

## Operating Reference

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The letters ARL are inserted in the preamble in the check and in the text before spelled out numbers, which represent texts from this list. Note that some ARL texts include insertion of numerals and text. Example: NR 1 R WIAW ARL 5 NEWINGTON CONN. DEC 25 DONALD R. SMITH AA 164 EAST SIXTH AVE AA NORTH RIVER CITY MO AA PHONE 73-3968 BT ARL FIFTY ARL SIXTY ONE BT DIANA AR. For additional information about traffic handling, consult [The ARRL Operating Manual](#), published by ARRL, or the [NTS Methods and Practices Guidelines](#).

<b>Group One—For Possible “Relief Emergency” Use</b>	
<b>Number</b>	<b>Meaning</b>
ONE	Everyone safe here. Please don't worry.
TWO	Coming home as soon as possible.
THREE	Am in _____ hospital. Receiving excellent care and recovering fine.
FOUR	Only slight property damage here. Do not be concerned about disaster reports.
FIVE	Am moving to new location. Send no further mail or communication. Will inform you of new address when relocated.
SIX	Will contact you as soon as possible.
SEVEN	Please reply by Amateur Radio through the amateur delivering this message. This is a free public service.
EIGHT	Need additional _____ mobile or portable equipment for immediate emergency use.
NINE	Additional _____ radio operators needed to assist with emergency at this location.
TEN	Please contact _____. Advise to standby and provide further emergency information, instructions or assistance.
ELEVEN	Establish Amateur Radio emergency communications with _____ on _____ MHz.
TWELVE	Anxious to hear from you. No word in some time. Please contact me as soon as possible.
THIRTEEN	Medical emergency situation exits here.
FOURTEEN	Situation here becoming critical. Losses and damage from _____ increasing.
FIFTEEN	Please advise your condition and what help is needed.
SIXTEEN	Property damage very severe in this area.
SEVENTEEN	REACT communications services also available. Establish REACT communication with _____ on channel _____.
EIGHTEEN	Please contact me as soon as possible at _____.
NINETEEN	Request health and welfare report on _____. (State name, address and telephone number.)
TWENTY	Temporarily stranded. Will need some assistance. Please contact me at _____.
TWENTY ONE	Search and Rescue assistance is needed by local authorities here. Advise availability.
TWENTY TWO	Need accurate information on the extent and type of conditions now existing at your location. Please furnish this information and reply without delay.
TWENTY THREE	Report at once the accessibility and best way to reach your location.
TWENTY FOUR	Evacuation of residents from this area urgently needed. Advise plans for help.
TWENTY FIVE	Furnish as soon as possible the weather conditions at your location.
TWENTY SIX	Help and care for evacuation of sick and injured from this location needed at once. Emergency & priority messages originating from official sources must carry the signature of the originating official.

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<b>Group Two—Routine Messages</b>	
FORTY SIX	Greetings on your birthday and best wishes for many more to come.
FORTY SEVEN	Reference your message number _____ to _____ delivered on _____ at _____ UTC.
FIFTY	Greetings by Amateur Radio.
FIFTY ONE	Greetings by Amateur Radio. This message is sent as a free public service by ham radio operators at _____. Am having a wonderful time.
FIFTY TWO	Really enjoyed being with you. Looking forward to getting together again.
FIFTY THREE	Received your _____. It's appreciated; many thanks.
FIFTY FOUR	Many thanks for your good wishes.
FIFTY FIVE	Good news is always welcome. Very delighted to hear about yours.
FIFTY SIX	Congratulations on your _____, a most worthy and deserved achievement.
FIFTY SEVEN	Wish we could be together.
FIFTY EIGHT	Have a wonderful time. Let us know when you return.
FIFTY NINE	Congratulations on the new arrival. Hope mother and child are well.
* SIXTY	Wishing you the best of everything on _____.
SIXTY ONE	Wishing you a very Merry Christmas and a Happy New Year.
* SIXTY TWO	Greetings and best wishes to you for a pleasant _____ holiday season.
SIXTY THREE	Victory or defeat, our best wishes are with you. Hope you win.
SIXTY FOUR	Arrived safely at _____.
SIXTY FIVE	Arriving _____ on _____. Please arrange to meet me there.
SIXTY SIX	DX QSLs are on hand for you at the _____ QSL Bureau. Send _____ self addressed envelopes.
SIXTY SEVEN	Your message number _____ undeliverable because of _____. Please advise.
SIXTY EIGHT	Sorry to hear you are ill. Best wishes for a speedy recovery.
SIXTY NINE	Welcome to the _____. We are glad to have you with us and hope you will enjoy the fun and fellowship of the organization.
* Can be used for all holidays.	

<b>ARRL Recommended Precedence's</b>	
Please observe the following ARRL provisions for PRECEDENCE'S in connection with written message traffic. These provisions are designed to increase the efficiency of our service both in normal times and in emergency.	
Precedence	Meaning
<b>EMERGENCY</b>	Any message having life and death urgency to any person or group of persons, which is transmitted by Amateur Radio in the absence of regular commercial facilities. This includes official messages of welfare agencies during emergencies requesting supplies, materials or instructions vital to relief of stricken populace in emergency areas. During normal times, it will be <i>very</i> rare. On CW/RTTY, this designation will <i>always</i> be spelled out. When in doubt, do not use it.
<b>PRIORITY</b>	Use abbreviation P on CW/RTTY. This classification is for a) important messages having a specific time limit, b) official messages not covered in the emergency category, c) press dispatches and emergency-related traffic not of the <i>utmost</i> urgency d) notice of death or injury in a disaster area, personal or official.
<b>WELFARE</b>	This classification, abbreviated as W on CW/RTTY, refers to either an inquiry as to the health and welfare of an individual in the disaster area or an advisory from the disaster area that indicates all is well. Welfare traffic is handled only after all emergency and priority traffic is cleared. The Red Cross equivalent to an incoming Welfare message is DWI (Disaster Welfare Inquiry).
<b>ROUTINE</b>	Most traffic in normal times will bear this designation. In disaster situations, traffic labeled Routine (R on CW/RTTY) should be handled last, or not at all when circuits are busy with higher precedence traffic. Note: The precedence always follows the message number. For example, a message number may be 207R on CW and "Two Zero Seven Routine" on phone.

## Operating Reference

Handling Instructions (Optional)	
Designation	Meaning
<b>HXA</b>	(Followed by number) Collect landline delivery authorized by addressee within ____ miles. (If no number, authorization is unlimited.)
<b>HXB</b>	(Followed by number) Cancel message if not delivered within ____ hours of filing time; service originating station.
<b>HXC</b>	Report date and time of delivery (TOD) to originating station.
<b>HXD</b>	Report to originating station the identity of station from which received, plus date and time. Report identity of station to which relayed, plus date and time, or if delivered report date, time and method of delivery
<b>HXE</b>	Delivering station get reply from addresses, originate message back.
<b>HXF</b>	(Followed by number) Hold delivery until ____ (date).
<b>HXG</b>	Delivery by mail or landline toll call not required. If toll or other expense involved, cancel message and service originating station.
For further information on traffic handling, consult the Public Service Communications Manual or the ARRL Operating Manual, both published by ARRL.	

Every formal radiogram message originated and handled should contain the following component parts in the order given.	
<b>I. Preamble</b>	<ul style="list-style-type: none"> <li>• Number (begin with 1 each month or year)</li> <li>• Precedence (R, W, P or EMERGENCY)</li> <li>• Handling Instructions (optional, see text)</li> <li>• Station of Origin (first amateur handler)</li> <li>• Check (number of words/groups in text only)</li> <li>• Place of Origin (not necessarily location of station of origin.)</li> <li>• Time Filed (optional with originating station)</li> <li>• Date (must agree with date of time filed)</li> </ul>
<b>II. Address</b>	as complete as possible, include zip code and telephone number
<b>III. Text</b>	limit to 25 words or less, if possible
<b>IV. Signature</b>	<ul style="list-style-type: none"> <li>• <b>CW:</b> The prosign <b>AA</b> separates the parts of the address. <b>BT</b> separates the address from the text and the text from the signature. <b>AR</b> marks end of message; this is followed by B if there is another message to follow, by N if this is the only or last message. It is customary to copy the preamble, parts of the address, text and signature on separate lines.</li> <li>• <b>RTTY:</b> Same as CW procedure above, except (1) use extra space between parts of address, instead of <b>AA</b>; (2) omit CW procedure sign <b>BT</b> to separate text from address and signature, using line spaces instead; (3) add a CFM line under the signature, consisting of all names, numerals and unusual words in the message in the order transmitted.</li> <li>• <b>PACKET/AMTOR BBS:</b> Same format as shown in the CW message example above, except that the <b>AA</b> and <b>AR</b> prosigns may be omitted. Most amtor and packet BBS software in use today allows formal message traffic to be sent with the “ST” command. Always avoid the use of spectrum-wasting multiple line feeds and indentations.</li> <li>• <b>PHONE:</b> Use <i>prowords</i> instead of prosigns, but it is not necessary to name each part of the message as you send it. For example, the above message would be sent on phone as follows: “Number one routine HX Golf WIAW eight Newington Connecticut one eight three zero zulu july one Donald Smith Figures one six four East Sixth Avenue North River City Missouri zero zero seven eight nine Telephone seven three three four nine six eight Break Happy birthday X-ray see you soon X-ray love Break Diana End of Message Over. “End of Message” is followed by “More” if there is another message to follow, “No More” if it is the only or last message. Speak clearly using VOX (or pause frequently on push-to-talk) so that the receiving station can get fills. Spell phonetically all difficult or unusual words--do not spell out common words. Do not use cw abbreviations or Q-signals in phone traffic handling.</li> </ul>

## Operating Reference

ARRL QN Signals For CW Net Use	
Q Sign	Meaning
QNA*	Answer in prearranged order.
QNB*	Act as relay Between _____ and _____
QNC	All net stations Copy. I have a message for all net stations.
QND*	Net is Directed (controlled by net control station).
QNE*	Entire net stand by.
QNF	Net is Free (not controlled).
QNG	Take over as net control station.
QNH	Your net frequency is High.
QNI	Net stations report In.*. I am reporting into the net. (Follow with a list or traffic or QRU).
QNJ	Can you copy me? Can you copy _____?
QNK*	Transmit message for _____ to _____
QNL	Your net frequency is Low.
QNM*	You are QRMing the net. Stand by.
QNN	Net control station is _____. What station has net control?
QNO	Station is leaving the net.
QNP	Unable to copy you. Unable to copy _____
QNQ*	Move frequency to _____ and wait for _____ to finish handling traffic. Then send him traffic for _____
QNR	Answer _____ and Receive traffic.
QNS*	Following Stations are in the net. *(Follow with list.) Request list of stations in the net.
QNT	I request permission to leave the net for _____ minutes.
QNU*	The net has traffic for you. Stand by.
QNV*	Establish contact with _____ on this frequency. If successful, move to _____ and send him traffic for _____
QNW	How do I route messages for _____?
QNX	You are excused from the net.* Request to be excused from the net.
QNY*	Shift to another frequency (or to _____ kHz) to clear traffic with _____
QNZ	Zero beat your signal with mine.
<ul style="list-style-type: none"> <li>• * For use only by the Net Control Station.</li> <li>• <b>Notes on Use of QN Signals:</b> The QN signals listed above are special ARRL signals for use in amateur CW nets only. They are not for use in casual amateur conversation. Other meanings that may be used in other services do not apply. Do not use QN signals on phone nets. Say it with words. QN signals need not be followed by a question mark, even though the meaning may be interrogatory.</li> </ul>	

International Q Signals		
A Q signal followed by a '?' asks a question. A Q signal without the '?' answers the question affirmatively, unless otherwise indicated.		
Q Sign	Question	Answer
QRA	What is the name of your station?	The name of my station is ...
QRG	What's my exact frequency?	Your frequency is ... kc.
QRH	Does my frequency vary?	Your frequency varies.
QRI	How is my tone? (1-3)	The tone of your transmission is ... 1. Good. 2. Variable. 3. Bad.
QRJ	Are you receiving me badly? Are my signals weak?	I cannot receive you. Your signals are too weak.
QRK	What is my signal intelligibility? (1-5)	The legibility of your signals is ... (1 to 5).
QRL	Are you busy?	I am busy (or busy with....). Please do not interfere.
QRM	Is my transmission being interfered with? Are you being interfered with?	I am being interfered with.
QRN	Are you troubled by static?	I am troubled by static.
QRO	Shall I increase transmitter power?	Increase power.
QRP	Shall I decrease transmitter power?	Decrease power.
QRQ	Shall I send faster?	Send faster ... (words per min.).

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QRRR		Official ARRL "land SOS." A distress call for emergency use only.
QRS	Shall I send slower?	Transmit more slowly ... (w.p.m.).
QRT	Shall I stop sending?	Stop transmission.
QRU	Have you anything for me? (Answer in negative)	I have nothing for you.
QRV	Are you ready?	I am ready.
QRW	Shall I tell _____ you're calling him?	Please advise ... that I am calling him on ... kc.
QRX	When will you call again?	I will call you again at ... hours (on ... kc.).
QRZ	Who is calling me?	You are being called by ...
QSA	What is my signal strength? (1-5)	The strength of your signals is ... (1 to 5).
QSB	Are my signals fading?	The strength of your signals varies.
QSD	Is my keying defective?	Your keying is incorrect; your signals are bad.
QSG	Shall I send _____ messages at a time?	Transmit ... telegrams (or one telegram) at a time.
QSK	Can you work break-in?	I can hear you between my signals. Continue: I shall interrupt you if necessary.
QSL	Can you acknowledge receipt?	I am acknowledging receipt.
QSM	Shall I repeat the last message sent?	Repeat the last telegram you sent me.
QSO	Can you communicate with _____ direct?	I can communicate with ... direct (or through...).
QSP	Will you relay to _____ ?	I will relay to ... free of charge.
QST *		General call preceding a message address to all amateurs and ARRL Members. This is in effect "CQ ARRL".
QSV	Shall I send a series of V's?	Send a series of VVV.
QSW	Will you send on this frequency (or ...kHz)(with emissions of class.....)?	I am going to send on this frequency (or ...kHz) (with emissions of class .....).
QSX	Will you listen for _____ on _____ ?	I am listening for ... on ... kcs.
QSY	Shall I change frequency?	Change to ... kc. without changing type of wave.
QSZ	Shall I send each word/group more than once? (Answer, send twice or _____)	Send each word or group twice.
QTA	Shall I cancel number _____ ?	Cancel number ... as if it had not been sent.
QTB	Do you agree with my word count? (Answer negative)	I do not agree with your word count; I shall repeat the first letter of each word and the first figure of each number.
QTC	How many messages have you to send?	I have ... telegrams for you or for....
QTH	What is your location?	My position (location) is....
QTR	What is your time?	The exact time is....
QTV	Shall I stand guard for you _____ ?	
QTX	Will you keep your station open for further communication with me?	
QUA	Have you news of _____ ?	
QUM	Is the distress traffic ended?	The distress traffic is ended.

