



**Publication of the
Northern California
Contest Club**



Issue 546
November 2017



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President's Report

Hello KB'ers, and Seasons Greetings.

It's Saturday, December 16th! That's the date of the NCCC Holiday Party. Same place. Same time. Same fun. This year, the Board voted to include door prizes. We will have about 12 door prizes for our spouses and a single grand prize for the testers. The grand prize is an Array Solutions PowerMaster II, wattmeter with the 3 KW coupler. I want to thank Jay, WX0B, for deeply discounting this prize for a club he respects and knows well. I hope to see you there. Details in this copy of the Jug and on the NCCC website.,

NCCC Holiday Party 16th December 2017

Please join us for the NCCC Holiday Party on Saturday 16th December ~ 11:00 am to 3:00 pm

Venue: Michael's at Shoreline, 2960 Shoreline Blvd. Mountain View, CA 94043



[See page 9](#)

As president of one of the world's finest contest clubs, I've been just ecstatic with what Matt, WX5S, and Gary, NA6O, have done with the KB Competition . This competition began with an enormous spreadsheet that I tried to keep up. Last year's scores were all calculated with my spreadsheet and reviewed by Gary. This year, it's going to be different. Matt has been cranking out the code and the entire process is now automated with near-real-time reporting to the website. You can find the current standings in the "Awards" section. Great job, guys! I can't wait for Gary to present the awards at our Awards Banquet this spring.

Continued on page 3



Northern California Contest Club

Excellence In Amateur Radio Contesting

Officers:

President	Bob Hess	W1RH	w1rh@yahoo.com
Vice President /Contest Chair	Chris Tate	N6WM	ctate@ewnetinc.com
Treasurer	Dick Wilson	K6LRN	treasurer.nccc@gmail.com
Secretary	Ian Parker	W6TCP	secretary.nccc@gmail.com
Past President	<open>		
Director	Rusty Epps	W6OAT	w6oat@sbcglobal.net
Director:	Rich Cutler	WC6H	wc6h@yahoo.com
Director:	Ron Castro	N6IE	ronc@sonic.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	<open>		
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

Our next big focus contest is RTTY Roundup. Let's take a look at how we've done as a club in recent years:

YEAR	RANK	CATEGORY	SCORE	NUMBER OF LOGS
2017	1 ST	Medium	1,879,145	43
2016	1 ^{ar}	Unlimited	3,809,079	67
2015	11 th	Medium	726,251	24
2014	1 st	Unlimited	3,302,878	65
2013	1 st	Unlimited	4,044,558	71
2012	1 st	Unlimited	3,715,609	73
2011	2 nd	Unlimited	1,824,779	52

It's pretty clear that this club can win the RTTY Roundup when we put our minds to it. 2015 was a year where we intentionally took a hiatus, but we came back with a vengeance in 2016. 2017 was a personal disappointment with a small turnout, but we won a gavel and, as they say, a win is a win. N6WM, our VP/CC wants to see 70 logs this year, and a big win in the Unlimited Category, so plan on tuning up your diddlers and join your fellow KB'ers in one of the most fun RTTY contests.

Our Life Membership ranks have increased. Welcome to:

Trey, N5KO
 Dave, NC6D
 Bob, W6RGG

Thanks, guys, for supporting your club!

Since we're now in the heart of the contest season, I want to point out some great scores from our members in recent contests.

CONTEST	CALL	SCORE
ARRL 160	N6JV	143,052
ARRL 160	N6ZFO	120,744
ARRL 160	N6RK	117,640
ARRL 160	W6DR	110,403
CQWW CW	P40L (N5KO, N7MH, W0YK, W6LD)	26,403,210
CQWW CW	NA6O (AI6JZ, K3EST, N6BV, N6RO, N6WM, WA6O, WX5S)	5,583,648
CQWW CW	K6XX	3,200,922
CQWW CW	N6JV	1,286,604

CONTEST	CALL	SCORE
CQWW CW	N0KQ (N0KQ, N6ZFO)	1,095,120
CQWW SSB	8P5A (W2SC)	14,459,071
CQWW SSB	P49Y (AE6Y)	5,673,206
CQWW SSB	K6XX	2,166,072
ARRL SS SSB	W7RN (WX5S)	296,144
ARRL SS SSB	WC6H	284,376
ARRL SS SSB	W1SRD	245,182
ARRL SS SSB	W6PZ (K6ARZ, KU6F)	222,108
ARRL SS SSB	N6JS	206,400
ARRL SS SSB	NW6P (W9KKN)	185,648
ARRL SS SSB	N6NU (K6WX, N6NU, N6WM)	170,424
ARRL SS SSB	W1RH (W1RH, K6LR)	161,048
ARRL SS SSB	N6JV	151,208
ARRL SS CW	W7RN (N6TV)	218,120
ARRL SS CW	WC6H	292,224
ARRL SS CW	N6RO (N6RO, NA6O)	200,860
ARRL SS CW	W1SRD	180,892
ARRL SS CW	N6PN (@N6TV)	178,240
ARRL SS CW	N6XG (WA6O)	172,640
ARRL SS CW	N6ZFO	162,240
ARRL SS CW	K6SRZ	154,710
ARRL SS CW	W6XU (K6JS, N6AD, W6XU)	153,052
ARRL SS CW	N6XI	150,396
ARRL SS CW	N6NU (N6NU, N6WM)	137,946
ARRL SS CW	W6SX	135,360
ARRL SS CW	W6OAT	132,030
ARRL SS CW	N3ZZ	131,868
ARRL SS CW	W1RH	127,980
ARRL SS CW	K7XC	124,662
ARRL SS CW	N6JV	108,378

There are other terrific scores out there, including single band, low power and QRP. I just wish I had the space and time to list them all!

I do want to note that MLDXCC had again scored well in Sweepstakes and may, for the third year in a row, win the Medium Club competition. Let's cross our fingers.

I hope to see you at the NCCC Holiday Party, and I hope to WORK you in the ARRL RTTY Round-up.

