

## 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

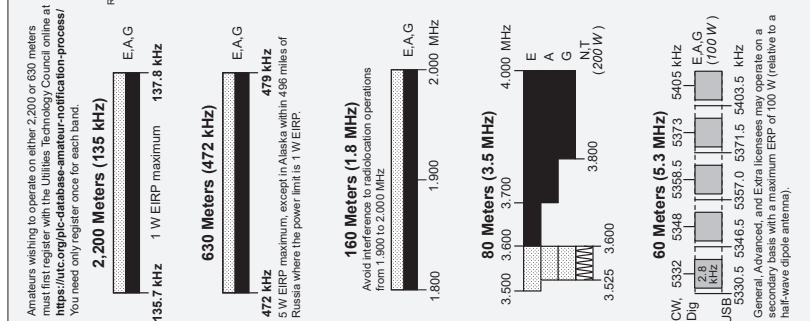
[https://www.icomamerica.com/lineup/amateur/Band\\_Plan\\_Map/](https://www.icomamerica.com/lineup/amateur/Band_Plan_Map/)

### 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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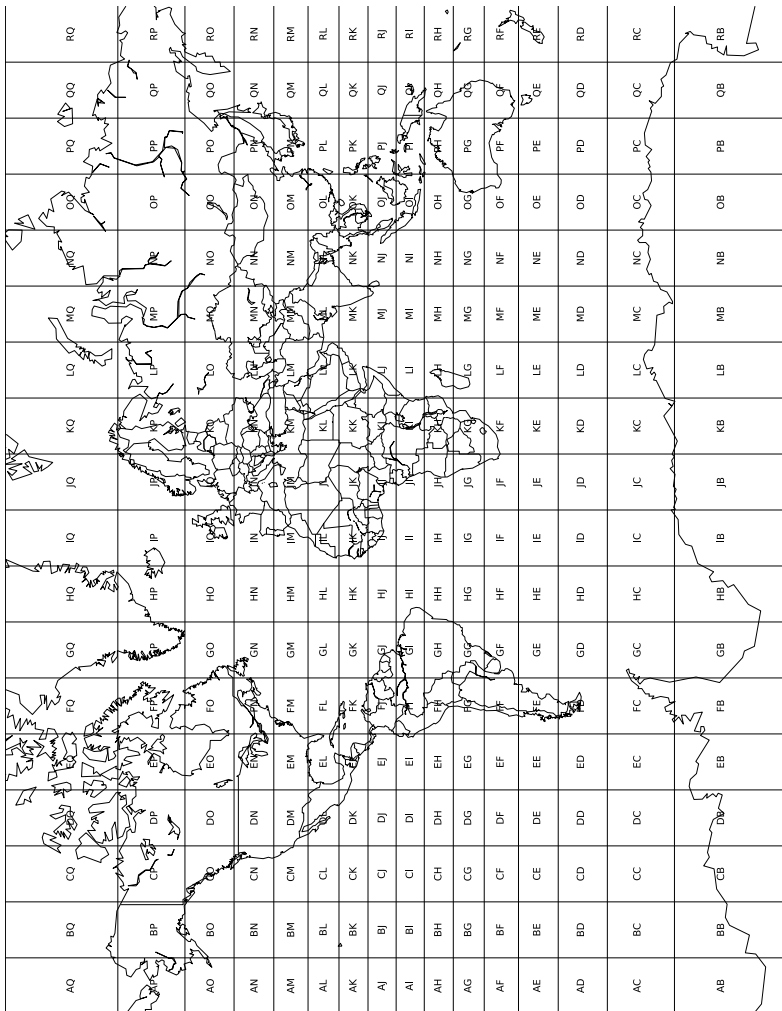
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## Considerate Frequency Usage

