The PROPAGATOR

April, 2000

The Monthly Newsletter of South Orange Amateur Radio Association

April Meeting to Feature Repeater Technology

This month's guest speaker will be Howard Brown (KG6GI) who will provide us with a presentation on Amateur Radio Repeater Technology.

His presentation will focus on the technical aspects of the repeater system and will discuss the system level considerations as well as major subsystem components. The presentation will include typical views of the communication sites.

Howard has been licensed since 1983 but has been intensely interested in amateur radio since the "50's". He has been a board member of HROC (Henry Radio of Orange County ARC) for over 13 years and assumed responsibility for their repeater maintenance two years ago. He serves as the HROC repeater trustee. He has also recently assumed responsibility for maintenance of the SOARA repeater complex.

Before retiring, Howard was employed by Hughes Aircraft Company and served as a Program Manager for large scale Command, Control, Communication and Intelligence (C3I) Systems as well as Air Traffic Control (ATC) Systems. He still consults, occasionally, on Air Traffic Navigation systems based on GPS technology, and other Military/ATC applications.

Howard's other interests include flying and genealogy. He has identified over 1500 members of his family tree.

New Members

A hearty welcome to SOARA's newest members:

Kevin Moon KG6ABX

Al Way KC6LNP

Election of SOARA Officers Underway

The ballots are in the mail, and if you have not received yours you should soon. Club officers are elected on even years for a two year term. Directors, also elected for two year terms come up for election on odd years. (I guess the directors are a little more "odd" than the officers.)

Two of the present officers have agreed to run for another term. Our president, Paul Levey, NZ1M, and secretary, Richard Coyne, WW7D (Don't we have any 6's around?) are on the ballot for another term.

Jerry Di Schino, KN6QK, is retiring as treasurer, and Marty Kornbloom, KF6TIR has agreed to run for that position. Jerry has served for two terms (4 years, although Jerry says he has aged 40 years while in that office!) and is looking forward to being "just another member" again. Jerry has done an outstanding job.

Our present vice president, Heiko Peschel, KR6EA has expressed a desire to move to another position and Malcolm Levy, KO6SY, has agreed to vacate the Education Director's position and run for vice president. A major duty of the vice president is to arrange for the speakers at the general meetings.

Heiko was appointed to fill the unexpired term as education director. His duties will be to plan and arrange for code and theory classes for those wishing to upgrade. In the past SOARA has held operating classes in areas of interest to the membership.

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Interested in getting on PSK-31?

By Malcolm Levey, KO6SY

A number of stations have shown some interest in getting on PSK-31, and I have already worked a number of locals. So just to have some fun, I have decided to try out a 10 meter PSK net.

The NET will take place on a Friday at 6 PM local time,. We can change this if others wish for a later time. The reason for this time is that we are at a sunspot maximum, and we could have some DX "check ins" at this time. The first NET will be this Friday March 31st. I will try to have a tame VK ready for you all to work.

Set your rig for 28.120 USB and your PSK software to 1000 Hz. I will call CQ SOARA members and then take it from there. If this frequency is occupied look above or below by a few hundred Hz. This net will allow us each to check our rigs IMD with each other, help each other set up their rigs, and if necessary call each other on the land line to talk through any software issues. A secondary value will be to make sure we are all familiar with PSK-31 and ready for Field Day

As I am not always in the area on Friday nights I hope that you will come up and take it in turns to run the net. You never know, there may be propagation from Oregon where I could be at the weekends.

Hope to see you all on my computer screen soon.

Malcolm, KO6SY

Malcolm is net control for the SOARA Sunday morning 40 meter net. The net meets on 7.233 MHz at 7:30 AM each Sunday.

Ray, AE6H, is net control for the SOARA 2 meter net which meets on Tuesday evenings at 8:00 PM on 147.645 - (PL = 110.9). Club members and visitors are welcome.

On the Proper Care and Maintenance of Radios

One of the greatest advances in electronics was made possible by the invention of the transistor in December of 1947 by Bardeen, Schockley, and Brattain at Bell Labs. As soon as the technology for manufacturing transistors was developed, these tiny marvels started rapidly replacing that workhorse of electronics, the vacuum tube. Vacuum tube manufacturers had developed ingenious ways to improve the performance and ruggedness of their product. They made multiple tubes in one envelope, and they developed acorn tubes, micro-miniature tubes and even rugged ceramic packages. Do you remember the "nuvistor"? Still there was one characteristic of the vacuum tube that was not to yield to the engineer's most valiant efforts. Vacuum tube grids tend to leak. Vacuum tube circuit designers were forced to include grid leak resistors in their circuits in an attempt to control this phenomenon.

