The REPEATER

The OFFICIAL newsletter of the Rogue Valley Amateur Radio Club

W7DTA

Volume 2011, Issue 2 **February 2011**

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Club Web Page:		**http://www.qsl.net/w7dta**		

Next Club Meeting

Thursday, February 3, 2011, 7:00 PM
Red Cross Building, 60 Hawthorne St., Medford, OR
Across from Hawthorne Park
Program: If you can't lick 'em, join 'em! - Allan Taylor, K7GT

President's Letter

Welcome to RVARC, version 20.11. There will be a lengthy bio on me in the March issue so I will get right to the point. I want to encourage operating activity in the club membership, both on HF and on VHF. A quick survey of any recent issue of QST or CQ will illustrate the wide variety of interests and phases of our wonderful hobby. My personal involvement has been almost entirely in CW, DXing and contesting. I have a personal list of other things to try. It includes: PSK31, DXpeditioning, mobile operating, and even that donald duck mode.

The apparent common thread that holds us together is the requirement for an official piece of paper allowing us to transmit RF at a power level beyond the trivial. One can be an electronics hobbyist or a SWL without a license. Those are great preoccupations

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Secretary's Report

MINUTES OF THE 6 JAN 2011 MEETING OF THE ROGUE VALLEY AMATEUR RADIO CLUB.

The meeting was called to order by President Allan Taylor, K7GT at the Red Cross building Medford, OR at 19:00L.

Allan announced the 2010 club dues are due, $20.00 regular membership and $15 for seniors.

We had three guests:
KF7EPA - Dan Bell
N8FY - Ed Macauley
KF7LAD - Chris Macauley

Allan suspended the reading of the minutes.

Lud Sibley KB2EVN presented the treas-

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President's Letter, Continued

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also. But they tend to be more inward than outward activities. Let's be more gregarious. Try a different mode, try a different time of day, try a different band, make a new antenna and ask for on-the-air comments, ask your next contact what else he/she does for fun, perhaps even learn about computers to become more relevant to the younger folks around you.

Put on your thinking caps now. What should YOU try that is new and different?
What activity can you suggest the club try to further friendships and on-the-air activities? A few come immediately to mind: a visit another shack program, a revitalized VHF chat-chat net, or perhaps an occasional local QSO party.

See you February 3rd !!

Newsletter now paperless

The RVARC Repeater is paperless starting with the January 2011 issue.

You can receive a copy one of three ways:

1. Email. Make sure your email address is current with the club newsletter editor, (n5eg@tapr.org) and you will receive each issue via email.
2. Club web site. Each copy of the newsletter is available about a week ahead of the meeting on the club's webpage (see page 1 for the link). Additionally, an archive for all past issues since late 2008 is available (via the club web page).
3. A few paper copies will be brought to the club meeting for those without Internet access.

The electronic versions are in PDF format.

Secretary's Report, Continued

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urer's report. We have over $6000 in the account. After the Pete Bateman estate is paid we will have about $4000 remaining.

Lud made a motion that we buy a projector so club members can show Power Point presentations. Herb W7MMI seconded the motion. After much discussion, it was suggested that Lud find out the prices of projectors and report back at the next meeting. The vote on the motion was put on hold till then.

Scott Cummings, KD7EHB volunteered to be head of the field day committee and is looking for helpers. He wants to get things organized early this year.

Don Bennett KG7BP put on the coffee and Jack WA7IHU brought the donuts.

A good time swapping and eye balling was had by all.

Submitted by Jacob O. (Jack) Schock, WA7IHU, Secretary

Broadband Wire HF Antennas and Feedlines—Part 2

Last month the feeding of broadband antennas was discussed, with the consideration of feedline SWR being probably the most important factor in determining overall efficiency.

This month we'll look at another aspect of broadband antennas—the radiation pattern. A broadband antenna is too short at some frequencies and too long at others, and the pattern of the antenna varies a lot of the wide frequency range that hams have available at HF.

80 Meters

First we'll examine the pattern of a dipole antenna at the lowest end of it's operation. For many that would be 80 or 160 meters (where the antenna is less than half a wavelength long). Horizontal antennas have a dipole pattern with the nulls filled in, resulting in a sort of kidney-bean shaped pattern at lower angles, and more omni-directional at higher angles. The elevation pattern depends on the height of the antenna above ground, but for practical 80 meter operation, the horizontal antenna is likely to be less than a quarter wave above ground.

