THE NEWSLETTER OF
THE KINGS COUNTY RADIO CLUB

KCRC

October 2022 "NULLUM BENEFICIUM IMPUNITUM" Volume 9, Issue 10

Minutes of the October 10th 2022 KCRC Meeting

Our October "Pre-Meeting Question and Answer Session" ran without any problems.

The monthly meeting was called to order at 8:10 PM, by our President Mitch N2RGA. Also present at tonight's meeting were Vice President Berlotte KD2MYF, Secretary Roy AC2GS, Executive-At-Large Joe N2DEJ, Chris KD2WOT, Bob KD2NVB, Ralph KD4RN, and Joe KD2MLY. We had one visitors Nikita.

The vote to accept the minutes of the July, and August and September meetings were tabled for this month, due to a lack of a quorum, until later into the meeting.

Treasurer Report—Frank KD2QPU was not able to attend the meeting, bu emailed Roy AC2GS to report that our Treasury currently has $1,642.30 in our bank account as well as $381.43 in our PayPal account for a total of 2,023.73 in assets.

Repeater status was discussed by Mitch N2RGA - There has been no further work on the Repeater, in the past month. Mitch plans to arrange a meeting with those interested in making up a new Repeater Committee.

2 Meter Net Report—Joe N2DEJ reported that the Net could use more participants by Club members..

10 Meter Report—Roy AC2GS reported that the 10 Meter Net continues to be poorly attended by Club members, and could use more Club member's participation.

KCRC TechNet—Roy AC2GS reported that the TechNet is alive and well, but suffers , as well, from a dearth of Club member participation, so please try to join us on the second and fourth Wednesdays of every month!

Fusion Net Report—No NCOs were present at the meeting, so this was tabled.

ARES Report—Was tabled due to William AC2ZV's absence.

Old Business: There has been no change, regarding the status of our bi-monthly VE Sessions.

We have 74 members on our Roster. We have two new members this past month, Gabe N1UFO, and Kazim . We are still selling Club patches at $5 a piece and $1 shipping and handling. You can save the shipping and handling fee by buying them at our monthly in-person meetings (when they are re-established).

The search for a viable location for our Club's functions (General Meeting and VE Sessions) was discussed. Our previous site was contacted and we were informed that they were still considering reversing their decision to limit meetings to only Hospital employees. We were advised to check back after the New Year. Chris KD2WOT suggested investigating room availability at Kings Plaza and the Knights of Colmbus. He said that he will look into this and report back for the next General meeting.

New Business: Berlotte KD2MYF discussed the 2022 KCRC Picnic, scheduled for October 15, 2022 and requested help to transport the supplies to the Picnic site on the day of the picnic. People were urged to contact her if they were willing to help at the picnic, and if they intended to attend.

We discussed when the 2023 Dues drive should begin. It was decided that Mitch N2RGA will reset the webpage on our site, regarding paying dues, from the present pro-rated 6 month membership, back to the annul membership price, after November 2, 2022. All new members paying after November 2, 2022 will have the remaining days of 2022 included in their 2023 membership. Our next club mailing will include a request for all present members, not yet paid up for 2023, please renew their dues!

During our upcoming November General Meeting there will be a request to nominate members to fill our Executive Board ranks for the 2023 year. Mitch N2RGA advised us that he does not plan on running for President in 2023 and suggested that our Vice President Berlotte KD2MYF be nominated for that position for 2023.

The meeting was closed 8:41 PM.