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		

CN70	CN71	CN72	CN73	CN74	CN75	CN76	CN77	CN78	CN79	FM00	FM01	FM02	FM03	FM04	FM05	FM06	FM07	FM08	FM09
CN80	CN81	CN82	CN83	CN84	CN85	CN86	CN87	CN88	CN89	FM10	FM11	FM12	FM13	FM14	FM15	FM16	FM17	FM18	FM19
CN90	CN91	CN92	CN93	CN94	CN95	CN96	CN97	CN98	CN99	FM20	FM21	FM22	FM23	FM24	FM25	FM26	FM27	FM28	FM29
CU00	CU01	CU02	CU03	CU04	CU05	CU06	CU07	CU08	CU09	FM30	FM31	FM32	FM33	FM34	FM35	FM36	FM37	FM38	FM39
CU10	CU11	CU12	CU13	CU14	CU15	CU16	CU17	CU18	CU19	FM40	FM41	FM42	FM43	FM44	FM45	FM46	FM47	FM48	FM49
CU20	CU21	CU22	CU23	CU24	CU25	CU26	CU27	CU28	CU29	FM50	FM51	FM52	FM53	FM54	FM55	FM56	FM57	FM58	FM59
CU30	CU31	CU32	CU33	CU34	CU35	CU36	CU37	CU38	CU39	FM60	FM61	FM62	FM63	FM64	FM65	FM66	FM67	FM68	FM69
CU40	CU41	CU42	CU43	CU44	CU45	CU46	CU47	CU48	CU49	FM70	FM71	FM72	FM73	FM74	FM75	FM76	FM77	FM78	FM79
CU50	CU51	CU52	CU53	CU54	CU55	CU56	CU57	CU58	CU59	FM80	FM81	FM82	FM83	FM84	FM85	FM86	FM87	FM88	FM89
CU60	CU61	CU62	CU63	CU64	CU65	CU66	CU67	CU68	CU69	FM90	FM91	FM92	FM93	FM94	FM95	FM96	FM97	FM98	FM99
CU70	CU71	CU72	CU73	CU74	CU75	CU76	CU77	CU78	CU79	FM000	FM001	FM002	FM003	FM004	FM005	FM006	FM007	FM008	FM009
CU80	CU81	CU82	CU83	CU84	CU85	CU86	CU87	CU88	CU89	FM010	FM011	FM012	FM013	FM014	FM015	FM016	FM017	FM018	FM019
CU90	CU91	CU92	CU93	CU94	CU95	CU96	CU97	CU98	CU99	FM020	FM021	FM022	FM023	FM024	FM025	FM026	FM027	FM028	FM029
CU000	CU001	CU002	CU003	CU004	CU005	CU006	CU007	CU008	CU009	FM030	FM031	FM032	FM033	FM034	FM035	FM036	FM037	FM038	FM039
CU010	CU011	CU012	CU013	CU014	CU015	CU016	CU017	CU018	CU019	FM040	FM041	FM042	FM043	FM044	FM045	FM046	FM047	FM048	FM049
CU020	CU021	CU022	CU023	CU024	CU025	CU026	CU027	CU028	CU029	FM050	FM051	FM052	FM053	FM054	FM055	FM056	FM057	FM058	FM059
CU030	CU031	CU032	CU033	CU034	CU035	CU036	CU037	CU038	CU039	FM060	FM061	FM062	FM063	FM064	FM065	FM066	FM067	FM068	FM069
CU040	CU041	CU042	CU043	CU044	CU045	CU046	CU047	CU048	CU049	FM070	FM071	FM072	FM073	FM074	FM075	FM076	FM077	FM078	FM079
CU050	CU051	CU052	CU053	CU054	CU055	CU056	CU057	CU058	CU059	FM080	FM081	FM082	FM083	FM084	FM085	FM086	FM087	FM088	FM089
CU060	CU061	CU062	CU063	CU064	CU065	CU066	CU067	CU068	CU069	FM090	FM091	FM092	FM093	FM094	FM095	FM096	FM097	FM098	FM099
CU070	CU071	CU072	CU073	CU074	CU075	CU076	CU077	CU078	CU079	FM100	FM101	FM102	FM103	FM104	FM105	FM106	FM107	FM108	FM109
