



The PROPAGATOR

June, 2000

The Monthly Newsletter of South Orange Amateur Radio Association

Field Day 2000 Last Weekend of June

QST QST QST DE K6SOA K6SOA:
Get Set for Field Day 2000 - June 24 and 25
at Gilleran Park in Mission Viejo.

North America's premiere operating event will commence at 1100 hours on Saturday, June 24 and end at 1100 hours on Sunday, June 25. Set up will begin at approximately 0800 hours on Saturday. SOARA will be one of thousands of clubs and individuals throughout North America vying for top honors in their classification.

Gilleran Park, Mission Viejo, SOARA's usual venue, is at the top of La Paz at Olympiad Road. After turning right on Olympiad Road, look for the water tower on the left hand side and turn left into the driveway.

This year SOARA will proudly transmit under the club's K6SOA call sign. The honor of having their call sign used for the novice operating station will go to Carroll Straus, KE6EER. Carroll is being honored for her continued hard work in bringing coffee and goodies for all the regular meetings.

Once again, SOARA will operate in the 3-A classification, meaning that we will be able to have a maximum of three HF transceivers on the air at any one time. There will be ample time to operate on both phone and CW for all those interested.

This year the club will emphasize digital modes to highlight the versatility of CW, packet, RTTY, and the newest digital mode, PSK31. Phil Pacier, AD6NH, ex-KE6GUQ,

will bring his fully functional PSK31 station which will be available for use by all. Phil will also do a demonstration of APRS (Automated Packet Reporting System), which will help the club gain extra points in a new category. He will attempt to make APRS contacts with others who may be mobile or stationary with the assistance of his GPS (Global Positioning System) receiver and HF transceiver.

As usual, SOARA will have the full complement of VHF and UHF stations, including 6 meter, 2 meter, 220, and 440 stations. Thanks to the McDonalds, KD6UIN, and KD6WWF, we will again have 10 GHz radios and ATV that will score the club extra points.

On Saturday three great meals will be served that are free to all Field Day participants. Sunday we will finish off the event with a great hot breakfast with cooking help from the Boy Scouts. Many thanks to Sherry, KF6UTX, for her hard work in organizing the food again this year.

Preliminary thanks go to the following people for all of their hard work, dedication, and professionalism: Ray Hutchinson, AE6H; Heiko Paschel, AT6OI; Chris Reed, KB6FYG, Sherry Kornbloom, KF6UTX; Dale Griffith, W8RRV; SOARA warmly invites all members and all guests to participate in Field Day this year. Even if you just come for a few hours, you will almost be guaranteed a great time. Remember, you don't need a license to operate, just a desire to have fun. (You don't need a license because a "control operators" with the appropriate license will be there.)

Mike Mullard, KF6HVO, Activities Chair

For further information, send Mike an e-mail at kf6hvo@soara.org or contact him on the SOARA net every Tuesday night at 8:00.

New Members

A hearty welcome to SOARA's newest members:

James Bollingmo, KD6PCO

Leonard Appelman, WA8MRQ

Local Ham Honored

SOARA's own Tim Smith, KF6AUE, was recognized for outstanding community service by the Orange County Fire Authority. Tim was selected for the Fire Authority's "**Civilian of the Year, 2000**" award for the Battalion 7 area. This area includes the city of Rancho Santa Margarita, the communities of Coto de Caza, Foothill Ranch, Portola Hills, Trabuco Canyon, and the Eastern portion of the city of Mission Viejo.

Tim was selected because of his extensive efforts for community safety, disaster assistance and preparedness. His extensive efforts include: serving as Chief of the Santa Margarita Amateur Radio Team (SMART) and Chairman of the Rancho Santa Margarita Disaster Preparedness Committee. In this capacity Tim and SMART assist the Fire Authority during serious emergencies by providing auxiliary radio communications and reconnaissance. Tim, in his role as volunteer Red Cross Disaster Assistance Worker, is often seen at the scene of serious residential fires, assisting the fire victims with relocation shelter, clothing and food allowances. Tim has received extensive training in disaster preparedness and mitigation, through the Red Cross and FEMA — the Federal Emergency Management Agency.

Congratulations Tim, for recognition well deserved.

