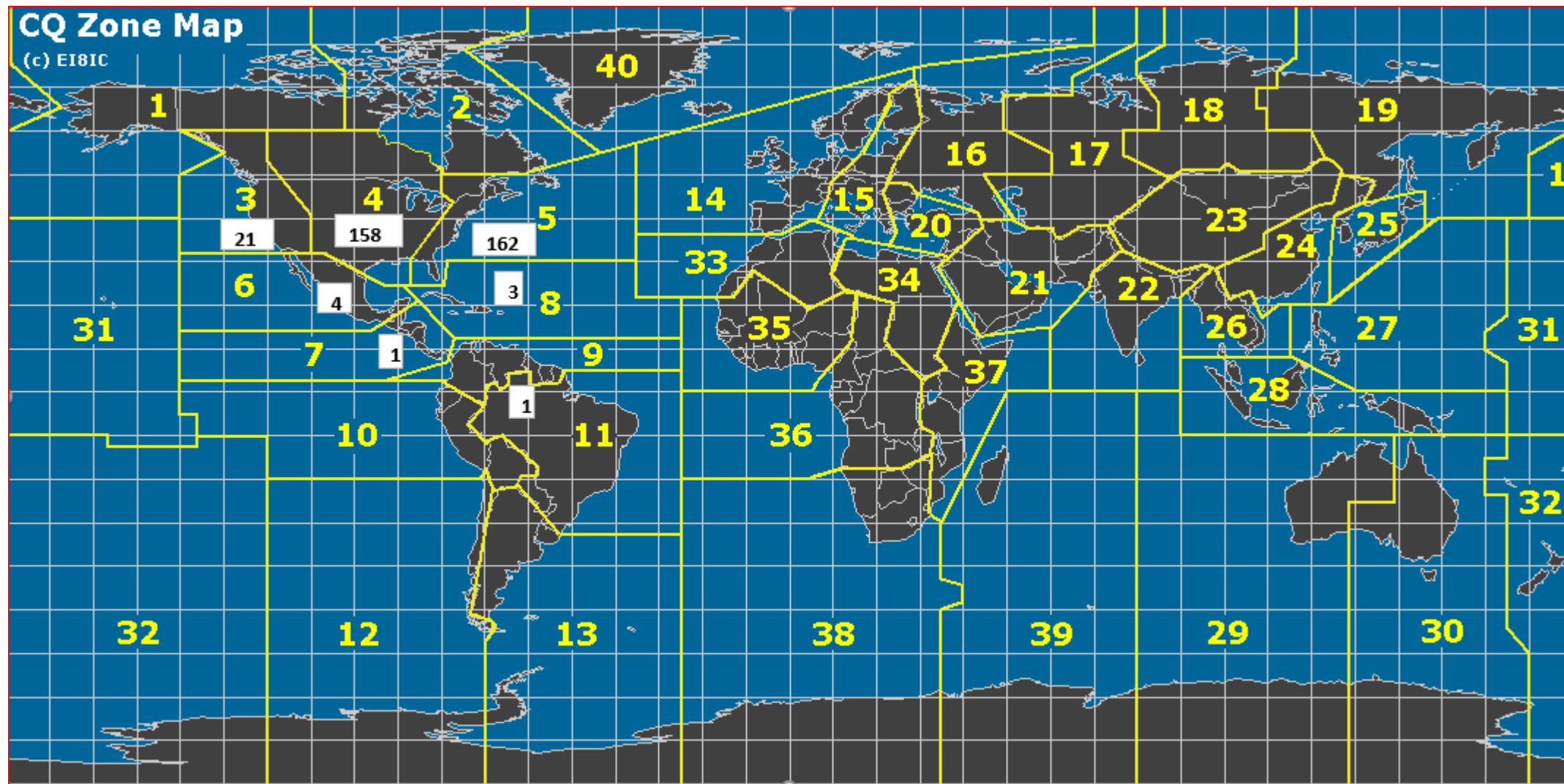
# W4ALF STATS ON 6 Meters

CQ ZONE	Count of Zone	%	
3	21	4.01%	
4	158	40.23%	<b>95%</b>
5	162	51.56%	
6	4	1.53%	
7	1	0.45%	
8	3	1.53%	
11	1	0.70%	
<b>Grand Total</b>	<b>350</b>	<b>100.00%</b>	

