

The PROPAGATOR

July, 2001

The Monthly Newsletter of South Orange Amateur Radio Association

Board Ponders New Dues Structure

SOARA's board has been struggling with the issue of dues for several months. About 98% of the club's income is derived from dues for membership and advanced access (phone patch). Membership has been fairly constant. It fluctuates as members move away, become silent keys, or lose interest in the hobby. New members make up for most of the numbers that leave.

A dramatic decrease in advanced access users has resulted in a drop in club income. The present dues structure is Basic Membership = \$24.00; Advanced Access = \$50.00 per year. In the past about 50% of members paid for advanced access. That number has dropped to about 10%. Clearly the added value of advanced access had disappeared.



When cell phones were rare or only for the rich, the use of the phone patch was a novelty and a treat. As cell phone became ubiquitous, the appeal of the phone patch dwindled. At present the board is leaning toward abolishing the advanced access charge and including all repeater privileges in the basic membership. This will encourage more use of the repeater capabilities and

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New Members

A hearty welcome to SOARA's newest member:s

Brian Roode,	KA6CCF
Dana Roode,	K6NR
Marcia King,	KF6VOL
Jon Pike,	KA6MOK

Talk on SKYWARN

Scheduled for the July general meeting on Monday, July 16, 2001, is an introduction to the SKYWARN system. Phil Pacier, AD6NH, who serves as the Orange County SKYWARN Amateur Radio Coordinator and Fred Coe, WA0RTO, the chief SKYWARN coordinator, will present an overview of the National SKYWARN plan and will discuss the local implementation of the plan.

SKYWARN, a program of the National Weather Service is new to Southern California. They are currently in the process of building their volunteer base of trained weather spotters. There will be an opportunity to join SKYWARN (which costs nothing, simply a willingness to keep an eye to the sky) and information on tours and training at the National Weather Service Forecast Office.



A word of Thanks



To: SOARA Members
From: Steve Perluss KR6CE, Activities Chair
Subject: Field Day 2001

Congratulations and thanks to everyone who helped make the 2001 field Day a success. Here are a few observations I made over the weekend. The food was great with plenty for everybody. Thanks to all the food preparers. The antennas, radios, and equipment was setup safely and functioned well. Thanks to everybody who helped with the setup and breakdown. Visitors were promptly greeted and made to feel welcome. Thanks to all. We now have several new hams and potential new club members. Thanks to all the VE's. Everyone had a great time and we made lots of points. Again, congratulations to all for a job well done.

73 KR6CE Steve.

Summer Fun! Picnic Set For Aug.

Field Day is over, but what a Field Day it was! The bands were hot and all SOARA operators stayed busy racking up points and having fun. One of our youngest and newest members, Jeremy, KG6FUT, become an outstanding operator in just a few short hours. (Bet he spends the rest of the summer working on his General License!)



Next on SOARA's agenda is the summer picnic to be held on Saturday, August 4, 2001, at Baby Beach in Dana Point Harbor. It will start at 10:00 AM. SOARA will provide hot dogs, hamburgers, and beverages. Please sign up to bring a side dish, salad or dessert at the July 16 SOARA meeting or call **Robin Whaling at (949) 215-3095**. There will be games for the children and lots of fun. Please contact **Steve Perluss at (949) 364-6195** if you would like to help with games or contribute prizes. All SOARA members and their immediate families are invited.

Baby Beach is located near the end of Dana Point Harbor Drive. After the divided grass median (approximately 2 blocks), turn left into the parking lot. Talk-in on the SOARA 2-Meter repeater (147.645 MHz).



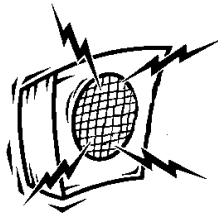
The Way I See It: Understanding Radio Theory Without

Can't quite pick up that weak signal? Turn up the gain — RF gain or audio gain. Add an amplifier; add a preamplifier. Maybe that will help, but maybe it will be to no avail. If the signal is buried in noise, then more gain will increase the noise as much as it increases the signal. Signal to noise ratio is everything!

If we include QRM as well as QRN in our definition of noise (all unwanted signals), then most of the circuits in a radio receiver are included in order to separate the signal from the noise. The skill in using a receiver is just skill in accomplishing this separation.

