

## References

### CW Parse Tree

<https://commons.wikimedia.org/wiki/File:Morse-code-tree.svg>

### World Maidenhead Grid Map

<https://www.dxengineering.com/techarticles/dxegeneralnews/download-a-free-worldwide-grid-square-map-from-dx-engineering>

### ARRL Frequency Allocation Chart

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

### ARRL Considerate Operator's Frequency Guide

<https://www.arrl.org/considerate-operator>

### ARRL Communicating with Other Hams

<https://www.arrl.org/files/file/Get%20on%20the%20Air/Comm%20w%20Other%20Hams-Q%20Signals.pdf>

### Icom US Grid Square Map

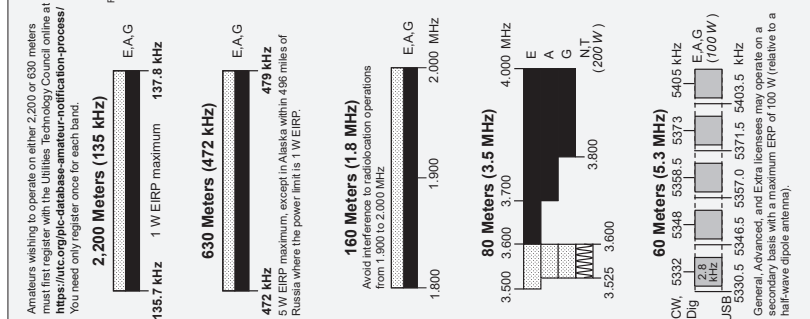
[https://www.icomamerica.com/lineup/amateur/Band\\_Plan\\_Map/](https://www.icomamerica.com/lineup/amateur/Band_Plan_Map/)

### Icom Common Prefixes of Countries

<https://www.hamqsl.com/bandchar.pdf>

# 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.



**KEY**

**Note:** CW operation is permitted throughout all amateur bands.  
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

▨ = 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

See [www.arrl.org/band-plan](http://www.arrl.org/band-plan) for detailed band plans.