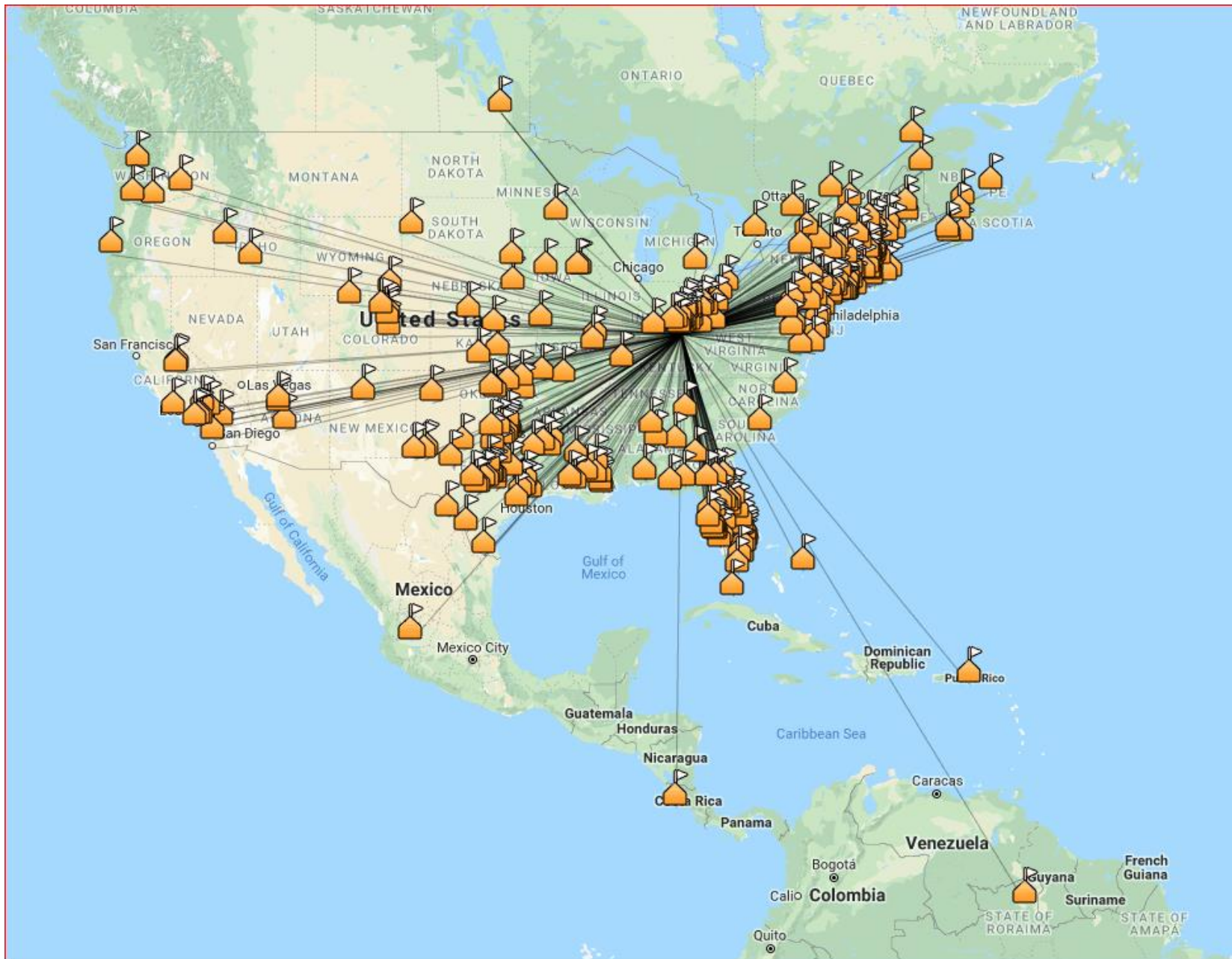
Maidengrid	Count of Gri	Pct of Total
EM	124	34.93%
FN	95	26.76%
EL	58	16.34%
DM	27	7.61%
EN	18	5.07%
FM	14	3.94%
DN	6	1.69%
CN	4	1.13%
	3	0.85%
DL	2	0.56%
FL	1	0.28%
FK	1	0.28%
ej	1	0.28%
FJ	1	0.28%
<b>Grand Total</b>	<b>355</b>	<b>100.00%</b>

