GOAT NOTES

Celebrating Amateur Radio!

https://gotahams.com

August-September 2023

WG6OTA RPT: 449.160 (-) PL 77.0 enc/dec

The Editors' two bits...

Hello all! I hope you are having a great summer. We had a good club meeting on the 8th with Clint Bradford, K6LCS giving a fascinating presentation on how to work amateur satellites with just a handheld radio and antenna. Thank you, Clint, for sharing your knowledge with us.

Radio In The Park went well in spite of the threat of rain. No rain, but a great club outing! If you've not ben to one of these events, please come to one. I promise you'll have a good time.

Speaking of rain, we had a real "frog strangler" of a rain on Sunday the 20th! I set new records for that day, exceeding all recorded rainfall since the government started keeping records. I hope the storm was kind to you and didn't do any damage.

The last I heard, your club has grown to 172 Members. I say YOUR club, because you good folks are making it happen! Due to your enthusiasm, good cheer, and friendliness, as well as our reputation as a club that welcomes new members and actually operates, people want to be a part of this organization. Keep up the good work!

Finally, many grateful thanks to the club leadership team for all the time, energy, and treasure you give to this club. You are very much appreciated!

73 de N6PCD

RADIO ACTIVITIES

Monthly Club Meeting

GOTAhams Monthly Club Membership Meeting - the second Tuesday of the month, 7PM , Zoom and In-Person. If you would like to join the meeting in person, please join us at Casa Jimenez Mexican Restaurant in Claremont at 921 W Foothill Blvd. Please arrive an hour early (at least) at 6PM so that you can order your dinner and have it out of the way ahead of the meeting. (The restaurant does expect you to order a meal.) We'll be in the back room. See the weekly email for Zoom details.

GOTAHams Nightly Net

Held each evening at 7:30 PM Pacific time on the club repeater: 449.160 (-) PL 77.0. Please see Dave's weekly email for a list of topics.

Radio In The Park & Elmering in the Park

See the weekly email for days and times. These are fun events, so come on out and join the fun!

Monthly Simplex net

Hosted by Erik KN6NRQ on 146.580MHz. A great way to explore the reach of your 2 meter equipment without benefit of repeater, both receiving and transmitting. Last Wednesday of the month. See the Weekly email for vital details.

V.E. Amateur Radio License testing

LAST SATURDAY EACH MONTH AT 1PM. Location is Brackett Field airport in La Verne. Sponsored by the GOTAhams. Frank Westphal and his experienced team of examiners are runnung in person Amateur Radio License testing at Bracket Field Airport in La Verne. *See Dave's weekly email for testing requirements and other important details.* No testing in December due to the holidays.

Interested?

If you would like more information about Amateur Radio, GOTAhams Club Activities, or have any interest in joining the GOTAhams Amateur Radio Club please contact the Club Secretary Dave Wilkie (K6EV) at K6EV@ARRL.NET. All are Welcome and no license is required to become a member.

A Coil Shortened Vertical Antenna for HF

By Nilesh Bellare KK6PAH

I recently watched a video on a DIY loading coil, when I realized the parts shouldn't cost more than $50. I searched for more videos then made a part list. This is what I built, most parts are locally sourced except for the Whip from eBay/AliExpress. The whole process is quite simple for a newbie. I built the coil on a 1.25" PVC pipe from home depot. It is an excellent clone of the Wolf River Coil.

Nilesh KK6PAH

Wolf River Coil clone construction video: https://youtu.be/DLTKTnn5DK4

Winding took about an hour as I needed to tightly wind the wire on the PVC pipe. I used a glue gun to keep the turns from not touching each other. Other options were using a threaded pipe from Australia ($40) or a wire grommet strip from McMaster-Carr (25 strips for $14).

Here is a summary of the steps:

1. Calculate the inductance for the lowest frequency you plan to use. Down to 40m is practical for an 18 foot whip. I used this website:

https://www.66pacific.com/calculators/coil-shortened-vertical-antenna-calculator.aspx

Example: Height 18 feet, base 0, diameter .0403 (18 gauge), frequency 3.5Mhz. Result: 51 microhenries

2. Calculate the length required for a 1.25" PVC pipe readily available at Home Depot in 2 feet lengths. I used this site to get 42 uHenries. Use this link:

