The PROPAGATOR

July, 2002

The Monthly Newsletter of South Orange Amateur Radio Association

Contest Station Talk

John Spencer, K7KF, will make the presentation at the July meeting. John presently works as an Instructor/Test Pilot for Boeing Aircraft in Long Beach.

His presentation is about an amateur contest station that he had back in the Midwest about 20 years ago. In cooperation with a DX and contest club in the area, he put a very competitive multi/multi contest station together. It was operated for about 5 years during the 1980 sunspot peak cycle. Some very large antennas were constructed and put up that proved quite competitive.

Included in the presentation will be a series of slides of the station and its equipment. Come out and enjoy some insights into assembling a top flight station.

Club programs for August and September will feature speakers on RF Safety (August) and on the Linux operating system for ham applications (September). The program on RF Safety will follow the ARRL book *RF Exposure and You* by Ed Hare, W1RFI. This will be a good opportunity to brush up on the requirements for ensuring that your station meets the FCC standards.

In September Matt Mc Kenzie, K6LNX, will speak on the Linux operating system. This is your chance to learn more about a powerful operating system and how it can be applied on the computer in your shack. ☐

New Members

A hearty welcome to SOARA's newest members:

Nicholas Parker KE6CYR

James Ricketts, W6LVO

Field Day a Success

Field Day, 2002, was dedicated in memory of Richard Coyne, WW7D, SK. Two HF radios from Richard's shack were used and then auctioned off. Richard had been an active Field Day participant for several years.

Field Day activities started on Friday, June 21, with our traditional hot dog roast and spud gun shoot-out. Well, supposedly the idea is to get a fish line over a couple of light standards on the ball field (for the wire antennas), but an impartial observer would conclude it was to play with spud guns — potato launchers. Check out the pictures on the SOARA web site.

The official activities started Saturday morning with the early birds arriving about 7:00 AM. Organization paid off and — believe it or not — we were set up and ready to go almost an hour early. Steve Perluss and his team of volunteers did an outstanding job. Antennas were up and tuned. The radio stations were assembled and tested — on the air contacts confirmed their status. The computers were up and running the new software. They were talking to each other over the LAN without problems.

A big **Thank You** goes out to Steve Perluss, KR6CE, who spearheaded the Field Day effort. Thanks also to: Malcolm, KO6SY who coordinated the radios; Heiko, AD6OI, and Jim, KI6HZ, who coordinated the antennas; Phil, AD6NH, who was responsible for the computers; Robin, (Jeremy's mom) who passed her license test at field day, who coordinated the food; Ray, AE6H, who took the responsibility for Publicity and for equipment; Lou, KA6BJO, for the test session; and to Al, KC6LNP, for photography. All of those who showed up to help set-up, take-down, to operate ,and to just share in the fun helped make this field day a great success. ☐

Picnic Time

School is out and summer is in full swing. Field Day has come and gone, the Forth of July celebrations and fireworks are history. It must be time for the annual SOARA picnic. Yes, it is just a few weeks away. It will be held on Saturday, August 3. The location is Baby Beach in Dana Point Harbor. Dedicated volunteers will arrive early to capture our traditional spot.

Activities will start at 10:00 AM. We plan to have an HF station in operation and activities for young and old alike. Of course, the best part is the chance to visit with other club members and to share some great food. The club will provide hotdogs, hamburgers and drinks. Please bring a side dish, salad or dessert.

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

NZ1M Takes Test Post

As you read in last month's Propagator, Lou and Muriel Parker, KA6VJO and KA6VJP, have moved. Their new residence is in Palm Desert, CA — not so far away that we won't see them on occasions. Lou has turned over the task of heading up the VE testing team to Paul Levey, NZ1M.

Paul is busy getting organized and will have a revised schedule of test dates for the next issue of the newsletter. ☐

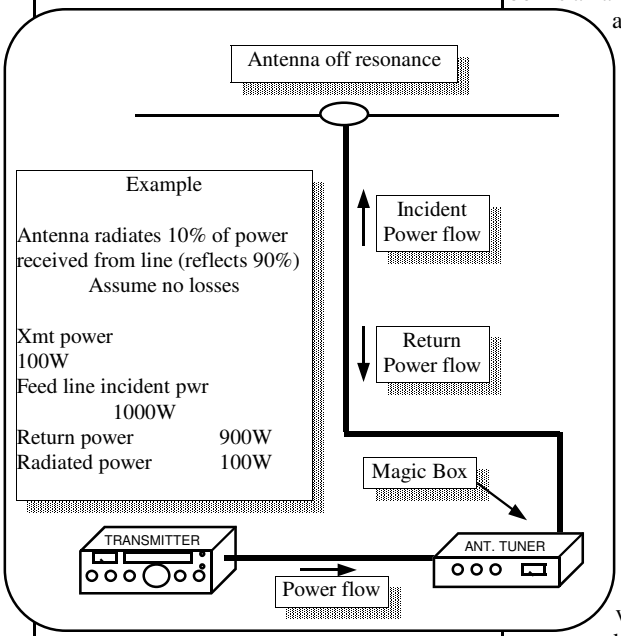
The Way I See It:

Understanding Radio Theory Without Math.