## Operating Reference

<b>ITU Phonetic Alphabet</b>					
<b>Word list adopted by the International Telecommunications Union</b>					
<b>Item</b>	<b>Pronunciation</b>	<b>Item</b>	<b>Pronunciation</b>	<b>Item</b>	<b>Pronunciation</b>
<b>A</b>	AL-fah	<b>M</b>	MIKE	<b>Y</b>	YANG-kee
<b>B</b>	BRAH-voh	<b>N</b>	no-VEM-bur	<b>Z</b>	ZOO-loo
<b>C</b>	CHAR-lee	<b>O</b>	OSS-kur	<b>1</b>	WUN
<b>D</b>	DELL-ta	<b>P</b>	pah-PAH	<b>2</b>	TOO
<b>E</b>	ECK-oh	<b>Q</b>	kay-BECK	<b>3</b>	TREE
<b>F</b>	FOKS-trot	<b>R</b>	ROH-me-oh	<b>4</b>	FOW-er
<b>G</b>	GOLF	<b>S</b>	see-AIR-ah	<b>5</b>	Fife
<b>H</b>	hoh-TELL	<b>T</b>	TANG-go	<b>6</b>	SICKS
<b>I</b>	IN-dee-ah	<b>U</b>	YOU-nee-form	<b>7</b>	SEV-en
<b>J</b>	JEW-lee-ett	<b>V</b>	VIK-tor	<b>8</b>	AIT
<b>K</b>	KEY-loh	<b>W</b>	WISS-kee	<b>9</b>	NIN-er
<b>L</b>	LEE-mah	<b>X</b>	ECKS-ray	<b>0</b>	ZEE-roh

<b>The R-S-T System</b>					
<b>Readability</b>		<b>Signal Strength</b>		<b>Tone</b>	
<b>1</b>	Unreadable	<b>1</b>	Faint signals, barely perceptible.	<b>1</b>	Sixty cycle AC or less, very rough and broad.
<b>2</b>	Barely readable, occasional words distinguishable.	<b>2</b>	Very weak signals.	<b>2</b>	Very rough AC, very harsh and broad.
<b>3</b>	Readable with considerable difficulty.	<b>3</b>	Weak signals.	<b>3</b>	Rough AC tone, rectified but not filtered.
<b>4</b>	Readable with practically no difficulty.	<b>4</b>	Fair signals.	<b>4</b>	Rough note, some trace of filtering.
<b>5</b>	Perfectly readable.	<b>5</b>	Fairly good signals.	<b>5</b>	Filtered rectified AC but strongly ripple-modulated.
		<b>6</b>	Good signals.	<b>6</b>	Filtered tone, definite trace of ripple modulation.
		<b>7</b>	Moderately strong signals.	<b>7</b>	Near pure tone, trace of ripple modulation.
		<b>8</b>	Strong signals.	<b>8</b>	Near perfect tone, slight trace of modulation.
		<b>9</b>	Extremely strong signals.	<b>9</b>	Perfect tone, no trace of ripple or modulation of any kind.
<p>If the signal has the characteristic steadiness of crystal control, add the letter 'X' to the RST report to indicate this. If there is a chirp, add the letter 'C' to the RST report to indicate this. If there is a click, add the letter 'K' to the RST report to indicate this. The above reporting system is used on both CW and voice, leaving out the "tone" report on voice.</p>					

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<b>Time Conversion Chart</b>							
<b>UTC</b>	<b>EDT/AST</b>	<b>CDT/EST</b>	<b>MDT/CST</b>	<b>PDT/MST</b>	<b>PST</b>	<b>Alaska</b>	<b>Hawaii-Aleutian</b>
0000*	2000	1900	1800	1700	1600	1500	1400
0100	2100	2000	1900	1800	1700	1600	1500
0200	2200	2100	2000	1900	1800	1700	1600
0300	2300	2200	2100	2000	1900	1800	1700
0400	0000*	2300	2200	2100	2000	1900	1800
0500	0100	0000*	2300	2200	2100	2000	1900
0600	0200	0100	0000*	2300	2200	2100	2000
0700	0300	0200	0100	0000*	2300	2200	2100
0800	0400	0300	0200	0100	0000*	2300	2200
0900	0500	0400	0300	0200	0100	0000*	2300
1000	0600	0500	0400	0300	0200	0100	0000*
1100	0700	0600	0500	0400	0300	0200	0100
1200	0800	0700	0600	0500	0400	0300	0200
1300	0900	0800	0700	0600	0500	0400	0300
1400	1000	0900	0800	0700	0600	0500	0400
1500	1100	1000	0900	0800	0700	0600	0500
1600	1200	1100	1000	0900	0800	0700	0600
1700	1300	1200	1100	1000	0900	0800	0700
1800	1400	1300	1200	1100	1000	0900	0800
1900	1500	1400	1300	1200	1100	1000	0900
2000	1600	1500	1400	1300	1200	1100	1000
2100	1700	1600	1500	1400	1300	1200	1100
2200	1800	1700	1600	1500	1400	1300	1200
2300	1900	1800	1700	1600	1500	1400	1300
2400*	2000	1900	1800	1700	1600	1500	1400

\* 0000 and 2400 are interchangeable. (2400 is associated with the date of the day ending, 0000 with the day just starting.) Universal Coordinated Time (UTC) is the time at the zero or reference meridian. Time changes one hour with each change of 15 degrees in longitude. The five time zones in the US proper and Canada roughly follow these lines.

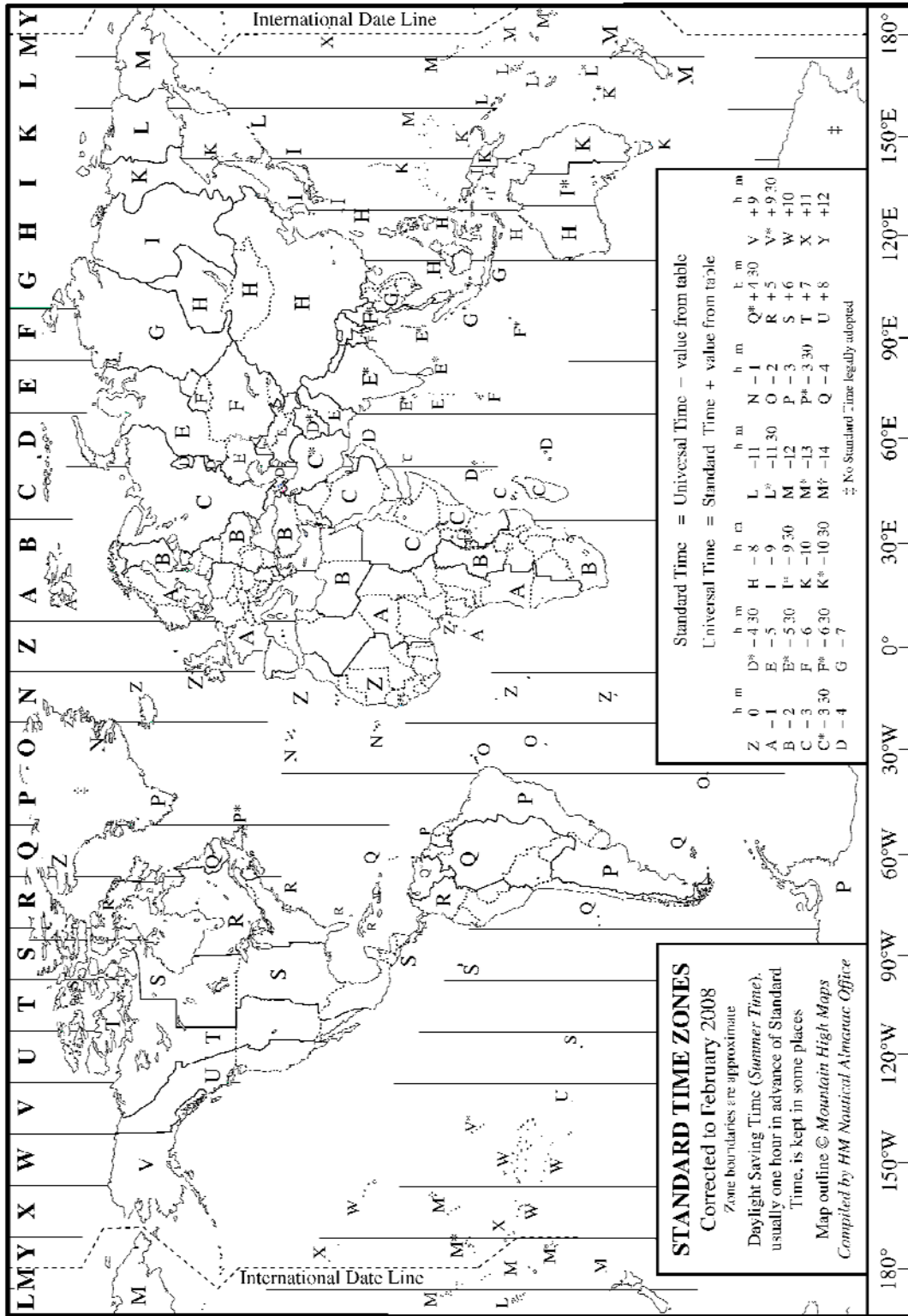
## Operating Reference

Greenwich Mean Time (GMT) or Universal Time Coordinate (UTC)	
Offset	Location
-12:00	International Date Line West
-11:00	Midway Island, Samoa
-10:00	Hawaii
-09:00	Alaska
-08:00	Baja California, Pacific Time (US & Canada), Tijuana
-07:00	Arizona, Chihuahua, La Paz, Mazatlan, Mountain Time (US & Canada)
-06:00	Central America, Central Time (US & Canada), Guadalajara, Mexico city, Monterrey, Saskatchewan
-05:00	Bogota, Eastern Time (US & Canada), Indiana - East, Lima, Quito, Rio Branco
-04:30	Caracas
-04:00	Atlantic Time (Canada), La Paz, Manaus, Santiago
-03:30	Newfoundland
-03:00	Brasilia, Buenos Aires, Georgetown, Greenland, Montevideo
-02:00	Mid-Atlantic
-01:00	Azores, Cape Verde Island
GMT	Casablanca, Dublin, Edinburgh, Lisbon, London, Monrovia, Reykjavik
+01:00	Amsterdam, Belgrade, Berlin, Bern, Bratislava, Brussels, Budapest, Copenhagen, Ljubljana, Madrid, Paris, Prague, Rome, Sarajevo, Skopje, Stockholm, Vienna, Warsaw, West Central Africa, Zagreb
+02:00	Amman, Athens, Beirut, Bucharest, Cairo, Harare, Helsinki, Istanbul, Jerusalem, Kyiv, Minsk, Pretoria, Riga, Sofia, Tallinn, Vilnius, Windhoek
+03:00	Baghdad, Kuwait, Moscow, Nairobi, Riyadh, St. Petersburg, Tbilisi, Volgograd
+03:30	Tehran
+04:00	Abu Dhabi, Baku, Caucasus Standard Time, Muscat, Yerevan
+04:30	Kabul
+05:00	Ekaterinburg, Islamabad, Karachi, Tashkent
+05:30	Chennai, Kolkata, Mumbai, New Delhi, Sri Jayawardenepura
+05:45	Kathmandu
+06:00	Almaty, Astana, Dhaka, Novosibirsk
+06:30	Yangon (Rangoon)
+07:00	Bangkok, Hanoi, Jakarta, Krasnoyarsk
+08:00	Beijing, Chongqing, Hong Kong, Irkutsk, Kuala Lumpur, Perth, Singapore, Taipei, Ulaan Bataar, Urumqi
+09:00	Osaka, Sapporo, Seoul, Tokyo, Yakutsk
+09:30	Adelaide, Darwin
+10:00	Brisbane, Canberra, Guam, Hobart, Melbourne, Port Moresby, Sydney, Vladivostok
+11:00	Magadan, Solomon Island, New Caledonia
+12:00	Auckland, Fiji, Kamchatka, Marshall Island, Wellington
+13:00	Nuku'alofa



**Operating Reference  
World Time Zone Map:**

**WORLD MAP OF TIME ZONES**



[http://aa.usno.navy.mil/faq/docs/world\\_tzones.php](http://aa.usno.navy.mil/faq/docs/world_tzones.php)