Bob W1RH

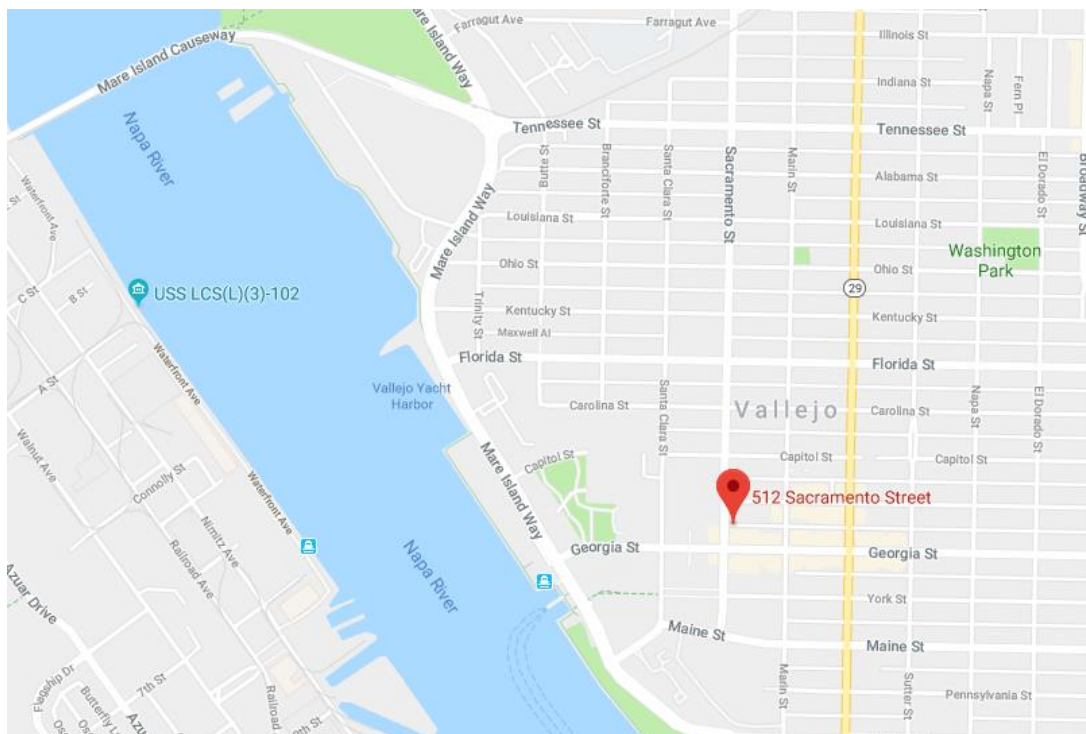
NCCC Meeting - January

Tuesday 9th January, 6 pm

Presentation: CQP 2017 Overview & DXpedition reports, John K6MM & Team

Venue:

China WOK, 512 Sacramento St, Vallejo, 94590



VP/CC Report

Christopher Tate, N6WM

N6WM@largeradio.org



VP/CC's Corner – December

The accidental discovery of a good playing station
(or how many of you are sitting on focus contest gold?)

There are a good number of us who are blessed with the opportunity to either own, operate or belong to a team of a superstation class station. But with big signals, great takeoff angles and big scores, come big complications.

One such complication struck the N6WM/N6NU SS team several days prior to the ARRL Sweepstakes CW. Our annual M/S effort from K6LRG has enabled us to be on the top of the PL-259 pack consistently, including a Pacific Division title and regularly delivering a top 10 overall in class effort in both modes. But this year, as N6NU and myself were preparing the station for this effort, disaster struck in the form of an arcing circuit at the power pole that reduced our current at the hilltop superstation by 40%, basically rendering it unusable until repair.

And then.. the idea is proposed

Andreas N6NU, suggested use of his home station for the effort. His station, on the flats of Redwood City, is an excellent DXing station, and he has been working hard to improve it continuously. with a 3 element 40-6 SteppIR at over 50ft, and wires for low bands that include a ground screen that had recently been deployed. With these operating conditions we should be able to do well in a domestic contest, and Andreas was enthusiastic about giving it a go in contest conditions. It would also enable us to test parts of new systems being developed for K6LRG. So we set our plan to go QRV from N6NU.

ARRL SS CW, the first test

I am not a stranger to the N6NU shack. For the last couple of years, we have operated K6LRG remote from there, where all the comforts of home exist and a quick drive over the Dumbarton gets me to the shack quick. But this time things were a little different. We were introducing QRO RF into the mix, so even though the seats we sat in were the same, our operating conditions were different. We had not committed to a full effort, but instead had a goal of producing 125k points and doing this sort of low key as we started to work the kinks out of the system.

A big signal is discovered!

As we proceeded to start the contest on 15m, it was clear we were a decent signal on the bands. Our rate was decent, and our ascending serials were keeping up with most on top of the pack. That 3 element SteppIR at 50ft is a very effective radiator, and we used an Expert 1.3k FA to put us in the QRO category. We operated 21 hours and we were very pleased with the results. Aside from some minor RF issues in the shack, the station delivered, and we were able to log 831 QSO's and get one of only a limited number of overall sweeps, including busting N6EE's NNY Pile up and logging the elusive QRP KP2/KP4 stations, all this while experimenting with newly assembled remote contesting equipment and newly home brewed interfaces programmed by N6NU and being debugged in use! Overall things worked well on all bands for CW. Claimed top 10 box performance achieved. Fine Business.

Sweepstakes SSB and discovering kinks that need to be worked out

Two weeks later, Andreas and I decided that since much of the work at K6LRG was still far from complete that we would continue the local N6NU effort and do SSB from his station and this time we were fortunate to have Kristen K6WX join us as well. That Saturday we once again kicked off on 15 meters. On sideband our starting rates were phenomenal, and I noticed that our serial numbers were at or greater than some of the best operators out on the bands. We were really kicking it. Again, this SteppIR antenna was showing its colors, and we were having a blast running great rate. But as darkness fell on the station and we started the transition to 80m, things took a dramatic turn. Andreas, attempting to put local multipliers in the log, discovered SWR problems on the 80M antenna, that was tripping the amp and its built in tuner. Work done to try and resolve this affected our rate deeply, and our killer score took a bit of a beating. We went to or break a bit frustrated and with only 28 QSO's in the log on 80.

Sunday morning had us once again making amazing rates, but the damage was done. Although we met our 1000 QSO goal and our club commitment, Work was needed on the low band antenna systems.

Lessons learned, and new beginnings

Since then, Andreas has been working diligently to remediate his 80m issues including attempting new antennas. Keep in mind these issues that would have only been brought to light by engaging in a serious competitive contest effort as his DX efforts work quite well. I am very confident that when this issue is resolved, N6NU will join the ranks of some of the more profound signals in contests on all bands from SCV. A new contest station has been discovered, and the future looks bright for us all to hear more regularly the call of my friend N6NU on the bands in future contests.

73 and until next time, enjoy your holiday season.

Chris
N6WM
Vice President and Contest Chairman

2018 Meeting Dates

Mark your calendars for the following 2018 Meeting dates, venues and presentations
Exact details to follow nearer the time.

