



***Want to take advantage of your Technician class privileges on 10 meters?***

***Been a Ham for a while but don't quite know the ropes of HF operations?***

***Take the anxiety out of calling CQ !***

***Better yet, take the anxiety out of someone ANSWERING your CQ !***

***Learn to talk on HF like a Boss!***



**Presented by The  
Delaware Valley  
Radio Association  
W2ZQ**

## The Radio Amateur's Code

### The Radio Amateur is

CONSIDERATE...The radio amateur never knowingly operates in such a way as to lessen the pleasure of others.

LOYAL...The radio amateur offers loyalty, encouragement and support to other amateurs, local clubs, the IARU Radio Society in their country, through which Amateur Radio in their country is represented nationally and internationally.

PROGRESSIVE...The radio amateur keeps their station up to date. It is well-built and efficient. Their operating practice is above reproach.

FRIENDLY...The radio amateur operates slowly and patiently when requested; offers friendly advice and counsel to beginners; kind assistance, cooperation and consideration for the interests of others. These are the marks of the amateur spirit.

BALANCED...Radio is a hobby, never interfering with duties owed to family, job, school or community.

PATRIOTIC...The radio amateur's station and skills are always ready for service to country and community.

- adapted from the original Amateur's Code, written by Paul M. Segal, W9EEA, in 1928



## ***Important Stuff!***

Some subjects which are a **no no** in amateur radio conversations on the air are:

- X** religion;
- X** politics;
- X** business (you can talk about your profession, but you cannot advertise for your business);
- X** derogatory remarks directed at any group (ethnic, religious, racial, sexual etc.).
- X** bathroom humor: if you wouldn't tell the joke to your ten year old child, don't tell it on the radio;
- X** any subject that has no relation whatsoever with the ham radio hobby.

Before calling CQ, listen to find a frequency that unoccupied by any other station. This may not be easy, particularly in crowded band conditions. If the frequency seems clear, ask if the frequency is in use, followed by your call. "Is the frequency in use?"



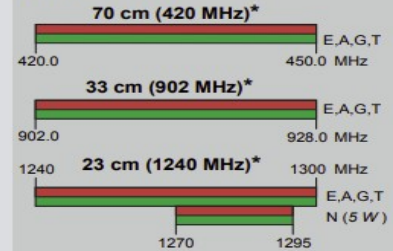
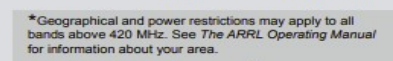
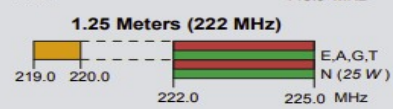
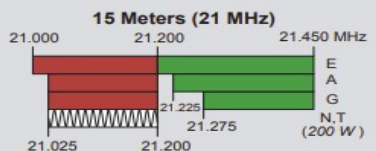
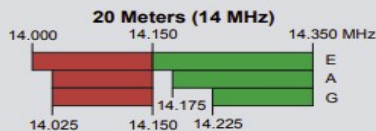
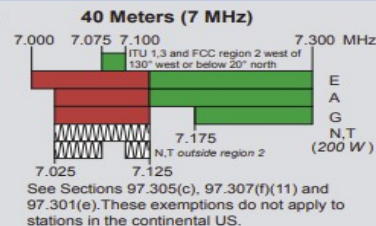
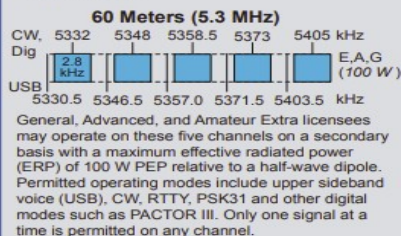
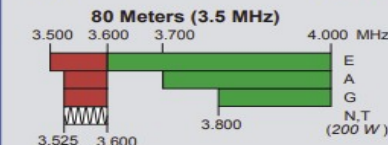
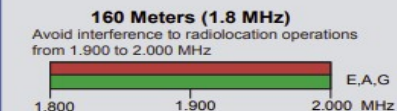
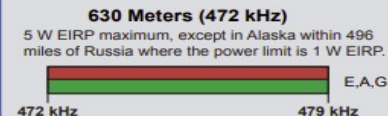
# Know Your License Privileges!

## Where & How You Can Operate

### US Amateur Radio Bands

**US AMATEUR POWER LIMITS** — FCC 97.313 An amateur station must use the minimum transmitter power necessary to carry out the desired communications. (b) No station may transmit with a transmitter power exceeding 1.5 kW PEP.

Amateurs wishing to operate on either 2,200 or 630 meters must first register with the Utilities Technology Council online at <https://utc.org/plc-database-amateur-notification-process/>. You need only register once for each band.



All licensees except Novices are authorized all modes on the following frequencies:

2300-2310 MHz	10.0-10.5 GHz ‡	122.25-123.0 GHz
2390-2450 MHz	24.0-24.25 GHz	134-141 GHz
3300-3500 MHz	47.0-47.2 GHz	241-250 GHz
5650-5925 MHz	76.0-81.0 GHz	All above 275 GHz

‡ No pulse emissions



**KEY**

- RTTY and data
- phone and image
- CW only
- SSB phone
- USB phone, CW, RTTY, and data
- Fixed digital message forwarding systems only

E = Amateur Extra  
A = Advanced  
G = General  
T = Technician  
N = Novice

MCW is authorized above 50.1 MHz, except for 144.0-144.1 and 219-220 MHz. Test transmissions are authorized above 51 MHz, except for 219-220 MHz

See **ARRLWeb** at [www.arrl.org](http://www.arrl.org) for detailed band plans.