Electronic design soon entered a stable period as transistors replaced tubes. Electronic equipment became lighter and consumed less power. This was the era of the seven transistor radio. Alas, these halcyon days were not to last. Advances in computer technology led to the development of the computer bus. Soon large numbers of transistors were being bussed. The era of integration had arrived. With integration, hundreds, then thousands and today, millions of transistors are forced to integrate in small packages. The age of integrated circuits is in full bloom.

This development has brought with it an entirely new set of problems. In order to understand one of the most troubling of these problems we must look at the way transistors work. Electron tubes operated by controlling the flow of electrons — all tubes have this in common. Transistors, however, come in complementary types. A basic N-type FET operated much like a vacuum tube, except that the electron flow is through a solid rather than through a vacuum. P-type FETs do not depend on the flow of electrons, but rather on the flow of "holes". In the crystal lattice of a solid semiconductor, a hole can be thought of as a sort of empty site for an electron (Not unlike an almost full class room with an empty desk.) Holes behave much like electrons, but they have an effective charge which is positive rather than the negative charge of the electron. Early p-type transistors did have a problem of tending to hog the current in a circuit (thus the term "Hole Hog"), but clever engineering has managed to control this phenomenon.

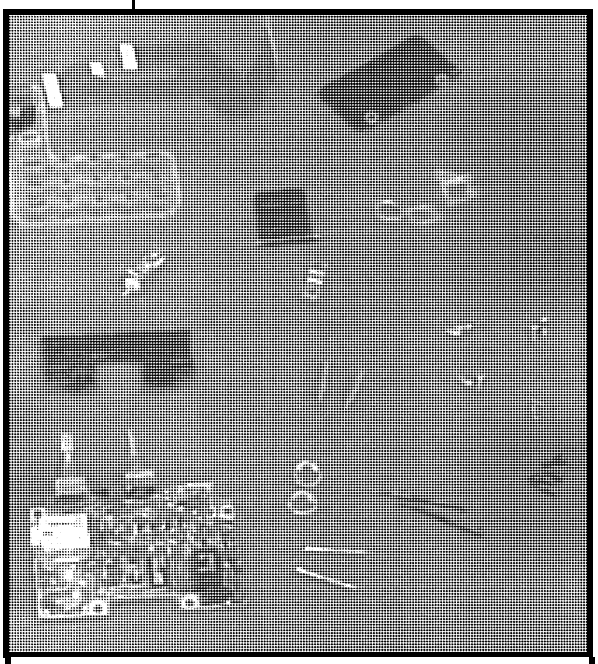

Figure 2 The third circuit board, connecting cable, keypad buttons and several unidentified small parts..

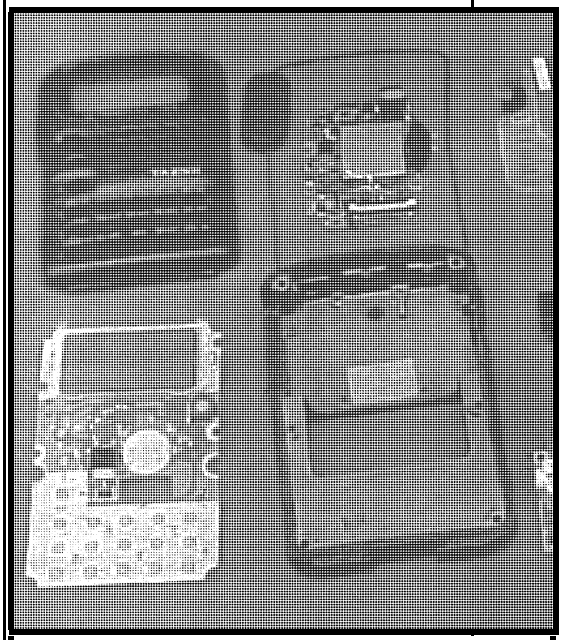

Figure 1 View of the disassembled radio showing the front, back and two of the three circuit boards.