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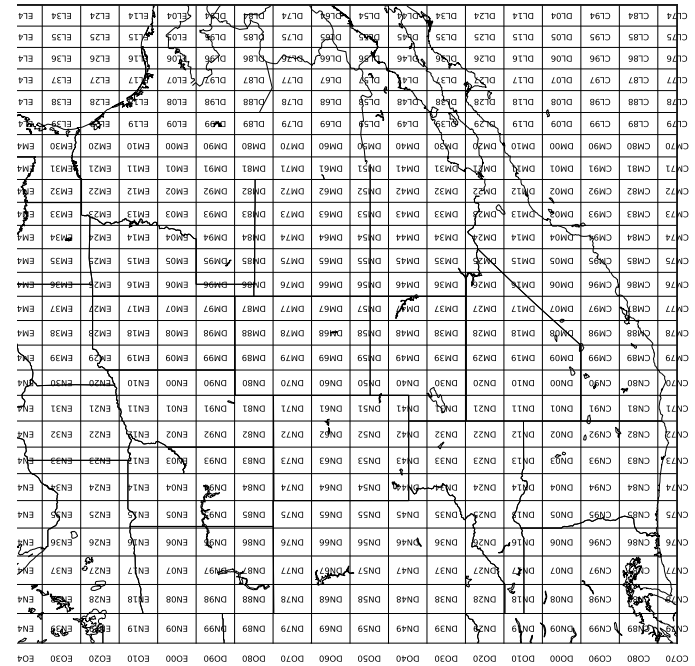
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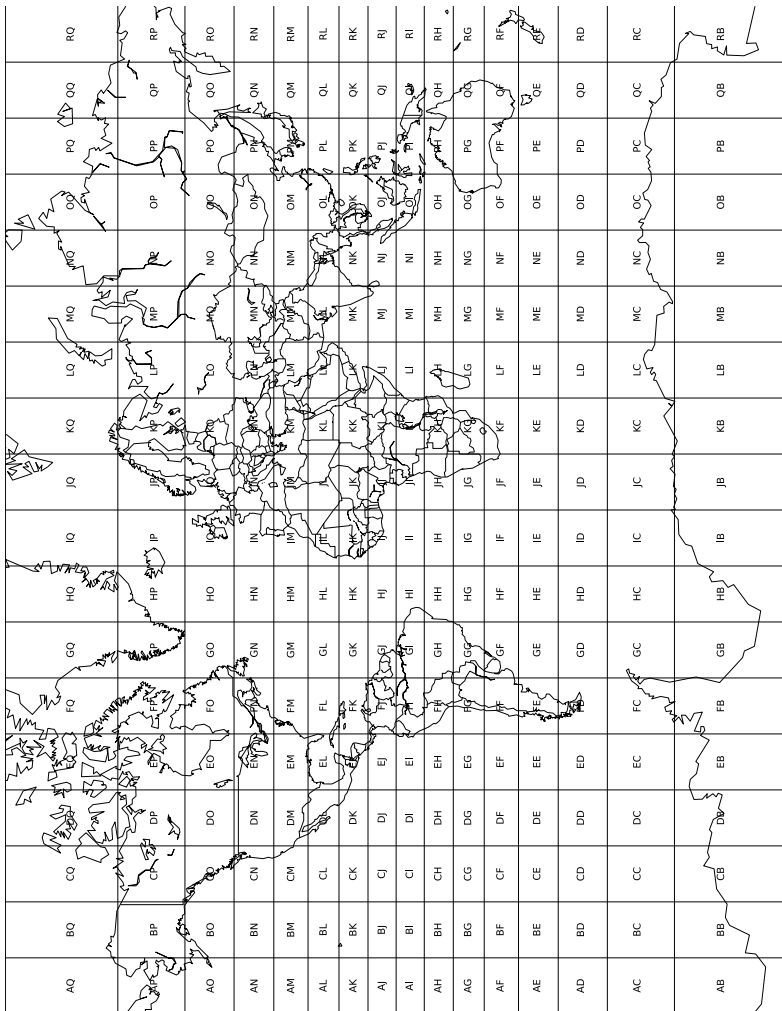
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## Considerate Frequency Usage

1.800–2.000	CW	14.233	D-SSTV
1.800–1.810	Digital Modes	14.236	Digital Voice
1.810	CW QRP calling	14.285	QRP SSB calling
1.843–2.000	SSB, SSTV and	14.286	AM calling
1.910	SSB QRP	18.100–	RTTY/Data
1.995–2.000	Experimental	18.105–	Automatically
1.999–2.000	Beacons	18.110	IBP/NCDXF
3.500–3.510	CW DX window	18.162.5	Digital Voice
3.560	QRP CW calling	21.060	QRP CW calling
3.570–3.600	RTTY/Data	21.070–	RTTY/Data
3.585–3.600	Automatically	21.090–	Automatically
3.590	RTTY/Data DX	21.150	IBP/NCDXF
3.790–3.800	DX window	21.340	SSTV
3.845	SSTV	21.385	QRP SSB calling
3.885	AM calling	24.920–	RTTY/Data
3.985	QRP SSB calling	24.925–	Automatically
7.030	QRP CW calling	24.930	IBP/NCDXF
7.040	RTTY/Data DX	28.060	QRP CW calling
7.070–7.125	RTTY/Data	28.070–	RTTY/Data
7.100–7.105	Automatically	28.120–	Automatically
7.171	SSTV	28.190–	Beacons
7.173	D-SSTV	28.200	IBP/NCDXF
7.285	QRP SSB calling	28.385	QRP SSB calling
7.290	AM calling	28.680	SSTV
10.130–	RTTY/Data	29.000–	AM
10.140–	Automatically	29.300–	Satellite downlinks
10.060	QRP CW calling	29.520–	Repeater inputs
14.070–	RTTY/Data	29.600	FM simplex
14.095–	Automatically	29.620–	Repeater outputs
14.100	IBP/NCDXF		
14.1005–	Automatically		
14.230	SSTV		



