NA1WJ
Amateur Radio

Operator's Manual

Contents

Welcome to NA1WJ,

North America's 1st World Jamboree!

We are excited to be part of the largest collection of Scouters from across the World for 12 days of fun, fellowship, commoradarie, and exploration as we congregate in West Virginia, USA.

This next 12 days will be full of excitement, as we congregate to construct our Amateur Radio station, demonstrate the magic of Radio to thousands of curious Scouts, hopefully sparking interest in the marvel of the technology that makes up the hobby, and plant the seeds of interest that potentially becomes a lifelong endevour in radio. That background and interest is the foundation of today's many technological marvels, and possibly new ones to come.

It is well to remember as we "toil in the vineyards" that we are at best "planting seeds" that might grow at some future date. For sure, we will find a few Scouts are energized by amateur radio and return several times to experience this new interest. Others will be intrigued and move on to all the other activities at the Jamboree. Still others, may not be interested at all but will receive some exposure to radio. Then at some future date, perhaps in vocational training or college, the Scout may choose a related area of study. Or, perhaps they are in middle-age or nearing retirement and seeking an avocation that can invigorate their leisure activities. We will never know.

It is our privilege to introduce the science, technology, fun, and magic of amateur radio to Scouts from around the world.

Demonstration Station

The demonstration for World Scout Jamboree 2019 is the largest single venue of Scouts getting on the air in the last 4 years. At previous US Jamborees, nearly 3,000 visitors attended the station for an introduction to ham radio and an opportunity to try their hand communicating with others in the US and elsewhere in the world (2,604 in 2013 over 9 days — 2,457 in 2017). The structure and layout of the station is designed to maximize the ability to handle upwards of 400-500 participants a day.

To help facilitate this, the Demonstration Station will be composed of multiple operating positions offering a variety of modes to the participants. These include:

- Six IC-7300 stations, offering phone and digital modes on HF
- Two IC-9700 stations, offering phone, and digital modes on VHF/UHF and the potential for satellite/ISS communications when the opportunities arise
- Two IC-5100 stations for VHF/UHF repeater and D-STAR communications

Each station will have the ability to host four participants at a time, plus one control operator (NA1WJ staff member /aka Guide). The goal is to give each participant about 8-10 minutes of operating time.

The demonstration station will maintain 24x7 operations, with the majority of the activity occurring when the Jamboree participants are able to visit areas in Centro Mondial (Summit Center), which is mostly from 8am to 5pm daily. During those times, all the stations will be active providing demonstrations.

From 6p to midnight, the station will be available for skeds, one-on-one time, and licensed Jamboree participants who wish to operate the demonstration station. Times available and duration of operation will be dictated by demand.

From 7p to 7am daily, the station will be operated by NA1WJ staff to provide QSO opportunities to amateur radio operators not in attendance who desire to complete a QSO with our station at the Jamboree held at the Summit. There will be a schedule posted of operators who will man the station for the night time hours, and this will rotate amongst the staff as needed.

The general flow of the station will be fairly standardized, and a script provided to each guide outlining points to cover while the participants are visiting the station. The outline is:

- Great all those who arrive and break them into small groups of up to four each.
- Take them through the entry area, providing a brief history of amateur radio, and how it has changed and stayed current over the years. Visuals will be available.
- Provide them a short introduction to Morse code, and allow them to try it on a set of oscillators with Morse sheets. Ask them to send each other's names. Outline that Morse (CW) is still an active part of amateur radio, but not a requirement for licensing as was in the past.
- Stop briefly at each exhibit and give a brief explanation of what they see. These will include a live APRS map, etc. The types of visuals are still being finalized.

After passing the entry area, the participants will enter the demonstration area. Each station can accommodate up to four participants. During 8a to 5p, the station is for demonstrations only unless some stations are inactive. Skeds, etc should be accommodated after 6p. See the shift supervisor if there are questions.

Each station type will operate under the same basic guidelines:

- Give a brief description of the radio and modes available
- Describe the correct procedures and topics for talking on the air
- Allow each participant to use either voice or digital modes (with a preference to show both)
- Allow the participants to ask questions as they progress.
- Keep the time per participant to 8-10 minutes unless the participant queue is light (none waiting).
- Log all QSOs, including participant, station, control operator, time, date, mode, station ID using N1MM logging program
- As much as possible, use JOTA recommended frequencies.
- Use all possible modes available. These can include phone, PSK, RTTY, FT8, etc.
- The venue will likely be noisy. Use headphones or keep the station AF gain (volume) down as much as possible. Keep voice levels to normal talking volume.
- Adjust the mike gain and ALC with each new participant and limit the use of compression.

For each specific station type, there will be variations to operating:

HF (IC-7300)

- Keep the station on the assigned band unless a change is required to limit interference to the other stations. Confirm changes with shift supervisor
- Use the tuner if needed. Monitor SWR periodically.
- There will likely be pileups to NA1WJ. Allow the participants rag-chew[1] QSOs as much as possible.
- During demonstrations, talk time is to be emphasized over giving out QSOs.
- Discuss the general station conditions if asked (antennas, etc).

IC-5100 (VHF/UHF/D-STAR)

- This station is mostly for repeater operation. Most QSOs will be with other staff or Jamboree participants, or via ECHOLINK or D-STAR, and can be with the other VHF/UHF/D-STAR stations in the venue (both repeater and simplex).
- Switch from analog to D-STAR to show the aural differences. Explain why.
- Show the ability to send packet data when possible
- These stations will be utilized during the nightly nets and during other times as needed by NA1WJ staff if requested by Jamboree management. Adjust the demonstrations accordingly See the shift supervisor as needed.

IC-9700 (satellite operation)

- When ISS or other satellite windows present themselves, other stations maybe requested to cease normal demonstrations (especially the IC-5100 stations) so they can accommodate these passes.

[1] A long QSO between two amateur radio operators. This is generally what amateur radio operators are doing on the radio when they're not contesting

- These times will be well known and will be posted. If there are questions, see the shift supervisor.
- These passes will most likely be an event, and the station will likely be moved outside, weather permitting, with audio provided so the maximum people can see and hear.
- A form of selection process (drawing, etc., to be determined) will be used for those participants who will be able to make these contacts.
- A discussion prior to and after the window will be offered to explain how these contacts work and how they are different than the ones conducted inside the venue (doppler-effect, apogee, pass prediction, why the antenna moves the entire time of the contact, etc).

DX Station (radio to be determined, most likely an IC-7300)

- This station will be used predominately in two ways.
  1. Primarily for demonstrations during the daytime and after 5p.
  2. To provide QSOs from NA1WJ to the amateur community at large (maximum QSOs). This will predominately occur later in the evening after the primary demonstration activity closes
- This station is will have a rotatable beam. A schedule of areas in the world and propagation maps will be provided nightly. These may change by region of the world daily to provide as many opportunities for hams in different regions of the world to make a QSO.
- DXpedition pile-up techniques maybe needed at times (region of the world, split operations, etc). Plan accordingly. Review the DXUniversity[2] material for guidelines. Training will be provided for those who need it, or want to practice their technique.
- A script to announce periodically will be provided announcing the NA1WJ operation at the Summit.

Other special operations

These operations will be events and will be scheduled and advertised on-site as much as possible to ensure the maximum participants.

These can include (but not yet finalized), balloon launches, distinguished operators, ISS (see satellite), and potentially others.

[2] http://www.dxuniversity.com/

Daily operations of the station

The demonstration station is open during program hours from 8 AM to 5 PM from Monday July 22 to Thursday August 1. Exceptions to these days are:

- Monday July 22: Demo team staff training, open from 1 PM to 5 PM
- Friday July 26: Cultural Celebration Day
- Sunday July 28: Open from 10 AM to 5 PM
- Thursday August 1: Open form 8 AM to 3 PM

Pre- post activity briefing

30 minutes prior to the opening of the demo station all staff on duty has a 15 minute briefing.

Roster

Every demo-team member has been scheduled for working shifts. For the actual roster follow this link: NA1WJ demo team roster

A demo team staff has shifts of 2 succeeding dayparts followed by 1 daypart time off. This means that after a full day of working at the demo station the following morning is off-time and the next shift starts in the afternoon after lunch e.g. 1 PM.

Roles

Operator [DEMO]

Operators are the demo team members that operate a station.

Control operators [CTRL]

The NA1WJ demo station is operated under supervision of control operators. Control Operators are radio amateurs that have an extra class license. A control operator is scheduled to be at the station during daily operation.

Tech-team

Tech-team members are operators that have the knowledge and skills to assist operators in using the equipment and allowed to authorize of perform band changes on the stations.

Demo team leadership [DTL]

3 team members are Demo-team-leadership and manage daily operations.

Facilities at the station

Storage

As there is little room in the station to store your day-pack, these will be hung on a rope in the station. Therefore a carabiner is required to hang the day-pack on the rope and stow it in a orderly manner.

Charging

Sockets will be available for charging hand-held radios. Charging of power-banks is possible. Charging of phones is discouraged and at the risk of the owner. Use your power bank for charging your phone and stow it in your day-pack.

Nightly operations of the station

Nightly operations of the demo station allows contacts outside the opening hours. This service will enable the use of propagation opportunities that are not available during opening hours and will allow contacts to other places on the world.

Nightly operations of the demo station is on a voluntary basis. While being scheduled for, a night shift can be declined. Team members are encouraged to enable to have the station operational through the night.

Operations guidelines

NA1WJ basic operating guidelines:

- Give a brief description of the radio and modes available
- Describe the correct procedures and topics for talking on the air
- Allow each participant to use either voice or digital modes (with a preference to show both)
- Allow the participants to ask questions as they progress.
- Keep the time per participant to 8-10 minutes unless the participant queue is light (none waiting).
- Log all QSOs, including participant, station, control operator, time, date, mode, station ID using N1MM logging program.
- As much as possible, use JOTA recommended frequencies.
- Use all possible modes available. These can include phone, PSK, RTTY, etc.
- The venue will likely be noisy. Use headphones or keep the station AF gain (volume) down as much as possible. Keep voice levels to normal talking volume.
- Adjust the mike gain and ALC with each new participant and limit the use of compression.

Pre-Jamboree Demo Team training agenda

Demonstration training (1-2 hours)

- Intro to the station
- Intro area to station flow
- Topics to discuss with the youth while taking to the station
- Introduce them to the station
- Radio Etiquette
- Topics to discuss while on the air
- Radio jargon (q'codes, greetings, etc)
- The QSL card/QSO form

Use of the station equipment (2-3 hours)

- 7300
- 7610
- ID-5100
- 9700
- Rotors
- Station Band rules
- N1MM logging
- ClubLog uploads
- LoTW uploads

Other activities (1 hour)

- Be familiar with satellite station schedule
- Be familiar with ARDF activity and location
- Be familiar with Balloon Launch schedule and location
- Transition if breaks needed
- Night-time ops

One-off Station Events/Safety (1 hour)

- Weather
- Electrical/RF Safety
- Stadium Shows
- Medical issue

Suggested questions to ask the youth on the air.

Note: The intent with this list is to ask questions that elicit responses that are more than a simple "yes/no" or simple one or two sentence response. The goal is to carry on a conversation that is both engaging and enlightening, which helps them to overcome any stigma they may have being "on-the-air", and at the same time enlighten them and possibly learn more about the hobby at the same time.

