JUG

Publication of the Northern California Contest Club

NCCC

Issue 555

August 2018

Inside this Issue:

NCCC Meeting
Sunday 23rd September

Summer BBQ

11:30am pm Social Hour, 12:30 PM Lunch

Location
WK6I Winery

Watch the Reflector for more information!

President's Report

Club contest plans

As you have hopefully already seen, N6WM announced the club contest plans for this year at the August meeting. A major part of that plan is to invite new contesters into our shacks to give them experience and mentoring in the fine art of contest operation. W9KKN used the opportunity of NAQP SSB to do just this at N6WP's station. Among the ops were a very experienced WX5S who along with W9KKN did a great job of sharing their knowledge with new members WA2FHF, AI6TK and AI6ZU. I am sure their efforts will continue as these exercises usually generate lots of questions that we can and should answer.

There are many more opportunities for mentoring as we enter the main part of the fall contest season. Perhaps the best contests for this is ARRL November Sweepstakes this year. While NCCC is not targeting Sweepstakes this year, it is still an opportunity to get on the air and operate our stations, sharing it with folks who will help add to the club score in years to come. We should do our absolute best to properly train these new NCCCers, as they are the future contesters we will rely on to continue our winning ways!

Continued Page 3

Officers:

President	Jack Brindle	W6FB	jackbrindle@me.com
Vice President /Contest Chair	Chris Tate	N6WM	ctate@ewnetinc.com
Treasurer	Tom Carney	K6EU	treasurer.nccc@gmail.com
Secretary	Ian Parker	W6TCP	secretary.nccc@gmail.com
Past President	Bob Hess	W1RH	w1rh@yahoo.com
Director	Rick Tavan	N6XI	rick@tavan.com
Director:	Bill Haddon	N6ZFO	n6zfo@arrl.net
Director:	Bill Fehring	W9KKN	bill+nccc@w9kkn.net

Volunteers:

New Member Mentor	Al Rendon	WT6K	wt6k@arrl.net
Charter Member	Rusty Epps	W6OAT	w6oat@sbcglobal.net
Awards Chair	Gary Johnson	NA6O	gwj@wb9jps.com
CQP Chair	John Miller	K6MM	k6mm@arrl.net
K6ZM QSL Manager	George Daughters	K6GT	k6gt@arrl.net
K6CQP,N6CQP,W6CQP QSL Mgr	Ed Muns	W0YK	w0yk@arrl.net
NCCC Email reflector Admin	Phil Verinsky	W6PK	kb-w6tqg@verinsky.com
Webmaster	John Miller	K6MM	k6mm@arrl.net
Webinars	Bill Fehring	W9KKN	bill+nccc@w9kkn.net
JUG Editor	Ian Parker	W6TCP	w6tcpian@gmail.com

Thursday Night Sprint:

The Northern California Contest Club sponsors Thursday evening (NA local time) contest practice sessions of 30 minute duration.

On the Thursday (and, sometimes Friday also) prior to a major contest weekend, the practice format follows the upcoming contest.

Generally, on other Thursday evenings, a special format is followed, called NS or "NCCC Sprint". The NS began in the summer of 2004 as a snappy, concise contest occurring most Thursday nights, North American time. The power limit is 100 watts.

Thursday Night Contesting Director and Founder	Bill, N6ZFO
NCCC CW Sprint	Tom, N3ZZ (initially, Ken N6RO)
NCCC RTTY Sprint	Ken, K6MR
NCCC Sprint Ladder	Bill, N6ZFO
Sprint Web master www.ncccsprint.com	John, K6MM.
non-NCCC:	Tim N3QE (Ladder Scores manager)
Thursday night Contesting Advisory Group:	N6ZFO, Bill (Chair) Mark K6UFO, (with W4NZ, N4AF, W9RE, K4BAI, N3BB and W0BH).
The Thursday night NCCC Net	Ken, N6RO

Each contest brings different characteristics and techniques. Sweepstakes and other domestic contests require skills that plan for and predict propagation to various parts of the US, Canadea and other North American entities. Generally this means operating times limited to daylight and evening hours for both coasts. This provides a great learning ground for propagation without depriving too much sleep time. DX Contests are a different matter as we plan our operation to times when propagation should be good to various parts of the world. What this really means is that each contest offers a different opportunity for mentoring and learning how to plan and operate in contest conditions. As an avid domestic contester who is just starting to pick up DX contesting, I am now seeing all sorts of new things that I need to learn, change and improve in order to compete in these frays. It definitely has given me a greater understanding of the skills the great contesters among us have built. I just wonder the detaisl we each could learn just watching some of these folks. Our mentoring program gives that opportunity to newer members and even those of us who wish to learn and improve our skills.

So where is the club headed to practice these skills? Over the last few years we have taken a very serious interest in a couple of areas. Digital contesting is a bright new arena that is decades old, but yet brand new. It has evolved from its hardware and oil start to the latest DSP computer technology. As W0YK and others can attest, it isn't SO2R that is in play, but rather SOnR where n may be 3, 4, 5, 6 or more transceivers active simultaneously (only one transmitting at a time). It requires computer command and control to make it work well, with a really good human watching over the whole operation. At the same time those of us who are still learning to spell digital can play as well. January starts the effort with the RTTY Roundup, a contest the club has done very well with in years past. Always hungry for contest gavels, we see this January's effort as the opportunity to add another gavel to our collection. This is not the only operation, however. The WPX family of contests hold its own RTTY session later in the year. This brings us to the second major part - CQ WPX. This contest offers three separate efforts for us - the afformentioned RTTY weekend, SSB, and CW. The skills we have shared and learned in the fall will be very handy in these efforts as we push very hard to show the world how good we really are. Be sure to plan for it, we have work to do, plans to make and skills to improve. I can't wait to see the NCCC name at the top of the WPX results listing for this coming year!

There is one more thing to be said here. Before all this gets under way in a very serious way, be sure to take part in a CQP operation. Yes, it is -our- contest, sponsored by NCCC, which means you will need to operate under another banner (another club or your own). This, too is a great opportunity to mentor others, put a rare county on the air, and be one of the most wanted stations on the air during the first weekend of October. It will be a long, hard,tiring weekend, and perhaps one of the most fun we will experience with our friends. Think of it as Field Day, only much, much better!

Baby Tower update

For those who have been following my station rework, the work is progressing. The first contest using the baby tower with my A3 tribander was the August running of NAQP SSB. I made up temporary cables for the rotor and antenna in the dark on Friday evening, and thought everything was ready for Saturday. Last minute details on Saturday morning took me just past opening time, but I was able to start the contest on 15 meters and quickly progressed to 20. Had there been propagation, the antenna would have worked well. But, there are always issues. The coax had a bullet

splice in the middle, laying in the dirt yard under the hot sun. As the sun heated the coax, the connector I had attached late Friday shorted. Flexing the coax got things going again, but only temporarily. I then re-flexed the coax and covered it from the sun's direct rays and was able to complete my 20m operation with no more issues other than a complete lack of decent propagation conditions.

Perhaps the best part was being able to rotate the antenna. It looks like the antenna project just might be a success! I reworked the cables on Sunday and tests show no problems at all at this point. The next part of the project is to run the permanent coax in the now-installed conduit over to the tower and bring it into the shack. With KB4TGE's encouragement, I built a nice wood cabinet that is attached to the workshop outside wall to house the arrestors and cable entry. Part of that encouragement was to add nice touches such as a gable roof and other touches that I am sure she will enhance over time. The project now is very close to completion, at least for the outdoor part. There is more to come as it moves inside the shack!

The cabinet attached to the shack surrounded by the KB4TGE garden.

Inside of the cabinet before cables and protectors are added.

Jack, W6FB

The New Improved Nevada QSO Party in October!

The Sierra Nevada Amateur Radio Society is proud to present the Nevada QSO Party which will be an annual event on the second full weekend in October. This year it will start at 2000 hours Nevada time (PDST) on Friday, October 12 (0300z 10/13/2018) and run until 1400 on Sunday, October 14 (2100z 10/14/2017)

The objective of this contest is to activate and work all 17 of the counties in Nevada. Nevada stations will work anyone, anywhere, and out of state stations will work Nevada Stations. All stations may be worked on the three different modes for up to three times on each HF band and only once on the VHF+ frequencies. Rovers in Nevada can be worked again when they change counties.

The state of Nevada is one of the rarest U.S. States on the air. Be sure to work Nevada in the upcoming Nevada QSO Party; it will be helpful you when going for ARRL WAS (Worked All States award) and other awards like grid zones and counties.

The VHF+ band will consist of all legal frequencies from 50 MHz up to 1300 MHz. In order to bring a lot of new hams into contesting, we are allowing the use of repeaters on these frequencies. There are linked systems which will allow out of state contacts. All modes will be allowed with the exception of the WSJT modes.

On the HF side, Phone, CW, and Digital modes will add multipliers to the QSO points. All conversational digital text modes are allowed with all counting the same. Currently, the WSJT modes do not have a contest exchange message that is handled as a valid regular message, so those modes are not allowed. (This may be changed if this is added to the WSJT program in the future)

Logging software from N1MM will have the ability to work on this contest. For those that are using paper and pencil or some other logging method that does not produce a Cabrillo file, we also have the WA7BNM Cabrillo log maker which will allow you to build a Cabrillo file. All entries over 10 contacts must submit an electronic Cabrillo log.

We also have a sign-up form to allow stations to sign up for the counties which they will activate and what modes they will be using. We are going to try and get operators out in all counties and have all modes covered. Please use this form if you are going to be operating in Nevada.

The Nevada QSO Party website is http://nvqso.com/ Complete rules are listed under the “Rules” tab and please read the FAQs for additional information.
Information is subject to change on the website so be sure to check back regularly. Please visit this site often and pass the word onto your friends!

We are looking forward to your participation in this contest!

For further information on this news release, contact Jim Shepherd at W6US@SNARS.ORG

Installing a Hy-gain DB1217
Dave KA6BIM

This is a short story on adding a Hy-gain DB 1217 beam to my existing stack of tri-banders on a 72' US crank-up tower. This is a 7 element beam for 12 and 17 meters. Living out in the sticks, I end up doing most of the work on my own.

Sunday morning I got outside to do a little work as the morning fog burned off. I cranked down the "Central Tower", the one that has 3 KT34XA tri-banders on it, at 72, 54' & 36'. Just above the top tri-bander, I had a 440 mhz beam that I put up last summer for an ARES exercise. I started by cranking down the tower as low as I could. Due to the way I have the lower tri-banders side mounted on the lower sections of the tower that made the top plate at about 28-30' up. Then I climbed up to the tower top, actually had to stand on the top plate, (I hate that!) and removed the 440 antenna. Then it was time to clean up and get ready for church. Sunday afternoon was pretty breezy so no antenna work was done the rest of the day.

Monday was the big day. This is the day I planned to mount the 12 & 17 meter beam that I assembled a couple weeks ago. I needed to levitate it to the top of the tower above the other existing antennas. Not yet having become a Jedi master, I was forced to use mountaineering/heavy rescue techniques I haven't practiced in about 30 years. It is called using a "Tyrollean". Most hams call it using a" tram"

I was up the tower as the fog was melting away. I secured one end of my rope (5/8" static kern mantle rope) to where the 440 antenna had been. The other end I attached to an anchor about 100' away, and tightened it up. This was to be my "tram line". I went back up the tower and ran a second, lighter rope to use as a haul line to move the antenna. I also loosened the booms of the three tri-banders and tipped the elements down on the side towards the anchor point, to make more room for the antenna being raised. I attached the new antenna to a pulley that was riding on the "tram" line. I attached the haul rope there also. Since I was doing this by myself, rather than using tag lines with helpers to keep the antenna level, I used a carabineer and clipped it over the tram line and the center element of the new beam. That actually kept the antenna on a plane with the tram line and kept it from getting tangled with the other antennas already on the tower. I then used the haul line and pulled the antenna along the tram line until it approached the other antennas. I had to tighten up the tram line up a little more to get rid of some sag and then the antenna was in the clear, and I brought it the rest of the way up. I then climbed the tower again. I had to rig another pulley, a little higher on the mast, to hoist the antenna up a little higher to get it up on the mounting bracket. I had also ended up with the element on the wrong side of the mast. That was an easy fix. Just loosened the element tip. Pulled it out, and reinstalled it on the other side of the mast. (it was still marked with a red sharpie line from assembly) I was then able to secure it to the bracket and tighten everything down. It then took a little bit to get all the rope hardware off the tower, roll the other beams back to horizontal again and tighten them up, but it was all done before the breeze came up at lunch time.