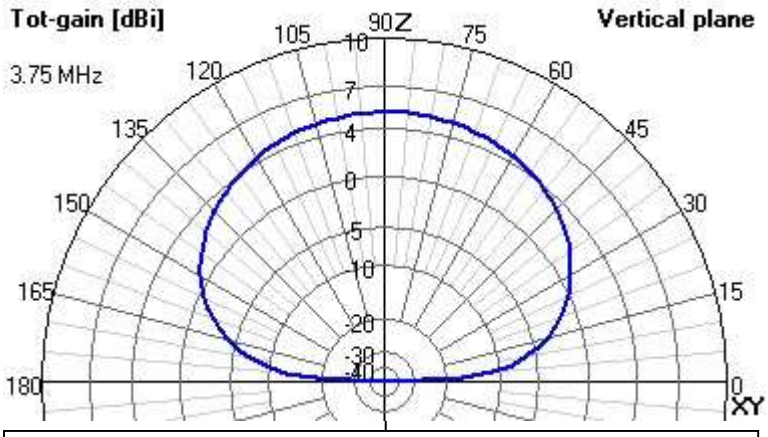

Figure 1—Elevation Pattern of 70 foot long dipole at 3.75 MHz

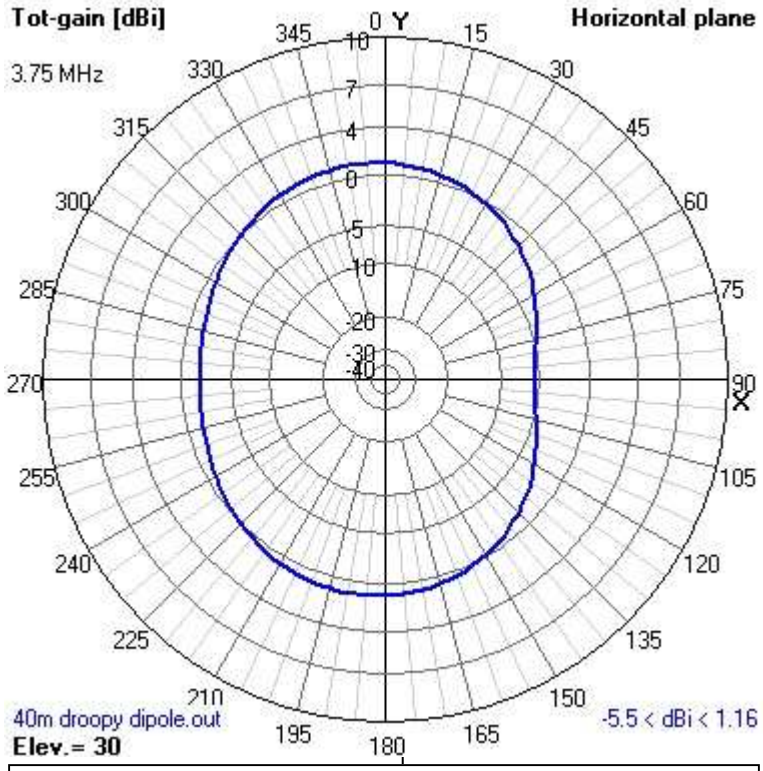

Figure 2—Azimuth Pattern at 3.75 MHz

Figures 1 and 2 show the azimuth and elevation patterns respectively for a 70-foot long slightly asymmetrical dipole at a height of 35 feet operating on 3.75 MHz. The antenna wire has 0.3 ohms of resistance distributed over the 70 feet of wire. The antenna efficiency including resistance and ground loss (but neglecting feedline loss) is 42%.

This same antenna has lower ground losses when it is moved up to 75 feet elevation, improving to about 65%, but with a similar radiation pattern.

40 Meters

At 7.15 MHz. the efficiency (neglecting feedline loss) improves to 71%. The patterns are really not much different than those on 80 meters. When the

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40 meter antenna is elevated to 65 feet however, it develops an elevation pattern with some gain depression at high elevation angles. The exact location of these nulls is dependent on the elevation. The antenna efficiency remains unchanged from operation at 35 feet.