- Where do you live, and what is your favorite thing about your hometown?
- What are your favorite things to do when not in school, and why?
- How long have you been in Scouting, and what rank are you now? What was the most memorable thing you have done in scouting, so far?
- What are your favorite sports teams, and do you participate in any sports? What position do you play?
- How long have you been in Scouting, and what is your favorite activity? Do you do any of that activity outside of Scouting and if so, why?
- Do you have any pets? What kind? Do you take care of them, or do your parents? What was the most interesting thing your pet did (does)?
- What things at the Jamboree have you done so far? Do have a favorite yet, and if so what?
- What is your favorite subject in school? Do you hope to go to university to further study that subject?
- Do you have a subject in school you don't like? Why?
- Have you ever talked with someone from another country? If so, from where and what was the most interesting you talked about?
- Is this your first experience with Ham Radio, and why did you go to the NA1WJ station? Was it curiosity, or something else? If not your first experience with Ham Radio, what interested in you to doing it again?
- Did you know you are talking with someone over _____ kilometer/miles from where you are located? Do you have any idea how that can happen without the internet? Can you guess how?
- Have you ever heard of Samuel Morse, or Marconi? Do you know what contributions they made to Ham Radio? Have you asked the operators at the NA1WJ station to teach you?
- Have the operators at your location explained the antennas/radios to you? Can to tell me about them?
- Has the operator explained to the Q codes ham radio operators use? Can you carry on a conversation using as many of those as possible? Let's try.
- What is the weather like at the Jamboree?
- What other activities/events have you participated in beside the Jamboree? If so, which ones did you like the most/look forward to and why?
- Have you met a lot of people from other countries and who was the most interesting? Why?
- Do you know other languages beside your native one? If you know that language, talk with them in it.
- What is the most interesting thing about your native country, and why?
- Are there places in the US or other countries you have been fascinated with, and if you were given the choice, would you visit them again, and why?

International Third-Party Traffic -- Proceed With Caution

Occasionally, DX stations may ask you to pass a third-party message to a friend or relative in the States. This is all right as long as the US has signed an official third-party traffic agreement with that particular country, or the third party is a licensed amateur. The traffic must be noncommercial and of a personal, unimportant nature. During an emergency, the US State Department will often work out a special temporary agreement with the country involved. But in normal times, never handle traffic without first making sure it is legally permitted.

US-Based Amateurs May Handle Third-Party Traffic With:

V2	Antigua/Barbuda
LO-LW	Argentina
VK	Australia
V3	Belize
CP	Bolivia
E7	Bosnia-Herzegovina
PP-PY	Brazil
VE, VO, VY	Canada
CA-CE	Chile
HJ-HK	Colombia
D6	Comoros (Federal Islamic Republic of)
TI, TE	Costa Rica
CM, CO	Cuba
HI	Dominican Republic
J7	Dominica
HC-HD	Ecuador
YS	El Salvador
C5	Gambia, The
9G	Ghana
J3	Grenada
TG	Guatemala
8R	Guyana
HH	Haiti
HQ-HR	Honduras
4X, 4Z	Israel
6Y	Jamaica
JY	Jordan
EL	Liberia
V7	Marshall Islands
XA-XI	Mexico
V6	Micronesia, Federated States of
YN	Nicaragua
HO-HP	Panama
ZP	Paraguay
OA-OC	Peru
DU-DZ	Philippines
VR6	Pitcairn Island*
V4	St. Kitts/Nevis
J6	St. Lucia
J8	St. Vincent and the Grenadines
9L	Sierra Leone
ZR-ZU	South Africa
3DA	Swaziland
9Y-9Z	Trinidad/Tobago
TA-TC	Turkey
GB	United Kingdom
CV-CX	Uruguay
YV-YY	Venezuela
4U1ITU	ITU - Geneva
4U1VIC	VIC - Vienna

Notes:[3]

* Since 1970, there has been an informal agreement between the United Kingdom and the US, permitting Pitcairn and US amateurs to exchange messages concerning medical emergencies, urgent need for equipment or supplies, and private or personal matters of island residents.

US licensed amateurs may operate in the US territories under their FCC license.

Please note that the Region 2 Division of the International Amateur Radio Union (IARU) has recommended that international traffic on the 20 and 15-meter bands be conducted on the following frequencies:

14.100-14.150 MHz
14.250-14.350 MHz
21.150-21.200 MHz
21.300-21.450 MHz

The IARU is the alliance of Amateur Radio societies from around the world; Region 2 comprises member-societies in North, South and Central America, and the Caribbean.

Note: At the end of an exchange of third-party traffic with a station located in a foreign country, an FCC-licensed amateur must transmit the call sign of the foreign station as well as his own call sign.

[3] This material is from the ARRL© website: http://www.arrl.org/third-party-operating-agreements

Frequencies

HF SSB Voice

Band	WOSM Calling Frequencies	Suggested Band Segment for US Stations	Notes
80 m	3.940 & 3.690(1)	3.920 – 3.940 3.670 – 3.690 (1)	(1) Extra segment
40 m	7.190 & 7.090 (2)	7.180 – 7.200 7.270 – 7.290	(2) 7.090 not available in Region 2
20 m	14.290	14.270 – 14.290 14.320 – 14.340	
17 m	18.140	18.140 – 18.150	
15 m	21.360	21.360 – 21.400	
12 m	24.960	24.960 – 24.980	
10 m	28.390 (3)	28.350 – 28.400 (3)	(3) Includes Novices & Techs
6 m	50.160	50.160 – 50.200	

HF CW

Band	WOSM Calling Frequencies	Suggested Band Segment for US Stations	Notes
80 m	3.570 (3)	3.560 – 3.570 (3)	(3) Includes Novices & Techs
40 m	7.030 (3)	7.030 – 7.040 (3)	(3) Includes Novices & Techs
20 m	14.060	14.050 – 14.060	
17 m	18.080	18.070 – 18.080	
15 m	21.140 (3)	21.130 – 21.140 (3)	(3) Includes Novices & Techs
12 m	24.910	24.900 – 24.910	
10 m	28.180 (3)	28.170 – 28.180 (3)	(3) Includes Novices & Techs
6 m	50.160	50.150 – 50.160	

HF PSK-31

Call CQ JOTA. The chart below shows the commonly used frequencies for PSK-31.

Band	Frequency	Notes
80 m	3.580	
40 m	7.080 (4)	(4) Region 2 (USA). 7.040 to 7.060 for Regions 1 & 3
30 m	10.142	
20 m	14.070 (5)	(5) Most activity for JOTA will be on 20 m
17 m	18.100	
15 m	21.080 (6)	(6) Most activity can be found at 21.070
12 m	24.920	
10 m	28.120	

HF FT-8

Call CQ JOTA. The chart below shows the commonly used frequencies for FT-8.

Band	Frequency	Notes
80 m	3.573	
40 m	7.074 (4)	(4) Region 2 (USA).
30 m	10.136	
20 m	14.074 (5)	(5) Most activity for JOTA will be on 20 m
17 m	18.100	
15 m	21.073 (6)	(6) Most activity can be found at 21.070
12 m	24.915	
10 m	28.074	
6m	50.313	

On-site Repeaters

NA1WJ will operate on VHF and UHF repeaters that deliver coverage on the WSJ site.

Local repeaters are installed at Rock Borrow site on The Summit property:

	Repeater	Downlink (MHz)	Uplink (MHz)	Shift	Tone (Hz)
NA1WJ	2 m Analog	146,700	146,100	- 600 kHz	123.0
WV8BSA	70 cm Analog	444,025	449,025	+ 5 MHz	123.0
WV8BSA	70 cm D-Star	441,812.5	446,812.5	+ 5 MHz	-
KC8AFH	DMR	442,875.0	447,875.0	+ 5 MHz	CC 1

- WV8BSA is running as Echolink node 9877.
- The D-star repeater is permanently connected to REF033A the full-time JOTA/Radio Scouting D-STAR Reflector.

Off-site Repeaters

2 DMR-repeaters are within range of WSJ. These are:

	Repeater	Downlink (MHz)	Uplink (MHz)	Shift	Tone (Hz)
KC8AFH (1)	DMR	443,875.0	447,875.0	+ 5 MHz	CC 1
KC8AFH (2)	DMR	442,875.0	447,875.0	+ 5 MHz	CC 1

1. Installed at Lick Knob. South-west of the Summit property
2. Installed at Keeny mountain covers from the WV/VA state line on I-64 all the way to Beckley then the Lick Knob repeater will take you to the Summit.

- All three DMR repeaters are linked to DMR-MARC. And deliver talkgroups JOTA (907), JOTA (9701) and JOTA 2 (9702).

Simplex operations

Where NA1WJ is expected to run primary on VHF and UHF repeaters, simplex frequencies can be used for local communications. These frequencies are suggested for scouts on site.

2 M FM Simplex

147.450, 147.480, 147.510, 147.540* * Use 147.540 as Calling Channel.

Avoid 146.520, the National FM Simplex Calling Frequency, as well as 146.550, which is commonly used by mobiles and RVers.

70 cm FM Simplex

446.000*, 445.950, 446.050, 446.100, 446.150 * Use 446.000 as Calling Channel.

D-Star Simplex

SIMPLEX Channels: 145.670*, 145.640, 145.610, 438.010. * 145.670 and 438.010 are

commonly used as the National D-STAR Simplex Channels and should be used only as

Calling Channels for JOTA. Always listen first to avoid interfering with another QSO.

DMR Simplex

SIMPLEX Channels: 441.0000*, 446.5000, 446.0750, 433.4500, 145.7900*, 145.5100. All

simplex frequencies operate on time-slot 1 and use color code 1. (*are commonly used as

the National DMR Simplex Channels and should be used only as Calling Channels.)

Linked operations

Echolink

NA1WJ can be found on Echolink conference *JAMBO* and *JOTA-365* and node 832996, NA1WJ Conference Node.

The local VHF/UHF repeater WV8BSA is running as Echolink node 9877 but currently off-line (13-2-2019)

Scripts

These scripts are an aid for the staff who will guide visiting scouts through the demonstration station.

Intro Area

“Welcome to NA1WJ. NA1WJ is a STEM (science, technology, engineering and math) activity within Scouting to introduce you to Amateur Radio and describe some of the fun things you can do as a Scout, and afterwards as a potential hobby or career.

Amateur Radio is a hobby authorized to people around the world by their respective governments, in the US the FCC, and regulated internationally by an alliance of the United Nations call the International Telecommunications Union. All the rules for licensing and operation are recommended by the ITU, and approved by law in each country that has amateur radio operators.

Amateur radio began in the late 1800s, and early 1900s by pioneering inventors like Lois Marconi, Hiram Maxim, and others, who experimented originally with various ways to communicate long distances to ships at sea, and later for their respective governments as a way to communicate with their armies around the world.

Most advances you see today in communications, like AM/FM radios, Television, Microwave ovens, cell phones, wifi internet connections, text messaging, motion sensor alarms, radar, satellite TV and radio, were invented by or the result of inventions by amateur radio operators.

Today amateur radio is a hobby, with a very serious purpose. Amateurs are a group of people who have their own communications equipment. These 'hams' are generally not dependent on commercial services to communicate with others. For example, your cell phone requires a 'node' (or tower) to talk or text with another user. A power outage at the cell site can knock everything within it’s range out of service. In the event of a major disaster (hurricane, earthquake, volcanic eruption etc.) hundreds or thousands of folks may not be able to reach friends or family. In these cases amateur radio continues to function thanks to operators who have their own solar panels, generators or batteries. It is in times like this that amateur radio has earned its nickname "when all else fails, amateur radio". Some recent cases of amateurs providing communications assistance are tsunamis in India, earthquakes in Haiti, or hurricane Katrina.

