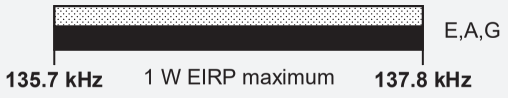
US Amateur Radio Bands

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.

ARRL The National Association for Amateur Radio®

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.

2,200 Meters (135 kHz)

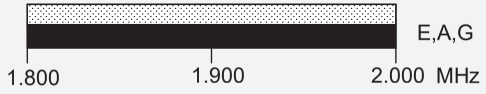


630 Meters (472 kHz)

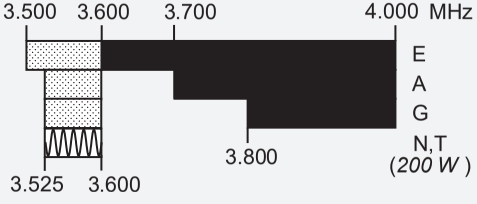
5 W EIRP maximum, except in Alaska within 496 miles of Russia where the power limit is 1 W EIRP.

160 Meters (1.8 MHz)

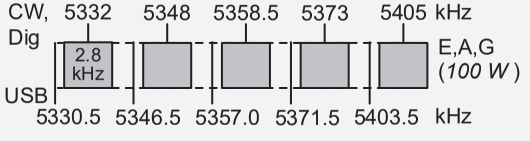
Avoid interference to radiolocation operations from 1.900 to 2.000 MHz



80 Meters (3.5 MHz)

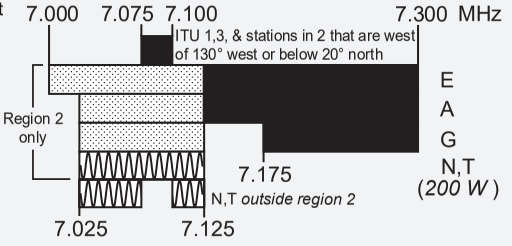


60 Meters (5.3 MHz)



General, Advanced, and Extra licensees may operate on a secondary basis with a maximum ERP of 100 W (relative to a half-wave dipole antenna).

40 Meters (7 MHz)

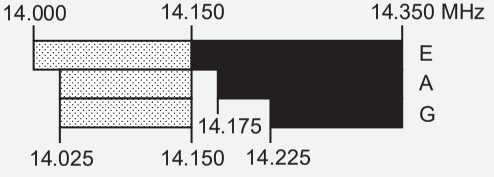


See Sections 97.305(c), 97.307(f)(11) and 97.301(e). These exemptions do not apply to stations in the continental US.

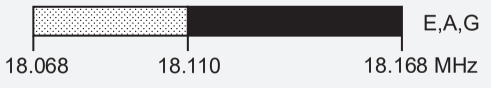
30 Meters (10.1 MHz)

Avoid interference to fixed services outside the US.

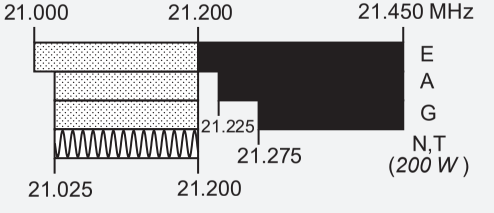
20 Meters (14 MHz)



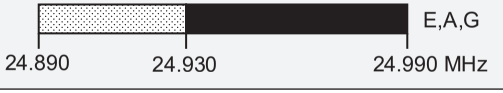
17 Meters (18 MHz)



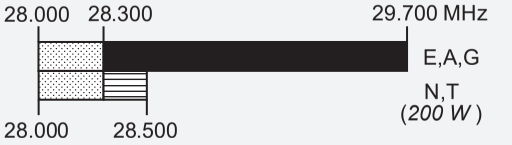
15 Meters (21 MHz)



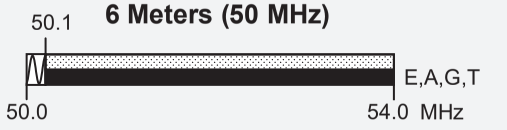
12 Meters (24 MHz)



10 Meters (28 MHz)



6 Meters (50 MHz)



2 Meters (144 MHz)

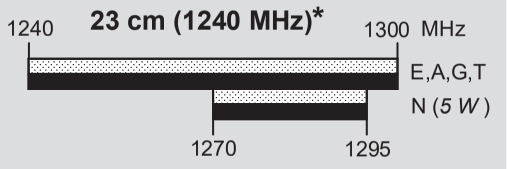
1.25 Meters (222 MHz)

*Geographical and power restrictions may apply to all bands above 420 MHz. See FCC Part 97.303 for information about your area.

