



Sierra Foothills Amateur Radio Club

SIERRA SIGNALS

<http://www.sf-arc.org/>

OCTOBER 2011

PO BOX 1005, NEWCASTLE, CA

At the Key of SFARC

OFFICERS

PRESIDENT

Al Martin, NI 2U
amartin4@wavecable.com

VICE PRESIDENT

Charles Baker, AE6LR
ae6lr@yahoo.com

SECRETARY

Dennis Gregory
wu6x@hotmail.com

TREASURER

Bob Balthrope, KD6WTY
kd6wty@yahoo.com

DIRECTORS

Mary Ann Balthorpe, KE6EST
Gary Cunningham, KQ6RT
Jim Griffith, KI 6AZH

Field Day Chairman

Dave Hund, N6SHD

REPORTERS

Satellites: Greg, KO6TH
History: Gary, KQ6RT
Misc Radio: Fred, K6DGW
Sunshine: Richard WA6RWS
rkuepper@gmail.com

RESOURCES

REPEATERS

145.430 (-0.6 MHz/PL 162.2)
440.575 (+5.0 MHz/PL 94.8)
223.860 (-1.6 MHz/PL 100.0)

CLUB NET

Thursdays, 7:30PM, W6EK/R
145.430

CLUB MEETINGS

Second Friday of the month,
7:30PM at the Library, 350
Nevada St, Auburn CA

CLUB BREAKFAST

Last Sat of the month at
Susie's Café, Cirby at
Riverside, Roseville - 8:00 AM

NET CONTROL OPS

Dave Jenkins, WB6RBE
Gary Cunningham, KQ6RT
Norm Medland, W6AFR
Casey McPartland, W7IB

NEWSLETTER EDITOR

Matthew Diridoni, KC6RUO
916-749-3032

matteod@comcast.net

WEBMASTER:

Carl A Schultz, WF6J

Calendar of Events

Oct 8-9

Tevis Cup



SFARC WHITE ELEPHANT SALE

Oct 14-16

PACIFICON 2011

Oct 22

Radio Operators Needed
for Cystic Fibrosis Bike
ride. See Page 5

SFARC CLUB MEETING PRESENTATION

White Elephant Sale

Tech Ten" topic is
"SHOW AND TELL"-HF PACKAGE FOR
FIELD OPERATIONS" presented by
Jim Piper N6MED
Everyone is welcome, bring a friend!

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We encourage members to receive Sierra Signals via email to save the Club the cost of reproduction and mailing

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From The Presidents Shack, Al Martin NI2U President's Thoughts



Proposals for awards are finally back in process. My current proposal has three awards, Life Membership, Superior Performance Award and Superior Performance Cash Award. These will be vetted with the Board before presentation to the membership. Please expect changes but the changes are moving forward.

As mentioned last month, we need to set a slate of officers and board members for next year. Volunteer organizations always have difficulties in providing leadership. This is our club and we need to encourage some younger and newer members to help running the club. My suggestion is to have board meetings separate from the membership meeting location. Also, a strong secretary and involved treasurer are very important.

The president's work should be to set the direction. This can be done by preparing the agenda for the board meetings.

This next one is contrary to general membership desires but, volunteering for the activities is really important. The club supports ARES, Bicycle Rides, The Tevis Cup, The Enduro and the Western States 100. There are more but helping with the communications is important practice for emergencies.

Letter Received by SFARC



George Simmons
SFARC

September 15, 2011

Hi George,

Enclosed please find a donation of \$ 400.00 to your radio club as a thank you for your club's services at the Fool's Gold Enduro we held a few months ago.

I must apologize on how late this donation is. We voted as a club to make this donation in July and it completely slipped my mind (perhaps a senior moment).

We look forward to working with your club in the future. Our next event in Georgetown is scheduled for the first weekend in May next year.

Thanks again for your support. Your club provides a valuable and essential support service for our events and we really appreciate it.