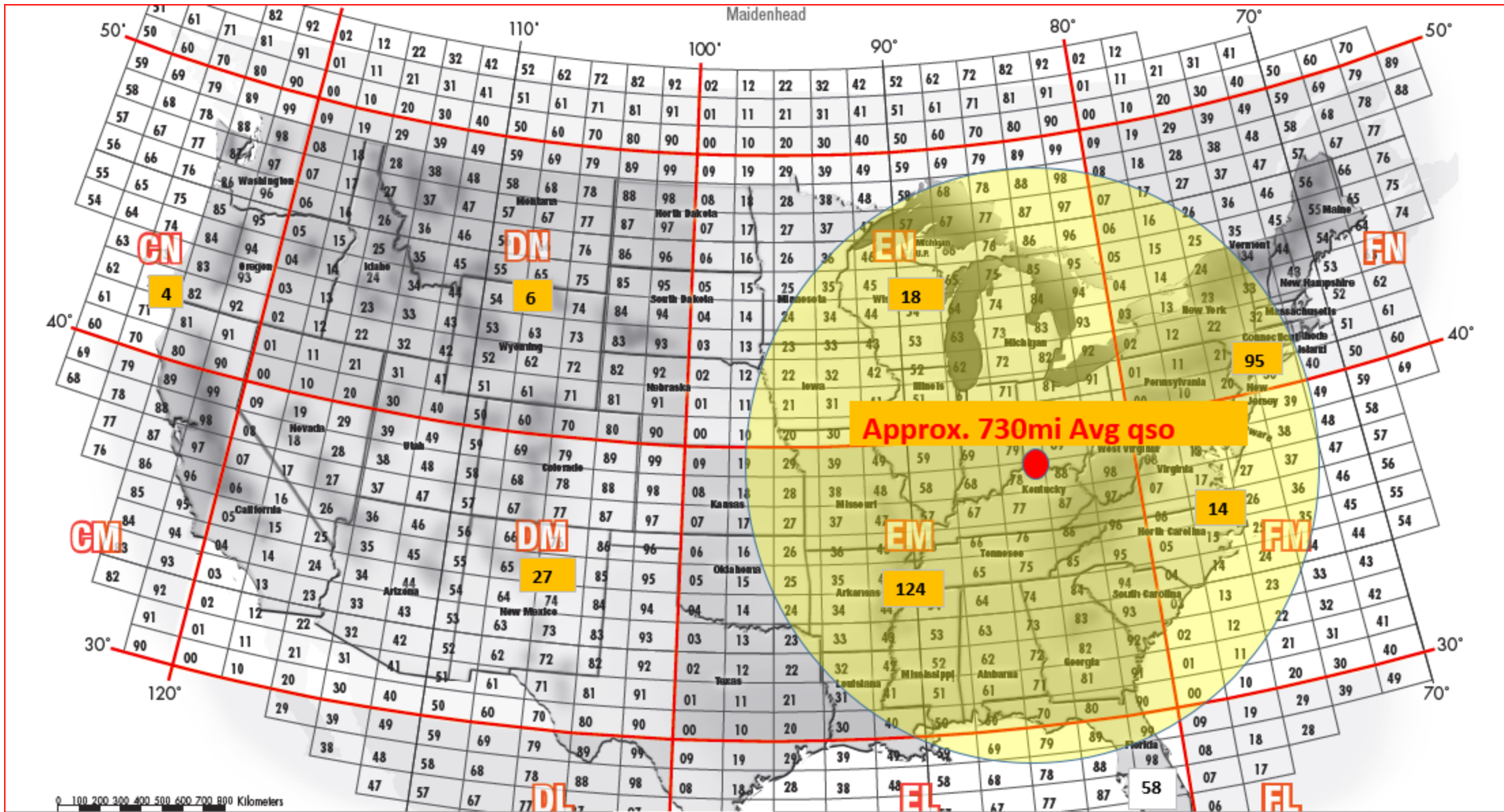
# CQ Zone Map

(c) EIBIC







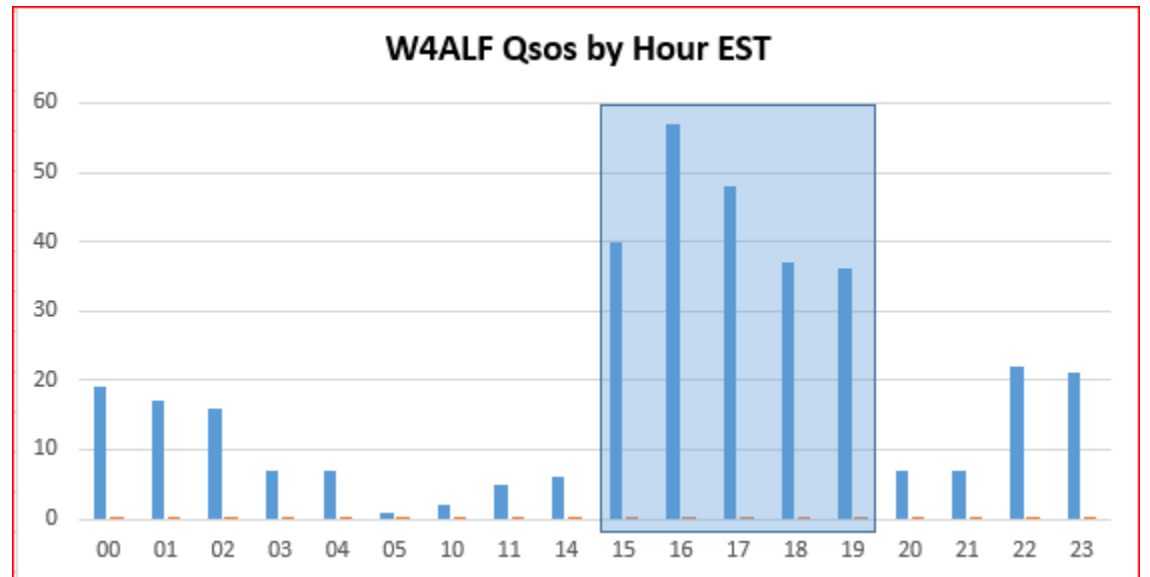


# W4ALF STATS ON 6 Meters – When?

W4ALF DATA - Year Qso's were made		
By Year	Count	Sum of Date
2015	13	3.66%
2016	84	23.86%
2017	253	72.48%
<b>Grand Total</b>	<b>350</b>	<b>100.00%</b>