As you progress through this exhibit, you will see some of the newer advances in amateur radio, including GPS location (like your smartphones, but without using it), text and video transmission, satellite communications (if the satellites cooperate ☺), and of course using your voice. There are other means as well, like morse code, invented by Samuel L Morse for use by the railroads, If time permits, we may get to show you some of those means as well.

APRS

On this display, we have a display of a number of staff for NA1WJ located throughout the Summit. They are carrying a small GPS receiver, and a radio that looks like a walkie-talkie (we call them handhelds, or H-Ts). These transmit their location every few minutes, and it displays here on the map. They are tracked by their FCC authorized call signs, like _____. They are powered by small batteries, and use very low power.

The ability to send a signal of their location as a small bit of data works because each radio transmits a little audio burst that sounds a lot like an old-fashioned dial-up modem, which is picked up by an antenna located high above us on a ridge called the Quarry Ridge. That location then re-transmits what it hears to a radio we have located on this table, which then sends that information to the PC next to it, and onto the screen. Re-transmitting radio signals is called repeating, and can be used for

a number of purposes. The most common purpose you might encounter of repeating is for the radios in police cars, fire trucks, ambulances, and public service vehicles. All of them receive their signals from very high radio towers, that repeat their signal to other people at greater distances then what would be possible if they talked directly to each other. This is because their radios work on a principal of line of sight, which means their signals go in a straight line. This is because of the frequencies they use. You will see later, that other frequencies are not necessarily line of sight, but can be bent, or reflected over great distances. That is how amateur radio operators can talk to other countries anywhere on the earth. There are a lot of complex interactions with a transmitted signal, the sun, time of day, and frequency, and not all of these interactions work together all the time for good long distance communications all the time. Amateur Radio operators understand these interactions and adjust their radios and antennas based on them to talk with people any time of the day or night. You may see some of this a little later.

APRS is capable of more than location information, it can also be used to send weather information, which can be picked up by the National Weather Service, send short text messages like Twitter can, track vehicles, and monitor lake/river levels. The ability of APRS is only limited by the imagination, and who is interested receiving it.

Morse Code Demo Area.

At this location, we want you to try your hand sending a short message to your buddy(s) using Morse code. Amateur Radio operators call this CW, or continuous-wave, because of how the signal is sent over the air (or modulated). Morse code is composed of three primary sounds. A long tone, called a dash, a short tone, called a “dit” or “di”, and a pause or no tone. These three sounds are combined to form letters. The more common letters in the alphabet are composed of the fewest of these three sounds, and the least used letters use more of the sounds to form a letter. A short gap is placed between letters to separate them.

Everyone has hears SOS, which is send as three short tones, or dits, for an ‘S’, three long tones or dah’s for an ‘O’, followed by three short tones (dits) for the last ‘S’.

As an amateur radio operator becomes proficient with Morse Code, they learn to hear not letters anymore, but entire words. That makes carrying on conversations more natural. You would never talk to your friend spelling every word, would you? Same with amateur radio. Whole words have a sound, just a single letter does, and you become more proficient, that is how things sound. And of course, as you get better, you can do it at faster and faster speeds.

An example of this is the videos you are seeing above, when a fiew years back, a late night TV host brought in a couple seasoned morse code operators, and had a competition with a couple of guys not much older then you, to a text messaging versus morse code competition. Watch what happened.

The morse code guys heard whole words, and did not not need to think in terms of letters to send their message. Plus it is easier than trying to type on a small keypad with your thumbs.

As a about 6 years ago, the FCC no longer requires morse code to be licensed as an amateur radio operator, and as such, we now have a lot more operators then even 10 years ago. All that is required now is to pass a written test to receive your first license. A total of three different licenses are available as ham operators, each progressively more difficult, but are meant to show an increased skill level being attained.

What I would like you to do now, is pair up, and using the chart in front of you, practice sending your name. After you feel comfortable doing this, swap with your buddy and let him practice for a minute

or so. Then send a short message like ‘how are you’, or my name is ’xxxxx’ and see if your buddy can understand what you sent.

With practice, it comes naturally.

Ham Radio Lingo.

You are now just about ready to go the demonstration area, where we will give you an opportunity to get on the air and talk, or text message with someone around the US or possibly around the world.

But before you can do that, you need to understand how they talk. It is a lingo evolved over the years, not much different than the emoticons or abbreviations you use when using your text messaging on a phone.

Hams don't use CB-like lingo like 'good buddy, or 10-4, but have other terms to say similar things.

When they want to know someone's location, they are referring to what is called QTH, or where are you, or I am here.

QSL is used to pass transmitting to the other person, kind of like 'over'

QRN is used to indicate a ham hears static or other noise on the transmission that is of a natural origin, like if the sun is causing it.

QRM is used to indicate a ham hears static or other noise on the transmission that is man-made, and can be caused by a number of things.

A ham will say CQ, often repeated a few times, followed by their call sign, if they are trying to find some on the air to talk with.

Hams refer to DX as a far-away station. It can also refer to someone in another country

73 said when they are done talking, it is kind of like 'goodbye'

QRZ indicates the current conversation is over, but they are ready to start another one.

Hams, by rule need to say their call sign every 10 minutes, but most will say it after every transmission. Depending how they are communicating, it may just be their call sign, or if using morse code, or digital modes, it is preceded by 'de' to be from _____.

An example of a conversation may sound like this:

'CQ CQ 20 meters, this is NA1WJ at the Boy Scout National Jamboree listening for a call'. They will repeat this over a few times, pausing 3-5 seconds between transmissions.

The guy at the other end will usually respond with something like 'NA1WJ, this is _____'. NA1WJ acknowledges the person who called by repeating their call, and starting the converstation.

_____, this is NA1WJ.. Every 10 minutes, or when they are done, they will say their call as part of the conversation, and at the end, say something like _____ from NA1WJ, 73. Or _____ from NA1WJ, QRZ to start a new converstation.

Hams, depending on the type of radios they use, will not say their call signs like letters of the alphabet, but phonetically. Below is a chart of the phonetic alphabet. This was invented to help make understanding letters better under noisy conditions. So you might hear us say November Alpha one Wisky Juliet, vs NA1WJ.

When you talk to someone over the air, you want to keep your conversation to simple subjects, like the weather, location, likes, hobbies, questions of the type of radio system and antennas in use, output power, how good the other person's signal sounds, etc. Items of a personal nature, politics,

or your full name, phone #, etc are normally never shared over the air. Amateur Radio is like a party line, and although you may think you are the only two on the radio, there can be numerous people listening who have not joined your conversation (kind of like Twitter). Whatever you say, and how you say it reflects on you.

At this point, I'd like all of you to wait here till the next radio position comes available. When you get to the station, I'll describe the radio briefly, and they give each of you about 5-10 minutes to talk with someone over the air. Depending on the radio, the frequency we use, and atmospheric conditions, it maybe someone in the US, around the world, here at the Summit, or over a repeater to someone using the internet to go around the world."

OK. Station # XX is available. Please walk to the station and sit down in the chairs in front of the table. We'll get started shortly."

Phone Script

Give a brief intro of the radio … List off the components the participants can see

Show how to use the PTT … Especially the PTT lock

Explain how close to hold it to their mouth

Use only first names, avoid ages, or other identifying information, like where you live, phone #, email addresses, etc.

Speak clearly, and avoid jargon. Talk like you are talking to a person in front of you.

Indicate when are you done talking and are giving the person on the other end a chance to talk. Use something like, “back to you <name>”, etc. No need to say the callsign, etc.

Give a list of possible things to talk about. The items should NOT BE yes/no answers. E.g.:

- Where are you located … QTH?
- What is the weather?
- What made you interested in HAM radio?
- Describe your experiences at the Jamboree. What are your favorite things?
- Describe your Boy Scouting experiences you find the most memorable
- Describe your future career/job goals, any desires for higher education, etc.
- What kind of radio system are you using? The one at the Jamboree is …
- Note any signal characteristics, like static, flutter, muddiness, shrill, etc. How strong is the signal (look at the meter .. this is an ‘S’ scale, the higher the stronger the signal. S9 is as high as practical on the meter.

Remind the youth they will receive a certificate after they complete their contact. If they take the Radio Merit Badge (or have), making five contacts qualifies for a completion of requirement 9.a(2).

Be sure to complete the contact card for the youth as they complete contacts.

If they are interested to further find out about Ham Radio, and want to operate more, after 7-8p each night we will be open till they close the Summit Center. Be sure to notify your SM and SPL of your intentions so they don’t worry if you return late or after dark.

Repeater Script

Give a brief intro of the radio … List off the components the participants can see.

Describe briefly how the repeater works. We call it a 'machine'. It is really made up of two interconnected radios, a computer like device called a controller that manages the two radios, a single antenna, amplifier, and something we call a duplexer, or 'cans' that allows both radios to share the same antenna. Let them know where it is located on site (Rock Borrow).

Show how to use the PTT …

Explain how close to hold it to their mouth

Use only first names, avoid ages, or other identifying information, like where you live, phone #, email addresses, etc.

Speak clearly, and avoid jargon. Talk like you are talking to a person in front of you.

Indicate you done talking and are giving the person on the other end a chance to talk. Use something like, "back to you <name>", etc. No need to say the callsign, etc.

Remind the participants to hold the PTT for a brief moment before talking, to let the repeater wake up.

Wait for the courtesy tone (beep, or little static noise), and pause for a second or so to let others join your conversation if they want to. Acknowledge others before continuing.

Give a list of possible things to talk about. The items should NOT BE yes/no answers. E.g.:

- Where are you located … QTH?
- What is the weather?
- What made you interested in HAM radio?
- Describe your experiences at the Jamboree. What are your favorite things?
- Describe your Boy Scouting experiences you find the most memorable
- Describe your future career/job goals, any desires for higher education, etc.
- What kind of radio system are you using? The one at the Jamboree is …
- Note any signal characteristics, like static, flutter, muddiness, shrill, etc. How strong is the signal (look at the meter .. this is an 'S' scale, the higher the stronger the signal. S9 is as high as practical on the meter.

Remind the youth they will receive a certificate after they complete their contact. If they take the Radio Merit Badge (or have), this contact qualifies as a completed requirement.

If they are interested to further find out about Ham Radio, and want to operate more, after 7-8p each night we will be open till they close the Summit Center. Be sure to notify your SM and SPL of your intentions so they don't worry if you return late or after dark.

RTTY/PSK Script

Give a brief intro of the radio … List off the components the participants can see

Describe how the water fall indicator shows various signals. Instruct the participants, this form of communications uses technologies that predated the internet, but is the basis of how most data communications work.

Remind them the conversation is made using the computer to the radio, and decoded on the other end. All they need to do is type.

Remind them that CAPS is OK in PSK, and is actually more efficient over the air, since lower case letters require more bandwidth to send.

Indicate there is some jargon used. Common are de, SK, AR, K, AGN, TU, BTU, Q codes.

Use only first names, avoid ages, or other identifying information, like where you live, phone #, email addresses, etc.

The conversation is carried like sending a continuous text message with the other end, except you end your half with a K. You start your conversation with their call, de, your call, and end it their call de your call SK. To ask for another conversation, type your call de QRZ.