Tuesday 9th January, 6 pm

Presentation: CQP 2017 Overview & DXpedition reports, John K6MM & Team
China WOK, 512 Sacramento St, Vallejo, 94590

Saturday 3rd February 11:30 am

Presentation: KB Awards Program 2.0
Cattlemen's, 2882 Kitty Hawk Rd, Livermore, CA 94551

Tuesday 13th March 6 pm

Presentation: TBD
Harrys Hofbrau, 390 Saratoga Ave, San Jose, 95129

Saturday, April 7th 11:30 am

Presentation: Annual Awards and Elections
Tied House, 954 Villa St, Mountain View, CA 94041

December 16th **NCCC** Holiday Party

Saturday 16th December ~ 11:00 am to 3:00 pm



Please join us for the NCCC Holiday Party on Saturday 16th December ~ 11:00 am to 3:00 pm

Venue: Michael's at Shoreline, 2960 Shoreline Blvd. Mountain View, CA 94043

XYL, YL's, and partners and guests are welcome!

Prize Raffle ticket for hams and non-hams, door ticket is included!

1) Sign up here <https://www.memberplanet.com/events/nccckb/holiday2017>

Chrome is the preferred browser

Paypal & Checks accepted

Note: There is no pay at the door option for this event! Please use PayPal or send a check!

2) If you are paying by Check PAYMENT MUST BE RECEIVED By Thursday, December 14th, 2017 mail your check to NCCC, c/o Dick Wilson K6LRN, P.O. Box 273, Somerset, CA 95684-0273.

Program Highlight:

"The Cursed Paradise Of Palmyra Atoll"

by John Miller, K6MM

Contact Ian W6TCP if you need help/assistance.

Rick Huisman N6DQ SK



Photo Credit Bob N6TV

It is with a heavy heart we hear of the passing of Rick N6DQ who fought a courageous 12 month battle with GBM brain cancer. Rick passed away on November 25th.

Please keep Joanna K6YL in your thoughts and prayers.

What Are Friends (and Clubmates) For? – A Tale of Antenna Repair at AE6Y

**By Andy Faber, AE6Y
Nov. 11, 2017**

I have a sort of “medium pistol” setup at home: one Rohn 45 tower, 65 feet high, but with its base on a hillside about 25 feet below the level of the house. It has three Force 12 antennas on the mast at the top, all installed years ago by Tom, N6BT, when he ran Force 12. The lowest is a 3 el. 20/2 el. 40 on a 30-foot boom, then an 80m rotatable dipole, all topped by a one-off design with three elements on 10 and three on fifteen on a common boom. Also at the 50-foot level is a two-element Stepplr. Here’s a picture, with a real rainbow behind



Each morning when I get into my car parked in the driveway I reflexively glance at the antennas, just to confirm that all is well. Unfortunately, one Friday morning (actually, the day before SS CW) all did not look well. The 20/40 appeared to be cocked at an angle and just didn’t look right at all. Checking with binoculars revealed that the boom-to-mast mounting plate appeared to have fractured, with the result that the antenna was either resting on the top of the tower or merely attached by its truss cable.

The tower has been up about 25 years, but is older than that, as it was purchased used from WA7NIN’s old superstation in Nevada. It came with rigid metal guys that attach at about the 23 foot level, and has Phillystran guys at the top. It is very solid and secure – but I still don’t like to climb it. I do notice that if I go up a few times in a short period of time, it gets much easier, but I’m still not a comfortable tower climber. On Aruba, for example, John Crovelli, W2GD, will have scooted up a tower while I’m still fiddling with my fall-arrest harness trying to remember how it all fits together. But then again, he does this for a living.

But the next morning I screwed up my tower-climbing courage carrying a rope and a cell phone to take pictures with. Here's what I found:



This is a Force-12 “Easy-On” mount, comprised of two aluminum plates. The horizontal plate holds the boom with two U-bolts, while the vertical one is attached to the mast with two more U-bolts. As you can see, the vertical plate had simply come apart and was no longer attached to the mast. I made an emergency repair by simply tying the boom to the mast with rope:



Now the question was, what to do? In discussing it with my Aruba mates, John W6LD, and Ed, W0YK, various suggestions were made about how to get a new plate fabricated. I didn't really want to spend the time to figure that out, but another John, KK9A (P40A on Aruba), came up with the suggestion to order a mounting plate from DX Engineering. It turns out that they sell a plate that is eight inches by ten inches in size and comes predrilled for booms and masts of 1 1/2-inch, 2-inch, and 3-inch diameters. The plate is made out of 1/4-inch aluminum, which is considerably thicker than the original plates. In this case, both the boom and the mast were two inches in diameter. So I ordered the plate along with six stainless steel U-Bolt assemblies from their outstanding website. Specifying next day air shipment meant that the items arrived in my office the next afternoon from Ohio. That is pretty awesome service!

But I knew I needed some help to install the new plate. I'm not really skilled at this, and the antenna weighs about 50 pounds, so assistance was in order. Both John and Ed volunteered to help out and Ed even said he might be able to do some climbing. But knowing that neither of them really should be climbing now, I declined their offers (and since Ed was recovering from a broken leg, I specifically forbade him from coming near the tower!).

As it turns out, PL-259 was looking for SS Phone scores to bolster our chances of a repeat win in the small club category. I mentioned on the reflector that I would commit to a 1,000-QSO effort ... except that there was this teeny, tiny little problem with my antenna that needed fixing. In the true amateur spirit of friendship and helpfulness, Chris, N6WM, and Dave, W6DR, immediately stepped forward and said they'd be happy to help.

They arrived promptly at 9 a.m. the next Saturday morning. Although I had procured the materials for the repair, and had the right tools on hand, and even had supplied coffee and pastries, it was immediately apparent to Dave and Chris that my planning had been seriously deficient. What I hadn't considered was how to support the weight of the antenna safely while we would be removing the old U-bolts, maneuvering the antenna into position, and attaching the new plate. With their experience, they immediately zeroed in on the problem. But, no worries: Dave drove home and returned shortly with a long reel of Dacron rope, some webbing to use to fashion a sling, and a pulley to attach the sling to.

Thus equipped, we were ready to proceed. Chris and I climbed the tower, while Dave furnished ground support. Here we are on top, having navigated through the SteppiR and around the side mounted 160-meter inverted vee support. Chris has the appropriate full body harness with gorilla hooks and a hard hat. I have a more casual outfit, consisting of a positioning belt (what used to be acceptable for climbers before full-body harnesses became the norm) with a rope positioner and a second webbing strap for more security.