### ARRL We're At Your Service

ARRL Headquarters:  
860-594-0200 (Fax 860-594-0259)  
email: [hq@arrl.org](mailto:hq@arrl.org)

Publication Orders:  
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Getting Started in Amateur Radio:  
Toll-Free 1-800-326-3942 (860-594-0355)  
email: [newham@arrl.org](mailto:newham@arrl.org)

Exams: 860-594-0300 email: [vec@arrl.org](mailto:vec@arrl.org)

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*Tiny 10 Meter SSB Priviledges!*



## ***Frequencies to be Aware of...***

### **80/75 METERS LSB**

3.790-3.800	SSB DX Window
3.710	QRP Novice/Tech CW Calling Freq
3.845	SSTV
3.885	AM Calling Frequency
3.799	DXpeditions SSB are frequently here
3.985	QRP SSB Calling frequency

### **40 METERS LSB**

7.290	AM
7.065	DXpedition SSB USA split to 7.150 and above
7.171	SSTV
7.268	Hurricane Net (When activated)
7.285	QRP SSB Calling frequency
7.290	AM Calling frequency

### **20 METERS USB**

14.195	Rare DX & DXpeditions Frequently Operate SSB Here — Generally Listening Up-Split
14.230	SSTV
14.285	QRP SSB Calling frequency
14.286	AM Calling Frequency
14.300	Maritime Mobile Net
14.325	Hurricane Net (When activated)
14.336	County Hunters when ever 20 is open and mobiles are around

### **15 METERS USB**

21.110	QRP Novice/Tech Calling Freq
21.150	NCDXF/IARU beacons (STAY OFF OF THIS FREQUENCY) Many Hams rely on these beacons for propagation determination.
21.295	Rare DX & DXpeditions Frequently Operate SSB Here - Generally Listening Up-Split
21.340	21430 SSTV
21.385	QRP SSB calling frequency

### **10 METERS USB**

28.380	10/10 SSB Intl Calling Frequency
28.385	QRP SSB Calling frequency
28.425	10/10 SSB Intl Calling Frequency - Another is 28.400
28.495	SSB Rare DX & DXpeditions Frequently Operate Here — Split
28.600	Old General Calling Frequency – Still used by Old Timers
28.675~.685	SSTV Operating Frequency — IARU Region 1

These are established by gentleman's agreement, history, established practice and perhaps sanctioned by an authority....or perhaps not.

Just be aware of these frequencies and for the least amount of aggravation or potential grief from Hams on the air, it's best to abide them.

*Just saying*



# First - Know the Basic Lingo !

## Q-Signals

Abbr.	Questions
<b>QRG</b>	Your exact frequency (or that of _____) is _____ kHz. Will you tell me my exact frequency (or that of _____)?
<b>QRL</b>	I am busy (or I am busy with _____). Are you busy? Usually used to see if a frequency is busy.
<b>QRM</b>	Your transmission is being interfered with _____ (1. Nil; 2. Slightly; 3. Moderately; 4. Severely; 5. Extremely.) Is my transmission being interfered with?
<b>QRN</b>	I am troubled by static _____. (1 to 5 as under QRM.) Are you troubled by static?
<b>QRO</b>	Increase power. Shall I increase power?
<b>QRP</b>	Decrease power. Shall I decrease power?
<b>QRQ</b>	Send faster (_____ wpm). Shall I send faster?
<b>QRS</b>	Send more slowly (_____ wpm). Shall I send more slowly?
<b>QRT</b>	Stop sending. Shall I stop sending?
<b>QRU</b>	I have nothing for you. Have you anything for me?
<b>QRV</b>	I am ready. Are you ready?
<b>QRX</b>	I will call you again at _____ hours (on _____ kHz). When will you call me again? Minutes are usually implied rather than hours.
<b>QRZ</b>	You are being called by _____ (on _____ kHz). Who is calling me?
<b>QSB</b>	Your signals are fading. Are my signals fading?
<b>QSK</b>	I can hear you between signals; break in on my transmission. Can you hear me between your signals and if so can I break in on your transmission?
<b>QSL</b>	I am acknowledging receipt. Can you acknowledge receipt (of a message or transmission)?
<b>QSO</b>	I can communicate with _____ direct (or relay through _____). Can you communicate with _____ direct or by relay?
<b>QSP</b>	I will relay to _____. Will you relay to _____?
<b>QST</b>	General call preceding a message addressed to all amateurs and ARRL members. This is in effect "CQ ARRL."
<b>QSX</b>	I am listening to _____ on _____ kHz. Will you listen to _____ on _____ kHz?
<b>QSY</b>	Change to transmission on another frequency (or on _____ kHz). Shall I change to transmission on another frequency (or on _____ kHz)?
<b>QTC</b>	I have _____ messages for you (or for _____). How many messages have you to send?
<b>QTH</b>	My location is _____. What is your location?
<b>QTR</b>	The time is _____. What is the correct time?