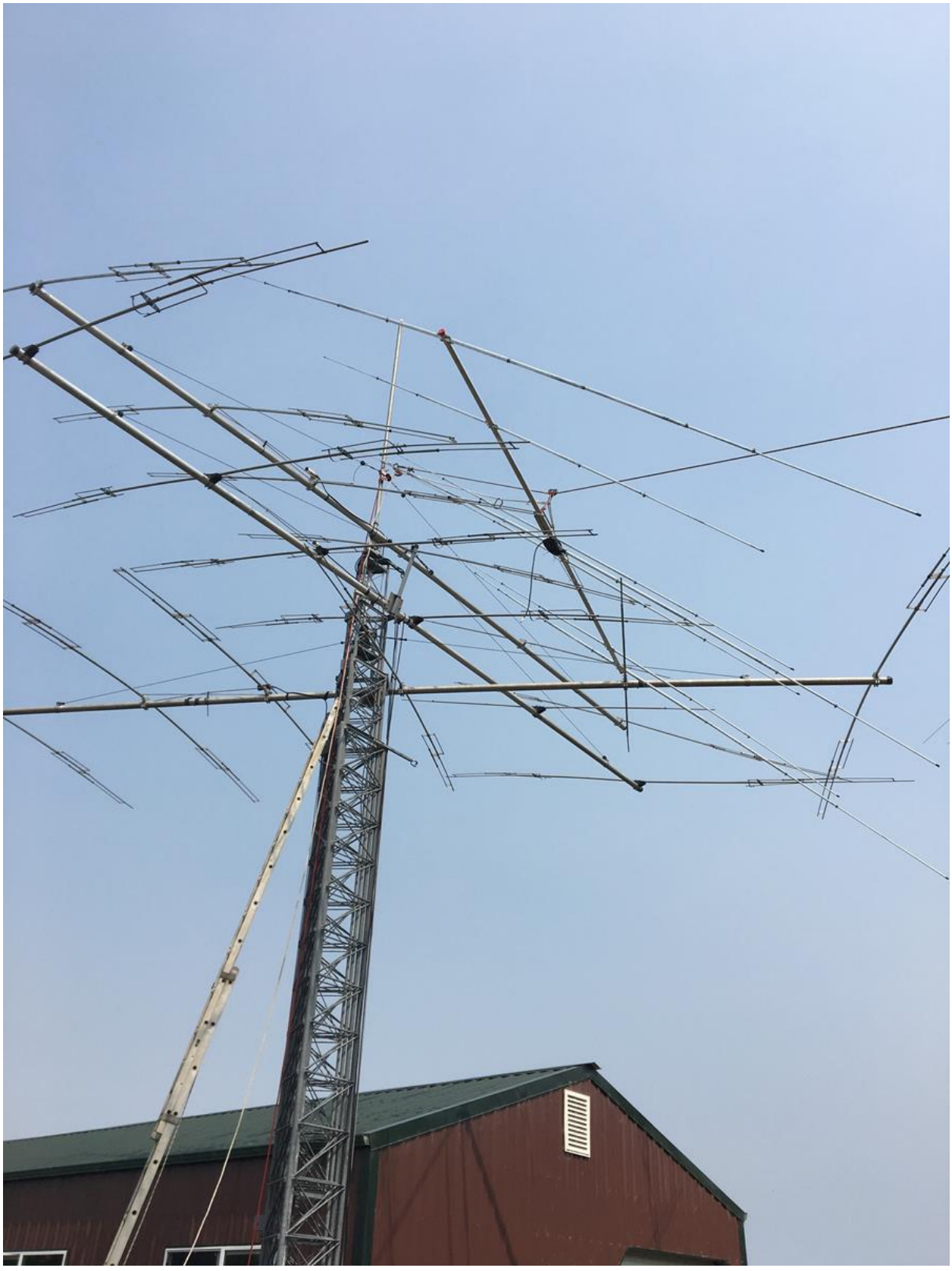
After a break I went back up the tower one more time with my antenna analyzer and checked it. 1.1-1.2 to 1 on both 12 & 17 meters. Sweet! Also looked like it was fairly resonant on 6 meters. I connected the coax, taped it all up and finished putting all my tools away.

In all the years ince the WARC bands opened up, I had only logged about 60 contacts on 12 meters, and that was by using my tuner on either a tri-bander, or on my 40 or 80 meter antennas, usually to chase some dxpeditions.. I went to the shack and gave it a test. SWR there was still great and I knocked out 29 12 meter contacts before dinner, increasing my total by 50%. I will play on 17 later.

Photos:

Mid way up the tram (VHF tower in the background)

Antenna almost up (It is a bit congested when it is cranked down!)

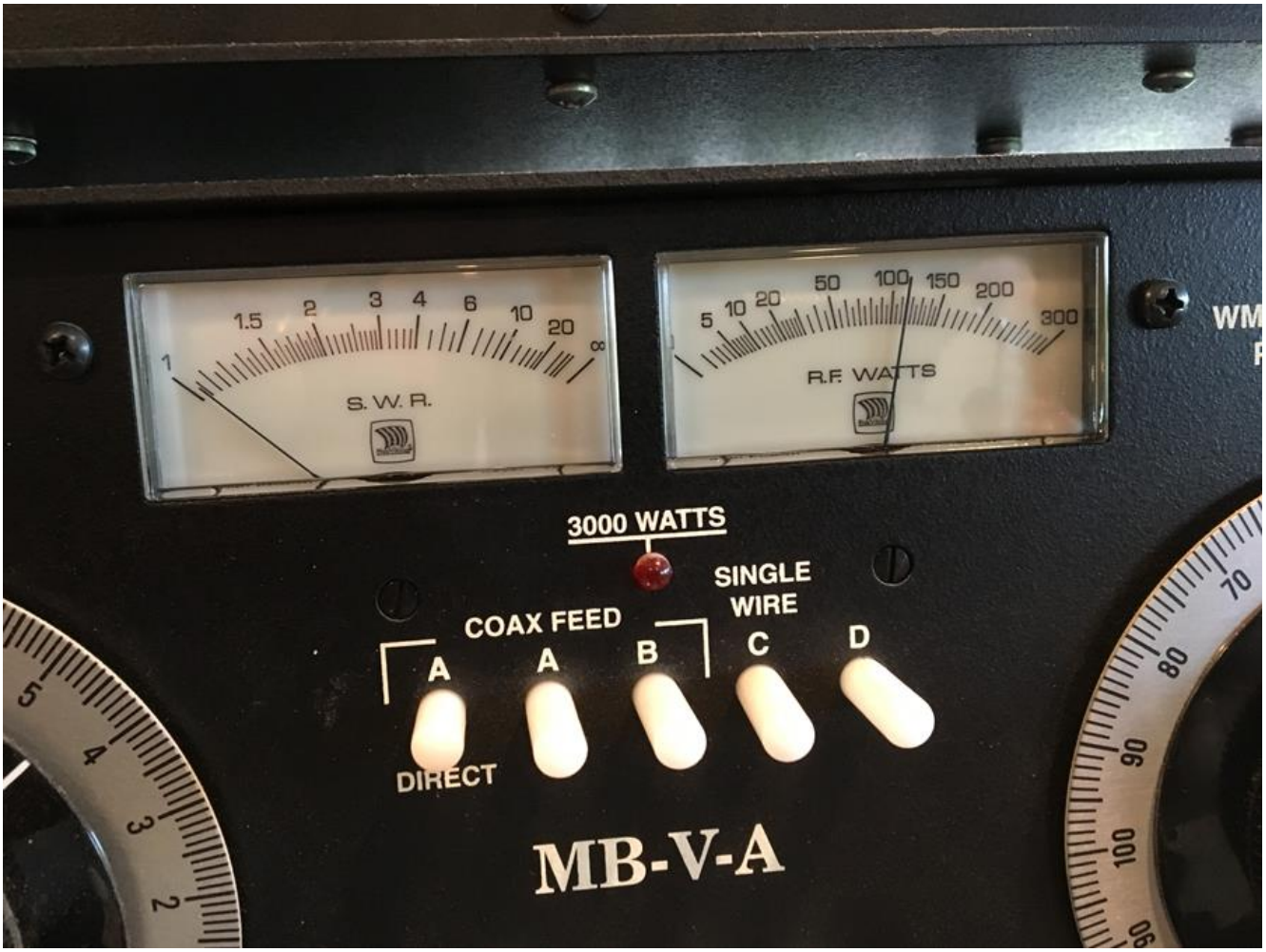


View from the anchor point

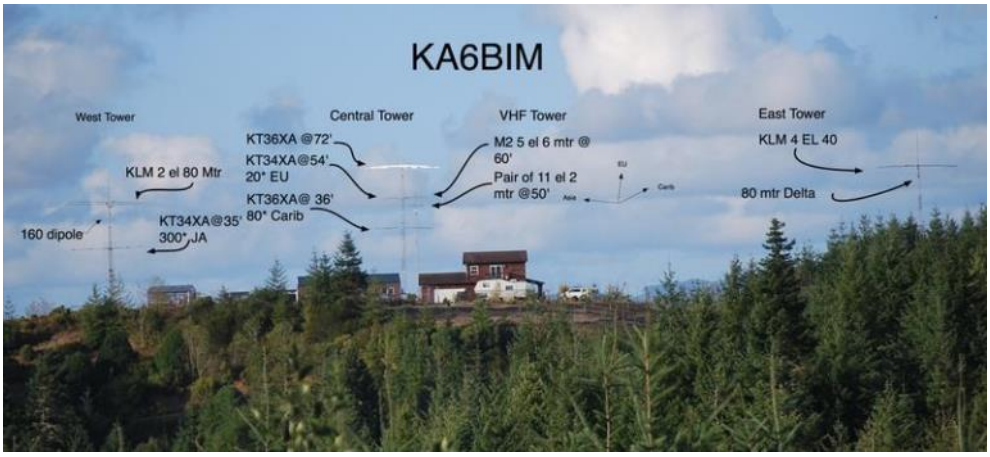
Its mounted!

Cranked up. The DB 12/17 is @ 77’ and KT34xa’s @ 72’, 54’ & 36'

12 mtr swr in the shack is 1.05 : 1



Qrz photo (2017)



Chokes and Isolation Transformers For Receiving Antennas

By Jim Brown K9YC

Why We Need Them A feedline must be grounded where it enters the shack-for lightning protection; causing the coax shield to behave as a long wire antenna with the base grounded. This makes it a receiving antenna for noise, and even possibly a parasitic element of another antenna nearby. If the feedline is coax, this current flows on the outside of the shield; on 2-wire line, it appears as the difference of currents in the two conductors (which would otherwise be equal and opposite). We call this "common mode current," as opposed to differential-mode current, which is the current carrying the signal inside the coax from antenna to receiver (or from transmitter to antenna).

Common mode current can couple 1) to circuits at either end of the feedline; and 2) directly to the inside of the coax by a mechanism often quantified as the cable's ***transfer impedance***.

Noise Coupling and Transfer Impedance: Shielded cables have a property often quantified as their ***transfer impedance***, which is the ratio of the differential voltage induced inside the coax as a result of common mode current on the shield. Its units are Ohms, a low value is better, and the lower limit is the resistance of the shield at the frequency of interest. The value of transfer impedance is a property of the cable itself, and is determined by the shield's physical properties – its resistance, overall quality, percent coverage, and uniformity.

Any RF current flowing on the cable shield will induce a corresponding voltage between center conductor and shield, which is added to the signal coming from the antenna. When that RF current is noise, it degrades the signal to noise ratio. When that RF current is a signal off-axis of the receive antenna's desired direction, it reduces its directivity (that is, it fills in the nulls in the antenna's pattern). In a multi-transmitter station, common mode current couples RF radiated by the transmitting antenna that is picked up on the coax shield, which can overload the input stage. In a multi-transmitter station, chokes and/or transformers can reduce crosstalk between transmitters on other bands and the receive antenna.

Transfer impedance can be particularly important because the shield construction of coax we often use for receive antennas is relatively poor on the lower ham bands. We use this cable for good reasons – it's flooded with a gooey material that is self-sealing against penetrations of its outer jacket, protecting the coax from water intrusion; it also helps that varmints don't like the taste of the goo.

And because it's sold in very high volume for use in CATV systems, it's dirt cheap (under $100 for a 1,000 ft spool). The downside though, is that the shield is aluminum foil and aluminum braid; this is generally just fine for the CATV systems in which it is designed to be used, but its high shield resistance makes it vulnerable to coupling via its transfer impedance.

The important point here is that common mode current on feedlines is a bad thing and should be avoided. Our two most useful tools for achieving this are 1) Common mode chokes; and 2) transformers.

Effective ***common mode chokes*** are formed by winding multiple turns of a feedline through a suitable ferrite core to form a parallel RLC circuit with a low Q resonance near the operating frequency. In this "near resonance" region, the choke "looks like" a high value of resistance to common mode current, effectively blocking it. We achieve this by choosing a core material (ferrite mix) that's very lossy in the desired frequency range, and by winding the right number of turns around the right size core to place the resonance near the middle of the desired frequency range. The lossy core makes the resonance very broad. Q values of 0.5 – 1 are typical of good chokes.

The differential circuit (the inside of the coax) doesn't see the choke (except as the added feedline length needed to wind it). Table 1 summarizes my work to find the right size core of the right core material for the 630M through 40M bands. These resonances can be clearly seen in plots of measured data for a few representative chokes in the Appendix.

Description		Choking Impedance Rs (Ohms) at Frequency					
Turns	Core	630M	160M	80M	40M	30M	20M
18	1 #75A / 5975001401	3K	**7.7K**	**5.2K**	3K	4.5K	6K
16	2 – #75A / 5975001401	3.8K	**8.2K**	**5.5K**			
17		**5K**	**11K**	**6.3K**	2.9K		
18		**5.8K**	**11.5K**	**6.2K**	2.5K		
19		**6.5K**	**12.5K**	**5.9K**	2.1K		
20		**7.2K**	**12.5K**	**5K**	1.7K		
21		**7.8K**	**13K**	**5.8K**	2K		
16	#75B / 2675821502	4.5K	**6K**	4.1K	2.5K		
18		**5.8K**	**7.2K**	4.6K	2.6K		
20		**7.5K**	**8K**	**4.7K**	2.2K		
22		**9.7K**	**8K**	4.2K	1.6K		
26		**15.6K**	**8K**	3.6K	1.1K		
15	#43 / 5943001601		550	1.7K	3.3K	4.5K	**6K**
27			2.2K	**9K**	**19K**	**8.5K**	1.5K

Table 1 – Receiving Choke Cookbook

The Receiving Choke Cookbook: Table 1 summarizes the results of my measurements of practical chokes wound using one pair removed from good quality CAT6 cable. Higher values of Rs are better; values for recommended chokes are **bold**, and are **red** for optimum chokes. Multiple chokes can be placed in series to increase choking impedance and to cover a wider frequency range. For example, 18-21 turns on two #75A cores in series with 27 turns on one #43 core would provide excellent choking from 480 kHz to 10 MHz (including the AM broadcast band).

The cores for both chokes and transformers are small toroids, typically about 1-in o.d. by about 0.3125-in thick, and are identified by their Fair-Rite part numbers. Cores were chosen on the basis of suitability for the frequency ranges and easy availability at low cost. See "Buying Them," later in this applications note.

Transformers, carefully wound to minimize capacitance between windings, add a very small capacitance (and thus a very high impedance) in series with the common mode circuit, providing an alternate means of blocking common mode current. Transformers used to carry high power (that is, for transmitting antennas) usually have bifilar windings – that is, the primary and secondary are wound in close proximity (nearly touching) to maximize coupling and minimize loss (and excessive heating). Too much capacitance between primary and secondary provides a path for common mode current; for this reason, bifilar transformer windings should be avoided with receive transformers.

With receive antennas the primary concern is signal-to-noise ratio. We are concerned with two kinds of noise – atmospheric noise picked up by the antenna, and circuit noise within the receiver (or its preamp). Most receive antennas are designed to reject atmospheric noise while maximizing pickup of signals in one or more desired directions. A few, like are magnetic loops, have very broad patterns with a pair of sharp nulls that are oriented to reject a single noise source.

