

## May Meeting

**Date:** May 23, 2003 - 7 PM socializing, meeting starts at 7:30 PM.

**Place:** Loyola Elementary School, 770 Berry Avenue, Los Altos. Directions to the meeting are later in the newsletter.

**Speaker:** Steve Stearns, K6OIK

**Subject:** The Ultimate Dipole

**Summary:** The best length for a dipole is not 1/2 wavelength as is commonly believed. Building on the philosophy that antennas should be designed for optimum radiation behavior rather than other superfluous criteria, we show how to design better dipole antennas.

We will have "Show and Tell" before the presentation. Additionally, during the break, you can submit written questions to Dr. Know-it-all on amateur radio related topics and see your questions answered in the Relay.

- Steve, K6OIK

## April Meeting Report

Jim Peterson, K6EI (see photo below), spoke on "Zen and the Art of Top Band Operating." Jim dispelled some myths of operating in the 1800 to 2000 kHz HAM band. He covered operating, propagation, DX possibilities, and antennas.



Jim Peterson, K6EI



Dave, KE6PFF

Dave, KE6PFF (see photo above), carried away the Handheld Transceiver.

The number for Frank Weiss, K6FCW, was chosen for the "Wish You Were Here" prize. Unlike most meetings, Frank was not present.

**Register Now For the  
No-Code Technician HAM Radio Course  
Tell your friends and family  
More information later in this newsletter**

## Presidents Column

**Incorporation.** The Articles of Incorporation have been mailed to the Secretary of State of California and we are waiting to hear back.

**Flea Market.** The next Foothill Electronics flea market is Saturday June 14. This one is sponsored by SPECS (South Peninsular Emergency Communication Service). You can find the schedule on the FARS web site [www.fars.k6ya.org](http://www.fars.k6ya.org). Spread the word about this year's flea markets.

**Field Day.** Is coming in about 6 weeks. We need volunteers to sign up for setup and run the various stations we will have this year. We are planning to run a 2A operation this year consisting of a HF SSB voice station and a combination CW/Digital station. In addition, we will have a VHF/Satellite station. There is a BBQ on Saturday open to all members and guests.

This is a great opportunity to try out different communication modes and to participate in a low-key, no pressure contest. Novices are welcome so don't be intimidated. You will get a lot of practical experience in just a couple of days. And most importantly, this is a lot of fun. **Don't miss it!**

We need setup crews Friday 12pm, and again Saturday 8am. We need a takedown crew at 11am on Sunday. We also need operators, loggers, and other help from 11am Saturday through 11am Sunday. Finally, we need help with the BBQ on Saturday afternoon.

**We cannot do Field Day without your help, so participate!**

Our captains are:

- HF SSB Paul Zander, AA6PZ
- CW/Digital Mikel Lechner, KN6QI
- VHF/Satellite Phil Hawkins, KA6MZE
- BBQ Peter Griffith, WA6VAQ

- de mikel, kn6qi

## Secretary's Report

The FARS Board held its monthly meeting on the evening of May 6, 2003. Members present were Mikel, KN6QI, Frank, K6FCW, Howard, KG6GRO, Stefan, KG6MAO, Omri, AA6TA, Herb, KF6BKL, Dick, N6ATD, Mark, KG6GRR, and Martin, KD6WJW. As part of the incorporation process, the "Waiver of Notice and Consent to Holding of First Meeting of Board of Directors" was signed by the president, treasurer, and secretary. The payment of outstanding bills was approved. Most of the time was spent discussing Field Day preparation issues.

- Martin, KD6WJW

## Upcoming Events

May 23 7:00 PM Club meeting, Loyola School  
 Jun 3 7:30 PM Board Meeting, Los Altos Town Crier  
 Jun 14 Dawn to Noon, Foothill Flea Market  
 Jun 20 7:00 PM Club meeting, Loyola School  
 Jun 28-9 Field Day  
 Thursdays 8:00 PM, FARS net, 145.230(-), 100 Hz PL  
 Wednesdays 9:00 PM, New HAM net, 147.39 (+), 151.4 PL  
 See more events, [FARS Calendar](http://www.fars.k6ya.org/events/calendar.shtml)  
<http://www.fars.k6ya.org/events/calendar.shtml>

Last month we stepped through an improved design procedure for designing twin-lead J-pole antennas. The final installment of the saga of the twin-lead J-pole will be next month.