## ITU Phonetic Alphabet

Letter	Word	Pronunciation
A	Alfa	<b>AL</b> FAH
B	Bravo	<b>BR</b> AH VOH
C	Charlie	<b>CHAR</b> LEE
D	Delta	<b>DELL</b> TAH
E	Echo	<b>ECK</b> OH
F	Foxtrot	<b>FOKS</b> TROT
G	Golf	<b>GOLF</b>
H	Hotel	<b>HOH</b> TELL
I	India	<b>IN</b> DEE AH
J	Juliet	<b>JEW</b> LEE ETT
K	Kilo	<b>KEY</b> LOH
L	Lima	<b>LEE</b> MAH
M	Mike	<b>MIKE</b>
N	November	<b>NO VEM</b> BER
O	Oscar	<b>OSS</b> CAH
P	Papa	<b>PAH PAH</b>
Q	Quebec	<b>KEH BECK</b>
R	Romeo	<b>ROW</b> ME OH
S	Sierra	<b>SEE AIR</b> RAH
T	Tango	<b>TANG</b> GO
U	Uniform	<b>YOU</b> NEE FORM
V	Victor	<b>VIK</b> TAH
W	Whiskey	<b>WISS</b> KEY
X	X-Ray	<b>ECKS</b> RAY
Y	Yankee	<b>YANG</b> KEY
Z	Zulu	<b>ZOO</b> LOO

**Note:** The **boldfaced** syllables are emphasized. The pronunciations shown in this table were designed for those who speak any of the international languages. The pronunciations given for "Oscar" and "Victor" may seem awkward to English-speaking people in the US.

*W2ZQ would be:*

**W**iskey  
**T**wo  
**Z**ulu  
**Q**uebec

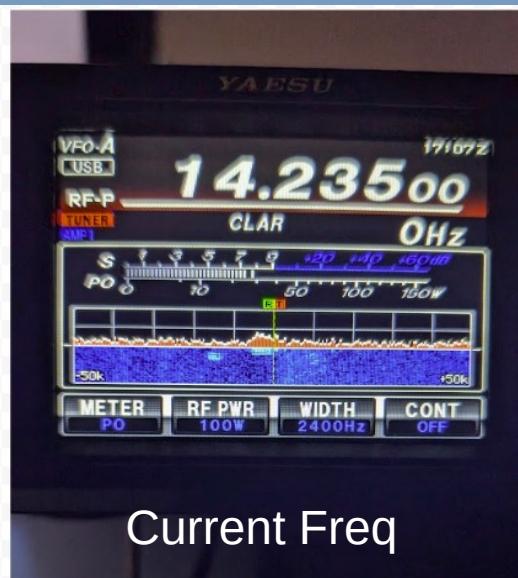


# ***Know What You're Being Asked to Do !***

If you hear, “please QSY up or down 10”



Down 10 khz



Current Freq



Up 10 khz



## *It isn't Stage Fright...It's Mic Fright!*



- ✓ Keep the mic about 4" from your mouth
- ✓ Think of what you're going to say and stick with Ham Radio lingo!
- ✓ Speak with confidence but don't yell, and start speaking when you key the mic. Don't delay!
- ✓ Keep each transmission short. Say what you need to complete the QSO. A good rule is to keep each transmission under 30 seconds.



## *A Typical HF QSO Goes Something Like This...*



"CQ CQ CQ here is **KT4HT** calling CQ CQ CQ 15 meters and standing by"

"**KT4HT** here is **W2ZQ**, Whisky Two Zulu Quebec over"

"**W2ZQ** here is **KT4HT**. You're **59** plus 10 in Fort Pierce Florida, name is Mike, QSL?"

"OK Mike name here is Dave you're also **59** in West Trenton, New Jersey and this is the Delaware Valley Radio Association Club station, QSL?"



*A Typical HF QSO Goes Something  
Like This...*



*"QSL Dave. Rig here is an Icom 7300 into a  
dipole up around 25 feet. 100 watts. Over"*

*"QSL on the station Mike. Doing great with  
100 watts. Rig here is a Yaesu FT101DX,  
Tokyo Hi-Power amp into a Force Magnum  
beam up around 100 feet aimed south. Back  
to you. KT4HT, W2ZQ"*



*A Typical HF QSO Goes Something  
Like This...*



*"Nice station there. I've got you in the logbook  
and will say 73 for now. Hope to work you  
again soon, QSL"*

*"OK Mike, it's been a pleasure and I'm sure  
we'll catch up again down the log. 73. KT4HT  
from W2ZQ clear"*

*"73, KT4HT clear with W2ZQ and calling CQ"*



## *We had a QSO. What Did We Say?*



All of the essential point that qualify a good *QSO* were checked off -

- ✓ *Each station identified the other.*
- ✓ *Signal reports were exchanged. Important!*
- ✓ *The QTH of each station was stated.*
- ✓ *The QSO ended with each station saying 73*



### **\* A QSL card?**

While some considered them 'Old School', they are still exchanged directly between Ham or via the ARRL DX QSL Bureau System. It's the ultimate confirmation of a QSO !



## *Let's Get W2ZQ Technical...*

- You can use station A or B for HF, but lets start with the main components of station A -
- *Yaesu FT101DX All mode Transceiver*
- *Tokyo Hi-Power Amp*
- *LDG Tuner*
- *Ham Radio Deluxe for logging*
- *Blue Heron Beam Heading Rotor Controller*



# Let's Get W2ZQ Technical...Station **A**

5



*Rotor Controller*



*Ham Radio Deluxe*

Dom  
N3DD is the  
W2ZQ Station  
Manager

North  
Tower



1



4



*Yaesu FT101DX All mode Transceiver*



*Tokyo Hi-Power Amp*



*LDG Antenna Tuner*

2



*Astron Power Supply*

<https://www.w2zq.com/wp-content/uploads/2020/10/W2ZQ-Station-Manual-Sept-2020.pdf>

PC

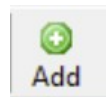


3



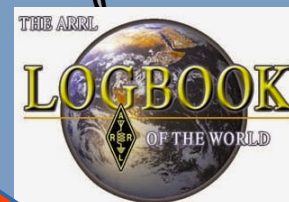
## Let's Get Logging...