From the viewpoint of circuit noise, receive antennas fall into two broad categories – those with relatively high output like Beverages and large loops, and those with relatively low output, like small loops. In this context, size is relative to a wavelength at the frequency of interest. On the lower bands, by the time it reaches our receivers, band noise from high output antennas is usually much stronger than circuit noise within the receiver; a few dB loss (in the feedline or a transformer) can usually be tolerated, but pickup of local noise on the line cannot.

This may or may not be true with small loops – their output may be too low to overcome circuit noise due to losses in the transmission line. In a well designed receiving system, signal to noise ratio for circuit noise is determined at the first gain stage. A good number to remember is that in order to hear the weakest signals, ***noise picked up on the antenna should be at least 10 dB stronger than circuit noise by the time it reaches the first gain stage,*** whether that first gain stage is an outboard preamp or the receiver's input stage. At this level, signal to noise ratio will be degraded by only 0.4 dB. Increasing the ratio to 13 dB makes it 0.2 dB. In practical terms, this means that we should see the band noise rise by at least 10 dB (about two S-units on a well calibrated S-meter) when an antenna is connected to our receiving system; if it doesn't, there's too much loss between the antenna and first input stage, so a preamp should be used. If some of the loss is in the feedline, the preamp should be at the antenna.

If that preamp is at the antenna, feedline loss doesn't matter – but if the preamp is powered via the coax you can't use a transformer (unless you run a separate pair to carry power)!

Total loss will be the loss in the transformer plus the loss in the coax. Measured loss in Commscope F677TSEF, the flooded RG6 often used for receive antennas, is 0.45 dB/100 ft at 2 MHz and 0.5 dB/100 ft at 3.6 MHz. [Loss deviates from sqrt (f) at low frequencies because the center conductor is copper clad steel.] Plots of the measured loss, VF, and Zo for this cable are in the Appendix.

Measured loss data for transformers wound on opposite sides of small cores for three different ferrite mixes is summarized in Table 2. Use this table to choose the core and the number of turns for your application. Loss in the chokes in Table 1 is too small to measure.

Fair-Rite Mix / Part Nr	Loss in dB						
	Turns	0.5 MHz	2 MHz	4 MHz	7 MHz	10 MHz	14 MHz
#61	2½		2.04	1.9	2.5	3.25	4.5
	3½		1.4	1.8	3.1	4.5	
	4½		1.6	2.9	5.4	7.4	
	5½		1.9	3.9	7.2	10	
	6½		2.2	4.7	8.5	10.8	
#75 / 5975001401	3	1.2	1.25	1.6	2	2.6	3.5
	4	0.7	0.8	1.25	2.1	3.1	4.4
	5	0.4	0.6	1.1	2.2	3.4	5.1
#43 / 5943001601	3	2.1	1.5	1.7	1.9	2.4	3.2
	4	1.15	1.1	1.6	2.5	3.7	5.2
	5	0.75	1	2	3.7	5.4	7.5

Table 2 – Loss Data for 1:1 Receive Transformers on Small Fair-Rite Cores

Resonance in Ferrite Inductors Figs 1a and 1b show why high frequency loss increases with more turns – the windings are resonating, as indicated by the peak around 26 MHz for the 5½ turn transformer wound on a #61 core. These are Vector Network Analyzer sweeps with the transformer connected between output and input. The VNA input and output impedances are 50 ohms, the unit can simultaneously measure both gain (loss) and the impedance seen by the generator. The blue curve is the gain (loss) through the transformer, 6dB/div, with zero at the top; the red curve is the impedance seen by the VNWA, 500 ohms/div, zero at the bottom. The sweep is logarithmic from 2 MHz to 50 MHz. The resonant peak in the 2½ turn transformer is much higher in frequency, off the graph.

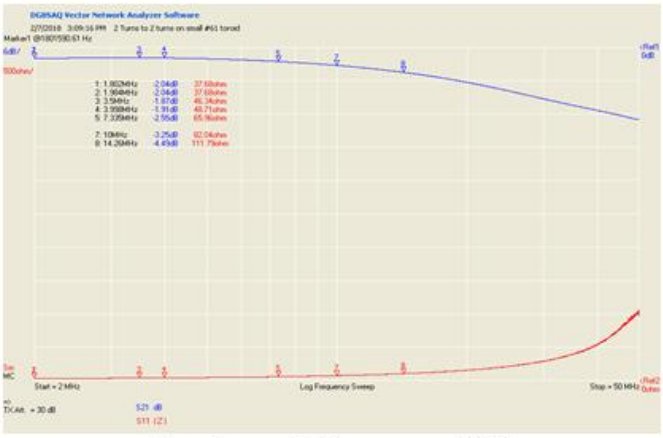


Fig 1a – 2½ turns #61

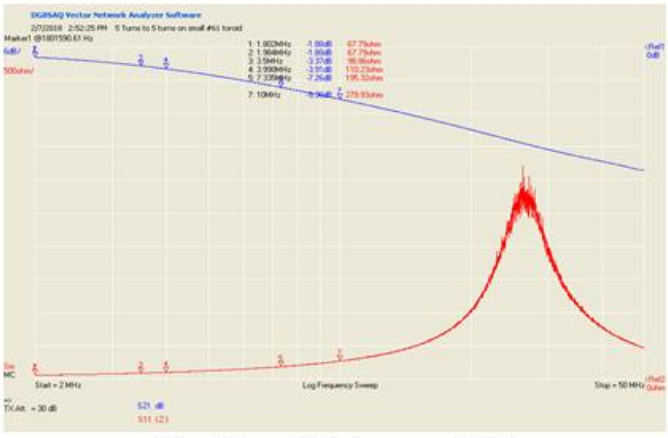


Fig 1b – 5½ turns #61

When a turns ratio other than 1:1 is used (usually to match a high impedance receive antenna to a coax feedline), the winding with the most turns will resonate at the lowest frequency. If wideband response is desired, the number of turns on the high impedance side should be chosen so that the rise in loss due to resonance in shown in Table 2 occurs above the highest desired operating frequency. For example, no more than about six turns should be used on #75 material for an antenna that we want to work well up to 40M. I plan to look at 3:1 turns ratio (9:1 impedance ratio) transformers in a future applications note.

Placement: A choke (or transformer) should always be placed at the antenna feedpoint. One or more additional chokes along the line "break up" the line into non-resonant lengths so that it becomes a less efficient receive antenna for noise, just as guy wires are broken up with egg insulators. I use transmitting chokes to break up the coax feedlines to high dipoles so that they do not act as parasitic elements to my 160M vertical. We also break up feedlines from receive antennas to prevent noise coupling via the coax's transfer impedance.

Choke or Transformer? The "right" transformer can cover the bandwidth of most receiving antennas, while chokes are generally optimum on one or two bands; multiple chokes in series can cover multiple bands. Chokes can pass DC to power a preamp or switch a relay at the antenna, while transformers cannot. Because they are electrically very short, the loss introduced by these chokes is too small to measure – less than 0.01dB.

When NOT to Use a Transformer: Low output antennas (small loops) where feedline loss is a concern, and for any antenna where switched DC on the coax is used to power a preamp or control a relay at the antenna.

When either one works: High output antennas (Beverages, large loops) with no DC on the coax for a preamp or relay.

Buying the Parts: I've found Arrow Electronics to have the best prices for small quantities of Fair-Rite parts that they stock, and shipping is free for orders of $20 or more. These are very inexpensive parts – less than $1 for the #75 cores and about $1.25 for #43. Buy enough to hit the $20 for free shipping, filling your parts stash and sharing with friends.

Part #	o.d. (in)	i.d. (in)	Thick (in)
5943001601	1.225	0.75	0.312
5975001401	1	0.61	0.32
2675821502	1.22	0.748	0.59

Table 3 – The Cores

Building Them: Chokes and transformers should be mounted in a non conductive enclosure and wired to chassis-mounted female F-connectors. (coax connectors mounted to a metallic enclosure would defeat the choke, by connecting the two cable shields). Weatherproof boxes should be used outdoors. Fig 3 shows a 4-in x 4-in x 2-in box with a gasketed screw cover that houses the transformer and termination for a VE3DO receive loop. The wing nuts connect the wires, coax goes to an F-connector on the bottom of the enclosure. I paid about $7 at the local big box store. It's Carlon p/n E989NNJL.

Fig 3 – Outdoor Enclosure

When winding chokes, pairs that are individually molded are strongly preferred. Belden's structured cables (CAT5/6) use this construction; I had some Belden 1872A left over from a project, and used that (Fig 4). [The two conductors in Fig 4 were shorted together for measurement. In use, they are connected as a transmission line.] These cables have a nominal Zo of 100Ω, which is close enough to 75Ω that the short electrical

Fig 4 – Receiving Chokes

Length of the winding that the choke does not add measureable loss. F-connectors with solder tabs can be found from internet vendors. For transformers, use any small diameter (18-26 AWG) insulated solid copper (solid is preferred simply because the windings stay in place better. Fig 5 shows one of the 3:3 turn transformers being measured. The windings are #24 solid copper.

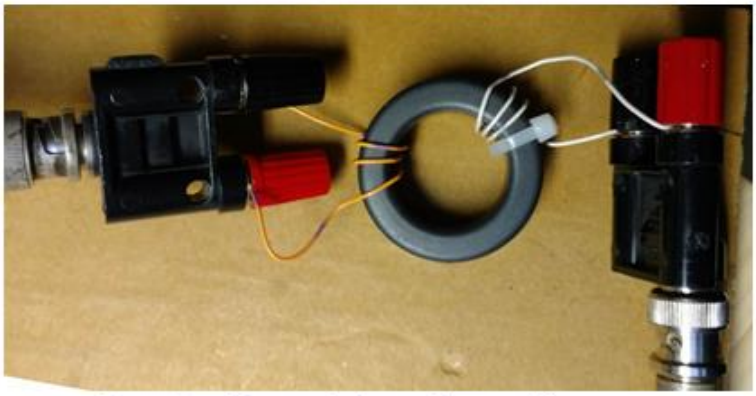


Fig 5 – Receiving Transformer

Series and Parallel Equivalent Circuits A ferrite choke works by forming a parallel resonant circuit, where Lp and Rp are the inductance and resistance coupled from the core and Cp is the stray (parasitic) capacitance between turns and between the windings through the core (the core is a dielectric). Lp, Cp, and Rp can be derived from the measured data using classic circuit analysis. ***For any given choke, Lp, Cp, and Rp are approximately constant with frequency, having values that depend on the core material and the physical arrangement of the winding.*** The parallel equivalent circuit helps us tweak the design of the choke to fit our needs by placing the resonance where we need to kill common mode current.

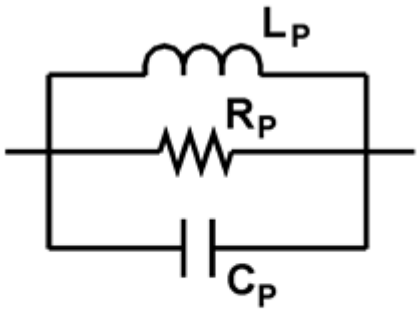


Fig 6a – Parallel Equivalent Circuit

This measured data provides values for the choke's **series** equivalent circuit, Rs + j Xs, and Zmag, where Zmag is the square root of the sum of the squares of Rs and Xs. ***For any given choke, these values are different for every frequency.*** Knowing Rs, however, is quite convenient for our analysis of their usefulness, because it is Rs that always reduces common mode current.

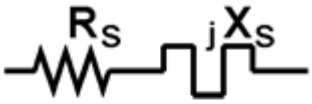


Fig 6b – Series Equivalent Circuit

Understanding the Common Mode Circuit: Consider a simple dipole fed with coax. In the common mode circuit, the coax shield becomes part of the antenna, acting as a single wire connected between one side of the center of the antenna and ground. As a common mode circuit element, its VF is near 0.98 (depending on the diameter of the shield and the outer dielectric). In the common mode circuit, this wire (the coax) has some impedance, (Rs + jXs), by virtue of its electrical length, which is different at every frequency. At some frequencies, Xs will be positive (inductive), at others it will be negative (capacitive).

Because it can be inductive or capacitive, and because the common mode circuit will be inductive at some frequencies and capacitive at others, Xs of the choke can cancel part or all of the Xs of the common mode circuit. This cancellation causes common mode current to increase, which is the opposite of the desired result. But Rs of the choke always adds to the common mode impedance, so a high value of Rs always reduces common mode current.

Fig 7 shows a choke added to a feedline that looks capacitive at some frequency of interest. In this example, the capacitive and inductive reactances partially cancel, adding to 4,040Ω +j 100Ω. Rs and Xs values for both choke and feedline will be different at every frequency, with Xs values sometimes adding and sometimes cancelling, but Rs values always adding.

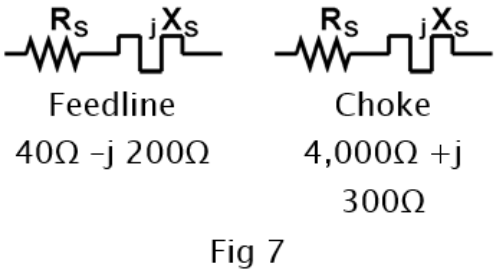


Fig 7

A line that is electrically short at a given frequency (< λ/4) looks inductive; Xs of a choke that looks inductive at those frequencies will reduce current. As the line becomes longer (λ/4 – λ/2) it becomes capacitive, and an inductive choke increases the current. This cyclical relationship repeats as the line gets longer electrically (i.e., longer coax or increasing frequency). A high value of Rs "swamps" the effects of reactance (so that the reactance values don't matter, or can only decrease current), so that a choke with a high value of Rs is effective for any length of coax.

