

Indian Wells Valley

New Ham Guide



Provided by the Sierra Amateur Radio Club
of the High Desert

On behalf of the Sierra Amateur Radio Club members, **congratulations** on passing your Amateur Radio exam. You are now a member of over 3 million Amateurs (Hams) world-wide, with just over 732,000 of those residing in the United States. You can be justifiably proud of your accomplishment.

This booklet is provided to you as a sort of “Operating Guide” to help you adjust to your new life as a Amateur Radio Operator. In this guide, you’ll find information about the Sierra Amateur Radio Club (SARC), accessing the local repeaters, frequencies of interest within the Indian Wells Valley, local events supported by SARC, operating guidelines and much more. You’ll also find some “Elmer” and “How To” articles that have been published in the SARC newsletter, ***THE AIRWAVES***.

As a newly licensed Amateur in the Indian Wells Valley, the Sierra Amateur Radio Club is extending you a ***FREE***¹ membership to the club. Membership includes the right to vote on items brought before the club and receiving the Sierra Amateur Radio Club newsletter, ***The Airwaves***. In order to register for your free membership, please print out the membership application available at:

<http://www.qsl.net/wa6ybn/membership.pdf>

Please print on the bottom of the application “NEW HAM / FREE MEMBERSHIP.” Either mail the completed form to the address at the top of the form or bring the form to the next SARC meeting.

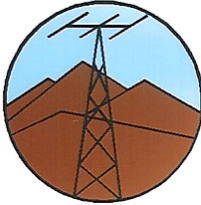
Again, congratulations on passing your exam and welcome to the world of Ham Radio !

The Sierra Amateur Radio Club
Of the High Desert

¹ Duration of free membership depends upon when license is obtained, typically 10 – 18 months.

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Callsign

Name

SIERRA AMATEUR RADIO CLUB
RIDGECREST, CA

Why should you join the Sierra Amateur Radio Club (SARC) after your free membership expires? Amateur radio can certainly be a solitary hobby. But joining a club such as SARC can expand your enjoyment of amateur radio. SARC maintains three repeaters, supports various local community events with communications, and provides a forum to meet others in your hobby. SARC puts on monthly meetings with informative presentations, sponsors Transmitter-Hunts and Field Day activities.

Need help with an antenna? SARC members are there. Have a TV Interference problem? SARC is there to help you. Want to upgrade your license? SARC Volunteer Examiners are there (and classes).

You can fill out the membership application by going to:

<http://www.qsl.net/wa6ybn/membership.pdf>

Once the form is completed, print it out and either mail it to the address listed on the application or bring it with you to a club meeting and give it to the club's secretary.

The application is also provided in "***THE AIRWAVES***" newsletter when memberships are due.

Hope to see you on the membership roster.

Popular Repeaters Accessible From Ridgecrest

Freq (offset)	Location	Notes
146.64 (-) #	Ridgecrest	Translator – No PL, NO squelch tail #
147.00 (+)	Ridgecrest	PL 107.2 – Phone Patch
145.34 (-)	Randsburg	PL 100.0 – Wide Coverage
146.97 (-)	Trona	PL 123.0
147.21 (+)	Little Lake	Linked to Mazourka Pk

Other Popular 2 Meter Frequencies

146.52 Simplex *	National Calling Frequency
146.55 Simplex	*
146.58 Simplex	*

= THERE IS NO SQUELCH TAIL on the 146.64 Ridgecrest Translator. Kerchunking this repeater/translator will only cause the repeater/translator to ID **once every 10 minutes**. All kerchunks between the 10 minute IDs will be **heard by everyone** monitoring the 146.64 repeater/translator **HOWEVER** you **WILL NOT** hear anything.....Unless someone tells you to **STOP** kerchunking.

* = 146.52 MHz and 446.00 MHz are referred to as the “National Calling Frequency” for their respective band. For other than emergency or priority traffic, it is common practice, and courtesy, to move to another frequency after contact is made. In the IWV, there is considerable simplex traffic on 146.52 MHz and nearby frequencies.

Making Your First 2 Meter Local Contact

How do you make your first contact? How do you get someone to talk to you? It's not easy. You have a new callsign, your voice is not recognizable, the regulars, a.k.a. "Old Timers" on the repeater haven't a clue as to who you are.

Here are some tips in helping you get an answer to your call.

- In order to let other hams know that you are open for a call, key the local repeater/translator/simplex frequency and say "THIS IS <YOUR CALLSIGN> MONITORING. That's all you need. Don't be upset if no one answers you on your first several attempts. Many hams who have been in the IWV for years will announce that they are "MONITORING" and won't get a response every time.
- DO NOT kerchunk a repeater and then ID or say you're monitoring. Kerchunking first is poor practice. It could also cause others to wonder whether or not you would ID if the repeater/translator did not respond.
- When saying your callsign on the air, say it slowly so those unfamiliar with your call will understand you. A callsign similar to Ed's/KI6PSP can be easily misunderstood. If Ed were to give his callsign quickly, you might think he said KI6PSE or KI6PST or KI6TST. Many letters sound the same over the air.
- When you do get a response, be sure to let them know you just got your license and callsign. Many hams enjoy being a "first contact" for a new ham.
- If you want to join an on-going conversation (QSO), key up and say your callsign during the short break between transmissions. Just your callsign. If the other hams heard you, they most likely will give you a chance to join them. When you do transmit, be sure to let them know you just got your license and wanted to get on the air.
- Try not to ask general questions, such as "What 2 meter mobile rig should I get?" or "What antenna should I get/build?" Most of these types of questions will get a response of "It depends." Do some research first and then ask a more specific question. Questions like "What features should I look for in a mobile rig?" or "Is there much difference between a ½ wave antenna and a 5/8 wave antenna?" will get a much better response.
- Do NOT say you are TESTING in an effort to get someone to respond. We don't know you want someone to reply when you say you are testing. Maybe you're just testing your equipment.

- Speaking of testing, DO NOT “test” your rig/equipment on a repeater’s frequency or a “calling” frequency. If you must test your rig on one of those frequencies, use a dummy load!
- A list of some of the valley hams is in the next article (Elmer’s Page). They are just a few of those who would enjoy talking to you and help you get acquainted with the ins and outs of Amateur Radio. If you hear them on the air, give them a call.

Check out the “Elmer” article ***Those First 100 HF (or VHF) Contacts***, located on page 14 of this handbook for more information on making your first contacts.

We know it’s hard to get your first contact (and subsequent contacts), but hang in there. In no time at all, you’ll be a regular “Old Timer.”

73.....Elmer

Elmer's Page

What is an Elmer? Simply put, an Elmer is anyone willing to teach you something about Amateur Radio. In other words, almost every Ham you meet can serve as your Elmer.

Need help in setting up your equipment to get on a new mode? Do you want to help provide communications for a Horse Ride or walk-a-thon but afraid to operate by yourself for the first time? Need advice on QSLing (paper, eQSL or Logbook Of The World) ? Chances are, there is an Amateur in the IWW that is familiar with the process and would be happy to assist you.

Don't expect your "Elmer" to wire up your rig, install PL-259 coax plugs, build your antenna or dig the hole in the ground for your anticipated tower. No, don't do that. But do expect your "Elmer" to show you or guide you in accomplishing what you need. Just recently, I needed to thread some aluminum bar for an antenna project. I have a bit and die set, but had never done this type of work before. I contacted one of my Elmer's and in no time at all, I was threading bar! And yes, as an Amateur Extra Class and 25 years as an Amateur, I still have a need for an occasional Elmer.

Below is a list of "Elmer's" that you can contact if you need assistance/guidance in any of the areas listed.

In no particular order...

WA6ARA/Mike – CW, satellite, voice operations, PSK31, QRP, portable operating, Echolink, APRS, kit building, designing/building electronic devices

KC6UWM/John – voice operations, wire HF antennas, portable operation, local event communications support

KI6PSP/Ed – APRS, Echolink, Allstar, local event communications support

KG6LEW/Lorilyn – Basic operating, local event communications support

WA6QYR/Bill – VHF/UHF/Microwave operations

N6HAL/Hal – Voice, data (non-CW) and portable operating, APRS, LoTW and paper QSLing

73.....Elmer



Good Operating Practices

Do

- ✚ Always be polite regardless of the circumstances. If not, avoid transmitting.
- ✚ Set a good example especially for short wave listeners who may be thinking about becoming a ham.
- ✚ Be a good listener. Maybe even take notes. It will help you better organize your thoughts before transmitting.
- ✚ Reply to a CQ, or call CQ yourself. It helps keep alive the magic of ham radio.
- ✚ Speak clearly and slowly, especially when giving your call sign to someone you have never worked before.
- ✚ When more than 2 hams are part of the conversation, make it clear at the end of your transmission which station is expected to transmit next.

