

# SCCARA-GRAM



## Santa Clara County Amateur Radio Association

Volume 26, Number 3

March 2010



### *Ed Hajny, W6ACW, SK*

Ed passed away at his home in Sunnyvale on January 18, 2010, at the age of 90. He was a SCCARA member since 1983. Many of us knew him as a regular on the SCCARA 2-meter net and the 40-meter Rhubarb net, as well as owner of Books, Etc.

Born in Fairfield, NE, on October 31, 1919, he enlisted in the Coast Guard in 1939 and served as a radioman in the South Pacific during WWII. Later, he worked for United Airlines in Cleveland and then in California. He retired from the Sylvania Electronics Defense Laboratory and remained in Sunnyvale.

Ed was one of the "Elmers" listed in the *SCCARA-GRAM* and was active on the air right up until the end. He would occasionally entertain the 40-meter net with a story from one of his past experiences with United or Sylvania. We always enjoyed hearing him, and he will be missed.

Don – AE6PM

## President's Prose

One of our members, Ed Hajny (W6ACW), passed away at home on January 18. You'll find more information elsewhere in this issue of the *SCCARA-GRAM*. Ed was a regular on the 40-meter Rhubarb net and the SCCARA 2-meter net.

The De Anza electronics flea market starts the 2010 season on March 13. SPARK is the first; we are next on April 10. We will probably have a table set up for donations or private sales. See [www.electronicfleamarket.com](http://www.electronicfleamarket.com).

It seems that we still have some issues to work out regarding our membership tracking. Your Board is aware of the problem. If you've paid your dues, the records will eventually get straightened out. Ignore any messages that might have been sent in error.

Be advised that the new Technician Class question pool becomes effective on July 1, 2010. If you've been studying the 2006 pool, you might want to take the exam before the end of June 2010.

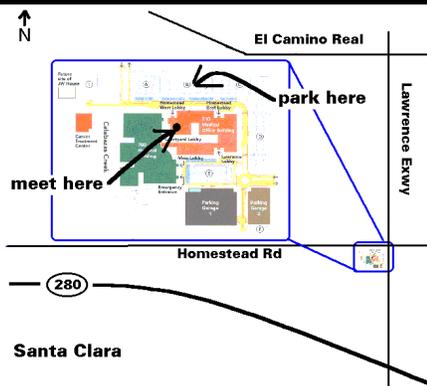
Along that line, SARA will be conducting a one-day Technician license class on March 20. In addition, FARS is holding a General License Preparation Class from April 15 through May 20.

## Calendar

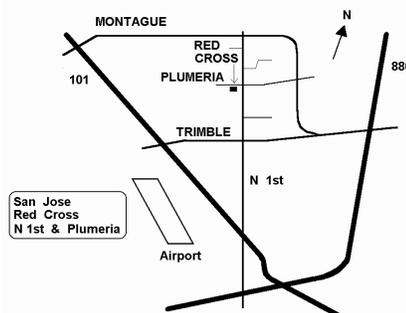
- 3/8 SCCARA General Meeting
- 3/13 Electronic Flea Market–DeAnza College
- 3/15 SCCARA Board Meeting--(San Jose Red Cross, 7:30p, all are welcome)

## General Meeting

- Day: Monday, March 8, 2010
- Time: 7:30 PM
- Place: Kaiser Santa Clara, Rm 196, 1
- Featuring: Brandon Hansen, KG6YPI, Remote operation of your home station



280  
Santa Clara



The **SCCARA-GRAM** is published monthly by the **SANTA CLARA COUNTY AMATEUR RADIO ASSOCIATION**, PO Box 6, San Jose CA 95103-0006. Permission to reprint articles is hereby granted, provided the source is properly credited.

**The deadline for articles is the last Monday of the month.**

SCCARA was formed in 1921 and became a non-profit corporation in 1947. SCCARA is an affiliate of the American Radio Relay League (ARRL). The club station is W6UW.