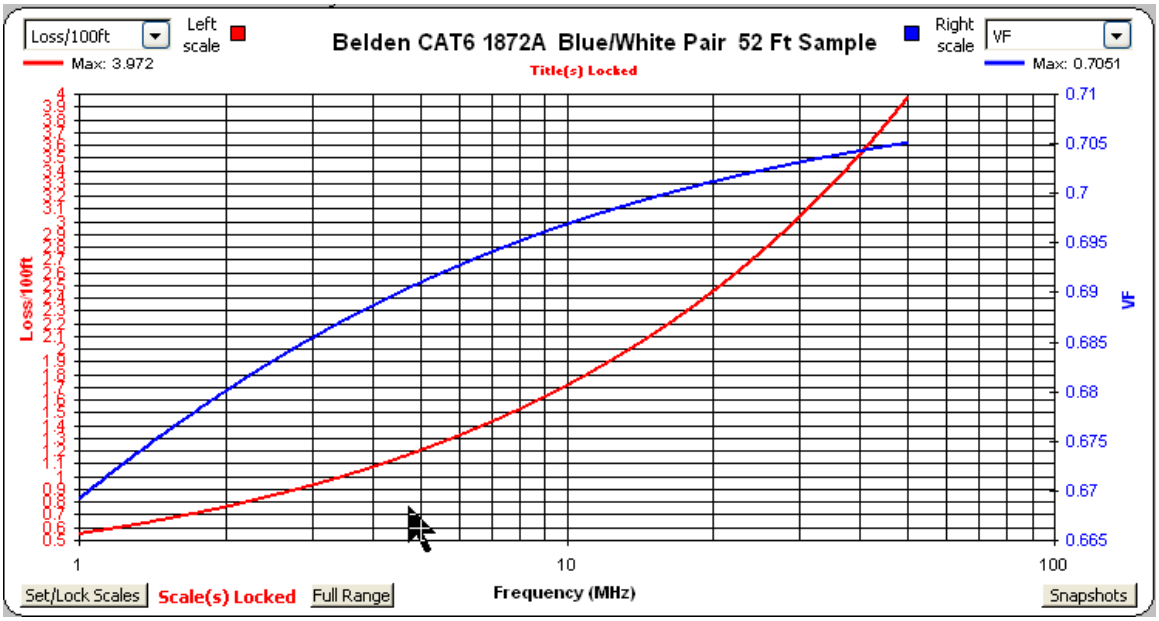
[Note that the coax shield doesn't have to be grounded to unbalance the antenna or to carry common mode current – <u>any</u> wire connected to any point on an antenna becomes part of the antenna and will carry current. The only effect of the connection, or the lack of a connection at the other end, or the length of the wire, is to change the current distribution on that wire (the coax shield).]

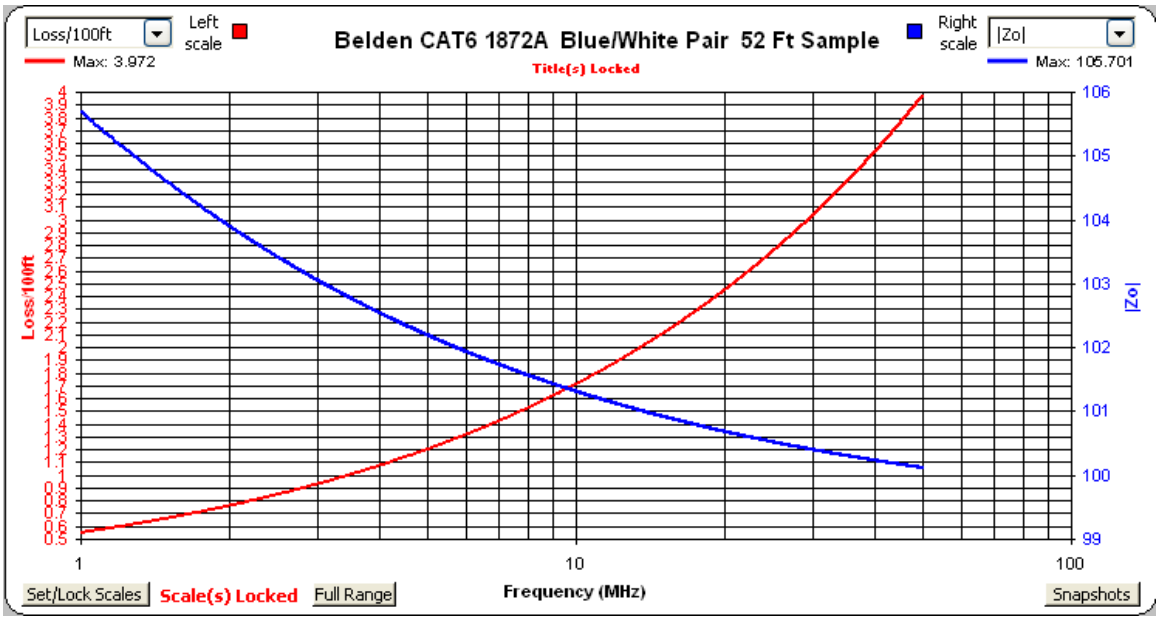
Appendix

Measured Transmission Line Loss Data

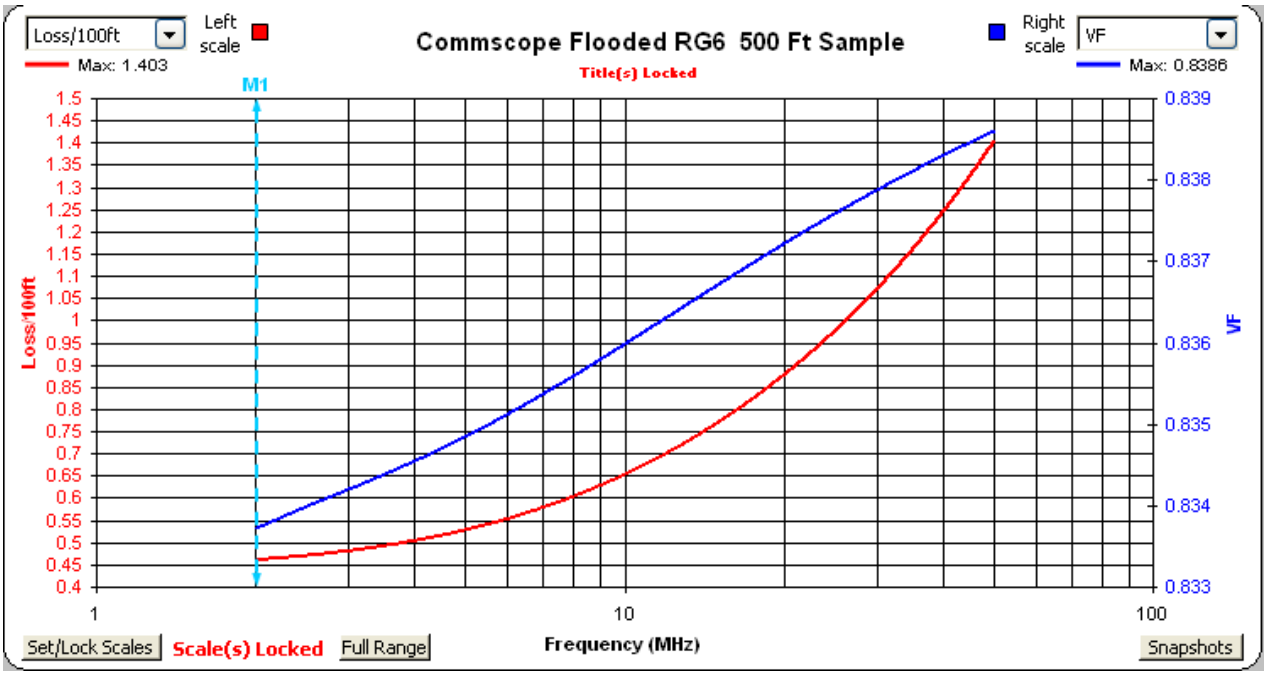
To obtain this data, two S11 measurements were made on known lengths of each cable using a DG8SAQ VNWA Vector Network Analzyer. For the first measurement the far end shorted, while for the second the far end was open circuit. Those data were posted processed using AC6LA's ZPlots Excel spreadsheet to compute and plot Zo, VF, and attenuation over the range of the measurement.

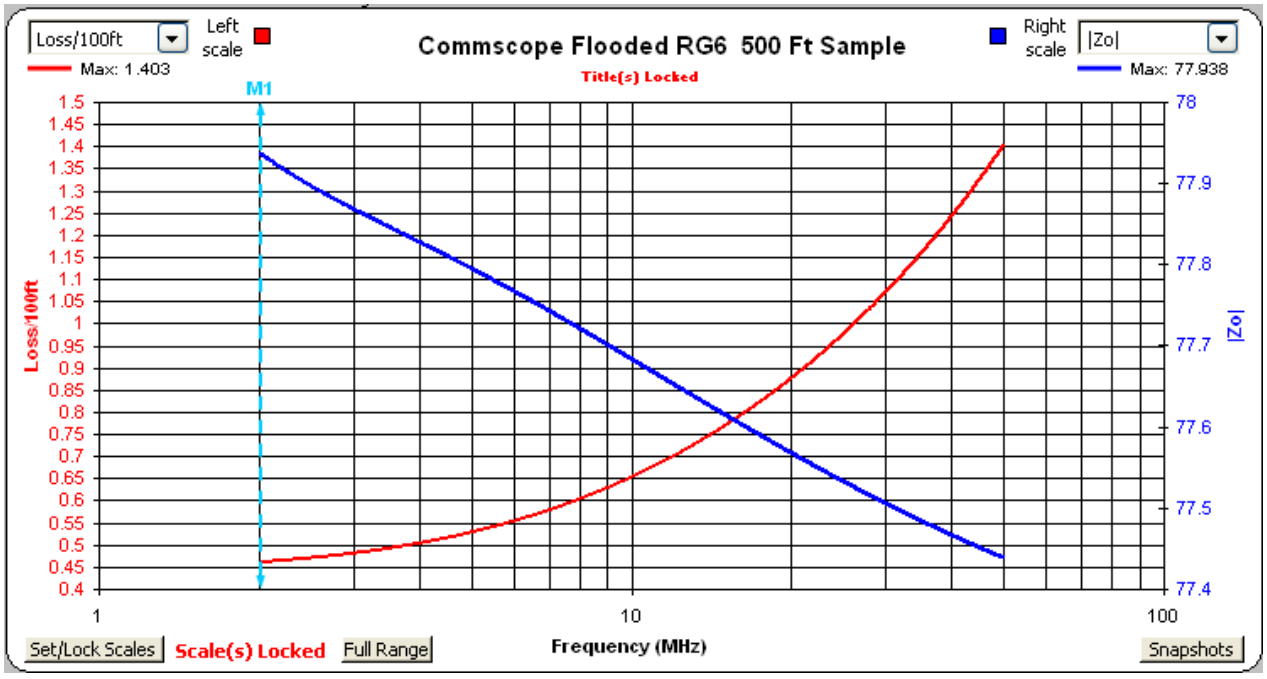
Belden CAT6 1872A: Zo (nom) = 99.15 ohms, = VF (nom) = 0.712, Loss = 0.77 dB/100 ft @ 2 MHz, 1 dB/100 ft @ 3.5 MHz, 1.42 dB/100 ft @ 7.15 MHz [Zo, VF, and attenuation vary with frequency for all practical transmission lines. Nominal values are those to which the line converges (flattens out) at high VHF. Zo (nom) = sqrt (L/C).]





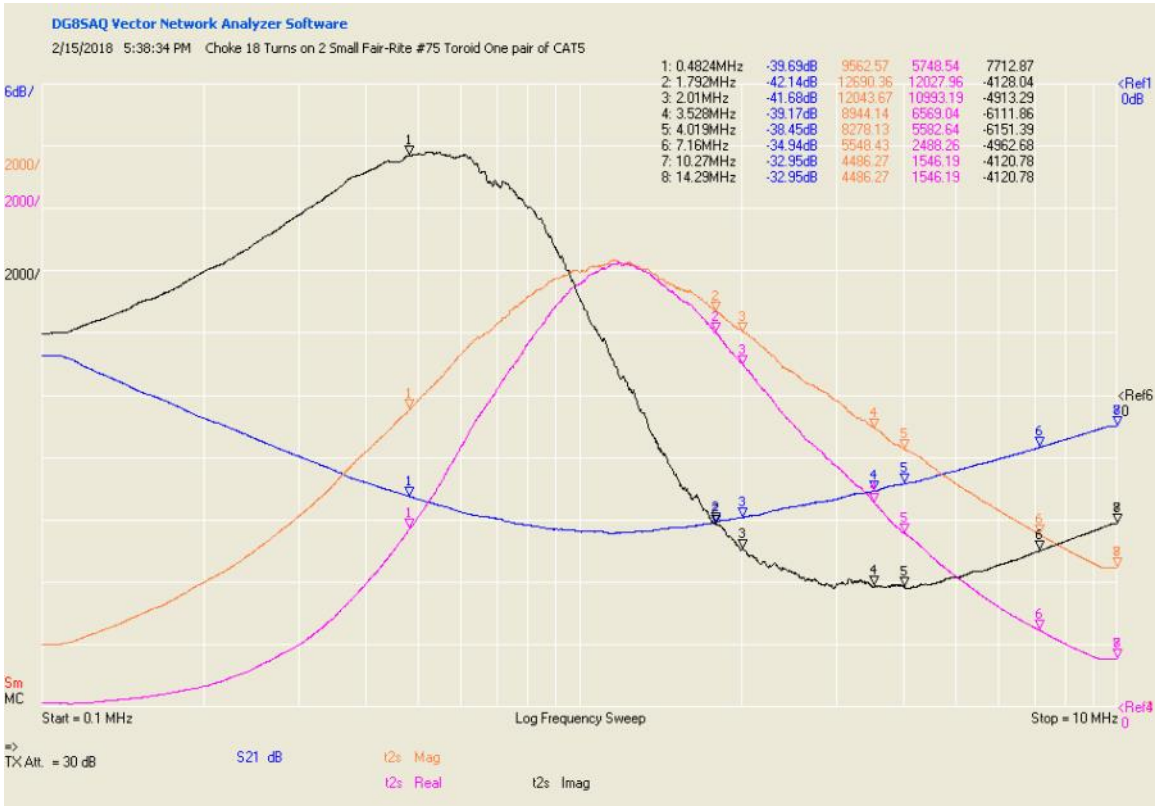
Commscope F677TSEF): Zo (nom) = 77.2 ohms, VF (nom) = .8414, loss = 0.46 dB/100 ft @ 2 MHz, 0.495 dB/100 ft @ 3.5 MHz, 0.583 dB/100 ft @ 7.15 MHz