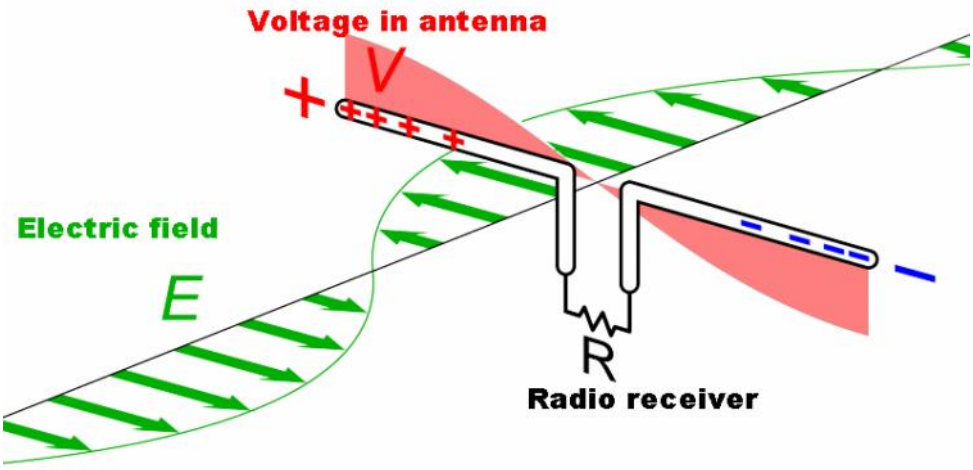
Stay Safe Everyone!

I Don’t Need No Stinkin’ Balun…

Or Do I?

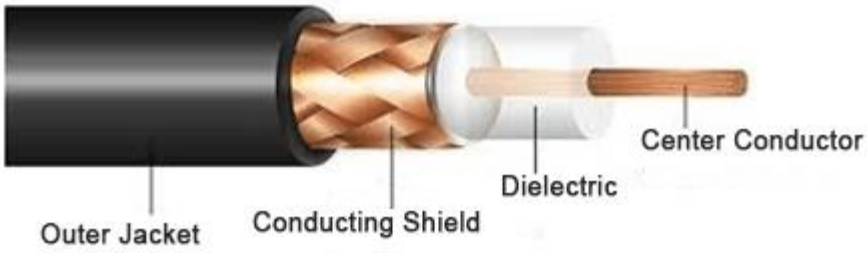
(Part of the “Fun with Antenna Simulator Series)

Well, let’s start again with one of the simplest antennas that exists, the ‘simple’ resonant center fed dipole:



The new Ham’s first home antenna might be the simple center fed dipole, and the question that inevitably comes up is: should I use a 1:1 balun, or some RF choke for this antenna?

Well, your dipole is a balanced antenna (there is a decidedly symmetrical aspect to its design – one leg mirrors the other leg of the dipole), and your transmission line is most likely going to be a coaxial cable:



Which is unbalanced (no mirror image symmetry going on with this kind of transmission line).

So, a balanced-to-unbalanced BALUN would seem to be in order, or in other terms a Common Mode Current choke.

But what's common mode currents?

Well, your coaxial cable is capable of providing a current path to TWO different currents. You may think that your coaxial cable has two conductors, and you can only handle one current in it, and that is the case for Direct Current (DC) use, but you are using it for Radio Frequency, Alternating Current (AC) use, and in that case, there are THREE conductors:

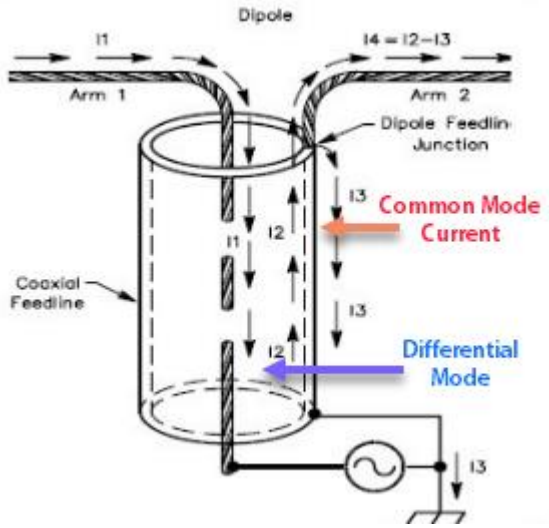
The center wire supplies differential mode current.

The inner surface of the braid shield supplies the opposing differential mode current.

And the outer surface of the braid shield supplies common mode current reflected from your feed point.

The two differential mode currents are able to cancel each other out in free space and prevent it from being radiated away as radio waves. That is why coaxial cable offers such great isolation (often estimated as being 100 dB – that means that only 1/10,000,000,000 of the signal leaks out of it), when used correctly!