Best regards,

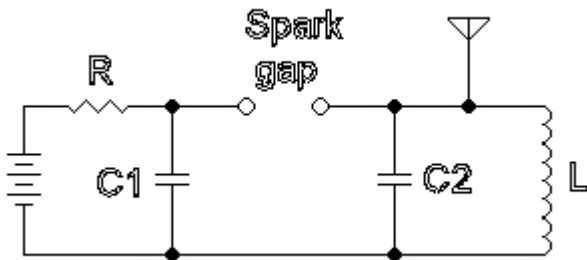
[signed]

Tony Godrich
Treasurer, CERA

MISCELLANEOUS RADIO -*Spark Transmitters*

“The Second Coming [and going]”

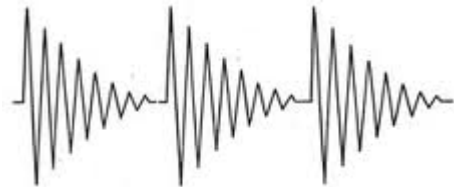
A great many things in our lives come only once, and then leave, never to be seen again. It is thus a very good idea to enjoy all of them while they're here. A few things manage to come around more than once, however. Although it's hard to imagine that early transmitters, comprising a noisy spark gap and a very broadband buzz suitable only for radiotelegraph, would ever come back after displacement by vacuum tubes, continuous waves, and then solid state devices, you can put on your “imagine this” hats because they did. Not exactly like the early ones, and capable of very precise timing and frequency/bandwidth control not even thought of at the beginning of the 20th century, but fundamentally, still the same. So, we'll crank up the Way-Back-Machine and take a look at the fundamentals first.



The diagram depicts the basic spark gap transmitter and is remarkably simple. A source of power, shown here as a battery but more commonly a high voltage power supply, charges capacitor C_1 through the resistor R . This is an RC time constant circuit and the voltage across C_1 rises toward the supply voltage. At some point, the voltage is high enough to bridge the gap, and the energy stored in C_1 is almost instantly transferred to the resonant circuit formed by C_2 and the inductor L in parallel.

The parallel circuit [C_2 and L] is arranged to be resonant at whatever frequency you want to transmit on ... let us say the Holy Frequency, 500 Kc ... and it acts like a bell. The energy pulse when the spark fires is analogous to hitting the bell with a hammer, and the circuit “rings” just like a bell. It doesn't ring for long, however. Like the bell, the energy is dissipated in resistance losses, and into the air [antenna] where it radiates.

Once the spark has transferred the energy to the parallel circuit, C_1 starts to charge again and the cycle repeats. The energy appears in the antenna as a damped wave [see diagram at right] with each firing of the spark gap creating one of those “triangles.” In our example, the higher frequency waveform is our 500 Kc signal, and the lower frequency “triangles” sound like modulation on the signal ... sort of a buzz. That little circuit is a bit oversimplified ... the bottom ends of C_1 and C_2 would be connected to ground, and there would be some way to interrupt the power supply to produce Morse code, but it pretty much covers the important points.



Technology invaded even the low-tech circuit above. The spark gap was put on a rotating disk with many gaps allowing better control over the power and pitch of the modulation, ways to “quench” the spark were developed to increase the energy pulse that “banged” the resonant circuit, and a number of others, but the concept remained pretty low-tech. And, note: The antenna, and everything connecting it to the transmitter became part of the tuned circuit and thus contributed to determining the transmitter frequency.

When vacuum tubes, and the oscillators and amplifiers that could be built from them came along, damped waves slowly disappeared from the radio spectrum. The tubes generated continuous waves [CW] for as long as the key was held down. What's more, the continuous waves occupied one frequency, not a broad range, and everything began to change in the radio world. Somewhere along the way, “CW” became associated with Morse code keying of the oscillators/amplifiers as distinct from amplitude modulation with audio signals, and to this day, “CW” to hams means Morse transmissions ... we've all but forgotten about damped waves.

So, spark transmitters and the damped waves they produced disappeared. When did they come back? Well, it starts just before WW2. The LORAN navigation system was rapidly being introduced into our 160 meter band, and since LORAN was a pulse system, it pretty well took that band out if you lived on one of the coasts. The peak pulse power was large [a couple hundred KW in LORAN-A], but the average power was still fairly low and was generated by vacuum tubes. LORAN-A was replaced by LORAN-C in the later 50's. All LORAN-C stations operated on 100 KHz, and transmitted with a great deal more power into bigger antennas. Their frequency and the pulse repetition rates were highly controlled by cesium beam atomic clocks since navigation accuracy depended on timing accuracy.

Most LORAN-C stations transmitted with multi-hundreds of kilowatts, some well over a half megawatt. They used vacuum tube transmitters [BIG tubes! ☺] and very large antenna systems. The most powerful was the station in George, WA which was part of both the US and Canadian West Coast chains. It originally ran 1.7 megawatts into an array of four Marconi-T antennas. The transmitters still resembled ours – some sort of oscillator to generate a signal, amplifiers to make it bigger, and a way to key it on and off to form the LORAN pulses.