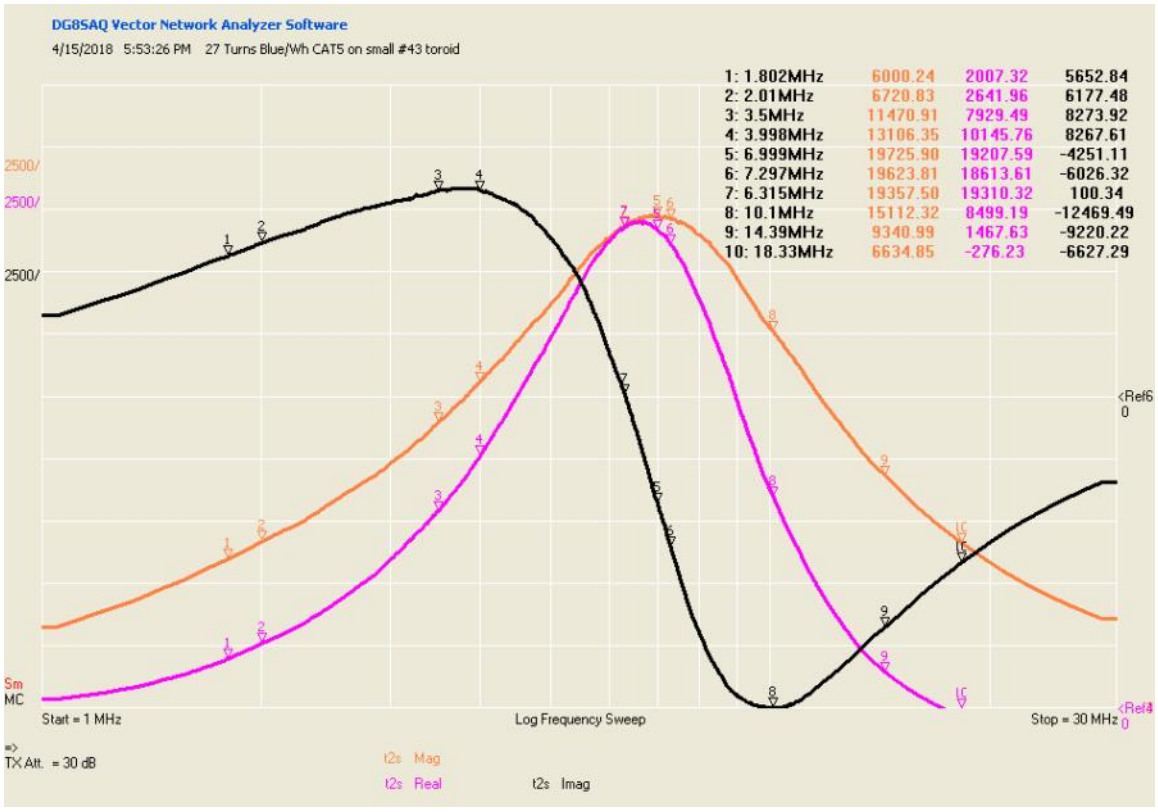


Measured Impedance of Representative Chokes

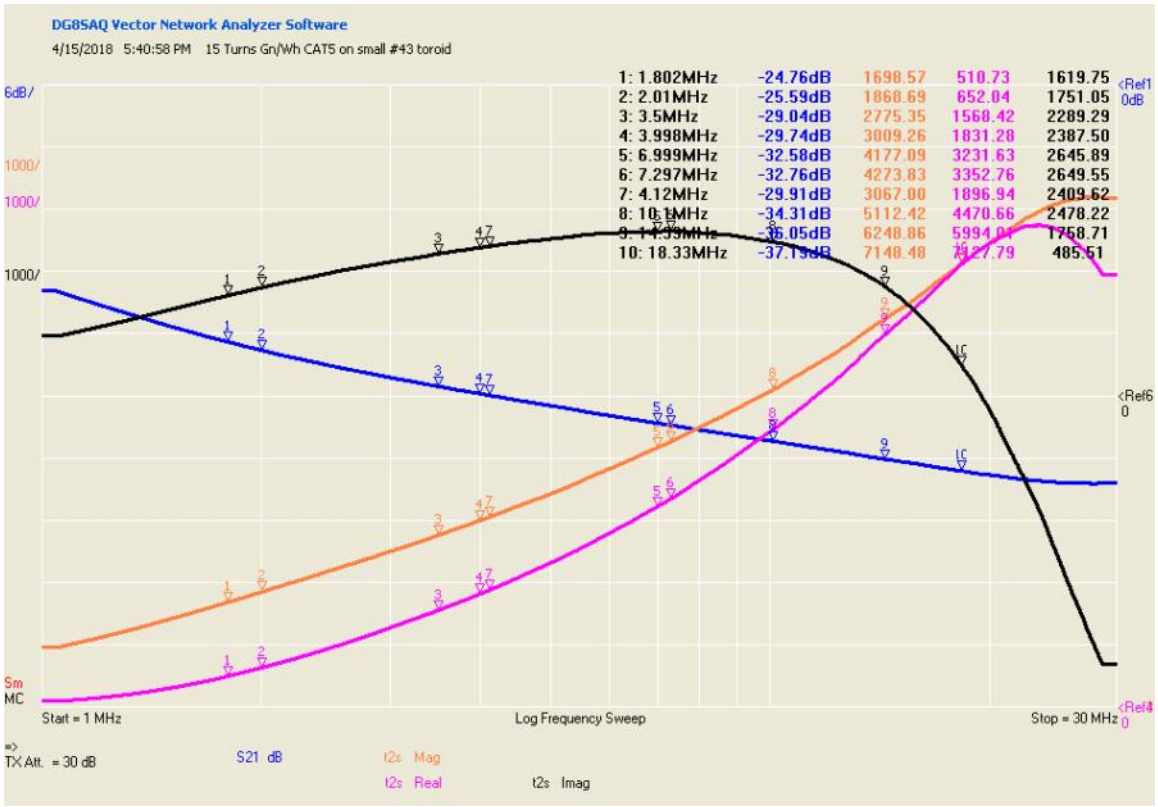
About these data: These data were measured using a VNWA 3e Vector Network analyzer. A network analyzer consists of a calibrated 50 ohm source and calibrated receiver with a 50 ohm input impedance. The choke was placed in series between generator and receiver, making it the series element of a voltage divider, the load element of which is the receiver's 50 ohm input impedance. The analyzer measures S21, which is the voltage gain of the circuit being measured. Zmag, Rs, and Xs are derived from S21 by solving the voltage divider equation backwards. The Orange curve is Zmag, the magnitude of the choking impedance, Magenta is Rs, the series equivalent choking impedance, and Black is Xs, the reactive component of the choking impedance. The blue curve is S21, with zero at the top of the plot. Axis calibration for each curve is along the left axis in dB/div; the frequency axis is logarithmic. Zero for Rs and Zmag is the bottom of the plot. Zero for Xs is the center of the plot.



18 turns of one pair from a CAT5 cable on two small #75 (Fair-Rite p/n 5975001401)



27 turns of one pair from a CAT5 cable on a small #43 toroid (Fair-Rite p/n 5943001601)



15 turns of one pair from a CAT5 cable on the same small #43 toroid

N6WM at the helm of his work computer

VP/CC's Corner – September 2018

Planning for our 2018-2019 Major contest season

Wow. The summer sure slipped on by and we are already in the month of September! The contest season is just around the corner. Hopefully most of you have gotten your requisite repairs and maintenance done on your antenna arrays and are dialing in your in shack improvements/repairs and modifications as its almost go time. For our newer members, the major contest season traditionally starts in October. One of the indicators that we are in it is our very own California QSO party, a favorite for contesters on all skill levels, and one that many major contesters use to shake down their stations before they roll into several months of heavy contest operating. This year CQP happens the weekend of October 6th/7th. Don't miss this great opportunity to "be the DX" and have some fun. Don't forget that there is another major contest that happens before CQP in fact its coming up at the end of this month. The CQWW RTTY contest is a super fun event to operate. It starts 0000 utc September 29th - 2359 September 30th. I have had the good fortune to operate this contest both domestically and as DX from ZF1A. Its loads of fun and gives us a full blown international DX RTTY fix prior to CQP (remember no RTTY in CQP!).

At the last NCCC meeting, I announced our Focus contests for the upcoming season. Those are:

Domestic focus: ARRL RTTY Roundup. January 5th and 6th 2019

We won this one in a landslide last year besting our closest competitor, PVRC, and we had a lot of fun doing it, showing the competition what we can do when we have good teamwork and motivated club action going on. This win restored the NCCC to the Unlimited category in this contest, where we truly belong. Lets do it again, and keep the heat on.. Unlimited style!

International contest Focus: The CQ Worked all prefix Club competition consisting of combined club scores from CQWPX SSB and CW. We will also be leveraging CQWPX RTTY as a warmup for the main 2 events in the club competition (WPX RTTY does not count toward the main club competition).

- **CQ WPX RTTY: Feb 10-11 2019: Our warmup so operation strongly recommended!**
- **CQ WPX SSB: March 30-31 2019: Be there or be square. We need critical mass.**
- **CQ WPX CW: May 25-26 2019: Same as above**

The Worked all prefix series should always be a contest on the minds of us here in Northern California. Its one of the few International DX Contests that can be won from NCCC territory, its loads of fun with oodles of multipliers (each unique prefix is a mult) and an adrenaline boosting scoring method that is addictive and keeps you at your operating position. We are placing particular focus on these to try and bring home a win. That means 2019 would be ideal to get all of our Multi-Operator stations QRV. Also folks who have the time and means to get to a DX location, in the Caribbean, and or even KH6, I strongly encourage this as these monster DX location scores fully count as scores applied to our club competition. So lets do this folks! Mark your calendars NOW! Don't wait, start preparing. We are going to need to hit critical mass on all modes. If you need to dust of your Mic, do it now and start practicing. If you have a rusty fist, lets download Morse runner (that is actually a CQ WPX simulator!) and get up to speed… literally. Google Morse runner and it will direct you to the download page. You have some time, so lets use it to plan for a win! For those inclined to go full bore for all 3 contests, Ed W0YK is sponsoring and award for high scorer of the combined 3 contests.. sort of a WPX triple play. This could both be fun and added motivation!

N6WM QRX for 30 days – W1RH stepping in to keep the ball rolling!

As many of you are aware, N6WM along with a few more NCCC members (WA6O, W1SRD N6XG) will be heading to the open seas of the south pacific to activate Duce Island(VP6-D) for the first time in 10 years under the call sign VP6D. We will be departing the Bay Area in Mid-October, and returning Mid-November. Knowing this was going to happen, planning in advance was done to have our Past president from the last 3 contest seasons, Bob W1RH temporarily cover the role of VP/CC for this one month period. Bob is also a sitting board member, and is fully aware and 100% on board with our focus contest agenda. Please accept any VP/CC related communication from W1RH as official, reviewed and approved. Thanks Bob and the entire NCCC for your support.

So lets start preparing for CQP, looking toward RTTY Roundup, and ultimately WPX.

Until next time, 73

Chris, N6WM

VP/CC

Welcome New Members

The following new NCCC members were voted in at the August NCCC meeting:

Amy AI6ZU, Jeri AI6TK, Bill AE6JV, Max W6BG & Michael WA2FHF …..welcome to the NCCC!

Max W6BG

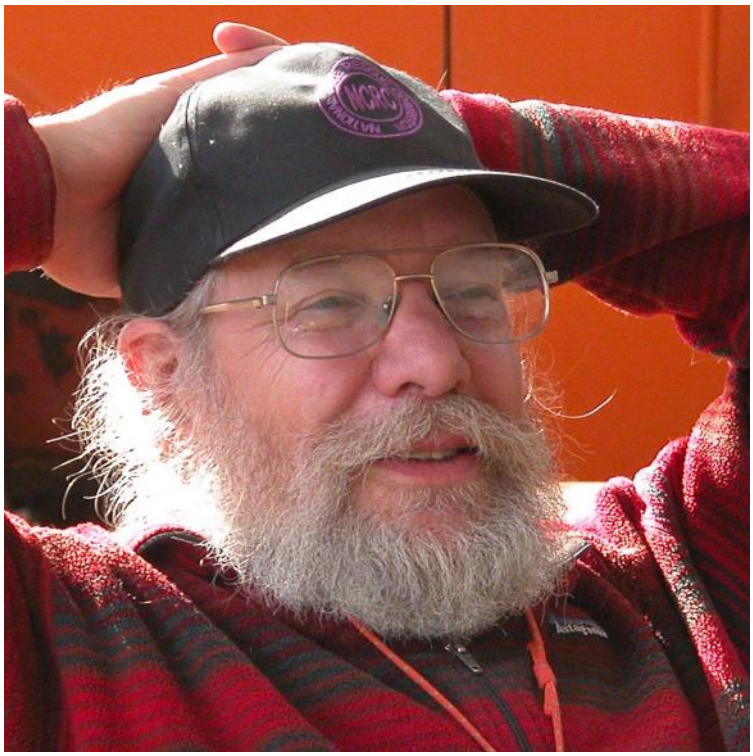
Max Lanfranconi, W6BG, holds a degree in Economy and Business from the University of Bergamo, Italy.

His past working experience includes R&D for the IT Department of a major Italian bank and several different roles over 11 years with Sun Microsystems. He is currently a Technical Program Manager with Oath. Got his license in 2009 as KJ6BRX and recently (2016) upgraded to Extra and got W6BG as his callsign.

Active with Cupertino ARES RACES
Work, kids, and HOA limitations prevented him from joining the big boys on HF but Jack Brindle got him “infected” with the Field Day bug for several years and eventually convinced me that contesting is something that I should look into. In order to be more effective, I recently enrolled in CW academy ad hope to become proficient in using morse as well. One of my kids got his license in 2016 (KM6FLL) and ended up becoming the VP of the ham radio club at CalPoly San Luis Obispo during his Freshman year.

Welcome New Members

Bill AE6JV



I was first licensed about 1960 as WV2NOO. That novice license lapsed without any QSOs. After the dot com crash, my startup company died and I had enough time to get a no-code tech as KG6JOH.