✓ Log your QSOs with Ham Radio Deluxe



Screenshot of the Ham Radio Deluxe "Add My Logbook" window. The window contains the following fields and values:

Field	Value
Date:	2/25/2013
(F2) Start:	15:17:59
(F3) End:	15:18:34
(F5) Call:	N8XEN
QRZ	QRZ
RST Sent:	59
RST Rcvd:	59
Locator:	EN91gc
290°/110°, 204mi	
Name:	ERICK L LIDHOLM
Country:	United States
Comment:	K3DFD
Freq:	14.070.000
Band:	20m
Mode:	USB
IOTA:	
State:	OH
QTH:	AKRON
Contact	<input checked="" type="radio"/>
SWL report	<input type="radio"/>



## About the Ham Bands ...



- **80 Meters: LSB** A reliable band less subject to variations of the solar cycle and is used a lot for regular net operations, message handling and "local rag chewing". Can be very noise prone in the summer static.
- **40 Meters: LSB** Summer daytime distances of 300-400 miles and night time distances of 1000 miles are common. Winter days with 500 miles or more are usual and night time conditions bring DX intercontinental communications. This band is shared with short-wave broadcast from countries outside of North America. Not as affected by the solar conditions as 20-10 meters.
- ★ **20 Meters: USB** Worldwide daytime communications are generally possible. During solar peak 20 can be open 24hrs. Less useful for short-range communications. Ground wave signals of about 75 – 100 miles average.
- **15 Meters: USB** Similar to 20 meters but more influenced by the solar conditions. Much less night time activity than 20 meters but at the peak of the cycle, 15 can provide much greater distances.
- **10 Meters: USB** Most heavily affected by solar conditions. Minimum power and simple antennas you can work a lot of DX in a short period of time when the sunspot cycle is rising towards the peak. At the bottom of the cycle however, 15 and 10 may not open for days.
- **WARC similar to adjacent non-WARC bands.**

★ It's a historical oddity. Early amateur SSB rigs used a 9 MHz IF system, and it was easier and cheaper to generate LSB below 9 MHz and USB above 9 MHz. With most designs these days, USB and LSB are equally easy to use, but we keep to the old convention.

73 Martin AA6E



## ***HF...The Sun Runs the Show!***

05 Jun 2024 1447 GMT

SFI 192 SN 178  
304A 164.3 @ SEM  
A-Ind 8  
K-Ind 2  
X-Ray C2.2  
Ptn Flx 689  
Elc Flx 1940  
Aur Act 2/n= 1.99  
Aur Lat 66.5°  
Solar Wind 410.7  
Mag (Bz) -4.4  
S Noise S1-S2  
Geomag QUIET  
<http://www.norhh.com>  
(C) Paul L Herrman 2023

05 Jun 2024 1438 GMT

Earth View From Moon

SFI	192	SM	178
X-Ray	C2.2		
A	8	K	2
304A	164.3	0	SEM
Ptn Flx	689		
Elc Flx	1940		
Aur Act	2		
Aur Lat	66.5°		
SW	410.7	Bz	-4.4
S Noise	S1-S2		
Geomag	QUIET		
EME			
Deg	Good		

<http://www.norih.com>  
(C) Paul I. Herrnan 2023



## Key for These Charts

The three main items you want to pay attention to are the **SFI** (Solar Flux Index), the **K-Index** and the **A-Index**.

## SFI - Summarization of the Sun's Radiation Output

- 70 – Not Good
- 80 – Good
- 90 – Better
- 100+ – Best

### A-Index - Daily Average of Magnetic Activity

- A = 0 – 7 Quiet
- A = 8 – 15 Unsettled
- A = 16 – 29 Active
- A = 30 – 49 Minor storm
- A = 50 – 99 Major storm
- A = 100 – 400 Severe storm

### K-Index Updated every 3 Hours

- K = 0 Inactive
- K = 1 Very quiet
- K = 2 Quiet
- K = 3 Unsettled
- K = 4 Active
- K = 5 Minor storm
- K = 6 Major storm
- K = 7 Severe storm
- K = 8 Very severe storm
- K = 9 Extremely severe storm

**\*\*If you are planning on using the HF bands, the chart below will assist you in knowing the condition of those bands based on the conditions at the time from 10M to 80M.**

**Solar-Terrestrial Data - <http://www.solar-terrestrial.com>**

VHF Conditions		HF Conditions		
Item	Status	Band	Day	Night
Aurora	Band Closed	80m-49m	Poor	Good
4m ESEU	50MHz ES	30m-20m	Poor	Good
6m ESEU	Band Closed	17m-15m	Good	Good
2m ESEU	High MUF	12m-10m	Good	Poor
2n ESNR	Band Closed	Geomag Field QUIET		
EME Deg	Good	Sig Noise Lvl S1-S2		
		MUF US Boulder NoPrb		
		Solar Flare Prb 5%		

05 Jun 2024 1447 GMT  
 SFI 192 SN 178  
 A 8 K 2 / Pntry  
 X-Ray C2.2  
 304Å 164.3 @ SEM  
 Ptn F1x 689  
 E1c F1x 1940  
 Aurora 2/n=1.99  
 Aur Lat 66.5°  
 Bz -4.4 SIM 410.7  
 0min 6 12 18 UTC