Ray Hutchinson, AE6H

Custom Keys

Look on page 30 of the June issue of QST for pictures and a story on the fine Morse Code keys built by Jim Richards, KD6VDH. Jim brought some of his keys to our local SOARA auction night. You will hear Jim on the 2 meter repeater regularly. Give him a shout — he is always glad to talk about telegraph keys. On occasions he has had the keys at the Friday informal lunch at Carl's Jr. at La Paz. and Margurite in Mission Viejo.



The Way I See It: Understanding Radio Theory

Last month we started this series with a discussion of the basic electrical concepts. All known matter is made up of a reasonably small number of types of elementary particles. The familiar ones are electrons (negative charge), protons (positive charge), and neutrons (zero charge). Charged objects exert a force on other charged objects, and the electric field (volts per meter) is a measure of the force per unit charge. The unit of charge is the coulomb. It takes 6,241,500,000,000,000,000 electrons to make one coulomb.

For the ordinary ham (are any hams “ordinary”?) the quantities voltage and current are the ones with which we are familiar. Getting a good grip on the concept of voltage is not trivial. Voltage (potential, Electromotive Force) is the electrical potential energy per unit charge. It is a bit like a very high shelf in a bookcase. A book that falls on you from the top shelf will hit harder than one from a low shelf. It has more (gravitational) potential energy (per pound of book) on that top shelf. Note that the potential does not have a direction, while the field (electrical or gravitational) does.

Current is a measure of the flow of charge. It is measured in amperes and one ampere is a flow of one coulomb in one second.

Voltage is the energy per unit charge. In other words, voltage multiplied by charge is energy. Energy is the ability to do work. One volt times one coulomb is one joule. But current is the flow of charge so voltage multiplied by current (now we are getting into more familiar territory) is a flow of energy. This is called power. Power is the rate at which energy flows, or the rate at which work is done. One joule per second is one watt, and one watt second is a joule.

Enough review — these concepts are important, but let's get down to brass tacks.

Well, better yet, let's get down to the copper wires that are so much a part of this “wireless” hobby.

Metals are good conductors of electricity. Within a metal there are many electrons free to move about. If we look at a metal at the atomic level, we find that metal atoms will allow their outer shell electrons to drift about among the atoms. This leaves the atom with a positive charge (the atom is “ionized”). The atoms in a metal are held together by the electrical attraction of this cloud of (negatively charged) electrons.

All of the obvious characteristics of a metal can be understood from this mechanism of bonding of the atoms. (Nonmetals have their atoms bonded together via a different mechanism.) Metals are malleable and ductile — they don't care which atoms are their nearest neighbors. They don't even care what type of metal atoms are their neighbors. They are still bonded through the electron cloud. Thus, you can produce any mixture (alloy) of metals you want. Metals are good electrical conductors because all those electrons are free to move. Heat conduction in metals also takes place by electron motion, giving rise to metal's good thermal conduction. Clean metals are good reflectors of light — easy to understand. Light is just electromagnetic radiation and the free motion of the electrons under the influence of the electric field of the light causes the reflection. (Ain't Science wonderful!)

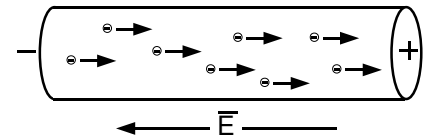
Why isn't a metal conductor a “perfect conductor” — why is there resistance? (We will ignore super-conductors which require verrrrry low

temperatures to exhibit their unusual characteristics.) Under the influence of an electric field, the electrons in a metal, or any material in which they are free to move, will experience a force (definition of an electric field) and will move. Actually they will be accelerated, but will suffer collisions within the material and give up some of the energy received from the field. Three important results follow from this view. (1) The collision of the electrons results in an effective friction to the electron flow. This electron flow is proportional to the electric field. This leads directly to Ohm's Law. Ohm's Law really states that the flow of current is proportional to the applied voltage. The current and voltage have a linear

relationship. If we say that a conductor or a contact is “ohmic”, we mean it has this linear relationship. Non-linear effects — like intermod — are caused by non-ohmic (nonlinear) components and contacts.

(2) Energy in the form of heat is transferred from the electric field via the electron collisions to the metal conductor. Current flow through a conductor results in an energy flow (as heat) into the material of the conductor. Remember that energy flow is power. So we see that a resistance with current flowing through it dissipates power.