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## Operating Reference

<b>NPSTC Standard Channel Nomenclature for the Public Safety Interoperability Channels (<a href="#">LINK</a>)</b>
<p style="text-align: center;"><b>Standardized Naming Format</b></p> <p>Each FCC-designated Interoperability Channel in the Public Safety Radio Services (47CFR Part 90) will have a unique name developed according to a standardized format. Tables 1 and 2 show the FCC designated Interoperability Channels and the related Channel Name. This format consists of a maximum of eight characters, as follows:</p> <p style="text-align: center;"><b>Btype##M</b></p>
<p style="text-align: center;"><b>“B” Spectrum Band</b></p> <p>The Spectrum Band designator is a unique single alpha or numeric character to designate the public safety spectrum segment the channel is found within:</p> <ol style="list-style-type: none"><li>1. <b>V</b> VHF High Band (150.8 – 162.0 MHz).</li><li>2. <b>U</b> UHF Band (450 – 470 MHz).</li><li>3. <b>7</b> 700 MHz Public Safety Band. As the spectrum for voice communications use in this band is currently further divided into two individual blocks, for interoperability channel numbering purposes these blocks are identified as follows:<ul style="list-style-type: none"><li>• <b>“A” Block:</b> Television Channels 63 and 68</li><li>• <b>“B” Block:</b> Television Channels 64 and 69</li></ul></li><li>4. <b>8</b> 800 MHz NPSPAC band <b>after the rebanding process</b> (806 – 809 / 851 – 854 MHz).</li></ol>
<p style="text-align: center;"><b>“type” Channel Use Designator</b></p> <p>The Channel Use Designator is an alphanumeric three- or four-place tag to signify the primary purpose of operations on the channel. In some cases, the Channel Use has been specified in FCC Rules or related Orders.</p> <ol style="list-style-type: none"><li>1. <b>CALL</b> Channel is dedicated nationwide for the express purpose of Interoperability calling only.</li><li>2. <b>DATA</b> Channel is reserved nationwide for the express purpose of Data transmission only.</li><li>3. <b>FIRE</b> Primarily used for interagency incident communications by Fire licensees.</li><li>4. <b>GTAC</b> Primarily used for interagency incident communications between Public Safety eligible entities and eligible non-governmental organizations.</li><li>5. <b>LAW</b> Primarily used for interagency incident communications by Police licensees.</li><li>6. <b>MED</b> Primarily used for interagency incident communications by Emergency Medical Service licensees.</li><li>7. <b>MOB</b> Primarily used for on-scene interagency incident communications by any Public Safety eligible, using vehicular repeaters (FCC Station Class MO3).</li><li>8. <b>TAC</b> Primarily used for interagency communications by any Public Safety eligible.</li></ol>
<p style="text-align: center;"><b>“##” Unique Channel Identifier</b></p> <p>The Unique Channel Identifier is a numeric one- or two-place tag to uniquely identify the specific channel. Channel Identifiers are grouped by band segment as follows:</p> <ol style="list-style-type: none"><li>A. <b>1-9</b> VHF Low Band (30-50 MHz) [No leading zero used]</li><li>B. <b>10-39</b> VHF High band (150.8 – 162 MHz)</li><li>C. <b>40-49</b> UHF band (450 – 470 MHz)</li><li>D. <b>50-69</b> 700 MHz “A” block (TV 63/68)</li><li>E. <b>70-89</b> 700 MHz “B” block (TV 64/69)</li><li>F. <b>90-99</b> 800 MHz “NPSPAC” band (806-809/851-854 MHz) [Post-rebanding]</li></ol> <p>Notes:</p> <ol style="list-style-type: none"><li>1. Starting in VHF High Band, Channel Identifiers are grouped by Channel Use type, with Channel Identifiers ending in “0” reserved for Interoperability Calling use.</li><li>2. Channels Identifiers specified for Emergency Medical Services (MED) in this document are numbered to avoid conflict with the FCC’s UHF medical channel naming methodology specified in 47CFR90.20(d)(65) and 47CFR90.20(d)(66)(i).</li><li>3. Channel Identifiers not specified in Tables 1 and 2 are reserved for future use.</li></ol>
<p style="text-align: center;"><b>“M” Modifier</b></p> <p>The Modifier character is a single alphanumeric tag to identify a modification to the default operation type on the channel / channel pair:</p> <ol style="list-style-type: none"><li>1. <b>D</b> Direct or “Talk around” use [Simplex operations on the output channel of a pair normally designated for half-duplex or mobile relay operations.</li></ol>
<p style="text-align: center;"><b>Standardized Tone Squelch or Network Access Codes</b></p> <p>The use of a common Continuous Tone Controlled Squelch System (CTCSS) tone of 156.7 Hz for transmit and receive on national Interoperability Channels was originally specified in the NPSPAC proceedings (Docket 87-112). In many areas, the 800 MHz Planning Regions allowed the use of an additional (secondary) access tone for in-</p>

## Operating Reference

cabinet repeat operations, as long as the 156.7 Hz tone was monitored by a live dispatcher or always repeated upon receipt. 156.7 Hz is always transmitted by repeaters.

In the development process of the *Standard Channel Nomenclature for the Public Safety Interoperability Channels*, the NCC Interoperability Committee's Working Group recommended that 156.7 Hz CTCSS transmit and receive be used for all analog voice operations on all interoperability channels in all bands.

For Project-25 (P-25) voice operations, the NCC Working Group initially recommended the 156.7 Hz equivalent Network Access Code (NAC) of \$61F. This recommendation was changed in 2001 to use the default ("carrier squelch equivalent") NAC of \$293.

### Analog Operations:

The use of **CTCSS Tone 156.7 Hz** has been adopted for all analog operations on Interoperability Channels:

1. All (fixed and subscriber) analog transmitters **will** encode 156.7 Hz.
2. Subscriber receivers should be set for carrier squelch operations unless conditions in the area require the use of tone protection to mitigate adjacent channel interference, or interference from intermodulation products. In those cases, receivers will decode 156.7 Hz.
3. Subject to the approval of applicable Statewide Communications Interoperability Plans and/or FCC-approved regional plans, mobile relay stations that are part of a local, regional, or statewide interoperability network may be equipped with a second receive CTCSS tone to provide local ("in cabinet") relay operation, provided:
  - The relay transmitter continues to transmit the common CTCSS tone of 156.7 Hz so that all users within range of the station are aware the station is in use;
  - The relay will accept the common CTCSS tone of 156.7 Hz and present the audio accompanying the 156.7 Hz-encoded transmission for automatic in-cabinet repeat or to a live operator at the appropriate controlling dispatch facility; and
  - The operational configuration of the Mobile Relay Station is published in applicable interoperability resource tracking documents (such as the appropriate Tactical Interoperability Communications Plan, Statewide Communications Interoperability Plan, and/or FCC-approved Regional Plan) and databases (CAPRAD, CASM, and NIIX).

### Digital Operations:

The use of Network Access Code (NAC) \$293 has been adopted for all digital operations on Interoperability Channels:

1. Subject to the approval of applicable Statewide Communications Interoperability Plans and/or FCC-approved Regional Plans, Mobile Relay stations that are part of a Local, Regional, or Statewide interoperability network may be equipped with a second receive NAC to provide local ("in cabinet") relay operation, provided:
  - The relay transmitter continues to transmit the Common NAC of \$293 so that all users within range of the station are aware the station is in use;
  - The relay will accept the Common NAC of \$293 and present the audio accompanying the \$293-encoded transmission for automatic in-cabinet repeat or to a live operator at the appropriate controlling dispatch facility; and
  - The operational configuration of the Mobile Relay Station is published in applicable interoperability resource tracking documents (such as the appropriate Tactical Interoperability Communications Plan, Statewide Communications Interoperability Plan, and/or FCC-approved Regional Plan) and databases (CAPRAD, CASM, and NIIX).

## Operating Reference

Morse Code						
Meaning	Code	Meaning	Code	Meaning	Symbol	Code
Letters		Numbers		Punctuation		
A	. _ .	1	. _ _ _ _	Acute	`	
B	_ . . . .	2	. . _ _ _	Ampersand (wait)	&	. _ . . . .
C	_ . . . .	3	. . . _ _	Apostrophe	‘	. _ _ _ . .
D	_ . . . .	4	. . . . _	Asterisk or Star Sign	*	
E	. _ _ _ _	5	. . . . .	At Sign or Commat	@	. _ . . . .
F	. . . . .	6	. . . . .	Brace	{ }	
G	_ . . . .	7	_ . . . .	Bracket	[ ]	
H	. . . . .	8	_ . . . .	Caret	^	
I	. . . . .	9	_ . . . .	Colon	:	_ . . . .
J	. _ . . .	0	_ . . . .	Comma	,	. . . . .
K	. _ . . .			Dollar Sign	\$	. . . . .
L	. . . . .			Double Dash	=	. . . . .
M	_ . . . .			Exclamation Mark	!	. . . . .
N	. _ . . .			Forward Slash	\	
O	_ . . . .			Greater Than	>	
P	. . . . .			Hyphen or Minus	-	. . . . .
Q	. . . . .			Less Than	<	
R	. . . . .			Multiplication Sign	*	. . . . .
S	. . . . .			Number or Pound Sign	#	
T	_ . . . .			Parentheses	( )	. . . . .
U	. . . . .			Percentage Sign	%	
V	. . . . .			Period or Full Stop	.	. . . . .
W	. . . . .			Pipe or Vertical Bar		
X	. . . . .			Plus Sign	+	. . . . .
Y	. . . . .			Question Mark	?	. . . . .
Z	. . . . .			Quotation Mark	“ ”	. . . . .
				Repetition (ii ii)		. . . . .
				Semicolon	;	. . . . .
				Separator		. . . . .
				Slash or Fraction Bar	/	. . . . .
				Tilde	~	
				Underscore	_	. . _ . .

Note: Items listed in **RED** mean that there is currently no corresponding Morse Code.

Prosigns and Abbreviations		
Prosign	Code	Meaning
	. _ .	Invitation to transmit
<u>AA</u>		(Separation between parts of address or signature.).
<u>AR</u>	. _ . . .	End of message. Often written +
<u>AS</u>		Stand by; wait. Respond with C (yes). AS2 means wait 2 minutes
<u>BK</u>		Break; break me; break-in (interrupt transmission on cw. Quick check on phone).
<u>BT</u>	. . .	Separation (break) between address and text; between text and signature.
<u>CL</u>	. . . . .	Clear (I am closing my station, going off the air)
<u>HH</u>		(Error in sending. Transmission continues with last word correctly sent.)
<u>IMI</u>		Repeat; I say again. (Difficult or unusual words or groups.)
<u>K</u>		Go ahead; over; reply expected. (Invitation to transmit .)
<u>KN</u>	. . . . .	Over (invitation to a specific station to transmit)
<u>SK</u>	. . . . .	End of contact, Out (proword)
<u>SOS</u>	. . . . .	International Distress
	. . . . .	Warning

## Operating Reference

Prosigs and Abbreviations		
Prosign	Code	Meaning
161		Best regards & Love and kisses
73		Best regards
88		Love and kisses
AA		All after (used after question mark to request a repetition, used to get fills)
AB		An before (similarly, used to get fills).
ABT		About
ADEE		Addressee (name of person to whom message addressed).
ADR		Address (second part of message).
ADR		Address
AGN		Again
ANT		Antenna
ARL		(Used with "check," indicates use of ARRL numbered message in text).
ARND		Around
ARRL		American Radio Relay League
Attention	.....	Attention
B		More (another message to follow).
B4		Before
BCI		Broadcast interference
BCNU		Be seeing you
BN		All between
BTR		Better
BUG		Semiautomatic mechanical key
C		Correct; yes.
CBA		Callbook address
CFM		Confirm. (Check me on this).
CFM		Confirm
CK		Check.
CLG		Calling
CQ		Calling any station
CQD		Original International Distress Call
CS		Callsign
CTL		Control
CUD		Could
CUL		See you later
CUZ		Because
CW		Continuous wave (i.e., radiotelegraph)
CX		Conditions
DE		From; this is (preceding identification).
DN		Down
DR		Dear
DSW		Goodbye (Russian: до свидания [ <i>Do svidanya</i> ])
DX		Distance (sometimes refers to long distance contact), foreign countries
EMRG		Emergency
ENUF		Enough
Error	.....	Error
ES		And
FB		Fine business (Analogous to "OK")
FCC		Federal Communications Commission
FER		For
FM		From
FREQ		Frequency
FWD		Forward
GA		Good afternoon or Go ahead (depending on context)
GE		Good evening
GG		Going

### Operating Reference

<b>GL</b>		Good luck
<b>GM</b>		Good morning
<b>GN</b>		Good night
<b>GND</b>		Ground (ground potential)
<b>GUD</b>		Good
<b>GX</b>		Ground
<b>HI</b>		Humor intended
<b>HR</b>		Here, hear
<b>HV</b>		Have
<b>HW</b>		How
<b>HX</b>		(Handling instructions. Optional part of preamble.) Initial(s). Single letter(s) to follow.
<b>II</b>		I say again
<b>IMP</b>		Impedance
<b>LID</b>		Poor operator
<b>MILS</b>		Milliamperes
<b>MNI</b>		Many
<b>MSG</b>		Message
<b>N</b>		No, Negative, incorrect; no more. (No more messages to follow.)
<b>N/A</b>		Read back. (Repeat as received.)
<b>NIL</b>		Nothing
<b>NR</b>		Number. (Message follows.)
<b>NR</b>		Number
<b>NW</b>		Now
<b>NX</b>		Noise; noisy
<b>OB</b>		Old boy
<b>OC</b>		Old chap
<b>OK</b>	. _ .	Received
<b>OM</b>		Old man (any male amateur radio operator is an OM)
<b>OO</b>		Official observer
<b>OOTC</b>		Old Old timers club
<b>OP</b>		Operator
<b>OT</b>		Old timer
<b>OTC</b>		Old timers club
<b>PBL</b>		Preamble (first part of message)
<b>PSE</b>		Please
<b>PWR</b>		Power
<b>PX</b>		Prefix
<b>QCWA</b>		Quarter Century Wireless Association
<b>R</b>		Roger, decimal point, received as transmitted or decimal point (depending on context).
<b>RCVR</b>		Receiver (radio)
<b>RFI</b>		Radio Frequency Interference
<b>RIG</b>		Radio apparatus
<b>RPRT</b>		Report
<b>RPT</b>		Repeat or report (depending on context)
<b>RST</b>		Signal report format (Readability-Signal Strength-Tone)
<b>RTTY</b>		Radioteletype
<b>RX</b>		Receiver
<b>SAE</b>		Self-addressed envelope
<b>SASE</b>		Self-addressed, stamped envelope
<b>SED</b>		Said
<b>SEZ</b>		Says
<b>SFR</b>		So far (proword)
<b>SIG</b>		Signal, Signed; signature (last part of message.)
<b>SIGS</b>		Signals
<b>SKED</b>		Schedule
<b>SMS</b>		Short message service
<b>SN</b>		Soon

