Saturday, Nov. 19, 2022

Fannin County Amateur Radio Club

K5FRC

Open Repeaters:

145.470, 443.775, and 442.525

Club Meeting every third Saturday

~~at the~~ Bonham Bois D'Ark Cowboy Church

Weekly Net (every licensed Ham can join) Tuesdays 8:00 pm

~~on~~ 2 meters 145.470 and 70 cm 442.525

Officer Reports

Presidents Report KF5KUW

This past month has been extremely eventful, with the severe weather event on November 4th being something we need to remember. I have heard from a number of sources and agencies about the great job we did, and how our efforts and information were critical to getting the word out on the weather that day.

Our club handled the SkyWarn net, and the subsequent storm spotting activities, fantastically! My hat is off to Sharon (KI5FHN) for taking the reins as net control, using her handheld radio! Sharon was handling net control duties, while I was coordinating with Troy Hudson, our Fannin County Emergency Manager, as well as the National Weather Service (NWS), and TDEM (Texas Department of Emergency Management).

I have recently seen an updated Public Information Statement from NWS, which included… “Numerous severe thunderstorms impacted North and Central Texas on the afternoon and evening of Friday, November 4th. At this time, 4 tornadoes have been confirmed. The highest rated tornado, EF-4 impacted Lamar County.” An EF-4 rating, which estimates the wind speed (and resulting damages) around 170 mph. The tornado track was 22 miles long, and ¾ mile at its maximum width. Best of all, no deaths or serious injuries have been reported.

The storm that resulted in dropping that tornado was one that I was tracking with NWS, and we had spotters located in Wolfe City, Ladonia, Honey Grove, and near Allens Point. ~~When~~ I was noticing a rotation signature on several radar sites I was monitoring when it was in Hunt County, so I contacted NWS and they immediately issued a Severe Thunderstorm Warning. The NWS was also monitoring our repeater, and when they heard the reports from Wolfe City, and the strengthening of the storm on radar, a Tornado Warning was issued. This storm crossed into Fannin County near Wolfe City, then traveled NE between Ladonia and Honey Grove, before moving into Lamar County with a tornado.

Without our diligence and service to our community, these storms could have resulted in death or serious injuries. Thank you to everyone who participated, even if you were not in this area but were on the net.

On a much more enjoyable note, our October meeting out at Lake Coffee Mill was a lot of fun. Several of us were out there all night, some of us acting like we were fishing, but having much better luck talking Marine Mobile on HF. On Saturday morning, we held our club meeting there at the Coffee Mill campground, and afterwards set up some of our portable radio operations. We had all different arrangements and go-box ideas on display, giving our club and our guests an opportunity to see and consider for what they wanted in their own go-box setup.

My go-box was used after this event during our Fannin County Search and Rescue training, which was also held that afternoon. I was showing off APRS, and what it could do to help our search and rescue efforts. With

everything all self-contained in a fully portable box, adding a portable antenna and they have a complete communications and tracking station. And I continued to emphasize to all our SAR members who don't have their Technician license that we offer free on line classes, where they would be able to get some help. I have heard from several of them that they are interested, and would like to see what can be done after the holiday season.

On November 8th, one of our newest Technician club member became the new Fannin County Judge – elect, as he ran uncontested in our mid-term elections. Congratulations Newt (KI5YDF)!

And don't forget our November meeting on the 19th, we will be doing the Spirit of Giving event, cooking and handing out hotdogs for these needy families. Looking forward to seeing all of you at this great public service event we do every year.

In closing, our Christmas Party and December club meeting will be held December 17th starting at 11:00 am, at the Windom Feed Sack restaurant. Our meal will be buffet style, and I hear there may be a lot of raffle prizes, too. Also at this meeting, we will be electing our club officers for 2023.

Mark Hetherington
KF5KUW
President, Fannin County Amateur Radio Club

Vice President Report KI5DQ

20220914
James Hunt – KI5DQ
Vice-President & Safety Officer – K5FRC Radio Club

Radio Station Grounding …

Figure A:

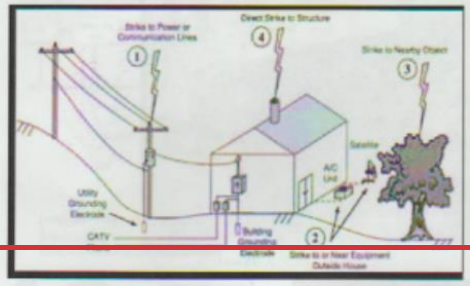
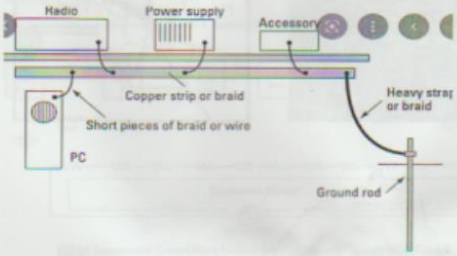


