

Spurious Emissions



The Newsletter of the South Bay Amateur Radio Society



Volume 2 Number 1

Winter 2013

From the Editor

By John Wright, K6CPO

It's time for the first newsletter of 2013. This time, we have a couple of articles from Dan Romanchik, KB6NU, one from our own John Markham, KD6VKW, about how things don't always work out the way you expect and an article from Fred Curtis, KI6GRO, about visiting the repeater farms on the top of Mt. Otay.

New Members

We would like to welcome the following new members to SOBARS.

Jim Ply

William Torre, KK6BGQ

Bill Elkerton, W6ZM

Steve Kubicek, W6SMK

Joe Bennett, W6VMX

Welcome! Be sure to join us on the nets each week.



This is the SOBARS repeater site on property belonging to the Sweetwater Water Authority. The project to provide solar power for the repeater is progressing and we hope to have it completed later this year.

John Wright Photo

From the President's Desk

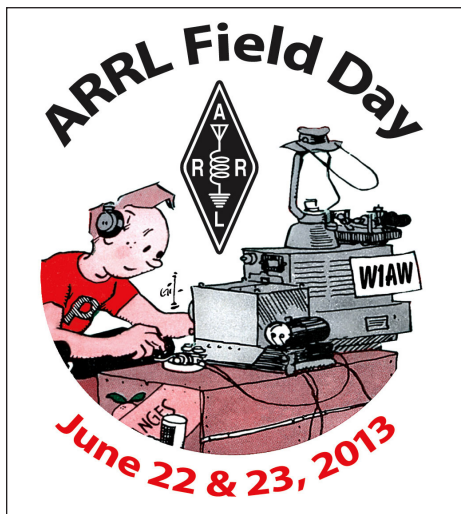
By John Wright, K6CPO

We're three months into 2013 and my term as President is just getting rolling. We had a good year in 2012 under the leadership of John Markham, KD6VKW. Thank you, John!

Field Day 2012 was a rousing success and 2013 promises to be just as good, if not better. Our Field Day Chairman, Bill Metzger, W6RGS, reports that preparations are proceeding on schedule. We will be a 6A this year with a GOTA station and the usual information table. Our field Day stations will be using the N3FJP network

logging software again this year. This system provided automatic duplicate contact checking and simplified preparation of our entry to the ARRL last year. Field Day 2013 will be the fourth full weekend of June, the 22nd and 23rd.

There is one rule change for Field Day in 2013. Stations operating as Class A or B may begin setting up at 0000 UTC on Friday (5:00 PM PDT.) Cumulative set-up time shall not exceed 24 hours. On-the-air operations commence at 1800 UTC (11:00 AM PDT) and shall





**SOUTHBAY
AMATEUR RADIO
SOCIETY
(SOBARS)
K6QM**

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SOBARS is an ARRL-affiliated ham radio club with members from San Diego, National City, La Mesa, Chula Vista, Bonita, Imperial Beach, and San Ysidro, California.

Club Repeater: 146.085 (+)
PL: 100.0

SOBARS meetings are held the 1st Thursday of the month at 7 PM, at the Chula Vista Yacht Club, 642 Marina Parkway #83 Chula Vista, CA 91910

OFFICERS

President: John Wright, K6CPO
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Vice-President: Ramon Duenas, KJ6QQK

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Secretary/Treasurer:

Fred Curtis, KI6GRO

ki6gro@sobars.org

Call-Sign Trustee:

Jim Beckman, N6RSL

Emergency Coordinator:

Dick Cupp, K6SJA

Property Trustee:

John Markham, KD6VKW

CLUB NETS

Club nets are held every Tuesday evening on the following bands:

1830: (PT) 449.980 (-) PL 88.5

223.840 (-) PL 107.2

1900: (PT) 146.085 (+) PL 100.0

1930: (PT) 28.480 USB

7.183 LSB

continue for a maximum of 24 hours.