With Field Day and summer camping season approaching, this month we address the following question.

**Question:** Can you provide information on solar rechargers for HT batteries? (From AA6PZ)

**Answer:** Although commercial solar 12-volt power supplies can be purchased, it's fairly easy to make one. If weight is a consideration, then amorphous silicon panels are the way to go. They are durable and flexible and don't require the heavy protective frame that crystalline silicon panels do. Such panels are made by Iowa Thin Film Technologies. A panel rated at 12 V and 50 mA is about 10 x 3 inches and weighs about 0.5 ounces. Iowa Thin Films does not sell directly to the public, so you have to buy the panel from a dealer, such as Sundance Solar Products

It would take too many panels to supply an HT's current draw to operate the HT off the panel directly. So the strategy is to operate the HT from its battery while trickle charging the battery continually. This strategy works fine for NiCad and NiMH batteries, but not Lithium-ion types.

Two or three of the panels just described can be wired in parallel. The HT is connected to the panels through a series diode. The diode prevents the HT battery from discharging back through the solar panel at night or when the sun disappears behind a cloud. The diode also drops the voltage to the HT battery by about 0.7 V. A series resistor can be added to drop the voltage further if needed.

The first step is to calculate the charging current of the HT battery. The rule of thumb is the charging current should not exceed  $I = C/10$ , where C is the mA·H rating of the battery. For trickle charging, I like to use C/15. So a 650 mA·H battery needs a current of 43 mA, and the current should not exceed 65 mA. Two of the panels described above with a series diode will do the job nicely – no series dropping resistor is required.

In situations where a series dropping resistor is needed, its value can be calculated from the panel (or array of panels) nonlinear V-I curve obtained from the manufacturer's product spec sheet. The voltage at the desired current is read from the curve. If this voltage is greater than 12 V, a series resistor is used to deduct this excess voltage. The resistor is found using Ohm's Law:

$$R = \frac{E_{resistor}}{I} = \frac{E_{panel} - E_{diode} - 12}{I}$$

So, for example, if  $E_{panel}$  is 14 V at a current of 43 mA and the voltage drop across the silicon diode is 0.7 V, then  $R = 1.3/0.043 = 30$  ohms.

When wiring everything up, make sure to get all polarities (panel, diode, and HT power plug) right.

That's all for this month. Next month we'll take a closer look at twin-lead antennas, and the J-pole in particular. Keep those questions coming.

CLUB INFORMATION

President:	Mikel Lechner, KN6QI
Vice President:	Steve Stearns, K6OIK
Treasurer:	Frank Weiss, K6FCW
Secretary:	Martin Liberman, KD6WJW
Radio Officer:	Omri Serlin, AA6TA
Training Officer:	Mike Zensius, KG6GUE
Relay Editor:	Mark Hardy KG6GRR
FARS Board:	Dick Baldwinson N6ATD, Herb Davidson KF6BKL, David Cooper KE6PFF, Howard Califf KE6PWH, Howard Takaoka KG6GRO, Stefan Goette KG6MAO.
Station Trustee:	Stan Kuhl, K6MA
FARS Web Page:	<a href="http://www.fars.k6ya.org">http://www.fars.k6ya.org</a>
Download Relay:	<a href="http://www.fars.k6ya.org/relay">http://www.fars.k6ya.org/relay</a>

Club embers 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 also submit an announcement 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 \$20, family \$25. Club badges are \$5.75. Visitors are always welcome! Directions on the back page. Talk-in: N6NFI (145.23-, 100 Hz) or W6ASH repeater (145.27 or 224.36).