The outer surface of the braided shield is operating in common mode, its current is not out of phase with the current running on the inner aspect of the shielded braid – it is flowing in the same, common phase. Without that opposing differential phase, your common mode current on the outer surface of your braided shield is free to radiate away! Radiate outside AND inside your shack.



Radiating outside your shack might be advantageous at some times, and some antenna designs utilize this transmission line RF radiation for different purposes, but for our simple dipole, we would like our RF to radiate out from our dipole and certainly not inside our shack, rebooting our computer, or triggering our garage your opener…

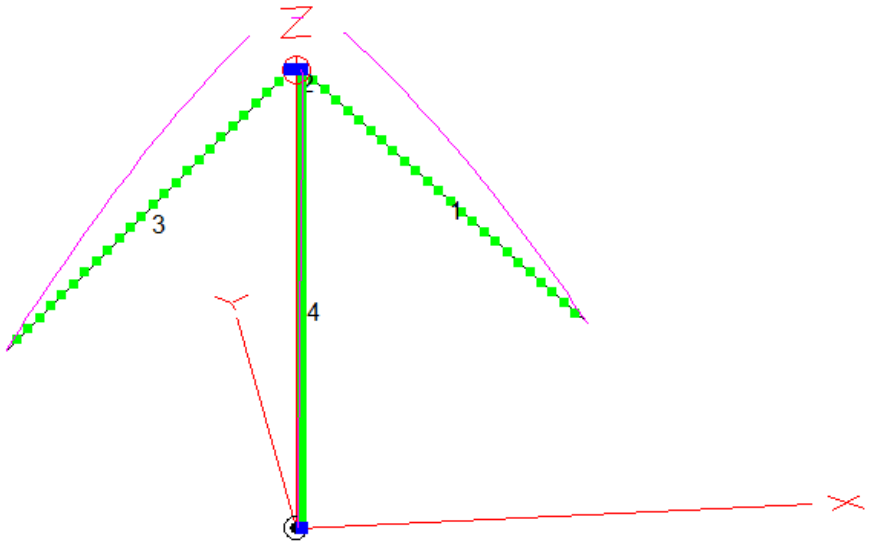
So, do you REALLY need that 1:1 balun/common mode choke? Well, you may get away without one, if you're lucky…

Do you feel lucky, punk <grin>?

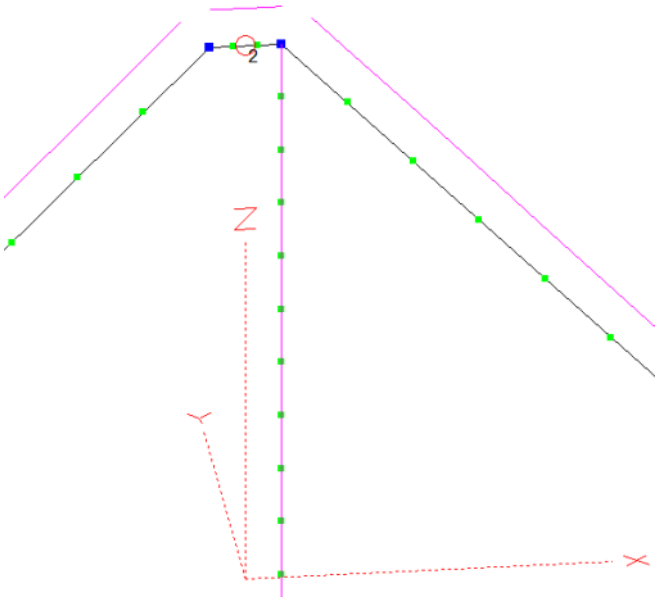
(Sorry, I just couldn't stop myself from using that line – check out 'Magnum Force, though – it was a great film.)

Well, let's not plummet down some technical 'rabbit hole' right now, this article is part of a series where I use antenna simulations to get most of my points across.

Let’s start with a simple 40-meter inverted V type of dipole.