How far can we go in our quest to reduce the noise on a signal? Let's consider a few fairly specific cases in order to gain some insight. First we will consider a phone (SSB) signal in the HF bands. A typical receiver has a large number of adjustments and perhaps even digital signal processing. What it doesn't have is a specification on noise figure. In fact you will find little if any reference to noise in the specifications. The noise comes in with the signal.

Have you ever wondered why AM Broadcast receivers are supplied with such small and inefficient antennas? The wavelength of a station at 1000 kHz on the broadcast dial is 300 meters. A quarter wave "whip" would be 75 meters (250 feet) — you have seen broadcast station antennas. Clearly that short antenna on your car makes a pretty poor antenna.

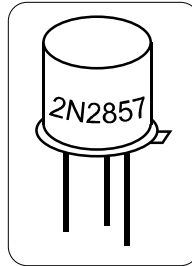


On the receiver we can compensate for a poor antenna by increasing the gain of the receiver as long as it doesn't add significant noise to the signal. This is easy at AM broadcast and HF frequencies because the atmospheric noise level is so high that it overwhelms any noise added by the electronics. You won't find a low noise HF

receiver preamplifier in HRO's catalog.

You will find a few items to help with noise pickup. Most desirable is rotatable beam antenna system with a good front to back gain ratio. The forward gain is nice, but sometimes the best results are obtained by directing the beam so that the null on the back side reduces the interference from another station. Horizontal antennas are known to pick up less noise than a vertical. This is because much of the noise is propagated by ground wave (vertically polarized).

So what do we do about noise? We use as narrow a pass band as we can to receive the signal, eliminating all of the noise components outside that bandpass. Impulse noise pulses can be removed by blanking the receiver whenever a very sharp pulse appears. DSP can recognize signals that are not normally expected in a voice signal and remove them.

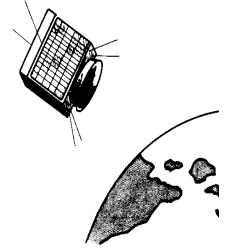


Let's look at VHF and higher frequencies. Here the atmospheric and man made noise is less and the noise characteristics of the receiver is much more important. Receivers and preamplifiers will have a Noise Figure specification which gives an indication of how much noise will be added to the signal. Simply adding a preamplifier will not help the performance of a receiver if the preamplifier has a worse Noise Figure than the receiver.

Let's step back here and look at where the noise in an electrical circuit arises. There are three significant sources of noise that we will consider. First is what is known as Johnson or Nyquist noise. It is also called by the more descriptive name of thermal noise. It arises due to the thermal agitation of the electrons in any conductor. The net result of the conduction electrons swarming around due to thermal energy is a noise current. A noise voltage is produced which depends on the resistance and the absolute temperature. The noise measured will depend on the bandwidth of the measuring equipment. In other words, the noise energy is evenly spread over the frequency spectrum. The noise it produces is "white" noise.

A transistor used in an amplifier has some


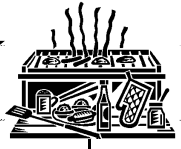
internal resistances so it exhibits thermal noise. There is a second source of noise in a device like a transistor. The operating current in a transistor consists of charge carriers (electrons or "holes") which arrive at the collector (or drain, in the case of a FET) as discrete packets of charge. There is a noise associated with this process which is analogous to rain on a tin roof. There is a noise due to rain on a tin roof because the water is arriving in discrete drops. This noise is called "shot noise." Like thermal noise, shot noise is "white."



In transistors there is another mechanism which causes fluctuations in the current. The silicon structure of a transistor is extremely pure with precisely controlled impurity levels, and the crystalline structure is made as free of defects as can be managed. A defect in the lattice structure will trap charge carriers (electrons or holes). After a random time, the carrier will escape and continue its contribution to the conduction. This gives rise to a noise which is inversely proportional to the frequency. It is known as "1/f" noise. It is not as important at RF frequencies as the other noise sources.

Transistors intended for preamplifiers at VHF and higher frequencies are constructed to have a minimum of noise. A good receiver at these higher frequencies must have a good low noise amplifier device in the first stage. Later stages are not as critical since the signal and the noise of the first stage will now be at a fairly high level.

Since the amplifier noise is detrimental at the VHF/UHF and above ranges, it is important to get as much signal as possible at the antenna terminals. Fortunately at these frequencies we can build an antenna which is quite efficient and high gain. Even a relatively small dish will suffice to pick up the signals from a TV satellite. Of course you want to have a good low noise amplifier at the antenna. The amplifier is located at the antenna because the signal loss due to the coax at these frequencies is too great. Oh, we could get it back by increasing the gain of an amplifier, but we could never get back the high signal to noise ratio that we have at the antenna.