AR BR CR DR ER FR GR HR IR JK KR LR MR NR OR PR QR RR



## Q Codes

QRG	Your exact frequency (or that of ___) is ___ kHz.	Will you tell me my exact frequency (or that of ___)?
QRL	I am busy (or busy with ___).	Are you busy? (Used to ask if frequency is in use)
QRM	Your transmission is being interfered with ___ (1-5).	Is my transmission being interfered with?
QRN	I am troubled by static ___ (1-5).	Are you troubled by static?
QRO	Increase power.	Shall I increase power?
QRP	Decrease power.	Shall I decrease power?
QRQ	Send faster (___ wpm).	Shall I send faster?
QRS	Send more slowly (___ wpm).	Shall I send more slowly?
QRT	Stop sending.	Shall I stop sending?
QRU	I have nothing for you.	Have you anything for me?
QRV	I am ready.	Are you ready?
QRX	I will call you again at ___ (on ___ kHz).	When will you call me again?
<b>QRZ</b>	<b>You are being called by ___ (on ___ kHz).</b>	<b>Who is calling me?</b>
QSB	Your signals are fading.	Are my signals fading?
QSK	I can hear you between signals.	Can I break in on your transmission?
<b>QSL</b>	<b>I am acknowledging receipt.</b>	<b>Can you acknowledge receipt?</b>
<b>QSO</b>	<b>I can communicate with ___ direct (or via ___).</b>	<b>Can you communicate with ___ direct or by relay?</b>
QSP	I will relay to ___.	Will you relay to ___?
QST	General call to all amateurs (CQ ARRL).	-
QSX	I am listening to ___ on ___ kHz.	Will you listen to ___ on ___ kHz?
QSY	Change to another frequency (or ___ kHz).	Shall I change to another frequency?
QTC	I have ___ messages for you (or for ___).	How many messages have you to send?
<b>QTH</b>	<b>My location is ___.</b>	<b>What is your location?</b>
QTR	The time is ___.	What is the correct time?

Prosigns

AR	End of message	Often sent as “di-dah-di-dah-dit” (•-•-•)
AS	Stand by	“di-dah-di-di-dit”; used to ask someone to wait
BK	Break	Used to invite the other station to transmit immediately
BT	Separator	Break between thoughts or paragraphs (“dah-di-di-di-dah”)
CL	Closing down	Used when signing off the air permanently or for the day
CQ	Calling any station	General call: “di-dah-di-dah” then “dah-dah-di-dah”
CT	Start of message	Used to begin formal traffic messages
EE	Error	Correcting a mistake; usually sent as “di-di-di-di” rapidly
K	Go ahead	Invitation for the other station to transmit
KN	Go ahead, named station only	Stronger version of K—only the called station should respond
R	Roger (message received)	Confirms receipt of last transmission
SK	End of contact	“Silent Key”; final sign-off (di-di-di-dah-di-dah)
SN	Understood	Used in formal message handling (equivalent to “QSL” or “Roger”)

Callsign Country Prefixes

K, N, W	United States	EA	Spain
AA–AL	United States	CT	Portugal
VE	Canada	LU	Argentina
VA, VO, VY	Canada	PY	Brazil
ZL	New Zealand	CX	Uruguay
VK	Australia	YV	Venezuela
JA, JE, JH	Japan	XE	Mexico
G, M	United Kingdom	TI	Costa Rica
F	France	OA	Peru
DL	Germany	CE	Chile
I	Italy	HL	South Korea
ON	Belgium	BY, BG, BH	China
PA	Netherlands	HS	Thailand
SM, SA	Sweden	9V	Singapore
OH	Finland	VU	India
LA, LB	Norway	4X, 4Z	Israel
OE	Austria	ZS	South Africa
OK	Czech Republic	SU	Egypt
SP	Poland	A6	United Arab Emirates
HA	Hungary	A7	Qatar
YU	Serbia	A9	Bahrain
		9K	Kuwait