Don't

- ✚ Act like some sort of Broadcast Radio station. Your fellow Amateurs will most likely not appreciate such a blatant display of personal ego.
- ✚ Acknowledge the presence of deliberate interference. After all, that's most likely the overall objective of the person doing the interfering.
- ✚ Be excessively long winded especially when in a round-table discussion.
- ✚ Just talk about ham radio. Most hams have many more interests.
- ✚ Operate when you are in a bad mood. You will be that much more vulnerable to losing your temper.
- ✚ Use Q-codes (QTH, QSL, etc) and other non-ham jargon (**ROGER THAT, GOOD BUDDY, DESTINATED**, etc) while operating voice modes.
- ✚ Claim or homestead any particular frequency for nets, schedules, etc. If your designated frequency is already in use, simply move up or down as necessary.

Do (Con't)

- ✚ Openly praise other hams when you observe them doing something that you feel is especially deserving. e.g., helping demonstrate ham radio to a group of scouts.
- ✚ Always be ready to quickly and calmly respond to emergency situations. Rehearse what you would do if presented with various scenarios.
- ✚ Wait about 1 second between transmissions. "Quick keying" gives the appearance that other hams are unwelcome in your QSO, **AND** it prevents someone from breaking into the conversation for Emergency or Priority traffic.
- ✚ Consider using the Internet to enrich your QSO. Many hams have developed their own comprehensive websites which you can usually find through QRZ.COM.
- ✚ Respect the privileges of hams operating in other modes on the HF bands including those who enjoy AM.
- ✚ Make a point to try 17 and 60 meters. Good operating practices are especially prevalent on these bands.

Don't (Con't)

- ✚ Transmit before determining the frequency is clear.
- ✚ Break into an ongoing QSO unless you can hear the majority of the participants.
- ✚ Ignore someone new to a round table QSO. Avoid making the discussion appear exclusive to your circle of friends.
- ✚ Test your transmitter over the air. It is far better to use a dummy load. If you must send test transmissions, choose a frequency not in use. For instance, instead of transmitting on 146.040 MHz (input frequency for SARC Translator), transmit on 146.020 MHz or 146.060 MHz.
- ✚ Cough, sneeze or clear your throat into your microphone.
- ✚ Become a "Band Policeman" quick to tell others what you feel they are doing wrong. In instances where it may be called for, always be polite and constructive.
- ✚ Turn up your microphone gain or resort to excessive speech processing in order to be heard. Such practices will most likely result in diminished audio quality and increased likelihood of interference to nearby QSOs.
- ✚ Use the word "break" when wanting to join an on-going QSO. Simply give your call sign between transmissions and reserve the use of the word "break" for more urgent situations.

Do (Con't)

- ✚ Look for opportunities to "Elmer" newly licensed hams when you hear them on the HF bands. Welcome them, solicit their questions and give them pointers on good operating practices.
- ✚ Remember that no one country can proclaim to be the leader of the Amateur Radio world. Likewise, no one country's foreign policy is any more right or wrong than that of another country.
- ✚ Develop good operating practices. You will be doing your part in helping insure the continuance of our long and proud tradition of self-regulation.

Don't (Con't)

- ✚ Join an ongoing QSO unless you have something to contribute to the discussion. It is especially rude to interrupt other hams with a request for audio checks, signal reports, etc.
- ✚ Operate in any fashion that is not in keeping with good amateur practice. Be certain to always comply with the provisions of Part 97 of the rules.
- ✚ Say that the frequency "is not" in use when you hear someone inquire. Refrain from responding at all unless you know for certain that the frequency or one nearby "is" in use.
- ✚ Ridicule other hams or express any negative views of the overall state of Amateur Radio. If you don't have something positive and constructive to say, avoid saying anything at all.

IWV Emergency Net Preamble

**(Also available at
www.qsl.net/wa6ybn/net_op.pdf)**

The Sierra Amateur Radio Club operates the IWV Emergency Net on 146.64 MHz (-) (No PL) every Monday evening at 1930 local time.

The following is the preamble used by Net Control Stations.

QST, QST, QST, please stand by for the Indian Wells Valley Emergency Net. This is <your call> net control for this evening.

The Indian Wells Valley Emergency Net meets every Monday night at 730pm, local time on the Sierra Amateur Radio Club 146.64 WA6YBN Translator.

The purpose of the net is to:

- 1) Pass emergency or priority traffic
- 2) Test and maintain the emergency capabilities of the Indian Wells Valley Amateur Radio Community
- 3) Provide a forum for passing information of interest to the Indian Wells Valley Amateur Radio Community

Is there any emergency or priority traffic, please go now

(acknowledge and handle any traffic)

Are there any announcements?

(Take calls of those who have announcements and allow each to give their announcement(s))

Check in follows

Are there any visitors or newcomers to the valley, please go now

(acknowledge any new visitor or newcomers. Ask for name and for them to say a few words)

Regular Check In follows. Please give your call, if you have traffic and if you wish to participate in the round table. Go now

(acknowledge each checkin, usually after a period of silence.)

Round Table follows

(announce the order of the round table call signs with net control being last)

(After the round table):

Are there any late or missed members, or visitors who would like to check in

(acknowledge each checkin, usually after a period of silence.)

There were <number of check in> check ins this evening. This is <your call> thanking all for checking in. The Indian Wells Valley Emergency Net is closed and the frequency clear for general use.

Circuit Discipline

ZKA (I AM NET CONTROL) **ZKB** (YOU MUST OBTAIN MY PERMISSION PRIOR TO PASSING TRAFFIC ON THIS FREQUENCY.

Wow, those Operating Signals (OPSIGs) bring back a lot of somewhat unpleasant memories. While operating a state-of-the-art HF 100 Word Per Minute (WPM) teletype circuit, also known as TGO (Task Group Orestes – Navy Battle **Task Group** and **Orestes** being the mythological designator of the cryptographic devices used on the circuit), you did everything you could to prevent the Net Control Station (NCS) from directing those two OPSIGs at you.

Even at a screaming 100 WPM, brevity was essential. When acknowledging receipt of a message, we would do so by typing “R 001/14” instead of “QSL 001/14”. Why? It’s a shorter transmission, if even by just two characters. The rule was to use PROSIGNs first (R = Roger, K = Over, AR = Out, AS = Wait, and a few others) then OPSIGs (Q and Z signals), and then plain language. Not much different than passing traffic on Amateur Radio networks. I’m here to tell you, after getting yelled at a couple of times by the Chief or even worse, having NCS send you ZBM2 (Put a qualified operator on this frequency.) (also note that there was no space or dash between the M and 2), most operators used plain language ONLY after a very exhaustive search of ACP 131, the Q & Z OPSIG publication.

I hope I didn’t bore anyone too much to get to this point in my little essay. And what is the point? As the title suggests, it’s Circuit Discipline. Let’s call it CD from now on. CD applies to everyone on a frequency, net, or channel: the Net Control Station and all logged in stations. There is no better teacher to CD and becoming a good operator and NCS, than by just LISTENING. The neat part about this learning process is that you don’t always need to learn from a good NCS. You can learn from even a new NCS or one with just a little experience. By LISTENING, you can hear what works and what doesn’t. Does this NCS take charge? Does NCS need to take charge or is the somewhat informal procedures being used adequate for the time? Is the NCS too restrictive or not strict enough?

Besides being entertaining, I have found that a great place to learn good NCS techniques is the Kern County Fire Dispatcher on 153.785 MHz. Listen to them for a while. When there are only a few “events” going on, most of the stations are assigned to the Kern 1 channel. However, once the dispatcher feels there is or might result in too much traffic on Kern 1, stations are moved to other channels or frequencies. We should do the same regarding Ham Radio NCS duties. If the Net can support being tied up for a few minutes while traffic is being passed, then it can be a judgment call of the NCS to either keep everyone on the same frequency or to move the two stations to another frequency to pass their traffic.

How else can we learn from the KCFD Dispatchers? How about keeping transmissions short. Keep It Short and Simple (yet another definition of KISS). If you are the NCS and you received the report or traffic but you missed the sending station's call sign, all you need to do is retransmit a part of the traffic or report you received and ask for the call sign only. Something like "FIRST RIDER THROUGH AT 0915, ID ONLY PLEASE."

A problem we have in some of the events we support on this side of the Sierra's is that all stations cannot always communicate with all other stations on the event. This requires NCS to be a little more active in their duties. If a station is going to be sending any type of traffic, regardless of precedence, the NCS should consider transmitting something like: "ALL STATIONS STANDBY, THE FREQUENCY IS IN USE. KK6PA SEND YOUR TRAFFIC." After the traffic has been passed, NCS should then announce that the frequency is clear.

