




# The PROPAGATOR

May, 2003

The Monthly Newsletter of South Orange Amateur Radio Association

Letting Go of Your Junk.	Education News	Ultimate DX
<p style="text-align: center;"><i>Getting ready for the Auction</i> By Malcolm Levy, KO6SY</p> <p>After our last auction, one of the club members Sten, WA2MRO, and I were reminiscing when we failed to sell all his “good stuff” at the auction. I got to thinking: “I wonder if there is any value in all those old transistors I kept from the 60’s, waiting for the time when I needed to fix a radio”. I don’t know what the US part numbers would be, but I still can find an OC45 Germanium transistor in my junk box. I think it had a gain of 10 at 1 MHz!</p> <p>Using a Mars bar to determine the universal value of currency around the world, I think I would have been able to buy ten Mars bars for the price of one of these OC45’s. Today you can probably buy ten transistors with infinitely more gain than those of the 60’s for the price of ONE Mars bar.</p> <p>There must have been a point in time when the value of this component was at its peak. It was probably just before its replacement came out in 1965. Now, all I can do is hold on to it until it is truly an antique in another 50 years, and I bet it might still only have the value of ten Mars bars. Have I held on to these components a little too long? I guess so. I will be throwing most of them out next week along with those old condensers (capacitors) that had a working voltage of 2000 v (Aagh). Yes, most rigs needed 2000 volts to get any power out.</p> <p>Sten then proceeded to relate an event that he had observed a very long time ago in a “Movietone News” short that shocked</p>	<p>Congratulations to the students of the latest SOARA license class. It started as one of the largest classes in recent memory and certainly finished with an outstanding show of success. The last class session on May 8, was the scheduled final test — the FCC test for their licenses.</p>  <p>Congratulations are in order for the students. They had a 100% passing rate. SOARA can be proud of its Education Director, Chad Edwards, KQ6TL, and all of the volunteer instructors. We may think of “amateur” as the opposite of “professional”, but the meaning is closer to “one who does a thing for the pleasure of it”. It seems only natural for amateur radio operators to want to help others learn about their hobby.</p>  <p>Please be listening on the repeaters for 16 hams with brand new calls. Take the time to become aquatinted and make them feel welcome. □</p>	<p>John Hoot, N6NHP, gave an outstanding presentation at the April general meeting. He covered the history of Radio Astronomy from the first observations of extra-terrestrial radio signals to the present time. A very interesting aspect of this history is the prominent role played by an amateur radio operator. Grote Reber, who held the call W9GFZ, was the person to map the skies by looking at radio waves. He started a new science and a new career for himself.</p> <p>John gave a clear explanation of how modern radio astronomy is pursued and of the equipment and techniques used. His many photographs and illustrations added to the interesting story he presented. John is a member of the Orange County Astronomers and has given technical presentations of the work that he has done in the field.</p> <p>If you missed the presentation you can view the slides on the internet. The URL is: <a href="http://68.5.152.104:800/observatory/radioast/index.html">http://68.5.152.104:800/observatory/radioast/index.html</a> □</p> 
<p style="text-align: center;"><b>New Members</b></p> <p>A hearty welcome to SOARA’s newest member:</p> <p style="text-align: center;">Tony English      KG6PXN</p>	<p>him into thinking about hanging on to “items” for too long. (Does anyone still remember those Lowell Thomas Movietone News shorts?)</p> <p>This one started off as a typical short propaganda-information film during World War II. Unfortunately, it did not end that way. The film opened with a typical blimp coming in to land at a New Jersey naval air base. The custom at that time was for ropes to be thrown out of the airship to men on the ground who would then proceed to pull the airship down. About 20 or more men caught hold of these ropes and were attempting to stabilize and pull down the blimp when a gust</p>	<p>of wind struck. The smart guys let go quickly, but others, thinking they would be able to keep the ship on the ground were suddenly pulled up high into the air. The wind did not let up and the men holding on soon tired, let go, and fell to their death.</p> <p>So, the moral of the story is simply to let go before it’s too late. Just bring your junk to the SOARA auction next Monday, and if it doesn’t sell, let that serve as a message. Throw the stuff away because it IS truly junk and obviously has no value to anyone. You will certainly feel much lighter and your garage will now actually be able to accommodate your car. □</p>



**The Way I See It:  
Understanding Radio Theory Without Math.**

**Digital Signal Processing II.**

We have looked at the conversion of a signal from the analog domain to the digital domain. Now let's look at the processing we can do on the digital data. Clearly we don't have the coils and capacitors that we use in the analog domain for constructing filters.