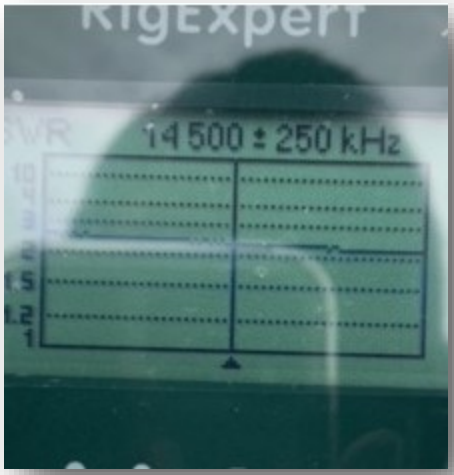
https://www.66pacific.com/calculators/coil-inductance-calculator.aspx

Example: Single layer Turns 165, dia. 1.25, length 20. Result: 51.7 microhenries

3. You can use the wire gauge diameter to determine the spacing between, how many turns will fit, and the length of the wire. I used this site to determine wire diameter and the length formula: 2 x Pi x Radius x Turns Example: 2 x Pi x 1.25" x 165 = 1295" / 12 = 107 feet

4. Sourcing connectors is a bit difficult as the Whip has an M10 metric thread, and we use Imperial. The CB bracket has 3/8-24, the whip has M10-1.5.

Photos by KK6PAH



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Parts list:

1. **1 spool 110 ft. 25 lb. Galvanized Steel Wire**
2. **1 each 1-1/4 in. x 2 ft. PVC DWV Sch. 40 pipe**
3. **2 each 1-1/4 in. PVC Schedule 40 Socket Cap**
4. **1 each 3/8-24 Zinc-Plated Grade #5 Hex Nut**
5. **1 each 3/8 x24 x 7/8 in. Zinc-Plated Grade 5 Fine Thread Hex Bolt**
6. **4 each 3/8 in. Galvanized Flat Washer**
7. **1 each 22-14 AWG Barrel-Insulated Alligator, Clip (2 Pack)**
8. **2 feet of By-the-Foot #12 Yellow Stranded CU THHN Wire**
9. **1 each BD7IBI 5.6m Stainless Steel Whip Antenna https://www.aliexpress.us/item/3256803953640790.html?spm=a2g0o.productlist.main.1.1d9e47093HtQ1D&algo_pvid=8e5772fb-a2a0-4e67-b60e-ab3dce95fcc0&algo_exp_id=8e5772fb-a2a0-4e67-b60e-ab3dce95fcc0-0&pdp_n**
10. **(I got the 3/8-16" from Home Depot and tapped one side M10 to fit the antenna base) 3/8 x 16 TPI Zinc Rod Coupling Nuts**
11. **CB radio antenna mirror mount on amazon - $10**
12. **3/8 in. x 12 in. Galvanized Spike Nails**

I used the Arrow Dual Temp Glue Gun and hot glue to keep the wires apart on the coil.

You can use wire grommet strips from McMaster Carr to make the build simpler but i didn't want to buy 25 for $14. You can skip or add washers or nuts to adjust the size of the bolts as 3/8 x 24tpi or M10 is hard to get. Will try to source them from Ali express. Except as noted in the parts list, all components are available at Home Depot.

Ham Radio Adventures at Cal Poly Pomona

By John Escobar KN6RRA

It's not everyday our family goes climbing steep hills to play on the radio but that is what we did on July 13th. Joanna (KN6RPB) was scheduled to be net control operator for the Cal Poly Pomona Amateur Radio Club's Thursday net at noon. For this particular net we decide to climb to the top of the CPP letters above the campus. Armed with our HTs, a Yagi antenna, bottled water and snacks we made the climb. It was warm that day but the heat didn't bother us since there was a nice breeze once we reached the top. The view was lovely.

At one point we tested the range of our HTs from our great vantage point although we had to rush because the net was due to start. Perhaps we will get more of an opportunity on our next visit. KN6RPB was able to complete the net successfully after one radio change due to a dying battery. Afterwards, we stayed to take a few family pictures to commemorate the occasion.

The experience was a reminder to us of what a great hobby we have and how much fun one can have with only an HT and a good pair of hiking shoes.

Photos by KN6RRA

VITAL SHACK FACTS!

The Shaq...

This month we're featuring the fine shack of Jason Welday, KJ6RTA...