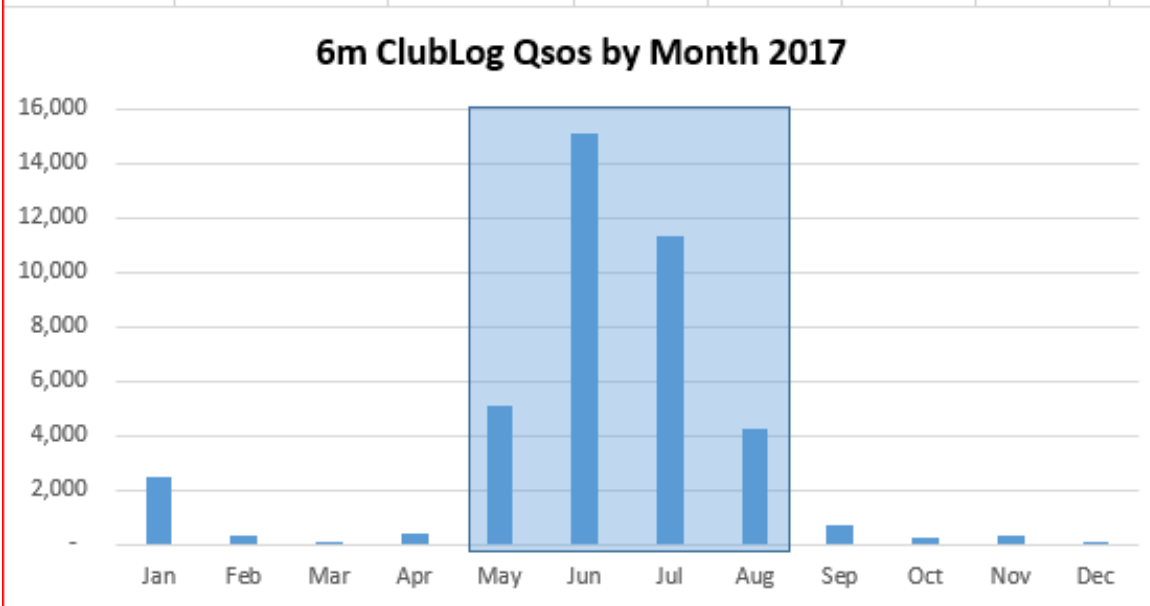
  

W4ALF DATA - Month Qsos were made		
By Month	Count of Month	Sum of Month
Jan	1	0.04%
Jun	174	45.12%
Jul	131	39.63%
Aug	44	15.21%
<b>Grand Total</b>	<b>350</b>	<b>100.00%</b>



# Clublog.org STATS ON 6 Meters - When?

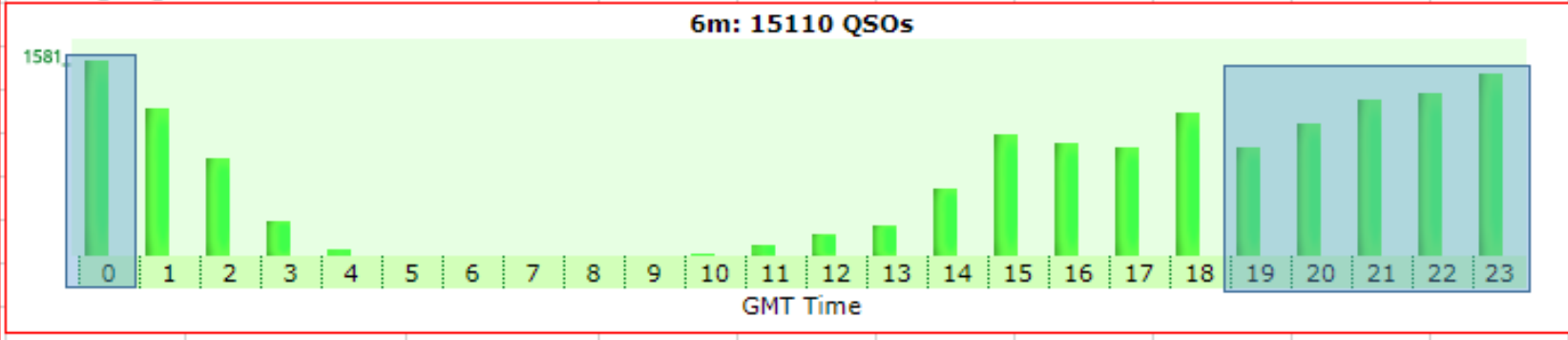
Clublog.Org Qsos uploaded for 2017 US to US Qso data



Clublog Data

Month	Qsos	Pct
Jan	2,473	6%
Feb	308	1%
Mar	1	0%
Apr	383	1%
May	5,128	13%
Jun	15,110	37%
Jul	11,328	28%
Aug	4,280	11%
Sep	716	2%
Oct	215	1%
Nov	344	1%
Dec	46	0%
<b>40,332</b>		<b>89%</b>

Clublog.org June 2017 QSO time data



# How do I know when to be on?

- [www.dxmaps.com](http://www.dxmaps.com) – has real-time maps of qso's and aggregates from cluster, RBN, WSPR, PSKreporter, etc
- Beacons on air: 50.060mhz to 50.080mhz
- Check DX Spotting networks e.g. <http://www.dxsummit.fi/#/> also Reverse Beacon Network
- Be on the air for Major VHF Contests. Sometimes propagation cooperates.  
ARRL Field Day in June  
ARRL VHF Contest in June and January
- Just get on the air and check near the calling frequencies??