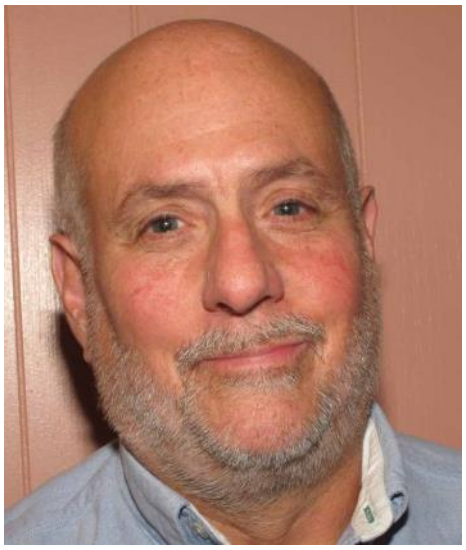
When I took that written test, a wily VE convinced me to take the general test as well, ("It won't cost you anything extra.", I remember him saying.) Well I managed to pass the general test, so I had a certificate good for a year that would give me a general if I could demonstrate 5 WPM code.

So, I "relearned" the code, and since I had some spare time, I decided I would also study for the extra exam. I passed both hurdles and got my extra.

I didn't really become active in HF until I helped operate PSK31 with WVARA on field day in 2009. It was so much like the text chat I had used on computers that I was hooked. I did a lot of DXing with PSK and did some RTTY contesting. I branched out into SSB contesting and I learned enough CW to make DX contacts. I still run CW contests in S&P mode.

Welcome New Members

Mike WA2FHF



I was first licensed as a Novice in 1972 as WN2FHF, and upgraded and received the WA2FHF call in 1973 (I grew up in NLI Section). My years as a teenage and young adult ham were very active, with lots of HF through UHF operations on a variety of different modes. Served as president of several school clubs, including three years for University of Rochester ARC (K2ZWI). Early on I discovered contesting, and did many events in both single and club multi-operator classes during that period. After 7 years in KH6 land while mostly in grad school, have been in SCV Section since 1987.

My last spurt of contesting was while my XYL (KF6NBZ) and I toured throughout the US for a year+ sabbatical in an RV in 2002-2003. I operated several US/DX contests from various locations (there's even a picture of me standing on top of our motorhome that was published in QST as part of the 10M Contest write up). Although my efforts were not particularly competitive, I did prove to my own satisfaction that single person portable operations could be both successful and logistically feasible.

Unfortunately, like many current hams, my home QTH has severe antenna restrictions and is plagued by a discouragingly high noise level; non-digital modes or contesting aren't particularly practical. My current goal is to re-establish a portable capability (this time trailer-based) to activate more RF-amenable locations. I'm quite impressed by the activities of NCCC members for this particular format of contest operations.

Antenna construction and rigging is one of my favorite focuses and activities in Ham Radio. Hopefully I can help out other NCCC members in their station improvements.

Professionally I am employed in the Biotechnology industry, currently in a customer technical support role. My other hobbies include SCUBA Diving/Underwater Photography and railroad preservation.

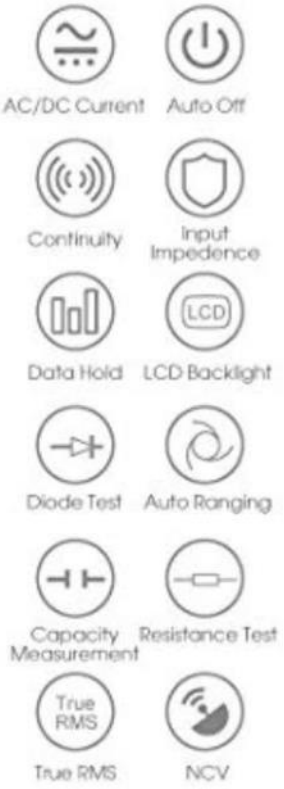
Affordable Clamp-on Current Meter for DC

Gary NA6O

I'm forever wondering how much current some item draws off of the 12V bus in the shack, and it's a nuisance to break the connection to insert an Ammeter. So I took a flyer and bought a Chinese clamp-on meter with a Hall Effect sensor. It does AC and DC current, but also has probes so it works like a regular DMM for AC/DC Volts, ohms, capacitance, diode test, and even has a proximity voltage detector. The one I bought is called a Synerky CM210E and cost $39 at Amazon. The main thing is that you can measure DC current as low as 10s of mA with reasonable accuracy. It's a good, compact utility meter that I'll always have in my tool bag for the field.

Here's the review I posted at Amazon:

Very pleasantly surprised at the performance and quality of such a low-cost instrument. For some reason I thought it was bigger, but it's a hand-sized device that fits your hand well. Built well, feels solid, controls are simple and seem like they should last. Good display, clear decimal point and other annotations and an effective backlight. Test lead quality is above average, with slip-on sleeves to cover 90% of the tips. Auto-ranging is reasonably fast. I did a full set of accuracy checks, comparing with my arsenal of lab instruments and RC standard components. All specs were met easily for all modes. Verified that it is indeed true RMS at least at low frequencies. AC response is down 3 dB at 3 kHz.



As a clamp-on ammeter (which is what I bought this for), it's about the only affordable unit that has a prayer of reading milliamps, AC or DC. In AC mode, it meets its specified 4% accuracy at currents above 30 mA. DC does the same above 40 mA. You can also use it as a compass in DC mode :-) which is not unusual for any high-sensitivity magnetic field probe like this. On DC current, it is VERY important to zero the instrument while holding it in exactly the attitude it will be used for measurement, at least on the lowest range. It also has some residual offset in the reading, but we're quibbling over a few mA which is down at the bottom of its lowest (2 A) range.

Very respectable performance indeed. Use with confidence.

August NCCC Meeting

The August meeting took place on Tuesday 14th August the meeting venue was the Tied House, Mountain View. The program was made up of a panel of members (Bob K6XX, Mike WA6O, Rick N6XI, Andy AE6Y, Ed W0YK, Rusty W6OAT Michael W6/DL1CMZ and Tom KW6W) who went to Germany either as a participant, referee or in a advisor capacity.

Rusty W6OAT will soon be moving to W7 land and received a standing ovation!

Attendees:

Michael DG1CMZ/W6, Barbara K6BL, David K6DAJ, Tom K6EU, Giuseppe KE8FT, Brian KJ6WH, Tom N3ZZ, Dean N6DE, Rich N6KT, Byron N6NUL,Tom ND2T, Dave W6NL, Ian W6TCP, Mike WA2FHF, Matt WX5S, Amy AI6ZU, Jeri AI6TK, Chris N6WM, Don K6GHA, Mark W6IA, Andy AE6Y, Bob K6XX, Tom KW6S, Rick N6XI, Ed W0YK, Rusty W6OAT, Mike WA6O, Ed AJ6V, Bobby K0XI, Jim K9YC, Gordon KM6I, Clay N5YJZ, Greg N6GD, Steve N6SJ, Bob-N6TV, Mike N7MH, Tom NW6P, Jack W6FB, Glen W6JGB, Bill W9KKN, Steve W1SRD, Doris K0BEE, Jon K6WV And Jennifer KB4TGE.


irman Chris, DL1MGB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Check Your SO-239s

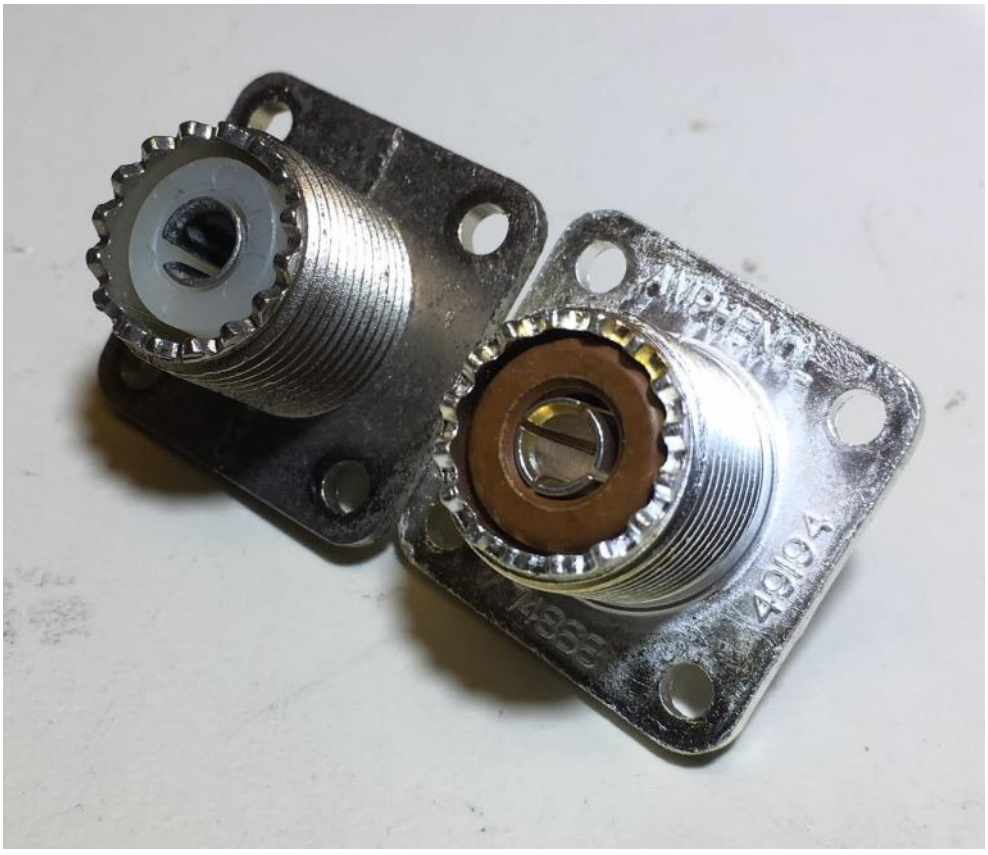
Gary NA6O

Everyone knows about connection failures with PL-259 plugs, but how often do you check your SO-239 sockets? At N6RO, we have had numerous problems specifically due to poor center pin connections. This results in intermittent loss of received signals, arc faults on the amplifiers, and probably some of the odd inter-station interference problems we deal with.

The QA check is easy: Take a clean, new PL-259 and push only the center pin into the socket. It should meet with substantial resistance, also known as pin retention force. Failed sockets required no force at all; the pin literally can rattle around in the socket. Why this happens, we don't know. It's not necessarily from frequent connection cycles because more than one StackMatch, sitting up on the tower for many years, has failed this way. I'm writing this because at this moment I'm replacing all the SO-239s on an old Top Ten 6-way switch. 100% failure! Also remember that *adapters* are subject to the same problem.

The photo below shows the old, generic connector. The center connection has only one slit and you can see that it has spread. Compare that to the new Amphenol with four slits, which will improve its chances of maintaining contact even with out-of-round pins. That's what you get with quality connectors.

By the way, the same thing happens with AC power sockets. Facility inspectors use a retention force test tool because those poor connections can quickly become fire- and life-safety hazards.



2018/2019 Dues

Dues renewals for 2018/2019 are $24 for full members and $12 for associate members (outside of the club circle). Dues are not mandatory. However, like every club, we have expenses that need to be paid and awards are only issued to paid members so please consider a paid membership. It's only $24!

Member Planet is used to collect dues and you will shortly receive an automated reminder that dues are payable. You don't need a Paypal account and you can use a credit card to pay dues.

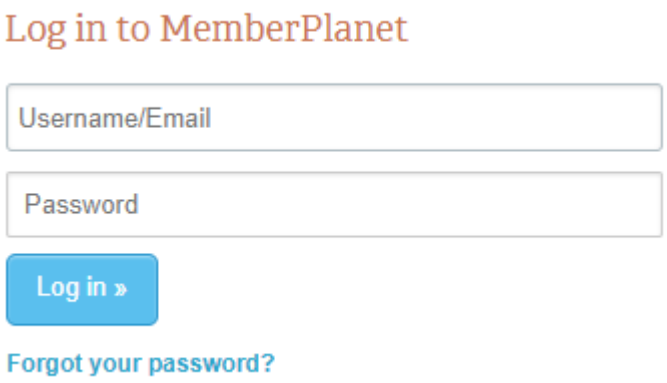
You can also pay for dues by check. Please mail $24 to the NCCC Treasure, K6EU Tom Carney, 1545 Elwood Dr, Los Gatos, CA 95032

As we are now a 501(c)(3) non-profit organization your dues might be tax deductible to the extent permitted by law. However, check with your tax professional for advice on your specific case.

To log in to Member Planet : Go to http://nccc.cc/membership.html

Scroll to the sign in button 

Log in using the credentials you signed up with



Select the Blue Renew Button

If you need help, contact Ian W6TCP w6tcpian@gmail.com

Point Generator Profile
Bob, W1RH

An impressive antenna system. A really impressive career resume. And, the best tip I've seen for contesters! It's all from Bill, W6FA, our featured Point Generator this month.

A look at 3830, shows Bill's activity back to 2010. He's been active in the Phone and CW HF contests and he has also been active in VHF contesting. On the HF bands, Bill has delivered impressive numbers in both the DX and the domestic contests, which is always what I like to see in our membership. Look for Bill in Nevada County for this year's CQP.

Now, more from Bill, W6FA:

Name/Call Sign: William B. Bridges (Bill) W6FA

Past calls: W6GEB, VK7WB, EI4VTC

Location: Harmony Ridge, just north of Nevada City

How much property do you have? 9 acres of hilltop forest

Describe your antenna system:
M-Squared 45' boom Yagis for 10m, 15m, and 20m on one 75' tower; and M-Squared 45' boom Yagi for 40m and 8 ele. Log Periodic on a second 75' tower. Two dipoles for 80m. Use one tower as a top loaded vertical for 160m; 40' mast with 5 element 6m beam and 14 element (CP) 2m antenna. Discone for 432 MHz. All coax runs to the shack are in 4" buried conduit. K7NV prop-pitch rotators.

What's in your shack? ICOM-7600, Alpha 87A, ICOM-7000

What are your previous QTH's?
All in CA: Inglewood, Reseda, Thousand Oaks, Altadena, Pasadena, Sierra Madre.

If you're working, what is your career? If not, what was your career?
Now retired.

1960-1977 Research scientist at Hughes Research Labs, Malibu, CA.

1977-2002 Professor of EE and Applied Physics at California Institute of Technology, Pasadena, CA.

Worked in microwave and laser devices and their applications. Inventor, noble gas ion lasers US Patent 3,395,364. For more bio information see Wikipedia William B. Bridges.