Anyone that wishes to help with Field Day should contact the Field Day Chairman, Bill Metzger, W6RGS. Everyone is welcome!

Our project to provide solar power for the SOBARS repeater is progressing. A letter has been sent to the Sweetwater Authority, owners of the property at the repeater site, requesting access to the property to install the solar equipment. Once this permission has been granted, we will contact the City of Chula Vista to request permission to attach the solar panels to the antenna tower and install related equipment in the building housing the repeater. When this project is completed, we

will have the only completely solar powered repeater in the county.

The SOBARS nets continue as usual with good participation on all bands. During February, several members began holding a net on 6 Meter FM Simplex following the 440 and 220 nets. Unfortunately, this didn't allow much time before the start of the 2 Meter net. At the March meeting a vote was taken to move the 6 Meter net to Thursday evenings at 6:30 PM. There was also discussion of starting a digital mode net in the future.

2013 promises to be a great year for SOBARS.

73, John

FCC Relinquishes Amateur Radio Licensing

By Anthony Good, K3NG

In a shocking and unexpected move, the FCC today transferred all amateur radio licensing responsibility to QRZ.com, releasing Report and Order 2013-699. Outgoing Chairman Julius Genchowski read a statement noting that the decision was due to a combination of automatic budget cuts from budget sequestration and an acknowledgement of reality.

Other commissioners released similar written statements. The Report and Order stated, "Our enforcement bureau received an inquiry from a radio amateur who was banned from QRZ.com ("QRZ"), an amateur radio portal and a popular callsign database. After his callsign listing was removed from the QRZ database, amateurs frequently questioned on the air whether he was really licensed. On a few occasions he was actually referred to as a 'bootlegger' by other radio amateurs, a derogatory term for an unlicensed individual operating illegally. Our research indicates that few licensees actually use the FCC ULS (the official online licensing database) for amateur radio license queries. In this ruling we have identified an opportunity to shed the responsibility of licensing and reduce administrative costs, and are therefore transferring administration of amateur radio licensing to a private entity."



FCC Chairman Genchowski makes the announcement to a stunned audience

At press time ARRL had not released a written statement due to a backlog in the ARRL email server, still processing emails from a month ago. However, in a conference call this afternoon it was announced that ARRL was petitioning the FCC to withdraw the R&O until it could present its solution for privatizing amateur radio licensing, a solution employing 65,535 bit encryption technology which would be ready sometime in 2019.

QRZ praised the FCC change and announced that for a limited time free Extra class upgrades will be included with an XML subscription or purchase of Ham Radio Deluxe. QRZ forums were abuzz, with both

support for and opposition against the change. One super moderator stated that QRZ super moderators will have enforcement privileges, with the ability to revoke licenses for bad behavior both online and on the air, later taunting to users to step out of line and “feel his wrath.”

The FCC announcement is the most notable change in US amateur radio licensing since the controversial and still-debated Incentive Licensing program, and will go into effect upon publication of the Report and Order in the Federal Register.

Editor's Note: This article was first published on April 1, 2013 and is reprinted by permission.

The Best Laid Plans...

By John Markham, KD6VKW

Scottish poet Robert Burns is credited with the saying, “The best-laid plans of mice and men oft go awry.” That’s not a exact quote but the idea is there.

I recently visited Livermore CA, where my daughter and son-in-law live. My son-in-law, Rick, is a newly licensed Technician and he wants to access nearby repeaters that link to Southern California so we can rag chew on the air. Two linked systems are decent prospects: The Condor Connection on 220 and the WIN System on 440 (mostly). I did some research with terrain modeling software to see how well these systems covered Livermore. All six possible signals, two Condor machines (San Jose and Napa) and four WIN System machines (San Francisco, San Jose, Vacaville and Patterson), have terrain blockage issues, meaning at least one mountain prevents line-of-sight access to the repeater.