The 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 or diskettes 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)  
 Fax: 408-243-0701  
 Email: [kg6grr@arrl.net](mailto:kg6grr@arrl.net), At FARS meetings.

## Last Signal!

Pioneer 10 spacecraft sends last signal: Talk about weak-signal DX! NASA says that after more than 30 years, it appears the venerable Pioneer 10 spacecraft has sent its last signal to Earth. Pioneer's last, very weak signal was received on January 22. NASA engineers report Pioneer 10's radioisotope power source has decayed, and it may not have enough power to send additional transmissions to Earth. NASA's Deep Space Network (DSN) did not detect a signal during the last contact attempt February 7. The previous three contacts, including the January 22 signal, were very faint with no telemetry received. The last time a Pioneer 10 contact returned telemetry data was last April 27. NASA plans no additional contact attempts for Pioneer 10, which is 7.6 billion miles from Earth. At that distance, it takes more than 11 hours 20 minutes for the radio signal to reach Earth. More information is available on the Pioneer 10 Web page <<http://nssdc.gsfc.nasa.gov/nmc/tmp/1972-012A.html>>.

From "The ARRL Letter," Vol. 22, No. 09, February 28, 2003

## Technician Class

Do you know of anyone wishing to become a HAM operator? Perhaps there is someone you know who wants to learn more of HAM radio. Tell them about this upcoming course.

**WHAT:** The Foothills Amateur Radio Society presents the "No [Morse] Code Technician Class" amateur radio license course. During this course, you will not only learn what you need to know to get your first federal amateur radio license, but you will also learn what to do once you have your license and how to use the information you learn. The course will get you more than prepared for the test and, once licensed, you'll be ready to operate!

**WHEN:** Six Tuesday evenings, June 17-July 22; 7 PM -10 PM

**WHERE:** Terman Library Conference Room, 661 Arastradero Palo Alto, CA

**FEES:** \$20 Students (under 18), \$30 Adults payable upon registration. Covers the cost of study materials. **BONUS:** One year FREE membership in The Foothills Amateur Radio Society for course graduates. Fee for the exam: TBD, ~\$10, payable at the time of examination.

**WHO:** This class is open to all. There are no age limits.

**REGISTRATION:** is by receipt of your check made out to FARS. Send the check with your name, a self-addressed-stamped-envelope, email address (or phone number) to: Michael Zensius, KG6GUE  
2275 So. Bascom Av. #107  
Campbell, CA 95008

Checks received after the class is full will be returned.

Further information may be found on the FARS club website:  
<http://www.fars.k6ya.org/classes.shtml>.

## Doppler-Calibration Oscillator By Dave Platt, AE6EO

The schematic for the little battery-powered calibration oscillator I showed at last month's FARS meeting, on my site at <http://www.radagast.org/~dplatt/hamradio/oscillator.pdf>

This calibrator is simply an ordinary quartz oscillator "can", mounted on a small PC board, with a voltage-regulation circuit which allows it to be driven from a 9-volt battery. These oscillators typically require either 3.3 or 5 volts. I could have used a monolithic regulator (LM317, LM7805, etc.) but decided to try something different in the interest of reducing the space needed on the board. I built an adjustable shunt-regulation circuit, using an NPN transistor and a resistor voltage divider - it's what's known as a " $V_{be}$  multiplier", and behaves somewhat like an adjustable Zener diode would. The fixed and variable resistors connected to the transistor base allow the voltage range to be adjusted from a minimum of .6 volts (the transistor's  $V_{be}$ ) up to about 6.6 volts ( $V_{be}$  times the ratio of the voltage divider).

The shunt regulator and the oscillator draw current from the battery through an LED and a current-limiting resistor R3. R3's value is a compromise: for a 5-volt oscillator its value must be small enough to pass the oscillator's required operating current, for a 3.3-volt oscillator its value must be large enough to limit the current to a level which won't damage the LED. 150 ohms is a decent starting value.