LORAN-C in the US [and a few other places we had military troops] was run by the US Coast Guard, and in early 2010, was shut down worldwide, having been replaced by the GPS satellite system. Prior to the shutdown, the vacuum tube transmitters at the George station were replaced with "Accufix" transmitters manufactured by Megapulse Corp, and for a few years, re-introduced the spark gap concept to radio.

Now, it takes a big room-full of state-of-the-art electronic equipment to create the timing accuracy required for LORAN-C, remembering that timing accuracy = position accuracy for those using it for navigation. But, ignoring that room-full of high tech stuff for just a moment, the transmitter itself had no tubes. In fact, it had no oscillators or amplifiers, yet it produced incredibly stable, perfectly shaped 100 KHz pulses, each exactly the right number of cycles long, at about 1.3 megawatts each, at two group repetition rates [George was part of two LORAN-C chains with different GRR's and did both].

It consisted of a huge capacitor bank [C₁] that would store massive amounts of energy, a bank of silicon-controlled rectifiers to act as a very precisely controlled spark gap, and a 100 KHz resonant circuit. The SCR's fired when commanded by the room-full of high tech stuff, discharged all that energy into the resonant circuit, and it began producing a damped wave when that energy "banged" it. Sound familiar? That's basically the description of a 1910 spark gap transmitter. The SCR's replaced the spark gap with no noise and with hugely better timing, but despite that, it was the essence of a spark gap transmitter.

There were fairly complex circuits, again driven by that room-full of electronics, that absorbed the energy in the damped wave "tail," appropriately nicknamed the "Tailbiter," and since the antenna array and everything else connected to it formed part of the 100 KHz resonant circuit, there were some very sophisticated automatic "antenna tuners" which compensated in real-time for antenna movement, changes in temperature, humidity, and a host of other variables.

It's all gone now, most of the LORAN-C stations have been demolished, or gutted and shuttered, becoming more US Government land not being used anymore. The Middletown CA station [over by Clear Lake] was so strong here at night that I could hear nothing but LORAN from 10 KHz up to the bottom of the AM broadcast band. With it off the air, we hams can SWL in the MF, LF, and VLF ranges again. And for awhile, a spark gap transmitter made a re-appearance in the radio spectrum. As vacuum tubes were overtaking spark so many years ago, I wonder if anyone then would have ever predicted it's return.

73,

Fred K6DGW



Radio Operators Needed

The Club has been asked to provide radio support for the Cystic Fibrosis Bike ride on October 22, 2011 from about 0630 until about 1300.

There will be 4 stationary locations and 2 or 3 mobile SAG wagons. We will not have to provide the vehicles or drivers.

We'll most likely be using the W6EK repeater as it is a ride that starts and ends in Newcastle. There are 2 circular routes with much of the same roads used for both rides

This is a new ride and the organizers need help.

Please let me know if you can help on the 22nd.

George
KG6LSB
530.888.0860



WF6J Report

By Carl Schultz, WF6J

SFARC Website - we continue to try and put up interesting item for all. If there is something you'd like to see, send me an email. There are lots of behind the scenes stuff going on to enhance the website. Hopefully by December we will all see some new things and more space.

Our Elmer help section has brought out some interesting people asking for assistance. I hope all club members will step up and help reach out to those asking for help.

I will post the .pdf for Dave, NO6NO's VE activity and 2012 Technician Class schedule and content. Thanks Dave for all your efforts and time! The Club By-laws will be added to the site so the membership can look them over and comment back, if needed, before the motion to pass them is made at the November meeting.

White Elephant Auction... I can't wait. This is one of my favorites all year (well maybe 2nd to the Holiday Dinner) will arrive with my Jeep empty and ready to haul away some junk...err auction offerings.

73,
Carl Schultz, WF6J



Satellite Report – By Greg Dolkas, KO6TH

"Oh my goodness!" said Chicken Little. "The sky is falling! I must go and tell the king!"

Just when you thought it was safe to take off that tin-foil hat and venture outside comes news that yet another large satellite will come crashing back to Earth. This time it's the German Roentgen satellite, ROSAT, estimated to re-enter in mid-October.

ROSAT was designed and built by a cooperative program between Germany, the United States, and the United Kingdom, and launched in June of 1990 by the United States. Its mission was to study the universe in the X-Ray and XUV parts of the spectrum, mapping the entire sky with several instruments. That mapping was accomplished in the first 4 years of operation, followed by nearly 5 years of pointed observations. More than 150,000 X-Ray objects were cataloged, and 479 more in XUV. It was finally turned off in February of 1999.