70 cm (420 MHz)*

33 cm (902 MHz)*

23 cm (1240 MHz)*



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
3400-3450 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

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* for detailed band plans.

ARRL
We're At Your Service

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

Publication Orders:
www.arrl.org/shop
Toll-Free 1-888-277-5289 (860-594-0355)
email: orders@arrl.org

Membership/Circulation Desk:
www.arrl.org/membership
Toll-Free 1-888-277-5289 (860-594-0338)
email: membership@arrl.org

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

Exams: 860-594-0300 email: vec@arrl.org

 rev. 07/25/2024

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
14.060	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		

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?
QRZ	**You are being called by ___ (on ___kHz).**	**Who is calling me?**
QSB	Your signals are fading.	Are my signals fading?
QSK	I can hear you between signals.	Can I break in on your transmission?
QSL	**I am acknowledging receipt.**	**Can you acknowledge receipt?**
QSO	**I can communicate with ___ direct (or via ___).**	**Can you communicate with ___ direct or by relay?**
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?
QTH	**My location is ___.**	**What is your location?**
QTR	The time is ___.	What is the correct time?

Prosigns

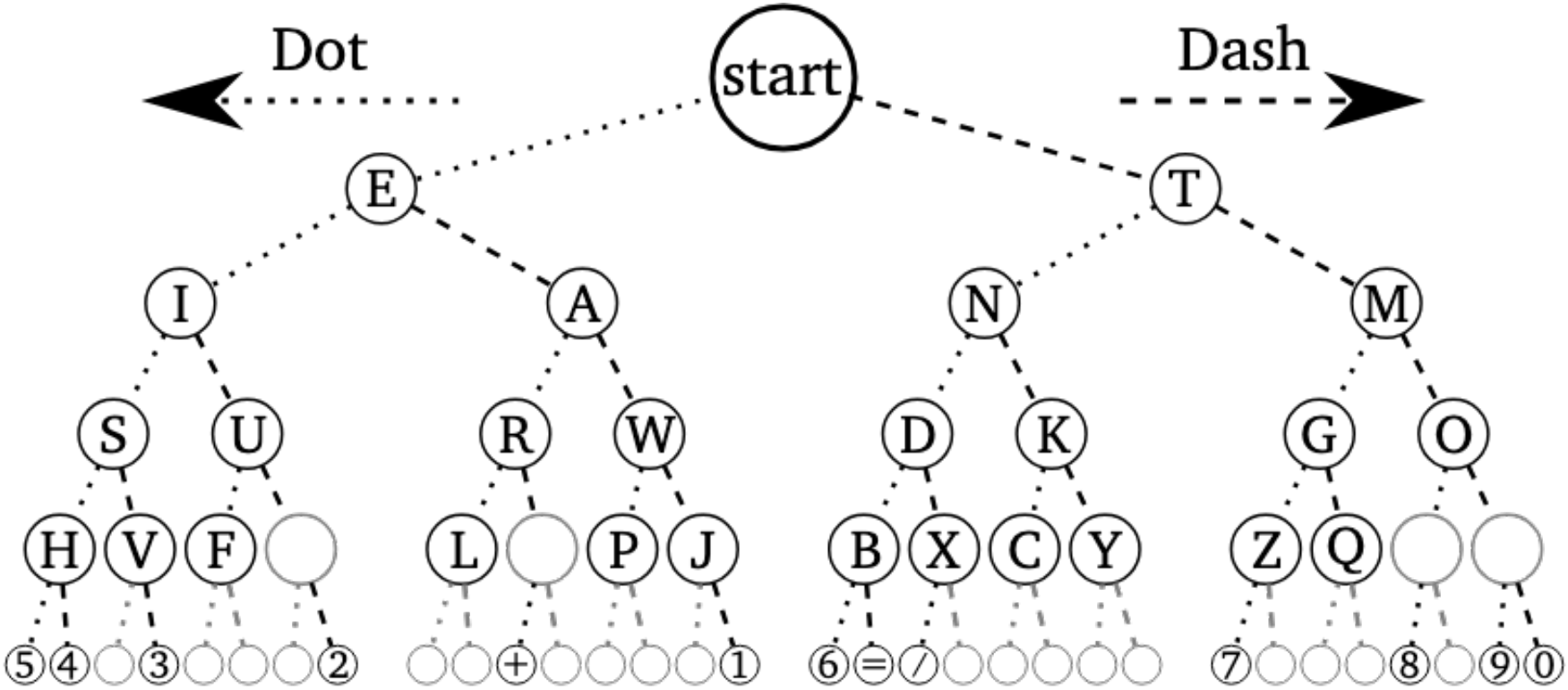
AR	End of message	Often sent as “di-dah-di-dah-dit” (•–•–•)
AS	Stand by	“di-dah-di-di-dit”; used to ask someone to wait
BK	Break	Used to invite the other station to transmit immediately
BT	Separator	Break between thoughts or paragraphs (“dah-di-di-di-dah”)
CL	Closing down	Used when signing off the air 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”)