We are accustomed to specifying a filter by its frequency response. This is the response we would see if we connect a signal generator to the input of the filter and a meter (or detector) to the output. Measurements over a range of frequencies gives us the information we need in order to characterize the filter. The formulas to relate the component values (inductors, resistors and capacitors) to the frequency characteristics are, if not familiar, easily found.

There is a second approach we could take to characterizing this same filter. That is to specify its *impulse response*. An impulse is defined as a signal of very short duration (approaching zero). A good example of an impulse signal is a lightning strike (well, not a direct strike — we wouldn't have a filter left!). If your radio is on, you hear the crackle from the lightning through the receiver's speaker. Which radio? Any of them from the lowest band to the highest. An impulse has its energy spread throughout the entire spectrum.

In the digital domain, after we have sampled and quantized (digitized) an analog signal, we have a sequence of numbers. For each of those numbers there is a time associated. If we sampled at 40 kHz, then there is a time difference of 25 microseconds between sequential samples (numbers). A representation of an impulse is trivial in this domain. Consider the sequence: 0, 0, 0, 1, 0, 0, 0, . . . — a single positive value in a long series of zeros.

Perhaps you can picture the output of a filter which has been excited by a single pulse.

You may have had occasion to see an actual trace on an oscilloscope. But does that trace actually characterize the filter the way that the frequency response curve does? Actually it does.

If you have been involved with radios long enough, you have developed a "feeling" for how filters work (and "look") in the frequency domain. And we certainly develop a feeling for frequencies being spread out, if not along a line, then at least along a radio dial. We don't develop much of a feel for filters having a characteristic time response.

For now accept that the impulse response of a filter is as much a characterization of that filter as is the frequency response. We will soon gain some insight to the relationship between the two.

My reason for bringing up impulse response is that in the digital domain it is very easy to implement a filter if we know its impulse response. First, in the digital domain a filter's impulse response is just a sequence of numbers! Lets consider the impulse above: 0, 0, 0, 1, 0, 0, 0, . . . Clearly causality requires that the filter has no output before the input (the "1"). After the 1(input), we find a series of numbers which we will assume dies out to all zeros after a reasonable time (a finite impulse response filter).

	t0	t1	t2	t3	t4	t5	t6	t7	t8	t9
<b>In</b>	1	0	0	0	0	0	0	0	0	0
<b>Out</b>	.1	.24	.3	.24	.1	0	-.1	-.1	0	0

In order to implement this filter in our digital signal processor, we merely multiply the current (t0) input sample by the value in the "Out" row of the table under t0. We multiply the previous (t1) input sample by the value under t1, and so forth, for all of the non-zero numbers in the OUT row. This is a very simple process for our DSP hardware and is a perfectly acceptable way to implement the filter.

**The Fourier Transform.** There is a mathematical relationship between the representation of any real signal in the time domain and that signal in the frequency domain. That relationship is the Fourier transform which takes us from the time domain to the frequency domain, and the

inverse Fourier transform which takes us back. The most common implementation of these math processes (in the computer world) makes use of a computational shortcut and is called the Fast Fourier Transform or FFT.

In many DSP applications it is convenient to use the FFT to transform the input data into a time domain representation. The filtering is then done in the frequency domain. This may be simply by multiplying each frequency component by the filter value (in the frequency response representation). It may involve recognizing that one, or several, frequency components (heterodynes) are constant and removing them. The data is then converted back to the time domain.

This process is complex but does present some advantages. The entire process; FFT / Filter / FFT, must be completed for a segment of data before any data is ready to leave the DSP. Today's powerful DSP chips can handle the job with ease.

Now let me return to the question of how we determine the impulse response of a desired filter. First, we would specify the frequency response for the filter. We use the inverse Fourier transform to get that response information into the time domain. The result is the impulse response. At most, we may have to take measures to ensure that we don't

have an output for negative times, i.e., times before the arrival of the impulse. (There is nothing in the mathematics which tells us which way time is running. In other words, there is no violation of the rules if we use negative times. It just doesn't correspond to the world we

live in where effects don't precede their causes.)

The current popularity of digital signal processing has been made possible by the availability of very high speed digital logic. As the speed of processors increases, we will move closer to Software Defined Radios. Radio hardware will become more complex but less expensive because it will be very standardized. Software will define nearly every aspect of how the radios (receivers and transmitters) operate. We already see early signs of this in our present equipment. Remove a jumper to open up new frequencies. Some radios allow updating by downloading new software. Tomorrow is here! □

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	No meeting
Program	W6XD	WD6DIH	W6PJ	N6NHP	Spring Auction	Field Day					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

Operating Tips by  
John Walker, AC7GK

There is an old definition that says: "A bore is someone who insists on talking about himself when you want to talk about yourself." Remembering this helps us make a newcomer to our radio conversations feel welcome.