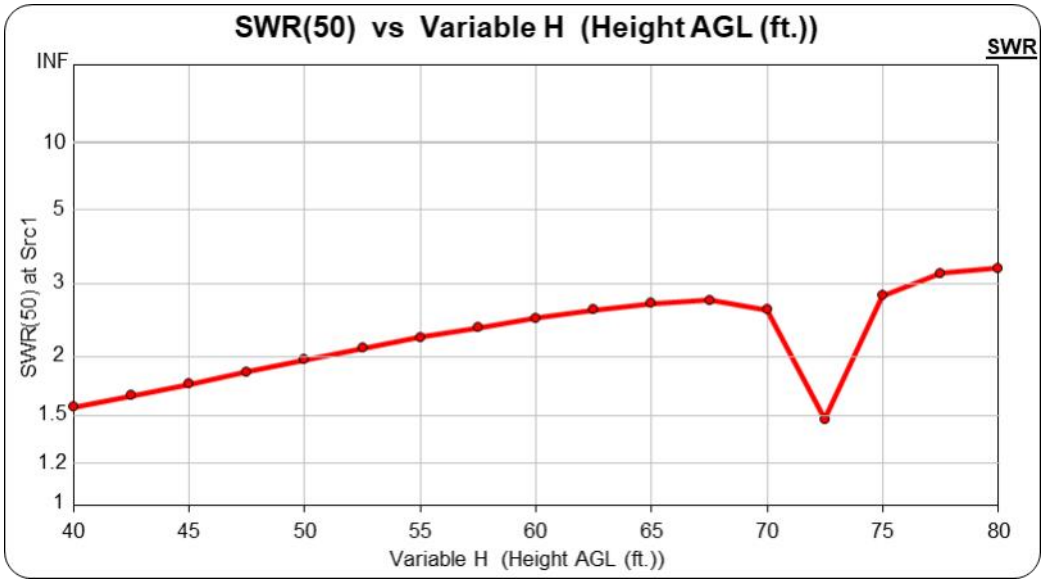


But what’s that vertical green wire? Why, it is our simulation for the grounded coax’s outer shield:



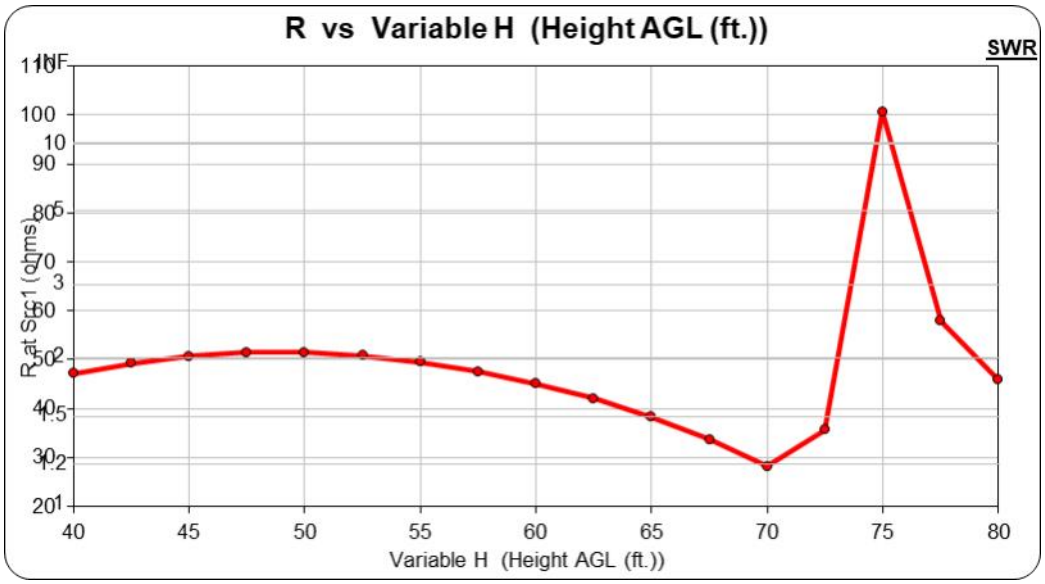
Now, we’re going to run a series of simulations where we will keep our antenna radiating a 7.15 MHz signal but vary our transmission line from 40 feet (12.2 Meters) long, all the way up to 80 feet (24.4 Meters) long and take a look where our transmitter’s current is showing up.