**Web page:** <http://www.qsl.net/sccara>.

**OFFICERS & DIRECTORS**

(all officers are also directors)

|                 |  |          |
|-----------------|--|----------|
| President       | Don Steinbach, AE6PM   | 867-3912 |
|                 | e-mail: <a href="mailto:ae6pm@arrl.net">ae6pm@arrl.net</a>               |          |
| Vice President  | Fred Townsend, AE6QL   | 263-8768 |
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| Past President  | - - -  |          |
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| Treasurer       | Ned Tufekcic, AC6YY  | 690-7250 |
|                 | e-mail: <a href="mailto:ac6yy@arrl.net">ac6yy@arrl.net</a>               |          |
| Station Trustee | Don Village, K6PBQ   | 263-2789 |
|                 | e-mail: <a href="mailto:donvillage7@yahoo.com">donvillage7@yahoo.com</a> |          |
| Director        | John Glass   |          |
| Director        | Lou Steirer, WA6QYS  | 241-7999 |
|                 | e-mail: <a href="mailto:wa6qys@aol.com">wa6qys@aol.com</a>               |          |
| Director        | Wally Britten, KA6YMD  | 293-3847 |
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| Director        | John Parks, W6JPP  | 309-8709 |
|                 | e-mail: <a href="mailto:w6jpp@arrl.net">w6jpp@arrl.net</a>               |          |
| Director        | Gary Mitchell, WB6YRU  | 269-2924 |
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**COMMITTEES**

|           |  |          |
|-----------|--|----------|
| Editor    | Gary Mitchell, WB6YRU  | 269-2924 |
|           | e-mail: <a href="mailto:wb6yru@ix.netcom.com">wb6yru@ix.netcom.com</a> |          |
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| N0ARY BBS | Gary Mitchell, WB6YRU  | 269-2924 |
|           | e-mail: <a href="mailto:wb6yru@ix.netcom.com">wb6yru@ix.netcom.com</a> |          |

**SCCARA REPEATERS**

SCCARA owns and operates two repeaters under the call W6UU:

2 meter: 146.985 - PL 114.8  
70 cm: 442.425 + PL 107.2

Phone auto-dial and auto-patch is available. The two meter repeater is located at Eagle Rock near Alum Rock Park in the foothills of east San Jose. The 70 cm repeater is located at the Regional Medical Center (formerly Alexian), east of downtown San Jose, north of 280 and 101.

**SCCARA NETS**

On our two meter repeater: Mondays at 7:30 PM, (not the second Monday--our meeting night). Coordinator: Don Village, K6PBQ. On ten meters, 28.385 MHz USB, Thursdays at 8:00 PM. Net control: Wally Britten, KA6YMD. Visitors welcome.

**N0ARY PACKET BBS**

SCCARA hosts the packet BBS N0ARY (Mt Umunhum). User ports: 144.93 (1200 baud), 433.37 (9600 baud), telnet sun.n0ary.org (login "bbs"). Sysop: Gary Mitchell, WB6YRU (packet info: [www.n0ary.org/nepa](http://www.n0ary.org/nepa))

**TELEPHONE NUMBERS**

|   |              |
|---|--------------|
| SCCARA contact Clark KE6KXO:                              | 408 262-9334 |
| ARRL/VEC Silicon Valley VE group,<br>Morris Jones, AD6ZH: | 408 507-4698 |

It's encouraging to note that the number of new FCC licenses issued each year continues to increase. The totals are: 16,368 for 2005; 21,112 for 2006; 26,728 for 2007; 28,066 for 2008 and 30,144 for 2009. At the end of 2009, there were 17,084 Novices, 334,245 Technicians, 150,970 Generals, 60,795 Advanced and 119,403 Extra class licensees. These numbers are from the March QST.