Jason KJ6RTA

"I recently did some rearranging in my shack and thought it would be a good time to share a pic. This space serves as both my home office for off-hours work and personal tasks as well as my modest shack. The shack consists of a Yaesu FT-857D that was up until this last week used for HF, VHF, and UHF but now is deployed for VHF and UHF. The Icom IC-7300 is new to me and I'm diving in to learn all that it can do. I supplement the "base stations" with a Yaesu FT-60 HT for walking around. I'm a Mac guy so I run a MacBook Pro for FT-8 and logging. Antennas consist of a Comet GP-1 for VHF/UHF and a homebrew 20-meter off-center fed dipole that is a work in progress." 73 de KJ6RTA

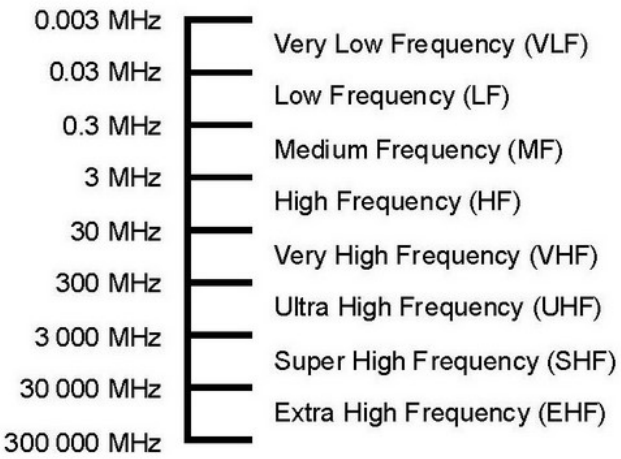
Fun Stuff You May Not Know...

The Firefox logo isn't a fox... it's a red panda!

The phrase "in a jiffy" is often used as an expression of time, but it's much more than that. It's actually also a unit of time. It's used in several scientific spheres for measuring time. For example, in computer engineering, a jiffy is the length of one cycle of the computer's system clock . In the physics, it represents the amount of time it takes light to travel a distance of one centimeter .

DID YOU KNOW THE TERM "ROBOT" COMES FROM A CZECH WORD, ROBOTA, MEANING "FORCED LABOR"? WE JUST HOPE THEY NEVER DISCOVER THAT TO BE THE CASE AS WE'RE FAIRLY SURE THAT'S WHEN THE ROBOT UPRISING WILL BEGIN !

What's the Difference Between HF, VHF, and UHF?



In Larkin Park: Saturday, August 19

Photos by K.C. Lin K6KWV & Ken Campbell N6PCD

In spite the weather report we had a beautiful day and a good turnout at the Radio-In-The Park event on Saturday, August 19. There was a good showing of club members, as well as a few other folks. Good WX, good friends, and radio: what's not to love?!?!

In Larkin Park: Saturday, August 19

Hope to see you next time!

TECH STUFF

Current Draw vs. Wire Guage

Amperage Capacities for Standard Non-Metallic (NM) Cable	
16-gauge wire	13 amps
14-gauge wire	15 amps
12-gauge wire	20 amps
10-gauge wire	30 amps
8-gauge wire	40 amps
6-gauge wire	55 amps
4-gauge wire	70 amps
3-gauge wire	85 amps
2-gauge wire	95 amps

These ratings are for standard copper NM sheathed wire, but there are instances where these amperage ratings vary. For example, there is aluminum wiring in some homes, and aluminum wires have their own current carrying capacity. While the sizes shown reflect the safety limits for household wiring you may wish to use heavier wire in certain circumstances where you need to limit voltage drop. A good example are DC power cables to transceivers, especially when planning on battery operation. In such cases you can calculate the voltage drop at the anticipated maximum current for any wire size and wire length. Make an allowance for voltage drop in the fuses and connectors.

There is the potential for danger anytime a device tries to draw more power on a circuit than the wire gauge is rated for. For example, plugging a device rated for 20 amps into a 15-amp circuit wired with 14-gauge wire poses a distinct danger. Should the fuse or circuit breaker fail to operate correctly, that device will draw more current than the wires can safely handle, and could heat the wires to the point of melting the insulation around the wires and igniting surrounding materials. NOT good!

On the other hand, there is no danger whatsoever in plugging devices with mild electrical loads into circuits with heavier gauge wires and a higher amperage rating. The circuit will draw the power asked for by whatever is plugged into them and no more. So, for example, running a laptop computer with a very small amperage demand on a 20-amp circuit wired with 12-gauge wire is fine.

The potential for danger is most pronounced with the use of light household extension cords. Many a household fire has occurred when a light extension cord with 16-gauge wire is used to power a heater or heating appliance of some sort. Most manufacturers will discourage the use of any extension cords with portable heaters, but if one must be used, it has to be a heavy-duty cord with a high amperage rating that matches the amperage of the appliance and of the circuit it is plugged into.

From TheSpruce.com

One Hams' Story

By Mark Witte, KN6SBK

Though I've been around our club for a couple years now, in many ways I'm still new to ham radio. I don't have a technical background but have enjoyed working my way through to an Amateur Extra License. That's another way of saying that I know way more than I used to, but am still new around equipment and basic practical experience!