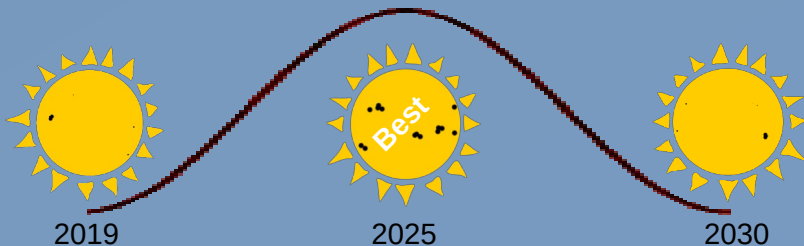
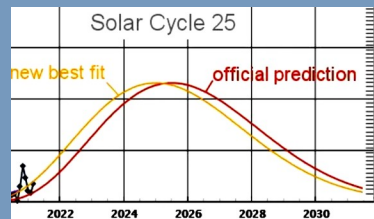
**Easiest way**  
to evaluate  
conditions  
and select  
a band

\* Or try  
<https://solar.w5mmw.net>



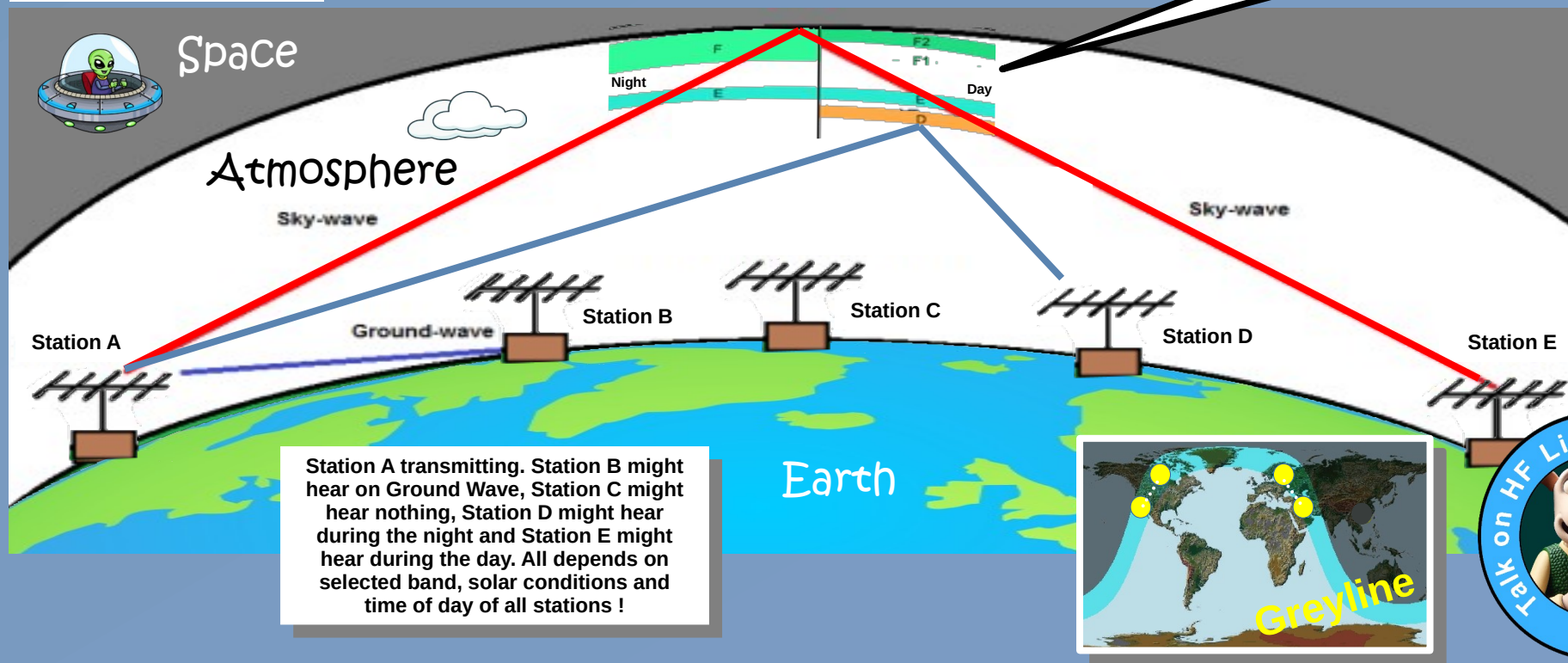
# Understand the Basics of \*Propagation

(\*It's complicated!)