Let’s sweep the SWR for this particular situation:



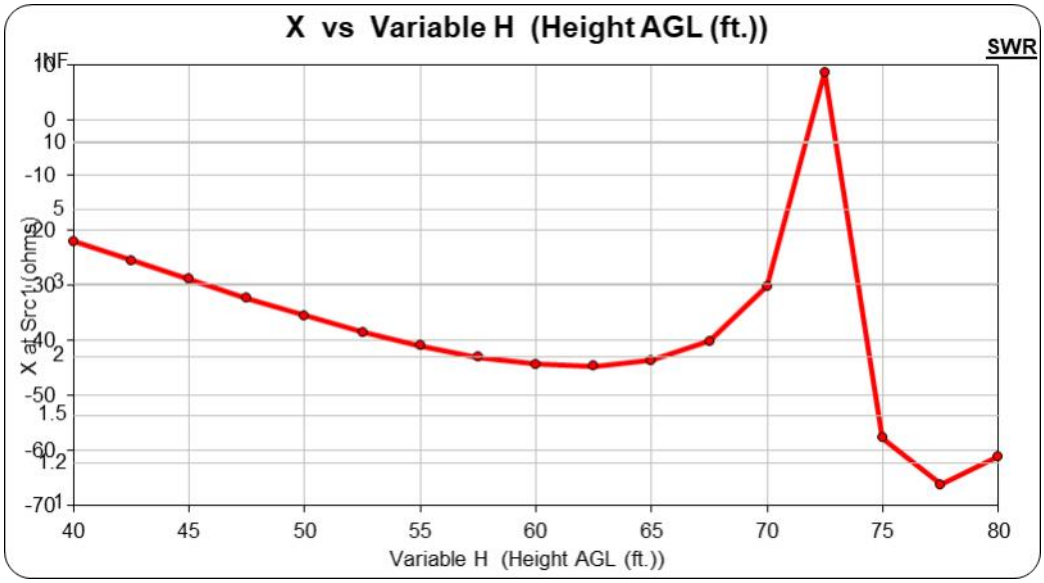
That's interesting. It would seem that as our transmission line gets longer, our SWR gets worse, but with about 72 feet of coax, our dipole's SWR suddenly gets a lot better? That's weird…

Let's take a look at what happens to the Resistance as the cable length increases:



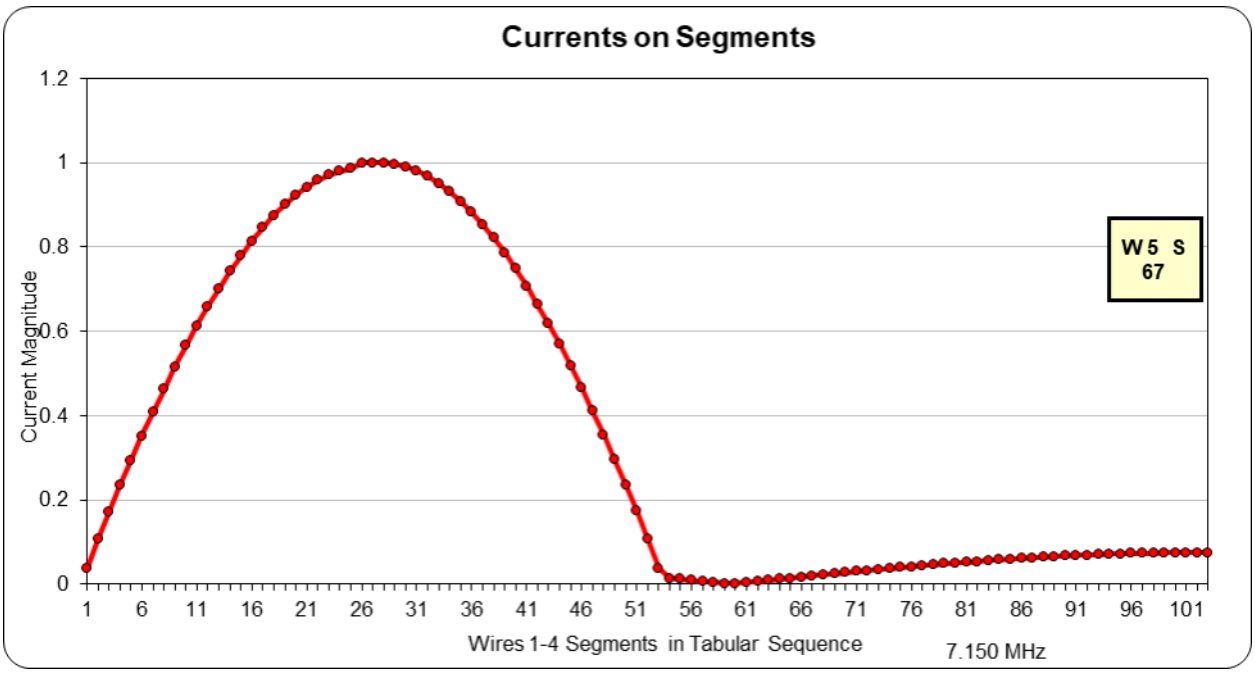
Gee… That doesn't look nice at all!