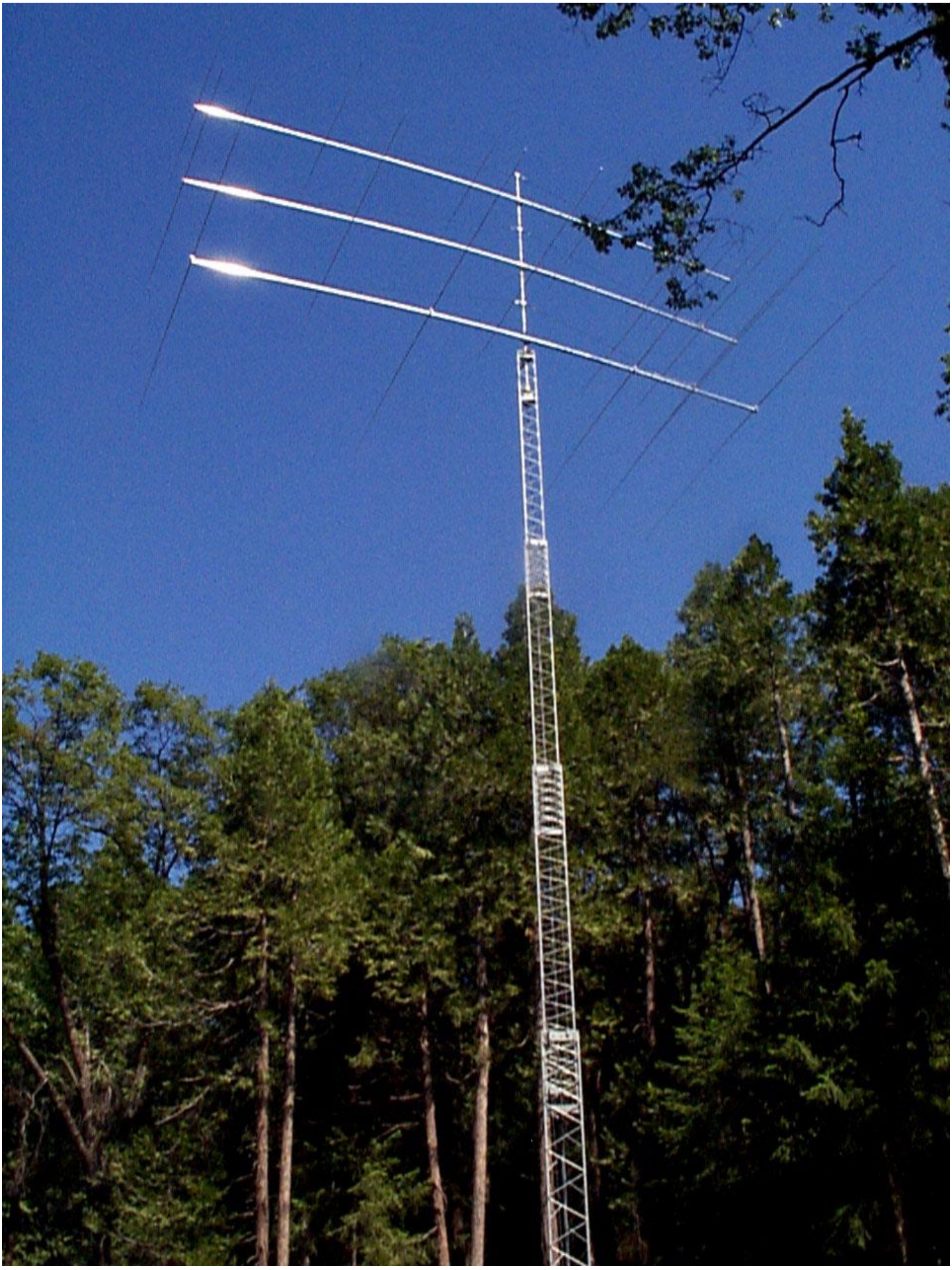
Married? Kids? Grandkids? Married, 3 kids, 4 grandkids

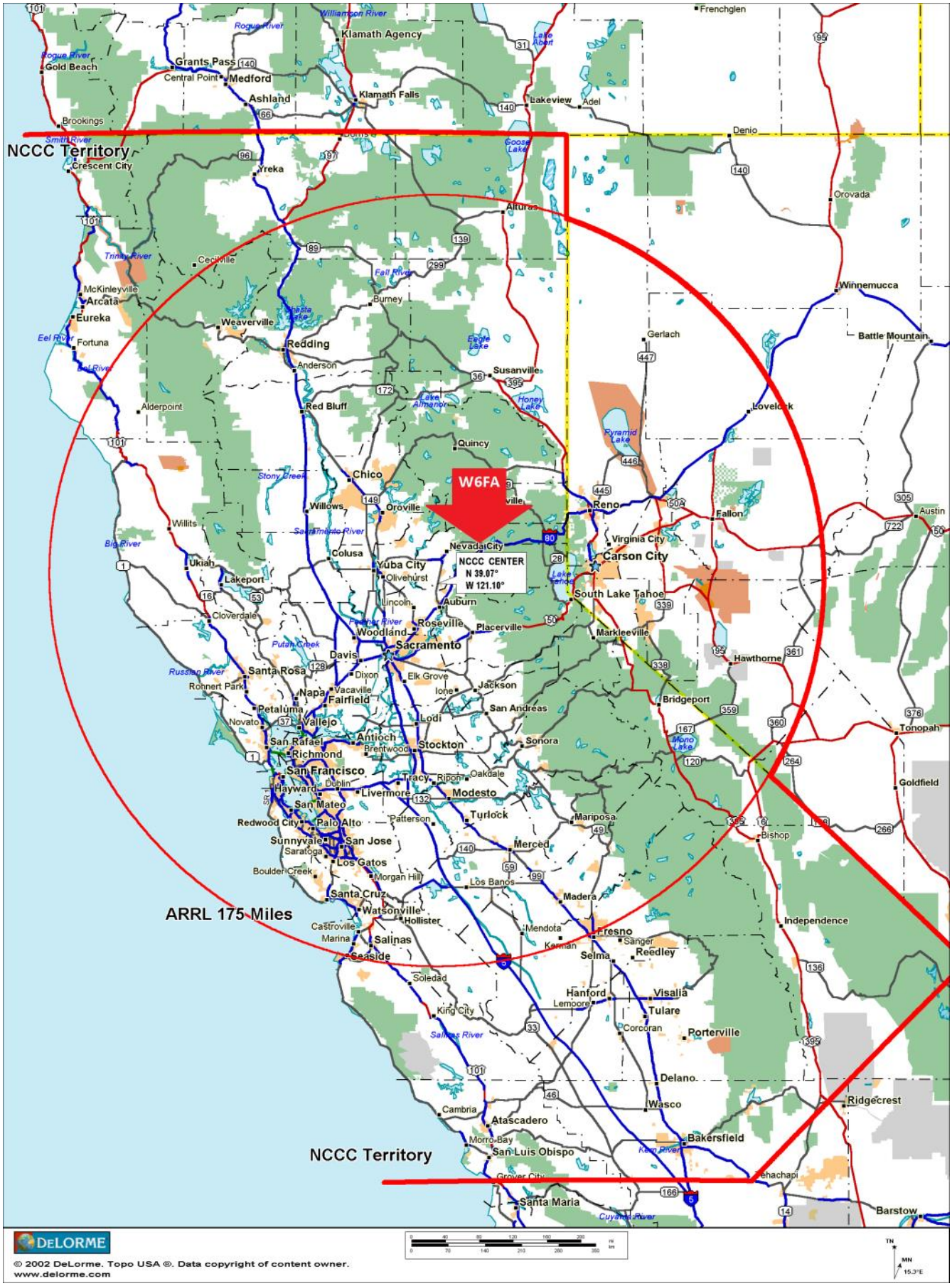
How many DXCC entities have you worked? More than 250 confirmed

What's your favorite contest? CQP

Any tips for contesters? Get a comfortable chair.

Any other hobbies besides ham radio? With 9 acres of forest, I don't need any other hobbies.




NCCC Territory
W6FA
NCCC CENTER
N 39.07°
W 121.10°
ARRL 175 Miles
NCCC Territory
Frenchglen
Klamath Agency
Grants Pass
Medford
Ashland
Klamath Falls
Lakeview
Denio
Orovada
Winnemucca
Battle Mountain
Gerlach
Lovelock
Fallon
Reno
Virginia City
Carson City
South Lake Tahoe
Markleeville
Hawthorne
Bridgeport
Tonopah
Goldfield
Bishop
Independence
Crescent City
Yreka
Alturas
Gold Beach
Brookings
Cedarville
McKinleyville
Arcata
Eureka
Fortuna
Weaverville
Redding
Burney
Anderson
Susanville
Red Bluff
Alderpoint
Quincy
Chico
Willows
Oroville
Willits
Ukiah
Lakeport
Cloverdale
Colusa
Yuba City
Olivehurst
Nevada City
Auburn
Lincoln
Roseville
Placerville
Woodland
Sacramento
Davis
Dixon
Elk Grove
Ione
Jackson
Santa Rosa
Rohnert Park
Napa
Vacaville
Fairfield
Petaluma
Novato
Vallejo
Lodi
San Andreas
Sonora
Antioch
Brentwood
Stockton
San Rafael
Richmond
San Francisco
Tracy
Ripon
Oakdale
Hayward
Dublin
Livermore
Modesto
San Mateo
Redwood City
Palo Alto
Patterson
Turlock
Mariposa
Sunnyvale
San Jose
Saratoga
Los Gatos
Merced
Boulder Creek
Morgan Hill
Los Banos
Madera
Santa Cruz
Watsonville
Hollister
Castroville
Marina
Salinas
Seaside
Mendota
Fresno
Kerman
Sanger
Reedley
Selma
Soledad
Hanford
Lemoore
Visalia
Tulare
King City
Corcoran
Porterville
Delano
Wasco
Ridgecrest
Cambria
Atascadero
Morro Bay
San Luis Obispo
Bakersfield
Grover City
Santa Maria
Barstow
Lake Almanor
Eagle Lake
Honey Lake
Pyramid Lake
Lake Tahoe
Mono Lake
Lake Isabella
Smith River
Rogue River
Williamson River
Trinity River
Eel River
Big River
Russian River
Putah Creek
Stony Creek
Cuyama River
Kern River
Salinas River
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NCCC Annual KB Competition Rules

Revised February 25, 2018

Purpose: To provide a means of rewarding NCCC members who are DX contesters, sprinters, VHFers, and especially active contesters in all modes.

Time period: The contest year starts at 0000 March 1 UTC. ARRL DX SSB is the first contest of the year. NAQP RTTY is the last.

Eligible contests: Currently, points from 38 contests are counted. See the table on the next page

Scoring: Score = number of contests in which you participated * sum of (points for each contest * each contest's multiplier). NCCC weekly sprints are special. Points for the entire year are added up, but it is only counted as a single contest.

Multi-ops: Points = total score divided by the number of operators.

Station owners: A station owner who does not participate in a particular contest receives 25% of the points.

Valid scores: Only scores posted to 3830scores.com are counted.

Brackets: There are four independent brackets for the purpose of awards: 1-Platinum, 2-Gold, 3-Silver, and 4-Bronze. Brackets are assigned at the beginning of the contest year according to your final position in the previous year’s standings.

Awards: Paid NCCC members may receive awards.

Contact: Gary, NA6O. gwj@wb9jps.com

NCCC Annual KB Competition Table (Updated 2/25/18)

Contest	Month	Multiplier
ARRL DX Contest SSB	March	5
CQ WPX SSB	March	1
NA Sprint Spring SSB	April	100
JIDX CW	April	10
Florida QSO Party	April	20
7th Area QSO Party	May	20
New England QSO Party	May	30
CQ WPX CW	May	1
ARRL June VHF	June	200
All Asian CW	June	10
RAC Canada Day	July	10
IARU HF World Championships	July	5
NAQP Summer RTTY	July	50
NAQP Summer CW	August	50
NAQP Summer SSB	August	50
Kansas QSO Party	August	20
NA Sprint Fall CW	September	100
CQWW RTTY	September	2
NA Sprint Fall SSB	September	100
CQP	October	20
Makrothen RTTY Contest	October	10
JARTS RTTY Contest	October	5
CQWW SSB	October	1
ARRL Sweepstakes CW	November	15
JIDX SSB	November	20
ARRL Sweepstakes SSB	November	15
CQWW CW	November	1
ARRL 160 Meter Contest	December	50
RAC Winter	December	10
ARRL RTTY Roundup	January	50
NAQP Winter CW	January	50
NAQP Winter SSB	January	50
NA Sprint Winter CW	February	100
CQ WPX RTTY	February	1
ARRL DX Contest CW	February	5
NAQP Winter RTTY	February	50
NCCC Sprint CW	Weekly	50
NCCC Sprint RTTY	Weekly	100

Platinum	Gold	Silver
AD6E	AJ6V	AI6JZ
AE6Y	K6AW	K6AAM
AF6SA	K6DGW	K6CSL
K2RD	K6IJ	K6ELE
K3EST	K6NV	K6JS
K5RC	K6RIM	K6KLY
K6GHA	K6TLR	K6KNS
K6LRN	K6UFO	K6KR
K6MM	K6XN	K6RB
K6MR	K6XV	K6ST
K6SRZ	KH2TJ	K6UM
K6XX	KH6LC	K7GK
K7XC	KM6I	K7MKL
K9YC	N0KQ	K7NV
KA6BIM	N2NS	KA6W
N6EE	N3RC	KD6WKY
N6IE	N3ZZ	KE8FT
N6JV	N6KT	KI6OY
N6RO	N6PN	KM9R
N6TV	N6XI	KO6LU
N6WM	NC6R	KX7M
N6ZFO	NJ6G	KZ2V
N7MH	NQ6N	N1DID
NA6O	NW6P	N5KO
W0YK	OH1VR	N6AJS
W1RH	W6DR	N6DE
W1SRD	W6EU	N6DW
W2SC	W6FA	N6GEO
W6NV	W6JTI	N6JS
W6OAT	W6NF	N6NU
W6SX	W6RC	N6RK
WB6JJJ	W6SR	N6VV
WC6H	W9KKN	N9YS
WK6I	WA6O	ND2T
WX5S	WU6X	NF1R
		NK7U
		NR6Q
		VY1JA
		W6LD
		W6NL
		W6RGG
		W6SC
		W6SZN
		W6TCP
		WE6Z

KB Award Brackets - New for 2018

There are four independent brackets for the purpose of issuing awards: 1-Platinum, 2- Gold, 3-Silver, and 4-Bronze.