Also in the March QST is an article on a stealth 5-band inverted-L antenna made from a Hustler 5-BTV trap vertical. The article is especially interesting in that the 5-BTV was never intended to be used in this configuration. This is yet another challenge to the sometimes heard "I can't put up any kind of an antenna." Put up anything you can and live with it. If it'll take power, it will work. Forget about all the theoretical issues that you've read about - the antenna doesn't know it's not any good! Many of us operate HF mobile where the antenna efficiency is somewhere between fair and dismal but manage to get out just fine.

Finally, does anyone out there want to be the 2010 Field Day Chairman? Lots of responsibility, no pay, instant fame. Let me know if you're interested.

Don't forget the 2-meter FM net on Monday nights, and the 10 meter SSB net (28.385 MHz USB) on Thursday nights. Anyone who has a license can participate in these nets.

73,  
Don - AE6PM



## **A non-review of the Yaesu FTM-350R with APRS**

**Yaesu what were you thinking?**

**By Fred Townsend, AE6QL**

I own a Kenwood TM 700. I love the duel receive capability. Where repeaters are linked, it allows poor man's diversity receiving. I also use the cross band repeater capability to expand my HT range when I am near the mobile. That way I can use 250 mw transmit power level on the HT and have the range of a 50 watt transmitter. The rig also has a built-in TNC that runs packet or APRS (with a tiny tracker GPS). The only problem is the radio is getting a little long in the tooth. There are some new technology features I'd like to see in my radio.

Now Kenwood comes out with the TM710. In the business this is known as a mid-life kicker. You finish off the features you didn't have enough time to fully develop in the original model and release the upgraded model. The TM710 is a fine radio too but the new features are minimal and perhaps a few features like intermod rejection may have regressed. There are still some problems looking for a better solution.

For any radio that has a control head, i.e. the controls are separated from the radio, the designer must determine how the two parts of the radio will talk to each other. The control head sends control settings to the radio and the radio returns status to the control head. There are also low-level, analog, transmit and receive audio signals to be dealt with.

Control head radios have been around for over sixty years. Digital technology has simplified status and control signals but until recently there were not a lot of options for the audio connections. For instance if the mike jack is placed on the left side of the head it will be in the wrong place and will interfere with control knobs 50% of the time. Place the jack on the right and it will still be on the wrong place 50% of the time. Place the jack in the middle of the head and it's always misplaced.

Some designers simply surrender the issue and place the mike connector on the radio itself. The most frequent complaint of the TM700 is it has a 4' mike cord and a 10' control cable. Guys you can't use ten feet of control cable with a four foot mike cord. You prove you really don't get it because you offer a 20' control cable option for a whopping \$67.95! Guys, what are you thinking? The TM710 moves the mike connector to the side of the radio but doesn't solve the problem at all.

Long control cables make wonderful antennas. They pick up RF sources and all the noise your fully computerized automobile can deliver. You don't want them anywhere near your mike input signal. Guys, we need a better solution.

Bluetooth technology has been around for a while. It's not a perfect fit for amateur use but with some creative engineering the cheap microchips can be used. Yaesu came out with a motorcycle radio that made creative use of Bluetooth technology to connect to a motorcycle helmet. Some of us held our breath and said, Can you give us a radio for those of us with four wheels?

Last fall Yaesu announced their FTM-350R was awaiting FCC type acceptance. It is a dual channel VHF/UHF radio with Bluetooth. The feature list looked like it was designed to one up the TM710. Right-on Yaesu!

I have always enjoyed the rugged military like construction used by Yaesu radios. You know they are going to take abuse without complaining. On the down side I don't like having to go out and buy software to program the radio. Kenwood gives good quality, free, software. But wait, Yaesu doesn't give you a program for the FTM-350R and you can't buy one either. Do you seriously think I'm going to program those two thousand channels by hand? Sure RT systems will fill the need shortly but you couldn't you let them alpha test a radio so they could do the programming ahead of release? Cancel all those ada-boys I gave you. Boo! Hiss!

I'm a forgiving person and if the rest of the radio is OK I will buy one and wait for the programming software. When HRO said they had a FTM-350R I dashed down to have a look. There was a black cloud hanging over the building. Had they fixed the traditional audio problems? Was Bluetooth the answer?

