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SIGNALS

Rockwell Collins

Monthly Newsletter of the

Amateur Radio Club

Volume 34 Issue 05 **Web Site** http://www.w5rok.us **February 2013**

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RCARC
Membership Meeting

Tuesday 26 February 2013
1700 Social 1730 Meeting
1800 Program

Methodist Richardson Medical Center
At Bush/Renner/Shiloh Intersection
Second Floor Conference Room 200

Subject:
Program in Process—Come and See

Local Club News

Meeting Notice

The January program is still being finalized as Signals is approaching publication. Whatever the program, it's always worth the trip. By the way, we still need an Activities Chair.

Bob Ashby, K5JHR (SK)

Robert Cooper (Bob) Ashby, 76, of Plano, Texas passed away Saturday, February 9, 2013 after a lengthy and courageous battle with cancer. He was the son of the late R.K. and Hilda Floyd Ashby of Richardson. After graduating from Richardson High School in 1954, he went to work at Collins Radio, retiring from Rockwell Collins in 1994. For over 40 years he was an active member and faithful servant of First United Methodist Church of Plano. He enjoyed many diverse interests and was an accomplished musician, a private pilot, and an avid amateur radio operator. Bobby is survived by his wife of 59 years, Zoenelle Turner Ashby. He is also survived by his sons Robert Scott Ashby (and wife Karen) of Phoenix, Christopher Mitchell Ashby (and wife Erin) of Phoenix, and Jeffrey Todd Ashby (and wife Christy) of Atlanta; grandchildren Nicole, Brook, Brittany (and husband Chris) Hammack, Trent, Cassidy, Cooper, Carson, Turner and Bennett; and brother Dr. Richard Harlan Ashby (and wife Shirley) of Dallas. Bob was preceded in death by his sister Barbara Jean Rogers and his granddaughter Caley Michelle Ashby. Special thanks to Dr. Sam Bibawi and the staff at Methodist Cancer Center and also Drs. Craig Paul and Joel Roffman and their staffs for their continuous care and support. A memorial service will be held in Atlanta where Bob and Zoenelle have been cared for by family. In lieu of flowers, the family requests that donations be made to First United Methodist Church of Plano Sound Ministry or the American Cancer Society (ref: AshbyMemorial@gmail.com).

January 2013 ARRL VHF Contest Report

W5ROK operated in the January 2013 ARRL VHF Contest. The longest W5ROK contact was on 2 Meter SSB to W5DPP in EM 10. He was in Bryan, Texas which is about 170 miles through the "ether" (or about 195 miles by road) from Richardson. *(Contributed by Dennis Cobb WA8ZBT)*

Bob Kirby, K3NT, Presents Fifi to RWK

On Monday 11 February 2013, Bob Kirby, K3NT and his XYL Cindy presented a program on the history of Fifi along with information on the B-24/B-29 Squadron to the Richardson Wireless Klub in Richardson, Texas. The presentation was well received. Several members of the club are interested in operating both the air and ground station. Other members have offered to volunteer their services to the B24/B29 squadron. The Richardson Wireless Klub website is http://www.k5rwk.org. Below is the RWK meeting announcement.

Fifi - The Last B-29 By Bob Kirby K3NT

Fifi is now at home at the Cavanaugh Air Museum, at nearby Addison Airport, Texas. She is the only remaining airworthy B-29 in existence.

Bob Kirby K3NT has been actively involved in returning Fifi's WWII Collins radio equipment to working condition. We have Fifi right in our own backyard and it can still touch the clouds!

"The B-29 played such a significant role in history that it is important that this airplane be preserved. Because of my close relationship with the CAF, I felt the need to get Fifi flying again." *(Jim Cavanaugh)*

(Continued on page 3)

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VE SESSIONS

Dallas tests are held 4th Sat of each month at 10:00. 13350 Floyd Rd. (Old Credit Union) Contact Bob West, WA8YCD 972.917.6362

Irving tests are held 3rd Sat. of each month at 09:00. 5th and Main St. Contact Bill Revis, KF5BL 252-8015

McKinney VE test sessions are held at the Heard Museum the first Sunday of the month. The address is 1 Nature Place, McKinney TX. The time of the testing is 14:30, ending no later than 16:45. ***Note: no tests given on holiday weekends.***

Garland testing is held on the fourth Thursday of each month, excluding November, and begins at 1930 sharp. Location is Freeman Heights Baptist. Church, 1120 N Garland Ave, Garland (between W Walnut and Buckingham Rd). Enter via the north driveway. A HUGE parking lot is located behind the church. Both the parking lot and the Fellowship Hall are located on the east side of the church building, with big signs by the entrance door. Contact Janet Crenshaw, WB9ZPH, 972.302.9992.

Plano testing is on the third Saturday of each month, 1300 hrs at Williams High School, 1717 17th St. East Plano. Check Repeater 147.180+ for announcements.

Greenville testing is on the Saturday after 3rd Thursday, 1000 hrs at site TBA, contact N5KA, 903.364.5306. Sponsor is Sabine Valley ARA. Repeater 146.780(-) with 118.8 tone.