All satellites have a limited orbital lifetime, though those lifetimes may be very long. The lower the orbit, the more the satellite encounters our atmosphere, slowing it down. Larger satellites feel this effect more than smaller ones, and lighter ones more than heavy. The International Space Station is the extreme example, getting a double hit. Even though it weighs over a million pounds, it's in a relatively low orbit, only 240 miles up, and is about the size of a football field. Between the structure itself, and nearly an acre of solar panels that it carries to provide power, atmospheric drag would cause the ISS to reenter a matter of a few years. It needs a periodic boost just to keep it up there. Small satellites in higher orbits can remain there for a long time. One of the first satellites, the grapefruit-sized Vanguard-1, launched by the US in 1958, is still in orbit after more than 50 years, and is the oldest man-made object in space. Early predictions estimated that it would remain in orbit for 2,000 years, but the study of its 400 x 2400 mile high elliptical orbit have given us new insights into the effects of the solar radiation pressure and atmospheric drag. Predictions now are that it will only be up there for 240 years.

ROSAT is smaller than UARS, NASA's Upper Atmosphere Research Satellite, which returned to its mother planet in flaming pieces last week. Where UARS was the size of a bus, and weighed 13,000 pounds, ROSAT is smaller and a mere 2 1/2 tons. "Less than 2 tons" of it, comprised of some 30 pieces, are expected to survive reentry. The odds-makers estimated the chance of UARS debris hitting someone were something like 1 in 3,200; ROSAT's particular orbital path ups that to 1 in 2,000. If that concerns you, we are told that the odds of it hitting anyone in particular are only 1 in 14 trillion. Ah, that's better.

ARISSat-1 is an Amateur Radio satellite that was launched from the ISS earlier this year. It's starting orbit was nearly the same as the ISS, but it weighs about a million pounds less, and without the orbital reboosting it's not expected to last more than a year or so in orbit. AMSAT is sponsoring a "Chicken Little contest, where you can enter your guess for when the little satellite will reenter. Head over to <http://www.amsat.org> and follow the link to the contest. Entries are due by October 15th.

Now, where did I put that tin-foil hat?

Greg, KO6TH



Fifty Years Ago at SFARC Oct. 11, 1961 Auburn

Our club was invited by the Aerojet Amateur Radio Club to their meeting. Six members attended. The main topic discussed there was the coming open house they were holding on Oct. 14th. All nearby ham clubs were invited and many interesting activities were scheduled.

We all had a very good time and some of us came home with door prizes as well as making new acquaintances.

Respectfully submitted,
Sage Otow

Treasurer's report:

		<u>Expense</u>	
Sept. Bal.	\$75.51	Health Co.	\$46.33
Income	<u>6.40</u>	Aub. Journ.	<u>12.74</u>
	\$81.91		\$59.07

New balance: \$22.84

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SFARC Board of Directors Meeting Minutes

BOARD OF DIRECTORS MEETING MINUTES 9 September 2011

The September Board meeting commenced at 1800 hours at Elm Avenue Round Table Pizza in Auburn.

Officers present: President Al Martin-NI2U; Treasurer Bob Balthorpe-KD6WTY; Directors Gary Cunningham-KQ6RT; Jim Griffith-KI6AZH and Mary Balthorpe-KE6EST were present. Also present were Sunshine Reporter Richard Kuepper-WA6RWS. Vice President Chuck Baker-AE6LR; Secretary Dennis Gregory-WU6X and PIO/Webmaster Carl Schultz-WF6J were absent. Guests in attendance were Jim Carman-K6ARR.

By-Laws Update: Dennis completed and submitted the By-Laws updates for Board review.

Treasurer's Report: Bob and the Board reviewed details of the Treasurer's report as submitted. Bills paid in September were for picnic expenses, Newsletter, PG&E for the repeater, AT&T for Internet and phone. Income included dues from new members. Al had not reconciled the budget-to-date as of the Meeting.

Welcome kit: The idea of developing a welcome kit for new members was discussed. Al suggested we develop a letter from the President's office and other Club officer functions, to briefly explain these areas and include the repeater director, newsletter editor, and PIO.

ARRL Pacific Division Meeting: Al suggested adding a Board member to accompany the President to attend the annual ARRL Pacific Division meeting this year in Livermore, as one of the two designated Club representatives who might attend.