What about its Reactance:



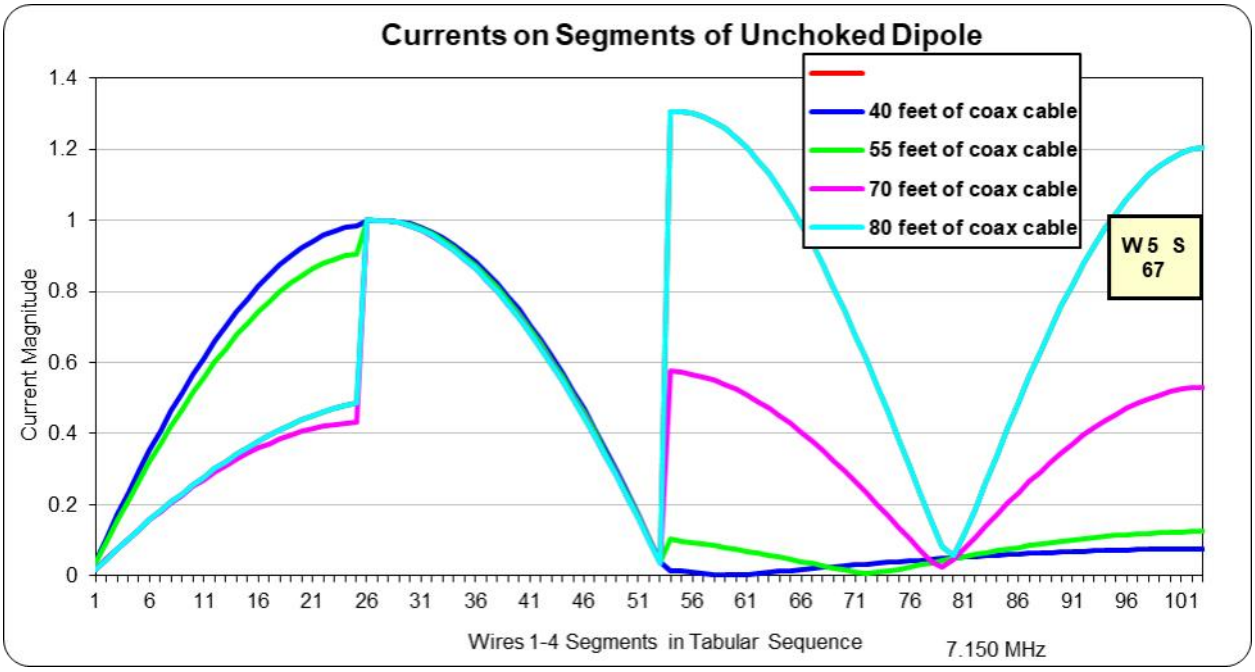
Gee… That's not great either…

Let's take a good look at the currents running through our dipole AND our coax shield:



This is with a cable length of 40 feet. Everything looks pretty good. The big bump at the beginning is the current in the dipole, where it belongs. The slightly upsloping tail is the common mode current. Less is always better, but it doesn't look too terrible>

But, let's see what happens when we lengthen the cable length:



Oops! That looks worse and worse as the cable lengthens! At 80 feet the current going to the dipole, where it belongs, drops precipitously and look at all that common mode current running on the outer surface of your coax, radiating all over the place as well as being reduced to waste heat!