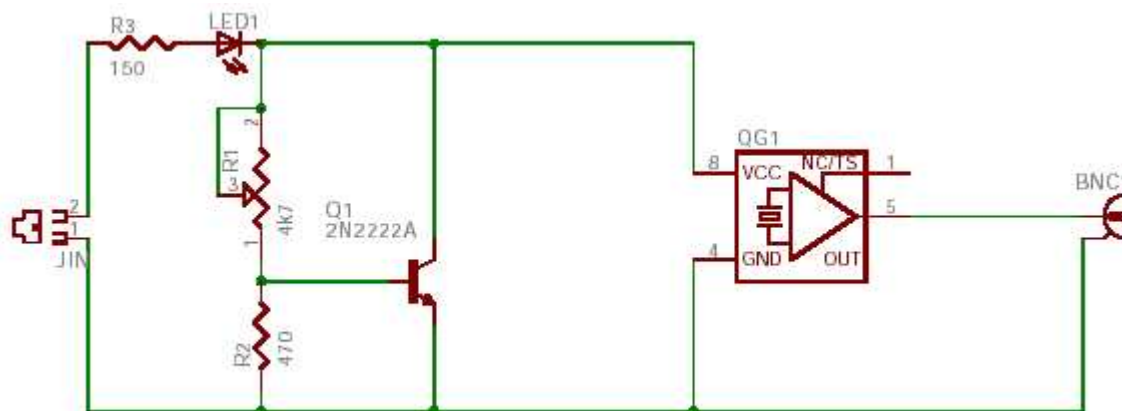
The oscillator's frequency is chosen so that one of its harmonic frequencies falls into the 2-meter amateur radio band. The one I bought is a 49.159 MHz 3.3-volt can, whose third harmonic is at 147.477 MHz. I'm trying to find an oscillator with a slightly lower frequency, whose third harmonic would be in the 2-meter beacon subband.

The oscillator can's output pin is simply wired to the center pin on a BNC connector. Even without an antenna attached, the board "leaks" enough RF that my HT picks up an S5-or-better signal from several feet away. I can calibrate my Ramsey Doppler system quite nicely by simply setting the oscillator board at the center of the back of my van (about 5' from the Doppler antennas) and adjusting the Doppler calibration to point "straight back".

When used in this way, I believe the calibrator complies with the emissions limits for a home-built Part 15 device. I would **not** recommend hooking up a long antenna to this sort of device, or using it for an actual fox-hunt. It'd almost certainly radiate a strong enough signal to exceed the Part 15 emissions limits, and it'd also emit enough harmonics (and the oscillator fundamental frequency) to fail to comply with the Part 97 rules for amateur-radio use. Also, it has no ability to send a proper callsign ID.

To make an actual fox-hunt transmitter, it'd be necessary to use some sort of tuned output circuit (to filter out the oscillator fundamental and unwanted harmonics) and to add a PIC or similar microcontroller to send a CW ID by pulse-modulating the oscillator power every few minutes.

- 73, Dave AE6EO



Schematic For Battery-Powered Calibration Oscillator

### New Field Day Entry Class

Field Day will gain another entry class for 2003. "Class F" stations will operate at emergency operations centers, or EOCs. The change renews the emphasis of Field Day's 1933 origins as an emergency preparedness exercise as opposed to a routine contest.

ARRL Contest Branch Manager Dan Henderson, N1ND, said that last year the League received a record number of Field Day entries from groups and individuals. Given the increased emphasis on emergency communications since September 11, 2001, the ARRL Board's Membership Services Committee asked that the Contest Branch come up with something to reflect that emphasis. The new Class F station is the result.

"This is a major change," Henderson said. "Class F has been established to encourage groups to test and further their working relationships with established emergency operations centers." The updated rules and a list of frequently asked questions in the new 2003 Field Day packet spell out the details.

A Class F entry station must set up at an "established EOC" center activated by a club or non-club group. Class F EOC operation must take place in cooperation with the EOC staff. Class F stations are eligible for the same bonus points as Class A stations

ARRL Bulletin, February 11, 2003

Check out the ARRL web site for more information on Field Day: <http://www.arrl.org/contests/announcements/fd>.

