

## Presidents Corner

**Club Meeting.** Our next meeting (a week earlier than usual because of Thanksgiving) is Friday, November 17th at 7pm. Just in time for your holiday shopping and enjoyment, Howard Califf, W6HOC, is pleased to show an assortment of the finest new accessories, gadgets, goodies, and must-have toys for the complete radio amateur's station.

**Am-Tech DAY.** The next Amateur Radio Technology Day is scheduled for December 2<sup>nd</sup> at the Stanford Linear Accelerator Center. Check the FARS web site ([www.fars.k6ya.org/amtechday/](http://www.fars.k6ya.org/amtechday/)) for the latest details and changes. Subscribe to the FARS Announcement list ([www.fars.k6ya.org/mail/](http://www.fars.k6ya.org/mail/)) to make sure you get an email reminder.

**FARS/PAARA Winter Banquet 2007** is scheduled for Friday, January 19<sup>th</sup>, 2007 at 6pm. Our speaker is Alan Eshleman, K6SRZ, who is a medical doctor by profession and a writer. He is also a ham who has worked a number of DXpeditions including: T33C, T30CA, T32CK, and Kure Atoll in 05. The banquet is always a fabulous fare and a lot of fun, so don't miss it! We are now taking reservations, so use the signup form in the RELAY, or go to the web site to sign up: <http://www.fars.k6y.org/banquet>.

**Membership.** A new year will soon be upon us, so members should think about renewing for 2007. Remember your membership entitles you our monthly newsletter, voting rights, and supports FARS educational programs.

**Elections.** The November 17<sup>th</sup> meeting is our annual meeting of FARS members. All members are encouraged to attend and vote on the board of directors or any other matters that may come before the meeting.

At the October 27<sup>th</sup> meeting the following directors were nominated for election for a three year term to the FARS board of directors: Mikel Lechner, KN6QI; Steve Stearns, K6OIK; Dave Cooper, KE6PFF; Phil Hawkins, KA6MZE; Robert Flemate, KE6TFU.

- de Mikel, KN6QI

## Upcoming Events

|             |   |
|-------------|---|
| Nov 17      | 7:00 PM, <a href="#">Club meeting</a> , Covington School  |
| Dec 2       | 8 AM to 9 PM, <a href="#">Am-Tech Day</a> , SLAC, 8AM-9PM |
| Dec 7       | 7:30 PM, Board Mtg at the Los Altos Town Crier            |
| Dec 15      | 7:00 PM, <a href="#">Club meeting</a> , Covington School  |
| Jan 19, '07 | 6:00 PM, FARS/PAARA Banquet                               |
| Thursdays   | 8:00 PM, FARS net, 145.230(-), 100 Hz PL                  |

See more events, [FARS Calendar <http://www.fars.k6ya.org/events/calendar>](http://www.fars.k6ya.org/events/calendar)

## November Club Meeting

**Date:** Friday, November 17, 2006.

**Time:** Socializing at 7 pm, Meeting at 7:30

**Place:** Covington School, 205 Covington Road, Los Altos

**Speaker:** Howard Califf, W6HOC

**Topic:** Goodies for the Complete Ham Shack

**Summary:** In time for your holiday shopping and enjoyment, Howard Califf, W6HOC, is pleased to show one and all an assortment of the finest new accessories, gadgets, goodies, and must-have toys for the complete radio amateur's station.

We will raffle off a grand prize at this meeting (winner's choice): a "Super Antennas" MP-1 Portable antenna covering 7 MHz through 450 MHz or, possibly, a Yaesu radio.

The club offers Anderson Power-pole crimping service and refreshments at the meeting. Be sure to attend for an enjoyable evening. Don't forget to bring your questions to Dr. Know-it-all.

## October Meeting Report

Chris Verges, KG4YSN, spoke on Communications Network Design for Emergency Communications. Chris is part of the Silicon Valley Wireless Users & Experimenters (SVWUX, [www.svwux.org](http://www.svwux.org)), a non-profit group of wireless enthusiasts devoted to data networking using wireless technologies. They are working to set up wireless networks for emergencies that augment existing HAM networks. He talked about how the wireless networks, that use IP-based communications are set-up, configured for traffic, and how prioritized traffic is handled.