Richardson The Richardson Wireless Klub (RWK) VE team hold license testing on the third Thursday of each month at St. Barnabas Presbyterian Church, 1220 West Beltline Rd. Testing begins at 7:00 PM in room 12. Enter through the Northern most door on the East side of the church building. For further information contact Dave Russell, W2DMR, phone 972-690-9894 or E-mail wart-hog4@tx.rr.com.

President's Message

There is no President's Message this month.

73,
Michael Schmit
WA9WCC
RCARC President

Secretary's Report

22 January 2013

The meeting was called to order by President Mike Schmit WA9WCC at 1730.

The following members were present at the meeting:

Jim Brown	TBA
Dennis Cobb	WA8ZBT
Michael Ketchum	K5MDK
Bob Kirby	K3NT
John McFadden	K5TIP
Steve Phillips	K6JT
Mike Schmit	WA9WCC
Jim Skinner	WB0UNI
Joe Wolf	N5UIC

Officers and Committee Reports:
President's Report: There was no formal President's Report.

Vice-President's Report: We currently have no Vice-President.

Secretary's Report: The Secretary's Report is in this newsletter.

Treasurer's Report: There was no Treasurer's Report.

Website Manager's Report: There was no Website Manager's Report.

Station Trustee's Report: There was no Station Trustee's Report.

Database Manager's Report: There was no Database Manager's Report.

Old Business:
Dennis Cobb WA8ZBT reported that the 26" television for the ham shack approved at the October 2012 meeting has been purchased and installed and is operating as expected. He requested that Bob Kirby K3NT be reimbursed for the purchase price.

New Business:
Mike Schmit WA9WCC identified problems with the VHF/UHF antenna at the W5ROK main station and requested a work party to investigate and address the problems. Michael Ketchum K5MDK agreed to send an email to all members to schedule the work party for 2 February at 0900.

Equipment items as listed below were proposed for purchase by the club:

- Elecraft KPA500 amplifier, not to exceed $2,500 (in kit form, Bob Kirby K3NT to build)
- Elecraft KAT500 antenna tuner, not to exceed $900 (in kit form, Bob Kirby K3NT to build)
- Bencher BY-1 key, not to exceed $200
- Idiom Press Logikey K-3 keyer (quantity 2), not to exceed $200 each
- Heil HM-12 microphone with selectable #4 and #5 cartridges for third station (to match existing two), including CB-1 base, not to exceed $200
- Replacement earpads for Heil headset, approximately $20 each

Approvals for purchases as above were deferred pending review of the Treasurer's Report, expected at the next meeting.

Bob Kirby K3NT also proposed purchase of an Elecraft K3/0 (not to exceed $1,500) for Internet control, but this was deferred pending further research by Bob on available Internet connections.

Jim Skinner WB0UNI requested timely notification of planned events to allow inclusion in the newsletter.

It was noted that the 80th anniversary of the Collins S-Line will be celebrated in September 2013.

Mike Schmit WA9WCC stressed the importance of public service event participation in support of continued funding by Rockwell Collins.

Mike Schmit WA9WCC announced a meeting of the "Executive Board" at his house at 1300 on Saturday, 23 February.

The next meeting will be at 1730 on Tuesday, 26 February 2013.

Adjournment:
The business meeting was adjourned at 1841. There was no program scheduled.

What You Don't Use, You Lose

Everyone knows what you don't use you lose. Or is it that we just slow down?

I have studied two languages other than English. Since I don't have occasion to use them, I am probably conversant at the two-year-old level. I have trained on a number of engineering development tools over the past 39 years but am more a jack of all trades rather than a master of one. I was an expert at one time.

You may now be asking what this aimless rant has to do with amateur radio. I have been spending less time on the air as the recent years have passed. My family has grown, and so have my family duties (babysitting, chauffeur, birthdays, anniversaries, etc.). Add to this the fact that it is taking me longer to perform my home maintenance chores, and my station is brought up only occasionally.

When I became a ham, CW was all my station would do, and at one time I was a fairly good CW op. I haven't forgotten all of my operator skill but, like my yard work, I have slowed down. So the other night when I got on the air, it took me awhile to find an operator willing to converse at 10-13 WPM. Finally K3Y/3 responded to me but I thought the Joey really had a lousy fist. I had a difficult time copying his call sign. I was copying K3YX-something-something. While sleeping that night the ol' subconscious kicked in, and I awoke realizing that the Joey had an excellent fist and rather than a weird "X-something", I was copying a "/" (-**-*).

In conclusion: I haven't lost my radio operator ability, but it has slowed down a bit. Thank You K3Y Special Event Station for helping us occasional CW ops make contacts and stay in the game!
(Contributed by Wayne Hughes, WA0TGH)

Bob Kirby, K3NT, Presents Fifi to RWK

(Continued from page 1

> The Commemorative Air Force is a nonprofit aviation association dedicated to honoring American military aviation, through flight, exhibition and remembrance. The CAF has more than 8000 members within 75 units worldwide, flying and restoring 171 vintage warbirds.
>
> Don't miss the chance to hear how ham radio operators have been restoring the vintage Collins radio equipment in Fifi to its original working order.
>
> Come early and mingle. Hey, bring a guest! Don't miss this opportunity to enjoy "eyeball QSOs" with fellow hams and learn something new to boot!

(Contributed by Bob Kirby, K3NT)

CAF Airpower History Tour

Spring 2013 Tour Details Set
Visit the new CAF B24/B29 History Tour website to access the detailed schedule for the spring tour.