Speak English. Slang is ok at times when the net is slow and casual. Go ahead and use ROG or the elongated RAAAW GER, to acknowledge that a station is going to be off the air for a few minutes. That is fine for most of the Nets we operate each year. However, when you have just reported that a rider / runner / walker / horse requires assistance and NCS is reading back essential information for confirmation, a much better response is, "THAT IS CORRECT." When important information needs to be acted on, hearing THAT IS CORRECT as confirmation should leave no doubt in anyone's mind.

It is essential that the Net Control station maintains control of their net. Chapter 5 of the *NTS Methods and Practices Guidelines (NTS MPG)*, discusses duties and responsibilities of the Net Control. Paragraph 5.1.1 starts off with the following. "The NCS makes the net "happen", directing all activities and managing the sequence of traffic dispatching to achieve an efficient and orderly net to accomplish the mission." And "The NCS is a manager, supervisor, tutor and mentor, and facilitator. The NCS becomes the individual the net stations expect to take care of the business of controlling what they do... a task respected and understood."

WOW! That sounds like a very intense, overwhelming, demanding job. Well, it is and it isn't. Sure it's going to be tough if you're assigned Net Control during the first 12 hours following a local major earthquake. For that type of event, it doesn't matter if you have little to no experience or many years of experience. But you can make it easier on yourself and the net members by preparing yourself BEFORE the earthquake or other major disaster.

A great way to gain this experience is to volunteer: Volunteer to coordinate communications support for the many events that SARC helps with (or assist the coordinator); volunteer to help with the various ARES/RACES functions; volunteer to be the IWV Emergency Net NCS; or if you're looking for an excellent opportunity, volunteer to coordinate SARC Field Day activities.

The Amateur Radio Relay League (ARRL) has a tremendous amount of information available. You can enroll in various ARRL Communications courses that are conducted online. There is also the above mentioned *NTS Methods and Practices Guidelines*. Although these guidelines refer to the National Traffic System, the information provided in many of the chapters are easily applied to our local Monday night nets, community support events, and that ever-pending, major earthquake. Browse on over to www.arrl.org and do some surfing.

ZKA. I AM NET CONTROL. In other words, I am the person responsible for the proper operation of this net. Here are a few suggestions from chapter 5.3 of the NTS MPG that might help you maintain control of your net.

a. Word your requests clearly. Avoid transmissions similar to "HAS ANYONE SEEN RUNNER 345?". This could result in getting 10 responses of YUP or NOPE. Instead, try taking an educated guess as to which check point the runner should have made it through and ask just that check point? Then, depending on whether the answer you receive is YES or NO, you know which direction to go. If the other check points are paying attention, they will be checking their logs for runner 345 in anticipation of receiving a call from you.

b. Avoid thinking out loud as NCS. It is usually boring and if you're listening to me, probably confusing.....

c. Let go of the PTT switch when the temptation to make idle chatter creeps upon you. Long periods of silence also make stations uncomfortable. If you need a moment to think, make a call for check-ins, or call for returning stations. The listening pause is then expected, giving you time to plan the next move.

This is just the tip of the iceberg. So get on the web and read some of the NTS MPGs. Sign up for one of the communications courses offered by the ARRL. And absolutely, sign up to be NCS for one of the many events SARC is involved with.

ZKJ (CLOSING DOWN) 73.....de Elmer

Those First 100 HF (or VHF) Contacts

Alright! You got your new General class ticket and you're just itching to get on the HF bands and make some contacts. You find a clear spot on 20M and call CQ a few times and someone comes back to you. Now what? Well, for your first contact, you can always say this is your first HF contact. That should be good for a couple of exchanges. Then what? Some Amateur contacts consist solely of passing what equipment and antennas are being used. After that, they end the contact, call CQ and start over again. I think we can do better than that.

Being "Mic Shy" is natural. Being at a loss of what to say is also a bit natural, after all, this is a total stranger you're talking to on the other side of the signal. But, you do have at least one thing in common and that is Amateur Radio. To help avoid being at a loss of words, try making up a list of questions to ask your contact and subjects you want to talk about. Both lists should be related to Amateur Radio or at least being able to be worked into the conversation. Who knows, you could mention that your hobby of horticulture allowed you to create several exotic strains of roses that pleased your wife so much that you were able to allocate funds for a new HF rig. Maybe your passion for tinkering on engines saved your family so much money you were able to convince your husband to let you buy that new rig for your car.

Here's some items you might consider. Almost every Amateur has built and/or installed an antenna. How about asking what their most memorable experience was putting up one of their antennas? If you were to ask me that question, I might tell you about the time the mosquitoes removed at least a quart of blood from me during a hot, humid day in Hawaii while we were in the rain forest *trying* to string up a wire antenna. If I heard you ask that antenna question while in a QSO with someone else, heck, I might stick around and call you afterwards just to tell you about that cold, gloomy morning the first week of 1986 when I was at the top of the 800 ft VLF tower on Adak, AK. Another question could be something like "I plan on building a 2 meter J-Pole antenna out of copper water pipe and was wondering if you've built one and if so, is there anything I should pay particular attention to?" How about asking if they participate in Field Day and if so, what is their favorite Field Day story? (Don't know what Field Day is? Then sign up to participate with SARC in this year's Field Day. Most memorable contact? I still remember several contacts I had with Jack/W1DW in 1990/91. What's notable is that Jack was in Maine and I was at Diego Garcia, a tiny island about 1,000 miles south of India. Our HF SSB contacts were so clear, it was almost like we were talking just across town on 2M FM rather than halfway around the world.

Until you reach the point that you can talk so much you can "time out a simplex frequency," keep the list at your operating position. Add to it. When your contact asks you an interesting question that triggered memories and had you responding for what seemed like hours, add that question to your list.

The great thing about having a list of things to talk about or to ask is that you're not saying "ah....ah" when it's your turn to talk. The station you're talking to is going to think you are a pro and might even think of you as a "memorable" QSO! But whatever you do, NEVER go through your entire list on a single contact. Just like the first rule of show business, *always leave them wanting more.*

73.....Elmer

Kerchunking

Within the Amateur Radio community, "kerchunking a repeater" refers to accessing a repeater by momentarily pressing the Push To Talk (PTT) button on your microphone and causing the repeater to activate. The noise our receivers make as the repeater goes off the air eventually became referred to as "kerchunk." At one time or another, I'm sure anyone who has owned a 2M rig has kerchunked a repeater. The number one reason for kerchunking is that you want to use a repeater and you don't know if you can reach it from your current location. Other top reasons are to test your rig, to see if the repeater's input frequency is +600 KHz or -600 KHz, and my favorite reason, working on your "Kerchunk All Counties" certificate.

Although we cannot put an end to all kerchunking, we can drastically reduce the number of kerchunks by making a slight change in our operating style. Instead of always assuming that we cannot reach the repeater, always assume we can! There, wasn't that simple? That's what professional communicators do. Here's an example using a repeater or our local translator (WA6YBN): KA6AA THIS IS KA6BB. No answer. Ok, here are some possibilities for not making the contact: KA6BB did not reach the repeater, KA6AA does not have his rig on (shame shame shame), he is not home, he is not mobile, he is out walking without an HT, or KA6AA heard the call but decided not to answer. There could be other reasons, but out of those 6 listed, the results are the same: No contact. Are you going to lose any sleep over not knowing why KA6AA did not answer you? Probably not. But in the mean time, you operated properly by identifying your transmission.

It is especially important not to kerchunk when you are using the 146.64 WA6YBN translator. Since there is no squelch tail on the translator, the only time you will hear any reply from the translator is when it IDs every 10 minutes in accordance with FCC rules. If WA7IRW announced that he was mobile and the translator ID'd 30 seconds before you turned your rig on, you're going to have to kerchunk the translator for another 9 ½ minutes before you find out if you're reaching it. During those 9 ½ minutes, I'm sure you'll be annoying a lot of people. Instead, just make your call. Be a professional.

Occasionally there is that unique time when a kerchunk might prove to be useful. I recently heard a local Ham talking about being up at Dantes View located in Death Valley. Who'd a thought he would be able to reach the 146.64 translator using just a mobile 5/8 wave antenna and 40 watts? Considering all the dirt and rocks separating the Ham and the 146.64 translator, his signal must have been taking a very amazing path.

So, you should always assume you have a good communications path when trying to make a contact. Whether it's via a repeater or simplex, VHF or HF, the results will be the same, you either make the contact or you don't. But also don't forget those rare opportunities to kerchunk a repeater from a far-off mountain top!