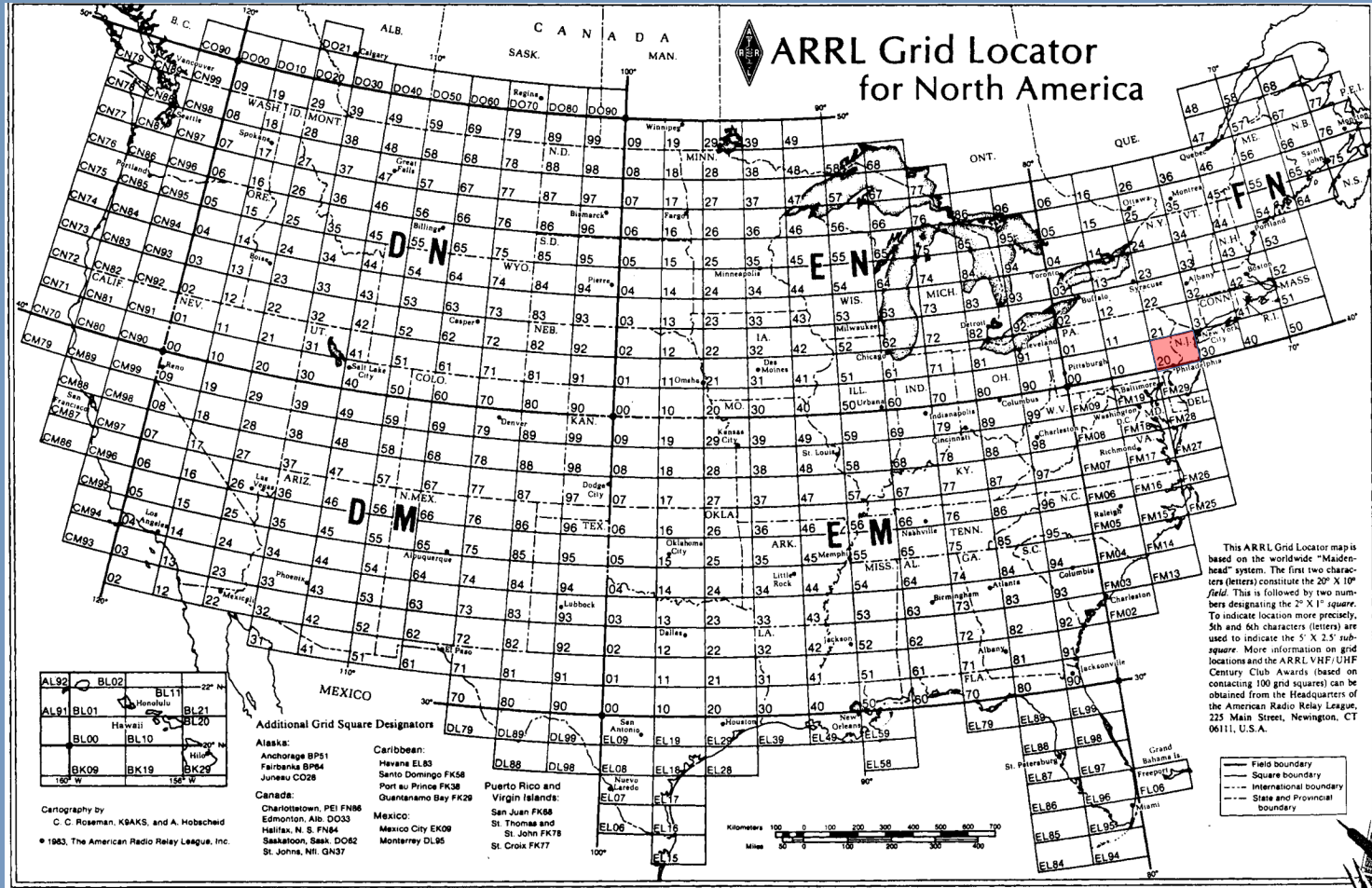


Ionospheric Propagation depends on Solar Conditions!

Generally 80 & 40 is better at night.  
10 & 15 favor the daytime and 20  
could be open 24 hours in good  
conditions



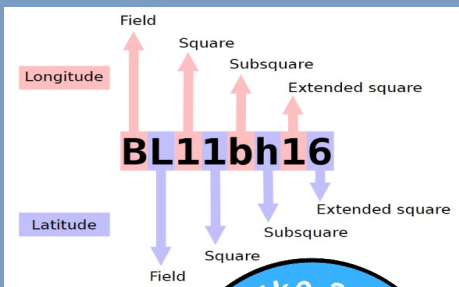
# HF...Not Just Your Grid Square



The Maidenhead Locator System is a Geocode system used by amateur radio operators to describe their geographic coordinates. The Maidenhead Locator System can describe locations anywhere in the world.

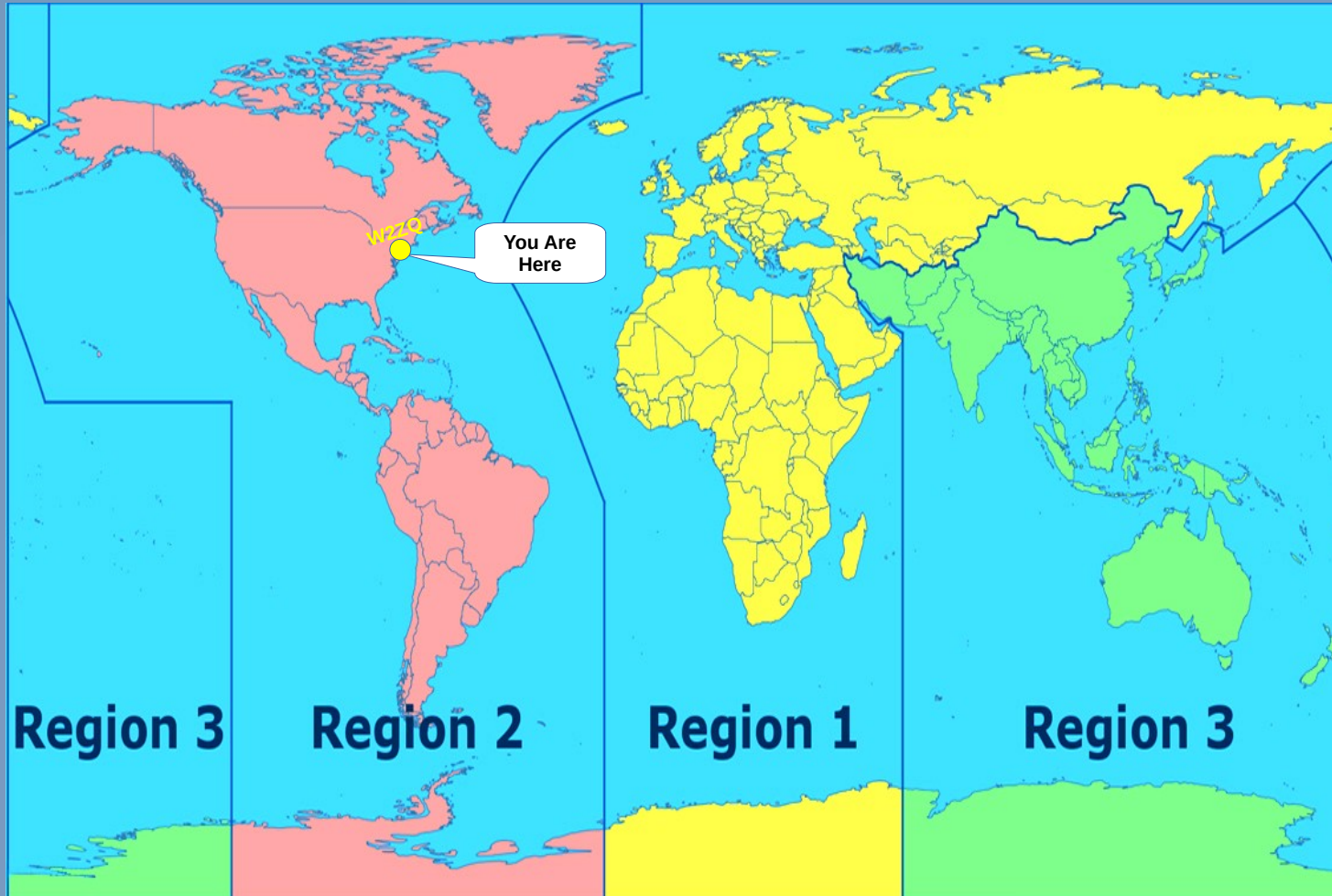
A Maidenhead locator encodes latitude and longitude into a short string of characters. This position information is presented in a level of precision needed for efficient transmission using voice, CW or other operating mode.

