THE NEWSLETTER OF
THE KINGS COUNTY RADIO CLUB

KCRC

January 2019 ""差不多 " Volume 6, Issue 1[A]

Minutes of the January 2019 KCRC Meeting, January 2nd, 2019

Our January "Pre-Meeting Question and Answer Session" was a lively affair, with no specific main topic.

The monthly meeting was called to order at 8:05 PM, by our new President, Joe AC2AE. Also present at tonight's meeting were our new Vice President Simon KD2LQE Treasurer Richard KA2KDQ, General Secretary Roy AC2GS, Howard N2GOT, Axel KD2OPM, Lloyd K2JVX, Gene KY2MY, Jason KD2PUW, Joe KD2QBR, Ralph KD2QBR, Frank KD2QDU, our newest member Dexter KD2LOM and a new visitor Sandra, that decided to join our club towards the end of our meeting that night!

The vote to accept the minutes of the December meeting was passed unanimously.

Treasurer Report—Richard KA2KDQ, reported that our Treasury currently has $1,762.77 in assets in our bank account, $115.32 in our PayPal account and $80 in cash, for a total of $1,878.09. This past month we had one new member!

Repeater status was discussed by Joe AC2AE - The Repeater locked up recently and needed to be manually rebooted. The control Yagi needs to be repositioned. The power amp is still out for repairs. The new digital files for the Repeater have not yet been loaded into the controller.

2 Meter Report—Richard KA2KDQ reported that he is averaging "about 4-5" check-ins weekly, most likely due to the holiday season.

10 Meter Report—Roy AC2GS reported that the 10 Meter Net is going well. Propagation conditions have limited DX communications, but despite that we had two check-ins from Florida! We have instituted a rotating schedule for Control Operators. Joe AC2AE will take the first Sunday of the Month, Howard KD2MSU will take the third Sunday, and Roy AC2GS will take the remaining Sundays until we can cajole more people to join our little rotation. The Club is still searching for a few new Net Control Operators to join the rotation for this Net. Anyone with a decent 10 Meter setup with a free hour or two on Sunday morning should consider volunteering. Perfect reception or a very strong signal is not necessarily needed. The participants of the Net are available to relay messages back and forth, as needed. Please consider volunteering for this position. The Club executive committee will try to cover the Net Control Operator post until a more permanent replacement is found.

KCRC TechNet —Our Net Control Operator and Host, Roy AC2GS, reported that the TechNet is alive and well, but can always use more participants—either to ask questions, or offer advice. Please consider listening and participating—either with questions or answers, or opinions. Participation makes or breaks a TechNet.

KC2RC FusionNet—The FusionNet continues to go strong, both locally and through its Wires-X room, and its Brandmeister access. There are 16+ check-ins weekly and Wires-X check-ins from around the world! Jason has instituted a weekly question for all participants to answer. Anyone wishing to suggest a topic or question for the Fusion Net can email it to: TheFusionExperience@KingsCountyRadioClub.com .

Old Business: Our next VE Exam is scheduled for January 13, 2019. For ANY individuals interested in joining our VE Team, please contact any Executive Member of the Club or the return email address for these emails of our Club Meeting's minutes. People took time out of their busy lives to help get you licensed – pass on the favor!

Our Club presently has 72 members, 56 of whom have paid their 2019 dues (78% paid up for 2019). We had one new member, Dexter KD2LOM join our Club this past month.

Although we appreciated the efforts of a local Ham to provide us with our patches, it does not seem as though he will be able to do this in a timely manner. We therefore voted to have Roy AC2GS investigate our options from custom patch manufacturers available on the Internet. We decided to aim for a 3 inch patch as the most useful size, the additional expense for metallic threads, since our new logo has a copper color, and Roy will obtain estimates for both 50 and 100 patches for our next monthly meeting—to be discussed and voted upon at that point.

Lloyd K2JVX reported how work continues for a Special Event Station on June 8-9, 2019 commemorating the commissioning of the U.S.S. Missouri.