Give a list of possible things to talk about. The items should NOT BE yes/no answers. E.g.:

- Where are you located … QTH?
- What is the weather?
- What made you interested in HAM radio?
- Describe your experiences at the Jamboree. What are your favorite things?
- Describe your Boy Scouting experiences you find the most memorable
- Describe your future career/job goals, any desires for higher education, etc.
- What kind of radio system are you using? The one at the Jamboree is …
- Note any signal characteristics, like static, flutter, muddiness, shrill, etc. How strong is the signal (look at the meter .. this is an 'S' scale, the higher the stronger the signal. S9 is as high as practical on the meter.

Remind the youth they will receive a certificate after they complete their contact. If they take the Radio Merit Badge (or have), this contact qualifies as a completed requirement.

If they are interested to further find out about Ham Radio, and want to operate more, after 7-8p each night we will be open till they close the Summit Center. Be sure to notify your SM and SPL of your intentions so they don't worry if you return late or after dark.

EchoLink Script

Give a brief intro of the radio … List off the components the participants can see.

Describe how Echo link is a collection of repeaters located around the world that are connected to the internet. Each repeater (node) can link to another system by its node id, and then any conversation held on your repeater is also sent over the internet to the other repeater (node) via VoIP (like Skype), and heard there. There are DTMF (explain these briefly) codes that allow you to control your Echolink node, including dropping a connection, asking for instructions/help, etc.

Describe briefly how the repeater works and that his system uses a regular computer to connect to the internet. We call it a 'machine'. It is really made up of two interconnected radios, a computer like device called a controller that manages the two radios, a single antenna, amplifier, and something we call a duplexer, or 'cans' that allows both radios to share the same antenna. Let them know where it is located on site (Rock Borrow).

Show how to use the PTT …

Explain how close to hold it to their mouth

Use only first names, avoid ages, or other identifying information, like where you live, phone #, email addresses, etc.

Speak clearly and avoid jargon. Talk like you are talking to a person in front of you.

Indicate you done talking and are giving the person on the other end a chance to talk. Use something like, "back to you <name>", etc. No need to say the callsign, etc.

Remind the participants to hold the PTT for a brief moment before talking, to let the repeater wake up.

Wait for the courtesy tone (beep, or little static noise), and pause for a second or so to let others join your conversation if they want to. Acknowledge others before continuing.

Give a list of possible things to talk about. The items should NOT BE yes/no answers. E.g.:

- Where are you located … QTH?
- What is the weather?
- What made you interested in HAM radio?
- Describe your experiences at the Jamboree. What are your favorite things?
- Describe your Boy Scouting experiences you find the most memorable
- Describe your future career/job goals, any desires for higher education, etc.
- What kind of radio system are you using? The one at the Jamboree is …
- Note any signal characteristics, like static, flutter, muddiness, shrill, etc. How strong is the signal (look at the meter .. this is an 'S' scale, the higher the stronger the signal. S9 is as high as practical on the meter.

Remind the youth they will receive a certificate after they complete their contact. If they take the Radio Merit Badge (or have), this contact qualifies as a completed requirement.

If they are interested to further find out about Ham Radio, and want to operate more, after 7-8p each night we will be open till they close the Summit Center. Be sure to notify your SM and SPL of your intentions so they don't worry if you return late or after dark.

Our node for NA1WJ-R is 4566
NASA
W1AW
JOTA-365
WV8BSA-R
JOTA-365, WV8BSA, and NA1WJ are all linked to our EchoLink node on Rock Borrow
Our request for information is *411
Request to link a node is XXXXXX
Request to drop a link is XXXXXXX

NA1WJ Nightly Net Control Procedures and Script

The NA1WJ Nightly Net is conducted each evening beginning at 7:30 PM local time on both analog repeaters at the Summit and on EchoLink conference node *JAMBO*

Procedures

We need info here on how to set up all the links for EchoLink and the repeaters.

From Bill Ragsdale's recommendations for net protocol:

The sequence should be a) call on the UHF repeater for UHF responses, b) call on the VHF repeaters for VHF responses, and c) call on either repeater for EchoLink responses. The requested response should be:

- Call sign
- Name
- Staff function
- Home state

The format needs to be repeated often, every five calls or so, as people join the net randomly.

Script

THIS IS: ***_(call sign)_*** THE NA1WJ WORLD SCOUT JAMBOREE NIGHTLY INFORMATION NET BEGINS IN ONE MINUTE. STATIONS PLEASE STAND BY.

GOOD EVENING AND WELCOME TO THE NA1WJ NATIONAL JAMBOREE NIGHTLY INFORMATION NET.

THIS IS ***_(call sign phonetically)_***, MY NAME IS _____ AND I AM LOCATED AT RADIO STATION NA1WJ, AT THE WORLD SCOUT JAMBOREE AT SUMMIT BECHTEL SCOUT RESERVATION***,*** WV, AND I WILL BE YOUR CONTROL OPERATOR AND NET CONTROL FOR THIS EVENING'S NET.

ANY STATION WITH AN ACTUAL EMERGENCY MAY BREAK INTO THE NET AT ANYTIME. THE NA1WJ INFORMATION NET MEETS NIGHTLY AT 7:30 PM LOCAL TIME (23:30Z) ON THE ***NA1WJ JAMBOREE*** REPEATER (146.700) USING 123.0 HZ TONE (CTCSS).

THIS IS A DIRECTED NET, AND AS SUCH ALL TRANSMISSIONS ARE MADE THROUGH NET CONTROL. NET CONTROL WILL CALL FOR STATIONS TO CHECK IN USING NUMERICAL CALLSIGN GROUPS. PLEASE CHECK IN WHEN YOUR CALLSIGN GROUP IS CALLED. AFTER YOU ARE RECOGNIZED YOU MAY LIST ANY TRAFFIC THAT YOU MAY HAVE. NET CONTROL WILL COME BACK LATER

FOR COMMENTS UNLESS YOU CHECK IN AND OUT. WHEN CHECKING INTO THE NET, STATE YOUR CALLSIGN

PHONETICALLY, GIVE YOUR NAME, YOUR JAMBOREE UNIT, AND YOUR HOME COUNTRY.

NOW - I'LL CALL FOR CHECK INS.

STATIONS with the number 1 in their call prefix, PLEASE CHECK IN NOW.

(Take traffic and record in Net log.) (Net Control may stop at any time to ensure all stations are acknowledged)

ANYONE ELSE with the number 1 in their call prefix, PLEASE CALL NOW.

(Acknowledge all who checked in after each prefix number, before going to the next number.)

STATIONS with the number 2 in their call prefix, PLEASE CHECK IN NOW.

(Take traffic and record in Net log.) (Net Control may stop at any time to ensure all stations are acknowledged)

ANYONE ELSE with the number 2 in their call prefix, PLEASE CALL NOW.

(Acknowledge all who checked in after each prefix number, before going to the next number.)

Repeat for prefix numbers 3 to 0.

ARE THERE ANY ADDITIONAL CHECK INS PLEASE CALL NOW.

IF THERE ARE ANY ADDITIONAL CHECK INS FROM ANYONE, PLEASE CALL NOW.

NET CONTROL HAS THE FOLLOWING INFORMATION OF INTEREST TO JAMBOREE PARTICIPANTS.

(Read any info announcements, field questions)

ARE THERE ANY STATIONS WITH INFORMATION FOR THE NET, COMMENTS OR QUESTIONS*?*

(Listen for comments or questions) (Field questions, comments.)

ARE THERE ADDITIONAL COMMENTS OR QUESTIONS?

ARE THERE ANY LATE CHECK INS FOR THE NET?

SINCE THERE ARE NO MORE QUESTIONS, COMMENTS, OR CHECK INS, I WANT TO THANK EVERYONE WHO CHECKED IN TONIGHT. PLEASE JOIN US AGAIN TOMORROW EVENING AT 7:30 PM LOCAL TIME (23:30Z) FOR THE NA1WJ JAMBOREE INFORMATION NET.

I HOPE YOU ENJOYED THE NET TONIGHT. I HAVE ENJOYED BEING YOUR NET CONTROL. I NOW RETURN THE REPEATER TO REGULAR AMATEUR RADIO USE.

73!

THIS IS ***_(call sign phonetically***)_CONTROL OPERATOR, CLEAR.

Attachments

Attachment A: Excerpts from FCC Rules Part 97 on Third Party Restrictions for NA1WJ

Italics are K2GW's interpretations.

FCC Definition

(47) Third party communications. A message from the control operator (first party) of an amateur station to another amateur station control operator (second party) on behalf of another person (third party).

Thus, at NA1WJ, the amateur radio operator (no matter what home country they are licensed from) is the First Party, the distant station operator is the Second Party, and the Scout is a Third Party.

§97.115 Third party communications.-

(a) An amateur station may transmit messages for a third party to:
  (1) Any station within the jurisdiction of the United States.
  (2) Any station within the jurisdiction of any foreign government when transmitting emergency or disaster relief communications and any station within the jurisdiction of any foreign government whose administration has made arrangements with the United States to allow amateur stations to be used for transmitting international communications on behalf of third parties. No station shall transmit messages for a third party to any station within the jurisdiction of any foreign government whose administration has not made such an arrangement.

(I've attached the current list of approved countries at the end)

This prohibition does not apply to a message for any third party who is eligible to be a control operator of the station.

(Thus it doesn't apply to the foreign licensed hams operating at NA1WJ, just the unlicensed Scouts sitting next to us)

(b) The third party may participate in stating the message where:
  (1) The control operator is present at the control point and is continuously monitoring and supervising the third party's participation; and
  (2) The third party is not a prior amateur service licensee whose license was revoked or not renewed after hearing and re-licensing has not taken place; suspended for less than the balance of the license term and the suspension is still in effect; suspended for the balance of the license term and re-licensing has not taken place; or surrendered for cancellation following notice of revocation, suspension or monetary forfeiture proceedings. The third party may not be the subject of a cease and desist order which relates to amateur service operation and which is still in effect.

(c) No station may transmit third party communications while being automatically controlled except a station transmitting a RTTY or data emission.

(d) At the end of an exchange of international third party communications, the station must also transmit in the station identification procedure the call sign of the station with which a third party message was exchanged.

[54 FR 25857, June 20, 1989; 54 FR 39535, Sept. 27, 1989, as amended at 71 FR 25982, May 3, 2006; 71 FR 66462, Nov. 15, 2006]

§97.117 International communications.

Transmissions to a different country, where permitted, shall be limited to communications incidental to the purposes of the amateur service and to remarks of a personal character.

[71 FR 25982, May 3, 2006]

So a Scout sitting next to an ham radio operator at NA1WJ can only talk to the below listed countries with which the US has a formal Third Party agreement. The ham operator himself can talk to licensed operators in any country.