NATO Phonetic Alphabet

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

CW

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


Dot
start
Dash
E
T
I
A
N
M
S
U
R
W
D
K
G
O
H
V
F
L
P
J
B
X
C
Y
Z
Q
5
4
3
2
+
1
6
=
/
7
8
9
0

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*)

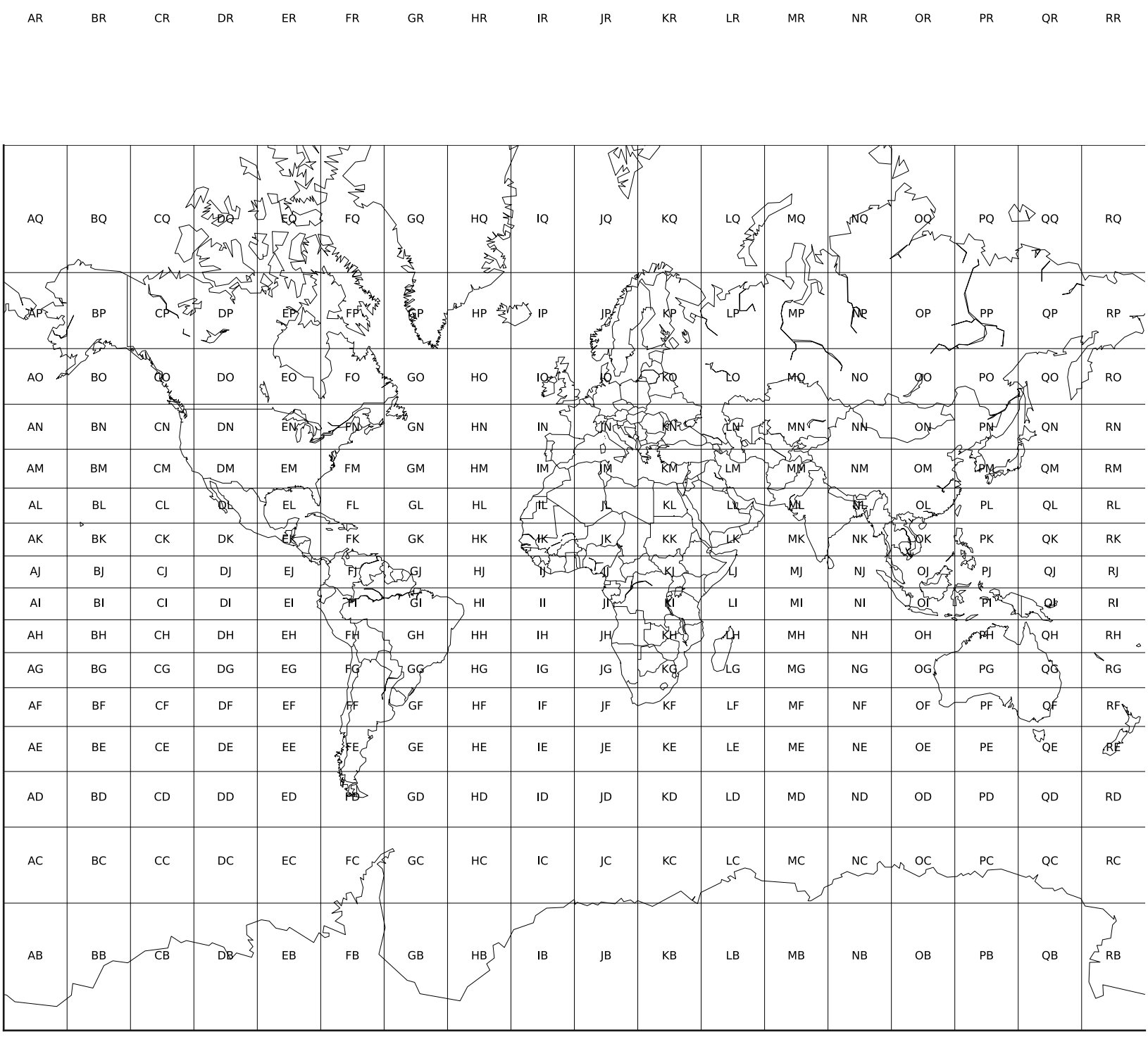
A: “W2XYZ DE K1ABC UR 599 IN MA. NAME JOHN. HW? W2XYZ DE K1ABC K”
(*You're 599 in Massachusetts. My name is John. How do you copy?*)