This tour includes 11 cities and multiple CAF partner wings for the tour.

We are very excited to unveil the new http://www.airpowertour.org website along with new ideas to cross-promote and work in conjunction with other CAF wings.

It is a very exciting future for the CAF.

New Air Show Bookings for 2013
We are continuing to be pro-active about making our tour schedule bookings as early as possible. The new bookings that are now confirmed include Reading, Pennsylvania; Cincinnati, Ohio; Dayton, Ohio; Fayetteville, Arkansas; Broomfield, Colorado; and New Century, Kansas. Bookings are coming in weekly this month so keep a watch on the website as our tour year takes shape. All cities will be included on the new Airpower website.

(Contributed by Bob Kirby, K3NT)

Greetings to Everyone:

If you were at the last club meeting, you know there are a lot of things our club is actively planning and doing. We are requesting funds for amazing projects for the club station, as well as other items. As a result, there are some items that need your timely attention related to upcoming club business.

Upcoming Events:
As our club moves forward, there are a couple of activities you should be aware of for the month of February. Mark your calendars, and I hope to see you there.

Executive Board Meeting - Saturday, 23 Feb, 2013 at 1300. Our Club President, Mike Schmit WA9WCC would like to invite any and all club members who are interested in planning club activities for the next several months to his home. This is your chance to contribute what you would like our club to do, activity-wise. So start brain-storming some ideas to bring to this afternoon get-together.

Speakers for the Club Meetings: If you have some ideas or topic requests for presentations at our club meetings, please let Mike WA9WCC know. We are trying to arrange for club presentations for the rest of this fiscal year.

Public Service Hours: If you have performed public service this last year using your ham radio and your skills, please send Mike WA9WCC a list of the hours. We are collecting public service hours for the annual report for corporate sponsorship. Ideas for public service may include your Skywarn duties. Maybe you helped out in a bike race or charity event. Some of you have also participated in passing traffic in the National Traffic Service. These are all good hours spent in service to others that can be included in our annual report. Thanks for taking the time to contribute to the community, and thank you for reporting your hours for club benefits.

Articles for the *SIGNALS* Newsletter: The RCARC has a fine publication that is delivered each month called the SIGNALS. However, the articles within don't just materialize out of thin air, unless you consider the Internet thin air. If you have an interesting QSO or a home radio project that you are working on, please consider sharing it with the club through the SIGNALS. Maybe you visited a hamfest, like the recent Cow Town Hamfest, and want to share what you saw or did there. You can even provide pictures to help explain your article. Send your submissions to Jim Skinner WB0UNI at wb0uni@arrl.net.

(Contributed by Michael Ketchum, K5MDK)

Events and Public Service Ops

2-3 March 2013: ARRL DX Contest-Phone. Mission: Encourage W/VE stations to expand knowledge of DX propagation on the HF and MF bands, improve operating skills, and improve station capability by creating a competition in which DX stations may only contact W/VE stations. Objectives: W W/VE amateurs work as many DX stations in as many DXCC entities as possible on the 160, 80, 40, 20, 15, and 10 meter bands. DX stations work as many W/VE stations in as many of the 48 contiguous states and provinces as possible. Contest Period: 48 hours. Starts at 0000 UTC Saturday; ends at 2359 UTC Sunday. More info at http://www.arrl.org/arrl-dx.

9 March 2013: The 11th Annual Irving ARC, Inc. Hamfest. The Irving Hamfest will be in full swing again this year at the Betcha Bingo Hall, located at 2420 W. Irving Blvd. #125, Irving, TX 75061 at Story Road. Check out the web site at http://irvingarc.org/iarchamfest.html. The doors will open at 8:00am and will close at 2:00pm. Look for a ton of door prizes. Your admission will include one door prize ticket. Additional tickets can be purchased for $1.00 each. Talk-In frequency is 146.72 (–) 110.9Hz PL. Advanced tickets $3.00, $4.00 after March 4th.

2 March 2013: The 2013 National Storm Conference. The National Storm Conference is a full day of presentations from some of the top severe weather experts in the country. Storm spotters, chasers, forecasters, researchers, emergency managers and others gather at the conference for a day of learning and fun. It's free and open to the public, so come and join us for the biggest event in Tornado Alley! The National Storm Conference is free and open to the public. Registration is not required. Arrive early, seating is limited. The location will be at the Colleyville Center in Colleyville, Texas, with hours from 9:00am till 5:00pm, Saturday, March 2nd. More information is available at http://www.tessa.org/meeting. html.

You might be a Real Ham if……your wife is overheard telling her girlfriends, "We don't need birth control pills. My husband has ham radio."

The 25-Foot Untuned Vertical -- 7 Bands

By Dave Benzel - KD6RF on October 16, 2012

With the interest in 43 foot untuned verticals, and some of the less than accurate claims being made, I thought I'd share the results of a 25 foot untuned vertical antenna I developed a few years ago. Hopefully, I can shed some more light on its practical use, as well as show how to gain a bit more performance.

The 25 foot vertical is qualitatively similar to the 43 foot vertical, but at half size, and is designed to provide acceptably efficient operation from 40 meters to 10 meters. So, the information here will roughly translate over to 80 through 20 meter operation of the 43 foot vertical (or, even better as you will see, a 50 foot vertical).