73. Elmer

More Power

One of my favorite T-shirts says "*Life's too short for QRP.*" Tim "The Tool Man" Taylor is always grunting and talking about needing "More Power." As Tim proved in each show, more power can get you in trouble when you're not paying attention.

My trouble with "more power" started a few weeks ago when it was my turn on the Indian Wells Valley Emergency Net Roundtable. I mentioned a problem I was experiencing with RFI when I operated WINLINK 2000 on 30 Meters. I mentioned that if I transmitted using 350 watts or more, my home cooler would momentarily come on with each PACTOR burst transmission even though the thermostat for the cooler was turned off. If I reduced power to 300 watts or less, the cooler would stay off.

Here's where the trouble came up. Shortly after the net, I received a very nice email from a fellow Ham reminding me of the power limit of only 200 watts on 30 Meters. Oops. Well shoot. I quickly did some research in hopes that the 200 watt limit was measured at the antenna or maybe even measured as ERP. Maybe I could claim that I had 2.8 db loss in the coax which would put me under 200 watts when measured at the antenna or as ERP. Well, it was not to be. Per the FCC rule book, the 200 watts is measured at the transmitter for the 30 Meter band.

So, I would like to apologize to everyone for not operating my Amateur Radio station within the proper constraints of the FCC rules and regulations. I have reviewed the power limitations on all Amateur Radio bands that I have the capability to operate on in an effort to avoid this subject in the future. Looking at the good side of this, my RFI issues with the cooler are no longer a problem since I will keep my operating on 30 Meters to 200 watts or less in the future.

I guess I shouldn't feel too bad. This past weekend during the annual CQ WWDX SSB contest, I heard several U.S. stations try to make contacts below 14.150 MHz. One N7 station went as low as 14.137 MHz and had to be told by a VE3 station that he was operating out of band.

By the way, a great source of information for power limitations, authorized modes, frequencies and more can be found at:

http://www.arrl.org/FandES/field/regulations/Hambands_color.pdf (or /Hambands_bw.pdf for a black and white version).

Finally, if you don't know what QRO, QRP, RFI or ERP means, I'm reminded of my days as a sea-sick U.S. Navy Radioman Second Class riding out one typhoon after another (or so it seemed at the time), right after our Senior Chief Radioman would knock me on the back of my head, he'd say "Look it up, you'll remember it longer!" You know what? He was right. Thanks Braz.

Till next time.....73.....Elmer

Where's The Manual

Oh no, Net Control/Base Camp wants me to come up on some frequency that I don't have programmed in my rig. How do I do that? How do I enter the repeater off-set and CTCSS (PL) tone? Where's the manual? Do I still have it?

Has this happened to you? It probably has if you've helped out with one of the many events that SARC supports throughout the year. Heck, just going someplace out of the valley can activate those sweat glands. How about going up to Visalia for the annual DX convention? I doubt it if you are going to program the "Talk-in" frequency for a once a year trip into one of your *valuable* 800 memories of your mobile rig. Plus, even if you did, would you remember this year that you programmed Visalia into memory 713 last year? I wouldn't.

Unless you can memorize all the procedures for all of your rigs, you need your manuals. So again, where's your manuals? I could tell you where mine are for all my mobile rigs and HTs, but that would be the end of this article and Editor Mike/WA6ARA would have to find less interesting *stuff* to fill out the Airways.

Obviously, the manual for your mobile rig **better** be with your mobile rig, with your vehicle. That's a no-brainer. But what about your HTs? How many of you have your HT manuals in your radio shack? Come on, raise your hand. If you do keep your manuals in the shack, do you always remember to bring the correct manual with you when you grab an HT? Raise your hand if you've forgotten to bring the manual at least once. Raise both hands if you brought the wrong manual at least once! Yeah, both of my hands were up in the air.

All right, I'll give you a hint on where to store you HT manuals. What's with you or near you most of the time? Give up? Your vehicle! Whether you are helping out with a SARC supported event, an ARES/RACES event, or at the mall, in all likelihood, you brought your vehicle with you. What do you have in all those door and map pockets? (Please don't tell me, I have a weak stomach). Besides maps, those pockets are an excellent place to store your ARRL Repeater Directory and manuals for your mobile rig and all of your HTs.

Don't complain that you now have to walk all the way out to the driveway or garage to grab the manual when you want to program your HT the night before the bike ride. At least you know where the manuals are. Besides, most of us could use the exercise! And the next time you're assigned to the intersection of Hwy 14 and 178 and need to transmit on the repeater output and listen on the repeater input, you'll have your manual a few feet away from you, not in your radio shack a few miles away from you!

73.....Elmer

Learning from KCFD ECC Dispatchers

Those of you who talk (or listen) to me on 146.64/SARC Translator, have occasionally heard me talk about how I like to listen to the various Kern County Fire Department frequencies. I feel that I pick up tips on becoming a better Net Control Station (NCS) and operator during Net Operations. There was some activity a couple of weeks ago that really caught my attention and showed me the training, experience and teamwork that must go on each day in the Kern County Emergency Command Center (ECC).

While listening to the KCFD Dispatch frequency, there was a short, maybe a one second, unidentified transmission consisting of some yelling and screaming. The dispatcher responded with the usual "Last unit transmitting you were unreadable." When there was no reply, the dispatcher repeated his last transmission again. Still with no reply, there was a longer pause, maybe 20-30 seconds, and the ECC Dispatcher transmitted "Engine 64, ECC." No response. "Engine 64, ECC." No response again. A few seconds later, ECC transmitted "Engine 64 ECC, KCSO (Kern County Sheriffs Department) enroute your location."

WOW! I immediately realized that during that 20-30 second pause, the dispatcher, and possibly others, was busy checking his log to determine who was out on a call where KCFD personnel might be exposed to yelling and screaming, and something that could possibly prevent them from answering their radios. Eventually Engine 64 responded that everything was fine. However, if they had required additional assistance, I'm sure they would have appreciated hearing ECC transmit "KCSO enroute your location."

So how can we become a better NCS from this experience? Two real life experiences come quickly to mind, one from one of our yearly supported horse rides. Base Camp lost communications with the Amateur at Hwy 395 and where the railroad tracks used to cross. Did the Amateur: 1) Go to sleep? 2) Experience depleted batteries? 3) Change frequencies? Or something worse? If you have another Amateur at Base Camp or nearby, or maybe one of the ride officials, you could/should send them over to check the status of the Ham you've lost contact with.

Another real event was experiencing interference on the frequency being used for an event. Rather than wait hoping that the interference will go away, shift the net to an alternate frequency. If you wait too long, you may not be able to contact all net participants to let them know of the shift and the new frequency. Of course, if you are a good NCS, you will have already briefed all participants of the alternate frequency(ies) in advance!

Whatever the case, as a good NCS, you should take the initiative. Send someone to check out the situation. Call for assistance. Don't hesitate until it is too late to do anything. The excuse that you were Overtaken By Events (OBE) is usually not appreciated by those who were affected by those events.

Till next time.....73.....Elmer

Hey, Sign Me Up!

Why do I do it? I just got to stop doing this...this volunteering to do stuff. Maybe if I keep my hands in my pockets I won't raise them to volunteer. Got to remember to keep my mouth shut also. Duct tape? Maybe if I stop attending meetings and don't answer the phone when I see Jerry's phone number on the Caller ID Display will help.

Why do I do it? Bragging rights? No, but I like the pins and occasional T-Shirt. I'm bored? It's a good cause? If I don't do it, no one will? I'm the most qualified? Hardly.

Why do I do it? I'm sure we all like to brag a bit at times. Remember the Coso Bun Buster Horse Ride that had heavy rain, hail and wind, and I moved a box of bottled water in front of KB6NIZ's truck, which he later ran over? Hah! That was fun and funny, and I WAS THERE! How about the rain and snow during one of the January horse rides? Not much fun, got a bit cold, but I WAS THERE! How about the lucky Ham at Check Point One of the Kiwanis Walk-a-Thon trying to count the number of people going by. It goes something like "1, 2, 3....4, 5,...150, 400..." Check Point Two is a little better, getting 8, 9, and 10 before jumping to 150. Things don't settle down until Check Point Four or Five. Regardless, I WAS THERE! How about some of those HOT Death Valley to Mt. Whitney bicycle races? Whew! Why does NOLV keep assigning me to the Darwin or Keeler check points? Well, at least he hasn't stuck me at the first day's finish line.... yet. Whatever, I WAS THERE!

But I don't like to brag. I do like my collections of pins and T-shirts from the various events I've helped out with. But I must have washed some of those shirts in HOT water a few times because they don't fit anymore. I can't think of any other reason to cause them to shrink.