### Operating Reference

<b>SNR</b>		Signal-to-noise ratio
<b>SRI</b>		Sorry
<b>SSB</b>		Single sideband
<b>STN</b>		Station
<b>T</b>		Zero
<b>TEMP</b>		Temperature
<b>TFC</b>		Traffic
<b>TKS</b>		Thanks
<b>TMW</b>		Tomorrow
<b>TNX</b>		Thanks
<b>TT</b>		That
<b>TU</b>		Thank you.
<b>TVI</b>		Television interference
<b>TX</b>		Transmit, transmitter
<b>TXT</b>		Text
<b>U</b>		You
<b>UR</b>		Your or You're (depending on context)
<b>URS</b>		Yours
<b>VE</b>	... _ .	Understood
<b>VX</b>		Voice; phone
<b>VY</b>		Very
<b>W</b>		Watts
<b>WA</b>		Word after (used to get fills.)
<b>WB</b>		Word before (used to get fills.)
<b>WC</b>		Wilco
<b>WDS</b>		Words
<b>WID</b>		With
<b>WKD</b>		Worked
<b>WKG</b>		Working
<b>WL</b>		Will
<b>WTC</b>		Whats the craic? (Irish Language: [ <i>Conas atá tú?</i> ])
<b>WUD</b>		Would
<b>WX</b>		Weather
<b>XCVR</b>		Transceiver
<b>XMTR</b>		Transmitter
<b>XYL</b>		Wife
<b>YF</b>		Wife
<b>YL</b>		Young lady (used for any female)
<b>ZX</b>		Zero beat

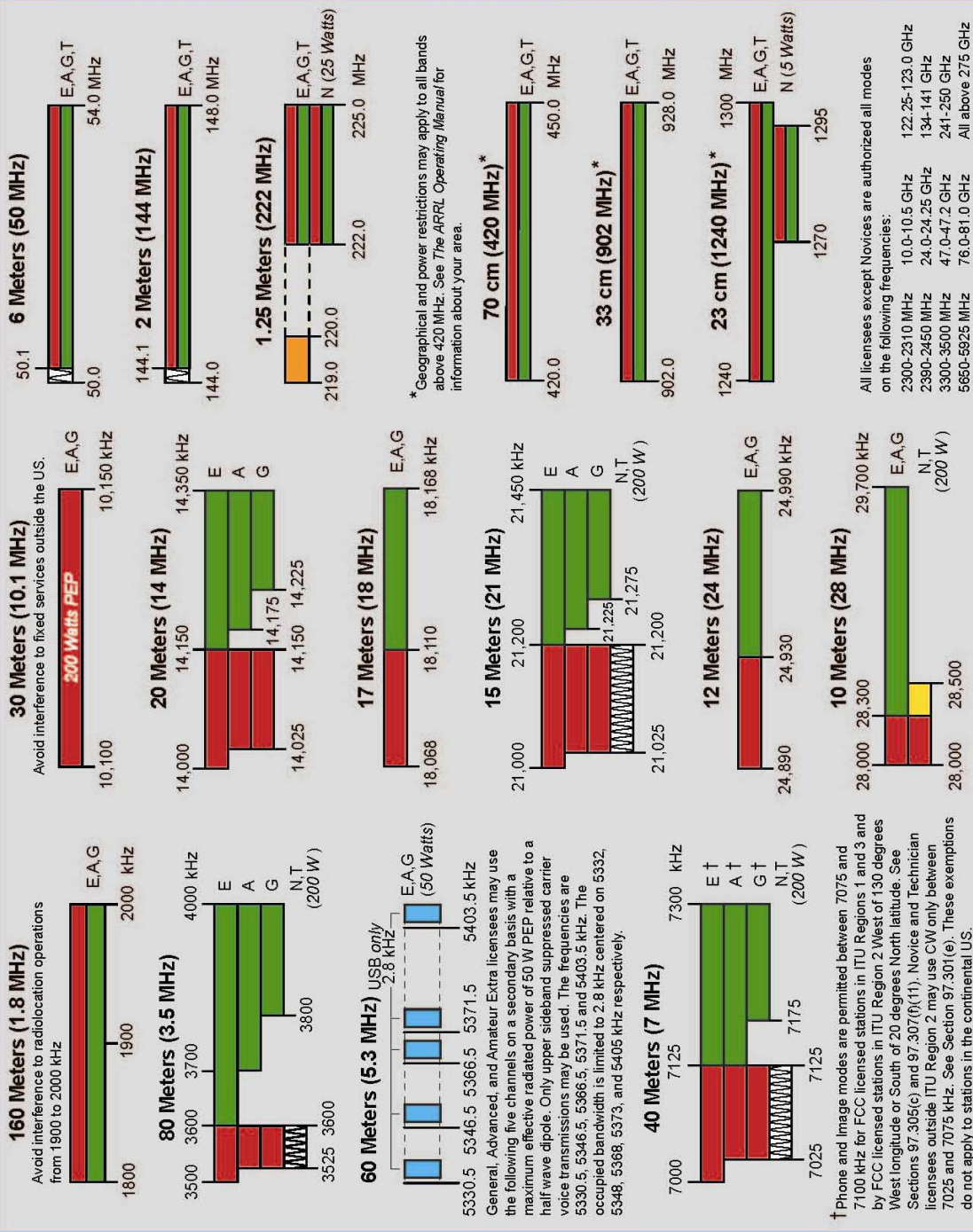
# US Amateur Radio Bands

US AMATEUR POWER LIMITS

At all times, transmitter power should be kept down to that necessary to carry out the desired communications. Power is rated in Watts PEP output. Except where noted, the maximum power output is **1500 Watts**.

Effective Date  
**February 23, 2007**

Published by:  
**ARRL AMATEUR RADIO**  
www.arrl.org  
225 Main Street, Newington, CT USA 06111-1494



\* Geographical and power restrictions may apply to all bands above 420 MHz. See *The ARRL Operating Manual* for information about your area.

All licensees except Novices are authorized all modes on the following frequencies:  
2300-2310 MHz 10.0-10.5 GHz  
2380-2450 MHz 24.0-24.25 GHz  
3300-3500 MHz 47.0-47.2 GHz  
5650-5925 MHz 76.0-81.0 GHz  
All above 275 GHz

**KEY**

Note:  
CW operation is permitted throughout all amateur bands except 80 meters.  
MCW is authorized above 50.1 MHz, except for 219-220 MHz.  
Test transmissions are authorized above 51 MHz, except for 219-220 MHz

- [Red bar] = RTTY and data
- [Green bar] = phone and image
- [Wavy bar] = CW only
- [Yellow bar] = SSB phone
- [Blue bar] = USB phone only
- [Orange bar] = Fixed digital message forwarding systems only

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

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

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[Home](#)



## Operating Reference

### Operating Guidelines:

The primary responsibility of the radio operator is to pass accurate and timely information from the sender to the receiver and follow through with an accurate and timely response to the sender if needed.

Calls and messages on the radio are known as “traffic.” Groupings of radios designed to handle certain types of “traffic” are called “nets.” Several nets may be operating on the incident:

- **Tactical Net:** This net is used by the crews, engines, etc. This net cannot be monitored by the Incident Command Post (ICP), as it is line-of-sight only. Usually a different frequency is assigned to each division. If someone requests this frequency, locate the ICS Form 205 (Incident Radio Communications Plan) and relay the frequency for the specific division requested.
- **Command/Operations Net:** This is the primary incident radio net. Most of the operational traffic is on this net, usually through a repeater, to operations, overhead or the incident base. An example of this would be instructions from the operations section to the field/base or traffic from one division to another concerning personnel movements, fire behavior, etc.
- **Logistics Net:** Logistics net traffic would be checking with the supply unit to see if items have arrived, tracking locations of vehicles and drivers in the ground support unit, calling the food unit for meal hours, etc.
- **Camp Net:** It is used because most units are back at the camp.
- **Air-to-Ground Net:** This is used almost exclusively by the helibase to communicate with aircraft associated with the incident. This is not monitored by the ICP. If someone requests this frequency, locate the ICS Form 205 (Incident Radio Communications Plan) and relay the frequency.
- **Air-to-Air Net:** This net is used strictly between aircraft. The ICP cannot monitor this frequency. If someone requests this frequency, locate the ICS Form 205 (Incident Radio Communications Plan) and relay the frequency.

The station/radio running the ‘Net’ is called ‘Net Control’.

If there is an emergency on the radio net, say: “All Units, There is a Medical Emergency, Please Clear This Frequency”. Repeat as necessary.

The best radio in the world is of little use if messages are misunderstood or can not be heard because of improper use.

- Official Use Only: Agency radios are used only for official business. Many private citizens have scanners capable of monitoring our frequencies. Cooperating agencies and organizations monitor our frequencies for informational purposes.
- When making contact/calling a station for the first time, use the following procedure. We will use the following message as an example:

Station callsign you are calling: **Shelter**

Your callsign station: **A1AA**

Message: Please advise the count of hot lunch meals you require at your location.

Spoken examples are in **Bold**.

- Press and hold the Push-To-Talk (PTT) button on the side of the radio.
- Speak clearly at your normal volume and rate (try to maintain a steady rhythm, speed, volume and pitch) and say “(callsign of station you are calling), Good (Morning/Afternoon/Evening), this is (your callsign), Over.”  
**Shelter, Good Morning, This is A1AA, over.**
- Wait for their response.
- Say the word “Over” to let the other station know you are finished talking. **Shelter, A1AA, go ahead, over.**
- If you have to step away from the radio (to deliver a message, go to the bathroom, etc.), let Net Control know. **Net Control, A1AA, Over** (wait for Net Control to respond). **Net Control, A1AA, away from the radio for** (however many minutes you think you will need) **minutes, over.** There is no hard and fast rule so don’t panic if you say 5 minutes and you come back 10 minutes later. The key is to let Net Control know you are away from the radio so they or someone else does not try to contact you. Wait for Net Control to acknowledge your request before stepping away.
- When you return to the radio, let Net Control know you are back at the radio. **Net Control, A1AA, over** (wait for Net Control to respond). **Net Control, A1AA, back at radio, over.** Wait for Net Control to acknowledge you are back at the radio.
- If you need to have the message repeated in its entirety, say “Say again” **Shelter, A1AA, say again, over.**
- If you need to have part of a message repeated, say “Say again after (last word you clearly heard)”. **Shelter, A1AA, say again after LUNCH, over** (referring to the message example above).
- If you need to have part of a message repeated, say “Say again from (last word you clearly heard) to (the next work you clearly heard). **Shelter, A1AA, say again from COUNT to REQUIRE, over.**

## Operating Reference

- If the other person is talking to fast, say “**Say again slower**”. **Shelter, A1AA, say again slower, over**
- If the other person is talking to slow, say “**Say again faster**”. **Shelter, A1AA, say again faster, over**. It is very rare that you will need someone to talk faster.
- If the other person is talking too quietly, say “**Say again louder**”. **Shelter, A1AA, say again louder, over**.
- If you are leaving the air (going home/shift change), say “**Clear on frequency**”. **Net Control, A1AA, over** (wait for Net Control to respond). **Net Control, A1AA, clear on frequency, over**. Wait for acknowledgement from Net Control clearing you to leave the channel/frequency. Do not just get up and leave.
- Do not change channels/frequencies unless instructed to do so. If you are instructed to change channels/frequencies, note who told you, what channel/frequency you were instructed to change to, who you are to contact on the new channel/frequency and the current date and time. Inform Net Control about channel/frequency change and say “**Request frequency change**”. **Net Control, A1AA, over** (wait for Net Control to respond). **Net Control, A1AA, request frequency change to channel (#) to contact (other station callsign), over**. Wait for Net Control to acknowledge your channel/frequency change.
- Once you are done with the channel/frequency change, return to the original channel/frequency and let Net Control know you have returned. **Net Control, A1AA, over** (wait for Net Control to respond). **Net Control, A1AA, back on channel/frequency, over**. Wait for Net Control to acknowledge your return to the channel/frequency.
- If a station is calling and Net Control cannot hear them, say “**Relay**”. **Net Control, A1AA, over** (wait for Net Control to respond). **Net Control, A1AA, relay, over**. This informs Net Control that you can hear the station calling and are able to relay their message/traffic. Wait for Net Control to acknowledge your offer to relay (Net Control may or may not want you to act as a relay so don’t take offense if Net Control does not take you up on your offer).
- If you could not hear who called you, ask them to identify themselves. For example, “**Station calling, this is (your call sign), please identify yourself, over**” or “**Station calling, this is (your call sign), please repeat, over**”. **Station calling, this is A1AA, please identify yourself, over** or **Station calling, this is A1AA, please repeat, over**.
- Net Control is the person/callsign who is running the net. A ‘net’ is an organizational way to manage callers on a channel/frequency.