US Amateurs May Handle Third-Party Traffic With:

Prefix	Country
V2	Antigua/Barbuda
LO-LW	Argentina
VK	Australia
V3	Belize
CP	Bolivia
E7	Bosnia-Herzegovina
PP-PY	Brazil
VE, VO, VY	Canada
CA-CE	Chile
HJ-HK	Colombia
D6	Comoros (Federal Islamic Republic of)
TI, TE	Costa Rica
CM, CO	Cuba
HI	Dominican Republic
J7	Dominica
HC-HD	Ecuador
YS	El Salvador
C5	Gambia, The
9G	Ghana
J3	Grenada
TG	Guatemala
8R	Guyana
HH	Haiti
HQ-HR	Honduras
4X, 4Z	Israel
6Y	Jamaica
JY	Jordan
EL	Liberia
V7	Marshall Islands
XA-XI	Mexico
V6	Micronesia, Federated States of
YN	Nicaragua
HO-HP	Panama
ZP	Paraguay
OA-OC	Peru
DU-DZ	Philippines

Prefix	Country
VR6	Pitcairn Island*
V4	St. Kitts/Nevis
J6	St. Lucia
J8	St. Vincent and the Grenadines
9L	Sierra Leone
ZR-ZU	South Africa
3DA	Swaziland
9Y-9Z	Trinidad/Tobago
TA-TC	Turkey
GB	United Kingdom
CV-CX	Uruguay
YV-YY	Venezuela
4U1ITU	ITU - Geneva
4U1VIC	VIC - Vienna

Notes:

* Since 1970, there has been an informal agreement between the United Kingdom and the US, permitting Pitcairn and US amateurs to exchange messages concerning medical emergencies, urgent need for equipment or supplies, and private or personal matters of island residents.

Attachment B: NA1WJ Guest Operations Policy

Objective

To allow for visiting amateur radio operators to operate the station who would like to have the experience of operating a World Jamboree station and where possible contact family members, Scouts, etc. It is not meant to supplement the existing staff of operators nor conduct demonstrations for Scouts. This policy also addresses those individuals without licenses who may wish to operate the station under supervision.

Applicable USA FCC Regulations

ARRL Control Operator FAQ at http://www.arrl.org/regulatory-faqs

The NA1WJ License Control Operator is Donald Kunst, W3LNE, trustee for the NA1WSJ Radio Association, which holds the license. Appointed control operators will be on site and part of the Jamboree IST assigned to the amateur radio operation. They will be appointed by the NA1WJ Team Leader and supervised by the Demonstration Station Team Leader. At least one control operator will be on duty at all times. They will need to hold an FCC issued Amateur Radio Extra Class license. [FCC regulations 97.103(b) and 97.105] They will take all action necessary to ensure proper operation.

Any licensed amateur radio operator can operate the station under the supervision of the control operator. This includes all FCC issued licenses and those who hold licenses in countries with reciprocal operating privileges in the USA. This includes all those countries with multilateral operating agreements with the USA, CEPT, or IARP. The list of countries can be found at http://www.arrl.org/reciprocal-permit More details on Operation in the US by Foreign Amateurs can be found at http://www.arrl.org/foreign-licenses-operating-in-u-s

Those who do not hold an amateur radio license must be supervised at all times by the control operator and they must communicate only with those countries that have third-party agreements with the USA [FCC regulations 97.115(a) and (b)] The latest listing of third-party agreements is at http://www.arrl.org/third-party-operating-agreements. Note that this same rule applies to all unlicensed Scouts and others using a station microphone during a demonstration.

Guest Operations Process

Front Desk process for licensed operators:

- Validate amateur radio license and identity.
- Document on-site contact information: text, email, etc.
- Determine whether operation will be with NA1WJ call sign or individual's own call sign.
- Determine desired operating days/times.
- Notify potential guest operator that this is a courtesy and not a commitment. Operations will be dependent on availability and other station priorities.
- Add to Guest Operator Schedule for sharing with station leadership.

Demonstration Station Leadership procedures:

- Determine current availability of station based on critical assignments.
- With guest operator, review operating procedures and requirements including third-party traffic regulations.

- Assign to station and directly observe operations to ensure compliance with procedures.
- Closely monitor operation during guest operator time in the station.

Front Desk process for unlicensed operators:

- Determine whether ongoing station demonstrations cannot address the individual's request.
- Document on-site contact information: text, email, etc.
- Determine desired operating days/times.
- Notify potential guest operator that this is a courtesy and not a commitment. Operations will be dependent on availability and other station priorities.
- Add to Guest Operator Schedule for sharing with station leadership.

Demonstration Station Leadership procedures:

- Assign an NA1WJ operator to work directly with the individual to operate the station and allow them time to communicate.
- As with all station demonstrations, ensure compliance with third-party traffic regulations.
- Control operator will monitor operation as with any other station in the tent.

Attachment C: EchoLink Operator Guide

Originally published for 2017 Jamboree and adapted for NA1WJ operation at the World Scout Jamboree.

Overview

EchoLink extends VOIP (voice over internet protocol) to amateur radio operators and repeaters. It enables hams to:

1. Communicate with remote repeaters and other hams via the Internet and RF.
2. Link multiple users into a conference.
3. Enable a repeater to be accessed worldwide.
4. Link multiple repeaters and more.

The primary benefits to the World Scout Jamboree at the Summit are:

- Reliable contacts for remote hams (and Scouts) desiring to 'work' the Jamboree.
- Inward messages to WSJ participants.
- Outbound use for WSJ participants.

Secondary uses may be to involve local Jamboree repeaters in the worldwide traffic and facilitate the local evening VHF/UHF net. Full linking of the on-site repeaters to the external world may be useful depending on the level of traffic and interest.

EchoLink Basic Background

EchoLink expands the scope of amateur radio by linking users worldwide over the Internet supporting contacts via transceiver, repeater or a simple computer. There now 5,335 users of all types around the word. Typically 2,130 repeaters are connected with 1,000 active users.

EchoLink operation is available in several modes:

- By accessing an EchoLink equipped repeater from your radio transceiver you may connect to another user, conference or repeater,
- As a computer User you may connect to another user or repeater of the Internet, and 3) as a "sysop" you may connect your computer to a transceiver for a local link or use it to add Echo-Link to a repeater you control.

EchoLink is provided at no cost and may be downloaded from www.echolink.org. You may register as either a User (no call suffix), a computer equipped with a microphone and speaker or else in the System Operator (Sysop) form.

The Sysop form allows a wired connection to control a local amateur radio transceiver. For a Sysop registration you must request to be a Link (suffix -L) or a Repeater (suffix -R). This suffix determines the on-line directory in which your call sign will be listed. If registered as a Repeater it is expected you will link to and support a full duplex, public repeater. If registered as a Link your transceiver will provide only half-duplex support to transceivers in your immediate area.

The control computer for Users, Links, and Repeaters may use a microphone and speaker for voice connections directly over the Internet. Additionally, the Link and Repeater setup allows the computer to be connected to an amateur radio transceiver. This transceiver may be set for local, simplex operation, a link to a remote repeater or be connected directly at the repeater itself.

EchoLink offers an Internet based interconnection for a licensed amateur radio operator between a computer (User), local simplex RF access to EchoLink (Link, –L), to a repeater (Repeater, -R) and Conferences (a high capacity computer to interconnect many EchoLink connections).

Echolink NA1WJ Installation

The core of the installation is an Internet connected computer at the NA1WJ Demonstration Station operating as NA1WJ-R Node 4566, equipped with a micro- phone and speaker. All inward contacts to NA1WJ-R can be served at this computer. It is planned to link fulltime to the EchoLink conference *JAMBO* as remote EchoLink uses will be directed to use that conference.

This simple facility can:

- Receive and originate contacts to remote EchoLink users whether computer or RF originated.
- Link to conferences for expanded capacity (*JAMBO*).
- Link to EchoLink equipped repeaters, locally or worldwide.
- No radio support is needed for this basic operation.

If interest and traffic allows this EchoLink support will be linked to the WV8BSA VHF and/or UHF repeaters to allow greater exposure and participation. Experience has shown the routine level of traffic should allow this option.

Jamboree ham participants with an HT may monitor remote calls for a Scout contact and to monitor the EchoLink “chatter.” Experience from prior Jamborees suggests the repeater usage is recreational (no critical Jamboree mission) and a sense of involvement will be generated across the full Jamboree. Additional layouts will be discussed later with their pros and cons.

EchoLink Locations	Call Sign	Node
NA1WJ HQ at Summit Center	K2BSA-R	4566
WV8BSA-R VHF at Rock Borrow	WV8BSA-R	6544
NA1WJ-R UHF at Rock Borrow	NA1WJ-R	873264
JAMBO Conference Node	*JAMBO*	832996
Alternative *JOTA-365* Conference	*JOTA-365*	480809

Operator Functions

The key responsibilities of the EchoLink control operators include: HQ installation, linking to the on-site repeaters, linking to *JAMBO*, remote control of the two repeater EchoLink computers, teaching local hams HT access, and demonstration to Jamboree attendees.

Linking To The *JAMBO* Conference

From the Index View, click on Node Types, Conferences, Scroll down to *JAMBO* and select. This may be added to Favorites by right clicking. We plan to link to *JAMBO* continuously.

Disconnecting

HT users disconnect by sending TouchTone 73.

Sending TouchTone ## will disconnect all users. This would be used in case of misuse or need to isolate a repeater.

The ## value may be changed at Tools/Sysop Setttings/DTMF Remote Control Of An EchoLink Node/Repeater Refer to the section: Technical Support. This ability may be used to control the WV8BSA-R and W6BSA-R computers from HQ.

Attachment D: NA1WJ Amateur Radio Introduction Outline

- What is NA1WJ?
    - This Amateur Radio Station is designed to tell the world about the importance of Scouting!
    - You will get the chance to talk on the air!

- What is Radio?
    - Radio is sending information electronically without wires.
    - Cellphones, WIFI, Bluetooth, TV, RADAR are all forms of radio

- What is Amateur Radio?
    - Amateur Radio Operators are people licensed by their government after taking a simple exam.
    - Governments license them because Amateur Radio Operators:
        - Learn about radio and electronics
        - Invent new forms of radio.
        - Promote international goodwill.
        - Help First Responders in Emergencies.

- How does it work?
    - Radio Transmitters are electronic devices that get electrons to vibrate very fast.
    - Electrons that vibrate very fast can generate electromagnetic radio waves that can travel very far.
    - Some radio waves can bounce around the world by alternately skipping off the upper atmosphere and the surface of the earth

- What's Next?
    - You will be assigned to one of our radio stations.
    - The operator there will try to find a distant radio station to talk to.
    - He will show you how to squeeze the transmit button and speak clearly into the microphone.
    - You will then have a short conversation with the distant station that may include:
        - What you like about Scouting
        - What you are doing at the Jamboree
        - What the weather is like at his location
        - What he likes about Amateur Radio
        - Other topics that interest you.

Attachment E: QSO- Cheat sheet

Q codes

QRM Are you being interfered with? / I am being interfered with

QRN Are you troubled by static? / I am troubled by static

QSB Is my signal fading? / Your signal is fading

QSL Can you acknowledge receipt? / I am acknowledging receipt

QSO Can you communicate with ... Directly? / I can communicate with ... Direct

QTH What is your position (location)? / My position (location) is ...

CQ Looking for contacts (example: “CQ CQ from NA1WJ”)

73 Best Regards

Signal Reports

RS; R=1-5, Readability; S=1-9 Signal Strength

The Phonetic Alphabet

Alpha	Juliet	Sierra
Bravo	Kilo	Tango
Charlie	Lima	Uniform
Delta	Mike	Victor
Echo	November	Whiskey
Foxtrot	Oscar	X-ray
Golf	Papa	Yankee
Hotel	Quebec	Zulu
India	Romeo	

“November Alpha One Whisky Juliet”

Suggested Discussion Topics

1. Where do you live?
2. What are your hobbies?
3. What ham radio activities do engage in?
4. What are your favorite sport teams?
5. Were you (or Are you) involved in Scouting? in what capacity?
6. What is your favorite thing to do outside of ham radio?
7. What is your favorite car?
8. Do you have any pets? What kind(s)?
9. What is your favorite food?
10. What do you like to do for entertainment?
11. Do you take vacation? What is your favorite vacation location?
12. Are you a member of a ham radio club?
13. Where is your home located?
14. Have you lived in other states/countries? Which ones?
15. What is your favorite movie?
16. What is your favorite TV show?
17. Do you do any type of camping?
18. What outdoor activities to you like?
19. Do you have any children? Grandchildren?
20. What is your favorite type of vehicle (car/truck, etc.)?