Why do I do it? Volunteering does give me something to do and it gives me a reason to put off drilling that $\frac{3}{4}$ " hole in the roof of my SUV for a new antenna. Just getting ready for these events can be very exciting. Imagine the night before the event, looking for the operating manuals for the two mobile rigs and five HTs that I *think* I might need. Are all the HT batteries charged up? Where are the batteries? Speaking of charged, where are the chargers? How much food, water, clothes, shelter, paper, pens...I better start a list right now before I forget I need a list.

Volunteering for the events that the Sierra Amateur Radio Club supports does make me feel good. The value of the communications support we provide is incalculable when someone's life or property is saved. Although I don't recall anytime where advanced medical support was necessary, if we hadn't been there and the horse/horse rider/ bicyclist/runner/walker had to return to base camp on their own, the outcome could have been totally different.

Whenever it comes down to me volunteering or the task doesn't get done, the task probably didn't need to be accomplished to begin with. As to being the "most qualified" at something, I don't think so. I'm very good at taking a bad situation and making it worse, and I also get lost fairly easily when out hiking. But being the most qualified, nah.

So, what is my real reason for volunteering? Simple. It gives me the justification I need to purchase that new HT, mobile rig, HF/VHF/UHF all mode, mobile radio shack....

Hummm.....My bank statement says I have some credit available on my charge card. I see that Yaesu is coming out with a new DC to Light, All Mode, cross-band/in-band repeater, 100 watt transceiver that operates off of 2 AA batteries for 96 hours and small enough to fit in a shirt pocket, with the antenna attached.

Oh what the heck, HEY, SIGN ME UP!

Till Next Time.....73.....Elmer

Can You Ever Have Too Many HT's?

The short answer is a resounding NO! If you think you need another rig, take my advice and just go get it. I'm talking about any HT that receives 2M, 440, and frequencies slightly above and below those bands. Scanners are included as far as this little essay applies.

Yes, I know, you can only talk on one radio at a time. Well sort of. Since you can talk on one and use another for packet or other digital mode, now you need two. But if you do any scanning of local frequencies of interest, you have now entered the world of unlimited needs.

Ok, so you like to hang out on a particular frequency. Fine. You don't really want to take a chance of missing a call so you have one rig set to that frequency. But you also sometimes like to monitor a local repeater or simplex frequency. Since those are not as important, you feel you can dedicate a scanning rig to those frequencies.

So we're only talking two rigs here. No problem, right. But wait! Do you monitor Kern County Fire Department (KCFD)? I do. KCFD has their Dispatch frequency and other "channels" that I want to scan. When the action gets hot, the KCFD dispatcher can be using three or more frequencies. So now I need one rig set to the primary frequency (153.785 MHz) and the scanner can handle the other frequencies/channels.

What? Oh yeah. I need another rig to monitor KCFD Stations 73 (Inyokern), 74 or 77 (Ridgecrest) if they move off the primary Dispatch frequency. Ok, I've got a small HT that can handle that task.

What about Kern County Sheriffs, Ridgecrest Police and China Lake Fire and Police? They hang out on their own frequencies. The scanner should be able to handle that unless something interesting is happening there. No problem, I've got another HT that can monitor KCSO on their frequencies.

How many rigs do you need to monitor your other favorite frequencies? CHP, CALTRANS, trains, forestry, BLM, aviation, SAR.....the list continually grows. This, THIS is the world of unlimited needs I mentioned earlier.

How many rigs am I using? Heck, I don't know. But one thing I do know is I need another radio!

73.....de Elmer

Line Loss Caused by High SWR

While preparing to teach my portion of the recent Technician Class Amateur Radio licensing class, Antennas and Feed Lines, I came across a chart in the 2010 ARRL Handbook (Fig – 1). It shows the resulting additional loss of signal due to various SWR levels.

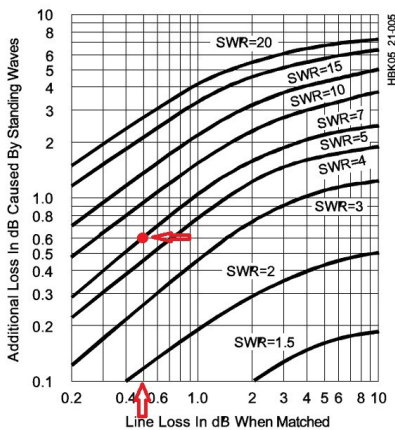


Fig - 1

Back in my younger years, I read several QST and antenna articles about the fanaticism that many Amateurs have about transmitting into an antenna with anything higher than a 1:1 SWR. Many of these Amateurs would spend hours, and sometimes days, adjusting their antenna to reach that heavenly number. Although I did not count myself in this group, I definitely understood their need to obtain the lowest SWR possible.

All of these articles basically said that any SWR less than 2:1 is fine. As long as your rig was not reducing output power due to high SWR, usually 2:1 or higher, don't worry about trying to tune your antenna for that mythical 1:1.

Can you imagine the uproar that caused? An SWR of 2:1? No way! To me, and many of my Amateur friends, that was heresy! I could not imagine any real Amateur would ever think of transmitting into an antenna that was over 1.5:1.

And now, many years later and many years of operating under my belt, I've come to realize that those old timers just may have been right. Using the chart above (Fig – 1), you can determine the total loss in decibels in a feed line having an SWR greater than 1. First determine the matched-line loss for the particular type of line, length and frequency, on the assumption that the line is perfectly matched. For example, Belden 9913 has a matched-line loss of 0.49 dB/100 ft at 14 MHz. Locate 0.49 dB on the horizontal axis. For an SWR of 5:1, move up to the curve corresponding to this SWR. The increase in loss due to SWR is 0.66 dB beyond the matched line loss.

To put those numbers into perspective, here are a few charts showing various types of coax, lengths, and SWRs. The numbers were obtained by

SWR	1:1 Feedline Loss (dB)	Additional SWR Loss (dB)	Power at Antenna
1:1	1.103	-	34.905
2:1	1.103	.211	33.247

Fig - 2

using the “Coax Cable and Line Loss Calculator” available at the Orchard City Amateur Radio Club website. In Figure 2, a typical mobile installation is

considered. Using a frequency of 146.000 MHz, 20 ft of Belden 8219 (RG-58) and 45 watts of power at the transmitter, if you have an SWR of 1:1, your power at the antenna will be 34.9 watts due to the feed line loss of 1.1 dB. If you have an SWR of 2:1, in addition to the 1.1 dB loss in the coax, you will have another .211 dB loss. This changes your power at the antenna from 34.9 watts to 33.25 watts. A petty little 1.65 watts difference. So, as long as your antenna has an SWR of 2:1 or less on all the 2 Meter frequencies you plan on transmitting on, don't kill yourself looking for 1:1 to show up on your SWR meter.

Let's look at a base station installation. The first chart, Figure 3, is a 2 Meter setup still operating on 146.000 MHz with 45 watts of output power, but this time with 75 ft of feed line. As you can see in the chart, the additional feed line loss and resultant reduction in power at the antenna due to an SWR of 2:1 is miniscule compared to the matched 1:1 feed line loss. It also shows that unless your feed line length is very short, you **DO NOT** want to use a RG-58 type of coax to feed your base station 2M antenna.

Feedline Type	Center Conductor	SWR	1:1 Feedline Loss (dB)	Additional Loss due to SWR (dB)	Power at Antenna (watts)
Belden 8219 (RG-58)	Stranded	1:1	4.138	-	17.354
Belden 8219 (RG-58)	Stranded	2:1	4.138	.439	15.685
Belden 8237 (RG-8)	Stranded	1:1	1.757	-	30.026
Belden 8237 (RG-8)	Stranded	2:1	1.757	.291	28.079
Belden 9913 (RG-8)	Solid	1:1	1.164	-	34.418
Belden 9913 (RG-8)	Solid	2:1	1.164	.220	32.721
Belden 8267 (RG-213)	Stranded	1:1	1.958	-	28.671
Belden 8267 (RG-213)	Stranded	2:1	1.958	.311	26.689

Fig - 3

Now let's look at an HF installation. Figure 4 shows the various feed line losses and power available at the antenna when operating on 14.225 MHz with a 100 watt transmitter and a feed line length of 75 ft. Here you can see that there are acceptable losses when using RG-58 type coax. Although the additional loss due to SWR is no longer miniscule when compared to the 1:1 feed line loss, the additional loss is still acceptable. Looking at the additional loss column for an SWR of 3:1, RG-58 has approximately .56 dB additional loss. RG-8 only has .29 dB additional loss while RG-213 shows an addition loss of .32 dB. You can get even less loss by using a solid center conductor type of coax.