### Message Handling:

- Never take for granted that a message has been received. The receiver should verify receipt of the message. Usually they will say “COPY” to tell you they heard the message. Do not acknowledge a transmission unless you are sure that you have it correct and understand it. If the terminology used in the system is unfamiliar to you, learn the terminology (all messages should be in ‘Clear Text’ or plain English). **Shelter, A1AA, copy, over**
- Caution should be exercised in attempting to explain or amplify a message given to you to transmit. If the person receiving the message indicates doubt as to the meaning of a message, repeat the message verbatim. If the person is still unable to understand the meaning of the message, refer the message to the originator for clarification. Use your best qualities of dialect and enunciation. Pronounce words clearly and somewhat slowly: a rate of about 60 words per minute is proper. Always use **CLEAR TEXT** (no codes, just plain English) when talking on the radio. It is your job to not only answer the radio, but to document all messages into and sent out through the radio by you on your shift. This is especially important because follow-up may be needed later by someone else. Your radio log is the official documentation of what happened. If there is a medical claim or other follow-up action, the log becomes a critical document.
- Message Priorities: Radio traffic becomes heavy at times and it may be necessary to set priorities on the messages to be sent. Please observe the following provisions for precedence’s in connection with written message traffic. These provisions are designed to increase the efficiency of radio communications service both in normal times and in emergencies. Priorities have been established in this order:
  - **EMERGENCY:** Any message having life and death urgency to any person or group of persons, which is transmitted by you in the absence of regular commercial facilities. This includes official messages of welfare agencies during emergencies requesting supplies, materials or instructions vital to relief of stricken populace in emergency areas. During normal times, it will be very rare. When in doubt, do not use it.
  - **PRIORITY:** This classification is for a) important messages having a specific time limit b) official messages not covered in the emergency category c) press dispatches and emergency-related traffic not of the utmost urgency d) notice of death or injury in a disaster area, personal or official.
  - **WELFARE:** This classification refers to either an inquiry as to the health and welfare of an individual in the disaster area or an advisory from the disaster area that indicates all is well. Welfare traffic is handled only after all emergency and priority traffic is cleared. The Red Cross equivalent to an incoming Welfare message is DWI (Disaster Welfare Inquiry).

## Operating Reference

- **ROUTINE:** Most traffic in normal times will bear this designation. In disaster situations, traffic labeled Routine should be handled last, or not at all when circuits are busy with higher precedence traffic.
- Plan Your Message: Make your message straight to the point by planning it. Know what you are going to say before you push the microphone button. Do not wait until you start transmitting and then do your thinking out loud, on the radio.
- Profanity: By planning your message you are also less apt to use profanity. Profanity is not allowed and is a violation under Federal Communications Commission (FCC) rules.
- Report Facts: Your messages should contain only facts, not opinions, unless your opinion is asked for.
- Brevity: Your messages should be to the point, factual, and brief. Avoid the use of unnecessary words.
- Clarity: You need to speak clearly, and at a constant speed to avoid misunderstandings. Speaking clearly is essential.
- Normal Conversation: Talk into the microphone at your normal conversation level and speed. If you speak too loudly or too fast, your voice and the message may be distorted.
- Unnecessary Noise: All sounds and noises cannot be avoided. When possible move away from excessive noise and post notices that advise personnel coming in to remain as quiet as possible.
- If you have a long message, break transmission (stop transmitting/release the Push-To-Talk button) every 30 seconds or so and wait before continuing. This allows time for the receiver to write down the message and creates a break on the frequency in case emergency traffic has to break in. Try to keep messages short and concise to avoid tying up the radio channel for too long. **Shelter, A1AA, 10 reducer's inch and a half to one inch, break.** (Pause) Then start up again **Shelter, A1AA, 100 feet of inch and a half hose, etc.** The receiver should reply with "COPY" after each break to let you know they have heard the message sent.
- If your message has numbers in it, when you get to that part of the message say "Numbers" **Shelter, A1AA, Numbers,** (say your numbers).
- If your message contains mixed (letters and numbers), when you get to that part of the message say "Mixed Group" **Shelter, A1AA, Mixed Group,** (say the part of the message containing the mixed letter and number group).
- To return from either of the above to regular text, say "Letters" **Shelter, A1AA, Letters** and continue with your message.
- If your message contains long or complicated words, say "I spell" **Shelter, A1AA, I spell.** Use the phonetic alphabet located in this manual.
- If you have a list of supplies, send it using a fax machine rather than using the radio. This ensures accuracy, provides a copy and does not tie up the radio channels.
- Do not change a single word in a formal relay message: Record and transmit it "as is". If the message seems unclear, clarify with the originator of the message.
- Do not acknowledge a message if you are unsure of its contents or meaning: Do not pass on unclear information.
- VHF/UHF (Very High Frequency/Ultra High Frequency) communications is half-duplex. This means that communications is in one direction at a time (you talk while the other person listens, then they talk while you listen). Your telephone is full duplex (which means you can both talk and listen at the same time).

### Things to NEVER do:

- Do not talk to the media. If you are entering or leaving your Assignment/COOP/AWL (Continuity of Operations/Alternate Work Location) site and anyone (probably from the media) approaches you and wants to talk to you about what is going on there, tell them you are not authorized to discuss anything with them and they need to contact the Public Information Officer (PIO).
- **DO NOT EVER SAY ANYTHING THAT CAN IDENTIFY YOU OR THIS AS GOVERNMENT (Local/State/Federal) OR ARES! ALWAYS USE CALL SIGNS.**
- If there is an injury or fatality, **DO NOT EVER ANNOUNCE THE PERSON(S) NAME OVER THE AIR!** This is a direct violation of Health Insurance Portability and Accountability Act (HIPAA) rules. There might be someone listening on a scanner (the news media often does this). Along with this, do not use your name or anyone else's name over the air for the same reasons. Always use your call sign.
- Profanity is not allowed and is a violation under Federal Communications Commission (FCC) rules.

## **Operating Reference**

### **Transition with Replacement Personnel:**

Brief your replacement on major events from the concluding operational period, unusual situations or conditions, and information required by the Communications Leader. The relief operator should arrive 30 minutes before their shift is supposed to start. This gives them time to be briefed and to familiarize themselves with the working environment. Provide written notes about items that need follow-up during the upcoming operational period. Include the following information:

- Operations Status:
  - Current activities
  - Orders not filled
  - Messages not delivered
  - Messages awaiting reply
  - Site statuses, including new sites opening or closing
- Equipment Status:
  - Incoming order(s)
  - Equipment being demobilized
  - Frequency change(s)
  - Phone number change(s)
  - Shift changes/rotations
- Any unusual communications situations:
  - Operational period change(s)
  - Arrival of new resources
  - Recent or on-going medical emergency(s)

### **Transfer of Command**

The process of moving the responsibility for incident command from one Incident Commander to another is called “transfer of command.” It should be recognized that transition of command on an expanding incident is to be expected. It does not reflect on the competency of the current Incident Commander. There are five important steps in effectively assuming command of an incident in progress.

**Step 1:** The incoming Incident Commander should, if at all possible, personally perform an assessment of the incident situation with the existing Incident Commander.

**Step 2:** The incoming Incident Commander must be adequately briefed. This briefing must be by the current Incident Commander, and take place face-to-face if possible. The briefing must cover the following:

- Incident history (what has happened)
- Priorities and objectives
- Current plan
- Resource assignments
- Incident organization
- Resources ordered/needed
- Facilities established
- Status of communications
- Any constraints or limitations
- Incident potential
- Delegation of Authority

The ICS Form 201 is especially designed to assist in incident briefings. It should be used whenever possible because it provides a written record of the incident as of the time prepared. The ICS Form 201 contains:

- Incident objectives.
- A place for a sketch map.
- Summary of current actions.
- Organizational framework.
- Resources summary.

**Step 3:** After the incident briefing, the incoming Incident Commander should determine an appropriate time for transfer of command.

## Operating Reference

**Step 4:** At the appropriate time, notice of a change in incident command should be made to:

- Agency headquarters (through dispatch).
- General Staff members (if designated).
- Command Staff members (if designated).
- All incident personnel.

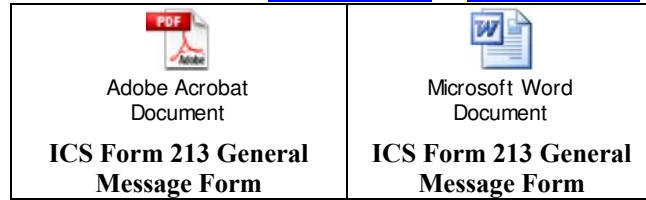
**Step 5:** The incoming Incident Commander may give the previous Incident Commander another assignment on the incident. There are several advantages of this:

The initial Incident Commander retains first-hand knowledge at the incident site. This strategy allows the initial Incident Commander to observe the progress of the incident and to gain experience.

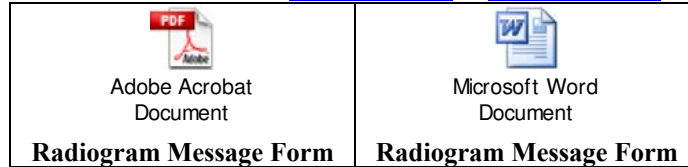
## Operating Reference

### Message Forms

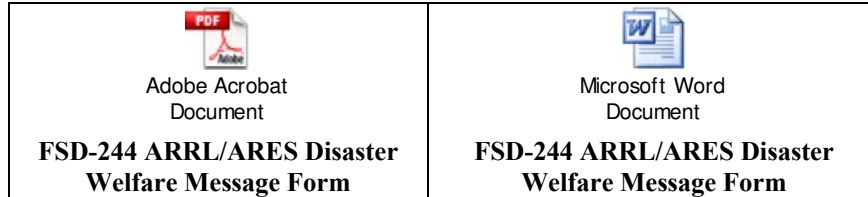
- If you need to take a message, use the FEMA ICS Form 213 General Message Form, or you can double click on the icons to open the embedded files in either [Adobe Acrobat](#) or [Microsoft Word](#):



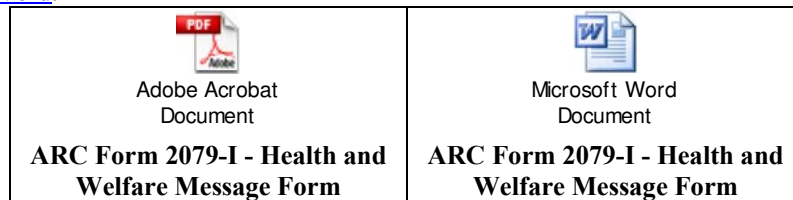
- If you need to take a Radiogram message, use the ARRL Radiogram Message Form, or you can double click on the icons to open the embedded files in either [Adobe Acrobat](#) or [Microsoft Word](#):



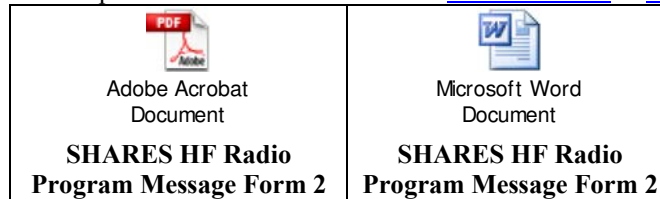
- If you need to take an ARRL/ARES Disaster Welfare message, use the FSD-244 ARRL/ARES Disaster Welfare Message Form, or you can double click on the icons to open the embedded files in either [Adobe Acrobat](#) or [Microsoft Word](#):



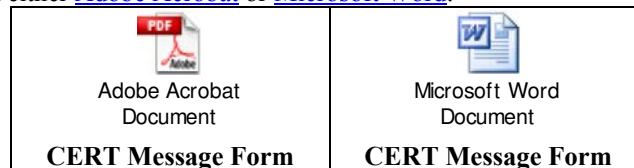
- If you need to take an American Red Cross Disaster Welfare message, use the ARC Form 2079-I - Health and Welfare Message Form, or you can double click on the icons to open the embedded files in either [Adobe Acrobat](#) or [Microsoft Word](#):



- If you need to take a SHARES message, use the SHARES HF Radio Program Message Form 2, or you can double click on the icons to open the embedded files in either [Adobe Acrobat](#) or [Microsoft Word](#):



- If you need to take a CERT message, use the CERT Message Form, or you can double click on the icons to open the embedded files in either [Adobe Acrobat](#) or [Microsoft Word](#):



If you click on either the Adobe Acrobat or Microsoft Word links, they will take you to the appropriate “Download Viewer” page so you can download and install either viewer.



**Operating Reference**  
**Instructions for Filling out the General Message (ICS FORM 213-OS) Form**

**Purpose:** The General Message is used by:

- Incident personnel to record incoming messages which cannot be orally transmitted to the intended recipients; Command Post and other incident personnel to transmit messages to the Incident Communications Center for transmission via radio or telephone to the addressee;
- Incident personnel to send any message or notification to incident personnel which requires a hard-copy delivery; Incident personnel to place resource orders.

**Preparation:** This form is prepared by any incident personnel needing to transmit a hard-copy message. The recipient should send a timely reply to the originator, as necessary.

**Distribution:** Upon completion, the General Message may be hand-carried to the addressee or to the incident Communications Center for transmission. Originator retains a copy of the form. All completed original forms MUST be given to the Documentation Unit.

<b>Item #</b>	<b>Item Title</b>	<b>Instructions</b>
1.	Incident Name	Enter the name assigned to the incident.
2.	Date and Time of Message	Enter the date and time of message origination.
	Message Number	Enter a tracking number of the message for later reference.
3.	To	Enter name and ICS position of message recipient.
4.	From	Enter name and ICS position of message sender.
5.	Subject	Indicate the message subject.
6.	Message	Enter message.
7.	Reply	This section to be used by the unit/person who receives the message to reply to your message.
8.	Signature/Position	Enter name and position of person replying to this message.
	Date/Time of reply	Enter date (month, day & year) and time of reply (24-hour clock).

Please be civil and do not put anything mean or degrading in the message as these message forms may become permanent files for the incident and may be subject to review later.



## Operating Reference

ARRL Radiogram							
Number	Precedence	HX	Station of Origin	Check	Place of Origin	Time Filed	Date
	Emergency P W R	A B C D E F G					
<b>To:</b>				<b>This Radio Message was received at:</b>			
Name _____				Amateur Station _____ Date _____			
Address _____				Name _____			
City, State & _____				Address _____			
ZIP _____				City, State & ZIP _____			
Telephone _____							
Message							
REC'D	From	Date	Time	SENT	To	Date	Time

A licensed Amateur Radio Operator, whose address is shown above, handled this message free of charge. As such messages are handled solely for the pleasure of operating; a "Ham" Operator can accept no compensation. A return message may be filed with the "Ham" delivering this message to you. Further information on Amateur Radio may be obtained from ARRL Headquarters, 225 Main Street, Newington, CT 06111.