Year 2001	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.
General Meeting 7:00 PM	22	26	19	16	21 Auction	18	16	20	17	15	19 Auction	No meeting
VEC Testing 5:30 PM	22	—	19	—	21	23	16	—	10	—	19	—
Propagator Deadline	6	10	3	1	5	2	1	4	1	9/29	3	2
Board Meeting	29	3/5	26	23	TBA	25	23	27	24	22	26	
Spring Auction					21							
ARRL Field Day						23 - 24						
SOARA picnic												
Fall Auction											19	
SOARA Holiday Party												2

Coming Events

ARRL Southwestern Division Convention will be held at the Convention Center, Riverside, CA. Early registration is only \$12.50, Registration at the gate is \$15.00. For details check the web site:

www.qsl.net/arrl-2001swdc

The dates are September 7 - 9. This is a popular annual event and several members will be setting up car-pools for Saturday.

Another popular event for SOARA members is the Fort Tuthill Hamfest. The July 27 - 29 event will be held at the Coconino County Fairgrounds, Flagstaff, AZ. For information visit the web site:

www.phx-az.com

The Western States Weak Signal Society Annual Conference will be held on Sept 21 - 23 at the Holiday Inn Hotel in Ventura.

Class Planned



Mike Mullard, KF6HVO, SOARA's Education Chair is planning a Technician level class to be offered in the fall. If there is interest, a code class will also be offered. There is no charge for the class. Classes are taught by experienced SOARA members. For information contact Mike at kf6hvo@soara.org.

Dues *Continued from page 1*

spread the actual cost more equitably over the membership.

Simple math indicates that to get the club back on a firm financial foundation that the basic dues should be raised to \$49.00. This would make up for the loss of advanced access income that we enjoyed a few years ago.

The board believes that doubling the dues for basic membership would impose a burden, if only one of "sticker shock", on some members. In order to hold the dues to a more modest level a figure closer to \$42.00 is being considered. The difference will be made up in part by an increased attempt to control expenses.



SOARA has managed to operate on a relatively small budget and still provide a wide range of services. We own and operate five repeaters, hold monthly meetings, regular test sessions, classes for entry level and upgrade licenses, Field day, an annual picnic, and a gala End-of-Year party. We have a monthly newsletter, a web site (www.soara.org) with a free e-mail alias (yourcallsign@soara.org) for each member, a VHF net (147.645MHz) every Tuesday evening at 8:00 PM, an HF net (7.263 MHz)

on Sunday mornings at 7:30 AM, and we actively support local emergency groups (RACES/ACS) through the use of our repeaters and by having informative speakers to discuss emergency operations. SOARA urges all of its members to be prepared for emergency operation and to be involved in local emergency organizations.

Due to efficient operations in the past, there is little "fat" to be cut in the operating budget and additional funds must be found to cover expenses. One option under consideration is to ask for donations from those members who can afford an additional annual contribution. We all benefit from the past members of SOARA who made possible the considerable assets which we enjoy.

Next month a proposed budget and dues structure will be presented to the general membership. If you wish to comment, please talk to any board members. All board meetings are open to members. The schedule for board meetings is listed in the calendar (page 3). Your continued support of the club is appreciated.



The PROPAGATOR

South Orange Amateur Radio Association

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**Meeting: Monday, 7/16/01 at 7:00 PM.
Program: "Sky Warn" by Phil Pacier,**

☛ **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 most SOARA meetings. Exams are from 5:30 to 7:30 PM. You must make an appointment at least a week in advance. Call Lou Parker, KA6BJO, at 951-0336. (No calls after 9:00 PM please.)

☛ **Contacting SOARA:** Questions about SOARA? Send e-mail to: info@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 and 70 cm repeaters are open to all licensed hams.

SOARA 2m — 147.645 - (110.9)

SOARA 2m — 145.240 - (110.9)

SOARA 440 — 445.660 - (110.9)

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 — 224.100 - (110.9)

SOARA 220 — 224.640 - (123.0)

HROC 440 — 447.180 - (131.8)

☛ **Nets:** SOARA 2 m repeater open net is held Tuesday 8:00 PM
40 meter HF net (7.263 MHz +/- for QRM), Sunday 7:30 AM
PSK-31 net: 28.120 USB 1 KHz meets Fridays at 6:00 PM.

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