Fortunately, VHF/UHF signal blockage is a relative thing; some of the signal reaching a mountain peak is diffracted downward into areas beyond, even though they’re hidden from the repeater. Testing is required to determine true coverage. I used a handheld with a whip antenna and checked each of the WIN System repeaters. I could hear two of them, Vacaville and San Jose but the signals were weak and if I moved even a few inches, I might gain or lose the signal. I couldn’t bring up either of the repeaters ... but at least I had *something* to work with.

I had two external 70cm antennas with me, a small six-element beam and a 27-element beam (17 dBd gain). I’ve used both antennas before and I know they’re good performers. They have low VSWR and “get out” quite well. I also brought six assorted pieces of connectorized low-loss Heliac cable. The cables were all bought used, so I never knew their history. To be safe, I also brought some Navy-surplus Heliac cable and suitable N-type connectors.

My small-beam attempts to bring up either Vacaville or San Jose were failures. However, using the big beam, I did get somebody to come back from the San Jose machine. He said my signal was noisy and I needed more power. (I didn’t have any more power; a 5-watt HT was my only 440 gear.) I began looking for other problems. My first check was for Power Out/VSWR. Power Out was good but VSWR was higher than optimum, nearly 2:1. That would hurt both transmit and receive.

First, I rechecked the antenna alone. Its SWR was in the range of 1.2:1—excellent, as usual, so I suspected a bad cable. I swapped cables and retested. Same problem. I stopped and tested all the cables into a dummy load. I had only one good cable out of the five I brought! Since the cables appear undamaged and show good DC continuity, I proceeded with the notion that the cable connectors were dirty or corroded or both and proceeded to clean them with emory cloth, alcohol and an aerosol solvent. With thorough cleaning and polishing of the cable connectors, I was able to restore four out of the five cables to functional status (low insertion loss and low VSWR). The remaining cable may have water intrusion. When water gets inside cables or connectors, they sometimes cannot be restored and must be discarded.

Lesson Learned: Never assume that equipment is in good condition simply because it was OK at some time in the past.

Next Issue: On the air with the big beam and some good cables.

SOLUTION HAM RADIO PUZZLE NO. 2

A	F	S	K			A	C	H	Y
C	A	C	H	E		W	H	O	A
C	R	A	Z	E		G	A	I	N
T	O	R		P	C		F	S	K
				B	R	U	N	E	T
		D	E	M	O	T	E		
A	R	M		M	O		R	I	T
P	O	O	L		U	L	T	R	A
R	O	T	C		T	O	T	A	L
S	P	E	D			S	Y	N	C

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How Do You Choose an Antenna Analyzer?

By Dan Romanchik, KB6NU

A reader recently e-mailed me:

"In the past you told me you started with the Autek RF-1, and later moved to the Palstar ZM-30. I am finally getting around to thinking about purchasing an antenna analyzer, but I am stumped by the choices. In order of increasing purchase price this is what I've turned up:

- * Autek RF-1 - \$139.95*
- * Autek RF-5 - \$229.95*
- * Rig Expert AA-54 - \$340.00*
- * Palstar ZM-30 \$399.99*
- * W4RT Electronics MiniVNA \$399.99*
- * Rig Expert AA-230PRO \$690.00*
- * Timewave Technology TZ-900S \$899.99*

"How does one decide? Where does one go to find out the differences? Other than asking a fellow ham, how does one find out which one is the best antenna analyzer without paying an arm and a leg (unless the feature(s) so purchased are deemed worth the cost)?

"Thanks! 73"

When I replied, I noted that he had actually missed several other good choices:

- * Autek VA1 - \$199.
- * MFJ 259B - \$240.
- * YouKits FG-01 - \$250.
- * Comet CAA500 - \$450.

The Autek VA1 is actually the antenna analyzer that I first purchased. The MFJ 259B is arguably the most popular antenna analyzer on the market. MFJ has several other models with different feature sets. The YouKits FG-01 is a very cute, little analyzer with a small graphical display. It is made in China and sold in the U.S. by TenTec.