It's nice to take a minute to greet newcomers, tell the group a few words about them, and then ask them something about themselves to give them something to say when their turn comes. It's even better to follow up on what they say, asking more questions or requesting their opinions, rather

than ignoring what they just said in order to talk about ourselves.

It is amazing what a marvelous conversationalist we become to people when we keep them talking about themselves through our earnest desire to relate to them. And then they have a tendency to do the same to us when they see how good it makes them feel. Neither side plays the bore. Remember that Elmering isn't just technical help; it extends to helping others feel good about themselves in actual radio conversations. □

### ARRL notes

The ARRL is the national organization of amateur radio operators. They provide a wide range of services for hams. One of the most important is to watch the FCC actions and legislation which affect our hobby. If for no other reason, we should support the ARRL.

A federal bill is now being considered which will provide some relief from antenna limitations due to CC&Rs. Passage of this bill will be a great benefit to amateurs. You will be receiving more information on this and on ways that you can help.



On September 5-7, the South Western Division Convention will be held in Long Beach. Registration is only \$10.00 before August 1. Pick up a registration form at the next SOARA meeting and register for this event.

In addition to talks on the latest developments and techniques, there are commercial displays where you can see new radios and get special convention prices on gear. □

### Need Help? Ask a SOARA ELMER

Lou Frank KG6FCT

Amateurs have a long history of helping each other. An experienced amateur who helps another is traditionally called an "ELMER". If you have any questions or problems you are encouraged to contact a SOARA ELMER. Below is a list to contact for each topic.

Annennas, feed-lines, tuners:	AD6OI, KG6FCT
Lighting protection, grounding:	
Station setup, equipment:	
TVI, RFI:	
Homebrew projects, construction, soldering:	AD6OH, KG6FCT
Computers, operating systems:	KA6JAD, NJ6N
DX (long distance propagation):	
Digital, packet, psk31, APRS:	NJ6N
Emergency operating, / preparedness:	
FM (VHF/UHF, repeaters):	
HF operating techniques( SSB, CW):	
Classes / license, upgrading:	
Legal, / FCC rules:	

If you feel competent in an area of amateur radio and would like to help others, please contact Lou Frank, [kg6fct@soara.org](mailto:kg6fct@soara.org)

# The PROPAGATOR

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



## Meeting: May 19, 2003 at 7:00 PM Auction

☛ **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 5:30 to 7:30 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: [info@soara.org](mailto: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 — 146.025 + (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 (7.268 MHz +/- for QRM), Sunday 7:30 AM.

### SOARA OFFICERS

*President:* Ray Hutchinson, AE6H . . . . . 949-496-8020

*ae6h@soara.org*

*V.P.:* Malcolm Levy, KO6SY . . . . . 949-951-1882

*ko6sy@soara.org*

*Secretary:* Mike Mullard, KF6HVO . . . . . 949-249-2846

*kf6hvo@soara.org*

*Treasurer:* Jerry Di Schino, KN6QK . . . . . 949-859-8149

*kn6qk@soara.org*

### SOARA DIRECTORS

*Repeater:* Howard Brown, KG6GI . . . . . 949-581-2634

*kg6gi@soara.org*

*Publications:* Dale Griffith, W8RRV . . . . . 949-830-3767

*w8rrv@soara.org*

*Membership:* Jim Riedel, KI6HZ . . . . . 949-498-0922

*ki6hz@soara.org*

*Education:* Chad Edwards, KQ6TL . . . . . 949-493-3063

*kq6tl@soara.org*

*Technical:* Bob Grant, W6CIC . . . . . 909-780-4788

*w6cic@soara.org*

*Communications:* Paul Robert, ND6Q . . . . . 949-498-0392

*nd6q@soara.org*

### SOARA COMMITTEES

*Activities:* Steve Perluss, KR6CE . . . . . 949-364-6195

*kr6ce@soara.org*

*Testing:* Paul Levey, NZ1M . . . . . 949-249-0121

*nz1m@soara.org*

*Website:* Chris Reed, KB6FYG . . . . . 949-361-1438

*kb6fyg@soara.org*

# SOARA Jackets

**Time to place your jacket order so you will have your SOARA jacket by Field Day!**

We have completed negotiations with the jacket vendor, and we now have all the pricing information.