Feedline Type	Center Conductor	SWR	1:1 Feedline Loss (dB)	Additional Loss due to SWR (dB)	Power at Antenna (watts)
Belden 8219 (RG-58)	Stranded	1:1	1.159	-	76.585
Belden 8219 (RG-58)	Stranded	3:1	1.159	.561	67.308
Belden 8219 (RG-58)	Stranded	5:1	1.159	1.241	57.549
Belden 8219 (RG-58)	Stranded	10:1	1.159	2.642	41.684
Belden 8237 (RG-8)	Stranded	1:1	.501	-	89.114
Belden 8237 (RG-8)	Stranded	3:1	.501	.288	83.392
Belden 8237 (RG-8)	Stranded	5:1	.501	.662	76.513
Belden 8237 (RG-8)	Stranded	10:1	.501	1.513	62.895
Belden 9913 (RG-8)	Solid	1:1	.348	-	92.302
Belden 9913 (RG-8)	Solid	3:1	.348	.209	87.961
Belden 9913 (RG-8)	Solid	5:1	.348	.486	82.528
Belden 9913 (RG-8)	Solid	10:1	.348	1.139	71.013
Belden 8267 (RG-213)	Stranded	1:1	.560	-	87.896
Belden 8267 (RG-213)	Stranded	3:1	.560	.317	81.702
Belden 8267 (RG-213)	Stranded	5:1	.560	.726	74.366
Belden 8267 (RG-213)	Stranded	10:1	.560	1.645	60.181

Fig - 4

To sum it up, don't worry about trying to adjust your antenna for that magical 1:1 SWR. As long as your rig is not clamping down on it's power due to excessive SWR, generally 2:1 or higher, the additional feed line loss due to SWR is usually tolerable. Besides, once you tune your rig a few KHz away from your prime setting, the SWR starts creeping up.

To calculate your feed line loss, check out the following website:

<http://www.arrg.us/pages/calc.htm>

73.....Elmer

Ask Elmer

Phone Patch Procedures

Question...

I see that the club's 147.00 repeater now has the auto-patch again. Just what is the proper procedures to use it.

Elmer answers...

Auto patches are a great thing. They allow hams to access the phone system from ham rig, in our case, a 2 meter rig. But, there are some important considerations to remember. These were derived from the ARRL web page

1) Use of the auto-patch involving the pecuniary interest of the originator, or on behalf of the originator's employer, must not be conducted at any time. The content of any patch should be such that it is clear to any listener that such communications [pecuniary - financial] are not involved. Particular caution must be observed in calling any business telephone. Calls to place an order for a commercial product may be made such as the proverbial call to the pizza restaurant to order food, but not calls to one's office to receive or to leave business messages since communications on behalf of ones employer are not permitted. Calls made in the interests of highway safety, however, such as for the removal of injured persons from the scene of an accident or for the removal of a disabled vehicle from a hazardous location, are permitted.

2) The auto-patches should never be made solely to avoid telephone toll charges. Auto-patches should never be made when normal telephone service could just as easily be used.

3) Third parties should not be retransmitted until the responsible control operator has explained the nature of Amateur Radio to them. Control of the station must never be relinquished to an unlicensed person. Permitting a person you don't know very well to conduct a patch in a language you don't understand amounts to relinquishing control.

4) Make sure the third parties know they are participating in radio communications, and that such communications are not private, and may be heard by people other than the parties involved.

5) Any auto-patch communication must be terminated immediately in the event of any illegality or impropriety.

6) Station identification must be strictly observed.

7) Auto-patch use should be kept as brief as possible, as a courtesy to other amateurs; the amateur bands are intended to be used primarily for communication among radio amateurs.

8) If you have any doubt as to the legality or advisability of a patch, don't make it.

The first question prior to activating the auto-patch is "is this necessary and can it be done using conventional phone methods instead" If it is necessary and cannot be done with a locally available phone, then go ahead. But, if a phone is readily available, then the phone should be used.

For the considerate amateur using the auto patch, start by listening to the repeater. Is it in use? If so, wait until the users are finished, or break in and ask that you might use it for the purposes of making an auto-patch.

Once you have determined no one else is using the repeater, announce your intentions to use the auto-patch, basically by saying something to the effect " **This is (your call) accessing the auto-patch**". Release the transmit and listen again. There maybe someone waiting to use it as well.

Assuming all is clear, access the auto-patch by entering ***6** and dial the number. Calls are restricted to 760 area code and it is implied, no need to enter it into the phone number. Once the other party answers, let them know immediately that you are on an amateur radio auto-patch, that it is open for all to hear, and that they need to say over when they are done speaking. If the conversation drifts into a questionable area or language, **TERMINATE THE PATCH IMMEDIATELY (*0)**. Otherwise, keep the time on the patch as short as possible. Remember you still must identify every 10 minutes, even while in phone patch. Actually any one phone patch should be a minute or less.

Once done, shut down the auto-patch by entering ***0** and announce "**This is (your call) clear of the auto-patch**". Verify that the auto patch is indeed shut down. If you have another call to make, repeat the whole process, as someone else may have a pressing need of the auto patch or the repeater.

Remember, you always have total control, and responsibility of the auto patch, you are the control operator! You can always terminate a call, at anytime, regardless of who is speaking by entering ***0**. This is a SARC, and Amateur Radio, resource. Please use it wisely and responsibly.

73 Elmer

Ask Elmer

Antenna Modeling Software

Question: I want to design a simple 4 element yagi 2 meter antenna. I'd like to use ½ inch diameter copper pipe for the elements and have a conductive boom. Can anyone recommend a software package to help in the spacing and dimensioning?

Answer: Yep, there is a lot of software out there for modeling antennas and to do exactly what you want. Certainly the various forms of NEC software will work but really are not for the casual user. Instead I would recommend the following web based program for yagi design.

<http://www.dxzone.com/cgi-bin/dir/jump2.cgi?ID=11183>

This software is easy to use and allows you to vary the dimensions, diameters, etc.

Also there are various "how to" build instructions on the web. While not using copper pipe, a good example is shown in:

<http://www.rmvhf.org/thinktank/TwoMyagi.html>

73.....Elmer

Ask Elmer

Station Ground

Question: Due to security at my location, a through the window option is not available for coax, or grounding. Can I use the ground from the wall plug in the house for a ground in the shack?

Answer: You really don't want to. The ground at your plug is a power ground; it's there for electrical safety. For RF safety and the proper operation of your rig, a good, low impedance ground is needed. This comprises of a short run of large diameter wire, preferably braid, to a ground as close to the rig as possible. This ground should be a dedicated rod or rods driven into the ground with the ground lead well bonded to it.

In using the ground in your house wiring, it may be traveling tens or as much as a hundred feet to the ground point. In many cases the ground wiring is daisy chained from AC wall plug to AC wall plug. Without a good RF ground, the power ground may become part of the antenna, actually hot with RF. This in turn may cause havoc with other household equipment, including computers, touch light control and DVRs.

It should be noted that it is likely that the power ground is indeed connected to the RF ground side of the rig. A power supply may have the AC power ground attached to the chassis, which is also bonded to the negative side of the power supply. This is in turn to the chassis of the rig. This makes it all the more important that a low impedance path for RF be supplied by a dedicated station ground.

73.....Elmer

ASK ELMER

VHF DXing

Question: What type of VHF DXing is possible from the local area?

Answer: Local 2 meter operation is the usual first stopping point for most who earn their technician license. And the tool of choice is the 2 meter hand held. But this is by no means the end of the DX opportunities.

First, you need to get into the mindset of DX on VHF. DX on VHF (and UHF) includes other states and chasing grid squares, not just countries. One of the most popular activities is collecting grid squares.

Beyond the 2 meter hand held are the multi-band VHF / UHF rigs with a bit more power, FM, SSB and digital. Now you can reach repeaters outside of the valley as well as IRLP (Internet Radio Linking Project). These rigs open up numerous "DX" activities in VHF.

Six meters is the band of choice for DX. Sporadic E season for six meters is starting now (each spring and summer). Openings pop up and you can work across the country with low power and modest antennas, collecting states, grids and maybe a country or two. It can be very addictive and enjoyable.

With more power and larger antennas, other modes such as meteor scatter and moon bounce become possible. Recent advances in digital modes such as the WSJT make these more esoteric modes within the realm of possibility for more hams.

Another mode for VHF DX is the use of amateur radio satellites. These repeaters in the sky allow you to work great distances when the satellite is available. From our location, it is possible to work all of the US, Canada, parts of Russia, all of Central America and parts of South America.