The American Radio Relay League, Inc. is the National Membership Society of licensed radio amateurs and the publisher of QST Magazine. One of their functions is promotion of public service communication among Amateur Operators. To that end, The League has organized the National Traffic System (NTS) for daily nationwide message handling.

ARRL Radiogram							
Number	Precedence	HX	Station of Origin	Check	Place of Origin	Time Filed	Date
	Emergency P W R	A B C D E F G					
<b>To:</b>				<b>This Radio Message was received at:</b>			
Name _____				Amateur Station _____ Date _____			
Address _____				Name _____			
City, State & _____				Address _____			
ZIP _____				City, State & ZIP _____			
Telephone _____							
Message							
REC'D	From	Date	Time	SENT	To	Date	Time

A licensed Amateur Radio Operator, whose address is shown above, handled this message free of charge. As such messages are handled solely for the pleasure of operating; a "Ham" Operator can accept no compensation. A return message may be filed with the "Ham" delivering this message to you. Further information on Amateur Radio may be obtained from ARRL Headquarters, 225 Main Street, Newington, CT 06111.

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## Operating Reference

### Instructions for Filling out the ARRL Radiogram

Item Title	Instructions
Number	Message number, used for tracking purposes
Precedence	<p>EMERGENCY: Any message having life and death urgency to any person or group of persons, which is transmitted by you in the absence of regular commercial facilities. This includes official messages of welfare agencies during emergencies requesting supplies, materials or instructions vital to relief of stricken populace in emergency areas. During normal times, it will be very rare. When in doubt, do not use it.</p> <p>PRIORITY: This classification is for a) important messages having a specific time limit b) official messages not covered in the emergency category c) press dispatches and emergency-related traffic not of the utmost urgency d) notice of death or injury in a disaster area, personal or official.</p> <p>WELFARE: This classification refers to either an inquiry as to the health and welfare of an individual in the disaster area or an advisory from the disaster area that indicates all is well. Welfare traffic is handled only after all emergency and priority traffic is cleared. The Red Cross equivalent to an incoming Welfare message is DWI (Disaster Welfare Inquiry).</p> <p>ROUTINE: Most traffic in normal times will bear this designation. In disaster situations, traffic labeled Routine should be handled last, or not at all when circuits are busy with higher precedence traffic.</p>
HX	<p>HXA: (Followed by number) Collect landline delivery authorized by addressee within _____ miles. (If no number, authorization is unlimited.)</p> <p>HXB: (Followed by number) Cancel message if not delivered within _____ hours of filing time; service originating station.</p> <p>HXC: Report date and time of delivery (TOD) to originating station.</p> <p>HXD: Report to originating station the identity of station from which received, plus date and time.</p> <p>Report identity of station to which relayed, plus date and time, or if delivered report date, time and method of delivery.</p> <p>HXE: Delivering station get reply from addresses, originate message back.</p> <p>HXF: (Followed by number) Hold delivery until _____ (date).</p> <p>HXG: Delivery by mail or landline toll call not required. If toll or other expense involved, cancel message and service originating station.</p>
Station of Origin	Location of station sending message (first amateur handler).
Check	Total word count of actual message.
Place of Origin	Location of message origination (not necessarily location of station of origin).
Time Filed	Time the message was filed.
Date	Date message was filed.
To	Whom the message is for/going to.
This Radio Message was received at	Information of station receiving message.
Message	Contents of message (limit to 25 words or less, if possible). Be attentive if using ARL message numbers.
REC'D	Fill in the following information: From- Callsign of station sending message, Date- Date message received, Time- Time message received (24-hour clock)
SENT	Fill in the following information: To- Callsign of station receiving message, Date- Date message sent, Time- Time message sent (24-hour clock)

Please be civil and do not put anything mean or degrading in the message as these message forms may become permanent files for the incident and may be subject to review later.

**Operating Reference**

FSD-244 ARRL/ARES Disaster Welfare Message Form							
Number	Precedence	HX	Station of Origin	Check	Place of Origin	Time Filed	Date
	Emergency P W R	A B C D E F G					
<b>To:</b> Name _____ Address _____ City & State _____ ZIP code _____ Telephone _____				<b>Message Receipt or Delivery Information:</b> Operator _____ Station _____ Sent To _____ Delivered To _____ Date & Time _____			
<b>Circle not more than two standard texts from the list below</b>							
<b>ARL ONE</b> Everyone safe here. Please don't worry. <b>ARL TWO</b> Coming home as soon as possible. <b>ARL THREE</b> Am in _____ hospital. Receiving excellent care and recovering fine. <b>ARL FOUR</b> Only slight property damage here. Do not be concerned about disaster reports. <b>ARL FIVE</b> Am moving to new location. Send no further mail or communications. Will inform you of new address when relocated. <b>ARL SIX</b> Will contact you as soon as possible. <b>ARL SIXTY-FOUR</b> Arrived safely at _____.							
Time	Date	Telephone	Signature	Name			

FSD-244 ARRL/ARES Disaster Welfare Message Form							
Number	Precedence	HX	Station of Origin	Check	Place of Origin	Time Filed	Date
	Emergency P W R	A B C D E F G					
<b>To:</b> Name _____ Address _____ City & State _____ ZIP code _____ Telephone _____				<b>Message Receipt or Delivery Information:</b> Operator _____ Station _____ Sent To _____ Delivered To _____ Date & Time _____			
<b>Circle not more than two standard texts from the list below</b>							
<b>ARL ONE</b> Everyone safe here. Please don't worry. <b>ARL TWO</b> Coming home as soon as possible. <b>ARL THREE</b> Am in _____ hospital. Receiving excellent care and recovering fine. <b>ARL FOUR</b> Only slight property damage here. Do not be concerned about disaster reports. <b>ARL FIVE</b> Am moving to new location. Send no further mail or communications. Will inform you of new address when relocated. <b>ARL SIX</b> Will contact you as soon as possible. <b>ARL SIXTY-FOUR</b> Arrived safely at _____.							
Time	Date	Telephone	Signature	Name			

## Operating Reference

### Instructions for Filling out the FSD-244 ARES Disaster Welfare Message Form

Item Title	Instructions
Number	Message number, used for tracking purposes. Begin with 1 each month or year.
Precedence	<p>EMERGENCY: Any message having life and death urgency to any person or group of persons, which is transmitted by you in the absence of regular commercial facilities. This includes official messages of welfare agencies during emergencies requesting supplies, materials or instructions vital to relief of stricken populace in emergency areas. During normal times, it will be very rare. When in doubt, do not use it.</p> <p>PRIORITY: This classification is for a) important messages having a specific time limit b) official messages not covered in the emergency category c) press dispatches and emergency-related traffic not of the utmost urgency d) notice of death or injury in a disaster area, personal or official.</p> <p>WELFARE: This classification refers to either an inquiry as to the health and welfare of an individual in the disaster area or an advisory from the disaster area that indicates all is well. Welfare traffic is handled only after all emergency and priority traffic is cleared. The Red Cross equivalent to an incoming Welfare message is DWI (Disaster Welfare Inquiry).</p> <p>ROUTINE: Most traffic in normal times will bear this designation. In disaster situations, traffic labeled Routine should be handled last, or not at all when circuits are busy with higher precedence traffic.</p>
HX	<p>HXA: (Followed by number) Collect landline delivery authorized by addressee within ____ miles. (If no number, authorization is unlimited.)</p> <p>HXB: (Followed by number) Cancel message if not delivered within ____ hours of filing time; service originating station.</p> <p>HXC: Report date and time of delivery (TOD) to originating station.</p> <p>HXD: Report to originating station the identity of station from which received, plus date and time. Report identity of station to which relayed, plus date and time, or if delivered report date, time and method of delivery.</p> <p>HXE: Delivering station get reply from addresses, originate message back.</p> <p>HXF: (Followed by number) Hold delivery until ____ (date).</p> <p>HXG: Delivery by mail or landline toll call not required. If toll or other expense involved, cancel message and service originating station.</p>
Station of Origin	Location of station sending message (first amateur handler).
Check	Total word count of actual message.
Place of Origin	Location of message origination (not necessarily location of station of origin).
Time Filed	Time the message was filed.
Date	Date message was filed.
To	Whom the message is for/going to.
Message Receipt or Delivery Information	Fill in information.
Circle not more than two standard texts from the list below	Circle not more than two standard texts from the list and fill in if needed. Contents of message (limit to 25 words or less, if possible). Be attentive if using ARL message numbers.
Time/Date/Telephone/Signature/Name	Fill in information for person making request.

Please be civil and do not put anything mean or degrading in the message as these message forms may become permanent files for the incident and may be subject to review later.

Operating Reference

**Do you have an immediate family member you have been unable to contact because of the disaster?**

The American Red Cross Disaster Welfare Information function can assist you. We will be happy to contact your relative and pass a brief message to them concerning your health and welfare following this disaster.

Please complete the information requested below, sign the form permitting us to contact your relative, and return it to the Red Cross worker with whom you are meeting.

Thank you and we look forward to reconnecting you with your family.

Client Information

Name		Date	
Pre-Disaster Address			
Post-Disaster Address			
Pre-Disaster Phone		Post-Disaster Phone	

Family Contact Information

Name		Relationship to You	
Address			
Phone		E-mail	
Your Short Message:			

Client Release to Contact Family

I authorize the American Red Cross to contact the designated family member to relay the above, informing them of my current health and welfare. I  do/  do not grant permission for the above designated family member to notify other family members.

Signature of Client \_\_\_\_\_ Date \_\_\_\_\_

Printed Name of Client \_\_\_\_\_

Name of Red Cross Worker \_\_\_\_\_ Function \_\_\_\_\_









## Operating Reference

NCDXF/IARU Beacon Transmission Schedule								
Written by Xavier				Wednesday, 08 August 2007				
Call	Location	14.100	18.110	21.150	24.930	28.200	Operator	Grid Square
<a href="#">4U1UN</a>	<a href="#">United Nations</a>	00:00	00:10	00:20	00:30	00:40	UNRC	FN30as
<a href="#">VE8AT</a>	<a href="#">Canada</a>	00:10	00:20	00:30	00:40	00:50	<a href="#">RAC/NARC</a>	EQ79ax
<a href="#">W6WX</a>	<a href="#">United States</a>	00:20	00:30	00:40	00:50	01:00	<a href="#">NCDXF</a>	CM97bd
<a href="#">KH6WO</a>	<a href="#">Hawaii</a>	00:30	00:40	00:50	01:00	01:10	<a href="#">KH6BYU</a>	BL11ap
<a href="#">ZL6B</a>	<a href="#">New Zealand</a>	00:40	00:50	01:00	01:10	01:20	<a href="#">NZART</a>	RE78tw
<a href="#">VK6RBP</a>	<a href="#">Australia</a>	00:50	01:00	01:10	01:20	01:30	<a href="#">WIA</a>	OF87av
<a href="#">JA2IGY</a>	<a href="#">Japan</a>	01:00	01:10	01:20	01:30	01:40	<a href="#">JARL</a>	PM84jk
<a href="#">RR90</a>	<a href="#">Russia</a>	01:10	01:20	01:30	01:40	01:50	<a href="#">SRR</a>	NO14kx
<a href="#">VR2B</a>	<a href="#">Hong Kong</a>	01:20	01:30	01:40	01:50	02:00	<a href="#">HARTS</a>	OL72bg
<a href="#">4S7B</a>	<a href="#">Sri Lanka</a>	01:30	01:40	01:50	02:00	02:10	<a href="#">RSSL</a>	NJ06cc
<a href="#">ZS6DN</a>	<a href="#">South Africa</a>	01:40	01:50	02:00	02:10	02:20	<a href="#">ZS6DN</a>	KG44dc
<a href="#">5Z4B</a>	<a href="#">Kenya</a>	01:50	02:00	02:10	02:20	02:30	<a href="#">ARSK</a>	KI88ks
<a href="#">4X6TU</a>	<a href="#">Israel</a>	02:00	02:10	02:20	02:30	02:40	<a href="#">IARC</a>	KM72jb
<a href="#">OH2B</a>	<a href="#">Finland</a>	02:10	02:20	02:30	02:40	02:50	<a href="#">SRAL</a>	KP20
<a href="#">CS3B</a>	<a href="#">Madeira</a>	02:20	02:30	02:40	02:50	00:00	<a href="#">ARRM</a>	IM12or
<a href="#">LU4AA</a>	<a href="#">Argentina</a>	02:30	02:40	02:50	00:00	00:10	<a href="#">RCA</a>	GF05tj
<a href="#">OA4B</a>	<a href="#">Peru</a>	02:40	02:50	00:00	00:10	00:20	<a href="#">RCP</a>	FH17mw
<a href="#">YV5B</a>	<a href="#">Venezuela</a>	02:50	00:00	00:10	00:20	00:30	<a href="#">RCV</a>	FK60nj

All about Beacon Project at: <http://www.ncdxf.org/beacons.html>

[Home](#)