Items to have at each station:

4 Head sets
Head set amplifier + powersupply
** 1/4" to 1/4" balanced interconnect cable between the radio and head set amplifier
** 1/4" to 1/8" head set adapters
Desktop microphone
** USB interconnect cable between radio and computer
Computer monitor
** computer monitor cable to laptop (VGA or HDMI .. need to know so correct cable is available)
laptop
** external keyboard (this makes computer placement less critical)
** mouse
** mouse pad
Bandplan chart
World Azmuthial map
Q-code chart
QSO cheat sheet in language for youth
CEPT chart/country list
Callsign Chart
Operator manual
Contact cards
** Notepads and pens
table
3-4 chairs
Desklamp
** Station frequency sign
** power strip
** box for contact cards + notepads
** string/chain to attach station pen

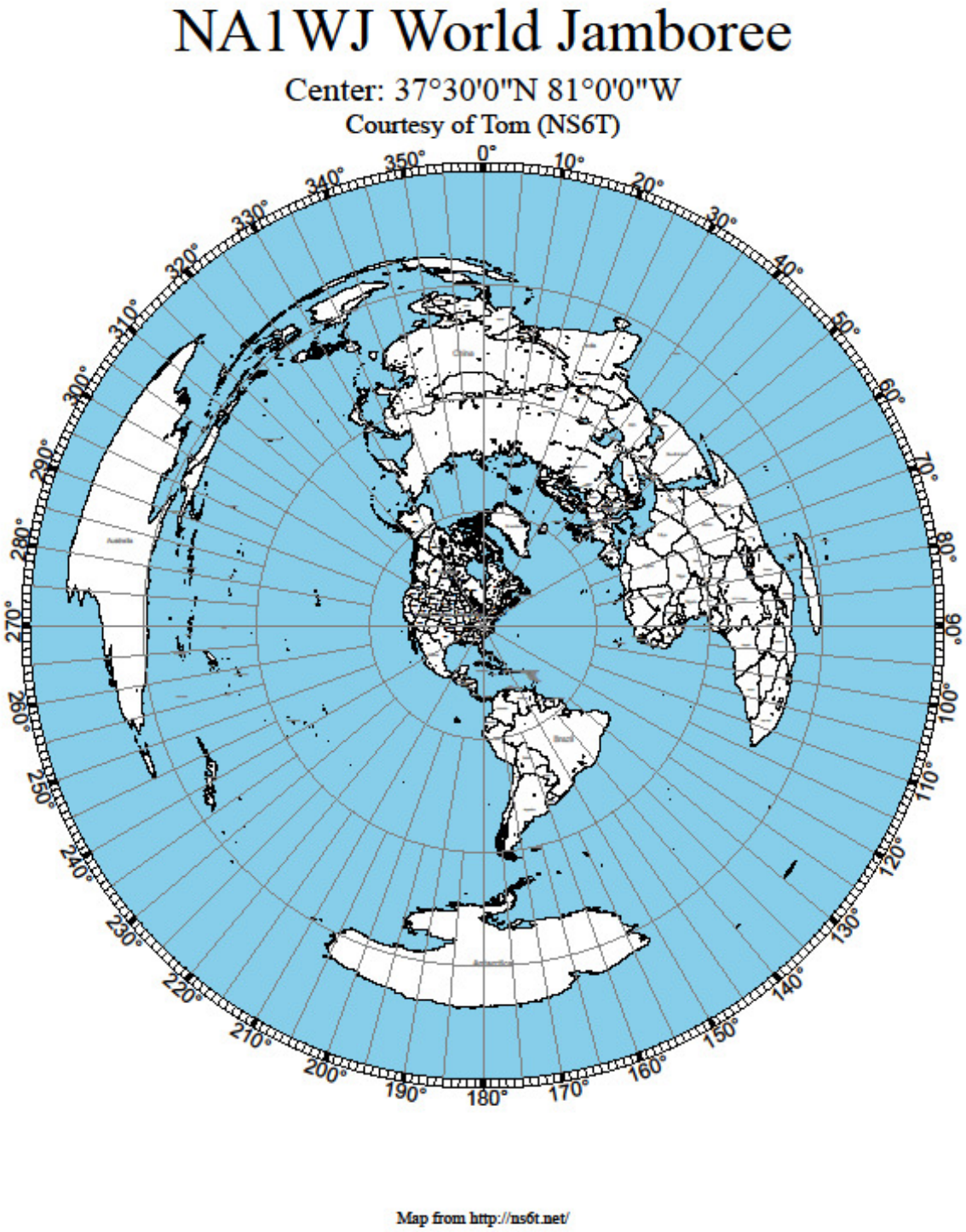
** These are small items, but typically are gotchas (expected, or forgotten) that get us in a bind during setup and
operation.

Satellite station requires two monitors (larger, like 32"+) plus the other items
SatPC32 installed (Mike, W4UOO probably will provide, and possibly computers as well).

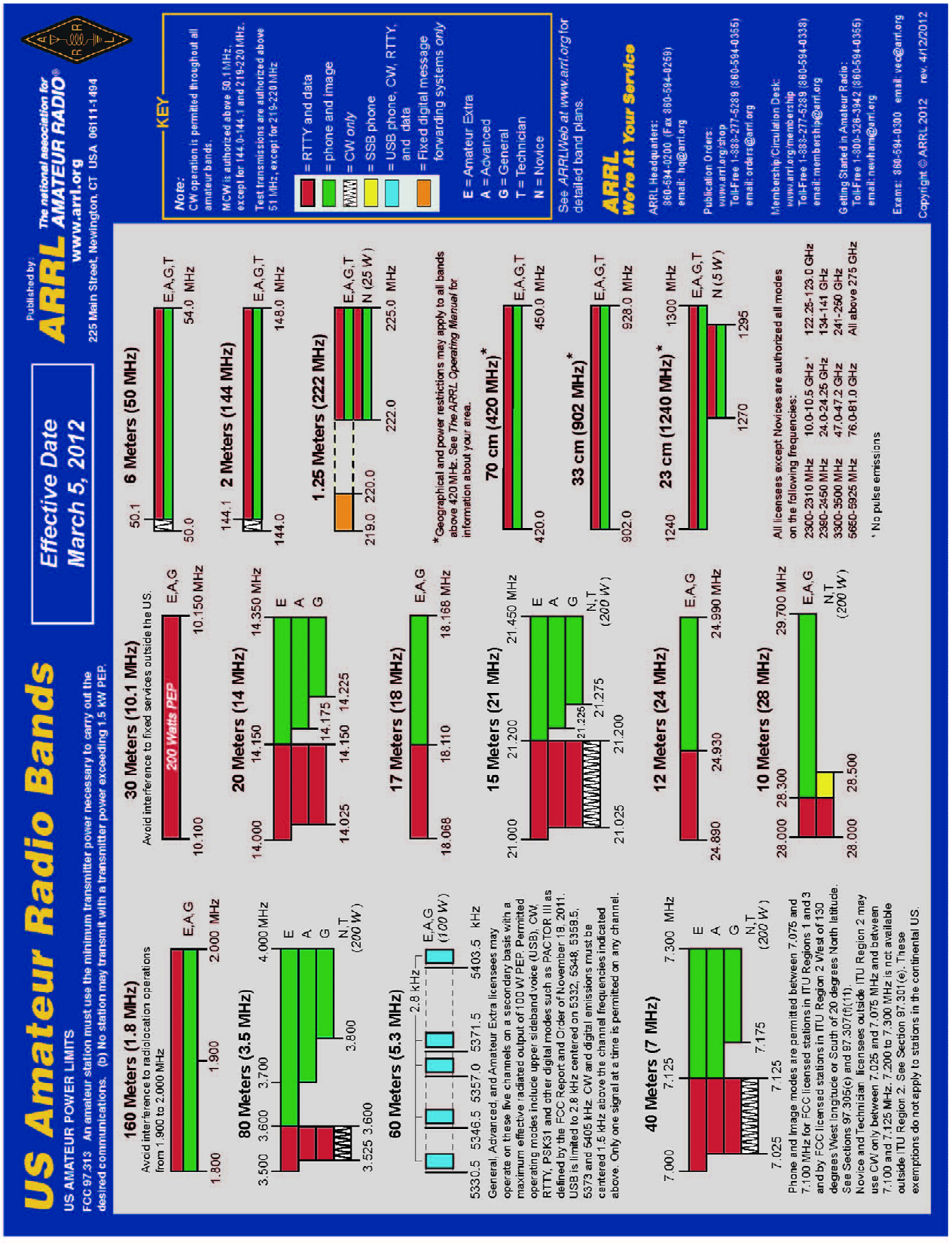
Things for computer:

Latest and greatest Windows update
N1MM configured w/desktop icon
Desktop icon of radio manual
Desktop icon of operator manual
Desktop icon of WSJT-x
Desktop icon of HRD (or other digital program, possibly RTTY, PSK-31, etc).