There were no new developments regarding Field Day 2019.

New Business:

The subject of events that the Club might take on, in addition to our previous ones, in the 2019 year was discussed. It was suggested that we get involved in the Winter Field Day as a Club event, that we host "outing" in public areas showing our technology to curious passers by, more Special Event Stations, similar to our commemorating the commissioning of the U.S.S. Missouri. Educational sessions were also proposed—antenna design, simple kit building, simple soldering techniques, etc. If we could not obtain approval for these activities by authorities of the NY Presbyterian-Methodist Hospital, Jason KD2PUW was kind enough to offer his home as a possible alternative site for such events!

Roy AC2GS mentioned that the partial government shutdown would be affecting our hobby. Although the FCC had originally suggested that they would be shutting down their main database for licenses, the FCC ULS sytem, they decided to keep it online, BUT freeze its content. The FCC does not plan to enter any more Amateur Radio Data UNTIL the government's budget is approved. This means that anyone who obtains a new license, when they had no previous one, will NOT be able to operate until the FCC ULS system is unfrozen and their names and privileges are posted onto that site.

At 9:05 PM the meeting was concluded, but discussions persisted well past 10 PM.

See you February 7th for our next meeting!

These minutes were respectfully recorded and submitted by Roy AC2GS on this day, January 2nd, in the two thousandth and nineteenth year of our Lord of Propagation…

What's So Special About Elevating My Dipole One Half of Its Resonant Wavelength Above Earth Ground?

Ham Radio can be a hodge-podge of highly technical information, and equations that would cause many of our ears to bleed (take a look at Maxwell's Equations, if you doubt this). Some aspects of Amateur Radio read like cookbook recipes with little to no explanation of why they work, and more than occasionally they end up not working all the time for sundry reasons.

Are we Scientists, Engineers, Technicians, or are we Cooks?

Personally, I prefer the former group to the latter, although cooks can be extremely useful.

One of the "eleventh commandments" of amateur radio is that a dipole works best when it is positioned *at least* one half of its resonant frequency above Earth ground. All too often, if you ask some old wizen Ham why, rather than sit you down for a fascinating talk, he might just tell you that it's just the way it is, like the sky being blue. Best not to worry why…

I don't know about you, but that ain't why I got into this hobby, so let's explore WHY!

Life is a complicated thing, and so is this situation, and there is more than one reason for the end result.

Earth ground is a variably conductive material, depending on how much sand, clay, or stone it is made of, and its water content. All varieties of Earth ground can couple with a nearby radiating antenna and absorb RF energy into the ground, where it might keep the earthworms warm for the winter but will not get that energy into the ionosphere for some interesting DX communications! So, one reason to get your dipole away from Earth ground is to limit that coupling and this energy dissipation.

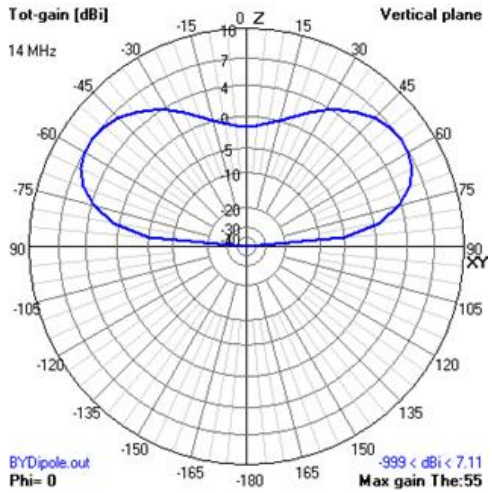
...And when we speak of Earth ground, we mean the real ground, even if your structure has some metal in it, even a metal tower does not function like the Earth's ground, so your building counts when you calculate your antenna's elevation above Earth ground!