# FT8 & WSJT-X Software

- FT8 is a weak signal prop digital mode with a 8-frequency shift keying format
- Uses FEC - [LDPC](#) (174,87)
- Bandwidth is 50hz
- Began to be used heavily on 6M last season 2017.
- Slightly less sensitive [-24db~ vs -26db jt65] than JT65 but much shorter tx time per interval 15sec vs 45sec.
- Locked in QSO pattern that sends SNR in db and Grid Square.
- Time sequenced in 15 sec intervals [12.45sec].
- WSJT-X software also does JT6M, FSK441, JT9, JT65, MSK144, etc.
- Use your same set up for other digital modes, just need to download the WSJT-X software
- FT8 requires accurate time synchronization on the PC that is running the software. The precision required is best achieved using a specialized time sync application. These can be found online.
- An auto-sequencing feature offers the option to respond automatically to the first decoded reply to your CQ.
- **USE IT ON ALL THE BANDS VHF/HF and LOW BANDS!!**

# FT8 & WSJT-X Software

The screenshot displays the WSJT-X software interface. At the top is a waterfall plot showing frequency activity from 800 to 2000 kHz. Below the plot is a control panel with various settings and data tables.

**Band Activity Table:**

UTC	dB	DT	Freq	Message
071530	-8	0.6	1210	~ N1RWY KF0DH -09
071530	-7	0.5	745	~ 3D2AG WL7CG BP61
071530	-1	-0.1	1009	~ KL7J KX4KU FM08
071530	-14	0.5	1573	~ N1SC VK3XZ QF22
071530	1	-0.3	1693	~ 9Y4DG NM9P 73
071530	-11	0.5	1886	~ KD8JV KM4SVF R-10

**Rx Frequency Table:**

UTC	dB	DT	Freq	Message
071415	-14	-0.1	745	~ CQ 3D2AG RH91
071430	-5	0.6	1210	~ CQ KF0DH EM63 ~U.S.A.
071446	Tx		1210	~ KF0DH N1RWY DM43
071515	Tx		1210	~ KF0DH N1RWY DM43
071530	-8	0.6	1210	~ N1RWY KF0DH -09
071545	Tx		1210	~ KF0DH N1RWY R-08

**Control Panel:**

- Frequency: 7.074 000
- Mode: FT8
- Power: 44 dB
- Buttons: Log QSO, Stop, Monitor, Erase, Decode, Enable Tx, Halt Tx, Tune, Menus
- TX/RX settings: Tx 1210 Hz, Rx 1210 Hz, Lock Tx=Rx, Report -8, Auto Seq, Call 1st
- Message list: KF0DH N1RWY DM43, KF0DH N1RWY -08, KF0DH N1RWY R-08, KF0DH N1RWY RRR, KF0DH N1RWY 73, CQ N1RWY DM43
- Status: Receiving, Last Tx: KF0DH N1RWY R-08, 14/15 WD:6m



# The End – Go operate 6M!

- Open mainly with Es season May thru August with minor opening Dec/Jan
- Use same equipment you already have
- Try out FT8, this will serve you well on other bands, I love it for 80M DX!
- Learn new propagation modes
- Chase new awards VUCC, WAS 6M, Fred Fish Memorial, etc.
- Gives you new focus of activity during lows of solar cycle
- Learn new tools to monitor propagation [www.dxmaps.com](http://www.dxmaps.com)
- Try 6m during Field day or ARRL VHF Contests

*Try, Try, Try to understand – It's the MAGIC BAND!*