## Operating Reference

National Capital ARES® Council Frequencies (All frequencies are in MHz)				
Jurisdiction	Primary Repeater	Secondary Repeater	Simplex	Packet
<b>Maryland</b>	147.105	146.730	3.920	144.390
Anne Arundel	146.805	147.105		145.750
Calvert	146.985 PL156.7	147.195 PL156.7	146.580	
Charles	145.390 PL186.2	443.700		
DC	145.430	147.045	146.505	
Frederick	147.060			
Hagerstown	147.090			
Montgomery	146.955	145.450	146.460	145.750
Prince George	146.610	146.880 & 147.150PL114.8	147.540	145.750
Skywarn	147.300			
Towson	147.030			145.730
ARC (Chapter-Chapter)			146.535	
ARC (On-Site)			147.420	
Baltimore Traffic Net	146.670			
<b>Virginia</b>	149.910 (Primary) 147.300 (Alt/Liaison) 145.210 PL141.3 (Western Counties)		3.947 or 7.240 (Alt)	145.730 144.390
Alexandria	146.655 PL141.3	147.315	146.490	
Arlington	445.150	449.325 PL151.4	445.959	
Fairfax	146.790	146.910 & 224.100	146.415	
Falls Church	447.425 PL91.5	147.210	147.540	
Fauquier	147.165			
Loudoun	145.310	443.225 PL103.5 (Portable) 147.330 PL203.5 (Dulles Airport 15W)	147.480	
Prince William	146.970 (Manassas) 147.240 (Woodbridge)	444.900 (Woodbridge) 442.200 (Manassas)	147.525 (Primary) 146.475 (Secondary) 445.925 (Tertiary)	145.730
Skywarn	147.300			
MedComm			146.445	145.730
ARC (Chapter-Chapter)			146.535	
ARC (On-Site)			147.420	
Northern Virginia Traffic Net	147.300			
<ul style="list-style-type: none"> <li>• These tables represent the NCAC Coordinated frequencies for ARES ®/RACES nets in the Greater Metro Washington, DC area. In the event of a regional emergency in Maryland, logistics support will be requested on 146.910 (VA). In the event of a regional emergency in Virginia, logistical support will be requested on 147.105 (MD).</li> <li>• Corrections and additions may be submitted by ECs and/or ROs to David Lane, KG4GIY (<a href="mailto:kg4giy@arri.net">kg4giy@arri.net</a>). The most current frequency list can be found at <a href="http://www.ncacdc.com/">http://www.ncacdc.com/</a>. In the event of an emergency, tune your radio to the logistics frequency and check in as instructed.</li> <li>• 144.390 MHz is the National APRS frequency. Set a CT tone of 100 Hz to “quiet” the radio and it will “beep” if there is a station within a mile or two of your position. Along with doing that, monitor 147.525 MHz and when the radio “beeps” from a nearby station, ask who is calling CQ.</li> </ul>				

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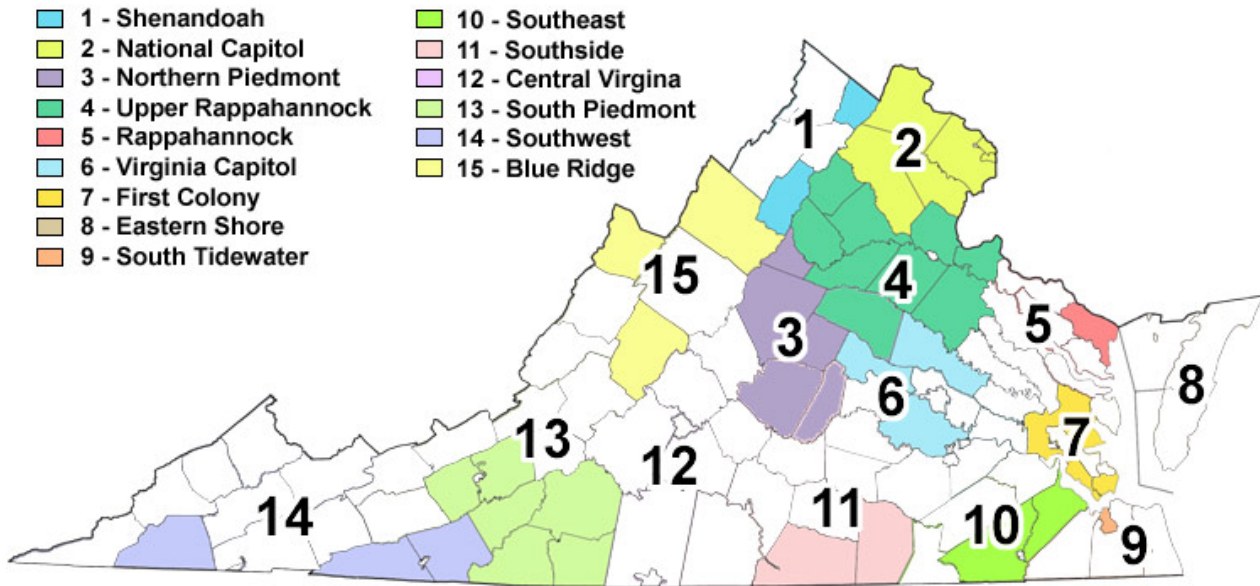
## Operating Reference

<b>Prince William County ARES @/RACES Frequencies</b> (All frequencies are in MHz)				
<b>Channel:</b>	<b>Name:</b>	<b>Function:</b>	<b>Frequency:</b>	<b>Remarks:</b>
1	OVH2M	Operations & Logistics	146.970- or 147.240+	Logistics Net
2	WWI2M	Operations & Logistics	147.240+ or 146.970-	Operations Net
3	NVFM2M	Fairfax ARES	146.790-	Fairfax ARES Logistics/Operations Net
4	NVREGN	Northern Virginia Regional Operations and Coordination	146.910- (Primary) 147.300+ (Alt/Liaison) 145.210 PL141.3 (Western Counties)	Washington Metro Regional Logistics Net (VA)
5	SKYWARN	Skywarn	147.300+	Skywarn/District 2/NVTN Regional Repeater
6	MDREGN	Maryland Regional Operations and Coordination	147.105+ (Primary) 146.730 (Secondary)	Washington Metro Regional Logistics Net (MD)
7	MTVERN	Mount Vernon (Alexandria)	146.655- PL141.3	Mount Vernon/Alexandria
8	ALEX2M	Alexandria ARES	147.315+	Alexandria ARES
9	ARL2M	Arlington ARES	145.470-	Arlington ARES
10	FAQ2M	Fauquier ARES	147.470+ PL167.9	Fauquier ARES
11	LOU2M	Loudon ARES	145.310-	Loudon ARES
12	DULLES	Dulles Airport	147.330+ PL203.5	Dulles Airport 2M, 15W output MAX
21	OVH440	Command and Control (CnC), Operations and Logistics	442.200+	W4OVH 440 Repeater (Logistics/CnC)
22	WWI440	Command and Control (CnC), Operations and Logistics	444.900+	WWI 440 Repeater (Logistics/CnC)
23	FALLSC	Falls Church ARES	442.425- PL91.5	Falls Church ARES
24	NERA	NERA Main Repeater	442.725+ PL107.2	NERA Main Repeater, Linked System
25	NERA	NERA DC	449.975+ PL107.2	NERA DC Repeater, Linked System
26	NERA	NERA Bull Run Mountain	448.325- PL100.0	NERA Bull Run Mountain Repeater, Linked System
31	VHF1	PWCARES VHF1	147.525	PWCARES VHF Channel 1
32	VHF2	PWCARES VHF2	146.475	PWCARES VHF Channel 2
33	MEDCOM	MedComm	146.445	MedComm Inter-hospital Communications
34	ARC-CHP	Red Cross Chapter-to-Chapter	146.535	American Red Cross Chapter-Chapter Communications
35	ARC-FLD	Red Cross Field Operations	147.420	American Red Cross Field/On-Site Communications
36	XBAND1	Cross Band	445.950 PL100.0	Combine with 147.525 (VHF1) on left band
37	XBAND2	Cross Band	446.050 PL100.0	Combine with 146.475 (VHF2) on left band
38	XBAND3	Cross Band	445.975 PL100.0	Combine with 146.970 (OVH2M) on left band
39	XBAND4	Cross Band	446.025 PL100.0	Combine with 147.240 (WWI2M) on left band
40	PACKET	Packet	145.730 @ 1200 baud	Packet
41	APRS	APRS	144.390	Optional CT 100.0, Monitor 147.525

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### Operating Reference

Additional Frequencies				
Channel:	Name:	Function:	Frequency:	Remarks:
		ODEN VEN/A	3.947 or 7.240 (Alt)	VA State HF Emergency Net
		ODEN VEN/B	3.943 or 7.248 (Alt)	Overflow for ODEN/A. Can be used as (1) hospital and medical support net, (2) logistics net, (3) H&W traffic net, as required.
		ODEN VEN/C	3.5785 CW or 7.050 CW (Alt)	H&W CW Traffic Net
		ODEN VEN/D	3.5785 or 7.050 (Alt)	H&W digital traffic net; can also be used for logistics and/or medical support net. Primary mode is CHIP64 (USB & 1300 Hz offset). Alternate modes could include PSK31, MFSK16, and RTTY
		OVH220	224.660-	W4OVH 220 Repeater (Logistics/CnC)
	Packet	Packet	145.030 @ 1200 baud	W4OVH 2M Packet Node
		VDEN	145.730 at 1200 baud	Primary user frequency
		VDEN	441.050 at 9600 baud	UHF 'High speed' backbone
		VDEN	446.075 at 1200 baud	UHF 'Low speed' backbone
		EOC Comms	445.925	EOC to Radio Room Communications



<http://www.aresva.org/aresva.html>

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## Operating Reference

Virginia Section NTS Nets (All frequencies are in MHz)					
Time	Day	Frequency	Net Name	Mode	Net Manager
1800 EST	Daily	3.947	Virginia Sideband Net (VSBN)	LSB	K0IBS
1830 EST	1 <sup>st</sup> & 3 <sup>rd</sup> M	3.947	<a href="#">Old Dominion Emergency Net (ODEN)</a>	LSB	K3EP
1900 EST	Daily	3.5785	Virginia Net Early (VNE)	CW	KV4AN
1915 EST	T, F	3.5785	Virginia Digital Net (VDN)	USB	W4TY
2200 EST	Daily	3.947	Virginia Late Net (VLN)	LSB	W4CAC
Other NTS Nets					
1345 EST	Daily	7.243	4th Region Net (4RN)	LSB	
1530 EST	Daily	7.243	4th Region Net (4RN)	LSB	
1930 EST	Daily	3.563	<a href="#">Maryland Slow Net (MSN)</a>	CW	
1945 EST	Daily	3.567 or 7.051	4th Region Net (4RN)	CW	
2000 EST	Daily	3.571	<a href="#">Carolinas Slow Net (CSN)</a>	CW	W4EAT
2130 EST	Daily	3.567	4th Region Net (4RN)	CW	
Virginia Section Wide-Area FM Nets					
1930 EST	Daily	147.300	<a href="#">Northern Virginia Traffic Net (NVTN)</a>		W1CAR
2000 EST	S, T, Th	146.850	Southeastern Virginia Traffic Net (SVTN)		KI4GWC
2000 EST	F	146.850	Portsmouth Amateur Radio Emergency Services Net (PARES)		KI4GWC
2030 EST	M	147.255	Eastern Shore Emergency Services Net		K4BW
Additional Nets					
As Needed	As Needed	14.325	<a href="#">Hurricane Watch Net</a> (Primary)		
As Needed	As Needed	3.950	<a href="#">Hurricane Watch Net</a> (Secondary)		
As Needed	As Needed	Primary: EchoLink *WX-TALK* Conference server Node # 7203 & IRLP Reflector Node # 9219 Secondary: EchoLink Conference *VKEMCOMM* Node #:270177 & IRLP Reflector 9508 Tertiary: EchoLink *NEW-ENG* Conference Server Node #:9123 & IRLP Reflector 9123		<a href="#">VoIP Skywarn/Hurricane Net</a>	
1500 EST	Daily	14.265	Salvation Army Team Emergency Radio Network “ <a href="#">SATERN</a> ”		
0745	Daily	7.268	<a href="#">Waterway Net</a>		
Wilderness Protocol					
The Wilderness protocol (see page 101, August 1995 QST) calls for hams in the wilderness to announce their presence on, and to monitor, the national calling frequencies for five minutes beginning at the top of the hour, every three hours from 7 AM to 7 PM while in the back country. A ham in a remote location may be able to relay emergency information through another wilderness ham that has better access to a repeater. National calling frequencies: 52.525, 146.52, 223.50, 446.00, 1294.50 MHz.					

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## Operating Reference

APRS Packet Nodes ( <a href="#">LINK</a> ) (All frequencies are in MHz)					
Callsign	Alias	Frequency	City	Coordinates	Features
KB2CEV		144.390	Chantilly, MD	<a href="#">38°54'58"N 77°30'39"W</a>	
N3UJJ		144.390	Edgewater, MD	<a href="#">38°54'34"N 76°31'07"W</a>	Digi/iGate
K4FDS-5	Mill Mtn.	144.390	Roanoke, VA	<a href="#">37°15'1"N 79°55'59"W</a>	1200 baud
KD4BNQ-3		144.390	Dismal Peak, VA	<a href="#">37°14'51"N 80°51'20"W</a>	1200 baud
KW4FM-3	Sand Mtn.	144.390	Wytheville, VA	<a href="#">36°54'17"N 81°4'4"W</a>	1200 baud
WA1ZMS-1	Apple Orchard Mtn.	144.390	Glasgow, VA	<a href="#">37°31'0"N 79°30'21"W</a>	1200 baud
KC8SDN-5		144.390	Richwood, WV	<a href="#">38°6'35"N 80°35'27"W</a>	1200 baud
KC8TYK-9		144.390	Belington, WV	<a href="#">39°1'19"N 80°1'33"W</a>	1200 baud
KE8NK-3		144.390	Pennsboro, WV	<a href="#">39°17'50"N 80°58'34"W</a>	1200 baud
KN0BY		144.390	Charleston, WV	<a href="#">38°21'14"N 81°37'34"W</a>	I-Gate via TCPIP
KN0BY-1		144.390	Huntington, WV	<a href="#">38°25'22"N 82°25'28"W</a>	I-Gate via TCPIP
W8GK-5		144.390	Charleston, WV	<a href="#">38°21'2"N 81°36'19"W</a>	1200 baud
WC8EC-7		144.390	Mineralwells, WV	<a href="#">39°14'33"N 81°27'19"W</a>	1200 baud

- 144.390 MHz is the National APRS frequency. Set a CT tone of 100 Hz to “quiet” the radio and it will “beep” if there is a station within a mile or two of your position. Along with doing that, monitor 147.525 MHz and when the radio “beeps” from a nearby station, ask who is calling CQ.