So, how do you choose just one from this list? Well, I think the first thing that you have to ask yourself is how you're going to use the analyzer. If all you're going to do is to check the SWR of your HF dipoles, then buy the Autek RF-1. It's the least expensive unit, is reasonably accurate, and is small and lightweight, making it easy to use outside where your antennas are located.

If you want to do some more serious frequency analysis, then you should be looking at the W4RT miniVNA or, if you have more cash, the Timewave TZ-900s. These instruments can help you do a lot more in-depth analysis of your antenna system. The software for the miniVNA, for example, will easily plot the SWR of a multi-band vertical antenna from 3 - 33 MHz.

Some antenna analyzers do more than just SWR. For

example, what sold me first on the Autek VA1 and then on the Palstar was that they also measured reactance. So, you can use the antenna analyzer as an LC meter as well. Palstar also says that you can use the ZM-3 as a low-level signal source. While I have used my Palstar to measure inductance and capacitance, I have yet to use it as a signal source.

Next, you need to consider what bands you'll be using it on. Many antenna analyzers only cover the HF bands. That's a bummer if you like operating 6m, or like to experiment with VHF/UHF antennas. A friend of mine bought the Palstar antenna analyzer after talking to the company at Dayton. At the time, they said that they were planning to come out with a model that covered 6m, as well as the HF bands.

Unfortunately, they never did come out with a 6m version, and he was sorely disappointed. He ended up buying a miniVNA instead. The miniVNA can be used up to 170 MHz right out of the box, and up to 1.5 GHz with an optional extender.

Asking your fellow hams about the antenna analyzers they have is actually a good way to figure out what's best for you. If you ask nicely, they might even let you borrow their analyzers or come over and show you how it works on your antennas.

Reading the reviews on eHam is also a good way to gather information before making a purchase like this. You certainly have to take the reviews there with a grain of salt, but if several reviewers mention a particularly good or particularly bad feature of a product, then it's certainly something worth taking a hard look at.

If you're new to the hobby, starting out small and working your way up might be a good strategy. You could buy one of the less expensive models and get used to how they work, then sell it and make the leap to a more sophisticated unit. The way things are going, you should be able to sell your first antenna analyzer for at least 80% of what you paid for it.

The March 2012 QST contains an in-depth review of four analyzers (available online to ARRL members), including the Comet CAA-500, MFJ-266, RigExpert AA-54, and the Youkits FG-01. Each analyzer reviewed had various pluses and minuses. Even if the unit you are considering was not reviewed, the article provides a guide to the kinds of questions you should be asking as you go through the selection process.

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When he's not analyzing antennas, Dan, KB6NU blogs about amateur radio at KB6NU.Com, writes and publishes the "No-Nonsense" series of amateur radio license study guides, and just has fun with amateur radio. You can reach him by e-mail at cwgeek@kb6nu.com, @kb6nu on Twitter, or on 40m CW many evenings.

A Trip to Mt. Otay

By Fred Curtis, KI6GRO

For some time now, I have wanted to drive up to Mt. Otay to enjoy the great views and to see where all of the antennas are. I had talked to a fellow club member about Mt. Otay and he told me, "You better go up there in a four wheel drive, it is rough going." With that advice, I talked my good friend Jorge Hernandez, into a trip up to the top. Jorge had previously made the trip and agreed to take me up there. He asked me if I was afraid of heights. I replied that I was not and was curious about his question. Later I would find out why. It should be mentioned here, that Jorge owns a 2002 H-1 Hummer, the first non-military Hummer sold to the public. It seats four, has a transmission tunnel that goes between the seats and an onboard compressor that can inflate and deflate huge tires on the fly! Needless to say, our transportation was up to the task.

On February 24th, we traveled down Otay Lakes Road to the Thousand Trails RV Park at Pio Pico. We entered a nondescript iron gate adjacent to the park and began our climb on a very narrow gravel road. As we made our ascent, I noticed there were no guard rails and a sheer cliff that would drop you several hundred feet. Thankful I am not afraid of heights.