Five minutes of hands on and I hated the radio. There was a 30mm speaker for each channel mounted on the back side of the control head. Audio sucked! My nose is bigger than 30mm (not that I listen with my nose). Couple that with a 10 cent, mounting suction cup, for the control head and it is obvious Yaesu hasn't thought very much about the control head problem. What are you guys thinking?

The initial menus were great but they got schizophrenic in a hurry. It looked like my controls were menu dependant but I couldn't tell. Navigation went from intuitive to what the hell in a few pushes of the button?

Oh well, I can forgive a lot if only the Bluetooth works. Yaesu didn't say whether I could use third party Bluetooth devices but they offer a BH1 (monaural) and a BH2 (stereo) headset. The bad news is I need a hundred dollar Bluetooth adapter unit for the radio. In other words the Bluetooth isn't really built in. But wait!

There is more. The Bluetooth is rated for a 1 meter distance between the headset and the adapter. So someone in the back seat or stepping out the car can't use the radio. If I am to be coupled with such a short leash, then it might as well be wire and I can save >\$200 on accessories.

Well I have a two channel radio and a stereo headset so I can set right and left channels for right and left ears, right? No actually on the 350 I have to set the stereo headset for monaural use if I'm going to use it for anything other than listening to the FM broadcast radio. Guys, one more time... What are you thinking?

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## Flea Market

Mark your calendars for April 10th. SCCARA will host the Electronics Flea Market at De Anza. This is two days before our regular second Monday SCCARA meeting on April 12th. We will need to get a crew of volunteers together to load the Red Cross Van, sell vendor spaces, man the food booth, police the grounds and unload the Red Cross Van. Let me know your shift preference at the March meeting. Shifts are: A 0500-0700, B 0700-0900, C 0900-1100, D 1100-1300.

De Anza 2010 Electronics Flea Market schedule:

March 13, South Peninsula Amateur Radio Klub  
**April, 10, Santa Clara County Amateur Radio Association**  
May 8, Southern Peninsula Emergency Communications System  
June 12, Foothills Amateur Radio Society  
July 10, Silicon Valley Emergency Communications System  
August 14, West Valley Amateur Radio Association  
September 11, American Red Cross  
October 9, Palo Alto Amateur Radio Association

73, Lou WA6QYS

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## ARRL News

From *The ARRL Letter*, January 28, 2010

### FCC NOTICE OF PROPOSED RULE MAKING TO REVISE AND CLARIFY VANITY CALL SIGN RULES OPEN FOR COMMENTS

Late last year, the FCC issued a Notice of Proposed Rule Making <[www.arrl.org/news/stories/2009/11/25/11220/?c=1](http://www.arrl.org/news/stories/2009/11/25/11220/?c=1)> (NPRM) -- WT Docket 09-209 <[edocket.access.gpo.gov/2010/pdf/2010-1262.pdf](http://edocket.access.gpo.gov/2010/pdf/2010-1262.pdf)> -- seeking to amend the Commission's Amateur Radio Service rules to clarify certain rules and codify existing procedures governing the vanity call sign system, as well as revise certain rules applicable to club stations. Interested parties may make comments on the NPRM in the following ways: via the Federal eRulemaking Portal <[www.regulations.gov](http://www.regulations.gov)> or via the FCC's Web site <[www.fcc.gov/cgb/ecfs/](http://www.fcc.gov/cgb/ecfs/)>. Comments must be submitted by March 26, 2010; reply comments are due no later than April 12, 2010.

### THE DOCTOR IS IN: TUBES AND TUBE REPLACEMENTS

Rick Richardson, VE7WF, of New Westminster, British Columbia, recently has acquired some vintage vacuum tube-based equipment. He recalled that years ago, there was a product on the market -- Tubesters -- solid state replacements for vacuum tubes. He asked

the ARRL's Doctor if anyone still manufactures such devices.

