

The PROPAGATOR

May, 2000

The Monthly Newsletter of South Orange Amateur Radio Association

Many SOARA members upgrade to HF privileges



Welcome to the HF bands. You can expect to hear more talk about DX and QSL cards from far away places. With restructuring having become effective many of our members are now, or soon will be, active on HF.

Many see this as one of the best things to have happened to 'ham' radio in a long time. Certainly a lot of studying took place in classrooms and in ham shacks. If all of the "old timers" extend a welcoming hand and help the new arrivals get accustomed to the operating procedures, we will have a crop of great hams occupying the bands.

With new modes being developed and good sun spot activity it is an ideal time to be entering the world of HF operation.

Upcoming Club Programs

This month's general meeting is the bi-annual auction. As always, if you are selling please bring your equipment to the club by 6:45 PM. We will start the meeting at 7:00 PM and shortly thereafter the auction.

The June meeting will focus on Field Day. Some time will be spent on last minute preparations and videos will be shown of previous years' successes. Come and join in the fun. This will be a good meeting to spend more time talking with your fellow ham.

Soon I hope to run a project night. This will be a night that you can bring along one of your ham projects and tell folks all about it. If there is lots of interest then you may be asked to give a full scale presentation in the future. In talking to many of you, I know there are special projects you have enjoyed doing, so please come along and share. More details soon.

Election and Survey Response Good

Response to the election and survey which accompanied the ballots was much better than in previous years. The ballots were counted just before the April meeting and the election results were announced. Two new members of the board, Marty Kornbloom (Treasurer) and Howard Brown (Repeater Director), started their official duties at the April 24 meeting of the board.



SOARA's board extends sincere thanks to all of the members who returned completed surveys. Many thoughtful comments were included. The board is in the process of digesting the information on the forms, and will use that information to guide their decisions and plans for the club.

40 Meter Net Update

Over the last year it has been very difficult to communicate over long distance on the net frequency of 7.233 MHz due to strong broadcast stations. We have been observing a frequency higher in the band and will be trying that from now on. Please look for the SOARA 40 meter net at 7:30 AM on 7.262 MHz. This move will be effective from the time you read the Propagator.

Malcolm KO6SY

Repeater Report

By Howard Brown, KG6GI

All of the SOARA repeaters have been operating properly this month.

A Z-Match impedance matching network has been installed on the Laguna 2 Meter Power Amplifier, which permits a more optimum adjustment of the antenna impedance. We gained a few percentage increase in transmitter output power.

The Board approved the acquisition of a Motorola MICOR repeater for the Laguna site at the March Board meeting, and the repeater has been acquired and is being modified for use. The interface specification for operation with the ACC RC-850 controller has been identified, and the crystals have been ordered. We plan to install this equipment during July.

In accordance with the new SCRBBB band plan (conversion of repeaters from 25 KHz spacing to 20 KHz spacing) the SOARA Laguna 440 repeater (currently operating on 447.050) will have to relocate. At the April Board meeting it was decided to request coordination on **445.660 MHz**. This will place us on an appropriate frequency for a low altitude repeater and will permit it to be operated as an open repeater. SOARA will be co-channelled with W7RF's repeater currently in the Los Angeles area. The repeater may be moved to the Hollywood Hills in the future.

It is understood that our coverage areas will overlap, and we can expect some interference from W7RF's repeater and visa versa. We will use TX PL to the repeater to aid members in avoiding much of this interference. The crystals have been ordered and we will move the repeater as soon as we have received approval for this frequency. It is anticipated



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The Way I See It: Understanding Radio Theory Without

This is the first of a series of notes, which I hope will be useful in understanding the technical aspects of the radio hobby. I will try to give a technically accurate description of the phenomena with a minimum of mathematics. The goal is to develop a good physical picture of electrical and radio theory.

