

# The PROPAGATOR

April, 2003

The Monthly Newsletter of South Orange Amateur Radio Association

## Radio Astronomy

April's speaker is John Hoot, N6NHP, who will give a presentation entitled: "A Brief History Of Radio Astronomy". The presentation will cover the evolution of radio astronomy over the past 70 years. The advancement of Radio Astronomy is tied to both amateur radio and the evolution of radio electronics. This is a rather exciting story of how one amateur radio operator, W9GFZ, started a new field of Astronomy. Dr. Grote Reber (he was awarded an honorary doctorate by Ohio State University in 1962) died in December of last year at the age of 90.

Come to the meeting April 21 and hear the exciting story of Radio Astronomy.



*Grote Reber's original antenna constructed in his back yard in Wheaton Ill about 1937.*

## New Members

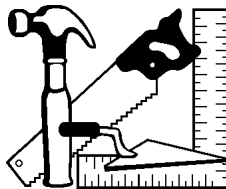
A hearty welcome to SOARA's newest member:

Tony deWitte      KG6IGZ

## Coming Events

### Spring Tune Up

SOARA is planning the annual spring "tune up" for the Laguna repeater site. This event is scheduled for Saturday May 10, 2003, at 0900. Coffee and donuts will be available and all club members are welcome. Projects will include shrub trimming, antenna maintenance, some minor equipment installation, and even a little painting. We hope to be done in 4 hours or less.



Even if you can't make it at 0900, or can't stay until the end, feel free to stop by. If you've never visited the site, and wondered what makes a repeater system "tick", this is a great opportunity to do so. Also the site has spectacular views of the local mountains and the Pacific. Please come and enjoy.

### SOARA Club Jackets

SOARA is in the feasibility study stage of having club jackets for members to purchase.

The jackets would be nylon windbreaker style, lined, medium blue, and would have the SOARA logo embroidered in color. In addition, there is the possibility of each member having their name and / or call sign also embroidered on the jacket.

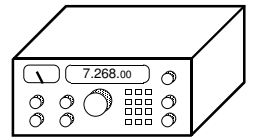
Prices for these jackets vary significantly with the quantity purchased being a major factor. We are targeting the \$40.00 range, but this will vary with quantity. We can only purchase these on a group order, with prepayment, in order to enjoy a quantity discount.

If you are interested., let me know at the upcoming April 21, meeting, or e-mail me: [ae6h@soara.org](mailto:ae6h@soara.org), so we can have a quantity estimate to get more definitive pricing.  
Ray, AE6H

## Remote Base Explained

SOARA sends a "thank you" to Pete Juul, W6PJ, for his interesting presentation at the March meeting. Pete talked on Remote Base Systems — operating an HF station from a remote location. Even the internet can be used for the link between the operator and the equipment.

A major benefit of this type of operation is avoiding the hassles and restrictions of CC&Rs and other restrictions on antenna installations. Even apartment dwellers can have the advantages of a fully equipped HF station via a remote base system.



## Election in progress

All SOARA members should have received a ballot within the past few weeks. This year the directors are standing for election. If you have not mailed your completed ballot then please bring it to the meeting on Monday.



## License Class

The current license class has progressed satisfactorily, and we can anticipate a group of new amateurs early next month. Chad Edwards, KQ6TL, SOARA's Education Director, has done an outstanding job of organizing the class. Several experienced club members have shared the teaching tasks.

Students are receiving a broad view of amateur radio. The class lectures go beyond the confines of the question material to provide a solid background in the material.





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

Digital Signal Processing was the topic of last month's column, and we just scratched the surface. We will return to that topic — but I want to discuss something of a more practical nature today. I have changed cars and need to install a radio in the current car.

Considerations in installing an amateur radio transceiver include: mounting the rig, installing a suitable antenna, and connecting appropriate power.

Visibility and convenience of controls are a real safety concern if you will (and you will at some time) be operating the controls while driving. Most modern mobile rigs have removable and remote mountable control heads. You really only have to find a convenient location for the control head. It is well worth taking the time and effort to find an optimum location. If you worry about theft, get in the habit of removing the control head when you are not in the car. Also, insurance through the ARRL is reasonable and reduces your risk of loss.

Antenna and antenna lead will have a great effect on your ability to make contacts. Antennas for amateur radios always seem to involve compromises. I would like to have a very tall tower and large beams for my home shack. It isn't going to happen — too expensive, too much of a battle to get all of the approvals, and, really, too much maintenance! So I settle for a more modest antenna.

On the car I have used a  $\frac{1}{4} \lambda$  mag-mount with good success. It is easy to install but certainly not the best antenna. On the newer car I have used a "lip - mount" with a larger antenna. In both cases the trunk lid was home for the antenna. The roof would have been better in too respects. The radiation pattern would be more symmetrical for a roof mount. However, the antenna encounters more obstacles when mounted on the roof. If the roof is metal, and most are, then it is well connected to the rest of the car, i.e., it is a good ground.

The trunk lid is not so well connected to the rest of the car metal. That nice rubber gasket which keeps the rain out of the trunk pretty well isolates the trunk lid. Yes, there is most likely a DC ground running through the hinge assembly — not a short path at VHF & UHF. Adding an RF ground strap (braid, for flexibility) between the trunk lid and the car body should increase the antenna efficiency and perhaps, its radiation pattern.

You may opt for a bumper mount. This is a good option for the HF antennas which are much larger. Modern cars with their plastic bumpers make the installation more complex. If you choose this location for a VHF or UHF antenna, you must be wary of mounting the antenna on a support mast. The mast will become part of the antenna structure since it is the path for the ground. If, for instance, the mast is one quarter wavelength long, then it will transform the good ground at the lower end where it attaches to the car to a very poor (high Z) ground at the base of the antenna. Mobile antennas are designed to have a good ground at their base. Remember, that in case you are planning to use a mobile antenna for a portable operation you will have to supply a ground at the base or a counterpoise in order to have a trouble free operation.