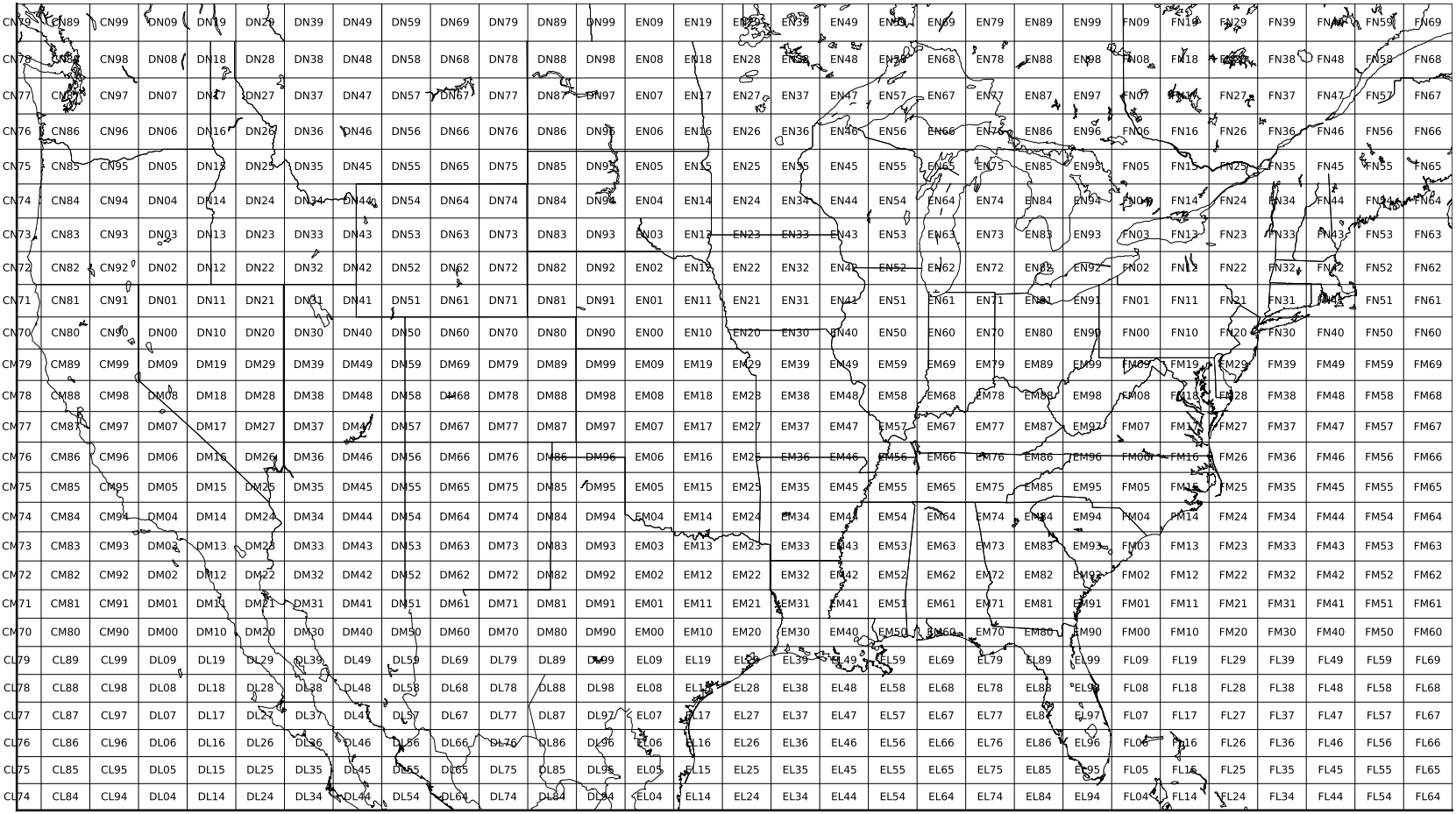
B: “K1ABC DE W2XYZ R UR 589 IN NJ. NAME MIKE. RIG KX3, 10W. WX SUNNY. K1ABC DE W2XYZ K”
(*Roger, you're 589 in New Jersey. My name is Mike. My rig is a KX3 running 10 watts. Weather is sunny.*)