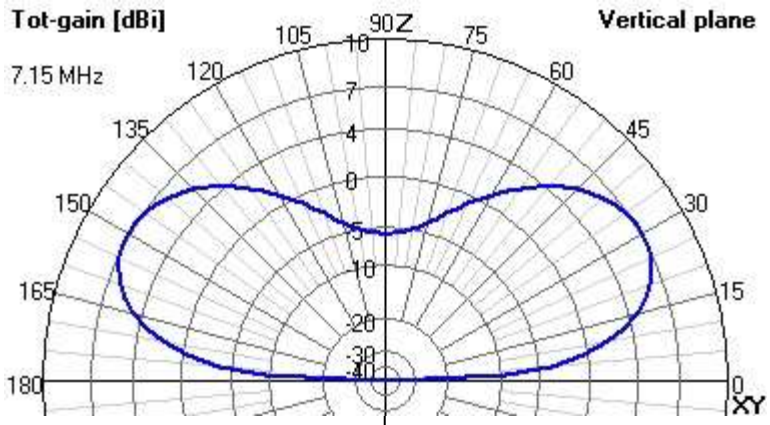

Figure 3—Elevation Pattern of 70 foot long dipole at 7.15 MHz, at 65 feet elevation.

Figure 3 shows the elevation pattern at 7.15 MHz at 65 feet elevation. This pattern is actually a bit worse off for local in-state contact, but better for DX operation.

The azimuth pattern is still pretty much unchanged from figure 2.

20 Meters

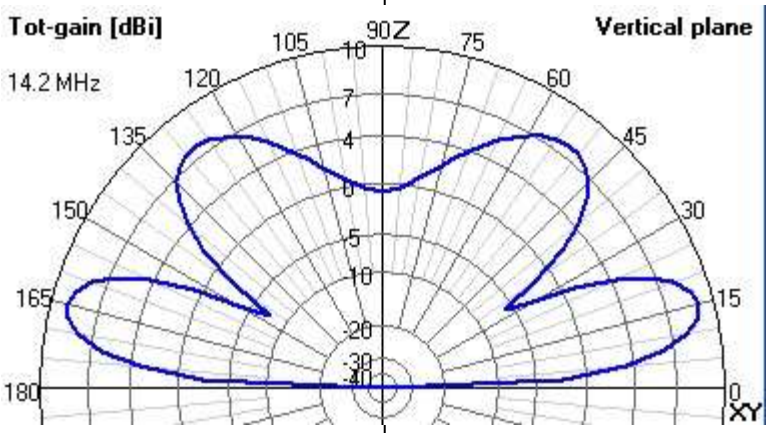

Figure 4—Elevation Pattern of 70 foot long dipole at 14.2 MHz, at 35 feet elevation.

At 14.2 MHz the dipole is a full-wave antenna and it actually has some broadside gain. Neglecting feed loss, the antenna efficiency remains a about 75%. The antenna clearly has multiple lobes, and a relatively low lobe near 15 degrees elevation. The azimuth pattern at 15 degrees elevation is shown in figure 5.

The antenna has deep nulls along the end of the antenna, and a peak broadside to the antenna, characteristic of an antenna with gain. This is both an advantage and a disadvantage. The narrow main lobe is useful if we can rotate the antenna, but it is harmful if the antenna is fixed and the desired station is not on a bearing along the main lobe of the antenna.

10 Meters

As we continue to increase the frequency of operation, the antenna starts to become long in terms of number of wavelengths. At 28.3 MHz, the antenna is roughly 2 wavelengths long, and the pattern has lobes that lie more along the wire and develops a null broadside to the antenna, and well as keeping the null off the end of the antenna. Essentially the radiation pattern looks like a four-leaf clover. Figure 6 shows the elevation, and figure 7 the azimuth patterns at 28.3 MHz.

The antenna actually has a lot of gain along the main low angle lobes, unfortunately they increasingly are more unlikely to actually point to where you want them to go. The higher-angle lobes are a bit less directional than the lower angle lobes (no figure).

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Loop antenna

A loop antenna behaves a bit differently than the dipole antenna in these examples.

Rather than having a null along the ends of the antenna, the loop has more of a 4-lobe horizontal pattern. Since a 265 foot loop is about 2 wavelengths in circumference, there is an overhead null on 40 meters.

Figure 8 shows the elevation pattern of a 265 foot loop at 35 feet elevation operated on 7.15 MHz, while Figure 9 shows the elevation pattern.

At 40 meters the loop has slightly lower efficiency than the dipole due to the resistance of the much longer length of wire needed (265 feet versus 70 feet).