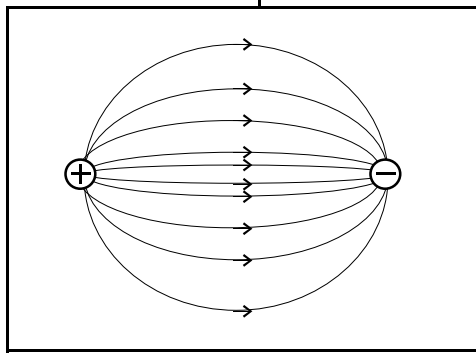
We may not think about it much, but we all have some familiarity with gravitational forces. It is the force which pulls us down toward the earth. It is the force which keeps the earth and other planets orbiting the sun. All masses are attracted to each other by gravity. Electrically charged objects experience a similar interaction between themselves. Perhaps the most obvious difference is that there are two (opposite) polarities of charge. Like charges repel and opposite charges attract. We call the two polarities positive and negative: electrons are said to have a negative charge and protons have a positive charge.

Gravitational forces are quite weak: You would not notice the gravitational pull of a huge block of steel when standing next to it. Hold your arm close to the CRT face of your TV set and you will feel the electrostatic tug on the hairs of your arm. Because electrical forces are so strong, and there are opposite charges available, most objects are electrically neutral. To separate significant amounts of charge we can make devices which are mechanical (generators) or chemical (batteries).

Charge is measured in Coulombs and is the property which determines the magnitude of

force between two charged objects at a given separation. The charge (value) is indicated by the symbol "Q". The more familiar "current" (i) is the rate of flow of charge. Charge is significant when we are talking about capacitors, current is significant when we are talking about resistors, and rate of change of current is significant when we are talking about inductors.

Let us look at the interaction between two (isolated) charges. They will experience a mutual force. This force will depend on the distance between the charges. It is convenient to describe the force on one charge as being produced by the "field" of the other charge. The value of this field at any point is just the force that would be felt by a unit of charge when placed at that point in space. We can visualize the field as lines of force radiating away from, say, a point charge. Each line originates on a positive charge and ends on a negative charge to give a direction to the line. The lines from an isolated charge will radiate out to infinity. The density of these lines drops off with distance just the way that the field intensity drops with distance. We get the correct physical behavior without any math.



Two opposite charges, showing the electric field lines. Note: the lines have a

The system of units we use in electronics uses **meters** for length, **newtons** for force, **joules** for energy or work, and **watts** for power. A meter is about 39 inches, a little over a yard. A newton is a force of just under a quarter pound. One joule (of work) is equal to one newton meter. Think of it as a force of one newton

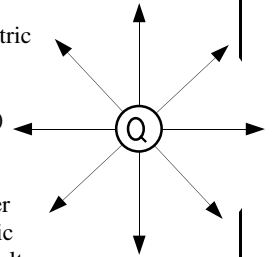
pushing on an object which it moves a distance of one meter. In more familiar units it is about 3/4 foot pounds. If this work is done in one second then the power is one watt. So a watt is one newton meter per second. Of all of these terms, you are probably familiar with all except the newton and perhaps the joule. The important thing is to have a feel for what these quantities refer to and how they relate to common quantities.

The one common unit of measure which we have not mentioned is the volt. How does that fit into all of this? Let's approach that question from familiar ground. One volt

times one ampere (flow of one coulomb per second) is one watt (one joule per second). Volts times amperes is watts so a volt is watts divided by amperes.

Since an ampere is a coulomb per second and a watt is a joule per second, we can say that a volt is a joule per coulomb. Voltage is work (or energy) divided by charge.

Going back to our electric field, which was force per unit charge (newtons per coulomb) we can now put it in electrical terms. Since a volt is a newton meter per coulomb the electric field can be stated in volts per meter.



Energy is the ability to do work. What you buy from the "electric power company" is energy. Power is the rate at which work is done. A slow elevator is just as capable of taking you to the top of a tall building as is a fast elevator. They will both do the same work in lifting you several stories. The fast one requires a more powerful motor because it does the work in a shorter time. Again, power is the rate at which work is done (or at which energy is transferred), a measure of flow. When you get your bill from California Edison, it will tell you how many kilowatt-hours of energy you used. Power multiplied by time is energy.