The actual repair was pretty straightforward. The first job was to use the rope to pull up a bag full of supplies and tools. Then we fashioned the webbing into a small sling around the boom, attached in turn to the rope run through the pulley (which was anchored to a small steel “step” that had been put on the tower a little above the antenna). Then Dave tied off the rope to give some vertical support to the antenna. All the U-bolts came off pretty easily. Putting new ones on to the new plate was more time-consuming, as it was a bit harder to get the antenna perfectly aligned and in position. But that was actually due to the slight off-centered nature of the truss, not to any intrinsic failure of the systems. I told Chris I was perfectly satisfied if the boom seemed to slope down slightly to one end, as it had been doing so for many years.

Here is a picture of the new plate, with Chris behind it retaping the balun to the boom after the new plate is installed:



Here's Chris in his element, also showing the webbing and pulley arrangement.



And here are Chris and Dave after we got back on the ground, posing next to one of the rigid guy rods:



The whole fix probably took us about an hour of top-of-the-tower time. Back in the shack, all antennas continue to work, so it looks like we didn't manage inadvertently to sever any cables. (And now I'm out of excuses to get out of doing SS Phone!). I can't thank Chris and Dave enough for their cheerful and knowledgeable assistance. They took several hours out of a beautiful Saturday morning to help get me back on the air – in the best spirit of NCCC and PL-259 ham camaraderie. Thanks, guys! 73, Andy



Photo N6TV is N6TV “warming up” for SS CW via vacuum tube heat in front of K5RC’s newly acquired KWS-1 and 75A-4.



Photo #2 is him actually operating SS CW with more tech-featured equipment. No RS232 or USB on the Gold Dust Twins. Photos: Tom K5RC



My term as NCCC president ends this Spring. It has been an unprecedented three years as president of this great club, but three years is enough. We need new blood...new leadership. We need someone to step up and volunteer to run this club.

So just what can you expect to do, as President? With a good leadership team, the job is pretty easy.

- We have monthly Board meetings, always via conference call, and led by our Secretary, Ian, W6TCP.
- We have a budget, approved by the Board and assembled and maintained by the Treasurer.
- We have a contest plan, approved by the Board and assembled by our VP/CC.
- We have a number of very qualified and energetic volunteers who keep things like CQP, and the Sprints going year after year.

If you've read down this far, it's pretty obvious that a lot of the hard work is distributed among the officers and members. As President, you lead. You come up with new ideas. You try to attend most meetings, but you don't have to attend all of them. You try to motivate the club to have fun and win contests.

For me, the past three years have been a lot of fun. Together with our Board:

- We have established a life membership category.
- We have automated and outsourced our membership process via Member Planet. This has taken a huge load off of the Treasurer and Secretary.
- We have established the KB Competition as a way to honor and recognize our members for their contesting efforts.
- We have brought back the holiday party and made the NCCC BBQ an annual event.
- We have made NCCC a 501 (c) (3) non-profit organization, making it possible for members to write off dues, donate plaques, and make donations to causes that we support.

- As part of the 501 (c) (3) process, we have incorporated NCCC. As a corporation, the club officers and members generally will not be on the hook for the Club's debts or liabilities. This is very important to me, and one of the reasons I pushed for incorporation and non-profit status for NCCC.

Being the President of NCCC is somewhat like running a business filled with good people. If you like what you're reading, I urge you to think about volunteering to lead this club in 2018/2019. You do not have to be a world-class contester, nor is it required that you have prior experience on the Board. I am certainly not a world-class contester and I never served on the Board prior to running for President. I know we have many in the club who are managers, run businesses, and know how to lead and motivate people. At least one of you needs to step forward and accept the HONOR of being the President of the best contest club in the world!

For Sale AI6V's estate

I am helping Sue AI6YL sell the remaining equipment from AI6V's estate. Carl was a past president of the NCCC.

For Sale Yaesu FT1000D loaded with 4khz roofing filter and TCXO-1 oscillator. Looks like brand new out of the box. Comes with manual, but no

mic or box. This is from the estate of AI6V. The radio is now in Los Vegas, but will be delivered to the Bay Area in early November. Asking price is \$1295, or best offer, this includes delivery with in 100 miles of San Francisco, as needed.

Interested parties should contact Russ K6KLY at [510-852-0002](tel:510-852-0002) or Email k6kly@sbcglobal.net

Thank you Russ K6KLY

NCCC Annual KB Competition Rules



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

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

Eligible contests: Currently, points from 35 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.

Only scores posted to 3830scores.com are counted.

Paid NCCC members may receive awards.

NCCC Annual KB Competition Table (Updated 9/30/2017)

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

NCCC Annual KB Competition Leader Board (Updated 9/30/2017)

RANK	CALL	CONTESTS	KB SCORE
1	W2SC	3	344,710,179
2	NA6O	17	304,943,717
3	N6RO	15	235,071,731
4	N6ZFO	13	196,378,403
5	KA6BIM	10	174,346,830
6	K6SRZ	11	171,027,351
7	N7MH	7	154,640,059
8	N6WM	9	140,732,699
9	K6MR	8	137,520,096
10	W6SX	12	119,467,392
11	K3EST	7	112,803,458
12	N6TV	5	107,378,290
13	K6XX	6	94,627,554
14	K9YC	6	90,065,868
15	K7XC	12	89,575,992
16	AE6Y	2	80,544,880
17	K6LRN	9	78,504,354
18	K5RC	9	74,917,800
19	W1SRD	9	74,908,611
20	W1RH	9	56,411,847
21	AD6E	5	56,349,440
22	WX5S	6	54,762,225
23	N0KQ	11	51,225,999
24	N6IE	7	43,215,942
25	AF6SA	11	42,802,056
26	WK6I	3	41,289,660
27	K2RD	9	36,640,116
28	K6GHA	6	32,413,848
29	W6FA	10	24,979,750
30	N6JV	3	21,303,444
31	ND2T	8	21,546,400
32	AJ6V	3	19,327,200
33	K6MM	8	19,183,824
34	KR6N	7	19,142,592
35	N2NS	12	18,617,304
36	K6AW	3	16,643,705
37	W6JTI	4	16,292,080
38	WB6JJJ	4	15,341,700
39	KH2TJ	9	14,807,088
40	N6EE	5	14,786,870
41	WC6H	3	14,782,626
42	W6NV	3	14,655,540
43	W6OAT	5	13,308,380
44	K6SCA	4	10,609,664
45	N6PN	3	9,293,745
46	N6AJS	6	8,478,480
47	KX7M	2	8,115,960
48	W6EU	2	8,014,260
49	KM6I	8	7,858,048
50	W6TCP	4	7,191,560