One of the great unsolved problems with so called large scale integration, upon which the modern electronics industry is based, is due to a very small difference in the sizes of holes and electrons. In single transistors this did not cause any problems. Designers of modest scale integrated circuits managed to cope with the problem. However with the advent of today's very large scale integrated circuits with millions of transistors, no way has been found to control the buildup of excess hole material directly. Industry's response has been to obsolete the devices before the buildup is great enough to do significant damage. Thus we have computers sporting the largest of chips, but with a useful life of only a few years.

The economies of scale have forces radio manufactures to follow this trend toward including these large chips in the design of modern radios. As amateur radio operators, we are faced with the options of having our gear become obsolete and useless within a few years or finding a way to remedy the problem. One solution, although one that few hams would venture to try without expert guidance, is to "field strip and clean" your radios periodically.

This is a concept which was developed by the military, and many of the older hams are familiar with the concept. The procedure is fairly straight forward and can eventually be performed in the dark.

The procedure starts by removing all of the screws from the case of the radio. Be careful with them, they are small and you will want to replace at least half of them later. Open the case and remove the circuit boards inside. This is generally easier with a new radio, although this is not always the case.

Scrub the circuit boards vigorously to remove any debris and worn out components. Use care during this operation. The loss of any of the circuit boards may impair the performance of the radio.

After washing the boards dry them thoroughly. A toaster oven is useful for speeding up this process. A microwave oven is not recommended, especially for the lower

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Year 2000	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.
General Meeting 7:00 PM	24	28 PSK-31	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						26 - 27						
SOARA picnic								TBA				
Fall Auction											20	
SOARA Holiday Party												3

Election

(Continued from page 1)

Jim Kelley, AC6XG, who has served as repeater director for several years has requested to be replaced in that position. Jim, who works for the Physics Department at UCI, has an extensive background in electronics, and has done an outstanding job of maintaining the repeaters and giving technical guidance to the club. SOARA operates four outstanding repeaters serving not only the membership but many visitors, making our 2 meter repeater one of the most popular in the south Orange County area.

Jim will remain active in the technical guidance of the club, but will spend more time pursuing other interests. Jim is an accomplished musician and plays in a musical group, among his other activities.

The board has appointed Howard Brown to fill the unexpired term as repeater director. Howard has experience in a similar position in HROC.

Both of these appointments will appear on the ballot for the membership's approval. Best wishes to the new board members.

Field Day Planning

A Field Day planning meeting open to all, is scheduled for Wednesday, April 26 at 6:30 PM at Emilio's Pizza on Muirlands between Los Alisos and El Toro Road. SOARA's year 2000 Field Day is shaping up to be one of the best ever. There will be an emphasis on digital communications this year. ATV, microwave, satellite communications and even an APRS demonstration will be featured. A lot of work has already been started to ensure that everyone has a chance to participate and to make this year's event a resounding success.

See you at Emilio's on April 26th and at Field Day on June 26 and 27th!

DOT

Notes:
1)The Dot is not interchangeable with the Period or the Decimal Point.
2) For use in Internet URLs and

●

DWG. NO. 427 **TITLE DOT**	**DATE: 04/01/'00**	**REV. 2**
	Not to Scale **DRAWN BY:**	

Field Strip & Clean

(Continued from page 2)
band radios.

Finally reassemble the radio in the reverse order to that from which it was disassembled. Learning the new positions of the keypad will be a beneficial mental exercise. Ensure that no components or wires are extending beyond the edges of the case. Replace enough of the screws to hold the case together. A bench vise is often found to be helpful in this assembly process.

Now you are ready to enjoy your radio and impress your friends with one of the cleanest signals on the band.

73 and good luck,

Justin Uther, KJØKE

Reminder

One last reminder about the April 29 - 30 *Association of Hand-Crafted Automobiles* show at Knott's Berry Farm.

If you want to sign up to work as a communicator at the event, call Heiko, KR6EA, at (949) 859-3868 or contact him via e-mail at *kr6ea@soara.org*.

The **PROPAGATOR**

South Orange Amateur Radio Association
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Mission Viejo, CA 92690

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Meeting: Monday 4/17/00 at 7:00 PM
Howard Brown on "Repeaters"

☞ **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: a SOARA board member will respond as soon as possible.

☞ **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 AC6XG 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 (7.235 MHz +/- for QRM), Sunday 7:30 AM