Records retention: A discussion was held on records retention rules and regulations for non-profits. Mary gave a brief report of IRS and filing requirements; a few stories of past issues with records retention and the importance thereof, was discussed. Discussion to continue when the Secretary returns from vacation.

Business cards: Carl reported (via email) that his source for business cards was more expensive than originally thought. Richard has a friend in the printing business that will print 500 cards for \$31 (front side only, matt finish, no shipping), and suggested that front side-only printing with basic information about the meeting time/date, would meet the intent of having the card available for current members to hand to potential new members. The alternative of printing cards ourselves using business card stock, as suggested by Chuck (via email), was also discussed but thought to be more expensive. The board agreed that having the cards professionally done for the \$31 (plus tax) appeared to be the best solution.

PIO Report: no report

Elmer Help: The submission to our first request for Elmer Help was discussed. The technical details of what was asked relative to antenna tuners, how we should respond, as well as the depth to which we should respond, was discussed. Potential design issues and electronic theories of design were also discussed. The possible alternative of directing the individual to purchase a tuner could be a better solution than building one from scratch, given the possible lack of electronic knowledge of the individual and obvious safety concerns. The Board decided that getting back in touch with the person submitting the request to be the next step.

Meeting adjourned at 1838 hours.

Submitted by Dennis-WU6X, Secretary

SFARC General Meeting Minutes

GENERAL MEETING MINUTES

Date: September 9th, 2011

The meeting commenced at 1930 hours at the Placer County Library in Auburn. Present were officers Al Martin-NI2U, President; Bob Balthorpe-KD6WTY, Treasurer; Directors Mary Ann Balthorpe-KE6EST; Gary Cunningham-KQ6RT and Jim Griffith-KI6AZH. Also present was, Richard Kuepper-WA6RWS, Sunshine Reporter and Carl Schultz-WF6J, PIO/Webmaster. Chuck Baker-AE6LR, VP and Dennis Gregory-WU6X, Secretary were absent.

Al led everyone in the Pledge of Allegiance. Officers, Directors, members and guests were introduced.

Past minutes – The August minutes were approved as published in the Newsletter.

Treasurer's report – Bob presented the Treasurer's Report. Balance on hand as of July 1st was \$1,744.57; bills paid totaled \$132.80; income received was \$10.00 (dues); leaving a balance on hand of \$1,621.77.

VE report – Dave-NO6NO gave the VE report. Four examiners served 6 candidates taking exams; all passed ... 3 techs, 2 generals, and 1 extra class. Dave reported finding a room at Raleys in Granite Bay to offer ham radio license classes starting January 7th. Class session dates/times (6 sessions) and upcoming exam dates to be published in the Newsletter and made available through other sources. Discounts for purchase of licensing manuals will be offered.

Satellite report – Greg-KO6TH did not have any new information on AirSat-1, but offered suggestions for finding due North for use in pointing antennas when a compass is not available.

Sunshine Report – Richard-WA6RWS, no report.

Newsletter – Carl -WF6J, no report.

Repeater – Comments were made as to the minimal use of the repeater lately. Richard queried as to how the auto-patch was working and if anyone was using the 220 machine. No negative comments were reported. Also, the possibility of adding a synthesized voice to the repeater for meeting announcements was mentioned.

Old Business – The By-laws, as updated by the Secretary, was acknowledged.

New Business – A water bottle left at the picnic was claimed by the rightful owner. *Welcoming Kit*: Al reported some of the Board's discussion regarding a "Welcoming Kit" for new members (to be created) that will include letters from Club officers, repeater (Richard), newsletter (Matt), and website and PIO (Carl). *Elmer Help*: The recent submission to our "Elmer Help" page and the Board's discussion on how we might respond was reported. Safety concerns and electronic construction issues was discussed. Al suggested we get directly in touch with the individual submitting the query as the next step, as proceeding only from the submitted schematic and query was insufficient to give advice. *Club Meeting Space*: George reported the meeting space was coming up for renewal in October. A motion was offered by Al, seconded and passed by the membership to renew the Library room rental for next year.

Announcements – Al gave announcements about schedules for the Club Net on Thursday's at 7:30, Board meeting time of 6pm on general meeting nights is back at Elm Avenue Round Table Pizza in Auburn; the General meeting schedule, Club breakfast (last Saturday at Susie's Café) and referenced the Club website for more information. *Tevis Cup* is scheduled for October 8th and the repeater is expected to be busy during that period. A *White Elephant Sale* is scheduled for the Club meeting time/date next month on October 14th.