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.*)

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


AR BR CR DR ER FR GR HR IR JR KR LR MR NR OR PR QR RR
AQ BQ CQ DQ EQ FQ GQ HQ IQ JQ KQ LQ MQ NQ OQ PQ QQ RQ
AP BP CP DP EP FP GP HP IP JP KP LP MP NP OP PP QP RP
AO BO CO DO EO FO GO HO IO JO KO LO MO NO OO PO QO RO
AN BN CN DN EN FN GN HN IN JN KN LN MN NN ON PN QN RN
AM BM CM DM EM FM GM HM IM JM KM LM MM NM OM PM QM RM
AL BL CL DL EL FL GL HL IL JL KL LL ML NL OL PL QL RL
AK BK CK DK EK FK GK HK IK JK KK LK MK NK OK PK QK RK
AJ BJ CJ DJ EJ FJ GJ HJ IJ JJ KJ LJ MJ NJ OJ PJ QJ RJ
AI BI CI DI EI FI GI HI II JI KI LI MI NI OI PI QI RI
AH BH CH DH EH FH GH HH IH JH KH LH MH NH OH PH QH RH
AG BG CG DG EG FG GG HG IG JG KG LG MG NG OG PG QG RG
AF BF CF DF EF FF GF HF IF JF KF LF MF NF OF PF QF RF
AE BE CE DE EE FE GE HE IE JE KE LE ME NE OE PE QE RE
AD BD CD DD ED FD GD HD ID JD KD LD MD ND OD PD QD RD
AC BC CC DC EC FC GC HC IC JC KC LC MC NC OC PC QC RC
AB BB CB DB EB FB GB HB IB JB KB LB MB NB OB PB QB RB