I started with the same general idea that the 43 foot vertical starts with – maximum frequency of operation limited to an antenna length of about 5/8 wavelength, above which lobing occurs and low angle radiation suffers.

In addition to ground losses, efficiency is largely determined by feedline loss, and in general, high VSWR starts killing efficiency at the upper end where VSWR starts hitting 20 plus, and at the low end where radiation resistance falls and where VSWR really skyrockets. There are excellent write-ups about this by WX7G here and VK1OD here (I'm new to this board, so my apology to others I may have missed!)

So, my goal was to design a system with less than 3 dB overall loss (excluding tuner loss) and has close to 0 dBi performance by:

• Reducing VSWR at the high end to reduce feedline loss in the 20 plus VSWR region.

• Reducing VSWR at the low end to reduce feedline loss in the 50 plus VSWR region.

• Using a minimalistic ground system.

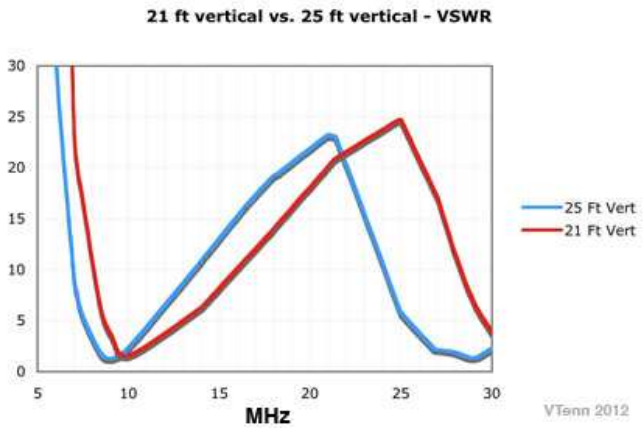
• Retaining lobe-free low angle radiation over the entire frequency range.

(Note – EZNEC model segmentation was standardized for consistency with "minimum recommenced" at 40 MHz for all data presented here. It's not hard to get a dB or two different answer if differing segmentation is used.)

Lowering the VSWR Throughout the Frequency Range

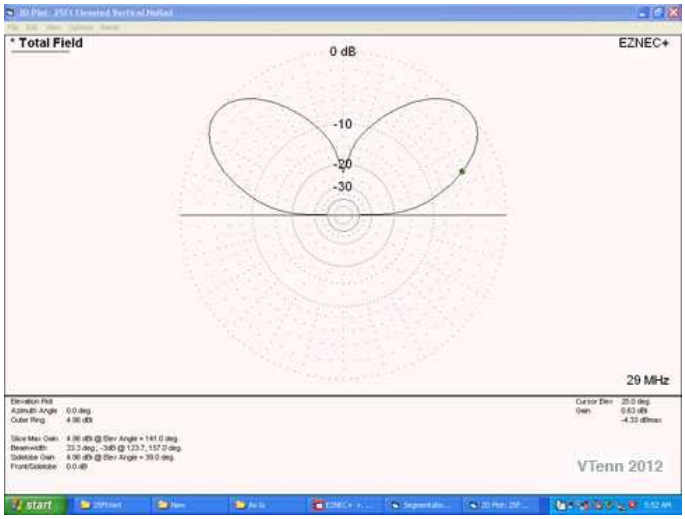
Not surprisingly, the first 2 goals are met by lengthening the antenna radiator – VSWR at the low end drops and radiation resistance increases as we start approaching ¼ wave, while VSWR also drops at the high end in the region of ¾ wave. As a consequence, feedline losses drop. Also, as the antenna is lengthened, we relax the requirements placed on the ground system.

Here is the effect of lengthening the antenna from 21.5 feet to 25 feet:



Re-Lowering Radiation Angle at High Frequencies

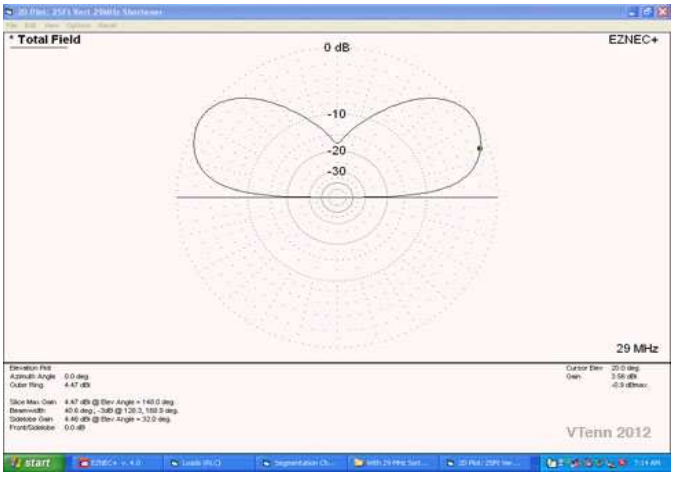
But of course, lengthening the antenna beyond 5/8 wavelength means we are killing low angle radiation at the high end of the frequency range as shown here for 29 MHz:



What to do.... What to do… In words, we want the antenna to have the desirable low angle radiation of the short 21.5 foot antenna, while retaining the desirable VSWR characteristics of the 25 foot antenna. We need a frequency dependant shortener!