We are fortunate that here in the IWV, and SARC in particular, we have folks who are experts in all of these areas. If you are interested in any of what I have mentioned above, just give out a shout [at a club meeting – editor] or an email to the [Airwaves] editor (wa6ybn@gmail.com) and you will be directed to the right person for a demo or help getting a station on the air.

73.....Elmer

ASK ELMER

Deep Cycle Batteries

Question: How about some tips on taking care of deep cycle batteries, what types of chargers to use and avoid, recommended wire gage sizes, etc.

Answer: Good question. There is lots of excellent reading available from various sources on this important subject. One of the best sources that I've found is the Emergency Power for Radio Communications by Michael Bryce, WB8VGE, available from the ARRL and various Amateur Radio stores. Although the book covers much more than just deep cycle batteries and chargers, this book can prove invaluable in helping you design the system that powers your radio shack.

Another excellent source of information is an article in the December 2003 issue of QST by Joel Hallas / W1ZR titled, Emergency Power at W1ZR. This article is available for download to all ARRL members by going to the "QST Archive Search" page and searching for the subject article. This article will most likely answer every one of your questions.

As far as taking care of your batteries, it depends on what type of battery you have. If you have the common flooded cell, lead acid battery, be sure to keep it topped off with distilled, deionized or other approved processed water. Never use tap water or mineral water. The impurities in the water will drastically shorten the life of your battery. Be sure to use these types of batteries in well ventilated areas. These batteries vent hydrogen gas when being charged and that gas **WILL** explode when exposed to a spark! If you are going to place the batteries in your house or enclosed area, AGM (absorbed glass mat) batteries are the way to go.

You should always use the largest wire within reason, your budget will allow. Keep your wire runs as short as possible also! Just because the manufacturer placed a 10 foot power cord on your HF or VHF rig doesn't mean you need to use it all. As a great example, Joel Hallas / W1ZR in his Emergency Power article talks about powering a rig that draws 20 amps using 6 feet of 10 gage wire from the power supply to a RigRunner and then another 6 feet of 10 gage wire to the radio. This equals a total of 24 feet of wire (12 feet times 2 wires each). Doing the math and calculating the resistance of the wire, the voltage drop between the power supply's output of 13.8V to the radio would be a minimal .5V, or in other words, the radio would see 13.3V. Nothing wrong with that. However, if you were to try to power that same radio with 16 gauge wire, that voltage drop would now be a whopping 2 volts! Not so good anymore. Yes, 10 gage wire costs a lot more money, but in the long run, it's worth it.

An excellent source of wire, powerpoles and accessories is:

www.powerwerx.com

73.....Elmer

Ask Elmer

2M “Hiking” Antenna

Question: Is a J-Pole antenna the only type VHF antenna that I can attach to a backpack for actual use while hiking? Is there such a thing as a 1 or 2 meter rubber duck style antenna?

Answer: While a J-pole antenna is certainly attractive to use while backpacking, by no means is it the only antenna you can use. In fact, you can use just about any VHF antenna you want. The issue is the ground plane required for proper operation. If you are using a metal backpack frame, just attach the to the frame. Most backpack frames are big enough to form a decent ground plane. You only need about 19 ¼ inches on 2 meters.

But what if you are using a composite frame, or a soft pack? No problem. Just use a trick that HF operators use when using a single end fed wire. Add a counterpoise. This is a wire attached at the base of the antenna, i.e., the shield side of the coax. This wire should be ¼ wavelength long. Again, for 2 meters, it only needs to be about 19 ¼ inch long. The unattached end is allowed to just hang. You will likely need to re-tune the antenna and for purist, the SWR will change as you move but not enough to be a major concern.

As an example of this taken to an extreme, check out www.hfpack.com. These folks operate on the low bands, 40, 20, 17 meters, using antennas on their backs. While the backpack frame is no way big enough to be a counterpoise ¼ wave long, they add a trailing counterpoise, dragging along the ground behind them. On 40 this is 65 feet long! Because they are dragging their feet due to the counterpoise, they call one of their operating event the “Zombie Shuffle”. 😊

You could also try mounting a ½ wave mobile antenna at the top of your metal / composite / soft framed backpack. A ½ wave antenna does not need a ground plane to operate effectively.

By all means, try your mobile or home brewed antenna while hiking and enjoy.

73.....Elmer

Ask Elmer

Effective Radiated Power

Question: "How does RF power into an antenna and the gain of the antenna give us effective radiated power of the antenna? We know that you can not have more RF power out that you put in. If you start with 100 watts the most you can have is 100 watts out in a perfect antenna system. So if say your antenna has a gain of 6db over a dipole in free space and you feed it with 100 Watts from your radio minus the loss in the connectors and coax what do you really have?"

Answer: You are right, if you start with 100 watts out of your transmitter, then the most you can radiate is 100 watts. The antenna system, including the antenna, feedline, tuner and all the various connectors, are passive and cannot "create" power. But they can consume it. So, 100 watts starts out at the transmitter, through various connectors, maybe a tuner, up a feed line and finally to the antenna. All along the way each component has an efficiency associated with it. The efficiencies change with the design of the component and the frequency involved.

Typically, the better the quality, the better the design and the lower the frequency, the more efficient the component. But, no matter what, there are always losses, and the power never exceeds that which you put into it, and it is always less. At 40 meters, the losses might be rather low, so an antenna system might reach 95%. On the other hand, a well built 440 Mhz antenna system with a long coax run might only be 60%.

Ok, still we have 100 watts going in and say 95 watts at the antenna. What's this gain stuff, anyhow? A good analogy is a flashlight. Remove the lens and reflector and turn it on. The bulb radiates out in all directions (more or less), and it will dimly light up a small room but you really can't see any detail. Now add the reflector and lens, and turn it on. There is a major difference. The light is concentrated in one general direction. In front of the beam it is much, much brighter, while behind it, darkness. The reflector and lens has formed a directional antenna for the RF (light waves), with considerable gain.

Your 6db antenna is the same. It is being compared to the mythical dipole in free space. If we look at the radiation pattern (the direction the RF goes out from the antenna) of a dipole in free space, for the most part it is omni directional. That is, it radiates outwardly the same in all directions. If this is a vertical antenna, the pattern will emphasize the horizon with almost no energy going straight up. If you want to work repeater on distant mountains, that is exactly what you want. On the other hand, if you want to talk to your buddy flying a glider overhead, not so good. You have sacrificed radiation going up and moved it to the horizon.

Beam antennas work the same way. The available energy is "focused" in a preferred direction. The increased radiation in that direction, at the cost of less radiation in other directions, is the "gain". So, if we started out with 100 watts, loss 5 watts due to connectors, cable, etc, we have 95 watts at the antenna. With every 3db of gain we are doubling the "effective" power. So for 95 watts with a 3 db gain antenna, we have 190 watts effective radiated power (ERP). A 6db gain antenna would have 380 watts ERP in the preferred direction. Of course, at the opposite end of the antenna, it would be way less than the 95 watts.

Remember, the antenna system is a passive device; it does not add power to the signal. So if we could collect together all the power radiated by our gain antenna, we would be right back to the original 95 watts (and maybe a bit less due to the gain antenna efficiencies).

73.....Elmer

Ask Elmer

Cross-Band Repeat

Question: I've been thinking about getting a dual-band mobile rig to complement my HT. I see that almost all dual-band radios are capable of a feature called "cross-band repeat." What is cross-band repeat and what benefit does this provide?

Answer: Although you can find a more technical explanation elsewhere, a cross-band repeater works very much like a regular repeater except that whatever signal it receives on one band, a cross-band repeater retransmits the signal on the rig's other band, therefore the term "cross-band repeat." Unlike a VHF or UHF repeater, where those repeaters only listen to a single frequency (and transmit on a single frequency), a cross-band repeater listens to the receive frequency on both bands. On a typical dual-band 2M/440 rig, you could have the 2 meter VFO set up for the SARC portable repeater frequency of 147.06 with a +600 KHz offset. On the 440 MHz side, you might decide to use 446.055 MHz simplex. Once your rig is activated to cross-band repeat, whenever a signal is received on the receive frequency of either band, in this case 147.060 MHz or 446.055 MHz, it will be transmitted on the transmit frequency of the other band, 446.055 MHz or 147.660 MHz.

So what's the big deal with this? It all depends upon how far you are from the station/repeater you want to reach. Let's use one of the horse rides that SARC helps out with each year as an example. Although the SARC Portable Repeater provides reasonably good coverage, it does not allow the use of hand held radios (HTs) at all check points. In order to provide good communications support, the Ham providing the support needs to be out with the riders and the horses, keeping track of each as they come in and out of their check point. If the Ham sets up their mobile rig as described above, they could use the LOW/MED/HIGH power of the mobile rig and the mobile rig's higher gain antenna to reach the portable repeater and then use a low power UHF HT for communications between the mobile rig and themselves. The Ham will be able to move about their check point in case they need to check with a Vet or hunt down one of the riders or hike to a hilltop to see if anyone has made a wrong turn, and still remain in contact with Base Camp.