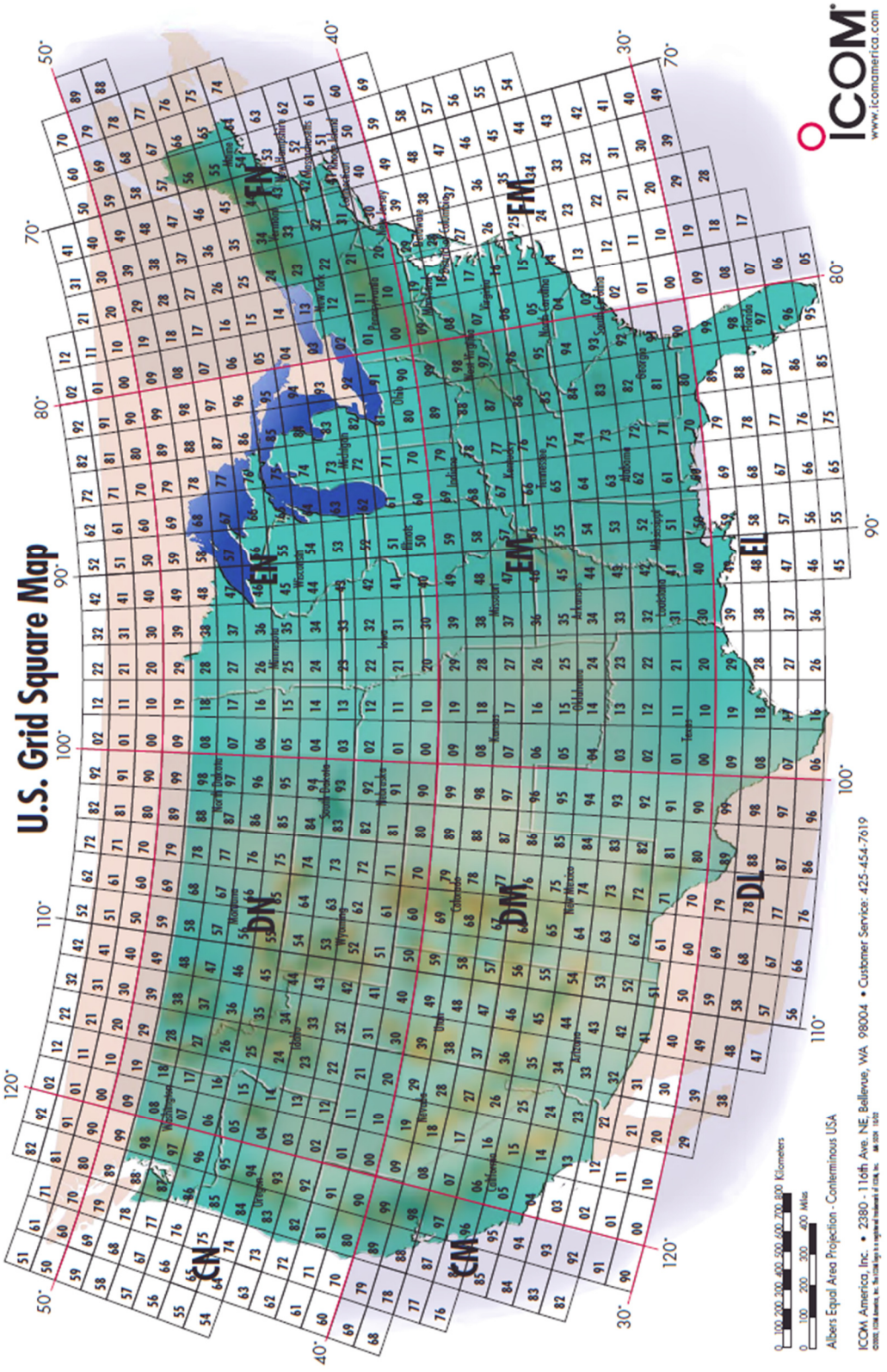
Attachment K: Azmuthal Map



Attachment L: US Band Plan



Attachment L: US Grid Square Map



Attachment M: DX Entity Call Signs

Prefix	Entity	Cont.	ITU	CQ	Az.
1A0	Sov. Mil. Order of Malta	EU	28	15	
1S	Spratly Is.	AS	50	26	
3A	Monaco	EU	27	14	
3B6, 7	Agalega & St. Brandon	AF	53	39	
3B8	Mauritius	AF	53	39	
3B9	Rodriguez I.	AF	53	39	
3C	Equatorial Guinea	AF	47	36	
3C0	Pagalu I.	AF	52	36	
3D2	Fiji	OC	56	32	
3D2	Conway Reef	OC	56	32	
3D2	Rotuma I.	OC	56	32	
3DA	Swaziland	AF	57	38	
3V	Tunisia	AF	37	33	
3W, XV	Vietnam	AS	49	26	
3X	Guinea	AF	46	35	
3Y	Bouvet	AF	67	38	
3Y	Peter I I.	AN	72	12	
4J,4K	Azerbaijan	AS	29	21	
4L	Georgia	AS	29	21	
4O	Montenegro	EU	28	15	
4P-4S	Sri Lanka	AS	41	22	
4U_ITU	ITU HQ	EU	28	14	
4U_UN	United Nations HQ	NA	8	5	
4W6	East Timor	OC	54	28	
4X, 4Z	Israel	AS	39	20	
5A	Libya	AF	38	34	
5B	Cyprus	AS	39	20	
5H-5I	Tanzania	AF	53	37	
5N-5O	Nigeria	AF	46	35	
5R-5S	Madagascar	AF	53	39	
5T	Mauritania	AF	46	35	
5U	Niger	AF	46	35	
5V	Togo	AF	46	35	
5W	Western Samoa	OC	62	32	
5X	Uganda	AF	48	37	
5Y-5Z	Kenya	AF	48	37	
6V-6W	Senegal	AF	46	35	
6Y	Jamaica	NA	11	8	
7O	Yemen	AS	39	21	

Prefix	Entity	Cont.	ITU	CQ	Az.
7P	Lesotho	AF	57	38	
7Q	Malawi	AF	53	37	
7T-7Y	Algeria	AF	37	33	
8P	Barbados	NA	11	8	
8Q	Maldives	AS/AF	41	22	
8R	Guyana	SA	12	9	
9A	Croatia	EU	28	15	
9G	Ghana	AF	46	35	
9H	Malta	EU	28	15	
9I-9J	Zambia	AF	53	36	
9K	Kuwait	AS	39	21	
9L	Sierra Leone	AF	46	35	
9M2, 4	West Malaysia	AS	54	28	
9M6, 8	East Malaysia	OC	54	28	
9N	Nepal	AS	42	22	
9Q-9T	Dem.Rep. Of Congo	AF	52	36	
9U	Burundi	AF	52	36	
9V	Singapore	AS	54	28	
9X	Rwanda	AF	52	36	
9Y-9Z	Trinidad & Tobago	SA	11	9	
A2	Botswana	AF	57	38	
A3	Tonga	OC	62	32	
A4	Oman	AS	39	21	
A5	Bhutan	AS	41	22	
A6	United Arab Emirates	AS	39	21	
A7	Qatar	AS	39	21	
A9	Bahrain	AS	39	21	
AP-AS	Pakistan	AS	41	21	
BS7	Scarborough Reef	AS	50	27	
BV	Taiwan	AS	44	24	
BV9P	Pratas	AS	44	24	
BY,BT	China	AS	33,42,43,44	23.24	
C2	Nauru	OC	65	31	
C3	Andorra	EU	27	14	
C5	The Gambia	AF	46	35	
C6	Bahamas	NA	11	8	
C8-9	Mozambique	AF	53	37	
CA-CE	Chile	SA	14.16	12	
CE0	Easter I.	SA	63	12	
CE0	Juan Fernandez Is.	SA	14	12	

Prefix	Entity	Cont.	ITU	CQ	Az.
CE0	San Felix & San Ambrosio	SA	14	12	
CE9/KC4	Antarctica	AN	67,69-74	(*41)	
CM, CO	Cuba	NA	11	8	
CN	Morocco	AF	37	33	
CP	Bolivia	SA	12.14	10	
CT	Portugal	EU	37	14	
CT3	Madeira Is.	AF	36	33	
CU	Azores	EU	36	14	
CV-CX	Uruguay	SA	14	13	
CY0	Sable I.	NA	9	5	
CY9	St. Paul I.	NA	9	5	
D2-3	Angola	AF	52	36	
D4	Cape Verde	AF	46	35	
D6	Comoros	AF	53	39	
DA-DL	Fed. Rep. of Germany	EU	28	14	
DU-DZ	Philippines	OC	50	27	
E3	Eritrea	AF	48	37	
E4	Palestine	AS	39	20	
EA-EH	Spain	EU	37	14	
EA6-EH6	Balearic Is.	EU	37	14	
EA8-EH8	Canary Is.	AF	36	33	
EA9-EH9	Ceuta & Melilla	AF	37	33	
EI-EJ	Ireland	EU	27	14	
EK	Armenia	AS	29	21	
EL	Liberia	AF	46	35	
EP-EQ	Iran	AS	40	21	
ER	Moldovia	EU	29	16	
ES	Estonia	EU	29	15	
ET	Ethiopia	AF	48	37	
EU, EV, EW	Belarus	EU	29	16	
EX	Kyrgystan	AS	30.31	17	
EY	Tajikistan	AS	30	17	
EZ	Turkmenistan	AS	30	17	
F	France	EU	27	14	
FG	Guadeloupe	NA	11	8	
FJ	Saint Barthelemy	NA	11	8	
FS	Saint Martin	NA	11	8	
FH	Mayotte	AF	53	39	
FK	New Caledonia	OC	56	32	
FM	Martinique	NA	11	8	

Prefix	Entity	Cont.	ITU	CQ	Az.
FO	Austral I.	OC	63	32	
FO	Clipperton I.	NA	10	7	
FO	French Polynesia	OC	63	32	
FO	Marquesas I.	OC	63	31	
FP	St. Pierre & Miquelon	NA	9	5	
FR/G	Glorioso Is.	AF	53	39	
FR/J, E	Juan de Nova, Europa	AF	53	39	
FR	Reunion	AF	53	39	
FR/T	Tromelin I.	AF	53	39	
FT8W	Crozet I.	AF	68	39	
FT8X	Kerguelen Is.	AF	68	39	
FT8Z	Amsterdam & St. Paul Is.	AF	68	39	
FW	Wallis & Futuna Is.	OC	62	32	
FY	French Guiana	SA	12	9	
G, GX	England	EU	27	14	
GD, GT	Isle of Man	EU	27	14	
GI, GN	Northern Ireland	EU	27	14	
GJ, GH	Jersey	EU	27	14	
GM, GS	Scotland	EU	27	14	
GU, GP	Guernsey	EU	27	14	
GW, GC	Wales	EU	27	14	
H4	Solomon Is.	OC	51	28	
H40	Temotu Province	OC	51	32	
HA, HG	Hungary	EU	28	15	
HB	Switzerland	EU	28	14	
HB0	Liechtenstein	EU	28	14	
HC-HD	Ecuador	SA	12	10	
HC8-HD8	Galapagos Is.	SA	12	10	
HH	Haiti	NA	11	8	
HI	Dominican Republic	NA	11	8	
HJ-HK	Colombia	SA	12	9	
HK0	Malpelo I.	SA	12	9	
HK0	San Andres & Providencia	NA	11	7	
HL	South Korea	AS	44	25	
HO-HP	Panama	NA	11	7	
HQ-HR	Honduras	NA	11	7	
HS	Thailand	AS	49	26	
HV	Vatican	EU	28	15	
HZ	Saudi Arabia	AS	39	21	
I	Italy	EU	28.37	15,33	

Prefix	Entity	Cont.	ITU	CQ	Az.
IS, IM	Sardinia	EU	28	15	
J2	Djibouti	AF	48	37	
J3	Grenada	NA	11	8	
J5	Guinea-Bissau	AF	46	35	
J6	St. Lucia	NA	11	8	
J7	Dominica	NA	11	8	
J8	St. Vincent	NA	11	8	
JA-JS	Japan	AS	45	25	
JD1	Minami Torishima	OC	90	27	
JD1	Ogasawara	AS	45	27	
JT-JV	Mongolia	AS	32.33	23	
JW	Svalbard	EU	18	40	
JX	Jan Mayen	EU	18	40	
JY	Jordan	AS	39	20	
K,W,N, AA-AK	United States of America	NA	6,7,8	3,4,5	
KG4	Guantanamo Bay	NA	11	8	
KH0	Mariana Is.	OC	64	27	
KH1	Baker & Howland Is.	OC	61	31	
KH2	Guam	OC	64	27	
KH3	Johnston I.	OC	61	31	
KH4	Midway I.	OC	61	31	
KH5	Palmyra & Jarvis Is.	OC	61.62	31	
KH5K	Kingman Reef	OC	61	31	
KH6	Hawaii	OC	61	31	
KH7	Kure I.	OC	61	31	
KH8	American Samoa	OC	62	32	
KH8SI	Swain's I.	OC	62	32	
KH9	Wake I.	OC	65	31	
KL7	Alaska	NA	1.2	1	
KP1	Navassa I.	NA	11	8	
KP2	Virgin Is.	NA	11	8	
KP4	Puerto Rico	NA	11	8	
KP5	Desecheo I.	NA	11	8	
LA-LN	Norway	EU	18	14	
LO-LW	Argentina	SA	14.16	13	
LX	Luxembourg	EU	27	14	
LY	Lithuania	EU	29	15	
LZ	Bulgaria	EU	28	20	
OA-OC	Peru	SA	12	10	
OD	Lebanon	AS	39	20	