(3) Finally, if we place a metallic conductor in a region of electric field the free electrons will move under the influence of that field.

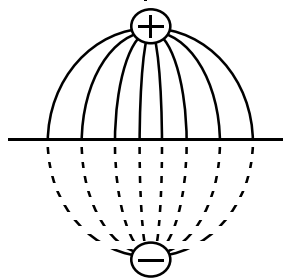


But, how many and how far? They will move until they have built up just enough charge on the surface of the conductor to neutralize the field within the conductor. In the static case you can not have an electric field within a conductor. Free (that is, free to move) electrons will immediately move to eliminate the internal field. Even at radio frequency, or a light frequency, the electrons move in response to the electric field. As in the case for a static field, the field due to the new positions of the electrons cancels the field due to external influences.

In a real conductor, because there is some resistance, there is some loss of energy associated with the internal flow of current. However, the most noticeable effect is one that we might associate with reflection. If we consider a static charge in the vicinity of a plane metal surface we can deduce the nature of the electric field pattern in space.

Consider the field lines at the metal surface. Any component parallel to the surface will cause a movement of the free charges in the metal. The condition will quickly obtain where all of the field lines are perpendicular to the surface. The field lines are exactly those which would result from the original charge and an image charge beyond the surface of the metal. The actual charge induced on the surface may be complex, but the image concept gives the correct answers.

More next month!



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 F D/kit	17 Misc.	21 Fractal	18 Hosp.	16 Gordo	20 Auction	No meeting
VEC Testing 5:30 PM	24	28	20	17	15	26	—	—	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

June Club Program

The June 19 general meeting will cover last minute details for Field Day and a presentation on constructing an all band radio by Jeff Stai, KQ6VQ.

In July it will be your own in house club night where we will find time to share our war stories and talk about any home brew projects or just operating experiences. For the new members or those just wanting to get on the air come along and ask questions of all the experts who have been doing it for a while. If you have something to show, then bring it along.

Upcoming programs include a talk on Fractal Antennas, presentations by April Moell on the Hospital Emergency communications. Gordon West is scheduled for the October meeting.

Hamfest at Flagstaff

Flagstaff, AZ, at 7500 ft. elevation is the setting for the annual Fort Tuthill Hamfest. The dates for this year's event are Friday, Saturday & Sunday: July 28 — 30. Several SOARA members have attended in past years. There is a possibility of car pooling and room sharing to save on expenses. If you are interested in going contact Richard, WW7D, via e-mail w7d@soara.org.

Please Note:

What? - you have a new call sign! Not an uncommon comment these days. Lots of club members have upgraded and obtained new call signs. Vanity call signs and upgrades, with or without a new call sign, require a change in SOARA's database. Naturally any change in address requires a change also.

If you have changed either your call sign or your class of license please send a note updating the information to Marty, KF6TIR, who maintains the database. In the next issues of the Propagator we will run a listing of new calls & upgrades. Send the information to **SOARA, P.O. Box 2545, Mission Viejo, CA 92690** or via e-mail to kf6tir@soara.org.

VE Exams at Field Day

Lou Parker and his team of VEs is offering exams at the Field Day site on June 24 between 11:00 AM and 2:00 PM. This is a "walk-in" session — no pre-registration is required. If you or a friend are planning on taking an Amateur Exam, come out to Field Day, enjoy the activities and take your test while there. Remember to bring: a picture ID, the original and one copy of your license and any applicable C.S.C.E., and the \$6.65 fee.

A.H.A. says "Thanks"

The Board of Directors for the Association of Hand-crafted Automobiles would like to express it's thanks to those Amateurs from SOARA that assisted in our parking efforts on Saturday morning, April 29th. Your help in organizing our 21st Annual "Fun Under The Sun" car show in it's new location greatly helped keep the confusion to a minimum. We hope that you had a fun



Quick Notes

AE6H, Ray Hutchinson, is mentioned in a letter to the editor on page 25 of the June, 2000 issue of QST.

Coming soon — a new frequency for the 440 repeater. SOARA has requested a change from 447.050 to 445.660 MHz.

The PROPAGATOR

South Orange Amateur Radio Association
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Meeting: Monday 6/19/00 at 7:00 PM "Build a Rig from a Kit" & "Field Day"

☛ **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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