A more detailed explanation on cross-banding is available at:

www.cvarc.org/tech/crossband.html (by Ken Larson KJ6RZ).

A word about IDing. You are required to ID both of your transmitters with your call sign. How do you ID your mobile rig's 440 MHz transmitter that is sending the portable repeater signal to your HT (and everyone else within range)? It's not easy. There's lots of discussion on the internet about that.

73.....Elmer

Ask Elmer

Ladder Line

Question: Ladder line is supposed to be better than coax for feeding multi-band antennas. How far away from metal should the ladder line be kept? How do I keep the ladder line from blowing around and up against a metal mast?

Answer: Generally, twin lead and ladder line should be kept away from metal by at least twice the width of the line. For example, ladder line is about 1" wide, so it should be at least 2" from metal. Both wires in the line should be equal distance from the metal so that the effect on the fields surrounding each wire are about the same. If your setup will support it, additional stand-off distance is better, up to 12". Stand-offs are used to support the ladder line at a fixed distance from the metal mast. A stand-off can be made from PVC pipe or other plastic material. An example of a PVC stand-off can be found in the July 2005 QST Hints and Kinks section "Heavy-Duty Stand-off Insulators for Ladder Line". Use a 12" stand-off every 8-10 feet along the length of the mast to keep the line from blowing about. Shorter stand-offs would need to be closer together.

Also, there should be a twist of 1 rotation of the ladder line every 6 to 10 feet to help prevent common mode currents from developing in the 2 conductors. This is the same reason the AC power lines cross themselves every so often. The twist also helps break up oscillations due to wind.

73.....Elmer

Popular Scanner Frequencies

(Note: Most listed frequencies between 26.9650 MHz and 133.6500 MHz use AM. All other frequencies use FM)

Frequency Tag

26.9650	CB CHNL 1
26.9750	CB CHNL 2
26.9850	CB CHNL 3
27.0050	CB CHNL 4
27.0150	CB CHNL 5
27.0250	CB CHNL 6
27.0350	CB CHNL 7
27.0550	CB CHNL 8
27.0650	CB CHNL 9
27.0750	CB CHNL 10
27.0850	CB CHNL 11
27.1050	CB CHNL 12
27.1150	CB CHNL 13
27.1250	CB CHNL 14
27.1350	CB CHNL 15
27.1550	CB CHNL 16
27.1650	CB CHNL 17
27.1750	CB CHNL 18
27.1850	CB CHNL 19
27.2050	CB CHNL 20
27.2150	CB CHNL 21
27.2250	CB CHNL 22
27.2350	CB CHNL 24
27.2450	CB CHNL 25
27.2550	CB CHNL 23
27.2650	CB CHNL 26
27.2750	CB CHNL 27
27.2850	CB CHNL 28
27.2950	CB CHNL 29
27.3050	CB CHNL 30
27.3150	CB CHNL 31
27.3250	CB CHNL 32
27.3350	CB CHNL 33
27.3450	CB CHNL 34
27.3550	CB CHNL 35
27.3650	CB CHNL 36
27.3750	CB CHNL 37
27.3850	CB CHNL 38
27.3950	CB CHNL 39
27.4050	CB CHNL 40
39.4600	OES Gold 06
42.1200	CHP Base
42.2000	CHP Mobile

Frequency Tag

120.1500	China Lake Twr
120.2500	China Lake Twr
121.5000	Int'l Air Distress
122.8000	Inyokern Airport
123.9750	Forestry Tanker
128.2500	China Lake Cntl
133.6500	JOSHUA Control
141.9500	China Lake Fire
143.5000	CLPD
143.7000	CLPD
145.3400	Randsburg Rptr
146.5200	National Simplex
146.5500	2M SIMPLEX
146.5650	SARC T-Hunt
146.5800	2M SIMPLEX
146.6400	Ridgecrest Rptr
146.9700	Trona Rptr
147.0000	Ridgecrest Rptr
147.0600	Portable Rptr
147.2100	Little Lake Rptr
151.1000	Kern Cnty Fire 5
151.1375	Kern 5 TAC 5 C
151.1450	Forestry Tac 1
151.1600	Forestry Tac 2
151.1750	Forestry Tac 3
151.1900	Forestry Tac 4
151.2200	Forestry Air-Grn
151.2500	Forestry Cmd 6
151.2650	Forestry Cmd 2
151.2725	Forestry Air21
151.2800	Forestry AirTac
151.2875	Forestry Air22
151.2950	Forestry AirTac
151.3100	Forestry AirTac
151.3250	Forestry Tac 6
151.3400	Forestry Cmd 3
151.3550	Forestry Cmd 1
151.3700	Forestry Cmd 5
151.3850	Forestry Tac 9
151.4000	Forestry Cmd 4
151.4450	Forestry Cmd 8
151.4600	Forestry Cmd 7
151.4750	Forestry Tac 13

Frequency Tag

151.8200 MURS
 151.8800 MURS
 151.9400 MURS
 153.7550 OES
 153.7850 Kern Cnty Fire 1
 154.1150 Ridgecrest PW
 154.1600 OES SAR
 154.2200 OES SAR
 154.2650 OES White 2
 154.2800 OES White 1
 154.2950 OES White 3
 154.5700 MURS
 154.6000 MURS
 154.8450 RPD
 154.8600 Kern Cnty Fire 4
 154.9200 CLEMARS
 154.9350 OES Gold 02
 155.1600 Kern Cnty SAR
 155.4750 OES Gold 03
 155.6250 Kern Cnty Fire 3
 155.7525 Kern 6 TAC 6 C
 155.8800 Kern Cnty Fire 2
 156.0750 CAL COORD
 158.7375 Kern 3 TAC 3 C
 159.2250 Forestry Tac 14
 159.2700 Forestry Tac 15
 159.2850 Forestry Tac 16
 159.3150 Forestry Tac 17
 159.3450 Forestry Tac 18
 159.3600 Forestry Tac 19
 159.3750 Forestry Tac 20
 159.3900 Forestry Tac 21
 159.4050 Forestry Tac 22
 159.4500 Forestry Tac 23
 159.4725 Kern 4 Tac 4
 164.9100 Forestry Copper
 166.3750 BLM
 166.6750 Forestry AirTac
 166.9750 BLM
 167.9500 TAC 5 Air - Grnd
 168.0500 Forestry Tac1
 168.2000 Forestry Tac2
 168.2500 BLM TAC 3
 168.4750 Cmd 6
 168.6000 Forestry Tac3
 168.7000 Forestry Cmd
 168.7750 Sequoia Forest
 169.0875 Forestry Air-Grnd
 169.1500 Forestry AirTac
 169.2000 Forestry AirTac

Frequency Tag

169.7750 BLM
 170.0000 Air to Ground
 170.1000 Death Valley Rngr
 170.9750 Forestry Cmd
 446.0000 National Simplex
 453.3000 Kern Animal Cntl
 458.4000 RPD
 458.6000 RPD
 458.7000 RPD
 460.0250 CLEMARS
 460.1250 Sheriff East Tac
 460.2250 Sheriff East Disp
 462.5625 FRS Ch 1/GMRS
 462.5875 FRS Ch 2/GMRS
 462.6125 FRS Ch 3/GMRS
 462.6375 FRS Ch 4/GMRS
 462.6625 FRS Ch 5/GMRS
 462.6875 FRS Ch 6/GMRS
 462.7125 FRS Ch 7/GMRS
 465.0250 OES Gold 05
 467.5625 FRS CH 8
 467.5875 FRS CH 9
 467.6125 FRS CH 10
 467.6375 FRS CH 11
 467.6625 FRS CH 12
 467.6875 FRS CH 13
 467.7125 FRS CH 14
 484.2375 OES Gold 22
 487.2375 OES Gold 23
 860.7375 CALTRANS
 866.1250 Mutual Aid CALL
 866.2000 OES Gold 20
 866.6250 Mutual Aid
 866.9125 OES MARS 2
 867.1250 Mutual Aid TAC2
 867.6250 Mutual Aid
 868.5125 OES Gold 08
 927.0125 Rdgcrst Rptr
 927.5000 Simplex
 935.4625 SCE
 935.4875 SCE
 935.9250 SCE
 936.0000 SCE
 936.9125 SCE
 936.9250 SCE
 937.2250 SCE
 937.5000 SCE
 937.6875 SCE
 938.9000 SCE
 939.9500 SCE