Does an Antenna have to be Resonant in order to Radiate?

By the term "resonant", applied to an antenna, we mean the frequency at which the feed-point impedance is purely resistive. If we feed an antenna with 50Ω coax and expect an SWR of 1:1, then the feed-point impedance must be 50Ω. It must look to the feed line as if there is no reactive component (i.e. neither inductive nor capacitive).

Even if an antenna is resonant, its feed-point impedance may well be different than that of the feedline — so we usually don't expect an exact 1:1 SWR. But, what if the antenna is far from resonant? Will it radiate?



Lets conduct a "thought experiment". It may expand our understanding of antennas. We will assume a drastic mismatch at the antenna . It is far from resonant, maybe a very short antenna for the frequency. Further, there are no measures taken at the antenna to compensate for these deficiencies. Since this is a thought experiment, we can make our antenna and feedline, etc., of loss free material.

The SWR will be very bad which means that a large portion of the power delivered to (well, lets say "offered to") the antenna will be returned. Again, since this is just a thought experiment, let us put a magic box in the transmission line. This magic box acts on the power coming back down the coax from the antenna and reflects all of it back toward the antenna.

As a result of this magic box, all of the power we send out of the transmitter will eventually have no place to go but to the antenna. True, it may have spent some time traveling up and down the transmission line. It will be absorbed by the antenna. This means that the transmitter sees a 50Ω load at the magic box (there is no reflected power returned to the transmitter which implies an impedance match!). It looks as if our terribly off resonant antenna will radiate as well as any other antenna — with the benefits of our ideal materials and our magic box.

You have probably recognized that the magic box is an antenna tuner. Note that the antenna tuner does just what was described above. In order to make an arbitrary impedance look to the transmitter like a purely resistive 50Ω load, it has to reflect back all of the power returned from the antenna. We won't go into how it does that.

Now, just to keep things in perspective, lets consider the limitations imposed by real world materials. Our magic box could handle any SWR (and any phase angle, although we didn't talk about that). A real antenna tuner generally has two variable capacitors and one variable (or switched) inductor. There are limits on the maximum and minimum values of these components, and therefore, on the range of conditions it can handle.

The transmission line and the antenna will have losses and the more the power "runs around", the more of that power will be converted to heat and lost. Under conditions of high SWR high peak currents and voltages will be developed. These can damage transmission lines and tuners. A 100 watt transmitter can burn up a 100 watt tuner under the right conditions (well, under the wrong conditions).

The discussion above was concerned with an off resonant antenna. Antennas exist which are non-resonant. In other words there are antennas which operate over a wide range of frequencies without showing pronounced reactance in their feed-point impedance. Examples include the terminated rhombic, the Beverage antenna and the discone.

So in conclusion, and just based on what we already know about antennas and transmission line behavior, *an off resonant antenna will radiate quite well*. It is for a variety of practical considerations that we want our antennas to be resonant at the working frequency. They boil down to being able to efficiently feed the RF power to the antenna. We want as much of the power to be radiated as possible. What is not turned into heat will be radiated. We don't want to burn up our feed line or tuners, and we want relatively simple and inexpensive antenna tuners. □

Erratum

(From the Latin for "OOPS!")

In last month's column by Tom, K6LON, on the Speaker Activity Indicator, an error crept into the parts list. Printed below is the list showing the correct values. As explained in the original article, many of the component values are not critical. The values shown are the ones Tom used to build his unit. It is in regular use in his car. He will be glad to demonstrate it for you. □

Speaker Activity Indicator
Parts List

C1	0.33 µF	Input capacitor	
C2	0.33 µF	Reference decoupling capacitor	
C3	10 µF	Timing capacitor	
C4	100 µF	Power decoupling capacitor	
D1	LED	Indicator	
FB	Ferrite Beads		
R1	470 KΩ	}	Note new
R2	500 KΩ Trimpot	}	Note new
R3	910 KΩ	}	Note new
R4	390 Ω		
R5	100 KΩ		
U1	LM555	Timer IC	

Year 2002	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.
General Meeting 7:00 PM	**28**	**25**	**18**	**15**	**20**	**17**	**15**	**19**	**23**	**21**	**18 Auction**	**No meeting**
Program				DX W6XD	T-hunt W6SQQ	pre Field Day	Contest Station	RF Safety	LINUX	open	Auction	—
VEC Testing 5:30 PM	**28**	—	**18**	—	**20**	**22**	New Test Schedule to be announced in August Propagator					
Propagator Deadline												
Board Meeting	**2/4**	**3/4**	**25**	**22**	**27**	**24**	**22**	**26**	**30**	**28**	**25**	
ARRL Field Day						**22 - 23**						
SOARA picnic								**3**				
Fall Auction												
SOARA Holiday Party												**1**