Figure B:



20220914
James Hunt – KI5DQ
Vice-President & Safety Officer – K5FRC Radio Club
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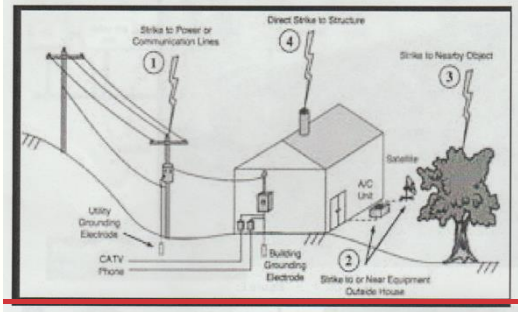

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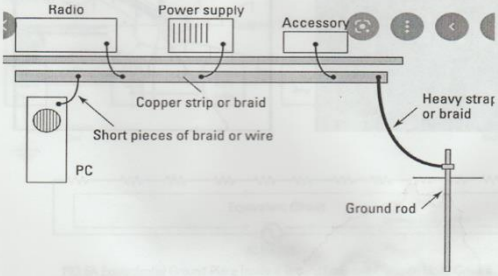
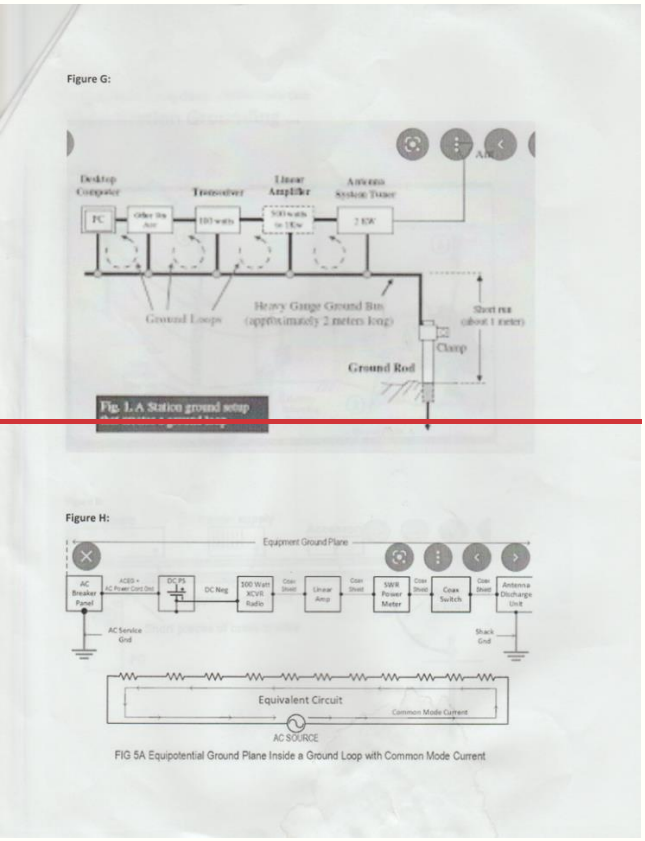




K5FRC Vice-President and Safety Officer
James Hunt - KI5DQ

Aurora Australis / Borealis and Northern / Southern Lights

Auroras are the result of disturbances in the magnetosphere caused by the solar wind. Major disturbances result from enhancements in the speed of the solar wind from coronal holes and coronal mass ejections. These disturbances alter the trajectories of charged particles I the magnetospheric plasma. These particles, mainly electrons and protons, precipitate into the upper atmosphere (thermosphere / exosphere). The resulting ionization and excitation of atmospheric constituents emit light of varying color and complexity. The form of the aurora, occurring with bands around both polar regions, is also dependent on the amount of acceleration imparted to the precipitation particles.

This is most common October to March – just like the amateur radio band of 160-meter propagation.

Aurora Australis seen from the ISS

shared by Italian astronaut Samantha Cristoforetti.
NASA UHD Video: Stunning Aurora Borealis from Space in Ultra-High Definition (4K)
https://www.youtube.com/watch?v=fVMgnmi2D1w

160-meter Propagation

The 160-meter signals are propagated at heights between bottom of the D region and the lower F region, it is of interest to first look at the variability. 1.800 – 2.00MHz, considered as the Top Band.

The solar wind, which interacts with the outer reach of the geomagnetic field to form the magnetosphere. The geomagnetic field, is a major factor in organizing the ionosphere at lower altitudes. It controls the motions of ionospheric electrons on release by photo-ionization, and by its configuration, it shapes the global distribution of ionization, particular at low latitudes. If anyone would like experienced assistance with antenna building, including multiplexed 80- and 160-meter array – just inquire!