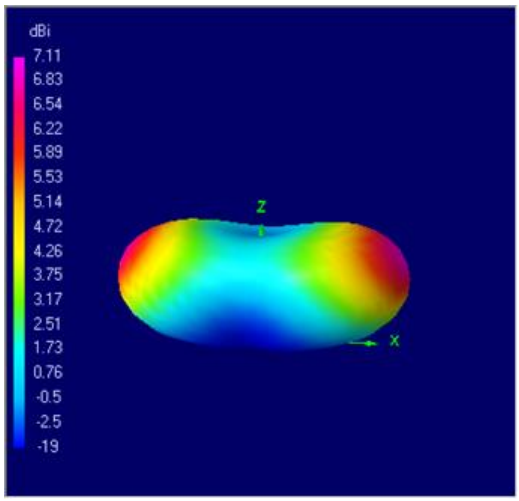
But there is "another" [see Star Wars references] …

The ground also can reflect radio waves, and they can have constructive and destructive interference patterns, which alter the direction that the antenna radiates their RF energy outward.

Let's take our "perfect" cookbook example – a simple 20-meter half-wave dipole elevated 30 feet up in the air (approximately 10 meters up, which is half of a 20-meter signal's wavelength. We will use a very interesting Antenna Simulator program, called 4NEC2 (you can "Google" it if you are interested, but it does have a bit of a "learning curve").

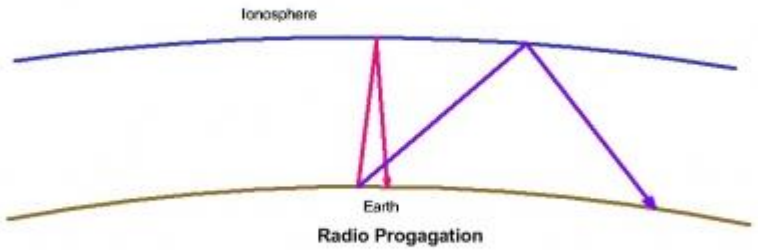
This is what an elevation plot looks like for a dipole at that height:





The simple 2D line drawing shows that most of the RF is being radiated out at a 30-degree angle from the horizon, the other 3D color rendering shows this 30-degree radiation redder and therefore “hotter” and more energetic than the radiation at other angles.

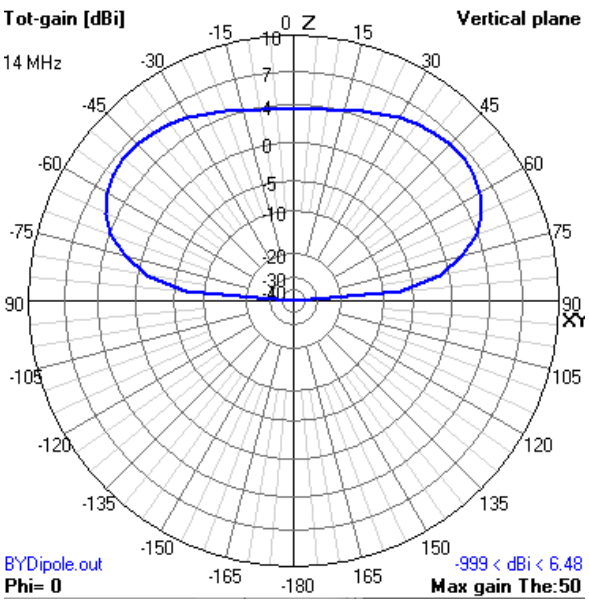
Why you may ask, is the radiation angle, or “the takeoff angle” so important? Well, you have to know how ionospheric propagation works as the ionosphere (hopefully) refracts and reflects your RF to distant lands. Here’s a simple diagram to demonstrate the difference between a good DX (distant) radio signal and one meant for local operators, better known as a Near Vertical Incidence Skywave (NVIS) antenna:

