

May Meeting

May 24, 2002 - 7 PM socializing, meeting starts at 7:30.
Directions to the meeting are later in the newsletter.

Speaker: Rolf Klibo, N6NFI

Presentation: The Ramsey Doppler Direction Finder Kit

Abstract: The Ramsey Doppler Direction Finder Kit is an implementation of the circuit developed by WA2EBY and published in QST magazine. Ramsey has made the circuit available, in kit form, to the hobby radio community at a reasonable cost. This presentation will briefly cover the principles of operation with some light math included. The kit is examined in terms of the various parts, quality and techniques of assembly. Finally, the operation and capability are explained by the example of a fortuitous foxhunt.

Secretary's Report

The FARS board held its monthly meeting on the evening of May 7, 2002. Members present were Mikel, KN6QI, David, KD6WRG, Herb, KF6BKL, Howard, KG6GRO, Omri, AA6TA, Mark, KG6GRR, Dick, N6ATD, Jack, WA6YJR, and Martin, KD6WJW. Shel, N6RD, was also present for a short period. Preparation continued to be made for the Flea Market and Field Day. Howard, KG6GRO, volunteered to be in charge of Flea Market activities. As always, additional help is needed, especially for the early shift at the Flea Market and more operators for Field Day. Mark, KG6GRR, volunteered to be the **Relay** editor.

From the last newsletter: The training officer position is still open. New badges, through the efforts of Dick, N6ATD, are now being offered for \$5.75.

- Martin, KD6WJW

Please let us know if you change your address, email, phone number, etc.

President's Corner

Plaques were presented to Jack Eddy, WA6YJR, and Sheldon Edelman, N6RD, for their efforts over the past years for the club. Jack has served as Club President and has helped with so many of the club activities. Shel has served as the Club Treasurer and has organized the club banquet and field day in addition to helping with many other activities. We thank them for their service.

Edited from the last newsletter:

Field day is June 22nd and 23rd this year and we are planning for this important club activity. We are currently planning to operate in the 2A category, which means two primary stations operating on HF. We may have a separate VHF station if there is sufficient interest. Richard Baldwinson, N6ATD, has graciously volunteered to organize field day this year, but he needs help from the club members. We need volunteers to help with setup, operation, and takedown of the Field Day site. Please contact Richard if you can help with Field Day setup or operations.

We also have a flea market to run on June 8th this year. Howard Takaoka, KG6GRO, has volunteered to organize the Flea Market. We need volunteers to help with the flea market. Please contact Howard if you can help with the flea market.

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Field Day Manual

There is a very complete "how to" manual on Field Day at <http://www.qsl.net/ta1dx/afet/fieldndir.htm>. It is aimed at organizers and new hams. I printed a copy to study.

- Steve, K6OIK

Field Day is a good place to learn how (and how not to) assemble and put up antennas and towers, work with emergency generators, and see equipment in operation. Please support FARS at field day. Contact Dick Baldwinson, N6ATD, or sign up at the club meeting.

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: (open)
Relay Editor: Mark Hardy KG6GRR

Board Members: Jack Eddy WA6YJR, Dick Baldwinson N6ATD, David Cooper KE6PFF, Frank Weiss K6FCW, Herb Davidson KF6BKL, Howard Calif KE6PWH, Mark Hardy KG6GRR, Howard Takaoka KG6GRO.

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

FARS announcement mailing list is moderated, so you cannot reply directly to the list: fars-announce@svpal.org

Also, note you can contact the FARS board of directors at fars-board@svpal.org

To subscribe/unsubscribe, send a message to: majordomo@svpal.org

In the e-mail message (in plain text) put one of:
unsubscribe fars-announce YOUR-EMAIL-ADDRESS
subscribe fars-announce YOUR-EMAIL-ADDRESS
(eg. Subscribe fars-announce dwilkes@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, Nov. & Dec. Annual membership \$20; family \$25. Visitors are always welcome! Directions on the back page. Talk-in: N6NFI (145.23-, 100Hz) 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 packet, 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 kg6grr@arrl.net
At FARS meetings.

Bill Introduced in the House

Thanks to the effort of the ARRL, a bill has been introduced in the House of Representatives that would insure "reasonable accomodation" for amateur antenna installations and over rule restrictions to the contrary that are in private CC&Rs.

I sent the letter below to Rep. Anna Eshoo, asking her to support the bill. I encourage all hams to contact their Representatives in Congress and ask them to support H.R. 4720.