W2ZQ is in grid square: FN20



This ARRL Grid Locator map is based on the worldwide "Maidenhead" system. The first two characters (letters) constitute the 20° X 10° field. This is followed by two numbers designating the 2° X 1° square. To indicate location more precisely, 5th and 6th characters (letters) are used to indicate the 5' X 2.5' subsquare. More information on grid locations and the ARRL VHF/UHF Century Club Awards (based on contacting 100 grid squares) can be obtained from the Headquarters of the American Radio Relay League, 225 Main Street, Newington, CT 06111, U.S.A.

## Where in the World is that Station?



### What are Radio ITU Zones?

Radio ITU Zones are a globally recognized system used to divide the Earth's surface into different regions for the purpose of radio communication.

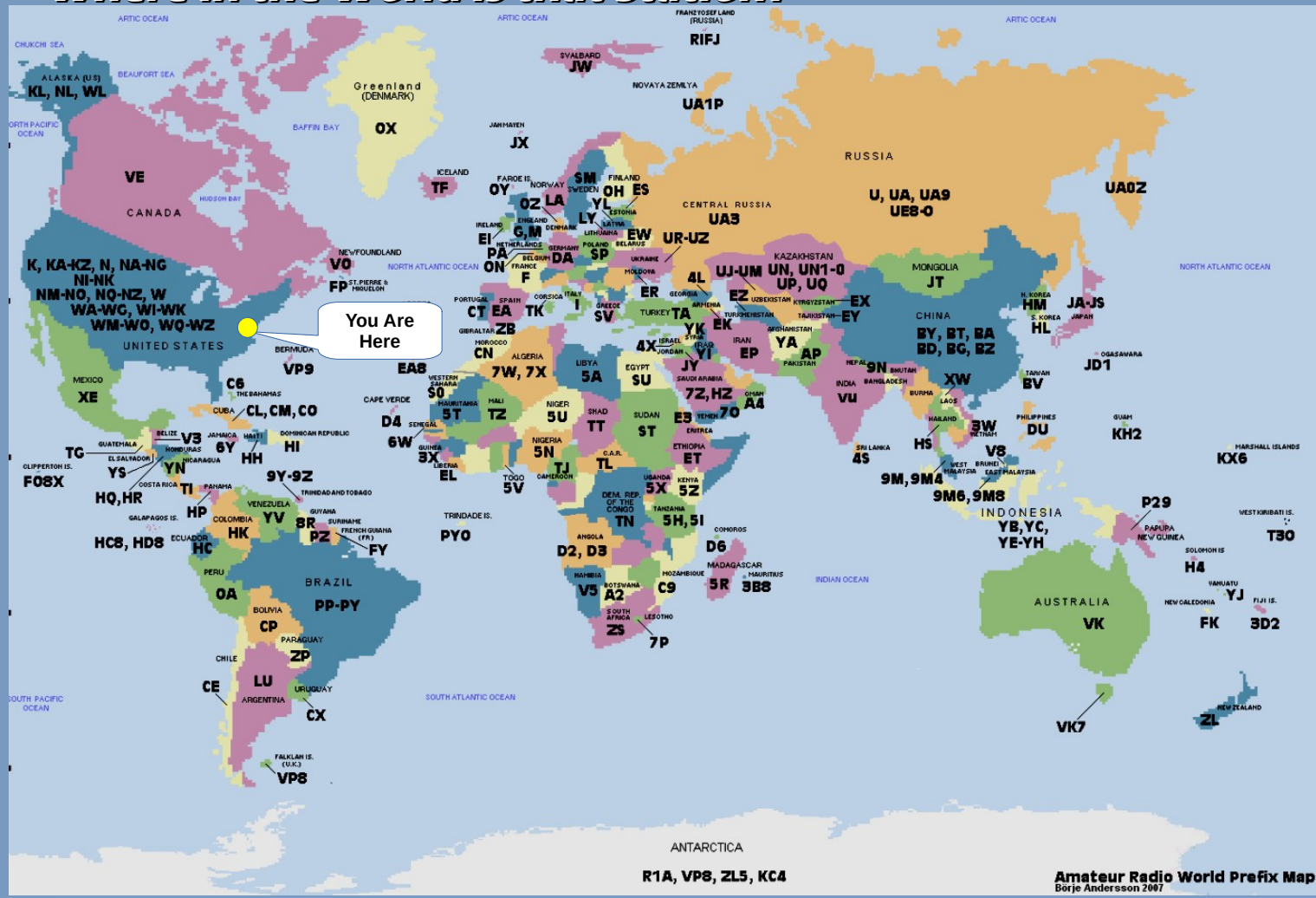
The *International Telecommunication Union* (ITU) is responsible for defining and managing these zones.