Here's what the Doctor had to say:

I do remember them, as well. If I recall, these were popular in the 1970s. To my knowledge, they are no longer available. You may find some on Internet auction sites from time to time. But before you go too far in that direction, I would think about what problem you are trying to solve. Old tube gear works very well with tubes, probably with better performance than "force fit" solid state replacements. In those days, many solid state receivers were quite vulnerable to overload and other problems, for example.

The nice thing is that most tubes are still available, often unused in original boxes and generally at similar prices to what they cost 50 years ago. An Internet search will turn up a number of places that sell tubes. I've always had good luck with Antique Electronic Supply <[www.tubesandmore.com/](http://www.tubesandmore.com/)>. If used within their ratings, tubes can last many years. I have WW2 vintage equipment that still works with some original tubes. I also have Drake tube based equipment from the period still going strong.

ARRL Lab Engineer Bob Allison, WB1GCM -- an amateur with years of dedicated experience with vintage gear -- notes that if the equipment has sat around for many years, the chances are the tubes are gassy. The glass part of a tube is not a perfect envelope. One molecule of air at a time leaks into the tube and after a few years, the performance degrades. If a tube hasn't been used in 20 or 30 years, it can appear to be totally dead. The trick to solve this is to let the radio run for a day or two. The filaments in the tubes will eventually burn away whatever air is inside and the tubes will often be back in good shape.

The only exception that I often make is to replace power rectifiers with plug-in solid state equivalents. I usually make my own, but they are also commercially available. My rationale is that rectifier tubes generate a lot of heat the old gear doesn't need. In addition, the filaments can draw 15 to 20 W and by removing that load from the power transformer it should stay cool and last longer. Unlike tubes, power transformers are not so easy to find. If needed, the original condition can be restored by unplugging the solid state unit and putting the tube back.

Thanks Doctor! Do you have a question or a problem? Send your questions via e-mail <[doctor@arrl.org](mailto:doctor@arrl.org)> or to "The Doctor," ARRL, 225 Main St, Newington, CT 06111 (no phone calls, please). Look for "The Doctor Is IN" every month in QST <[www.arrl.org/qst](http://www.arrl.org/qst)>, the official journal of the ARRL.

## HINTS AND KINKS: UNISTRUT ANTENNA SUPPORT

This idea comes to us from Louis Kobet, WB3DZD, of Camas, Washington.

When considering a center support for the installation of an inverted V antenna I decided on the following requirements: a strong material, easy assembly, corrosion resistant and with tilt-over capability. The initial design was to use several 10-12 foot sections of antenna mast or 2 inch galvanized pipe coupled together. Due to the cost of antenna mast and galvanized pipe being more than anticipated, an alternative, 10 foot sections of 1-5/8 inch Unistrut channel was selected.

Unistrut is a ham's Tinkertoy. It is available in 13/16, 1 1/4 and 1-5/8 inch widths, 10 and 20 foot lengths and in 12, 14 and 16 gauge sizes. It is made with dipped surface protective treatments from electro-deposition acrylic green to "hot dipped" galvanized coatings and multiple channel designs (including telescoping sections). A vast selection of brackets and fasteners is available and it is continuously slotted for easy guying. The design and choices for project use are limited only by the creativity of the

user.

The tilt over base support consisted of a treated 4x4" inch landscape post anchored in concrete. (The wooden post was moisture sealed at the top using the dipped coating used for hand tools and along the length with several coats of wood sealer.) The Unistrut mast pivot point on the support base was a 3 inch lag bolt about 50 inches above ground. In retrospect, a section of Unistrut could have been set in the concrete as the antenna base support.

The Unistrut mast preparation consisted of black paint (except for areas where the sections were bolted together) and the addition of a hoisting pulley mounted at the end of a 2 foot PVC pipe (see Figure 1). One problem encountered was in bolting the Unistrut together. Bolting back-to-back against the base of the "U" was not possible because I couldn't get a socket on the bolt head inside the Unistrut channel. To get around this the Unistrut was bolted with the open "U" ends face to face. Square Unistrut channel would have eliminated this issue. The three Unistrut sections were bolted together with about a 12 inch overlap.