**Chris Verges, KG4YSN**



**Doña Kerns, KI6DAR**

Doña Kerns, KI6DAR, won the raffle and took home the Yaesu VX-170 Radio. The Wish You Were Here number for Del Harbold, K6JPX, was chosen. Unfortunately, Del was not present.

## FARS Board Meeting Minutes

7 September 2006

Los Altos Town Crier offices

Meeting started 7:42 pm

### Present:

Richard Baldwinson (N6ATD), Dave Cooper (KE6PFF), Robert Flemate (KE6TFU), Ron Green (KG6RLG), Phil Hawkins (KA6MZE), Mikel Lechner (KN6QI), Kristen McIntyre (K6WX), Barbara Neuhauser (AE6RM), Rob Riley (KG6HVW)

### Minutes

Minutes of the Board meeting on 3 August 2006 will be discussed and amended during the next (October) meeting. FARS program suggestions were discussed.

### Financial update

Treasurer Dave Cooper (KE6PFF) reported on the current balance and on Field Day expenses.

### Winter Banquet

Sponsored by FARS and PAARA but open to anyone interested in amateur radio

Scheduled for Friday evening, 19 January 2007, at Michael's in Shoreline Park in Mt. View

Menu same as in 2006: Prime Rib, Chicken Florentine, Salmon, or Vegetable Brochette

Prices TBD

Expenditure of \$1000 for prizes was unanimously approved; prize selection will be determined by Ron Green (KG6RLG) of FARS and Jim Rice (K6AK) of PAARA.

Banquet speaker not yet selected.

Ron Green (KG6RLG) suggested that a Planning Committee be formed including two members from FARS and two members from PAARA. Ron and Dave Cooper (KE6PFF) will represent FARS.

Dave Cooper (KE6PFF) suggested that attendees be encouraged to wear their club badges if they are members of any radio club. Unaffiliated attendees will be provided with name tags when they arrive at the banquet.

Dave Cooper (KE6PFF) stressed the need for publicity and suggested putting up posters at such places or events as the two HRO's, Halted, Pacificon, Am-Tech Day, etc.

### Flea Market

Ron Green (KG6RLG) has continued to organize preparations for the 14 October Flea Market.

Kevin Weiler (KG6YYW) will deliver left-over Field Day soda and water to the Red Cross on Friday night before the Flea Market. Ron thought that another case of Coca Cola is needed.

Howard Takaoka (KG6GRO) may be able to pick up doughnuts on Saturday morning. Ron still needs to investigate how many doughnuts to buy, but he thinks it might be reasonable to cut back by 33% because Pacificon will draw people away from the Flea Market.

Volunteers are needed to set up and take down the canopy.

Dave Cooper (KE6PFF) suggested that we should optimize our choices for food sales:

We should ask ASVARO to collect information about food sales.

We should try offering different items such as crackers, hot dogs, chips, etc and see if we earn more money than we do from coffee, doughnuts, and soft drink sales.

Food not sold at the Flea Market could be used at Am-Tech Day.

### FARS station site

Phil Hawkins (KA6MZE) had a promising "handshaking" meeting with a representative from a Middle School in Mountain View.

Phil prepared a draft of a station definition document for internal use by FARS.

Dave Cooper (KE6PFF) suggested that we convert Phil's document into a full presentation document including details of space and utilities requirements for the FARS station, a floor plan, and RF safety documentation

### Am-Tech Day

The Am-Tech Day on 9 September will be the twenty-fourth of the series. The ARRL Section Manager will give a presentation about Marketing for Amateur Radio.

The Am-Tech Day on 7 October will feature special event station N6T in celebration of two years of Am-Teching

Dave Cooper (KE6PFF) will ask Dale O'Harra (NX6S) to bring his tennis-ball launcher to Am-Tech Day and will explore the cost of buying a launcher for FARS.