The "shortener" is just a grounded 4 foot mid loaded spike near the base of the radiator which is tuned to a bit above the highest frequency of operation (10 Meters). The idea is to have lots of current flow at 10 Meters (and to a lesser extent at 12 Meters) which effectively shortens the antenna and brings down angle of maximum radiation, while have little current flow, and little effect, at low frequencies.

Here is the radiation pattern at 29 MHz with the "shortener", showing decent low angle radiation. Gain at 20 degrees elevation goes up to 3.6 dB (compared to 0.6 dB without the "shortener"):



And, at the low end we see that the input impedance remains mostly unaffected (and, with God and Mr, Maxwell smiling upon us, the high end VSWR actually becomes more favorable), which shows that we still have the desirable impedance and VSWR characteristics of the full 25 feet:

	W/O Shortener Real part	With Shortener Real part	W/O Shortener	With Shortener
f MHz	of Input Z	of Input Z	VSWR	VSWR
7	37.8	37.3	9.3	9.4
10	75.7	78.5	2.4	2.3
14	200.0	228.9	11.4	10.8
18	1017.0	962.3	21.9	19.2
21	288.2	253.3	26.7	23.2
25	75.2	63.9	5.3	6.2
30	157.2	39.8	5.3	2.3

VTENN 2012

A Miminalistic Ground

A big topic, with lots of possibilities. Much has been written about ground – some of it is even true ☺.

Here is the approach I took for this design – A raised feed point (5 feet in this case), and a long metal fence as ground/counterpoise. Raising the feed point relaxes the requirement on the ground system by moving the counterpoise away from lossy earth. There are a few nice write-ups regarding raised feedpoint verticals.

Most or all of them assume use of a set of tuned radials. A really nice and efficient system, but it is starting to become a pretty complex and real-estate consuming project to hoist a radial system up in the air.

Always being one with a eye toward Madman Muntzing, I did the modeling and analysis of a long metal fence for use as a grounding system.

It's always a matter of concern and debate as to how one measures and compares performance of one system over another. The 2 metrics I usually use are:

• How do the R losses of the system over "real" ground compare to the same system over "perfect" ground.

• How does the real-earth far-field absolute gain of the system compare to a similar reference system at the same height?

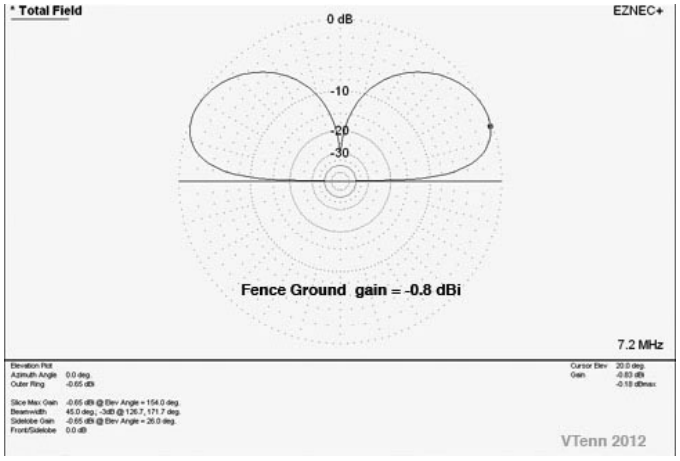
Fence Ground with "real" earth (0.01S/M) vs. Fence ground with "perfect" ground – this gives us an idea of how much loss is contributed to the system by ground resistance:

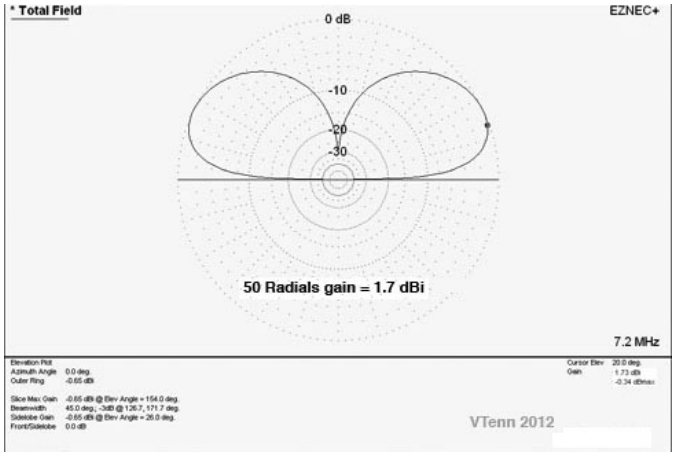
f MHz	RadRes FenceGnd .01S/M	RadRes FenceGnd PerfGnd	dB loss due to Fence gnd resistance
4	15.4	4.9	4.9
7	37.4	22.5	2.2
10	74.5	56.8	1.2
14	196.3	188.6	0.2

VTenn 2012

Feedpoint resistance increases only a moderate amount at 40 Meters, and results in 2.2 dB of real-world loss due to Fence ground system resistance. Good enough for my purposes given that the alternatives are a much more complex ground/counterpoise system.

