The PROPAGATOR

August, 2003

The Monthly Newsletter of South Orange Amateur Radio Association

Low-Down On EchoLink

This month's speaker is Brian Roode, NJ6M, and his topic is EchoLink. Brian's interest in amateur radio began through observing his Dad, Ralph,K6VO (SK), a ham for over 60 years, and his brother Dana, K6NR, talk to stations around the world on CW. Brian was first licensed as KA6CCF at 15 and now holds the Extra Class license. An active SOARA member, Brian conducts the very popular raffles at the general meetings.

When not working (manager of the Network & Support Programming group at UCI), or operating on the air, Brian enjoys building electronic projects. He resides in Laguna Niguel with his golden retriever Osh Kosh.

EchoLink is software which allows Amateur Radio stations to communicate with one another over the Internet, using voice-over-IP (VoIP) technology. The program allows worldwide connections to be made between stations, from computer to station, or from computer to computer, greatly enhancing Amateur Radio's communications capabilities. There are more than 100,000 registered users in 137 countries worldwide.

Come see how other Amateur Radio Operators like you are using EchoLink to keep in touch with their friends through Internet connected EchoLink-enabled repeaters. Find out how you can participate using your Windows, Macintosh, or Linux Computer. We plan on having a live EchoLink demonstration and discussion and plenty of EchoLink experienced SOARA members to answer any questions you might have. ☐

New Members

A hearty welcome to SOARA's newest members:

Mark St. George	KG6QXD
Paulette Gauthier	KG6QXC

Fall Course Schedule

Two FCC Amateur Radio license classes will be offered this Fall.

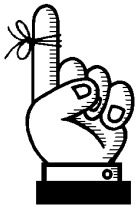
Technician course: Aug 28t — Oct. 16

General Class course: Oct 30 — Dec. 11

Cost for each course is $35.00 for materials & fees. Classes are held on Thursday evenings at 7:00 p.m.at the Norman P. Murray community Center, 24392 Veteran's Way, Mission Viejo.

If you know someone who might be interested in one of these classes, please pass this information along. The classes have been very successful and popular. Early registration is advised as room is limited.

For information or to register contact *classes@soara.org* . ☐



Just a reminder, the ARRL Southwest Division will be holding HAMCON 2003, September 5,6, and 7 at the Hilton Hotel, 701 W. Ocean Boulevard in downtown Long Beach, CA. The Convention will consist of VE testing, Vendor exhibits, Technical forums, Emergency Vehicle displays, a W1AW special events station, as well as breakfasts, luncheons, and the Grand Banquet. SOARA will be hosting a display table at the event.

I would like to encourage all SOARA members to try to attend at least a part of this event because it promises to be an enjoyable and great learning event for all amateurs. We would also welcome some assistance with covering the SOARA club table.

For more information see the website at <www.hamcon.org>

Ray, AE6H ☐

F.D. Video and More

SOARA's July meeting started off with a recap of this year's Field Day performance. Our Activities Director, Steve Perluss, KR6CE, reported our claimed score came to 6036 points. Conditions were not reported to be as good as last year, but this score is higher than we achieved last year.

Following Steve's report, Dave Seroski, KG6QCI, presented a promotional video tape featuring scenes and interviews from our 2003 Field Day site. This tape will be available for promoting amateur radio.

The remainder of the evening was conducted by Malcolm, KO6SY, who had prepared a list of questions to "Stump the Elmers". Actually the questions were taken from the amateur exam question pools and were open for anyone to answer. Points were awarded for correct answers (and subtracted for incorrect answers!) adding an element of fun and challenge to the proceedings. It was an enjoyable as well as enlightening exercise. ☐

SOARA's Annual Picnic

On Saturday, August 2, SOARA members and their families gathered at "Baby Beach" in Dana Point for the annual picnic. As usual it was a beautiful day with a cool ocean breeze. The food was plentiful and delicious.

A few "thank you"s are in order to those who helped make this event so successful. Steve Perluss, KR6CE, the Activities chair was responsible for the overall planning and execution. Paul Robert, ND6Q, and Jerry Di Schino, KN6QK, were the brave souls who arrived very early (well before sunrise) to stake a claim on our regular spot. Lou Frank, KG6FCT, not only did much of the shopping, but was the chief chef. Heiko Peschel, AD6OI, brought an HF rig and all of the auxiliary equipment. Several HF contacts were made from the location. Ah — what a fine way to spend a Saturday afternoon. ☐

The Way I See It:

Understanding Radio Theory Without Math.

A Discussion of Repeater Desense

Howard G. Brown, KG6GI, Repeater Director

This article discusses a condition know as "desense" that SOARA has been experiencing on our Laguna Beach site.

What is "Desense"?

In its simplest form, desense occurs when some unexpected signal is present at or near the repeater's receive frequency. In order for a user to operate the repeater under this situation, the user's power level at the receiver input must exceed the unexpected signal by a significant amount in order to be heard by the repeater. This means that more user power is required than if the unexpected signal were not present; thus, the user is experiencing "desense". The unexpected signal may not contain any modulation that is discernible by the FM discriminator so the user may be totally unaware that he is competing with the other signal.