The FARS club will set up at Maryknoll, the same place as last year. Field Day has always been fun and this year should be no different! Please come and support Field Day.

### ARRL and TAPR 22nd Annual

## Digital Communications Conference

September 19-21, 2003  
Hartford, Connecticut

### Information

Mark your calendar and start making plans to attend the premier technical conference of the year, the **22nd Annual ARRL and TAPR Digital Communications Conference** to be held **September 19-21, 2003**, in **Hartford, Connecticut**. The conference location is the **Marriott Hartford Windsor Airport** hotel. Updated conference information is available at <http://www.tapr.org/dcc>.

### Call for Papers

Technical papers are solicited for presentation at the 22nd Annual ARRL and TAPR Digital Communications Conference to be held September 19-21, 2003 in Hartford, Connecticut, and The ARRL and TAPR Digital Communications Conference is and publication in the Conference Proceedings. Annual conference proceedings are published by the ARRL. Presentation at the conference is not required for publication. Submission of papers are **due by August 5th, 2003**

# FARS Membership Form

PLEASE fill out the membership form for all new/renewal members.

FARS 2003 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 Member(s)? \_\_\_\_\_

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

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

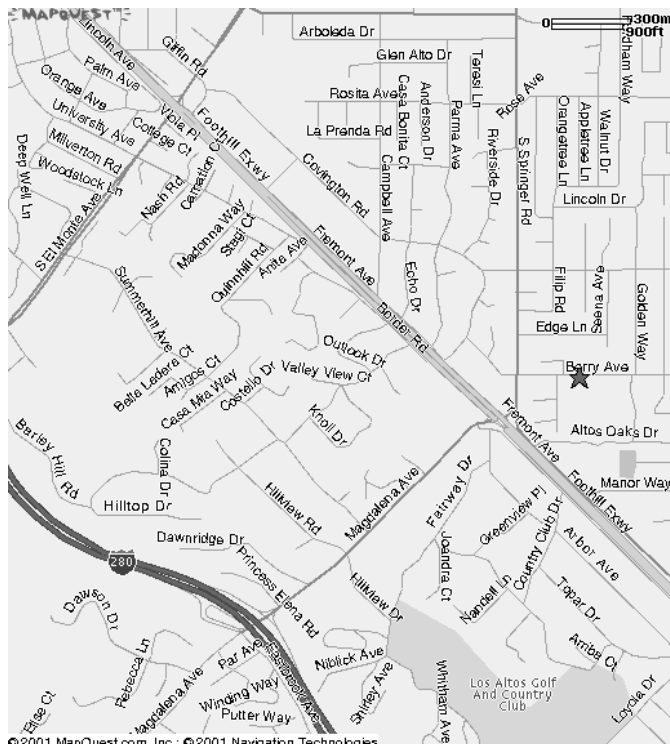
Special topics of interest / suggestions for club meeting speakers: \_\_\_\_\_

Dues: personal: \$20; family: \$25.

**Please note:** Membership runs from January 1 to December 31.

Send your check payable to FARS, to:

FARS, c/o Frank Weiss K6FCW, 109 Stratford Court, Mountain View, CA 94040



## How to get to meetings:

(Visitors always welcome)

Our meetings usually will be held at the Loyola School gym room (directions below) on the fourth Friday at 7 PM for the code practice/socializing and 7:30 PM for the regular meeting. There may be changes in the meeting dates for January, June, November, and December.

### DIRECTIONS:

Loyola School is at 770 Berry Avenue in Los Altos, between Springer Rd. and Miramonte Ave.

FROM FOOTHILL EXPWY take the Rancho shopping center exit and go east (toward El Camino Real) on Springer one short block; turn right onto Berry; watch for the school parking lot on your right. Walk past the office and turn right. The gym is the first building on your right.

FROM I-280 take the Magdalena Av. exit and go east (towards Foothill Expwy). Cross Foothill Expwy onto Springer; then follow directions as above.