Treasurers Report KI5FHN

Treasurer's Report

The current balance of the club's checking account is $5462.53.

The club will be reimbursing Mike Durbin $372.49 for the new Pi/IRLP controller replacing the club's failed one. The club will also be reimbursing Mark Hetherington $30 for parking fees from last month's meeting held at Lake Coffee Mill. And finally, the club will be purchasing hot dog weiners and buns to be handed out at the "Spirit of Giving".

The savings account balance is $223.92.

Also, just a reminder 2023 club dues are right around the corner.

Thank you,
Sharon
KI5FHN

Trustee K5MJD Report

LINE OF SIGHT

We have all heard the term line of sight communications. I will attempt to explain a bit about this and how it effects our everyday life. First of all, this discussion typically is associated with VHF/UHF/MICROWAVE ETC. However, it effects all frequencies even HF!! Thanks to reflections, ducting, and terrain HF is not usually thought of as line of sight. Communications would be much simpler for the world if the world was flat. To start with let's discuss the effect of the earth curvature which will include some of that nasty old stuff called math. Ill do this in Metric because believe it or not most of the world uses metric. DON'T worry I will show some answers in miles so you don't have to convert.

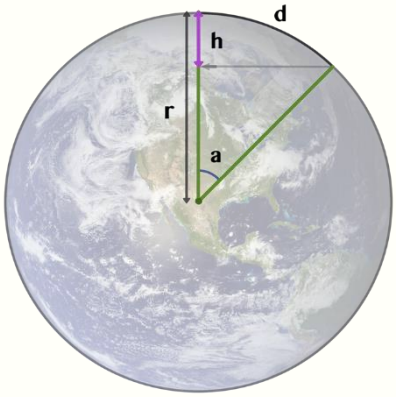
Explanation:

The Earth's radius (r) is 6371 km or 3959 miles, based on numbers from Wikipedia, which gives a circumference (c)of $c = 2 * \pi * r = 40\,030$ km

We wish to find the height (h) which is the drop in curvature over the distance (d)

Using the circumference, we find that 1 kilometer has the angle $360° / 40\,030 \text{ km} = 0.009°$. The angle (a) is then $a = 0.009° *$ distance (d)

The derived formula $h = r * (1 - \cos a)$ is accurate for any distance (d)



Note: Using the formula *8 times the distance in miles squared* is not accurate for long distances but is fine for practical use.

A good place to start this discussion is why the National Weather Service radar can't see what we see as spotters and why they rely on us. Hey we could all chip in and buy our own radar for the local area. Just a rambling thought. I will attach a quick chart for the radar which is of interest to all the weather following folks. Assuming the radar is 120 miles from us (true for those of us in the north part of the county). As can be seen below the NWS radar can't see anything below 9,602 feet above us. Folks most tornadoes we are concerned with are on the GROUND.

In Kilometers first then miles.

1.81861 miles = 9602.28 feet

Distance	Curvature
1 km	0.00008 km = 0.08 meters
2 km	0.00031 km = 0.31 meters
5 km	0.00196 km = 1.96 meters
10 km	0.00785 km = 7.85 meters
20 km	0.03139 km = 31.39 meters
50 km	0.19620 km = 196.20 meters
100 km	0.78479 km = 784.79 meters
200 km	3.13897 km = 3138.97 meters
500 km	19.6101 km = 19610.09 meters

MILES

1.81861 miles = 9602.28 feet

Distance	Curvature
1 mile	0.00013 miles = 0.67 feet
2 miles	**0.00051 miles = 2.67 feet two antennas 2.67 feet above ground range (Talkies)**
5 miles	0.00316 miles = 16.67 feet
10 miles	0.01263 miles = 66.69 feet
20 miles	0.05052 miles = 266.75 feet
50 miles	0.31575 miles = 1667.17 feet
100 miles	1.26296 miles = 6668.41 feet
200 miles	5.05102 miles = 26669.37 feet
500 miles	31.5336 miles = 166497.53 feet