Happily, at our August Radio in the Park event I was finally able to set-up my portable HF station, a process that I rehearsed several times outdoors at home before taking it on the road. I use the now out-of-production Yaesu FT-818 QRP radio and a Buddistick Pro HF antenna. I'm in the process of learning CW - the punctuation marks and basic arithmetic signs have been a challenge - but step-by-step I'm getting there. I received some encouragement recently from a HRO employee who told me that a 5 watt transmitter on phone can effectively operate as a 50 watt transmitter on CW.

Apart from my fledging experiences on HF, I've appreciated the encouragement I've received from so many remarkable GOTAHams club members. Behind them stand our outstanding leaders whose generosity and love of the hobby create the magic that propels our club forward. I learn not only from their technical expertise, but also from their etiquette on the air and on how much they care about the rest of us.

On the way home from our August Radio in the Park, I stopped at HRO in Anaheim and bought a hands-free mic and headphone set for my hand-held FT-70D. I look forward to putting this new purchase to work soon when we provide support to this year's Tour-de-Foothills bike event and Covina Christmas Parade. I'll look forward to working alongside a bunch of you then.

73, Mark KN6SBK

Handy Ham Tips

By Ken Campbell N6PCD

Do you own HT's? Do you have several extra batteries for same? Do you have trouble keeping track of them like I do? Well, here's a handy and inexpensive solution to the problem!

I had a spare one-gun pistol case in the inventory here at Casa Campbell and decided to give it a try as a potential fix for the battery storage issue . It works great!

This is the Plano Model 1403. It's a hard plastic case with egg crate foam interior, two closure snaps, and provision for a pad lock. The foam is nonconductive and holds the batteries securely. Great for when you want to carry several batteries along on a road trip, on field expeditions, or for EMCOMM deployments.

NOW I know exactly where those darn batteries are! The price on Amazon.com is $8.99 as of this writing. Available most gun shops and sporting goods stores as well.

Give it a try! 73 de N6PCD

What the HECK Do Those Numbers Mean?

By Ken Campbell, N6PCD

SFI? MUF? K index? A index? One constantly hears those terms and more anytime the subject of HF propagation comes up, which is frequently! I'm going to try and present a simplified guide to a complex subject, one that even your humble editor can understand and use. So, here we go, I hope you find the article useful!

K Index: **The K index is a three hourly measurement of the variation of the Earth's magnetic field compared to what are "quiet day" conditions. K index values range from 0 (quiet) up to 9 (extremely disturbed). Even if maximum usable frequency is not reduced by geomagnetic activity, the quality of HF radio communication is likely to be degraded when geomagnetic activity has increased. A K index of 4 or more may indicate poorer HF communications quality. The K index indicates average values over the most recent 3 hour interval for a local region.** ***On the K Index, lower numbers mean generally better HF propagation.***

Kp Index: **The planetary or Kp index has values that range between 0 and 9. The values of the Kp index give a good indication of geomagnetic activity. Values between 0 and 1 indicate quiet magnetic conditions and would give rise to virtually no degradation in HF radio communications conditions. Values for the Kp index between 2 and 4 provide an indication of unsettled magnetic conditions that indicate the possibility of some degradation on the HF bands for radio communications. A value of 5 signifies a minor storm and 6 a larger one. Values through to 9 indicate steadily worsening conditions with 9 representing a major storm that is likely to result in a blackout in HF ionospheric propagation for several hours. The Kp index indicates the planetary average of all K indexes over the most recent 3 hour interval for the entire planet.** ***For the Kp index, a lower number means better quality HF propagation.***

A Index: **The A index is a linear measure of the Earth's field. As a result of this, its values extend over a much wider range. It is derived from the K index by scaling it to give a linear value which is termed the "A" index. This is then averaged over the period of a day to give the A index. Like the K index, values are averaged around the globe to give the planetary Ap index. Values for the A index range up to 100 during a storm and may rise as far as 400 in a severe geomagnetic storm. The A index is an rolling average of the last 8 sets of 3 hour intervals (24 hours) and is thus somewhat slower responding than the K and Kp indices.** ***With the A Index, a lower number is better.***