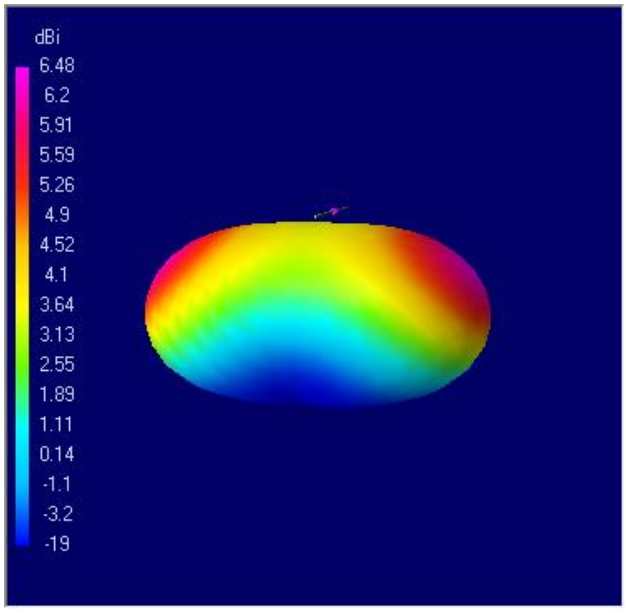


The narrow refracted/reflected signal is an NVIS antenna, the wider more distant radio propagation is from a DX antenna like your dipole elevated half a wavelength above Earth ground!

So, you see how a takeoff angle positioned closer toward your horizon will get you farther than one pointed straight up into the sky.

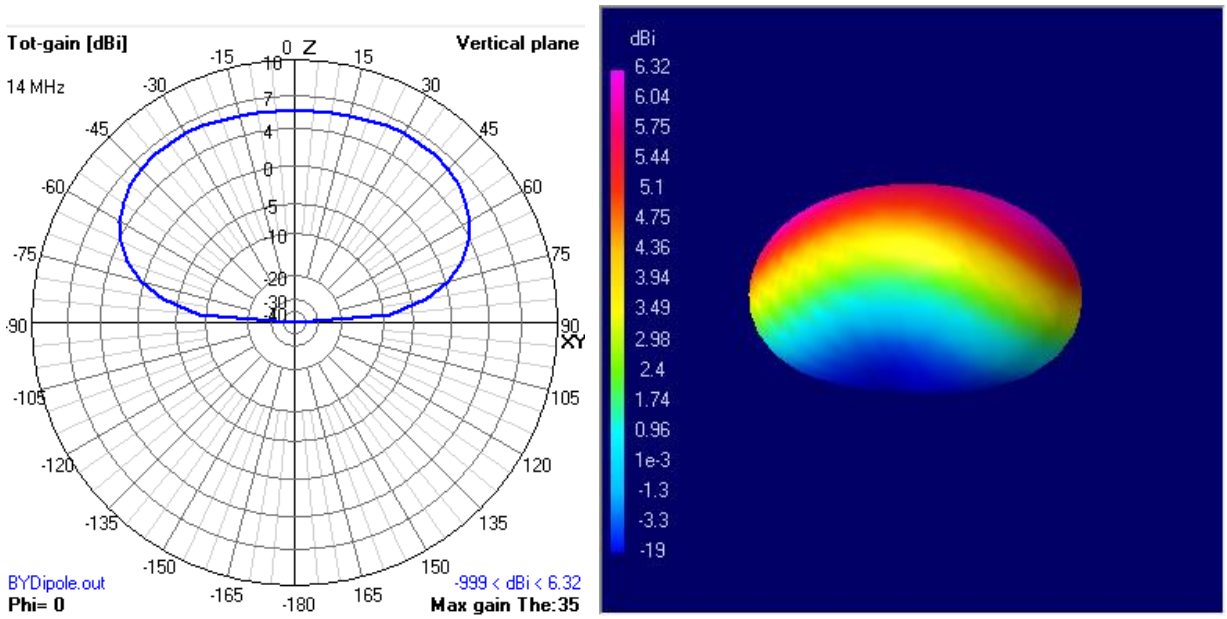
What happens as you lower that lovely dipole that we have simulated? Let’s lower it from 30 feet above earth ground to 25 feet…