Dave is writing an article about Am-Tech Day for publication in QST and possibly CQ.

Meeting adjourned at 9:14 pm

{notes taken by Barbara Neuhauser (AE6RM)}

## FARS/PAARA 2007 Winter Banquet

Mark your calendars. The FARS/PAARA annual banquet will take place on Friday evening, January 19, 2007. FARS is again teaming up with [PAARA](#) to put on this special ham radio event. The speaker for this banquet is Alan Eshleman, K6SRZ. Alan has worked a number of DXpeditions including: T33C, T30CA, T32CK, and Kure Atoll in 2005. Past banquets have been very enjoyable and had large attendance with great speakers and presentations, wonderful dinners, and great prizes. The banquet will be held at Michael's at Shoreline in Shoreline Park in Mountain View.

Schedule: 6:00 pm - Open Bar (No Host)  
7:00 pm - Dinner  
8:00 pm - Presentation

Attendance at the banquet is open to anyone, but reservations and payment in advance is required. Reservations may be made online at <https://www.fars.k6ya.org/cgi-bin/b-signup> or with a printed form at <http://www.fars.k6ya.org/events/banqsignup> or in this newsletter. Payment with your reservation must be received by January 15th at 12 noon. For more information see <http://www.fars.k6ya.org/events/banquet>.

We will be raffling ~\$1000 in valuable prizes at the banquet. Raffle tickets will be sold on site for \$1/ticket or \$5/6 tickets. We will have a NO HOST BAR for soft drinks, wine, beer, etc. Don't Miss it! This is going to be a fun time for everyone, so let's make it a big turnout. See you there!



**Bob, WA2CFN and Mike, W6WZ  
2006 Banquet Prize Winners**



**Robert Schmieder, KK6EK  
2006 Banquet Speaker**

## HAM Radio License Class

Study Session, Followed by Exam: The Bay Area Educational Amateur Radio Society is sponsoring a one day study session for Technician or General class theory, followed by testing. Morse code tests will not be given. Our next session will be on January 13, 2007 from 8 am to 5 pm at the Coyote Point Yacht Club in San Mateo. Go to our website: <http://baears.com/> for more information and registration.

Class size is limited, reservations are required.

Ross Peterson, WB6ZBU  
650-349-5349, [wb6zbu@arrl.net](mailto:wb6zbu@arrl.net)

## CLUB INFORMATION

President: Mikel Lechner, KN6QI  
Vice President: Steve Stearns, K6OIK  
Treasurer: David Cooper KE6PFF  
Secretary: Rob Riley, KG6HVW  
Radio Officer: Phil Hawkins, KA6MZE  
Training Officer:  
Relay Editor: Mark Hardy, KG6GRR

FARS Board: Dick Baldwinson N6ATD, Robert Flemate KE6TFU, Pink Foster KG6ILA Ron Green KG6RLG, Kristen McIntyre K6WX, Barbara Neuhauser AE6RM, Kevin Weiler KG6YYW.

Station Trustee: Stan Kuhl, K6MA  
FARS Web Page: <http://www.fars.k6ya.org>  
Download Relay: <http://www.fars.k6ya.org/relay>

Club members and non-members are encouraged to subscribe to the FARS Announcement list by browsing [www.fars.k6ya.org/mail](http://www.fars.k6ya.org/mail), clicking on Subscribe/Unsubscribe and following the instructions under "Subscribing to fars-announce."

You may submit announcements to the FARS Announcement at [fars-announce@svpal.org](mailto:fars-announce@svpal.org). The list is moderated and messages will be posted as approved by the list moderator.

The FARS board of directors may be reached at [fars-board@svpal.org](mailto:fars-board@svpal.org)

Club meetings are held at 7 PM on the fourth Friday of each month except January (Winter Banquet); and sometimes there are changes for June (for field day) and Nov. & Dec (for holidays).

Annual club membership is \$20. Club badges are \$8. Visitors are always welcome! Directions in this newsletter. Talk-in: N6NFI (145.23-, 100 Hz) or W6ASH repeater (145.27-, 100 Hz).