If you are a regular reader of QST, you are probably familiar with the "recommended" configuration for connecting the power for the rig. Most of the manuals for mobile rigs seem to follow the same configuration. Two power wires are run from the rig to the battery terminals. A fuse is provided at the rig, and a fuse is supplied in each line very close to the battery.

Why the fuse in the negative side of the line? A heavy cable connects to the engine block. This lead carries the return starter current which may be greater than 100 amperes. If that heavy lead opens then the path to the starter (negative) might be through the negative lead to the radio and on to the frame. The resulting heavy current could cause damage.

On my car there are two leads from the negative battery terminal. One connects to the engine block and a second goes directly to the car frame. The negative return for all circuits is through these two heavy wires. This arrangement is probably quite standard for modern cars. Older cars may have had only the one cable to the engine block and a

cable from the block to the car frame. In that case, it might well have been a long and noisy path from the battery negative terminal to the frame. The only justification I have read for the direct negative connection to the battery is based on noise pickup.

Chrysler insists that the negative lead should not be fused and that the negative connection be made directly to the car frame. An open fuse in the negative line might cause the rig to power up through an alternative path and might damage the antenna feedline. If a separate negative lead is run to the point where the battery cable connects to the frame (there is already a screw there), they suggest a 6 or 8 AWG black wire.

You can estimate the resistance of the car body from the battery to the rig location compared to a run of copper wire. My VHF rig was supplied with 12 AWG wire for power. Steel has about 12 times the resistance of copper. Number 12 wire has a cross section of 0.005129 square inches. To get the same resistance in the steel car body we need a cross section of about 0.06 square inches. To obtain this cross section in a sheet of steel the width of a car the thickness would have to be on the order of only one thousandth of an inch!

Cars have always been RF noise generators, and the increased use of electronic controls in then has added the potential problem of the radio interfering with the car. Ford states that they have designed their cars to tolerate transmitters with less than 100 watts output. Still it is important to use good practice to confine the RF to the outside of the car and to suppress noise on power and antenna leads.

Following are some web sites with useful information.

Guides from General Motors, Ford, and Chrysler are found at:

<http://service.gm.com/techlineinfo/radio.html>

<http://www.fordemc.com/>

<http://www.arrl.org/tis/info/pdf/INSTG01.pdf>

The ARRL laboratory staff's notes are at:

<http://www.arrl.org/tis/info/pdf/39574.pdf>

A broad general discussion is found at:

<http://www.cot.net/~n6mrx/ares/mobile.htm>

A review of automotive power transients at:

<http://www.littelfuse.com/PDFs/AppNotes/an9312.pdf>

Happy Mobiling! ☐

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											
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,

Last month, as you will recall, I talked about how to form a round-robin when there are multiple stations in a radio conversation to make sure no one is left out. The question could be raised about how to carry on a private conversation under such group circumstances. Obviously, if two people start to make their own private QSO, the others have to stand around idle and feeling left out.

One good way is to say as you finish your remarks: "Bill, when it's your turn, tell us how your wife's operation turned out. And Mary, did you ever get your new hand-held?" Then turn it over to the next person in line. When it is Bill's turn, he will answer his question, as will Mary hers. No one is by-passed or ignored. Of course, two of you could always go to another frequency to

continue your private QSO, but this could still be seen by the others as slighting them.

It helps to remember that radio, by its nature, is a social sport. Not only does it take at least two people for a conversation, but anyone else can listen in and join at any time because the airwaves are open to us all. Keeping up group social interactions rather than only holding dialogues with selected people keeps everyone feeling good about being on the air and helps our hobby prosper, a big thing to remember in these days of declining ham radio club memberships.

Next month: more on how to treat the newcomer to the conversation.

### ELMER Opportunity

Lou Frank, KG6FCT

A new ham or an old ham — sometimes we can use some help. I have not done any DX, where do I begin. When you start tuning slowly over all the HF bands, it seems like a lot of space to cover. Where does one start. **Ask an ELMER!** Amateurs have a long history of helping each other. An experienced amateur who helps another is called an "Elmer".

I would like to start an Elmers group. If you consider yourself to be reasonably competent in at least one area of amateur radio and would be willing to help others, please let me know. I wish to start and maintain an Elmers list for the Propagator and SOARA web site. The list would have *area(s), name, call sign, phone number, and e-mail* for each volunteer.

Areas of expertise might include: antennas, feed-lines, lightning protection, grounding, station set-up, construction, digital modes, emergency operating / preparedness, legal / FCC rules, working with CC&R antenna restrictions, and any area which interests YOU!

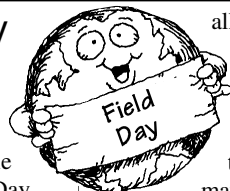
I am eagerly waiting for all the e-mail from those that will help and suggestions for additional categories.

73  
Lou Frank, KG6FCT

### Field Day on the Way

Its true, Field Day is just around the corner. First lets correct the date published in this newsletter previously. The dates given were June 22 & 22. The correct dates for Field Day 2003 are June 28 & 29, the last full weekend in June.

Planning and preparations will be starting very soon and there are opportunities for



all to make a contribution. Steve Perluss, KR6CE, will be looking for helpers with a wide range of duties. Come to the April meeting and talk to Steve about ways that you may be able to help.

Whether you are an old hand at Field Day or this will be your first experience, we want you to attend and have fun. Mark your calendar with the correct date.

# The PROPAGATOR

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



## Meeting: April 21, 2003 at 7:00 PM John Hoot, N6NHP: Radio

☛ **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.

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