ATV Repeaters ( <a href="#">LINK</a> ) (All frequencies are in MHz)				
Callsign	City	State	2M	70cm
WB3DZO/R	Baltimore	MD	147.030 +	
<a href="#">KB4CVN/R</a>	Lynchburg	VA		420.050 +

D-STAR Repeaters ( <a href="#">LINK</a> ) (All frequencies are in MHz)						
Callsign	City	State	2M	70cm	23cm	23cm DD
<a href="#">WW4EMC</a>	Spotsylvania	VA	145.2400 -	448.4600 -	1282.4000 - 12.000	1254.000
<a href="#">NV4FM</a>	Tysons Corner	VA	145.3400 -	448.0350 -	1282.8000 - 12.000	1254.200
<a href="#">W4BBR</a>	Virginia Beach	VA	145.3500 -	441.9000 +	1284.6000 - 12.000	
<a href="#">N4USI</a>	Haymarket	VA	145.4500 -	442.4125 +		
<a href="#">WD4HRO</a>	Woodbridge	VA			1293.0000 - 20.000	1254.000
<a href="#">W4HFH</a>	Alexandria	VA	145.3800 -	442.0600 +	1284.6000 - 12.000	1253.600
<a href="#">WS4VA</a>	Stafford	VA	147.3750 +	447.2750 -	1282.2000 - 12.000	1298.400
<a href="#">W4FJ</a>	Richmond	VA	147.2550 +			
2M (Usually "C" Node)		70cm (Usually "B" Node)		23cm Voice (Usually "A" Node)		

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## Operating Reference

Echolink Nodes ( <a href="#">LINK</a> ) or <a href="http://www.echolink.org">www.echolink.org</a> (All frequencies are in MHz)																													
<p><b>#2206 NV4AA-L</b> Round Hill, VA 146.505 PL107.2</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><th colspan="2" style="text-align: center;">DTMF Codes</th></tr> <tr><td style="width: 10%;">#</td><td>disconnect</td></tr> <tr><td>08</td><td>linkstatus</td></tr> </table>	DTMF Codes		#	disconnect	08	linkstatus	<p><b>#4111 K1CV-L</b> Garrisonville, VA 147.555 PL123.0</p>	<p><b>#37200 N4DSL-R</b> Harrisonburg, VA 443.150 PL131.8</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><th colspan="2" style="text-align: center;">DTMF Codes</th></tr> <tr><td style="width: 10%;">#*nnnn</td><td>connect</td></tr> <tr><td>#B</td><td>disconnect</td></tr> <tr><td>#A</td><td>linkstatus</td></tr> <tr><td>#08</td><td>playinfo</td></tr> </table>	DTMF Codes		#*nnnn	connect	#B	disconnect	#A	linkstatus	#08	playinfo	<p><b>#49660 WB4SUB-L</b> Portsmouth, VA 146.415 (no PL)</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><th colspan="2" style="text-align: center;">DTMF Codes</th></tr> <tr><td style="width: 10%;">#</td><td>disconnect</td></tr> <tr><td>08</td><td>linkstatus</td></tr> <tr><td>*.)</td><td>playinfo</td></tr> </table>	DTMF Codes		#	disconnect	08	linkstatus	*.)	playinfo		
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<p><b>#52555 N4NW-R</b> Stafford, VA 145.375+ PL79.7</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><th colspan="2" style="text-align: center;">DTMF Codes</th></tr> <tr><td style="width: 10%;">n/a</td><td>uplink</td></tr> <tr><td>n/a</td><td>downlink</td></tr> <tr><td>C</td><td>connect</td></tr> <tr><td>#</td><td>disconnect</td></tr> <tr><td>B</td><td>linkstatus</td></tr> <tr><td>*</td><td>playinfo</td></tr> </table>	DTMF Codes		n/a	uplink	n/a	downlink	C	connect	#	disconnect	B	linkstatus	*	playinfo	<p><b>#53005 KG4LUL-L</b> Lynchburg, VA 146.430 PL123.0</p>	<p><b>#57604 KC4SUE-L</b> Martinsville, VA 147.285+ PL107.2</p>	<p><b>#69078 W4CLJ-R</b> Dale City, VA 444.950 PL123.0</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><th colspan="2" style="text-align: center;">DTMF Codes</th></tr> <tr><td style="width: 10%;">#</td><td>disconnect</td></tr> <tr><td>*0</td><td>playinfo</td></tr> </table>	DTMF Codes		#	disconnect	*0	playinfo						
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<p><b>#77982 NA5B-L</b> Springfield, VA 145.650 (no PL)</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><th colspan="2" style="text-align: center;">DTMF Codes</th></tr> <tr><td style="width: 10%;">D</td><td>disconnect</td></tr> <tr><td>08</td><td>linkstatus</td></tr> </table>	DTMF Codes		D	disconnect	08	linkstatus	<p><b>#91801 AE4XI-L</b> Virginia Beach, VA 145.530 (no PL)</p>	<p><b>#93516 KG4YJB-L</b> Petersburg, VA 444.275+ PL103.5</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><th colspan="2" style="text-align: center;">DTMF Codes</th></tr> <tr><td style="width: 10%;">#</td><td>connect</td></tr> <tr><td>#73</td><td>disconnect</td></tr> <tr><td>#08</td><td>linkstatus</td></tr> <tr><td>#*</td><td>playinfo</td></tr> </table>	DTMF Codes		#	connect	#73	disconnect	#08	linkstatus	#*	playinfo	<p><b>#175627 KI4EKI-L</b> Annandale, Va 146.430 446.430 PL141.3</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><th colspan="2" style="text-align: center;">DTMF Codes</th></tr> <tr><td style="width: 10%;">#nnnnn</td><td>connect</td></tr> <tr><td>##</td><td>disconnect</td></tr> <tr><td>A</td><td>linkstatus</td></tr> <tr><td>08</td><td>playinfo</td></tr> </table>	DTMF Codes		#nnnnn	connect	##	disconnect	A	linkstatus	08	playinfo
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<p><b>#126596 K4IJ-R</b> Roanoke, VA 444.175+ PL103.5</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><th colspan="2" style="text-align: center;">DTMF Codes</th></tr> <tr><td style="width: 10%;">*</td><td>connect</td></tr> <tr><td>#</td><td>disconnect</td></tr> <tr><td>08</td><td>linkstatus</td></tr> <tr><td>411</td><td>playinfo</td></tr> </table>	DTMF Codes		*	connect	#	disconnect	08	linkstatus	411	playinfo	<p><b>#132278 W4MT-R</b> Newport News, VA 442.900+ PL100.0</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><th colspan="2" style="text-align: center;">DTMF Codes</th></tr> <tr><td style="width: 10%;">A</td><td>connect</td></tr> <tr><td>A</td><td>linkstatus</td></tr> <tr><td>A</td><td>playinfo</td></tr> </table>	DTMF Codes		A	connect	A	linkstatus	A	playinfo	<p><b>#146895 WB3T-R</b> Wytheville, VA 146.895- PL103.5</p>	<p><b>#236460 KI4BWJ-L</b> Petersburg2, VA 147.530 PL74.4</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><th colspan="2" style="text-align: center;">DTMF Codes</th></tr> <tr><td style="width: 10%;">#</td><td>disconnect</td></tr> <tr><td>08</td><td>linkstatus</td></tr> <tr><td>*</td><td>playinfo</td></tr> </table>	DTMF Codes		#	disconnect	08	linkstatus	*	playinfo
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<p><b>#237304 W4GEO-L</b> Chesapeake, VA 147.570 (no PL)</p>	<p><b>#281806 KD4CMK-L</b> Richmond, VA 147.255+ PL100.0</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><th colspan="2" style="text-align: center;">DTMF Codes</th></tr> <tr><td style="width: 10%;">#</td><td>disconnect</td></tr> <tr><td>08</td><td>linkstatus</td></tr> </table>	DTMF Codes		#	disconnect	08	linkstatus																						
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## Operating Reference

IRLP Nodes ( <a href="#">LINK</a> ) (All frequencies are in MHz)							
Callsign	City	State	6M	2M	1.25M	70cm	33cm
			Node	Node	Node	Node	Node
<a href="#">WA3KOK</a>	Washington	DC				449.975 – PL107.2 #4000	
WA3KOK	Clarksville	MD		144.440 PL107.2 (1B) #4173		448.725 – PL107.2 #4542	
WA3KOK	Ashton	MD					927.725 – 25k PL156.7 (5A) #4088
N3HVC	Gaithersburg	MD		146.465 PL103.5 #4537			
N3HF	Silver Spring	MD				443.450 – PL156.7 #4712	
<a href="#">K3OCM</a>	Elkton	MD		146.555 PL156.7 #4083			
N1SZ	Olney	MD					927.650 PL100.0 #4765
<a href="#">K3BAY</a>	Pasadena	MD		145.540 PL 107.2 #4974			
<a href="#">AJ3U</a>	Hollywood	MD		145.350 – PL146.2 #4879			
<a href="#">WA0OJS</a>	Manchester	MD		146.895 – PL107.2 #7070			
N3HF	Manassas	VA				446.000 PL156.7 #4291	
<a href="#">K4DCA</a>	Reagan National Airport (DCA)	VA				444.750 + PL203.5 #4232	
K4QJZ	Front Royal	VA	51.940 – PL141.3 #4331				
<a href="#">K4DND</a>	Charlottesville	VA		145.450 – PL151.4 #4703			
KC4VDZ	Richmond	VA				442.300 + PL114.8 #5770	
<a href="#">W4RAT</a>	Richmond	VA		146.880 – PL74.4 #4424		442.550 + PL74.4 #4995	
<a href="#">KE4EUE</a>	Chesterfield	VA		145.390 – PL131.8 #4860			
<a href="#">KE4SCS</a>	Petersburg	VA		146.985 – PL127.3			



**Operating Reference**

				#4769			
<a href="#">KG4YJB</a>	Petersburg	VA		146.595 PL97.4			
				#4055			
<a href="#">KB4ZIN</a>	Williamsburg	VA		147.105 + PL0.0			
				#4943			
K4TJS	Yorktown	VA		145.580 PL88.5			
				#4358			
<a href="#">KA4VXR</a>	Hampton	VA		147.225 + PL136.5			
				#4183			
WA1ZMS	Lynchburg	VA			224.180 – PL100.0		
					#5330		
<a href="#">KG4ZXX</a>	Portsmouth	VA		145.600 DCS053			
				#4865			
<a href="#">AB8E</a>	Elkins	WV				442.100 + PL162.2	
						#4737	
K8NR	Buckhannon	WV				446.150 PL103.5	
						#4472	
KD8BMI	Morgantown	WV		146.595 PL103.5			
				#4163			
<a href="#">N8UEV</a>	Morgantown	WV			223.600 PL103.5		
					#4357		
<a href="#">AA8CC</a>	Buckhannon	WV		146.925 –			
				#8550			

### Operating Reference

IRLP Repeaters ( <a href="#">LINK</a> ) (All frequencies are in MHz)							
Callsign	City	State	6M	2M	1.25M	70cm	Notes
			Node	Node	Node	Node	
<a href="#">N3HF/R</a>	Silver Spring	MD				443.450 + PL156.7 #4712	
<a href="#">KE4EUE</a>	Chesterfield	VA		145.390 - #486			
<a href="#">N4NRO</a>	Front Royal	VA				442.735 + PL107.2 #23020	
KE4SCS	Petersburg	VA		146.985 – PL127.3 #4769			
<a href="#">WB8YST</a>	Beckley	WV	53.590 – PL107.2 #4873			444.525 + PL110.9 #4873	Echolink #60297 WIRES #1189
<a href="#">WB8YST</a>	Charleston	WV	53.630 – PL107.2 #4873	145.430 – PL107.2 #4873	224.360 – PL107.2 #4873	444.350 + PL107.2 #4873	Echolink #60297 WIRES #1189
<a href="#">KD8JCS</a>	Elkins	WV				442.100 + PL162.2 #4737	
<a href="#">WB8YST</a>	Richwood	WV	53.710 – PL107.2 #4873		223.860 – PL107.2 #4873		Echolink #60297 WIRES #1189

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## Operating Reference

Packet (All frequencies are in MHz)								
Node	Club	City	State	2M	1.25M	70cm	23cm	23cm DD
OVH	<a href="#">W4OVH</a>	Manassas	VA	145.730	223.540	440.925		
		Anne Arundel	MD	145.750				
KV3B-1 & KV3B-2	<a href="#">MARC</a>	Montgomery	MD	145.750				
		Prince George	MD	145.750				
National APRS				144.390				
<ul style="list-style-type: none"> <li>144.390 MHz is the National APRS frequency. Set a CT tone of 100 Hz to “quiet” the radio and it will “beep” if there is a station within a mile or two of your position. Along with doing that, monitor 147.525 MHz and when the radio “beeps” from a nearby station, ask who is calling CQ.</li> </ul>								

WIRES-II ID List ( <a href="#">LINK</a> )					
ID Number	Call Sign	City	State	Country	Room
#1520D	N3LHD	Davidsonville	MD	USA	-
#1525D	N3LHD/2	Davidsonville	MD	USA	-
#1451D	KB3IIE	Upper Marlboro	MD	USA	-
#1297D	WS4W-1	Danville	VA	USA	-
#1444D	N4JOG	Fairfax	VA	USA	-
#1298D	WS4W-2	Ridgeway	VA	USA	-
#1411D	K4FDS	Roanoke	VA	USA	-
#1259D	KE4IAP	Woodbridge	VA	USA	-
#1329D	KF4SCN	Woodbridge	VA	USA	-
#1407D	W3CZ	Fairfax Station	VA	USA	-
#1189D	KC8NDZ	Charleston	WV	USA	#0111D
#1121D	K8VE	Philippi	WV	USA	-

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