Prefix	Entity	Cont.	ITU	CQ	Az.
OE	Austria	EU	28	15	
OF-OI	Finland	EU	18	15	
OH0	Aland Is.	EU	18	15	
OJ0	Market Reef	EU	18	15	
OK-OL	Czech Republic	EU	28	15	
OM	Slovak Republic	EU	28	15	
ON-OT	Belgium	EU	27	14	
OX	Greenland	NA	5.75	40	
OY	Faroe Is.	EU	18	14	
OZ	Denmark	EU	18	14	
P2	Papua New Guinea	OC	51	28	
P4	Aruba	SA	11	9	
P5	North Korea	AS	44	25	
PA-PI	Netherlands	EU	27	14	
PJ2	Curaçao	SA	11	9	
PJ4	Bonaire	SA	11	9	
PJ5,6	Saba & St.Eustatius	NA	11	8	
PJ7	Sint Maarten	NA	11	8	
PP-PY	Brazil	SA	13,15	11	
PP0-PY0	Fernando de Noronha	SA	13	11	
PP0-PY0	St. Peter & St. Paul Rock	SA	13	11	
PP0-PY0	Trindade & Martim Vaz Is.	SA	15	11	
PZ	Suriname	SA	12	9	
R1FJ	Franz Josef Land	EU	75	40	
S0	Western Sahara	AF	46	33	
S2	Bangladesh	AS	41	22	
S5, YU3	Slovenia	EU	28	15	
S7	Seychelles	AF	53	39	
S9	Sao Tome & Principe	AF	47	36	
SA-SM	Sweden	EU	18	14	
SN-SR	Poland	EU	28	15	
ST	Sudan	AF	48	34	
SU	Egypt	AF	38	34	
SV-SZ	Greece	EU	28	20	
SV/A	Mount Athos	EU	28	20	
SV5	Dodecanese	EU	28	20	
SV9	Crete	EU	28	20	
T2	Tuvalu	OC	65	31	
T30	W. Kiribati (Gilbert Is.)	OC	65	31	
T31	C. Kiribati (Brit. Phoenix Is.)	OC	62	31	

Prefix	Entity	Cont.	ITU	CQ	Az.
T32	E. Kiribati (Line Is.)	OC	61.63	31	
T33	Banaba I. (Ocean I.)	OC	65	31	
T5	Somalia	AF	48	37	
T7	San Marino	EU	28	15	
T8	Belau (W. Caroline Is.)	OC	64	27	
T9	Bosnia-Herzegovina	EU	28	15	
TA-TC	Turkey	EU/AS	39	20	
TF	Iceland	EU	17	40	
TG, TD	Guatemala	NA	11	7	
TI, TE	Costa Rica	NA	11	7	
TI9	Cocos I.	NA	11	7	
TJ	Cameroon	AF	47	36	
TK	Corsica	EU	28	15	
TL	Central Africa	AF	47	36	
TN	Congo	AF	52	36	
TR	Gabon	AF	52	36	
TT	Chad	AF	47	36	
TU	Cote d'Ivoire	AF	46	35	
TX0	Chesterfield Is.	OC	56	32	
TY	Benin	AF	46	35	
TZ	Mali	AF	46	35	
UA-UI1,3,4,6,RA-RZ	European Russia	EU	(E)	16	
UA2	Kaliningrad	EU	29	15	
UA-UI8,9,0,RA-RZ	Asiatic Russia	AS	(F)	(G)	
UJ-UM	Uzbekistan	AS	30	17	
UN-UQ	Kazakhstan	AS	29-31	17	
UR-UZ, EM-EO	Ukraine	EU	29	16	
V2	Antigua & Barbuda	NA	11	8	
V3	Belize	NA	11	7	
V4	St.Kitts & Nevis	NA	11	8	
V5	Namibia	AF	57	38	
V6	Micronesia (E.Caroline Is.)	OC	65	27	
V7	Marshall Is.	OC	65	31	
V8	Brunei	OC	54	28	
VE, VO, VY	Canada	NA	2-4,9,75	5-Jan	
VK	Australia	OC	55,58,59	29,3O	
VK0	Heard I.	AF	68	39	
VK0	Macquarie I.	OC	60	30	
VK9C	Cocos-Keeling Is.	OC	54	29	
VK9L	Lord Howe I.	OC	60	30	

Prefix	Entity	Cont.	ITU	CQ	Az.
VK9M	Mellish Reef	OC	56	30	
VK9N	Norfolk I.	OC	60	32	
VK9W	Willis I.	OC	55	30	
VK9X	Christmas I.	OC	54	29	
VP2E	Anguilla	NA	11	8	
VP2M	Montserrat	NA	11	8	
VP2V	British Virgin Is.	NA	11	8	
VP5	Turks & Caicos Is.	NA	11	8	
VP6	Pitcairn I.	OC	63	32	
VP6	Ducie I.	OC	63	32	
VP8	Falkland Is.	SA	16	13	
VP8, LU	South Georgia I.	SA	73	13	
VP8, LU	South Orkney Is.	SA	73	13	
VP8, LU	South Sandwich Is.	SA	73	13	
VP8, LU,CE9, HF0, 4K1	South Shetland Is.	SA	73	13	
VP9	Bermuda	NA	11	5	
VQ9	Chagos Is.	AF	41	39	
VS6, VR2	Hong Kong	AS	44	24	
VU	India	AS	41	22	
VU	Andaman & Nicobar Is.	AS	49	26	
VU	Laccadive Is.	AS	41	22	
XA-XI	Mexico	NA	10	6	
XA4-XI4	Revilla Gigedo	NA	10	6	
XT	Burkina Faso	AF	46	35	
XU	Cambodia	AS	49	26	
XW	Laos	AS	49	26	
XX9	Macao	AS	44	24	
XY-XZ	Myanmar	AS	49	26	
YA	Afghanistan	AS	40	21	
YB-YH	Indonesia	OC	51.54	28	
YI	Iraq	AS	39	21	
YJ	Vanuatu	OC	56	32	
YK	Syria	AS	39	20	
YL	Latvia	EU	29	15	
YN	Nicaragua	NA	11	7	
YO-YR	Romania	EU	28	20	
YS	El Salvador	NA	11	7	
YT-YU, YZ	Serbia	EU	28	15	
YV-YY	Venezuela	SA	12	9	
YV0	Aves I.	NA	11	8	

Prefix	Entity	Cont.	ITU	CQ	Az.
Z2	Zimbabwe	AF	53	38	
Z3	Macedonia	EU	28	15	
ZA	Albania	EU	28	15	
ZB2	Gibraltar	EU	37	14	
ZC4	UK Sov. Base Areas on Cyprus	AS	39	20	
ZD7	St. Helena	AF	66	36	
ZD8	Ascension I.	AF	66	36	
ZD9	Tristan da Cunha & Gough I.	AF	66	38	
ZF	Cayman Is.	NA	11	8	
ZK1	N. Cook Is.	OC	62	32	
ZK1	S. Cook Is.	OC	62	32	
ZK2	Niue	OC	62	32	
ZK3	Tokelau Is.	OC	62	31	
ZL-ZM	New Zealand	OC	60	32	
ZL7	Chatham Is.	OC	60	32	
ZL8	Kermadec Is.	OC	60	32	
ZL9	Auckland & Campbell Is.	OC	60	32	
ZP	Paraguay	SA	14	11	
ZR-ZU	South Africa	AF	57	38	
ZS8	Prince Edward & Marion Is	AF	57	38	
Number or entities:	339				
Deleted entities					
	Blenheim Reef	AF	41	39	
	Geyser Reef	AF	53	39	
	Abu Ail Is.	AS	39	21	
1M	Minerva Reef	OC	62	32	
4W	Yemen Arab Rep.	AS	39	21	
7J1	Okino Tori-shima	AS	45	27	
8Z4	Saudi Arabia/Iraq Neut. Zone	AS	39	21	
8Z5, 9K3	Kuwait/Saudi Arabia Neut. Zone	AS	39	21	
9S4	Saar	EU	28	14	
9U5	Ruanda-Urundi	AF	52	36	
AC3	Sikkim	AS	41	22	
AC4	Tibet	AS	41	23	
C9	Manchuria	AS	33	24	
CN2	Tangier	AF	37	33	
CR8	Damao, Diu	AS	41	22	
CR8	Goa	AS	41	22	

Prefix	Entity	Cont.	ITU	CQ	Az.
CR8, CR10	Portuguese Timor	OC	54	28	
DA-DM	Germany	EU	28	14	
DM, Y2-9	German Dem. Rep.	EU	28	14	
EA9	Ifni	AF	37	33	
FF	French West Africa	AF	46	35	
FH, FB8	Comoros	AF	53	39	
FI8	French Indo-China	AS	49	26	
FN8	French India	AS	41	22	
FQ8	Fr. Equatorial Africa	AF	47,52	36	
HK0	Bajo Nuevo	NA	11	8	
HK0,KP3,KS4	Serrana Bank & Roncador Cay	NA	11	7	
I1	Trieste	EU	28	15	
I5	Italian Somaliland	AF	48	37	
JZ0	Netherlands N. Guinea	OC	51	28	
KR6,8,JR6, KA6	Okinawa (Ryukyu Is.)	AS	45	25	
KS4	Swan Is.	NA	11	7	
KZ5	Canal Zone	NA	11	7	0
OK-OM	Czechoslovakia	EU	28	15	
P2, VK9	Papua Territory	OC	51	28	
P2, VK9	Terr. New Guinea	OC	51	28	
PJ2, 4, 9	Bonaire,Curacao (Neth. Antilles)	SA	11	9	
PJ5-8	St.Maarten,Saba,St.Eustatius	NA	11	8	
PK1-3	Java	OC	54	28	
PK4	Sumatra	OC	54	28	
PK5	Netherlands Borneo	OC	54	28	
PK6	Celebe & Molucca Is.	OC	54	28	
R1MV	Malyj Vysotskij I.	EU	29	16	
ST0	Southern Sudan	AF	47.48	34	
UN1	Karelo-Finnish Rep.	EU	19	16	
VO	Newfoundland, Labrador	NA	9	2.05	
VQ1, 5H1	Zanzibar	AF	53	37	
VQ6	British Somaliland	AF	48	37	
VQ9	Aldabra	AF	53	39	
VQ9	Desroches	AF	53	39	
VQ9	Farquhar	AF	53	39	
VS2, 9M2	Malaya	AS	54	28	
VS4	Sarawak	OC	54	28	
VS9A, P, S	People's Dem. Rep. of Yemen	AS	39	21	
VS9H	Kuria Muria I.	AS	39	21	
VS9K	Kamaran Is.	AS	39	21	

Prefix	Entity	Cont.	ITU	CQ	Az.
ZC5	British North Borneo	OC	54	28	
ZC6, 4X1	Palestine	AS	39	20	
ZD4	Gold Coast, Togoland	AF	46	35	
ZS0, 1	Penguin Is.	AF	57	38	
ZS9	Walvis Bay	AF	57	38	
Number or deleted:	61				