FARS *Relay* is the official monthly newsletter of the Foothills Amateur Radio Society. Contributions to the newsletter from members, family, and guests are earnestly solicited! Contributions subject to editing and/or compression. ASCII files via Internet preferred; but all readable forms welcome.

Here is how to reach the editor:

Mark Hardy, KG6GRR  
Mail: 2998 Jerald Avenue  
Santa Clara, CA 95051  
Voice: 408-243-0701 (Before 9 PM, preferred)  
Email: [kg6grr@arrl.net](mailto:kg6grr@arrl.net), At FARS meetings.

# Dr. Know-It-All

November 2006

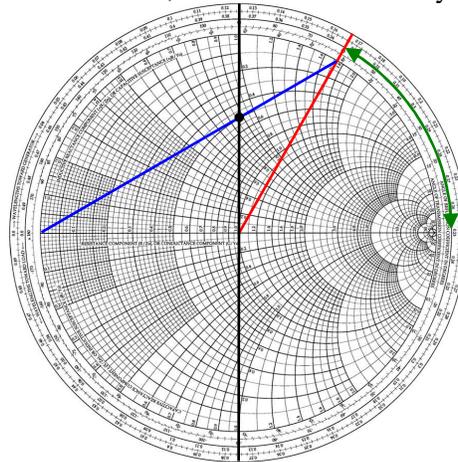
**Dear Doctor,**

After reading about how to calculate tangents and cotangents and their inverses on a Smith Chart in October's edition, I'm curious about other trigonometric functions. Can you calculate sines and cosines and their inverses on the Smith Chart too?

Anonymous

**Answer:** The inventor of the Smith Chart, Phillip H. Smith, wrote "the sine and cosine functions of  $\alpha$  are not directly obtainable from the Smith Chart" [1]. Apparently, Smith was stumped. Sine and cosine are hardly more work to calculate than tangent and cotangent, described last month. Here is how to do it.

First, draw a vertical line from the topmost point to the bottom point of the Smith Chart, passing through the center point of the chart. This reference line is handy to have on the chart and will be used in what follows. Next, to compute  $\sin\theta$  and  $\cos\theta$  for any angle  $\theta$  between  $-90$  and  $+90$  degrees, place a dot on the perimeter of the chart at reflection coefficient angle  $\theta$ . The dot will lie in the right half of the chart because  $\theta$  is between  $-90$  and  $+90$  degrees. Now, draw a straight line from the dot to the leftmost (zero impedance) point on the chart. This line intersects the vertical line, and miraculously, the intersection point has coordinates  $r = \cos\theta$  and  $x = \sin\theta$ , which are read directly from the chart.



$$\theta = 60^\circ$$
$$r = \cos \theta = \frac{1}{2}$$
$$x = \sin \theta = \frac{\sqrt{3}}{2} \approx 0.866$$

Inverse sine and cosine are obtained by reversing the procedure. Locate the sine value on a reactance arc or the cosine value on a resistance circle, and place a dot where the arc or circle intersects the central vertical line. Extend a line from the leftmost (zero impedance) point through the dot to the perimeter of the chart, at which point the angle of the reflection coefficient is read. This angle is the inverse sine or cosine.

A simple proof of the procedure given by Senise runs as follows. The angle  $\theta$  is a supplementary angle of the triangle formed by the two inclined lines in the figure. Because the triangle is isosceles, its two acute angles are  $\theta/2$ . Hence, the line extending from the leftmost point to the perimeter has a slope of  $\tan(\theta/2)$ . This means that the point of intersection with the central vertical line occurs at height  $v = \tan(\theta/2)$ , i.e. at reflection coefficient  $\Gamma = j \tan(\theta/2)$ . The impedance corresponding to  $\Gamma$  is given by the formula

$$z = r + jx = \frac{1 + \Gamma}{1 - \Gamma} = \frac{1 + j \tan(\theta/2)}{1 - j \tan(\theta/2)} = \frac{1 - \tan^2(\theta/2) + j2 \tan(\theta/2)}{1 + \tan^2(\theta/2)} = \cos \theta + j \sin \theta$$

So we obtain  $r = \cos\theta$  and  $x = \sin\theta$ . QED.

