

Northern California FM Simplex Operations Guide

**Robert B. Carleton
KJ6VVJ**

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Introduction

Scope

The purpose of this work is to provide information about FM simplex phone operation. It's intended for use in the region extending from California's coast to the Nevada border and from Tehachapi in the south to the Oregon border in the north.

Content

Commonly used FM simplex frequencies in Northern California are summarized. It outlines use of the Wilderness Protocol. A quick reference is included to provide a concise reference of techniques and pro-words for radio communications by any means. An additional goal of the guide, is to encourage and popularize the use of simplex as an alternative to repeater operation. With some forethought and discipline, simplex operation can be effectively used for routine and emergency communications. All frequencies are presented in MHz.

Calling Frequencies

To properly use calling frequencies, make your calls, then move to a working frequency so others can use the calling frequency. It's suggested that you wait until 4 minutes after the hour to make a call. This timing helps prevent interference to those in trouble using the Wilderness Protocol. They are likely to transmit between minute zero and minute four at the top of the hour.

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Microphone Techniques

It is important to use prescribed microphone techniques when operating a radio. Most microphones used today are extremely sensitive and should be held or placed about one-half inch from your lips and spoken into at a normal level without raising your voice. The use of correct procedures shortens transmission time and releases the frequency to other users. Experience shows that the four most important factors in voice communications are the degree of loudness, rate of speech, pronunciation, and pattern of speech used. A brief summary of these factors follows:

LOUDNESS: The degree of loudness (volume) to use depends on a number of factors such as propagation quality, type of emission, and type of microphone being used. Speaking too loudly on a single sideband circuit may over modulate the signal to a point where it becomes unintelligible. As a general rule of thumb, speak clearly, distinctly, and in a normal tone.

RATE OF SPEECH: There is no fixed rate of speech that is best for all occasions. Generally, words are spoken at approximately 100 words per minute. If the message is to be written down, the transmission speed should be slowed accordingly. Speak at a rate which sounds natural, and allows the message to be written down by the receiving operator.

PRONUNCIATION: The third factor for good readability is the clear and distinct pronunciation of all sounds, syllables, and words. Words not pronounced distinctly may be misunderstood. Give all words a commonly accepted pronunciation.

PATTERN: Good readability in voice communications requires a not too fast, not too slow rate of speech and strict attention to pronunciation. A radio message should not be transmitted word-by-word. It should be transmitted idea by idea, with adequate spacing between the words that make up the separate ideas. To ensure understandability, radio transmissions should be similar to conversational speech.

ITU Phonetics

Letters

- A - Alfa "AL-FAH"
- B - Bravo "BRAH-VOH"
- C - Charlie "CHAR-LEE" or "SHAR-LEE"
- D - Delta "DELL-TAH"
- E - Echo "ECK-OH"
- F - Foxtrot "FOKS-TROT"
- G - Golf "GOLF"
- H - Hotel "HOH-TELL"
- I - India "IN-DEE-AH"
- J - Juliett "JEW-LEE-ETT"
- K - Kilo "KEE-LOH"
- L - Lima "LEE-MAH"
- M - Mike "MIKE"
- N - November "NO-VEM-BER"
- O - Oscar "OSS-CAH"
- P - Papa "PAH-PAH"
- Q - Quebec "KEH-BECK"
- R - Romeo "ROW-ME-OH"
- S - Sierra "SEE-AIR-RAH"
- T - Tango "TANG-GO"
- U - Uniform "YOU-NEE-FORM" or "OO-NEE-FORM"
- V - Victor "VIK-TAH"
- W - Whiskey "WISS-KEY"
- X - X-ray "ECKS-RAY"
- Y - Yankee "YANG-KEY"
- Z - Zulu "ZOO-LOO"

Numbers

- 0 - "ZEE-RO"
- 1 - "WUN"
- 2 - "TOO"
- 3 - "TH-UH-REE" or "TREE"
- 4 - "FOW-ER"
- 5 - "FI-IV" or "FIFE"
- 6 - "SIX"
- 7 - "SEV-EN"
- 8 - "ATE" or "A-IT"
- 9 - "NIN-ER"
- DECIMAL = "DAY-SEE-MAL"

Anomalies and idiosyncrasies

- To distinguish “Z” from “C” on phone, it is common practice to say “zed” (an old British phonetic) for “Z”, especially when saying a call sign. “Zed” is shorter (one syllable vs. two for “zulu”.) However, in formal traffic, the ITU: “ZULU” is more correct and proper.
- “ROGER” (an early phonetic) is still used for “received” - It does NOT mean “yes” or “affirmative”. It only means: “I have received your message completely.”