The Official SOARA jacket will be a rip stop nylon, lined, Royal Blue, snap closure, "Coaches Style" windbreaker jacket. The front upper left side will have the official SOARA logo, and the right will have the member's name and call sign. Both embroidered in Orange, silver, and white.

Prices are:     \$32.00 each, out the door. For sizes S, M, L, and XL.  
                   \$34.00, for XXL, and  
                   \$34.50. for XXXL

Thanks to many of you who have expressed interest, and furnished me size info, etc. This allowed us to determine that it was feasible to go forward and negotiate a better price than we first were quoted. Please make your check payable to: Ray Hutchinson, and note on the check that it is for "Jacket". In addition, please complete the order form below to insure we get the details correct for your jacket. I will be collecting orders and money at the May 19th meeting, but if you can't make the meeting, you can mail your order and payment to:

Ray Hutchinson  
 24292 Timothy Dr,  
 Dana Point, CA 92629

Just a note: I make nothing on these jackets, and any surplus proceeds will go to the SOARA treasury. The Board determined that it was better not to run the funds through the SOARA accounts.

SOARA JACKET ORDER FORM

Date: \_\_\_\_\_

Name: \_\_\_\_\_ Jacket Size: \_\_\_\_\_

Name & Call on Jacket (i.e., Bob AB6DEF): \_\_\_\_\_

Check # \_\_\_\_\_ Amount (See pricing above): \$ \_\_\_\_\_



## A Report from the President

Saturday, May 10, 2003, was the date for our annual "Spring Tune-up Party" at the Laguna Beach repeater site. We had a fun and productive day. The weather was perfect, the turnout was excellent (14 folks), and the equipment cooperative. We were able to accomplish and address everything we had hoped to, as well as some tasks that weren't anticipated.

One group lowered the main tower, cleaned, repaired and weather-sealed the feedline connections, inspected the upper tower components, and raised the tower back into operating position. Additionally, the main grounding strap was cleaned the bonding clamp replaced.

Another team removed and replaced one of the vertical masts on the building roof, rustproofing the mast, and mounting a yagi for the IRLP project link radio. While on the roof, they cleared

the drains, and some roof seams that appeared on the verge of leaking were re-sealed with roofing mastic. All other antennas on the roof were inspected and found to be in good condition.

Another team worked on the grounds and building, repairing the drainage, tree trimming, and painting the steel entrance door with

rust inhibiting paint. You may remember that the siding and trim were painted last year, so the exterior of the building is now in very good condition.

And finally, a 4th team replaced the power feed-through on the 440 Amplifier and worked on the future locations for the new system power distribution panel and locations for a new battery back-up system. The battery system will be a redundant back up in the event that the on-site emergency power generator unit fails.



Those working on the various project teams were (in no particular order): Nick (new ham, from the latest SOARA class), Joe, W6BGR, Jim K6VDH, Brian NJ6N, Steve KG6OYK, Lou KG6FCT, Patti AD6OH, Heiko AD6OI, Ken KB6RYC, Paul ND6Q, Jeremy KG6JAD, Robin KG6MCA, Dale W8RRV, and Ray, AE6H. If you attended, and I forgot to mention you, please forgive me.

A hearty thanks to all those folks who graciously contributed their Saturday to Protecting and improving the club's investment.

Unfortunately, 3 boxes of Krispy Kremes had to be sacrificed to the project, but they gave their all for a good cause!

Thanks again to all. The group that worked was another example of why we have a club of which we can all be very proud.

## Field Day is on the Way

The first official, well, sort of, Field Day 2003 activity was held at Emillo's Pizza parlor on May 12. Some planning was accomplished, and certainly a good bit (a good bite?) of pizza was consumed.

The meeting was very much in keeping with the spirit of SOARA field days. A lot of people having fun — and getting the job done. Yes, it looks as if the plans are in place for another successful event this year.

There will be plenty of opportunities for both old timers and new recruits. Crews are assembled to arrange for (and check out) antennas. The food is planned and arrangements for the radios, computers, etc. have been made.

Activities will start with several adventuresome souls gathering at the site (Gilliran Park in Mission Viejo) on the evening of Friday, June 27. Locations of the wire antennas will be planned and lines set for raising the antennas.



This may not sound too exciting, but the methods are a bit unorthodox and certainly amusing to watch.

It is a good way to start the Field Day weekend. Antenna raising will begin early on Saturday morning, June 28.

There will be opportunities to work, to watch, and to actually



get on the air and add to our score. If you think we don't need YOU, then we have news for you — WE DO. Plan on visiting the site and enjoy the event.

Mark your Calendar.