An antenna hoisting line was fed through the pulley and mast section carried to the base support for mounting. After attaching the mast to the pivot point it was tilted up into position, plumbed and secured in place with three additional lag bolts.

The V antenna was spread out, transmission cable attached and hoisted to the top of the mast. The ends of the V antenna were attached to a 12 foot landscape treated 4x4" that was secured to the property fence.

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# Meeting Minutes

## General Meeting, Feb. 8, 2010



SCCARA met at Hometown Buffet in Santa Clara, CA. There was no speaker. Prior to eating Don Steinbach, AE6PM had all in attendance introduce themselves & Any guests.

Jeannie Felix, KG6YOR-Secretary

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## Board Meeting, Feb. 15, 2010



Red Cross, 2731 N. 1st St., San Jose, CA

The SCCARA Board Meeting was called to order @ 7:40 pm by AE6PM, Don Steinbach

### ATTENDANCE

AE6PM, DON STEINBACH, PRESIDENT KG6YOR, JEANNIE FELIX, SECRETARY AC6YY, NED TUFEKIC, TREASURER K6PBQ, DON VILLAGE, TRUSTEE NU6P, JOHN GLASS, DIRECTOR WA6QYS, LOU STEIRER, DIRECTOR KA6YMD, WALLY BRITTEN, DIRECTOR WB6YRU, GARY MITCHELL, DIRECTOR W6JPP, JOHN PARKS, DIRECTOR

### EXCUSED ABSENCE

AE6QL, FRED TOWNSEND, VICE PRESIDENT

### VISITORS

AE6MV, DAVID PAUL KF6OTD, GWEN STEIRER

### ANNOUNCEMENTS

Don Steinbach, AE6PM asked the board to review the agenda. There were no changes. Don announced the deadline for the

scara-gram is 02/22/10

Don Steinbach announced we need to make a write up for Ed Hajny, W6ACW - Silent Key

John Parks announced the March Program is Brandon Hansen, KG6YPI - Remote operations of your HF base station. www.Remotehams.com

#### TREASURER'S REPORT

\$5749.92 (Checking) \$3845.91 (Savings) \$169.53 (Cash)  
TOTAL \$9765.36

Gary Mitchell is still working on the bylaws

David Paul reports he is still working w/ Ben Vickers to get the replacement controller for the W6UU 2-meter repeater programmed.

David Paul reports return of M.O.U but it has not yet been confirmed.

Gary Mitchell is asking for guidance in working on the bylaws Gary asked if we ever might want to upgrade our non-profit status to 501-(c)3 (Public Benefit)

John Glass reports the kenwood repeater is the best choice for purchase & it costs \$1175.00, doesn't include software and cable which costs &150.00 which still puts everything under \$1600.00 (Retail cost \$2600.00) but is not available due to prior vendors illness and we had to secure a new vendor that raised the price from \$1700.00 allocated \$2000.00 dollars total cost.

John Parks made a motion to allocate \$2000.00 for new 440 repeater. Gary Mitchell seconded the motion. 6 - in favor, 1 - against, 1 - abstained Motion carried

Dec 14 Board meeting minutes are approved. Don Village made a motion to accept minutes as is. Gary Mitchell seconded the motion. Motion carried

Jan 18 Board Meeting Minutes are approved. Don Village made a motion to accept minutes as is. John Parks seconded the motion. Motion Carried There were corrections. The board voted to accept as amended.

John Parks made a motion to pay ASVARO for flea market. Wally Britten Seconded the motion. Motion Carried

Secretary to Pick up the mail, review it for any new or renewal membership correspondence and update the membership database accordingly. Bring the mail to the next meeting and ensure the editor receives any newsletters from other clubs and that the treasurer receives any financial items such as checks or bill payable.

Property List is still being worked on.