CU080	CU081	CU082	CU083	CU084	CU085	CU086	CU087	CU088	CU089	FM110	FM111	FM112	FM113	FM114	FM115	FM116	FM117	FM118	FM119
CU090	CU091	CU092	CU093	CU094	CU095	CU096	CU097	CU098	CU099	FM120	FM121	FM122	FM123	FM124	FM125	FM126	FM127	FM128	FM129
CU100	CU101	CU102	CU103	CU104	CU105	CU106	CU107	CU108	CU109	FM130	FM131	FM132	FM133	FM134	FM135	FM136	FM137	FM138	FM139
CU110	CU111	CU112	CU113	CU114	CU115	CU116	CU117	CU118	CU119	FM140	FM141	FM142	FM143	FM144	FM145	FM146	FM147	FM148	FM149
CU120	CU121	CU122	CU123	CU124	CU125	CU126	CU127	CU128	CU129	FM150	FM151	FM152	FM153	FM154	FM155	FM156	FM157	FM158	FM159
CU130	CU131	CU132	CU133	CU134	CU135	CU136	CU137	CU138	CU139	FM160	FM161	FM162	FM163	FM164	FM165	FM166	FM167	FM168	FM169
CU140	CU141	CU142	CU143	CU144	CU145	CU146	CU147	CU148	CU149	FM170	FM171	FM172	FM173	FM174	FM175	FM176	FM177	FM178	FM179
CU150	CU151	CU152	CU153	CU154	CU155	CU156	CU157	CU158	CU159	FM180	FM181	FM182	FM183	FM184	FM185	FM186	FM187	FM188	FM189
CU160	CU161	CU162	CU163	CU164	CU165	CU166	CU167	CU168	CU169	FM190	FM191	FM192	FM193	FM194	FM195	FM196	FM197	FM198	FM199
CU170	CU171	CU172	CU173	CU174	CU175	CU176	CU177	CU178	CU179	FM200	FM201	FM202	FM203	FM204	FM205	FM206	FM207	FM208	FM209
CU180	CU181	CU182	CU183	CU184	CU185	CU186	CU187	CU188	CU189	FM210	FM211	FM212	FM213	FM214	FM215	FM216	FM217	FM218	FM219
CU190	CU191	CU192	CU193	CU194	CU195	CU196	CU197	CU198	CU199	FM220	FM221	FM222	FM223	FM224	FM225	FM226	FM227	FM228	FM229
CU200	CU201	CU202	CU203	CU204	CU205	CU206	CU207	CU208	CU209	FM230	FM231	FM232	FM233	FM234	FM235	FM236	FM237	FM238	FM239
CU210	CU211	CU212	CU213	CU214	CU215	CU216	CU217	CU218	CU219	FM240	FM241	FM242	FM243	FM244	FM245	FM246	FM247	FM248	FM249
CU220	CU221	CU222	CU223	CU224	CU225	CU226	CU227	CU228	CU229	FM250	FM251	FM252	FM253	FM254	FM255	FM256	FM257	FM258	FM259
CU230	CU231	CU232	CU233	CU234	CU235	CU236	CU237	CU238	CU239	FM260	FM261	FM262	FM263	FM264	FM265	FM266	FM267	FM268	FM269
CU240	CU241	CU242	CU243	CU244	CU245	CU246	CU247	CU248	CU249	FM270	FM271	FM272	FM273	FM274	FM275	FM276	FM277	FM278	FM279
CU250	CU251	CU252	CU253	CU254	CU255	CU256	CU257	CU258	CU259	FM280	FM281	FM282	FM283	FM284	FM285	FM286	FM287	FM288	FM289
CU260	CU261	CU262	CU263	CU264	CU265	CU266	CU267	CU268	CU269	FM290	FM291	FM292	FM293	FM294	FM295	FM296	FM297	FM298	FM299
CU270	CU271	CU272	CU273	CU274	CU275	CU276	CU277	CU278	CU279	FM300	FM301	FM302	FM303	FM304	FM305	FM306	FM307	FM308	FM309