A part of the antenna farm on the summit of Mt. Otay.

Fred Curtis Photo

After our slow careful climb to the "top" we encountered several antenna farms. The first one was a commercial farm with lots of antennas, dishes, fencing and lots of signs, indicating radiation danger. Hmm. After visiting a couple of farms, Jorge put the Hummer in 4 wheel drive and we drove up a short hill to what appeared to be an amateur radio antenna farm (see photo). I stopped counting antennas after 20 and was amazed at the array. The design was simple but functional and there were hundreds of feet of cable. I was not able to go inside the building but I am sure it is filled with racks of repeaters and other related ham radio equipment.

After walking around the building and taking pictures, it was time to make contact. I keyed up the SOBARS repeater and made contact with Dick Cupp, K6SJA. I told Dick where I was and we had a great QSO! This was my second QSO from a mountaintop with Dick; my previous one from atop of Mt. San Miguel. We went to a couple more repeater farms (some not operational) and enjoyed the views of the surrounding area.

Our trip down the mountain was uneventful and I was glad not to be looking over the steep cliffs on the way down. It was a fun trip up to the repeater farms and the top of the mountain. I would recommend a sturdy SUV or truck with sufficient ground clearance if you are contemplating a trip up to Mt. Otay. Some of the repeater farms are accessible without using four-wheel drive.

Many thanks to my friend Jorge for taking me up to the top of Mt. Otay!

47 CFR Part 97

Editor's Note: From time to time, when space permits, I will be including excerpts from Title 47 – Part 97 of the Code of Federal Regulations (CFR). Part 97 sets forth regulations for the Amateur Radio Service.

Subpart A—General Provisions

§ 97.3 Definitions.

(a) The definitions of terms used in part 97 are:

(1) *Amateur operator*. A person named in an amateur operator/primary license station grant on the ULS consolidated licensee database to be the control operator of an amateur station.

(2) *Amateur radio services*. The amateur service, the amateur-satellite service and the radio amateur civil emergency service.

(4) *Amateur service*. A radio communication service for the purpose of self-training, intercommunication and technical investigations carried out by amateurs, that is, duly authorized persons interested in radio technique solely with a personal aim and without pecuniary interest.

(5) *Amateur station*. A station in an amateur radio service consisting of the apparatus necessary for carrying on radio communications.

(6) *Automatic control*. The use of devices and procedures for control of a station when it is transmitting so that compliance with the FCC Rules is achieved without the control operator being present at a control point.

(7) *Auxiliary station*. An amateur station, other than

in a message forwarding system, that is transmitting communications point-to-point within a system of co-operating amateur stations.

(8) *Bandwidth*. The width of a frequency band outside of which the mean power of the transmitted signal is attenuated at least 26 dB below the mean power of the transmitted signal within the band.

(9) *Beacon*. An amateur station transmitting communications for the purposes of observation of propagation and reception or other related experimental activities.

(10) *Broadcasting*. Transmissions intended for reception by the general public, either direct or relayed.

(11) *Call sign system*. The method used to select a call sign for amateur station over-the-air identification purposes. The call sign systems are:

(i) *Sequential call sign system*. The call sign is selected by the FCC from an alphabetized list corresponding to the geographic region of the licensee's mailing address and operator class. The call sign is shown on the license. The FCC will issue public announcements detailing the procedures of the sequential call sign system.

(ii) *Vanity call sign system*. The call sign is selected by the FCC from a list of call signs requested by the licensee. The call sign is shown on the license. The FCC will issue public announcements detailing the procedures of the vanity call sign system.

(iii) *Special event call sign system*. The call sign is selected by the station licensee from a list of call signs shown on a common data base coordinated, maintained and disseminated by the amateur station special event call sign data base coordinators. The call sign must have the single letter prefix K, N or W, followed by a single numeral 0 through 9, followed by a single letter A through W or Y or Z (for example K1A). The special event call sign is substituted for the call sign shown on the station license grant while the station is transmitting. The FCC will issue public announcements detailing the procedures of the special event call sign system.