Typically, the unexpected signal comes and goes so some of the time the repeater may appear more sensitive than at other times. This appears to be the situation on our two-meter repeater at Laguna Beach.

Why is a repeater unique?

One of the things that distinguish a repeater from a user's radio is that in the case of a repeater, both the transmitter and receiver are operating concurrently. In the case of a user's radio, either you are listening or talking, but not both at the same time. This unique situation imposes special engineering considerations to assure that the input to the receiver is as absent of foreign signals as possible.

One of the primary sources of nearby high power signals includes our own transmitter. In the case of this machine, our transmitter is producing 100 watts (+50 dBm) and is only 600 kHz higher in frequency than our receiver. The repeater is equipped with a six-cavity duplexer including a very deep notch filter (> 90 dB) set to our transmitter frequency. Measurements have shown that the foreign signal is not directly our own transmitter.

It is also possible that the foreign signal is another transmitter on our input frequency, but measurements have shown that this is not the case here.

An additional possibility is an adjacent channel repeater that is leaking into our pass band. Such a repeater exists in Costa Mesa whose transmitter is only 15 kHz away from our receiver, but again this has not proven to be the source of our "desense".

Finally our investigation has focused on the possibility that our own transmitter is getting back into our receiver through some indirect path. After numerous measurements we think this is the case.

Some other interesting facts!

We share the site with several other radios including the local water district, the KSBR translator serving Laguna Beach, a Red Cross repeater, and several SCE transmitters. For purposes of this discussion we will focus on the KSBR translator that is listening to KSBR on 88.5 MHz and translating their signal to 89.1 MHz with a 10-watt transmitter.

Desense is frequently caused when various carriers mix in a non-linear device and generate frequency components that are the sum and difference of their carriers and their many harmonics (intermod or "IMD"). A typical non-liner device is the final amplifier in a nearby transmitter as it is operating class C for efficiency.

Examining the KSBR signals, we note that they are separated by precisely 600 kHz, the difference between our transmitter and receiver frequencies. If our transmitter carrier were also present in such a non-linear device, it together with the KSBR signals would produce, among other frequencies, our receiver frequency. This is, we believe, exactly what is happening.

And there is the complications of CTCSS to the story,

There is a little more to the story. In order for the receiver to un-gate the repeater controller and make its input available to our transmitter, there must be PL (also know an CTCSS) present. Normally, the user's radio is providing the tone. If the user's power level is high enough he will control the radio and will be unaware of any problem. If his signal is marginal relative to the foreign signal, he will compete for control of the repeater.

Just to add a little more complexity to the story our transmitter includes a PL tone for the first 5 seconds of each transmission. Consider a situation where a local mixing source is available. When the user key's up his/her radio (let's assume adequate power) he starts the timer. If he un-keys in less than 5 seconds (typical), the transmitter will not un-key until after the remainder of the 5-second interval. This is because the foreign signal now contains a PL from our own transmitter which satisfies the receiver PL requirements. After the timer expires, courtesy tone will occur and the transmitter will un-key. During the period after the user un-keys and the timer expires, a harsh noise will be heard from the repeater.

If, on the other hand, the user talked for more than 5 seconds, the transmitter PL tone will be removed and the repeater will appear normal.

Wide band signals will not be demodulated clearly by our discriminator.

The KSBR signals are deviating 20 to 35 kHz typically compared to the pass band of our receiver which is a little more than 5 kHz. Thus, generally we won't hear intelligible FM broadcast signals but rather will hear a harsh noise which occurs from those signals as they pass through our pass-band.

When the transmitter is getting back into the receiver with little or no user input, the audio will sound very harsh for a short period. I am sure you have all heard the phenomena.

Now, all of the above is only true if the mixing transmitter is transmitting. So, the "desense" will come and go with another unheard transmitter. We are trying to correlate the "desense" with operation of other nearby transmitters.

Power levels play a role in the analysis,

Concerning power levels, I have made the following measurements on the repeater site using a typical dual band mobile antenna and a spectrum analyzer.

K6SOA (100 watt transmitter, omni antenna)	-10 dBm
KSBR Broadcast Station (Saddleback CC)	-72 dBm
KSBR Translator (10 watt transmitter, yagi antenna)	-10 dBm

The IMD products power level will be determined by the weakest signal and typical mixing efficiencies are –12 dB. Thus, the power available at the input to our receiver is likely on the order of –82 dBm or 18 microvolts. Of course this estimate could be off by as much as +0, –20 dBm as it depends on the mixing efficiency and any path attenuation.