SSB

**A (Calling CQ):** “CQ CQ CQ, this is K1ABC, Kilo One Alpha Bravo Charlie, calling CQ and standing by.”

**B (Responding):** “K1ABC, this is W2XYZ, Whiskey Two X-ray Yankee Zulu.”

**A:** “W2XYZ, good afternoon, you’re 59 here in Boston, Massachusetts. Name is John, Juliet Oscar Hotel November. Back to you, W2XYZ from K1ABC.”

**B:** “Thanks John, you’re 59 as well in New Jersey. Name is Mike, Mike India Kilo Echo. Nice to meet you, John. K1ABC, this is W2XYZ.”

**A:** “Very good Mike, thanks for the QSO. 73 and have a great day. K1ABC is now clear.”

SSB Contest

**Activator (A) calling:** “CQ POTA, CQ Parks on the Air, this is K1ABC, Kilo One Alpha Bravo Charlie, calling CQ POTA and standing by.”

**Hunter (B) responds:** “K1ABC, this is W2XYZ.”

**Activator (A):** “W2XYZ, you’re 59 into park K-1234.”

**Hunter (B):** “Thanks for the 59. You’re 57 in New Jersey. 73!”

**Activator (A):** “Copy the 57 New Jersey. Thanks for hunting! QRZ, this is K1ABC, park K-1234.”

CW

**A (Calling CQ):** “CQ CQ CQ DE K1ABC K1ABC K1ABC K”  
(Calling any station, this is K1ABC, standing by)

**B (Responding):** “K1ABC DE W2XYZ W2XYZ K”  
(K1ABC, this is W2XYZ, over)

**A:** “W2XYZ DE K1ABC UR 599 IN MA. NAME JOHN. HW? W2XYZ DE K1ABC K”  
(You’re 599 in Massachusetts. My name is John. How do you copy?)

**B:** “K1ABC DE W2XYZ R UR 589 IN NJ. NAME MIKE. RIG KX3, 10W. WX SUNNY. K1ABC DE W2XYZ K”  
(Roger, you’re 589 in New Jersey. My name is Mike. My rig is a KX3 running 10 watts. Weather is sunny.)

**A:** “R TNX MIKE. 73 ES HPE CUAGN. W2XYZ DE K1ABC SK”  
(Roger, thanks Mike. Best regards and hope to see you again. Signing off.)

NATO Phonetic Alphabet

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

**CW**

<b>A</b>	..	<b>N</b>	..	<b>0</b>	----	<b>'</b>	.....
<b>B</b>	....	<b>O</b>	---	<b>1</b>	.....	<b>!</b>	.....
<b>C</b>	....	<b>P</b>	....	<b>2</b>	.....	<b>/</b>	.....
<b>D</b>	..	<b>Q</b>	....	<b>3</b>	.....	<b>(</b>	.....
<b>E</b>	.	<b>R</b>	..	<b>4</b>	.....	<b>)</b>	.....
<b>F</b>	....	<b>S</b>	...	<b>5</b>	.....	<b>&amp;</b>	.....
<b>G</b>	..	<b>T</b>	-	<b>6</b>	.....	<b>:</b>	.....
<b>H</b>	....	<b>U</b>	..	<b>7</b>	.....	<b>;</b>	.....
<b>I</b>	..	<b>V</b>	....	<b>8</b>	.....	<b>=</b>	.....
<b>J</b>	----	<b>W</b>	....	<b>9</b>	.....	<b>+</b>	.....
<b>K</b>	..	<b>X</b>	....	<b>.</b>	.....	<b>-</b>	.....
<b>L</b>	....	<b>Y</b>	....	<b>,</b>	.....	<b>_</b>	.....
<b>M</b>	--	<b>Z</b>	....	<b>?</b>	.....		