CO70 CO80 CO90 DO00 DO10 DO20 DO30 DO40 DO50 DO60 DO70 DO80 DO90 EO00 EO10 EO20 EO30 EO40 EO50 EO60 EO70 EO80 EO90 FO00 FO10 FO20 FO30 FO40 FO50 FO60 FO70
CN79 CN89 CN99 DN09 DN19 DN29 DN39 DN49 DN59 DN69 DN79 DN89 DN99 EN09 EN19 EN29 EN39 EN49 EN59 EN69 EN79 EN89 EN99 FN09 FN19 FN29 FN39 FN49 FN59 FN69 FN79
CN78 CN88 CN98 DN08 DN18 DN28 DN38 DN48 DN58 DN68 DN78 DN88 DN98 EN08 EN18 EN28 EN38 EN48 EN58 EN68 EN78 EN88 EN98 FN08 FN18 FN28 FN38 FN48 FN58 FN68 FN78
CN77 CN87 CN97 DN07 DN17 DN27 DN37 DN47 DN57 DN67 DN77 DN87 DN97 EN07 EN17 EN27 EN37 EN47 EN57 EN67 EN77 EN87 EN97 FN07 FN17 FN27 FN37 FN47 FN57 FN67 FN77
CN76 CN86 CN96 DN06 DN16 DN26 DN36 DN46 DN56 DN66 DN76 DN86 DN96 EN06 EN16 EN26 EN36 EN46 EN56 EN66 EN76 EN86 EN96 FN06 FN16 FN26 FN36 FN46 FN56 FN66 FN76
CN75 CN85 CN95 DN05 DN15 DN25 DN35 DN45 DN55 DN65 DN75 DN85 DN95 EN05 EN15 EN25 EN35 EN45 EN55 EN65 EN75 EN85 EN95 FN05 FN15 FN25 FN35 FN45 FN55 FN65 FN75
CN74 CN84 CN94 DN04 DN14 DN24 DN34 DN44 DN54 DN64 DN74 DN84 DN94 EN04 EN14 EN24 EN34 EN44 EN54 EN64 EN74 EN84 EN94 FN04 FN14 FN24 FN34 FN44 FN54 FN64 FN74
CN73 CN83 CN93 DN03 DN13 DN23 DN33 DN43 DN53 DN63 DN73 DN83 DN93 EN03 EN13 EN23 EN33 EN43 EN53 EN63 EN73 EN83 EN93 FN03 FN13 FN23 FN33 FN43 FN53 FN63 FN73
CN72 CN82 CN92 DN02 DN12 DN22 DN32 DN42 DN52 DN62 DN72 DN82 DN92 EN02 EN12 EN22 EN32 EN42 EN52 EN62 EN72 EN82 EN92 FN02 FN12 FN22 FN32 FN42 FN52 FN62 FN72
CN71 CN81 CN91 DN01 DN11 DN21 DN31 DN41 DN51 DN61 DN71 DN81 DN91 EN01 EN11 EN21 EN31 EN41 EN51 EN61 EN71 EN81 EN91 FN01 FN11 FN21 FN31 FN41 FN51 FN61 FN71
CN70 CN80 CN90 DN00 DN10 DN20 DN30 DN40 DN50 DN60 DN70 DN80 DN90 EN00 EN10 EN20 EN30 EN40 EN50 EN60 EN70 EN80 EN90 FN00 FN10 FN20 FN30 FN40 FN50 FN60 FN70
CM79 CM89 CM99 DM09 DM19 DM29 DM39 DM49 DM59 DM69 DM79 DM89 DM99 EM09 EM19 EM29 EM39 EM49 EM59 EM69 EM79 EM89 EM99 FM09 FM19 FM29 FM39 FM49 FM59 FM69 FM79
CM78 CM88 CM98 DM08 DM18 DM28 DM38 DM48 DM58 DM68 DM78 DM88 DM98 EM08 EM18 EM28 EM38 EM48 EM58 EM68 EM78 EM88 EM98 FM08 FM18 FM28 FM38 FM48 FM58 FM68 FM78
CM77 CM87 CM97 DM07 DM17 DM27 DM37 DM47 DM57 DM67 DM77 DM87 DM97 EM07 EM17 EM27 EM37 EM47 EM57 EM67 EM77 EM87 EM97 FM07 FM17 FM27 FM37 FM47 FM57 FM67 FM77