RANK	CALL	CONTESTS	KB SCORE
51	N3ZZ	3	6,838,500
52	K7GK	1	6,565,104
53	K6KNS	5	6,458,970
54	N5KO	2	6,174,807
55	W6GJB	2	5,515,596
56	K6YK	4	5,416,164
57	K6RIM	4	4,107,960
58	W6SR	3	4,052,118
59	KE8FT	5	3,730,530
60	K6XN	4	3,610,308
61	K6AAM	1	3,498,756
62	K6ST	1	3,389,802
63	NW6P	3	3,288,954
64	WA6O	1	3,237,633
65	W6SFK	2	3,038,100
66	K6RB	1	3,019,200
67	KM9R	2	2,419,120
68	NJ6G	5	2,347,900
69	K6XV	3	2,226,075
70	KA6W	3	2,093,100
71	W6RGG	3	2,039,982
72	WU6X	4	1,845,944
73	W6OTC	1	1,797,404
74	OH1VR	1	1,763,755
75	W6LD	1	1,763,755
76	K6CSL	6	1,691,916
77	NR6Q	1	1,552,320
78	N6NU	1	1,483,943
79	NQ6N	1	1,483,943
80	K6ELE	2	1,453,800
81	K6UFO	3	1,323,750
82	K6GFJ	2	1,192,764
83	K6IJ	1	1,168,400
84	AE6YB	4	1,140,968
85	K6DGW	2	1,035,180
86	N6GQ	1	1,012,671
87	N6GEO	2	866,436
88	W6FB	2	835,200
89	K6NV	2	1,443,300
90	WU6W	3	610,224
91	NH6V	1	518,410
92	AI6JZ	1	518,410
93	K7XE	3	511,290
94	N6SPP	1	456,000
95	K6EU	1	417,000
96	W6RD	1	337,845
97	KK6DF	1	326,400
98	N3RC	2	325,872
99	W6NL	1	322,500
100	KI6OY	5	313,750

WRTC 2018 is coming - 250 days to go

There are now just 250 days to WRTC 2018 in Jessen/Wittenberg. A lot has already happened - but there is still a lot left to be done and time flies. In recent months, important subprojects have been finished.

- The qualification stage is completed with the applications received from and invitations sent out to the participants.
- At the IARU Contest, several WRTC 2018 participants visited Germany and have already evaluated propagation routes and station equipment.
- During the big test day, 100 volunteers at 15 locations tested the WRTC 2018 technology and logistics.
- Here as well as at "Ham Radio" in Friedrichshafen you could feel a great deal of the Ham spirit, which carries us along the way to WRTC 2018.

The most important aspect of the WRTC is of course the sport. Meanwhile, the participants are confirmed (see [Participants Page](#)). To mark 250-days out from the event we asked the participants a few questions and asked them to tell us about their enthusiasm.

Generation-Connecting Sport

Looking at the age structure of the WRTC 2018, a picture emerges that makes amateur radio sport something special. The youngest participant is Bryant, KG5HVO, at the age of 14. The oldest is the well-known Contester [Maryyn](#), N5AW, at the age of 77. In between, all age groups are represented almost equally, so that we will experience amateur radio not only as a global sport but also as a generation-connecting one. All participants compete in the same competition and on the same level.



Very Young Competitors: [Tamas](#) -HA8RT), Bryant - KG5HVO, Xenia -ZL4YL



PRESS RELEASE

WRTC 2018 e.V.
c/o Michael Höding, DL6MHW
Phone: +49 39201 20779
E-Mail: dl6mhw@wrtc2018.de



Very experienced Competitors Marvin- N5AW (77), Alan - N3AD (75), Dale VE7SV (73)

Start Young for a lifelong Sport

Another view point shows a very uniform picture. Almost all of the participants started amateur radio as teenagers, i.e. they acquired their first license as a teenager and continued into a lifelong radio sport passion. The survey showed an average age of 13.3 years when the competitor's first amateur radio license was achieved. Starting young - teenager contesters from five decades



Starting young - teenager contesters from five Decades

Great Expectations

Asked about the sporting goals, there were a number of interesting answers. There were clear announcements, for example, from reigning World Champion Chris, KL9A "To Win!", Vice-champion Tonno, ES5TV with "Gold", or Stefan, DL1IAO, (bronze at WRTC 2014) with "To do the best within my limits and get on the Podium!". However, there were also cautious



PRESS RELEASE

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c/o Michael Höding, DL8MHW
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E-Mail: dl8mhw@wrtc2018.de

remarks such as those of Bud, AA3B, "To be competitive." Or Ingo, SM5AJV, "To have our best competition position ever.", also show clear sporting ambitions.

Asked about who was expected to be on the podium, the reigning World Champions N6MJ / KL9A were mentioned several times. Several answers favored the medalists of the previous two World Championships. There were also calls such as "It's time for the German team!" Or "EU teams" from the participants. It's going to be exciting.

The expectations of the German organizers were pretty much the same. K5WA writes: "TNX a lot for all you are doing to make WRTC 2018 a success. You have my respect! ". With this motivation, the organizing team and the many volunteers will continue to work hard for the next 256 days, so that on July 16, 2018, we can select the next World Radiosport Champion.

NCCC Life Membership

NCCC Life Membership is available for a one-off payment of \$250.00

If you would like to apply for life membership, please submit your request using this link [here](#)

Each request will be reviewed by the NCCC BOD at the regular monthly BOD meeting.

For further information, contact Ian W6TCP

Point Generator Profile

By Bob, W1RH

You all remember Fred, KH7Y, right? I'm sure all of you have that call sign in your log. With nearly 11 million points in the 2013 ARRL 10 meter contest, I'm sure that call is in at least 2,143 logs! There are plenty of other big scores from KH7Y, either made from his station or at KH6LC.

Well, meet Fred, K6IJ, formerly KH7Y. Fred has moved the family back to Pine Grove, in Amador County. The tower and antennas have been growing (with more to come) and Fred is now back in the contesting business. More importantly, Fred's scores can again go to NCCC (and MLDXCC when appropriate)!

We're glad to have you back, Fred!

Name/Call Sign: Fred Honnold, K6IJ

Past calls: W6YKM, W6YM, 3C7Y, KH7Y

Location: PINE GROVE, AMADOR COUNTY

How much property do you have? ABOUT 1.5 AC.