Fence ground with "real" earth vs. 50 radial with "real" earth, at same feedpoint height – this gives us an idea of how the system performs compared to a similar, but more complex, "optimum" system:





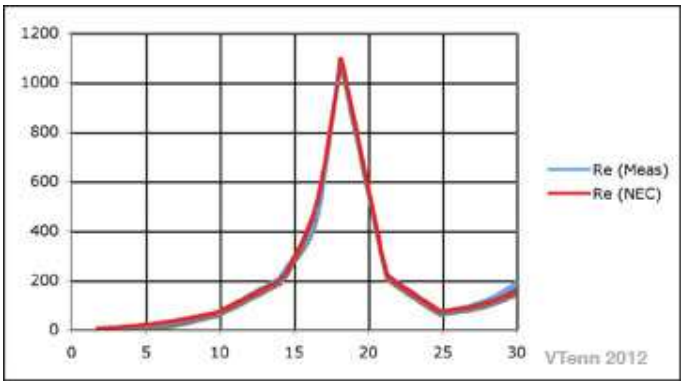
The far-field gain difference between the Fence ground system (-0.8 dBi) and the 50 radial system (1.8 dBi) is only

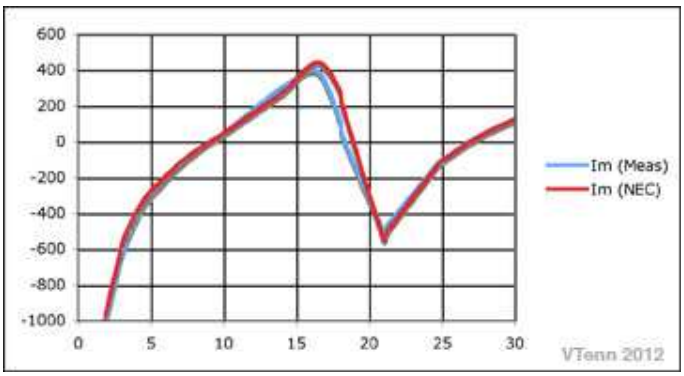
2.6 dB – a value which I find to be perfectly acceptable in trade-off with ground system complexity.

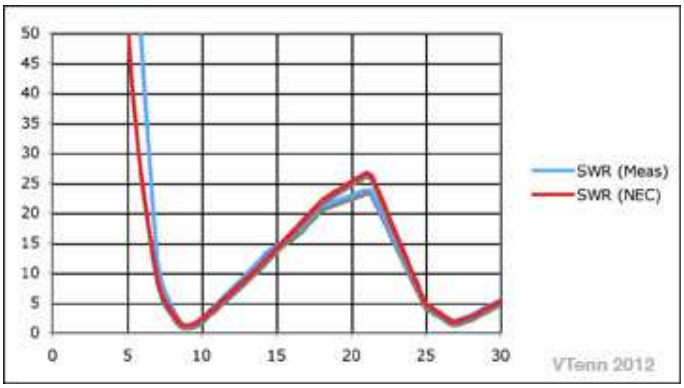
How Good is my EZNEC model?
EZNEC and other modeling software is great, but do they actually reflect reality?

The qualified answer is – Yes!, provided one tweaks the model to reflect reality. The model I used for this project was tweaked by using a small element at the base of the antenna to force EZNEC to actually feed the antenna near the base (oddly enough, this is quite critical to get model results that match measurements), and by shifting around "real" ground conductivity, in my case to 0.01 S/M.

Here is the side-by-side comparison of my EZNEC model vs. Measured data (HP8753 vector network analyzer, 64 averaging) for the 25 ft vertical:



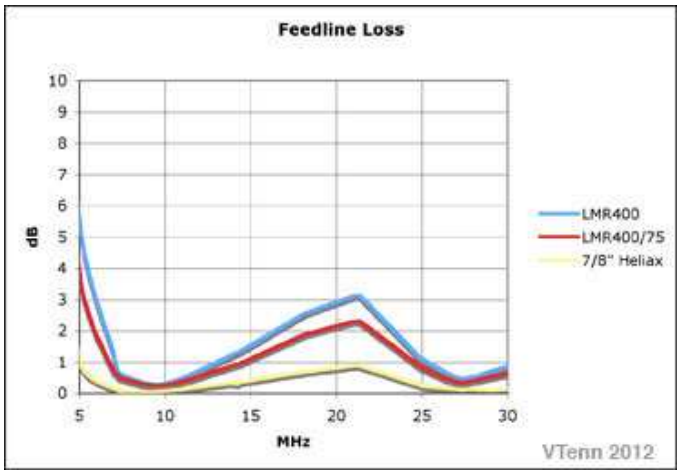




Feedline Losses
No system, especially one the operates with high VSWR over much of it's range like the 25 ft vertical (or the 43 foot vertical) is complete without considering feedline loss. Again, there are very good write-ups out there by WX7G and VK1OD and others.

I my case, I had a nice chunk of 7/8" heliax laying around, and just used that for the 15 meter long feedline.