As time permits, we will continue to search for the mixing device, but IMD is a very difficult problem to isolate. □

Year 2003	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.
General Meeting 7:00 PM	27	24	17	21	19	16	21	18	15	20	17 Auction	No meeting
Program	W6XD	WD6DIH	W6PJ	N6NHP	Spring Auction	Field Day	Q&A	NJ6N			Fall Auction	
VEC Testing 5:30 PM	27	24	17	21	19	16	21	18	15	20	17	—
Propagator Deadline	21	17	10	14	12	9	14	11	8	13	10	
Board Meeting	2/3	3/3	24	28	26	23	28	25	22	27	24	
ARRL Field Day						28/29						
SOARA picnic								2				
Fall Auction											17	
SOARA Holiday Party												7

ON THE AIR

Operting Tips by John Walker, AC7GK

Has anyone ever told you that you have a great "radio voice"? It's a real compliment, and indicates that, in addition to your great technical expertise, your voice has a rich, mellifluous (that word is worth a buck and a half), Bing Crosby sound (ouch - my age is showing) and is very pleasing to the ear. Although much of a person's voice quality is due to what he or she was born with, there is still much that we can all do to develop a pleasing radio voice. If you don't mind, I will devote the columns of the next few weeks to this mellow subject.

The first step is to completely relax the throat area when you speak. Just relaxing the shoulders is a good start. For most of us, that is where tension is most easily detected. Your jaw should be loose and relaxed, not clenched. Your neck should also be loose and able to move and twist easily. Your chin should be down, since stretching it upwards tightens the vocal area and produces a thin, pinched sound. In fact, your whole body should be relaxed with the exception of . . ..

Tune in next month for the rest of the sentence.

73 de John ☐

AB6EI, SK

We regret to announce that long time Mission Viejo resident and SOARA member, Stu Klein, AB6EI passed away recently. Stu was a faithful and active member of the Mission Viejo Emergency Amateur Radio Club (ARES/RACES) since the inception in 1993. In 1994 Stu was appointed Assistant Radio Officer and served in this capacity until health reasons caused him to step down last year.

Stu was also involved in many SOARA activities over the years including the Mission Viejo Antenna Ordinance committee, and he was very instrumental in the obtaining of the K6SOA club call sign. ☐

Opportunity

Mike Mullard, JF6HVO, would like to organize a Saturday afternoon hike and potluck picnic/dinner for sometime in late September/early October. It would be on a trail near the Ortega Hwy. so that we could picnic at the Upper San Juan campgrounds. If this sounds interesting to you. please see Mike at the upcoming meeting or contact him by e-mail at: *kf6hvo@soara.org*. ☐

Field Day Results

Mode	QSOs	Points
CW	669	1338
Digital	71	142
Phone	833	833
Total QSO points		2313
Power multiplyer		2
Claimed score		4626
Bonus points		1410
Final claimed score		6035

O. C. Fair

Several SOARA members volunteered to man the Amateur Radio Booth at the Orange County Fair last month. It is a good way of contacting inactive hams and people with an interest who have never obtained a license. ☐

Last month you were promised that the "As I See It" column would continue on to discuss the Smith Chart. Our Repeater Director submitted a very timely article which seemed more relevant, so it appeared this month. We will get to the Smith Chart next month. ☐

The PROPAGATOR

South Orange Amateur Radio Association
P.O. Box 2545
Mission Viejo, CA 92690

First Class Mail

Meeting: August 18, 2003 at 7:00 PM
Brian Roode, NJ6N on "EchoLink"

☞ **SOARA** meets at the Mission Viejo Community Center, 26932 Veterans Way, Mission Viejo, the third Monday of every month at 7:00 PM. Changes to the meeting time or place are announced in this newsletter and on the two-meter repeater.

☞ **License Exams**: Amateur License Exams are given prior to SOARA meetings. Exams are from 5:00 to 7:00 PM. Walk-in applicants are welcome. For information call Paul Levey, NZ1M, at 949-249-0121.

☞ **Contacting SOARA:** Questions about SOARA? Send e-mail to: i*nfo@soara.org*, or leave a message at 949-249-1373.

☞ **Web Site:** SOARA maintains a web site with current club information. The URL is: **http://www.soara.org.**

☞ **Repeaters:** The SOARA 2-meter, 70 cm and 224.100 MHz repeaters are open to all licensed hams.

SOARA 2m — 147.645 **–** (110.9) Laguna Beach
SOARA 2m — 146.025 **+** (110.9) San Clemente
SOARA 2m — 145.240 **–** (110.9) Trabuco
SOARA 220 — 224.100 **–** (110.9) Laguna Beach
SOARA 440 — 445.660 **–** (110.9) Laguna Beach

The SOARA 220 and HROC 440 repeaters are shared by members of both clubs. Each machine is subject to the operating rules of its respective club. Call KG6GI for details.

SOARA 220 — 224.640 **–** (123.0) Santiago Pk. (C)
HROC 440 — 447.180 **–** (131.8) Santiago Pk. (C)

☞ **Nets:** SOARA 2 m repeater open net is held Tuesday 8:00 PM 40 meter HF net (7.268 MHz **+/–** for QRM), Sunday 7:30 AM.

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