NO VICE PRESIDENT REPORT - ABSENT

#### STATION TRUSTEE

02/27 Club Station open at Red Cross 03/27 Club Station open at Red Cross

Weather Permitting raise vertical antenna another 10 feet

Christmas reservations made for holiday party

#### EDITOR

Adjust number of scara-gram pages to lower costs for continued

newsletters.

Former newsletters from other clubs missing and a few have been returned.

BBS No Changes

REPEATER No Changes

WEBMASTER No Changes

Meeting Adjourned at 9:15 pm

Jeannie Felix, KG6YOR, Secretary

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## Need Help?

Amateurs have a long history of helping each other. An experienced amateur who helps another is traditionally called an "Elmer." If you have a question or problem, you are encouraged to ask one of SCCARA's Elmers. Below is a list of topics including who to contact for each.

If you consider yourself to be reasonably competent in at least one area of amateur radio and would be willing help others, please fill out an Elmer form from the club secretary.

Antennas, feed-lines, tuners: WB6EMR, W6JPP, K6PBQ, WB6YRU

Lightning protection, grounding: WB6YRU

Station set-up, equipment: K6PBQ, W6JPP

TVI/RFI: WB6YRU

Homebrew projects, construction: KD6FJI, WB6YRU

Computers: older IBM PC: WB6YRU

Packet Network (BBS, forwarding): WB6YRU

Code operating and installations: WB6EMR, K6PBQ

DX (long distance/propagation): WB6EMR

Emergency operating/preparedness: WA6QYS

HF operating techniques (SSB, CW): WB6EMR, K6PBQ

Legal/FCC rules: WB6YRU

SCCARA (club inner workings): K6PBQ, WB6YRU, WA6QYS

EchoLink: KK6MX

WB6EMR, James D. Armstrong, Jr.,  
evening & msg: (408) 945-1202

KD6FJI, Lloyd DeVaughns,  
(408) 225-6769 e-mail: kd6fji@arrl.net

KK6MX, Don Apte, (408) 629-0725  
e-mail: kk6mx@aol.com

W6JPP, John Parks, (408) 309-8709  
e-mail: w6jpp@arrl.net

K6PBQ, Don Village, (408) 263-2789  
e-mail: donvillage7@yahoo.com

WA6QYS, Lou Steirer, (408) 241-7999  
e-mail: wa6qys@arrl.net

WB6YRU, Gary Mitchell, (408) 269-2924  
packet: home BBS NOARY  
e-mail: wb6yru@ix.netcom.com

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**SCCARA**

Santa Clara County Amateur Radio Association  
PO Box 6  
SAN JOSE CA 95103-0006

Affiliate of the ARRL,  
American Radio Relay League



**FIRST CLASS**

**ADDRESS SERVICE REQUESTED**

**SCCARA Membership Form for 2010**

If none of your info has changed, fill in name and call only

Name: \_\_\_\_\_ Call: \_\_\_\_\_ Class: E A G T+ T N

Address: \_\_\_\_\_ Licensed since (yr): \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_ - \_\_\_\_\_ Licence Expiration  
Date (mo/yr): \_\_\_\_\_

Telephone: ( ) \_\_\_\_\_  New Member  Renewal  
 I'm also a member of the ARRL

E-mail: \_\_\_\_\_

Memberships begin January 1 and expire December 31.

**If renewing:** annual membership dues (base rate) are: \$20 Individual, \$25 Family, \$10 Student (under 18)

**For new members:**

If joining in January: base rate

If joining in February through October: base rate x (11 - month) x 10% (e.g. for June, that would be: base rate x 50%)

If joining in November or December: free for November and December if paying the base rate for the following year

\$ \_\_\_\_\_ **Dues payment for:**  individual  family  student

For family memberships (at the same address), please include a separate form for each family member.

**I want the newsletter by:**  U.S. Mail  internet (make sure your e-mail address is legible and correct)

Give this completed form (or copy) with payment to the Secretary or Treasurer at any meeting or mail to the club address.