Describe your antenna system: 50 FOOT ROHN 55 WITH 24 FOOT MAST

Current: .M2 8 ELEMENT LPA, 2X7 ELEMENTS ON SIX METERS, ¼ WAVE VERT ON 80, INVERTED L ON 160 M

Future: ON THE GROUND 4 ELEMENT STEPPIR, 4 ELEMENT 20 M

What's in your shack? 2X K-3 UPGRADED TO "S" FT5K, TS-990S .

What are your previous QTH's? OCEAN VIEW, BIG ISLAND OF HAWAII

If you're working, what is your career? If not, what was your career? CORPORATE ENGINEERING MANAGE FOR KING BROADCASTING CO. MANAGER VOLCANO TELEPHONE CO.

ALSO AIRPORT MANAGER AMADOR COUNTY AIRPORT AND COMMERCIAL PILOT.

Married? Kids? Grandkids? MARRIED TO SANDY (55 YEARS) 3 ADULT CHILDREN

How many DXCC entities have you worked? ABT 329

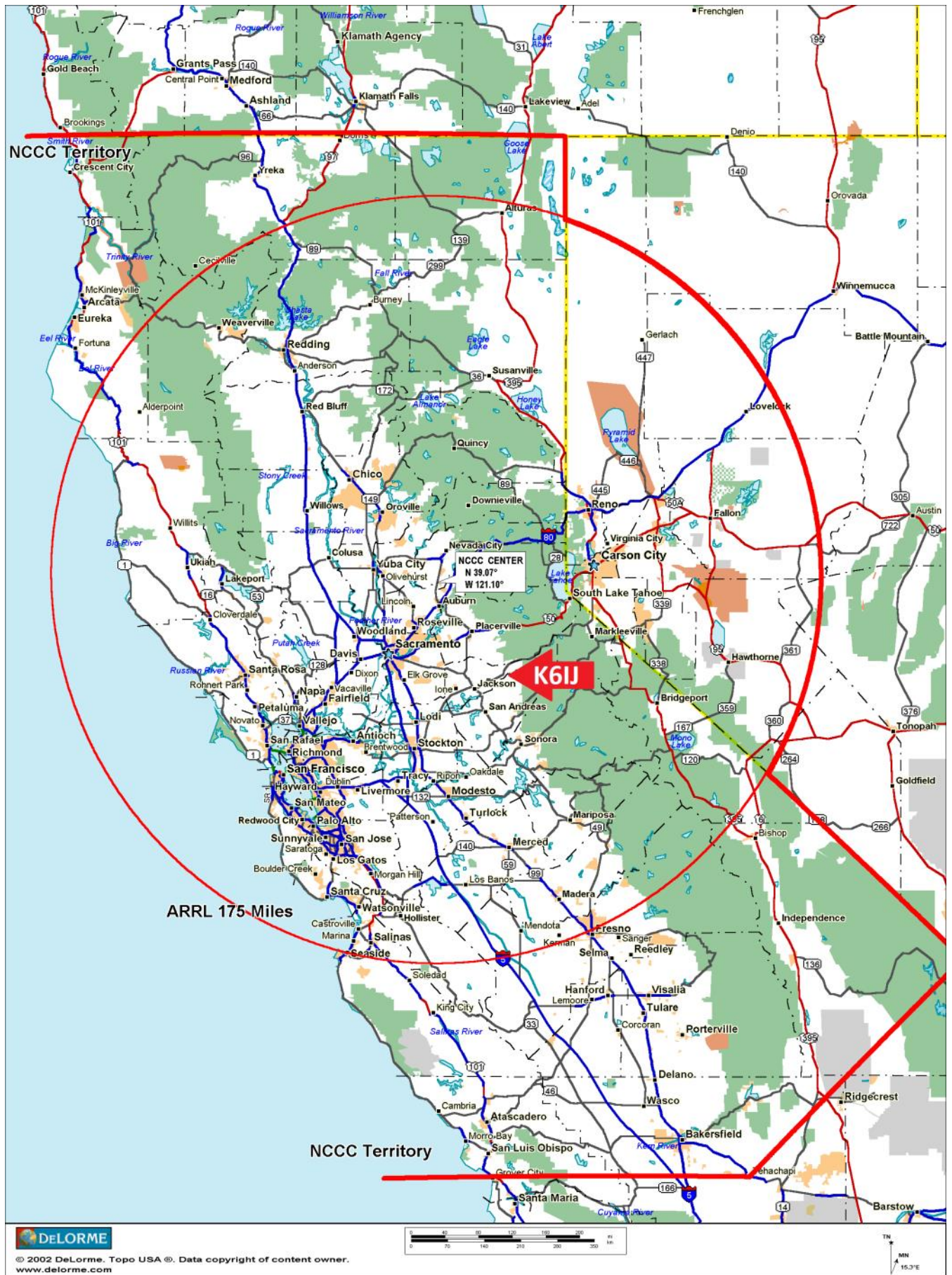
What's your favorite contest? ARRL TEN METER CONTEST

Any tips for contesters? HAVE FUN, JUST FUN

Any other hobbies besides ham radio? We like to RV and spend time at Silver Lake, Grandkids.







NCCC November Meeting

The November meeting of the NCCC took place on November 14th at Tied House, Mountain View

In attendance was 37 members/guests :

Denny AE6C, Andy AE6Y, Bill AI6JZ, Ed, AJ6V, Tom, K6EU, Don K6GHA, George K6GT, John K6MM, Bob, K6XX, Jim K9YC,. Jerry KD6WKY, Gordon KM6I, Tom N3ZZ, Ric N6AJS, Dean N6DE, Dave N6NZ, Bob N6TV, Chris N6WM, Rick N6XI, Tom ND2T, Mike NH7M, Gary NI6T, Tom NS6T, Tom NW6P, Ed W0YK, Tom W2SC, Scott W6CT, Glen W6GJB, Dave W6NL, Rusty W6OAT, W6SC Jim, Ian W6TCP, Ken W6XB, Bill W9KKN, Matt WX5S, Bruce N6TU, John W6LD