Each zone is assigned a unique identifier, known as an ITU Zone number, which helps in identifying the location of a radio station or operator.

Understanding Radio ITU Zones is crucial for amateur radio enthusiasts as it allows them to determine the operating conditions and regulations specific to their location.



# Where in the World is that Station?



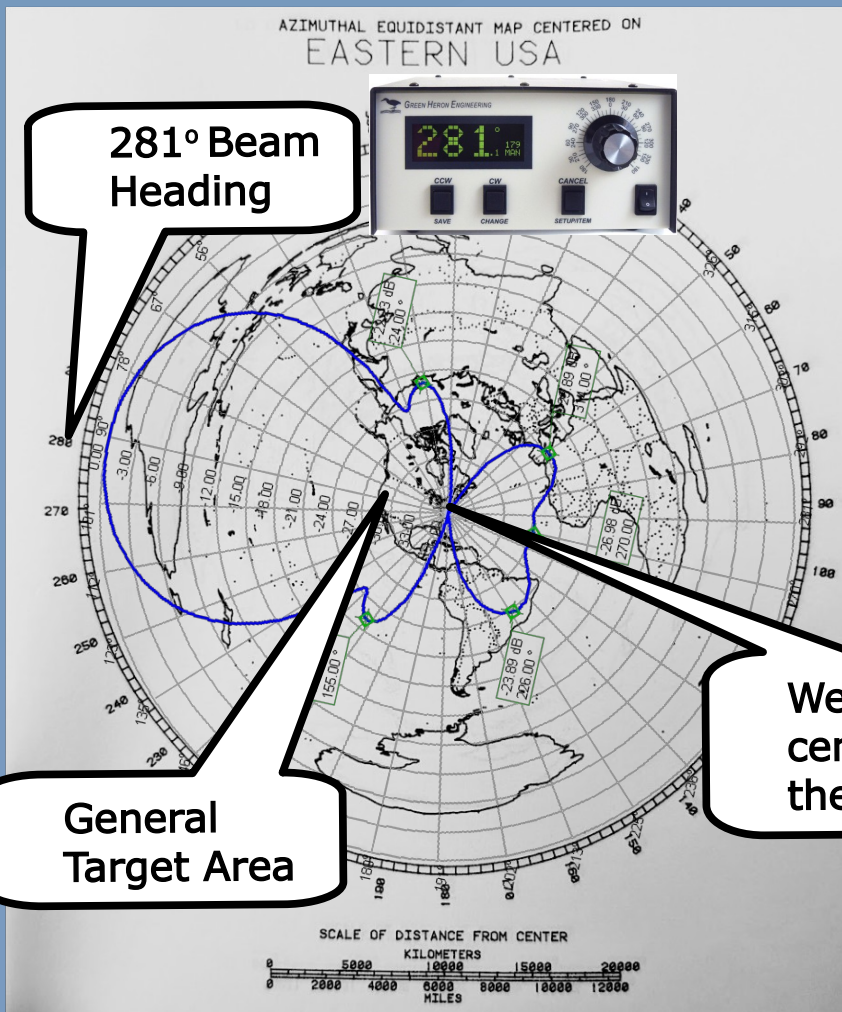
Call signs for the world's nations are determined by the International Telecommunications Union (ITU), the United Nations agency that co-ordinates radio activity for all spectrum users.

The prefixes used by a country for both commercial and amateur radio purposes are determined from one or more ITU allocation blocks issued to that country.

Call signs use combinations based on those prefixes.



# The Mystical Art of Antenna Aiming



## Things to Think About

- Antenna aiming is not precise! It has more importance on 10 meters than 20. The lower the frequency, the wider the radiation pattern.
- Save wear and tear on the antenna rotor!





## ***Let's Summarize!***

- ***Abide by the Radio Amateur's Code***
- ***Listen, Listen and Listen some more.***
- ***Ask if the Frequency is in Use before CQ***
- ***Don't be Mic Shy. Speak with Confidence***
- ***Know the Topics to Avoid***
- ***Know the Lingo and Use It!***
- ***The Back & Forth of a Good QSO***
- ***A QSO needs Signal Reports***
- ***Log Your QSOs in Ham Radio Deluxe***
- ***Get to Know the W2ZQ HF Equipment***
- ***Understand the Basics of Propagation***
- ***Become Familiar with Grid Squares***
- ***Where in the World is that Station?***
- ***Antenna Aiming is an Art. Be nice to our Rotor!***
- ***Q&A***