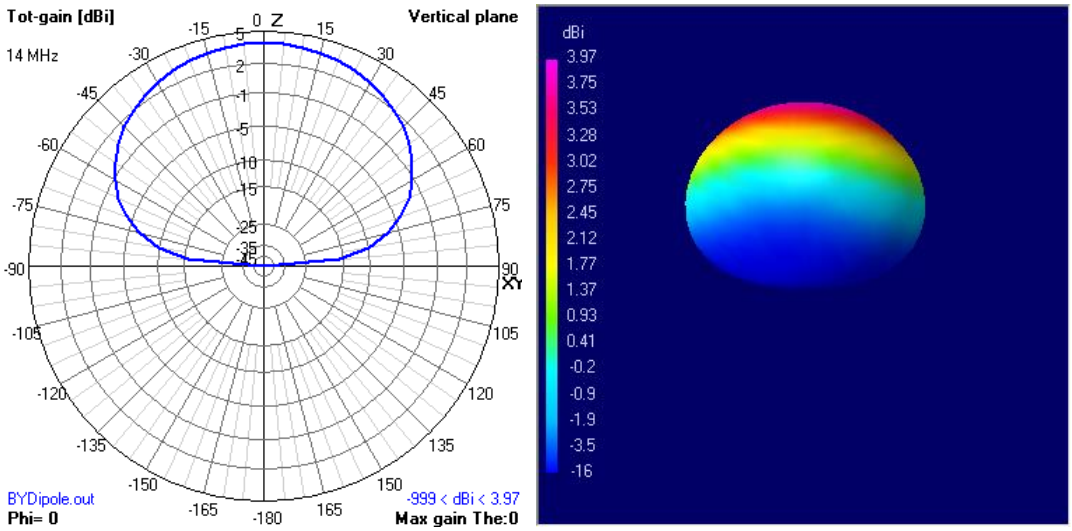
Notice how that peak radiation is moving further above the horizon?

What about 20 feet above Earth ground?



Now things are getting very obvious, a LOT of this antenna's RF is going straight up – some will just shoot through the ionosphere on its way to Alpha Centauri, or some other extra solar QTH, or bounce almost right back down and be a decent NVIS antenna, but not a great DX antenna (unless you need Alpha Centauri for your Worked All Solar Systems Award).

Let's get REALLY silly and drop that dipole to a mere 5 feet above the Earth Ground:



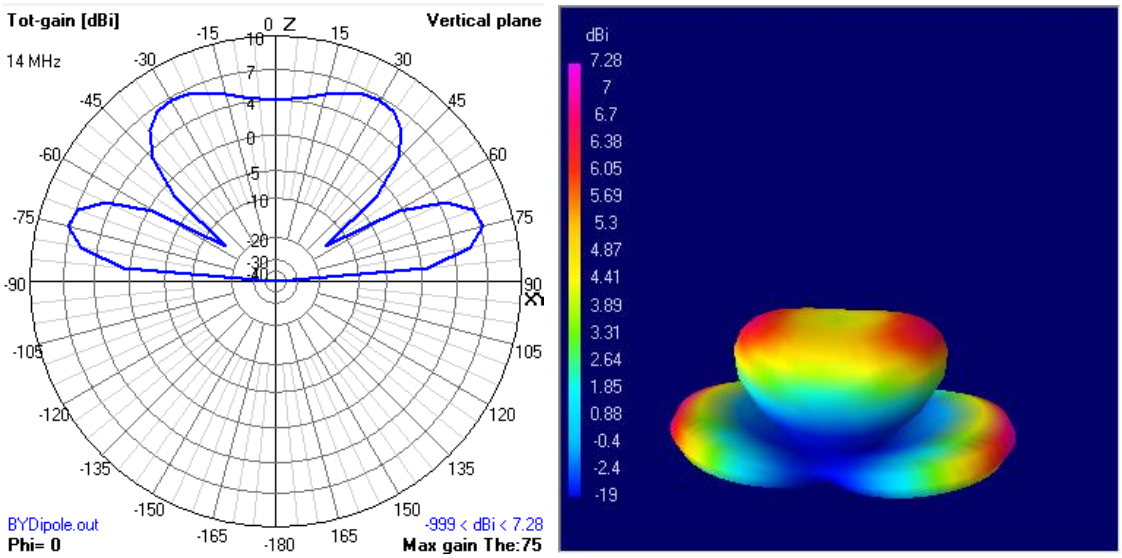
Now you can clearly see that most of your RF is shooting out of your dipole STRAIGHT UP! NVIS, pure and simple.