Tech-Ten – Al presented a discussion on “filters” as used in amateur radio applications. Band-pass, band reject, low and high pass, notch, mechanical, latch and Q-multipliers was offered as types of filters that can be explored for those interested. Band-pass and low-pass filters were discussed in detail.

Nominating Committee – A volunteer was sought to chair the Nominating Committee. A suggestion was posted to have Al act as the committee chairperson as he is not eligible for re-election; he accepted.

Presentation – Jettie Hill, W6RFF, gave a very interesting presentation on the history of amateur radio. Jettie was first licensed in 1938 and gave a detailed account on licensing as well as other social, economic and world issues affecting amateur radio at that time. His technical experience at the time was mostly from the ARRL Handbook, which sold for \$1. His first radio was a Hallicrafters Sky Buddy receiver, which he used to listen and learn Morse Code. Transmitters could not be purchased easily or cheaply, and most hams modified or used parts from existing electronic equipment available to construct simple CW transmitters. He built his first transmitter and several others over time, in this manner. New parts were easy to come by if you had the money. The Class-A license (voice) required 1 year of prior experience on CW to be eligible to take the test. (Secretary’s note: Thank you Jettie, for helping to preserve our heritage.)

The meeting adjourned at 2030 hours.
Submitted by, Dennis – WU6X, Secretary



Pacificon 2011 HAMFEST/CONVENTION
October 14, 2011 – October 16, 2011

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Public Contact: John Ronan , K3ZJJ

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Phone: 510-649-9045

Email: jtronan@aol.com

SFARC WEB PAGE

Don't forget to visit our web page at <http://www.sf-arc.org/> for up to date information, advertisers that support our club and informative links related to amateur radio.



Sierra Foothills Amateur Radio Club

Home

Welcome to our website • SFARC is located in Auburn, CA • our club call sign is W6EK

Meetings

Oct-02-2011 Sun 08:18:42 PM

Nets

Newsletter

Officers

Membership

Elmer Help

VE exams

Videos

Photos

Links

Activities

send us [email](#)

Next Meeting:

Friday

October 14th

White Elephant

Auction 7:30pm

Auburn Library

Club Breakfast:

October 29th

8:00am

Susie's Roseville

Next VE Exam:

Saturday

October 1st

Thursday Night

Net 7:30pm



Elmer page - Our way of lending a "helping hand" to want-to-be Hams, Ham students, New operators, Seasoned operators, SWLs and anyone interested in the Amateur Radio Hobby. Just click on the Elmer page button in the left menu to be taken to this new page. Have a question? just email it to us at: [email Elmer!](#)



[NEW - Ham Radio Search Page](#)

ARISSat-1 - Read AR Newline #175 link about the new Chicken Little Contest!

[Click HERE for info](#) Be sure to "refresh" your browser to see new content!

HF propagation conditions: 2011 Oct 03 0305 UTC

Solar flux: 131- A: 11- K: 1↓ Sunspots: 86 Radio blackouts expected

Conditions: <10MHz: Excellent 10-20MHz: Good 20-30MHz: Good

Solar data from [WVU](#), WebProp copyright © [G4ILO's Shack](#), [Put this on your website.](#)

Carl Schultz, WF6J, Webmaster

SIERRA FOOTHILLS AMATEUR RADIO CLUB
P.O. Box 1005
Newcastle, CA 95658

PLACE
STAMP
HERE

**Sierra Foothills Amateur Radio Club
2011 Membership Application**

Please Print

Name: _____ Call: _____ Class: _____ e-mail: _____

Address: _____ City: _____ State: _____ Zip: _____

Associate Name: _____ Call: _____ Class: _____

Phone Number: _____ Application: (Circle One) New Renewal

Member Dues: Circle Amounts That Apply. Applications (for new members only) received in the middle of the year will be pro rated. Contact the President or Treasurer for exact rate.

Membership: (P)	\$22.00	Name Badge: (R)	\$7.00
Associate: (Q)	\$ 7.00	Repeater Donation: (S)	\$ _____
Auto Patch Donation: (T)	\$ _____	Newsletter Booster: (V)	\$ _____
Misc. Donation: (X)	\$ _____	Christmas Donation: (W)	\$ _____
TOTAL: (Y)		\$	_____

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Date: _____ Treasurer: _____ Secretary: _____ Roster: _____

Payment: _____ Check Number: _____ Cash: _____