(12) *CEPT radio amateur license*. A license issued by a country belonging to the European Conference of Postal and Telecommunications Administrations (CEPT) that has adopted Recommendation T/R 61-01 (Nice 1985, Paris 1992, Nicosia 2003).

(13) *Control operator*. An amateur operator designated by the licensee of a station to be responsible for the transmissions from that station to assure compliance with the FCC Rules.

(14) *Control point*. The location at which the control operator function is performed.

(15) *CSCE*. Certificate of successful completion of an examination.

(16) *Earth station*. An amateur station located on, or within 50 km of, the Earth's surface intended for communications with space stations or with other Earth stations by means of one or more other objects in space.

(17) [Reserved]

(18) *External RF power amplifier*. A device capable of increasing power output when used in conjunction with, but not an integral part of, a transmitter.

(19) [Reserved]

(20) *FAA*. Federal Aviation Administration.

(21) *FCC*. Federal Communications Commission.

(22) *Frequency coordinator*. An entity, recognized in a local or regional area by amateur operators whose stations are eligible to be auxiliary or repeater stations, that recommends transmit/receive channels and associated operating and technical parameters for such stations in order to avoid or minimize potential interference.

(23) *Harmful interference*. Interference which endangers the functioning of a radio navigation service or of other safety services or seriously degrades, obstructs or repeatedly interrupts a radio communication service operating in accordance with the Radio Regulations.

(24) *IARP* (International Amateur Radio Permit). A document issued pursuant to the terms of the Inter-American Convention on an International Amateur Radio Permit by a country signatory to that Convention, other than the United States. Montrouis, Haiti. AG/doc.3216/95.

(25) *Indicator*. Words, letters or numerals appended to and separated from the call sign during the station identification.

(26) *Information bulletin*. A message directed only to amateur operators consisting solely of subject matter of direct interest to the amateur service.

(27) *In-law*. A parent, stepparent, sibling, or step-sibling of a licensee's spouse; the spouse of a licensee's sibling, step-sibling, child, or stepchild; or the spouse of a licensee's spouse's sibling or step-sibling.

(28) *International Morse code*. A dot-dash code as defined in ITU-T Recommendation F.1 (March, 1998), Division B, I. Morse code.

(29) *ITU*. International Telecommunication Union.

(30) *Line A*. Begins at Aberdeen, WA, running by great circle arc to the intersection of 48° N, 120° W, thence along parallel 48° N, to the intersection of 95°

W, thence by great circle arc through the southernmost point of Duluth, MN, thence by great circle arc to 45° N, 85° W, thence southward along meridian 85° W, to its intersection with parallel 41° N, thence along parallel 41° N, to its intersection with meridian 82° W, thence by great circle arc through the southernmost point of Bangor, ME, thence by great circle arc through the southernmost point of Searsport, ME, at which point it terminates.

Definitions will be continued in the next issue—Editor

Ferreting Out Noise Sources

By Dan Romanchik, KB6NU

About three months ago, I put up a 20m antenna—an end-fed, half-wave antenna (<http://www.kb6nu.com/kb6nu-finally-builds-an-end-fed-half-wave-antenna/>). Right off the bat, I was flummoxed by the high noise level. It was nearly S9, obliterating all but the strongest signals.

The strange thing about this noise was that I was only experiencing it on 20m, and only using this antenna. If I switched to my 40m dipole, the noise dropped back to the S1 - S2 noise level that I usually experience here. (Yes, I know. I'm really lucky to have such a low noise level here.)

It didn't really make any sense to me that this antenna would be so susceptible to noise while my other antennas weren't, but I just couldn't come up with any other explanation. I was not experiencing any noise on any of the other bands, after all. Sometimes 40m is so quiet here that I check to make sure that the antenna is connected to the radio.