So, that's why everyone tells everyone else to put that dipole up ½ a wavelength above Earth ground, whether they can read radiation patterns or not!

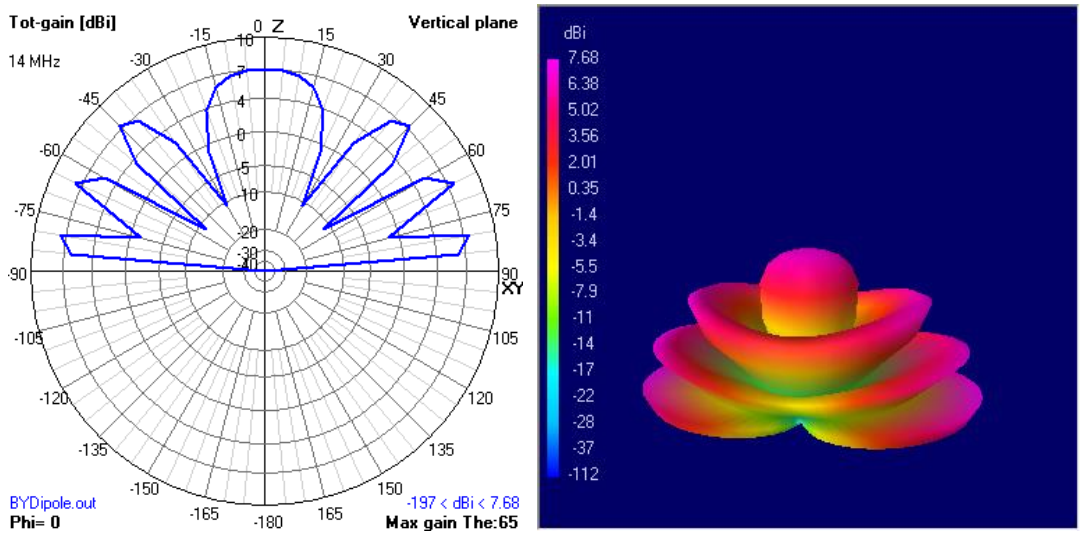
But, if one magic pill will cure you, shouldn't a dozen magic pills make you a Superman, or at least a Spiderman??

Well, medicine doesn't work like that, and neither does electrodynamics!

Let’s hoist our simulated antenna up a full wavelength above Earth ground:



What about two full wavelengths above Earth ground?



See? It’s not better, just weirder (but still safer than taking all those “magic pills” mentioned earlier).

So, the moral of this story is that as long as you plan on operating on this planet, for more distant places on this planet, the closer your dipole is to one half its wavelength above Earth ground, the better. If you can’t, you can’t. An antenna pointing at a less optimal direction is still much better than no antenna at all…

But don’t you like knowing what’s going on, now?

Dipole elevation also affects its impedance – a half-wave dipole in “free-space” is supposed to have a nominal impedance of 73 ohms, not the 50 ohms that is all Amateur Radio Operator’s dream come true. Its impedance can change with the dipole’s proximity to Earth’s ground and to distortion of the dipole leg’s geometry…

But we will save that for another article!

73,

Roy AC2GS