Program:
Contesting Take-Aways
from Aruba - Ed W0YK



Contesting ~ Christmas Style

from the Internet – AA6DX

Twas the night before World Wide, when all through the shack; Not a rotor was turning, not even the stack;
The finals were warmed in their chimneys so clear, In hopes that DXpeditions soon would appear;
The guest ops were nestled all snug in their beds, While visions of morning runs danced in their heads;
And mamma in her 'headphones, and I in my cap, Had just settled down for a last minute nap,
When out on the lawn there arose such a clatter, I sprang from the bed to see what was the matter.
Away to the window I flew like a flash, Tore open the shutters and threw up the sash.
The moon on the piles of unraked leaves below, Gave rise to the guilt of yard tools still stowed.
When, what to my wondering eyes should appear, But a full-on mobile, all bris'ling with gear.
With a little old guest op, so lively and free, I knew in a moment it must be 'DG.
A wink of his eye and a twist of his head, Soon gave me to know I had nothing to dread;
He was chubby and plump, a right jolly old Op, And I laughed when I saw him, I just couldn't stop;
More rapid than eagles his QSOs they came, And he whistled, and shouted, and called them by name;
"Now, G3! now, DL! go P4 and VE! On, VK! next ZL! now, ZK and TT!
To the top of the Section! to the top of the Zone! Now dash away, records, top them, alone!"
As QRM that before the high speed run splatter, He lost not a moment to deal with the matter,
And using his mouse to zero beat the zoo, 'Get off my freq AR, I know that it's you'!
He spoke not a word, but went straight to his work, And filled up the log; then moved for a jerk.
And laying his finger aside of his Bose, And giving a nod, up the standings he rose.
He copied the QSOs, some strong and some light, And worked them all quickly, late into the night.
With uncanny speed the log he did fill, I knew after checking his UBN would be nil!
He sprang to his mobile, to his mic gave a whistle, And away QSY'd with the speed of a missile.
But I heard him exclaim, 'ere he drove like a nut, Happy WorldWide to all, and to all, a 'KICK BUTT' !!

CQ WW CW @ N6RO



Another big M/M operation in CQ WW CW at N6RO. Operators were: AI6JZ K3EST N6BV N6RO N6WM NA6O WA6O WX5S.

Gary NA6O

TUBE OF THE MONTH

Visit the museum at N6JV.com

Norm N6JV

GS-35B (ГC35Б)

The cost of new tubes available for amateur radio applications has gone through the roof. The 8877 even when a commercial pull, will run about \$300. A new one is the house payment. When the Soviet Union fell apart, different tubes began appearing for sale. The Eastern Europeans were quick to establish marketing for these tubes. The cost was relatively low and new commercially made amplifiers for hams were produced. The favorite is the GS-35B. It is large, heavy (6 lbs), powerful, rugged and cheap. The tube was intended for UHF applications up to 1000 MHz and its specifications reflect that use. As a ham amplifier tube, the ratings can be pushed. The published dissipation of a GS-35B is 1500 watts, but 2500 watts is considered appropriate. The conservative maximum anode voltage of 3000 volts can easily be pushed to 4000 volts and although it is common to push them to 4300 volts, explosions have been common at the higher voltages. The large copper anode radiator may be removed and replaced by a water jacket.

In operation, the GS-35B will put out 1500 watts on 6 meters with less than 100 watts drive. Sockets are available, but the cost is twice the cost of the tube itself. It's easier to just cut a hole in the chassis and bolt it down on its grid ring.

<http://home.comcast.net/~n6jv/gs35b.html>

TUBE OF THE MONTH

Visit the museum at N6JV.com

Norm N6JV

GS35



NCCC Life Membership!

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

CQP T-Shirts

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

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 !

Worked All California Counties Certificate #61 - W8KNO

Please welcome Joseph Wehner, W8KNO, in Hiram OH as the latest to qualify for Worked All California Counties #61. Joe qualified with all QSO's from CQP, and all on Phone

73,

Fred ("Skip") K6DGW



Contest Calendar— December page 1

NCCC RTTY Sprint	0145Z-0215Z, Dec 1
QRP Fox Hunt	0200Z-0330Z, Dec 1
NCCC Sprint	0230Z-0300Z, Dec 1
ARRL 160-Meter Contest	2200Z, Dec 1 to 1600Z, Dec 3
Wake-Up!QRP Sprint	0600Z-0629Z, Dec 2 and 0630Z-0659Z, Dec 2 and 0700Z-0729Z, Dec 2 and 0730Z-0800Z, Dec 2
TOPS Activity Contest	1600Z, Dec 2 to 1559Z, Dec 3
EPC Ukraine DX Contest	2000Z, Dec 2 to 1959Z, Dec 3
Ten-Meter RTTY Contest	0000Z-2400Z, Dec 3
SARL Digital Contest	1300Z-1600Z, Dec 3
ARS Spartan Sprint	0200Z-0400Z, Dec 5
QRP Fox Hunt	0200Z-0330Z, Dec 6
Phone Fray	0230Z-0300Z, Dec 6
CWops Mini-CWT Test	1300Z-1400Z, Dec 6 and 1900Z-2000Z, Dec 6 and 0300Z-0400Z, Dec 7
QRP ARCI Topband Sprint	0000Z-0600Z, Dec 7
NRAU 10m Activity Contest	1800Z-1900Z, Dec 7 (CW) and 1900Z-2000Z, Dec 7 (SSB) and 2000Z-2100Z, Dec 7 (FM) and 2100Z-2200Z, Dec 7 (Dig)
NCCC RTTY Sprint	0145Z-0215Z, Dec 8
QRP Fox Hunt	0200Z-0330Z, Dec 8



Contest Calendar— December page 2

NCCC Sprint	0230Z-0300Z, Dec 8
ARRL 10-Meter Contest	0000Z, Dec 9 to 2400Z, Dec 10
SKCC Weekend Sprintathon	1200Z, Dec 9 to 2400Z, Dec 10
International Naval Contest	1600Z, Dec 9 to 1559Z, Dec 10
AWA Bruce Kelley 1929 QSO Party	2300Z, Dec 9 to 2300Z, Dec 10 and 2300Z, Dec 16 to 2300Z, Dec 17
QRP ARCI Holiday Spirits Homebrew Sprint	2000Z-2359Z, Dec 10
CQC Great Colorado Snowshoe Run	2100Z-2259Z, Dec 10
4 States QRP Group Second Sunday Sprint	0100Z-0300Z, Dec 11
NAQCC CW Sprint	0130Z-0330Z, Dec 13
QRP Fox Hunt	0200Z-0330Z, Dec 13
Phone Fray	0230Z-0300Z, Dec 13
CWops Mini-CWT Test	1300Z-1400Z, Dec 13 and 1900Z-2000Z, Dec 13 and 0300Z-0400Z, Dec 14
NCCC RTTY Sprint	0145Z-0215Z, Dec 15
QRP Fox Hunt	0200Z-0330Z, Dec 15
NCCC Sprint	0230Z-0300Z, Dec 15
UN DIGI Contest	1400Z-1559Z, Dec 15 and 1600Z-1759Z, Dec 15
AGB-Party Contest	1600Z-1700Z, Dec 15
Russian 160-Meter Contest	2000Z-2400Z, Dec 15
OK DX RTTY Contest	0000Z-2400Z, Dec 16
Feld Hell Sprint	0000Z-2359Z, Dec 16
Padang DX Contest	1200Z, Dec 16 to 1159Z, Dec 17