Here is the feedline loss (using VK1OD's enhanced calculator) and worst case assumptions:



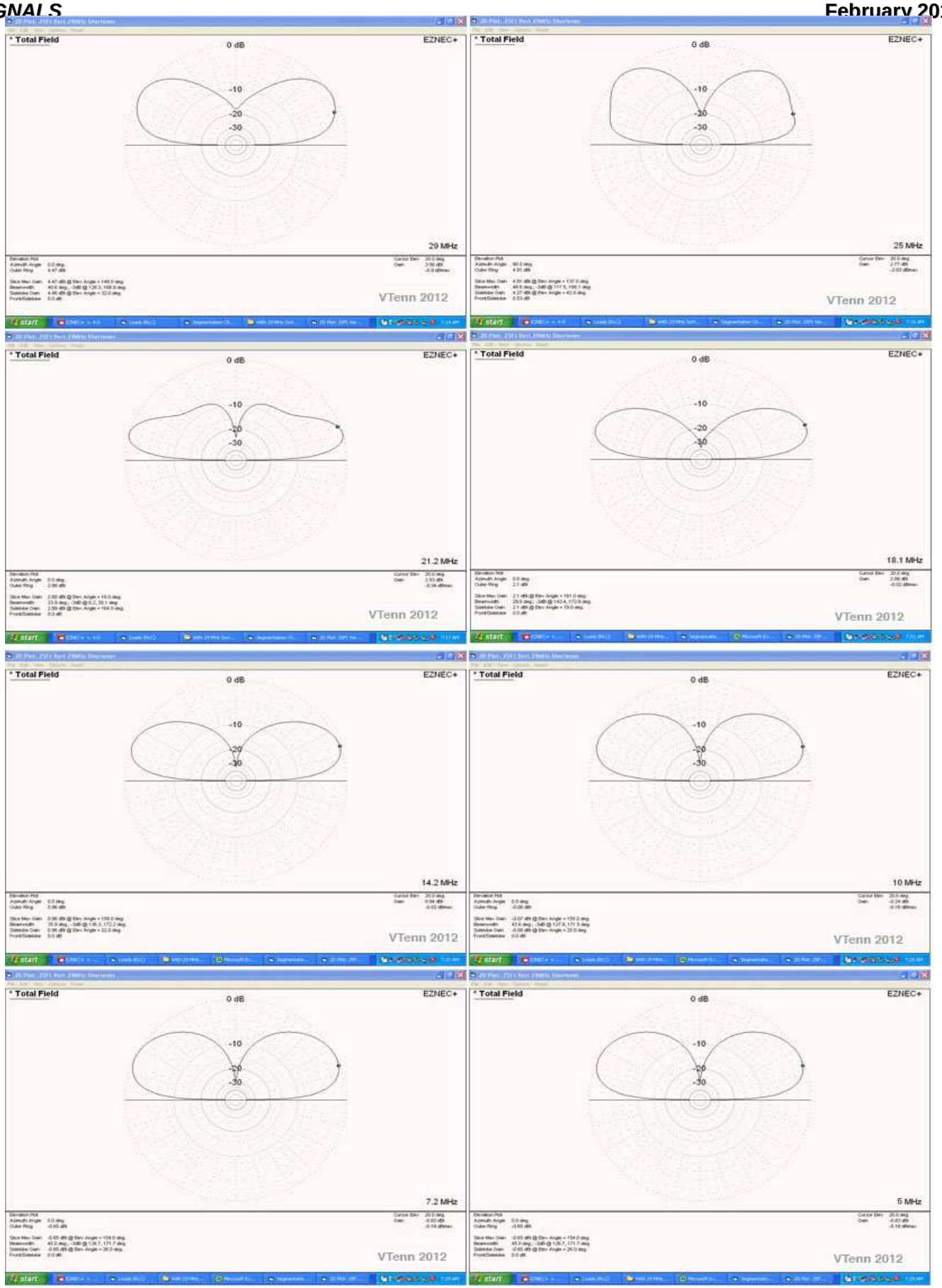
It's nice to have heliax laying around ☺. If you are thinking of buying some line for a system like this, you may want to consider the old reliable LMR-400, but in it's 75 ohm version. Using 75 ohm line buys us a about 1 dB in reduced line loss. Of course, you could put a remotely tuned Tuner at the antenna, but that can get pretty pricey pretty quick.

The Whole System
Shown below is the system performance of the whole system (sans Tuner, which is a whole-nuther topic in and of itself):

Including feedline loss (but excluding the tuner), the overall gain is:

	Antenna Gain	Antenna Gain plus Cable Loss
f MHz	dBi	dBi
5.0	-1.3	-2.4
7.2	-0.8	-1.0
10.0	-0.8	-0.8
14.2	0.1	-0.2
18.1	0.9	0.2
21.2	0.9	0.0
24.9	0.8	0.5
29.0	1.2	1.1

25 Ft vertical, with "shortener" VTenn 2012


* Total Field
0 dB
EZNEC+
-10
-20
-30
29 MHz
VTenn 2012
* Total Field
0 dB
EZNEC+
-10
-20
-30
25 MHz
VTenn 2012
* Total Field
0 dB
EZNEC+
-10
-20
-30
21.2 MHz
VTenn 2012
* Total Field
0 dB
EZNEC+
-10
-20
-30
18.1 MHz
VTenn 2012
* Total Field
0 dB
EZNEC+
-10
-20
-30
14.2 MHz
VTenn 2012
* Total Field
0 dB
EZNEC+
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-20
-30
10 MHz
VTenn 2012
* Total Field
0 dB
EZNEC+
-10
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-30
7.2 MHz
VTenn 2012
* Total Field
0 dB
EZNEC+
-10
-20
-30
5 MHz
VTenn 2012

Note that I have included 5 MHz data. We might be able to get away with using the system on 5 MHz, but 3.8 MHz is not really practical. We could add a loading coil to for 80 Meters (160 Meters for the 43 foot antenna) to lower the feedline loss, but coil Q would be an issue, and the shear magnitude of the voltage extremes are pretty problematic (ask me how I know ☺).