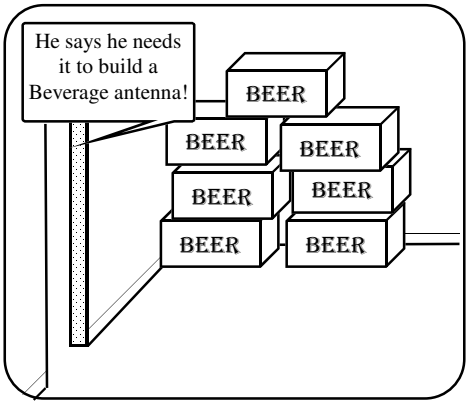
Picnic on Saturday, August 3. Plan to be

License Class Reminder

SOARA is committed to supporting amateur radio and education. An entry level class is scheduled to start in September. If you know of anyone having an interest in Amateur Radio, please pass along the information about the class. Details are on the web site.

Classes will be held on Thursday evenings from 7:00 p.m. to 9:00 p.m. beginning September 12, 2002 and concluding with FCC testing on November 14, 2002. All classes will be held at the Norman P. Murray Community center in Mission Viejo.

In order to pre-register for the class, please send an e-mail to Mike Mullard, KF6HVO, at kf6hvo@soara.org. □



WW7D Remembered

Two HF radios from WW7D's shack, a Yaesu FT100 and a Kenwood 450S, were used at Field Day and then sold. The sale was conducted by means of a silent auction.

The high bidders for the rigs were Mike Mullard, KF6HVO, and Alan Gallagher, WB6T. A portion of the sale price was donated to the club.

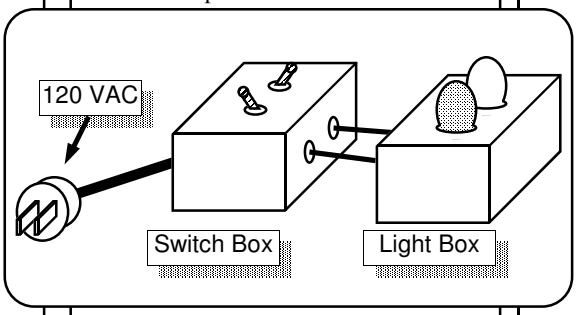
Jim Kelley, AC6XG, has kindly donated a Heathkit QRP HW8 HF CW transceiver, a TenTec QRP rig, and a PK88 to the club. These are in memory of Richard WW7D and funds raised by the sale of these items will be used for a special WW7D memorial event.

Jim has also donated to the club a multiple headset system for administering code tests. This means that multiple testees can be accommodated at a code test without distracting those in the room taking written tests. □

Mark your calendar for August 3, 2002. That is the date of the annual SOARA picnic. Don't miss it.

How Do They Do That?

In the sketch below is a system consisting of two boxes. A 120 volt a.c. line runs in the left box which has two switches. The box on the right has two 120 volt lamps. Each switch on the first box controls one of the lamps. Each light can be turned on or off by the corresponding switch.



Nothing very unusual about that — except that there are only **two** ordinary wires connecting the boxes! How do they do that? Can you figure it out?

Give it a try. You can see a working demonstration at the this month's SOARA meeting. If you don't have the solution by then you can find out how it is done.

I wonder why they don't wire houses this way and save half the wire?

The **PROPAGATOR**

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

Address Service Requested

First Class Mail

Meeting: July 15, 2002 at 7:00 PM
John Spencer, K7KF: Contest Station

☞ **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 every other month. Exams are from 5:30 to 7:30 PM. Walk-ins are welcome. For information call Paul Levey, NZ1M, at (949) 249-8001.

☞ **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 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 (7.268 MHz +/- for QRM), Sunday 7:30 AM.
PSK - 31 net (28.120.15, 1000 on waterfall) Friday 7:00 PM.

SOARA OFFICERS

President: Ray Hutchinson, AE6H 949-496-8020
ae6h@soara.org
V.P.: Malcolm Levy, KO6SY 949-951-1882
ko6sy@soara.org
Secretary: Richard Coyne, WW7D . . . . . **S K**
7/23/1945 — 5/28/2002
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: Chris Reed, KB6FYG 949-361-1438
kb6fyg@soara.org
Education Mike Mullard, KF6HVO 949-249-2846
kf6hvo@soara.org
Technical: Bob Grant, W6CIC 909-780-4788
w6cic@soara.org
Communications: To Be Announced . . . . . .

SOARA COMMITTEES

~~*Activities:* Steve~~ Perluss, KR6CE . . . . . ~~949-364-6195~~
kr6ce@soara.org
Testing: Paul Levey, NZ1M 949-249-8001
ka6bjo@soara.org
Website: Chris Reed, KB6FYG 949-361-1438
kb6fyg@soara.org
License Trustee: Paul Levey, NZ1M 949-380-0399
nz1m@soara.org