Contest Calendar— December page 3

Croatian CW Contest	1400Z, Dec 16 to 1400Z, Dec 17
ARRL Rookie Roundup, CW	1800Z-2359Z, Dec 17
Run for the Bacon QRP Contest	0200Z-0400Z, Dec 18
QRP Fox Hunt	0200Z-0330Z, Dec 20
Phone Fray	0230Z-0300Z, Dec 20
CWops Mini-CWT Test	1300Z-1400Z, Dec 20 and 1900Z-2000Z, Dec 20 and 0300Z-0400Z, Dec 21
NAQCC CW Sprint	0130Z-0330Z, Dec 21
NCCC RTTY Sprint	0145Z-0215Z, Dec 22
QRP Fox Hunt	0200Z-0330Z, Dec 22
NCCC Sprint	0230Z-0300Z, Dec 22
RAEM Contest	0000Z-1159Z, Dec 24
DARC Christmas Contest	0830Z-1059Z, Dec 26
SKCC Sprint	0000Z-0200Z, Dec 27
QRP Fox Hunt	0200Z-0330Z, Dec 27
Phone Fray	0230Z-0300Z, Dec 27
CWops Mini-CWT Test	1300Z-1400Z, Dec 27 and 1900Z-2000Z, Dec 27 and 0300Z-0400Z, Dec 28
NCCC RTTY Sprint	0145Z-0215Z, Dec 29
QRP Fox Hunt	0200Z-0330Z, Dec 29
NCCC Sprint	0230Z-0300Z, Dec 29
RAC Winter Contest	0000Z-2359Z, Dec 30
Stew Perry Topband Challenge	1500Z, Dec 30 to 1500Z, Dec 31
Original QRP Contest	1500Z, Dec 30 to 1500Z, Dec 31
Bogor Old and New Contest	1200Z-2359Z, Dec 31



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!

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 !

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.



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NCCCKB



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14 STORE BUYING POWER!

ICOM



IC-7600 | All Mode Transceiver

- 100W HF/6m Transceiver, gen cov. receiver • Dual DSP 32 bit • Three roofing filters- 3, 6, 15kHz • 5.8 in WQVGA TFT display • Hi-res real time spectrum scope



IC-7200 | HF Transceiver

- 160-10M • 100W • Simple & tough with IF DSP • AGC Loop Management • Digital IF Filter • Digital Twin PBT • Digital Noise Reduction • Digital Noise Blanker • USB Port for PC Control



IC-7100 | All Mode Transceiver

- HF/50/144/430/440 MHz Multi-band, Multi-mode, IF DSP • D-STAR DV Mode (Digital Voice + Data) • Intuitive Touch Screen Interface • Built-in RTTY Functions



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

- Analog FM/D-Star DV Mode • SD Card Slot for Voice & Data Storage • 50W Output on VHF/UHF Bands • Integrated GPS Receiver • AM Airband Dualwatch • FM Analog/DV Repeater List Function

ID-51A | VHF/UHF Dual Band Transceiver

- 5/2.5/1.0/0.5/0.1W Output • RX: 0.52-1.71, 88-174, 380-479 MHz** • AM/FM/FM-N/WFM/DV • 1304 Alphanumeric Memory Chls • Integrated GPS • D-STAR Repeater Directory • IPX7 Submersible



TH-F6A | 2M/220/440

- Dual channel receive • .1 - 1300 MHz (cell blocked) RX • FM, AM, SSB • 5W 2M/220/440 TX, FM • 435 Memories • Li-Ion Battery

KENWOOD



TS-590SG | HF/50MHz Transceiver

- Equipped with 500 Hz/2.7 kHz roofing filter as standard • ALC derived from TS-990S eliminating spike issues • Antenna output function (shared with DRV connector) • CW - morse code decoder function



TM-D710G | 2M/440 Dualband

- V+V/V+U/U+U operation • Built-in GPS • Built-in TNC for APRS & DX-Cluster operation • 50W 2M & UHF • 1,000 memories • Dual receive • Green or amber backlight colors • Latest APRS firmware w/new features • Sky Command II remote functions



TM-V71A | 2M/440 Dualband

- High RF output (50W) • Multiple Scan • Dual receive on same band (VxV, UxU) • Echolink® memory (auto dialer) • Echolink® Sysop mode for node terminal ops • Invertible front panel • Choice of green/amber for LCD panel • 104 code digital code squelch



TM-281A | 2 Mtr Mobile

- 65 Watt • 200 Memories • CTCSS/DCS • Mil-Std specs • Hi-quality audio



FT-60R | 2M/440 5W HT

- Wide receiver coverage • AM air band receive • 1000 memory channels w/alpha labels • Huge LCD display • Rugged die-cast, water resistant case • NOAA severe weather alert with alert scan

YAESU
The radio



FT-991 | HF/50MHz/2M/440 Transceiver

- 160 M-440MHz - SSB/CW/FM/C4FM Digital/AM/RTTY/PSK • 100 W (2M/440: 50 Watts) • 3.5" TFT full-color touch panel operation • High speed spectrum scope • Roofing filters: 3kHz & 15kHz • 32-bit high speed floating point IF DSP



FTDX1200 | 100W HF + 6M Transceiver

- Triple Conversion Receiver With 32-bit Floating Point DSP • 40 MHz 1st IF with selectable 3 kHz, 6kHz & 15 kHz Roofing Filters • Optional FFT-1 Supports AF-FFT Scope, RTTY/PSK31 Encode/Decode, CW Decode/Auto Zero-In • Full Color 4.3" TFT Display



FT-450D | A100W HF + 6M Transceiver

- 100W HF/6M • Auto tuner built-in • DSP built-in • 500 memories • DNR, IF Notch, IF Shift



FTM-400DR | 2M/440 Mobile

- Color display-green, blue, orange, purple, gray • GPS/APRS • Packet 1200/9600 bd ready • Spectrum scope • Bluetooth • MicroSD slot • 500 memory per band



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

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PHOENIX, AZ
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PLANO, TX
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Contact HRO for promotion details. Toll-free including Hawaii, Alaska and Canada. Call will be routed to the nearest store. All HRO 800-lines can assist you. If the first line you call is busy, you may call another. AZ, CA, CO, GA, VA residents add sales tax. Prices, specifications and descriptions subject to change without notice.