You may have seen Einstein's famous equation:

$$E = mc^2$$

It says that matter can be converted into energy. The sun is kept hot by the conversion of Hydrogen into Helium with some loss of mass and a corresponding gain in energy. But in our daily experience matter (mass) and energy are individually conserved. The fact that energy is conserved allows us to calculate the behavior of systems in terms of the energy.

Energy can be converted from one form to another, and some forms of energy are more useful than others. We would prefer that RF energy flowing through our antenna feed lines not be converted to heat. But heat is a form of energy, and the total amount of energy is not changed. If we ignore the small heat loss from our feed line and antenna, then we can see that any power (flow of energy) that reaches the antenna and doesn't get reflected back down the feed line will have been radiated. €

Year 2000	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.
General Meeting 7:00 PM	24	28 PSK31	20 T-hunt	17	15 Auction	19	17	21	18 Hosp.	16 Gordo	20 Auction	No meeting
VEC Testing 5:30 PM	24	28	20	17	15	26	17	21	18	18	20	
Propagator Deadline	8	12	4	1	4/29	3	1	5	2	9/30	4	2
Board Meeting	31	3/6	27	24	22	26	24	28	25	23	27	
Spring Auction					15							
ARRL Field Day						24 - 25						
SOARA picnic								5				
Fall Auction											20	
SOARA Holiday Party												3

Field Day Plans Ready.

Mark your calendars — Field Day will be held on June 24 - 25 this year. Plan on being there and sharing in the fun and excitement of this great event.



If you are not familiar with Field Day, it is a national event which is a combination of a contest and an emergency preparedness drill. (Plus fun, fellowship and food!)

SOARA will set up in Gilleran Park, Mission Viejo (on Felipe, just south of La Paz Road). We will be operating three HF rigs, voice, CW and digital. You will be able to witness amateur TV, packet,

microwave communications and just about every mode. Control operators will be present at all times so that any one wishing to try their hand at a new mode of operation will be able to do so.

A VE testing team will be on duty between 11:00 AM and 2:00 PM on Saturday (26th) for any one wishing to take an FCC amateur radio exam. For this event no pre-registration is necessary. Just get up to speed and show up.

In the past years SOARA had made a very good showing in their class. We expect to continue this tradition and bring in an outstanding score this year. Do plan on visiting the site and partaking in this very exciting aspect of the hobby.

Good News for GPS Users

On May 1 the government gave civilian GPS users a nice gift. The Department of Defense turned off the selective availability (SA) feature. SA, as it was known among users, introduced errors into the satellite signals to limit the accuracy of the position data. Turning off the SA feature will improve the accuracy of GPS units by a factor of close to 10.

Repeaters

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that the frequency change could occur during June. The change will be announced on the net at least once before the change is implemented.

After the MICOR is installed at the Laguna site, the radio currently there, a Yaesu, will be installed in the Trabuco repeater and tested. The final step before the site can be installed is to receive a coordinated frequency, order the crystals, install then in the Yaesu radio, and retune the system. We are estimating that the site will be installed in late August or early September.

An inventory of SOARA repeater equipment has been completed and is being integrated with an overall SOARA inventory by Ray (AE6H).

California PRB-1 bill gets committee assignment

ARRL Newsletter

The proposed California PRB-1 bill, SB 1714, has been assigned to the Local Government Committee of the California Senate. A hearing was held May 3. The group of experts organized to testify included Pacific Director Jim Maxwell, W6CF, Harry Styron, K6HS, Dean Straw, N6BV, and Dave Leeson, W6NL.

**I have a spelling checker,
It came with my PC.
It plainly marks for my revue
Mistakes I cannot sea.
I've run this poem through it,
I'm shore your pleas too no,
It's letter perfect in it's
weigh,
My checker tolled me sew.**

The PROPAGATOR

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Meeting: Monday 5/15/00 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 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 repeater is open to all licensed hams. The SOARA 440 repeater is for club members only.

SOARA 2m — 147.645 - (110.9)

SOARA 440 — 447.050 - (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 on Tuesdays at 8:00 PM following the Laguna and M.V. emergency nets.

40 meter HF net (7.262 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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