That's it for this month. You can send your comments or questions about any aspect of Amateur Radio to Dr. Know-It-All. Written comments and questions are accepted at the monthly meetings of the Foothills Amateur Radio Society, by email to FARS officers and board members, or through the FARS web site at <http://www.fars.k6ya.org>.

## References

1. Phillip H. Smith, *Electronic Applications of the Smith Chart*, Noble Publishing, 1995, ISBN 1884932398. First published in 1969 by McGraw-Hill.
2. J.T. Senise, "Trigonometric Functions and the Smith Chart," *IEEE Trans. Microwave Theory Tech.*, vol. 21, no. 8, pp. 569-570, August 1973.

FARS Membership Form

PLEASE fill out the form for all new/renewal memberships.

**FARS 2006 MEMBERSHIP RENEWAL FORM** Date: \_\_\_\_\_

Name(s) & Callsign(s) & Class (E-A-G-T-N-None): \_\_\_\_\_

Mailing Address: \_\_\_\_\_

Home phone: \_\_\_\_\_ Work phone: \_\_\_\_\_

Fax (H or W?) \_\_\_\_\_ Packet BBS Address: \_\_\_\_\_

E-mail: \_\_\_\_\_ ARRL Exp Date(s): \_\_\_\_\_

Preferred modes: (e.g. HF-SSB/VHF/QRP/Other): \_\_\_\_\_

I'm willing to Elmer new hams with: \_\_\_\_\_

Special topics of interest / suggestions for club meeting speakers:

Dues: \$20 per year, new members add \$8 for badge fee. **Please note:** Membership runs from January 1 to December 31.

**FARS/PAARA 2007 WINTER BANQUET SIGNUP (January 19, 2007 at Michael's at Shoreline)**

| <u>Name &amp; Call</u> | <u>Meal Choice</u> | <u>Amount</u> |
|------------------------|--------------------|---------------|
| You _____              | _____              | _____         |
| Email _____            | _____              | _____         |
| Guest1 _____           | _____              | _____         |
| Guest2 _____           | _____              | _____         |
| Guest3 _____           | _____              | _____         |
| Guest4 _____           | _____              | _____         |
|                        | Total              | _____         |

This form may be used for membership renewal, banquet signup or both.

Send your check payable to FARS, to:

David A. Cooper, KE6PFF  
 PMB 41  
 270 Redwood Shores Parkway  
 Redwood City, CA 94065-1173

| <b>Choice</b> | <b>Menu Description</b>            | <b>Price</b> |
|---------------|------------------------------------|--------------|
| Beef          | Roast Prime Rib of Beef            | \$ 38        |
| Chicken       | Breast of Chicken, Florentine      | \$ 31        |
| Fish          | Broiled Salmon, Lemon Beurre Blanc | \$ 33        |
| Veg           | Vegetarian Brochette w/ Wild Rice  | \$ 26        |



How to get to FARS Club meetings (Visitors always welcome)

Meetings are held at the Covington Elementary School (directions below) on the fourth Friday. Socializing at 7 PM with the regular meeting at 7:30 PM. There may be changes in the meeting dates for January, June, November, and December.

**DIRECTIONS:**

**From Interstate 280.** take the El Monte exit Northeast. Cross Foothill Expressway. (A) At the first traffic light turn right on Covington. (B) Immediately at the fork take the left street (Covington). Go about 1/10th of a mile. Turn left into the parking lot. The gym is the tall building to your right with red and white stripes.

**From Foothill Expwy.,** take the El Monte exit and go Northeast; then follow directions as above at point (A).

**From US101 or El Camino:** take San Antonio Road west (to Foothill Expressway). Then follow directions above at point (A).

**TALK-IN** via the [N6NFI](#) (145.230-; 100Hz PL) repeater or the [W6ASH](#) 145.27- (100Hz PL) repeater.

# FARS Meeting

## FRIDAY 11/17/06

### Covington School