CM76 CM86 CM96 DM06 DM16 DM26 DM36 DM46 DM56 DM66 DM76 DM86 DM96 EM06 EM16 EM26 EM36 EM46 EM56 EM66 EM76 EM86 EM96 FM06 FM16 FM26 FM36 FM46 FM56 FM66 FM76
CM75 CM85 CM95 DM05 DM15 DM25 DM35 DM45 DM55 DM65 DM75 DM85 DM95 EM05 EM15 EM25 EM35 EM45 EM55 EM65 EM75 EM85 EM95 FM05 FM15 FM25 FM35 FM45 FM55 FM65 FM75
CM74 CM84 CM94 DM04 DM14 DM24 DM34 DM44 DM54 DM64 DM74 DM84 DM94 EM04 EM14 EM24 EM34 EM44 EM54 EM64 EM74 EM84 EM94 FM04 FM14 FM24 FM34 FM44 FM54 FM64 FM74
CM73 CM83 CM93 DM03 DM13 DM23 DM33 DM43 DM53 DM63 DM73 DM83 DM93 EM03 EM13 EM23 EM33 EM43 EM53 EM63 EM73 EM83 EM93 FM03 FM13 FM23 FM33 FM43 FM53 FM63 FM73
CM72 CM82 CM92 DM02 DM12 DM22 DM32 DM42 DM52 DM62 DM72 DM82 DM92 EM02 EM12 EM22 EM32 EM42 EM52 EM62 EM72 EM82 EM92 FM02 FM12 FM22 FM32 FM42 FM52 FM62 FM72
CM71 CM81 CM91 DM01 DM11 DM21 DM31 DM41 DM51 DM61 DM71 DM81 DM91 EM01 EM11 EM21 EM31 EM41 EM51 EM61 EM71 EM81 EM91 FM01 FM11 FM21 FM31 FM41 FM51 FM61 FM71
CM70 CM80 CM90 DM00 DM10 DM20 DM30 DM40 DM50 DM60 DM70 DM80 DM90 EM00 EM10 EM20 EM30 EM40 EM50 EM60 EM70 EM80 EM90 FM00 FM10 FM20 FM30 FM40 FM50 FM60 FM70
CL79 CL89 CL99 DL09 DL19 DL29 DL39 DL49 DL59 DL69 DL79 DL89 DL99 EL09 EL19 EL29 EL39 EL49 EL59 EL69 EL79 EL89 EL99 FL09 FL19 FL29 FL39 FL49 FL59 FL69 FL79
CL78 CL88 CL98 DL08 DL18 DL28 DL38 DL48 DL58 DL68 DL78 DL88 DL98 EL08 EL18 EL28 EL38 EL48 EL58 EL68 EL78 EL88 EL98 FL08 FL18 FL28 FL38 FL48 FL58 FL68 FL78
CL77 CL87 CL97 DL07 DL17 DL27 DL37 DL47 DL57 DL67 DL77 DL87 DL97 EL07 EL17 EL27 EL37 EL47 EL57 EL67 EL77 EL87 EL97 FL07 FL17 FL27 FL37 FL47 FL57 FL67 FL77
CL76 CL86 CL96 DL06 DL16 DL26 DL36 DL46 DL56 DL66 DL76 DL86 DL96 EL06 EL16 EL26 EL36 EL46 EL56 EL66 EL76 EL86 EL96 FL06 FL16 FL26 FL36 FL46 FL56 FL66 FL76
CL75 CL85 CL95 DL05 DL15 DL25 DL35 DL45 DL55 DL65 DL75 DL85 DL95 EL05 EL15 EL25 EL35 EL45 EL55 EL65 EL75 EL85 EL95 FL05 FL15 FL25 FL35 FL45 FL55 FL65 FL75
CL74 CL84 CL94 DL04 DL14 DL24 DL34 DL44 DL54 DL64 DL74 DL84 DL94 EL04 EL14 EL24 EL34 EL44 EL54 EL64 EL74 EL84 EL94 FL04 FL14 FL24 FL34 FL44 FL54 FL64 FL74

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/

Icom Common Prefixes of Countries
https://www.hamqsl.com/bandchar.pdf