At higher frequencies, the pattern of the loop develops many lobes just as the dipole does,

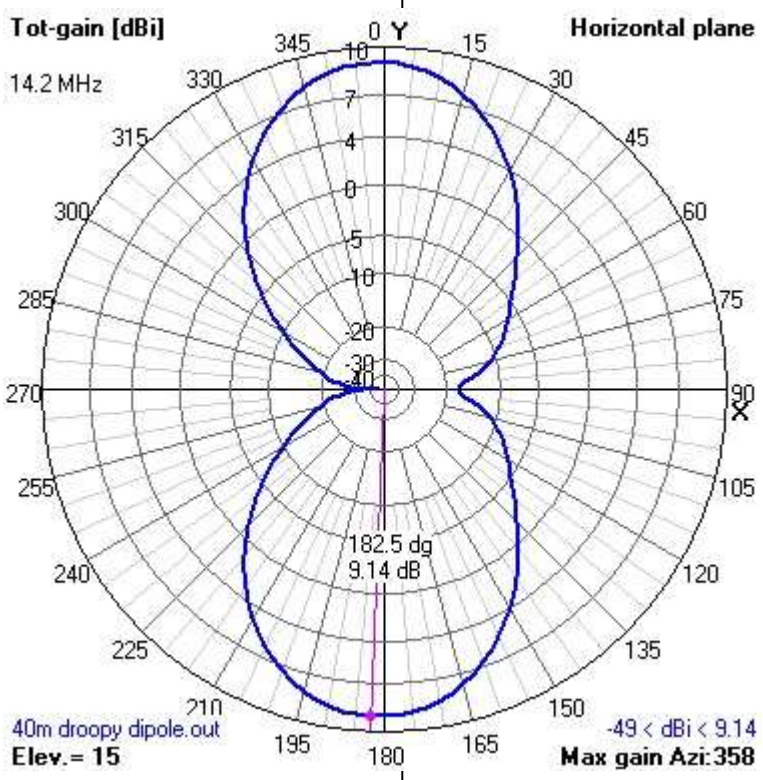

Figure 5—Azimuth Pattern of 70 foot long dipole at 14.2 MHz, at 35 feet elevation.

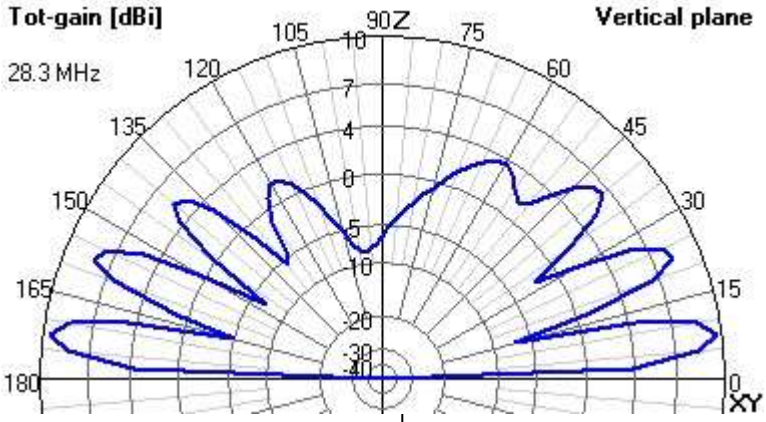

Figure 6—Azimuth Pattern of 70 foot long dipole at 28.3 MHz, at 35 feet elevation.

and unfortunately there's a chance that they are pointed in the wrong direction for the particular station that you might want to work.

Getting clean lobes can be accomplished at higher frequencies by building loops that are rhombic in layout rather than square. The difficulty in getting the lobes of relatively long wire antennas pointed in a direction that can do good and the need for a lot of real estate for them explains the increasing popularity of rotatable yagi antennas starting after World War II.

This concludes our tour of low cost, simple, hard to see, and simply fed broadband antennas.