- Steve, K6OIK

Representative Anna Eshoo
United States House of Representatives
Washington, DC 20515

Dear Representative Eshoo,

I urge you to co-sponsor H.R. 4720, the "Amateur Radio Emergency Communications Consistency Act," sponsored by Rep. Steve Israel. The bill would alleviate a problem facing many federally licensed Amateur Radio operators living within development communities who are subject to unreasonable restrictions or outright prohibitions regarding the installation of external antennas.

Under current law, the FCC applies a policy that instructs states and localities that they must reasonably accommodate Amateur Radio antenna. The policy, however, fails to address situations affecting private land-use groups. Rep. Israel's bill would ensure consistent application of these regulations.

This legislation seeks to insure that Amateur Radio operators are available for emergency communications in all sections of the country, regardless of whether they live in a development, such as a retirement community, or townhouse subdivision. Restrictions against antennas render Amateur Radio operators unable to utilize their licenses, which in turn may ultimately hinder their emergency communication role during times of disaster or national crisis.

Amateur radio provides a vital public safety communications service to the public at no cost to taxpayers. I hope you will join Rep. Israel in co-sponsoring his bill.

I look forward to hearing from you as you consider this important legislation.

Sincerely,

Stephen D. Stearns
Los Altos, California

Primer on Power Amplifiers by Steve Stearns, K6OIK

Last month we learned that antenna VSWR is relatively unimportant for receiving. This month we'll look at the other side of the issue and see why VSWR is very important for transmitting. In particular, VSWR determines how much power you can coax out (no put intended) of a given final stage power amplifier.

Vacuum tube and solid-state final power amplifiers can be damaged if too much power is reflected back from the antenna. Vacuum tube power amplifiers generally are damaged by overheating, whereas solid-state power amplifiers can be damaged by exceeding voltage or thermal ratings. A lot has to do with how conservatively the manufacturer is with power specs. Let's examine this issue.

A power amplifier manufacturer faces a dilemma. The marketing department wants the power rating to be as big as possible. Consider an amplifier final stage that consumes 1 kW and operates at 60% efficiency. It's output power is 600 Watts, and it dissipates 400 Watts as heat. Suppose it is capable of dissipating 600 Watts of heat. The margin of 200 Watts means that it can handle 200 Watts of reflected power from the antenna. In other words, it can operate into a load having VSWR of 3.42.

Now suppose the director of marketing decides he needs two new products to boost company sales - an 850 Watt linear power amplifier for the amateur market and a 350 Watt high-reliability instrumentation amplifier. The director of engineering decides he can save development money by using the current 600 Watt amplifier for both new products by changing only the cases. How is this possible?

Well, at 850 Watts of output power, the amplifier is dissipating 567 Watts, which is less than the 600 Watt thermal limit. It still has room for 33 extra Watts of reflected power before hitting the limit. As long as the VSWR stays below 1.5, things are okay. To keep units from burning up, the sensing circuits might be recalibrated to reduce power once the VSWR reaches a threshold of, say, 1.4, which provides a 9 Watt margin.

Now consider the commercial instrumentation amplifier. At 350 Watts of output power, it dissipates 233 Watts. If the load is an open or short, the VSWR is infinite, and the reflected power is 350 Watts. Total dissipation is only 583 Watts, leaving a 17 Watt margin.

Figure 1 shows the tradeoff explicitly as a graph of the maximum safe load VSWR for an amplifier versus the output power sent toward the load. The abscissa of the graph is the power ratio in dB of the output power incident on the load to the maximum thermal power that the amplifier can safely dissipate. The relationship depends on the efficiency of the power amplifier. For low efficiency amplifiers, a small amount of power reduction or "backoff" results in the ability to withstand large VSWR loads;

whereas, for high efficiency amplifiers, the same amount of backoff in decibels enables smaller increases in load VSWR.