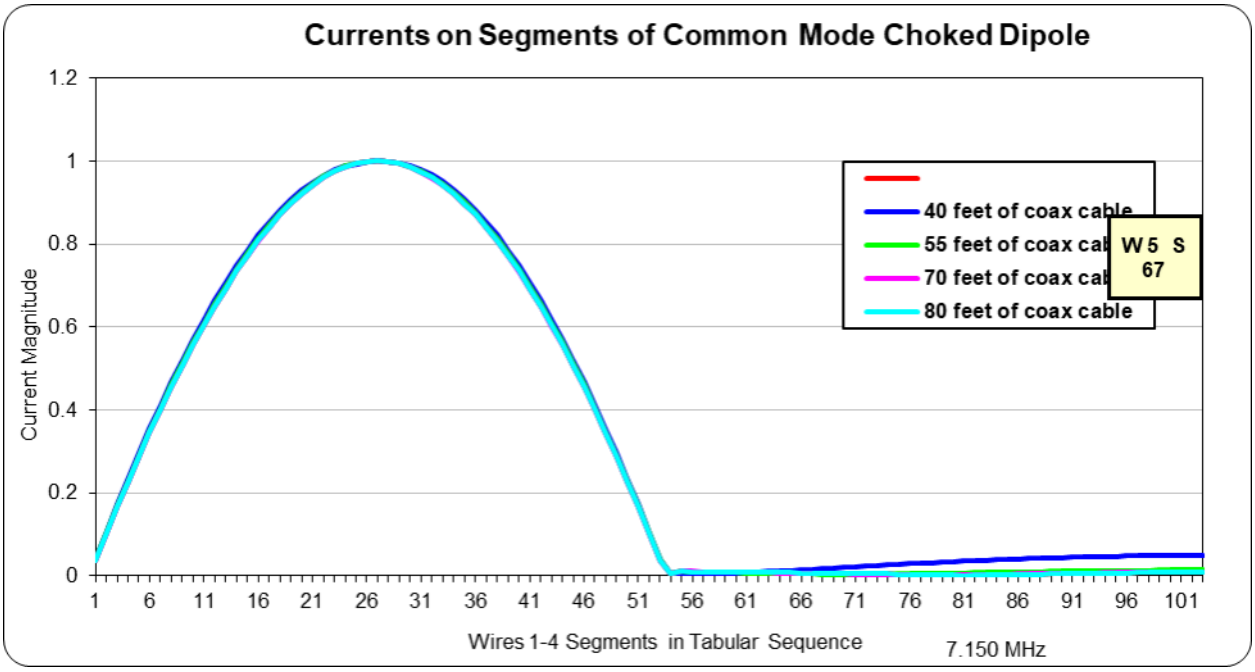
This gets better, though, as you continue lengthening the coax cable,and then worse again – every multiple of 80 feet you see this mess! If you happened to have used this simulated 40 Meter dipole with a simulated 40-foot length of cable, you would be fine without a common mode choke. If you happened to use an 80-foot length of coaxial cable, you'd be screwed.

The morale of the story: sometimes you can get away without a common choke, but sometimes you really can't.

So, DO YOU FEEL LUCKY, PUNK <grin>?

(Sorry, again.)

SO, what happens if we add common mode choke?



Well, if you didn't notice any difference, might I suggest a visit to an Ophthalmologist as soon as possible?

Obvious, now most of your RF current is sitting at the radiating dipole, letting it radiate, as you want! The common mode current on your coaxial cable is very very small, by comparison!

So, the morale of this little story is that you REALLY should use a common mode choke near your dipole's feed point. You might get lucky and not need it, but…

DON'T DEPEND UPON LUCK. Depend on Physics!

Vy 73,

Roy AC2GS

My thanks to Mike WA7ARK for his excellent YouTube video (https://youtu.be/xgFT9WZ8EmM) that was the inspiration for this article.)