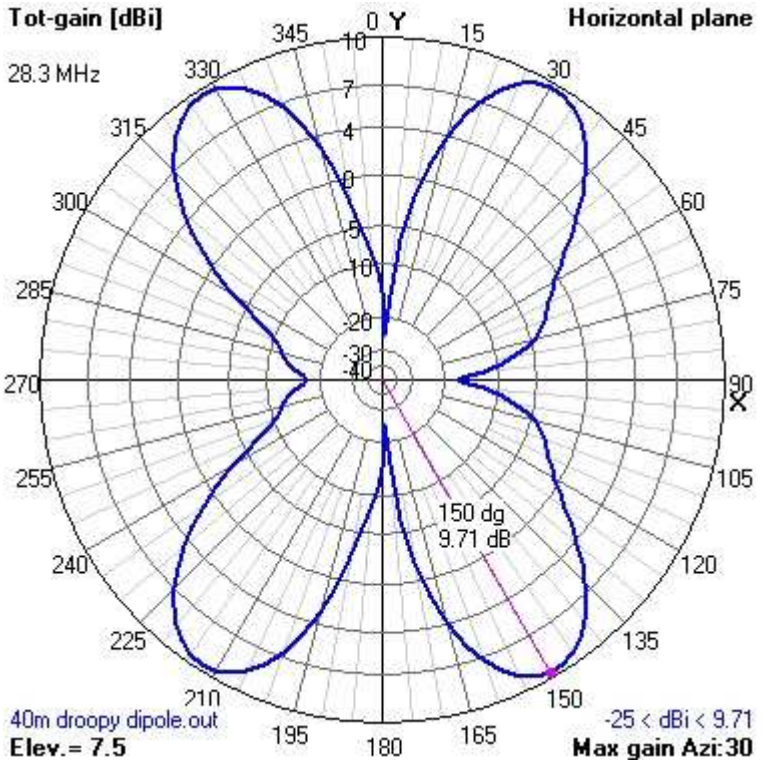

Figure 7—Azimuth Pattern of 70 foot long dipole at 28.3 MHz, at 35 feet elevation.

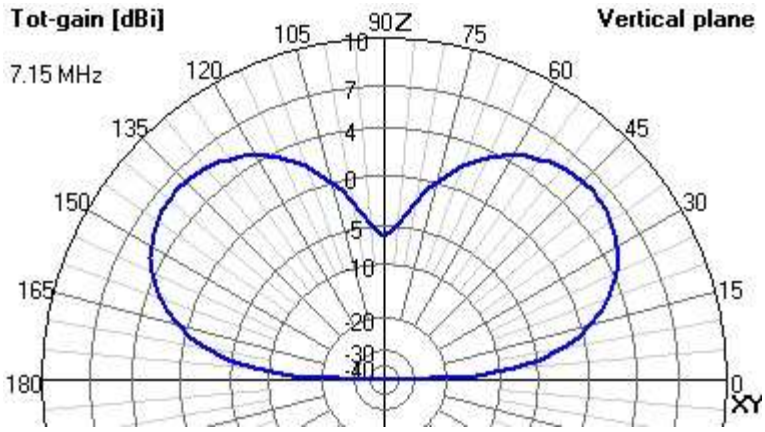

Figure 8—Elevation Pattern of 265 foot long loop at 7.15 MHz, at 35 feet elevation.

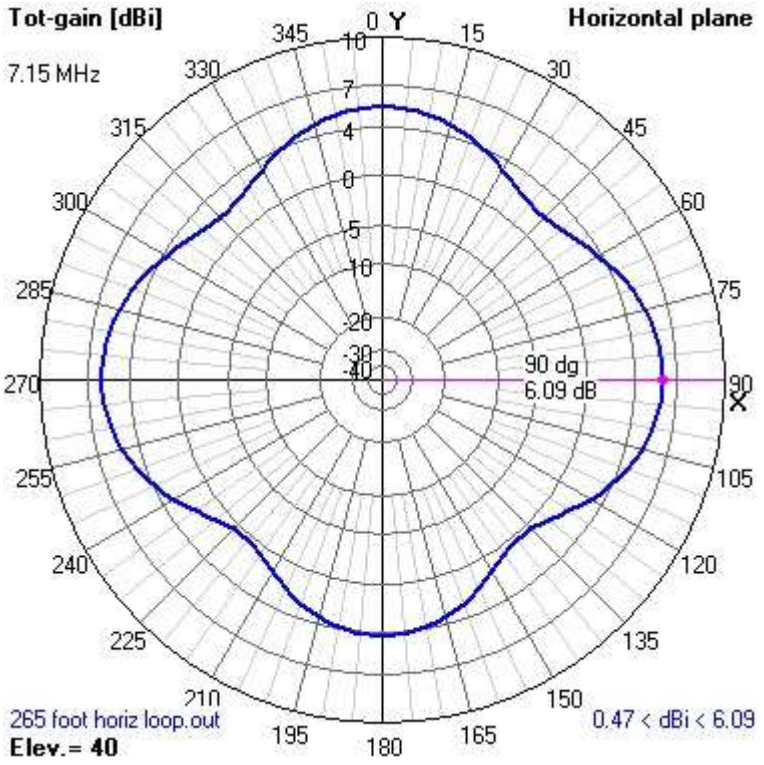

Figure 9—Azimuth Pattern of 265 foot long loop at 7.15 MHz, at 35 feet elevation.

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