As luck would have it, I stumbled upon the noise source a couple of days ago. I had taken the laptop I normally use in the shack somewhere one day last week, and when I returned it to the shack that evening, I switched the rig over to 20m before connecting the power supply back to the laptop. No noise! When I plugged the power supply into the laptop, the noise jumped up to S9 again. The problem noise source was found!

I posted about my experience to my blog and to the Ham Radio Help Group (<http://groups.yahoo.com/group/HamRadioHelpGroup/>). Mark, K5LXP, one of the gurus on HRHG, advised me to throw the main circuit breaker in order to determine if it was something inside the house generating the noise. Bob, K0NR, commented on my blog post, "I have found that flipping off circuit breakers in my house is a good first step to try and find a noise source. Usually ticks off the family, but what the heck :-)" Either of these methods will help you determine if a noise source is inside or outside of your house.

I'm still thinking that the way my antenna is positioned

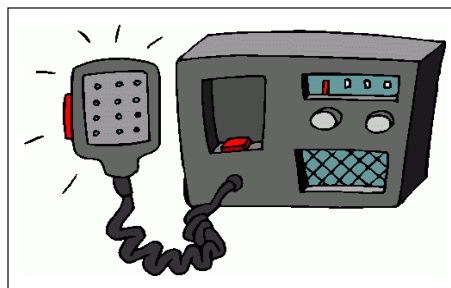
may have something to do with its picking up the noise generated by the power supply. I plan to play around with the positioning of the antenna once the snow melts and see if that makes any difference. Until then, I can work 20m with the power supply disconnected and run the laptop off the battery.

So, the next question you might ask is how does the antenna work? It seems to be putting out a very good signal. One evening last week, I worked several DX stations, including 6W/HA0NAR in Senegal. It's not a beam, but I'm pretty happy with it.

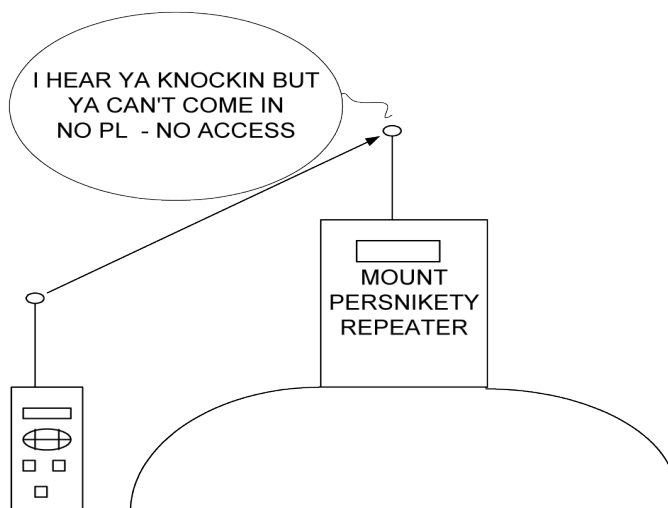
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When he's not worrying about his signal-to-noise ratio, Dan, KB6NU publishes the "No-Nonsense" series of amateur radio license study guides. The latest in this series is the No-Nonsense Extra Class License Study Guide. For more information, go to KB6NU.Com or e-mail cwgeek@kb6nu.com.



The antenna tower at the SOBARS repeater site. Once the solar power installation is completed, the panels will be located on the tower itself. *John Wright Photo*



HAM RADIO PUZZLE NO. 3 - REPEATERS



1	2	3	4		5	6	7	8	9

10	11	12	13	14	15	16	17	18		19	20	21		22	23
							O								

1. A type of FM detector

				O	<- Your Answer Here
3	23	21	13	17	<- Place letter in puzzle number above ^

2. A digital mode

19	16	20	8

4. YL name

10	9	5

3. Type of autopatch call forbidden on most repeaters

1	2	11	12

6. Beam

18	7	22

5. Wire size

4	6	14

7. Alpha

15