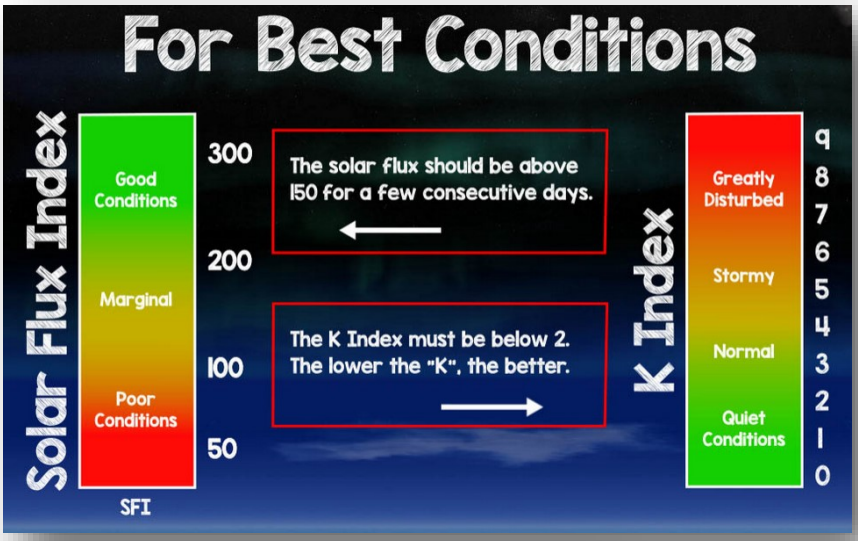
Sunspot Number: **Derived from number of sunspots + sunspot groups. From 0 to 250.** ***A higher number is better.***

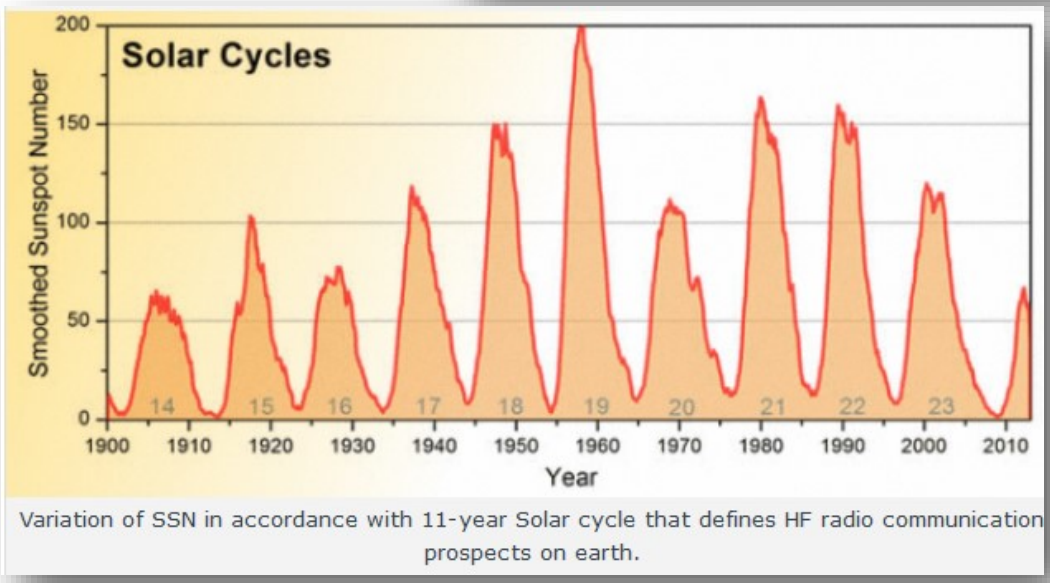
Smoothed Sunspot Number: **The SSN for any month is the average number of sunspots for the preceding and succeeding six months. Typical smoothed numbers range from single digits during solar minimums to over 200 during a VERY good solar maximum.** ***A higher number is better.***

SF: Solar Flux: **The values of Solar Flux vary over a wide range. At their lowest (typically during the periods of sunspot minimums) they may be as low as 50 but rise to maximum values of around 300 (around the times of sunspot maximums.)** ***Regarding SF, lower numbers mean worse propagation, higher numbers mean better HF propagation.***

SFI: Solar Flux Index. The SFI number is the number of solar flares emitted from the Sun. Solar flux is measured in solar flux units (SFUs). It is the amount of radio noise or flux emitted at a frequency of 2800 MHz (10.7 cm, it is also called the 10.7 cm flux index). ***SFI index of 70 is not good, 80 is good, 90 is better, 100+ is best. A higher number is better.***

MUF: Maximum usable frequency. The highest frequency at which an RF skywave is refracted back to Earth by the ionosphere's F layer under current propagation conditions. It can vary rapidly depending on the time of day and sunspot activity. Frequencies above the MUF will continue out into space. ***The experienced DX'ers rule-of-thumb for reliability is to tune about 80% - 90% of the MUF.***





Variation of SSN in accordance with 11-year Solar cycle that defines HF radio communication prospects on earth.