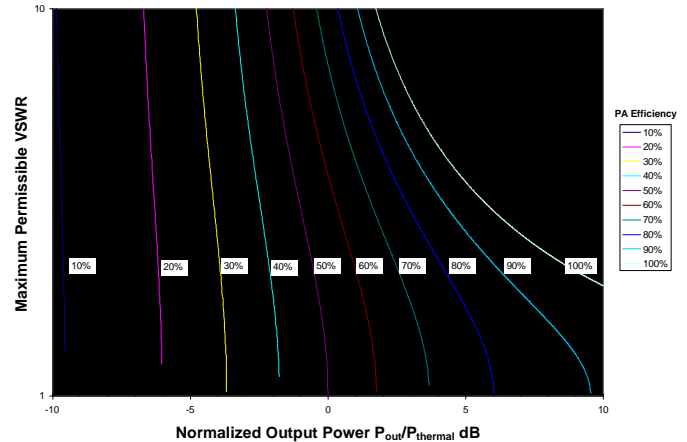


Figure 1. Maximum Safe VSWR versus Output Power Incident on Load.

A key point is that a power back-off exists for every power amplifier that enables it to operate safely into an infinite VSWR load, for example, an open or short circuit. This fact is quite useful. Figure 2 shows the tradeoff as the number of decibels of power backoff that is required for an amplifier to operate into an infinite VSWR load as a function of the maximum permissible VSWR at which the amplifier is designed to operate when at full power, i.e., the manufacturer's VSWR spec. for full output power.

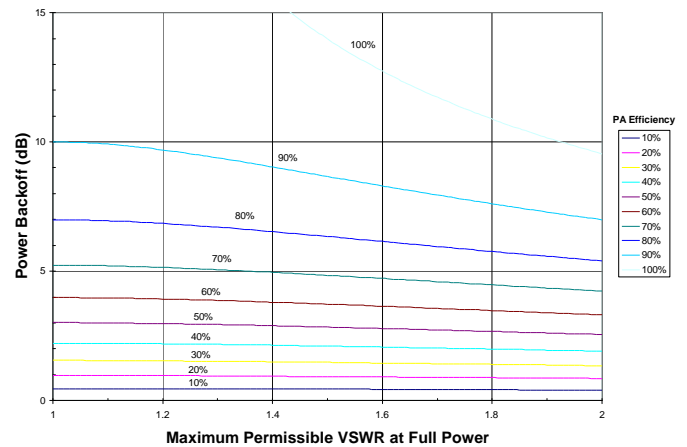
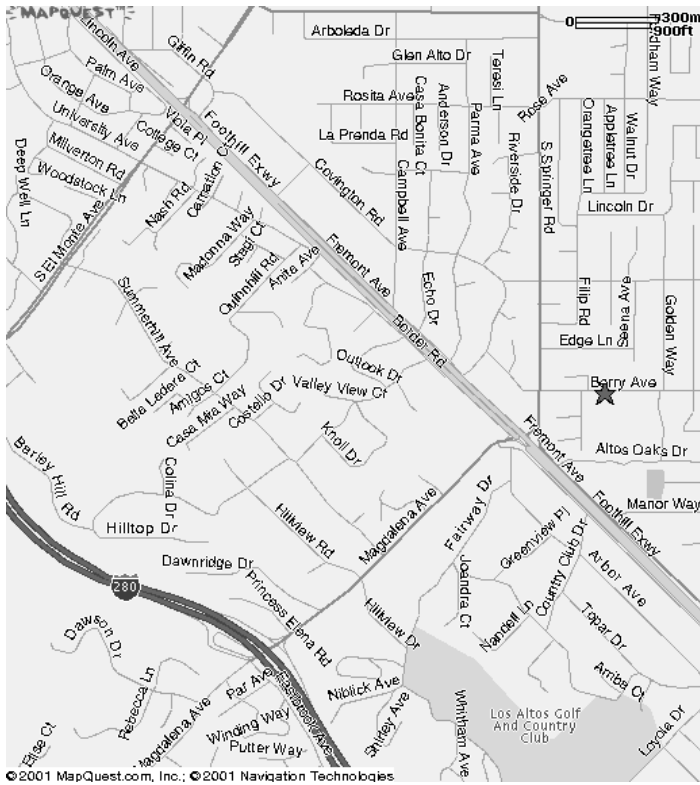


Figure 2. Power Reduction Needed to Operate into an Open or Short Circuit Load.

Most transceivers, including VHF/UHF HTs, have final PA efficiencies below 70% and have multiple output power settings. As long as a transmitter has a setting that is at least 5 dB below maximum, i.e. less than 31.6% of full power, a unit can be operated into an open or short circuit load, e.g. with the antenna disconnected, with impunity. The power amplifier will not be damaged due to thermal overload. Just don't try it at full power!

So there you have it for this month. Reader feedback is welcome. Send comments and questions to the author at k6oik@arrl.net.



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 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.