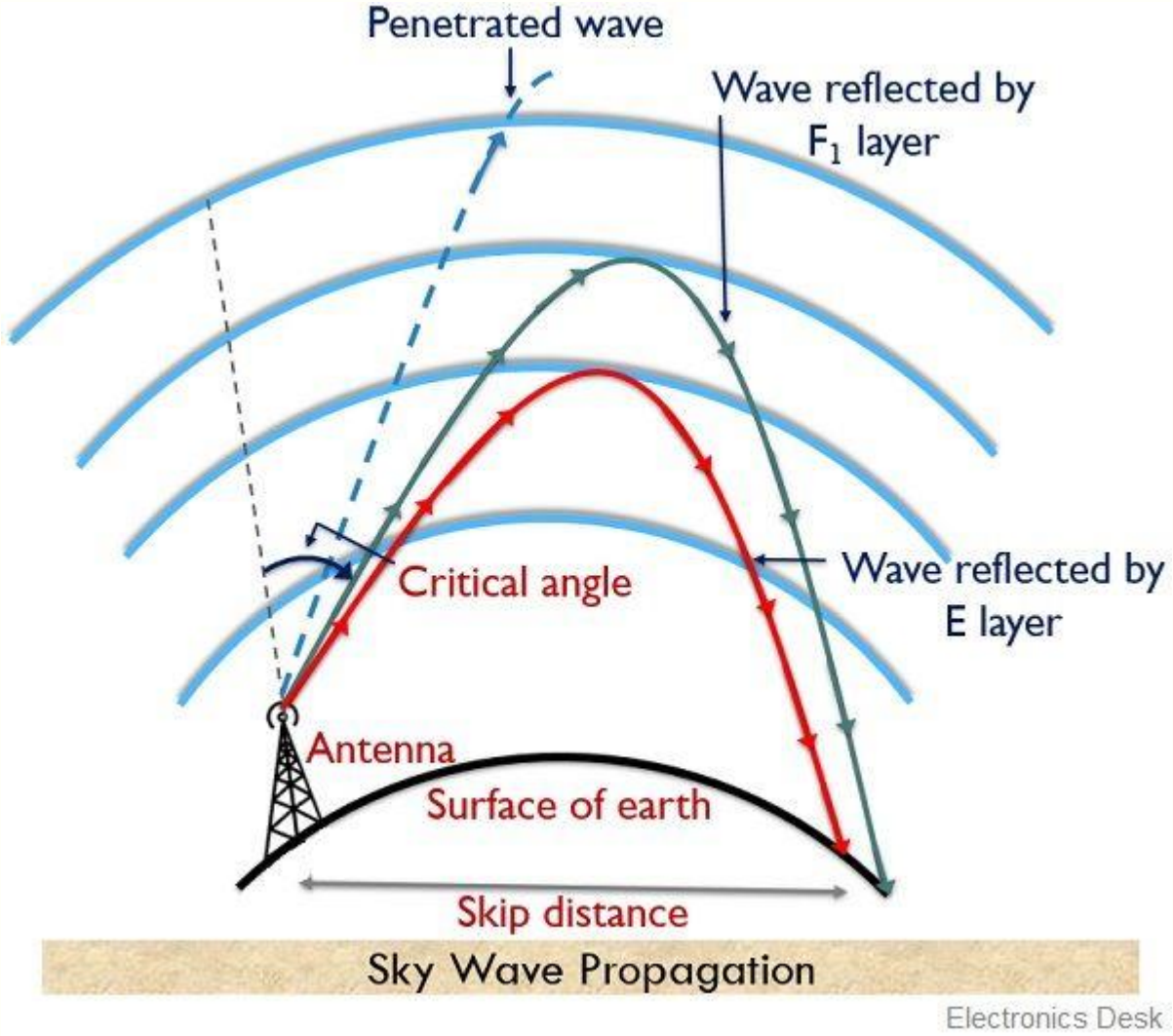
Now on to some ham radio fun. Assuming no reflections, ducting, and terrain issues here is an example of why our repeater goes much further than your direct signal. Let's assume you are wanting to work a station 15 miles from you (remember a flat earth assumption) your antenna would have to be **150.05 feet. OF COURSE, THAT ASSUMES HE IS ON THE GROUND.** So practically speaking both of you need to compromise and one of you at 75 feet and the other at 75 feet would be line of sight. I can hear the comments now about that's not right. Yes, it is but I did leave out a few things like reflections, terrain following etc.

So, our repeater is at 300 feet. Assuming no terrain change (wow that would be a flat earth) the coverage for line of sight would be; ***approx. 21 miles.*** Real world takes into account that the antenna above average terrain height is better than most places in the county, the actual calculated range is 27 miles assuming no terrain issues.

So, I hear the questions now. So why can I talk to the repeater from 40 or 50 miles away? Well, we call things like that HIL TOPPING, DUCTING, AND EVEN REFLECTIONS.

Note I have not discussed other parameters like foliage absorption, rain, snow, etc. But bet you have all noted that our repeater coverage is better in the winter. Rain, snow etc. dramatically effect attenuation based on frequency. Actually, in the ham world below 450 MHz and below rain is not as big a factor as it is at higher frequencies like satellites. Anyone with Direct TV can help you out with rain fade.

So enough for this news letter except for HF which if you remember I said was also truly line of site. Odd I am sure Fiji isn't line of sight so I will end with this picture (remember reflection topic?) It is line of sight just bent a little…



Secretary N5DJB August Meeting Minutes