CU280	CU281	CU282	CU283	CU284	CU285	CU286	CU287	CU288	CU289	FM310	FM311	FM312	FM313	FM314	FM315	FM316	FM317	FM318	FM319
CU290	CU291	CU292	CU293	CU294	CU295	CU296	CU297	CU298	CU299	FM320	FM321	FM322	FM323	FM324	FM325	FM326	FM327	FM328	FM329
CU300	CU301	CU302	CU303	CU304	CU305	CU306	CU307	CU308	CU309	FM330	FM331	FM332	FM333	FM334	FM335	FM336	FM337	FM338	FM339
CU310	CU311	CU312	CU313	CU314	CU315	CU316	CU317	CU318	CU319	FM340	FM341	FM342	FM343	FM344	FM345	FM346	FM347	FM348	FM349
CU320	CU321	CU322	CU323	CU324	CU325	CU326	CU327	CU328	CU329	FM350	FM351	FM352	FM353	FM354	FM355	FM356	FM357	FM358	FM359
CU330	CU331	CU332	CU333	CU334	CU335	CU336	CU337	CU338	CU339	FM360	FM361	FM362	FM363	FM364	FM365	FM366	FM367	FM368	FM369
CU340	CU341	CU342	CU343	CU344	CU345	CU346	CU347	CU348	CU349	FM370	FM371	FM372	FM373	FM374	FM375	FM376	FM377	FM378	FM379
CU350	CU351	CU352	CU353	CU354	CU355	CU356	CU357	CU358	CU359	FM380	FM381	FM382	FM383	FM384	FM385	FM386	FM387	FM388	FM389
CU360	CU361	CU362	CU363	CU364	CU365	CU366	CU367	CU368	CU369	FM390	FM391	FM392	FM393	FM394	FM395	FM396	FM397	FM398	FM399
CU370	CU371	CU372	CU373	CU374	CU375	CU376	CU377	CU378	CU379	FM400	FM401	FM402	FM403	FM404	FM405	FM406	FM407	FM408	FM409
CU380	CU381	CU382	CU383	CU384	CU385	CU386	CU387	CU388	CU389	FM410	FM411	FM412	FM413	FM414	FM415	FM416	FM417	FM418	FM419
CU390	CU391	CU392	CU393	CU394	CU395	CU396	CU397	CU398	CU399	FM420	FM421	FM422	FM423	FM424	FM425	FM426	FM427	FM428	FM429
CU400	CU401	CU402	CU403	CU404	CU405	CU406	CU407	CU408	CU409	FM430	FM431	FM432	FM433	FM434	FM435	FM436	FM437	FM438	FM439
CU410	CU411	CU412	CU413	CU414	CU415	CU416	CU417	CU418	CU419	FM440	FM441	FM442	FM443	FM444	FM445	FM446	FM447	FM448	FM449
CU420	CU421	CU422	CU423	CU424	CU425	CU426	CU427	CU428	CU429	FM450	FM451	FM452	FM453	FM454	FM455	FM456	FM457	FM458	FM459
CU430	CU431	CU432	CU433	CU434	CU435	CU436	CU437	CU438	CU439	FM460	FM461	FM462	FM463	FM464	FM465	FM466	FM467	FM468	FM469
CU440	CU441	CU442	CU443	CU444	CU445	CU446	CU447	CU448	CU449	FM470	FM471	FM472	FM473	FM474	FM475	FM476	FM477	FM478	FM479
CU450	CU451	CU452	CU453	CU454	CU455	CU456	CU457	CU458	CU459	FM480	FM481	FM482	FM483	FM484	FM485	FM486	FM487	FM488	FM489
CU460	CU461	CU462	CU463	CU464	CU465	CU466	CU467	CU468	CU469	FM490	FM491	FM492	FM493	FM494	FM495	FM496	FM497	FM498	FM499

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**

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	...	?	.....		