Conclusions

A very simple system is shown here that:

• Is long enough to provide low VSWR at the low and high ends of the frequency range

• Has a “shortener” that prevents high angle lobing and radiation at 10, and to a lesser extent at 12 Meters, while not hurting efficiency at the 40 Meter low end.

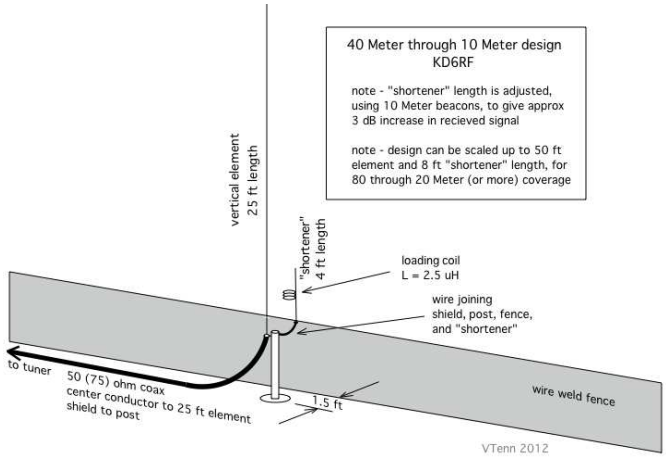
• Has low feedline losses over entire 40 to 10 Meter range.

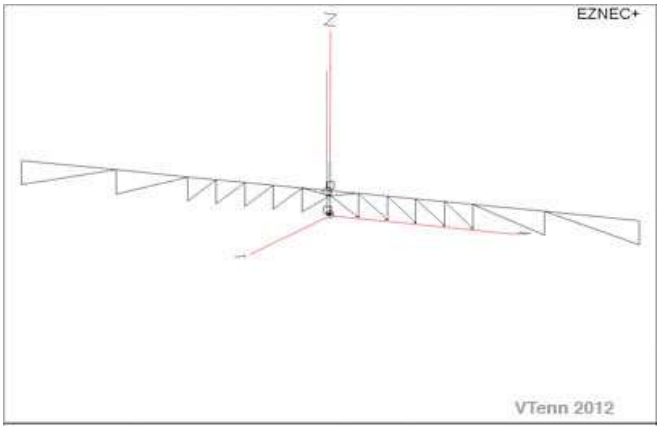
• Has reasonably near 0 dBi gain over entire 40 to 10 Meter range.

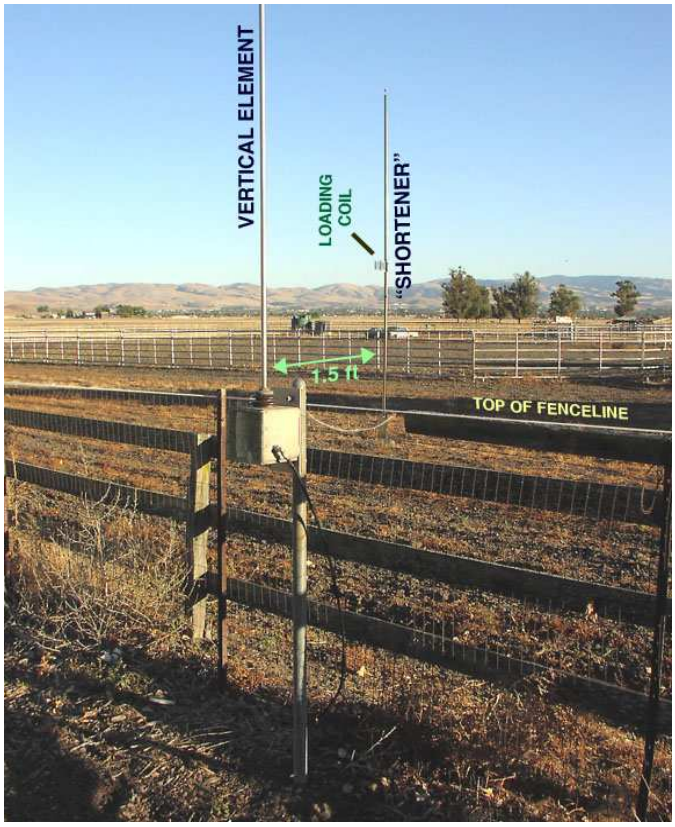
• Uses an existing metal fence line as a fairly efficient ground/counterpoise.

• Decent low angle radiation over entire 40 to 10 Meter range.

It can’t get much simpler:







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Rockwell-Collins

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Tuesday 26 February 2013

1700 Social 1730 Meeting

Methodist Richardson Medical Ctr
At Bush/Renner/Shiloh Intersection

Second Floor Conference Room 200

NEXT SIGNALS INPUTS DEADLINE:
➔➔➔ 15 March 2013 ➔➔➔