Your bracket is assigned automatically at the beginning of the contest year according to your final position in the previous year's standings. New members or those who have never posted a score to 3830 default to the Bronze level.

On the left, is an alphabetical list of the current assignments to the top three brackets.

If your call is not listed, you are in Bronze. If you believe your current bracket is incorrect, please contact NA6O.

TUBE OF THE MONTH

Visit the museum at N6JV.com

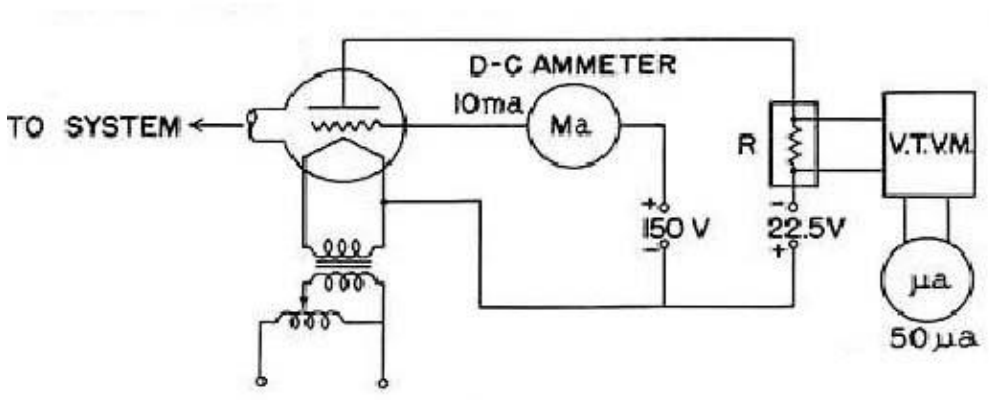
Norm N6JV

Visit the Museum: www.n6jv.com

Ion Gauges (Tubes that measure vacuums)

Early vacuum tubes did not have a high vacuum and would not stand very high plate voltages. Often getters were used to improve the vacuum. With the production of high power tubes, a means of measuring the vacuum was needed. Tube builders could see that when they tested a new tube, the current would vary with the amount of vacuum. If it was real bad, the tube turned blue. The first tubes that where designed to measure vacuums were existing types that were open to the atmosphere and could be plumbed into the vacuum pumping system. Tubes like the 35IG are examples. With experimentation, they leaned to make tubes that were more sensitive and that could be calibrated to measure even higher values of vacuum. The plate was replaced by a single wire and the grid grew into a large coil.

The blue color in a leaky tube is caused by electrons colliding with ions. The filament of an ion gauge tube emits electrons that are drawn to the large positively charged grid. Any ions that are hit by the electrons will be attracted to the negatively charged plate and causes the current to rise in the plate lead. A typical ion gauge tube would have +150 VDC on the grid and about –30 VDC on the plate. The filament voltage must be variable. A resistor is placed in the plate lead and a sensitive galvanometer measures the current across the resistor. The current will be in the microampere range and can be calibrated to be proportional to the vacuum. A good ion gauge tube will measure vacuums down to 10-8 mm of mercury.



TUBE OF THE MONTH

Visit the museum at N6JV.com

Norm N6JV

TUBE OF THE MONTH

Visit the museum at N6JV.com

Norm N6JV

NCCC Life Membership!

The NCCC Life member program was introduced for a flat fee of $250. If you are interested in becoming an NCCC Life member, please contact Ian W6TCP at w6tcpian@gmail.com

80/20 Rule:

Members who have reached 80 years young and been a NCCC Member for 20 years are eligible for Honorary life membership. Contact Ian W6TCP at w6tcpian@gmail.com

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CQP T-Shirts 2016

We have a small number of T-Shirts left for anyone that wants one. They are $15 each, available on a first come first served basis.

Available sizes:

2XL

XL

M

Contact Ian W6TCP at w6tcpian@gmail.com for details

BoD meeting minutes

The monthly minutes from the NCCC BoD meetings are available in the members only section of the NCCC website. See http://nccc.cc/members/minutes.html

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JUG Articles Wanted!

Without your help we cannot reproduce a quality newsletter so please consider submitting a suitable article!

We welcome any and all relevant articles for inclusion in the JUG.

Deadline is 7 days before month end. Preferred format is MS Word, Arial 12 point and pictures should be full resolution. Send your material to Ian, W6TCP at w6tcpian@gmail.com Don't worry about the formatting, we can take care of that if necessary !

Contest Calendar– September

All Asian DX Contest, Phone	0000Z, Sep 1 to 2400Z, Sep 2
CWOps CW Open	0000Z-0359Z, Sep 1 and 1200Z-1559Z, Sep 1 and 2000Z-2359Z, Sep 1
Russian RTTY WW Contest	0000Z-2359Z, Sep 1
Wake-Up!QRP Sprint	0600Z-0629Z, Sep 1 and 0630Z-0659Z, Sep 1 and 0700Z-0729Z, Sep 1 and 0730Z-0800Z, Sep 1
AGCW Straight Key Party	1300Z-1600Z, Sep 1
RSGB SSB Field Day	1300Z, Sep 1 to 1300Z, Sep 2
Colorado QSO Party	1300Z, Sep 1 to 0400Z, Sep 2
IARU Region 1 Field Day, SSB	1300Z, Sep 1 to 1259Z, Sep 2
Alabama QSO Party	1500Z, Sep 1 to 0300Z, Sep 2
PODXS 070 Club Jay Hudak Memorial 80m Sprint	2000Z, Sep 1 to 2000Z, Sep 2
WAB 144 MHz QRO Phone	1000Z-1400Z, Sep 2
Tennessee QSO Party	1800Z, Sep 2 to 0300Z, Sep 3
MI QRP Labor Day CW Sprint	2300Z, Sep 3 to 0300Z, Sep 4
ARS Spartan Sprint	0100Z-0300Z, Sep 4
Phone Fray	0230Z-0300Z, Sep 5
CWOps Mini-CWT Test	1300Z-1400Z, Sep 5 and 1900Z-2000Z, Sep 5 and 0300Z-0400Z, Sep 6
UKEICC 80m Contest	2000Z-2100Z, Sep 5
NRAU 10m Activity Contest	1700Z-1800Z, Sep 6 (CW) and 1800Z-1900Z, Sep 6 (SSB) and 1900Z-2000Z, Sep 6 (FM) and 2000Z-2100Z, Sep 6 (Dig)
SKCC Sprint Europe	1900Z-2100Z, Sep 6
NCCC RTTY Sprint	0145Z-0215Z, Sep 7

Contest Calendar– September

NCCC Sprint Ladder	0230Z-0300Z, Sep 7
Kulikovo Polye Contest	0000Z-2359Z, Sep 8
WAE DX Contest, SSB	0000Z, Sep 8 to 2359Z, Sep 9
SARL Field Day Contest	1000Z, Sep 8 to 1000Z, Sep 9
SKCC Weekend Sprintathon	1200Z, Sep 8 to 2400Z, Sep 9
Ohio State Parks on the Air	1400Z-2200Z, Sep 8
Russian Cup Digital Contest	1500Z-1859Z, Sep 8 and 0600Z-0959Z, Sep 9
ARRL September VHF Contest	1800Z, Sep 8 to 0300Z, Sep 10
North American Sprint, CW	0000Z-0400Z, Sep 9
Swiss HTC QRP Sprint	1300Z-1900Z, Sep 9
4 States QRP Group Second Sunday Sprint	0000Z-0200Z, Sep 10
RSGB 80m Autumn Series, SSB	1900Z-2030Z, Sep 10
Phone Fray	0230Z-0300Z, Sep 12
CWOps Mini-CWT Test	1300Z-1400Z, Sep 12 and 1900Z-2000Z, Sep 12 and 0300Z-0400Z, Sep 13
NCCC RTTY Sprint	0145Z-0215Z, Sep 14
NCCC Sprint Ladder	0230Z-0300Z, Sep 14
SARL VHF/UHF Analogue Contest	1600Z, Sep 14 to 1000Z, Sep 16
ARRL 10 GHz and Up Contest	0600 local, Sep 15 to 2400 local, Sep 16
SARL VHF/UHF Digital Contest	1000Z, Sep 15 to 1000Z, Sep 16
All Africa International DX Contest	1200Z, Sep 15 to 1200Z, Sep 16
Scandinavian Activity Contest, CW	1200Z, Sep 15 to 1200Z, Sep 16
SRT HF Contest SSB	1300Z, Sep 15 to 1300Z, Sep 16
Iowa QSO Party	1400Z, Sep 15 to 0200Z, Sep 16
New Hampshire QSO Party	1600Z, Sep 15 to 0400Z, Sep 16 and 1600Z-2200Z, Sep 16
Washington State Salmon Run	1600Z, Sep 15 to 0700Z, Sep 16 and 1600Z-2400Z, Sep 16
New Jersey QSO Party	1600Z, Sep 15 to 0359Z, Sep 16 and 1400Z-2000Z, Sep 16

Contest Calendar– September

QRP Afield	1600Z-2200Z, Sep 15
Feld Hell Sprint	1800Z-1959Z, Sep 15
North American Sprint, RTTY	0000Z-0400Z, Sep 16
BARTG Sprint 75	1700Z-2059Z, Sep 16
Run for the Bacon QRP Contest	0100Z-0300Z, Sep 17
144 MHz Fall Sprint	1900 local - 2300 local, Sep 17
Phone Fray	0230Z-0300Z, Sep 19
CWOps Mini-CWT Test	1300Z-1400Z, Sep 19 and 1900Z-2000Z, Sep 19 and 0300Z-0400Z, Sep 20
RSGB 80m Autumn Series, CW	1900Z-2030Z, Sep 19
NAQCC CW Sprint	0030Z-0230Z, Sep 20
NCCC RTTY Sprint	0145Z-0215Z, Sep 21
NCCC Sprint Ladder	0230Z-0300Z, Sep 21
AGB NEMIGA Contest	2100Z-2400Z, Sep 21
FOC QSO Party	0000Z-2359Z, Sep 22
Maine QSO Party	1200Z, Sep 22 to 1200Z, Sep 23
UK/EI DX Contest, SSB	1200Z, Sep 22 to 1200Z, Sep 23
AGCW VHF/UHF Contest	1400Z-1700Z, Sep 22 (144) and 1700Z-1800Z, Sep 22 (432)
North American SSB Sprint Contest	0000Z-0400Z, Sep 23
Classic Exchange, CW	1300Z, Sep 23 to 0800Z, Sep 24 and 1300Z, Sep 25 to 0800Z, Sep 26
220 MHz Fall Sprint	1900 local - 2300 local, Sep 25
SKCC Sprint	0000Z-0200Z, Sep 26
Phone Fray	0230Z-0300Z, Sep 26
CWOps Mini-CWT Test	1300Z-1400Z, Sep 26 and 1900Z-2000Z, Sep 26 and 0300Z-0400Z, Sep 27
UKEICC 80m Contest	2000Z-2100Z, Sep 26
RSGB 80m Autumn Series, Data	1900Z-2030Z, Sep 27
NCCC RTTY Sprint	0145Z-0215Z, Sep 28
NCCC Sprint Ladder	0230Z-0300Z, Sep 28
ARRL EME Contest	0000Z, Sep 29 to 2359Z, Sep 30
Feld Hell Sprint	0000Z-2359Z, Sep 29
CQ Worldwide DX Contest, RTTY	0000Z, Sep 29 to 2400Z, Sep 30
Texas QSO Party	1400Z, Sep 29 to 0200Z, Sep 30 and 1400Z-2000Z, Sep 30
Classic Exchange, Phone	1300Z, Sep 30 to 0800Z, Oct 1 and 1300Z, Oct 2 to 0800Z, Oct 3

NCCC Membership Information

If you wish to join NCCC, you must fill out an application for membership, which will be read and voted upon at the next monthly meeting.

To join, you must reside within club territory which is defined as the maximum of:

- Northern California, anything north of the Tehachapi's up to the Oregon border, and
- A part of north-western Nevada (anything within our ARRL 175-mile radius circle centered at 10 miles North of Auburn on Highway 49).

JUG Articles Wanted!

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We welcome any and all relevant articles for inclusion in the JUG.

Deadline is 7 days before month end. Preferred format is MS Word, Arial 12 point and pictures should be full resolution. Send your material to Ian, W6TCP at w6tcpian@gmail.com Don't worry about the formatting, we can take care of that if necessary !

Northern California Contest Club Reflector—Guidelines

This reflector is devoted to the discussion of contesting.

This includes contests, station building, dxpeditions, technical questions, contesting questions, amateur radio equipment wants/sales, score posting, amateur radio meetings/conventions, and membership achievements.

This does not include personal attacks, politics, or off-subject posts which will be considered a violation of the Guidelines.

Violations may result in removal of the violator from the reflector and possibly from club membership in good standing.

Find us on Social Media

NCCCKB

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ICOM

IC-7610
All Mode Transceiver

IC-7200
HF Transceiver

IC-7100
All Mode Transceiver

ID-5100A Deluxe
VHF/UHF Dual Band Digital Transceiver

ID-51A Plus2
VHF/UHF D-STAR Portable

KENWOOD

TS-590SG
HF/50MHz Transceiver

TM-D710G
2M/440 Dualband

TM-V71A
2M/440 DualBand

TM-281A
2 Mtr Mobile

TH-D74A
2M/220/440 HT

YAESU
The radio

FT-991A
HF/VHF/UHF Transceiver

FTDX1200
100W HF + 6M Transceiver

FT-450D
A100W HF + 6M Transceiver

FTM-400XD
2M/440 Mobile

FT-60R
2M/440 5W HT

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- RETAIL LOCATIONS – Store hours 10:00AM - 5:30PM - Closed Sunday
- PHONE – Toll-free phone hours 9:30AM - 5:30PM
- FAX – All store locations
- ONLINE – WWW.HAMRADIO.COM
- MAIL – All store locations

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BURBANK, CA (877) 892-1748	SAN DIEGO, CA (877) 520-9623	DENVER, CO (800) 444-9476	ATLANTA, GA (800) 444-7927	NEW CASTLE, DE (800) 644-4476	SALEM, NH (800) 444-0047	ONLINE STORE WWW.HAMRADIO.COM