Procedure words

Procedure words, or "pro-words" are used to save time and increase readability of voice communications. Their usage is optional. The following pro-words are based on recommendations by the Amateur Radio Emergency Service (ARES) and operating procedures from other radio services.

General communications

You may hear these pro-words in radio nets or during regular amateur radio operations.

- Over - Used to let another station that they can respond
- Out - This is the end of my transmission to you and no answer is required or expected. (Since OVER and OUT have opposite meanings, they are never used together.)
- Stand by - A temporary interruption in the contact
- Roger - Indicate that a transmission was completely received and understood
- Break - Interrupt transmission (see usage in message handling)

Message handling

These pro-words are typically used during formal traffic nets, though you may hear them in other contexts. Note the different usage of Break during a traffic net.

- Break - Separates address from text and text from signature (see usage in general communications)
- Correction - I am going to correct and error
- End - End of message
- More - Additional messages to follow
- No more - No additional messages
- Figures - Used prior to saying a group of numbers
- Initial - Used to indicate a single letter will follow
- I say again - Used to repeat a word or phrase
- I spell - "I am going to spell a word phonetically"
- Letter group - Used to indicate several letters together in a group
- Mixed group - A group of letters and numbers will follow
- X-Ray - Used to indicate the end of a sentence, or as a period
- Correct - Correct, yes
- Confirm - Please check on this for me
- This is - Used to precede your station identification
- HX - Precedes single letter handling instructions
- Go ahead - Invitation to another station to transmit
- Word after - Used to identify text after a word that needs correction
- Word before - Used to identify text before a word that needs correction
- Between - Used to identify text between words that needs correction
- All after - Used to identify text after a word that needs correction
- All before - Used to identify text before a word that needs correction

Wilderness Protocol

The Wilderness Protocol suggests radio operators (Amateur service) should monitor standard simplex channels at specific times in case of Emergency or Priority Calls. The idea is to allow communications between hams that are hiking, backpacking or camping in uninhabited areas, outside repeater range. The protocol offers an alternative opportunity to be heard.

The wilderness protocol was inspired by KG4YFE, an avid hiker and camper. It was refined and popularized by William Alsup, N6XMW.

Monitoring Frequency

Monitor the primary frequency - 146.520 MHz and any or all of the secondary frequencies - 52.525 MHz, 223.500 MHz, 446.000 MHz, 1294.500 MHz.

Monitoring Times

Monitor every 3 hours from 7:00 am (0700 Hrs) until 5 (five) minutes past the hour 7:05am (0705 Hrs). Monitoring times: 7:00am - 7:05am, 10:00am - 10:05am, 1:00pm - 1:05pm, 4:00pm - 4:05pm, 7:00pm - 7:05pm, 10:00pm - 10:05pm, 1:00am - 1:05am, 4:00am - 4:05am.

Alternate Times

Monitor every 3 hours as suggested above, however monitor 5 minutes before the hour till 5 minutes past the hour, in case the calling stations watch is incorrect.

Enhanced Monitoring

Fixed stations or portable stations with enough battery power could listen every hour at the top of the hour. Continuous monitoring is also an effective option, assuming it's practical for the operator.

Scanning

Consider entering 146.520 MHz, 52.525 MHz, 223.500 MHz, 446.000 MHz and 1294.500 MHz in to your scanning radio.

Calling

The wilderness protocol frequencies are national calling frequencies. Make your calls, then move to a working frequency so others can use the calling frequency. It's suggested that you wait until 4 minutes after the hour to make a call. This reduces the chance of interference with emergency or priority traffic from wilderness protocol users.

Silence Periods

Silence should be maintained on wilderness protocol frequencies from the beginning of minute 0 to the end of minute 3 at the top of the hour. Standard calling should only start after the beginning of minute 4, preceded by listening for 30 seconds. Listen first, then call. This is similar in spirit to the silence periods observed on maritime calling and distress frequencies prior to the introduction of the Global Maritime Distress Safety System.

Inform Others

Remind others of this protocol at meetings, on nets and in the field.

Use LiTZ to Call for Assistance

If possible, begin calls for assistance with 10 or more seconds of tone with the LiTZ (Long Tone Zero) signal. If you have a DTMF pad, use it to generate a LiTZ call by pressing the 0 key while transmitting and holding it for at least ten seconds.

APRS Calling

APRS Calling is a manual procedure for calling stations on APRS to initiate communications on another frequency. It is inspired by Digital Selective Calling, a part of the Global Maritime Distress Safety System. It also builds on existing digital procedures inherited from morse code and radio-teletype operation. The idea is to replace monitoring calling frequencies with APRS monitoring. ITU Q codes are used in conjunction with APRS text messages to implement APRS calling.

Procedure

1. The calling station sends a QSX signal to the station or group they wish to reach using an APRS text message. The QSX should include the frequency and other necessary information for contact.
2. Once the called station or stations are ready to communicate on the specified frequency, they answer using a QSX text message on APRS.
3. The stations shift communications to the arranged frequency.

Example

All APRS transmissions include the call sign programmed into the APRS unit. The text message doesn't necessarily require the station identification commonly seen in voice, CW or RTTY exchanges, so long as the programmed call sign is valid.

This example shows N6BRK announcing a net on 147.480 MHz to the NALCO APRS group. When ready to communicate on the coordinated frequency, KJ6VVJ responds with an acknowledgment to the QSX. If the operating mode isn't obvious, the initiating QSX should specify what it is.

Sender	Recipient	Message
N6BRK	NALCO	QSX NALCO Net 147.480 MHz
KJ6VVJ	N6BRK	QSX

Simplex Channels

6 Meter

Calling Frequency

- 52.525

Working Frequencies

- 51.520
- 51.540
- 51.560
- 51.580
- 52.000
- 52.020
- 52.040
- 53.000
- 53.020
- 53.520
- 53.900

2 Meter

Calling Frequency

- 146.520

Working Frequencies

- 146.415
- 146.430
- 146.445
- 146.460
- 146.475
- 146.490
- 146.505
- 146.535
- 146.550
- 146.565
- 146.595
- 147.405
- 147.420
- 147.435
- 147.450
- 147.465
- 147.480
- 147.495
- 147.510
- 147.525
- 147.540
- 147.555
- 147.570
- 147.585

1.25 Meter

Calling Frequency

- 223.500

Working Frequencies

- 223.420
- 223.440
- 223.460
- 223.480

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70 Centimeter

Calling Frequency

- 446.000

Working Frequencies

- 441.000
- 446.500

23 Centimeter

Calling Frequency

- 1294.5

Working Frequencies

1294.025	1294.525
1294.05	1294.55
1294.075	1294.575
1294.1	1294.6
1294.125	1294.625
1294.15	1294.65
1294.175	1294.675
1294.2	1294.7
1294.225	1294.725
1294.25	1294.75
1294.275	1294.775
1294.3	1294.8
1294.325	1294.825
1294.35	1294.85
1294.375	1294.875
1294.4	1294.9
1294.425	1294.925
1294.45	1294.95
1294.475	1294.975

Glossary

- Automatic Packet Reporting System (APRS) - An amateur radio based system for real time tactical digital communications of information of immediate value in the local area.
- ARES - The Amateur Radio Emergency Service (ARES) consists of licensed amateurs who have voluntarily registered their qualifications and equipment for communications duty in the public service when disaster strikes. Every licensed amateur, regardless of membership in ARRL or any other local or national organization, is eligible for membership in the ARES. The only qualification, other than possession of an Amateur Radio license, is a sincere desire to serve. Because ARES is an amateur service, only amateurs are eligible for membership. The possession of emergency-powered equipment is desirable, but is not a requirement for membership.
- ARRL - The American Radio Relay League (ARRL) is the largest membership association of amateur radio enthusiasts in the USA. ARRL is a non-profit organization, and was founded in May, 1914 by Hiram Percy Maxim of Hartford, Connecticut. The ARRL represents the interests of amateur radio operators before federal regulatory bodies, provides technical advice and assistance to amateur radio enthusiasts, and supports a number of educational programs throughout the country.
- Command Net - As the size of an incident increases and more jurisdictions become involved in the incident, a command net may become necessary. This net allows the incident commanders to communicate with each other to resolve interagency or intra-agency problems, particularly between cities, or within larger jurisdictional areas. It is conceivable that this net could become cluttered with a high volume of traffic. It may also be necessary to create multiple command nets to promote efficiency.
- DEC - The ARRL District Emergency Coordinator (DEC) is appointed by the SEC to supervise the efforts of local Emergency Coordinators in the defined district.
- Emergency Operations Center (EOC) - A central command and control facility responsible for carrying out the principles of emergency preparedness and emergency management, or disaster management functions at a strategic level in an emergency situation, and ensuring the continuity of operation of a company, political subdivision or other organization.
- FEMA - Federal Emergency Management Agency
- ICS - Incident Command System. The Incident Command System (ICS) is a standardized, on-scene, all-hazard incident management concept in the United States. It is a management protocol originally designed for emergency management agencies and later federalized. ICS is based upon a flexible, scalable response organization providing a common framework within which people can work together effectively. These people may be drawn from multiple agencies that do not routinely work together, and ICS is designed to give standard response and operation procedures to reduce the problems and potential for miscommunication on such incidents.

- NARCC - The Northern Amateur Relay Council of California, Inc. (NARCC) is the Amateur Radio coordinating organization for the 10 meter band and higher in northern California. NARCC performs the repeater coordination function for the region in cooperation with the FCC, ARRL, and the support of the hams in northern California. NARCC's region extends from California's coast to the Nevada border and from Tehachapi in the south to the Oregon border in the north.
- NTS - The National Traffic System (NTS) is a means for systematizing amateur traffic handling facilities by making a structure available for an integrated traffic facility designed to achieve the utmost in two principal objectives: rapid movement of traffic from origin to destination, and training amateur operators to handle written traffic and participate in directed nets.
- Official Emergency Station - Amateur operators may be appointed as an Official Emergency Station (OES) by their Section Emergency Coordinator (SEC) or Section Manager (SM) at the recommendation of the EC, or DEC (if no EC) holding jurisdiction. The OES appointee must be an ARRL member and set high standards of emergency preparedness and operating. The OES appointee makes a deeper commitment to the ARES program in terms of functionality than does the rank-and-file ARES registrant.
- Official Relay Station - An Official Relay Station is a traffic-handling appointment that is open to all classes of license. This appointment applies equally to all modes and all parts of the spectrum. It is for traffic-handlers, regardless of mode employed or part of the spectrum used. The potential value of the skilled operator with traffic know-how to his country and community is enhanced by his ability and the readiness of his station to function in the community interest in case of emergency. Traffic awareness and experience are often the signs by which mature amateurs may be distinguished.
- Packet radio - A form of digital data transmission used to link computers. Its name is a reference to the use of packet switching between network nodes, which allows multiple virtual circuits to coexist on a single radio channel. Packet radio networks use the AX.25 data link layer protocol, derived from the X.25 protocol suite and adapted for amateur radio use.
- RACES - The Radio Amateur Civil Emergency Service (RACES) was established under the Federal Communications Commission Rules and Regulations, as part of the amateur radio service. The mission of RACES is to establish and maintain the leadership and organizational infrastructure necessary to provide amateur radio communications in support of emergency management entities throughout the United States and its territories.
- Resource Net - For larger-scale incidents, a resource net is used to recruit operators and equipment in support of operations on the tactical nets. As an incident requires more operators or equipment, the resource net evolves as a check-in place for volunteers to register and receive assignments.
- SEC - The Section Emergency Coordinator is the assistant to the Section Manager (SM) for emergency preparedness. The SEC is appointed by the SM to take care of all matters pertaining to emergency communications and the Amateur Radio Emergency Service (ARES) on a sectionwide basis.

References

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- NARCC Northern California 2M Band Plan
- NARCC Northern California 1.25M Band Plan
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