



#643 Feb 2026



Publication of the  
Northern California  
Contest Club



55 Years of Contesting  
Excellence

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**NCCC MEETING**  
<https://nccc.cc/meetings.html>

**ZOOM**  
**Tue 10 Feb 1830 PST**  
Gary Johnson, NA6O  
"Building Ham Radio Projects"

(See description in this issue)

**President's Report**

**David West, KO6M**

**AI in contesting Part 2.**



I was afraid my thoughts would ramble into "Chapter 2," so to speak. Last month I talked about some of the possibilities. I had hoped to use this month to talk about personal achievements and what I had done "successfully" in terms of AI and my contesting. I'll start by saying, I spent hours and hours on a CW app.

If you count it in AI Credits, I spent about 500 credits. For those unfamiliar, a credit is the way the AI measures its work. You can use them when you ask it anything from a simple question to an advanced question. A simple question costs less than an advanced question, and many times you get charged by the .01 credit. In terms of good old dollars, I would have spent about \$10 finding out that my AI bot and I made a program that didn't really do much. Luckily, the plan I "used" allowed this adventure to be free. Now granted, I use AI for work, so I have plans with various companies, and I know enough to make my AI work semi-usefully. Had I started from scratch, it would have been more costly.

**Things I found out:**

Remember I thought AI would do a few things well: Copy calls and exchanges, run stations with consistent speed, figure out dupes, optimize a Run vs S&P plan. Well, my current program copied calls and



exchanges decently (if there was no noise or a pileup). It never got to dupes because I never let it actually work that far into a contest. Lastly, it did handle dupes, so there is that. It's not ready for prime time and it sure isn't ready for being a manned semi-autonomous thing. What I learned: AI when used as a Contest Bot, takes the fun out of it. Sure, I had thought to myself, "Self, if I could win, then I won. We won, my bot and I." To what end? Did I actually win a contest or was it my bot? There was no fun, no challenge.

It was great as a tinkerer project. It was fun to see what could be done, where I could make improvements, and what limits I could push. However, it took the fun out of it. It didn't have the same fun that even FT8 has in a contest. I mean no disrespect to FT8 here. However, it didn't even have the "I know there is someone on the other end of the radio wave" feel to it. Coincidentally, there was a CW Bot Battle competition last month. It drew my eye, but due to a football tournament, I couldn't try it or even pay attention to it. At the time of writing this article, the event was just barely over. I plan on reaching out to the organizers in the coming month for feedback.

That's enough about AI. It's February, and we will be announcing the Awards luncheon soon. I hope to see many of you there. Along with the awards, we also have our election. Please consider being a part of the Board even if you have been a member of it before. The rules just say that you can't be an official more than 3 years in a row; they don't say you can't be involved in the Board again. As you all know, we've had a tough year with things because of vacancies. I hope that you will step up. If you are still wondering what the roles are, Jeff, WK6I, and the rest of the Board put together a list of duties per role. We are happy to have it in this publication, and we will have it on the website shortly. Please feel free to reach out with any questions.

Thank you and KB!  
Dave, KO6M

## Errata

The JUG Staff struggles to get everything right ... sometimes that effort fails and it did in NA6O's article on antenna feedpoint matching networks and enclosures in the Jan 2025 issue of the JUG. Fig 7, which should have been a photograph of the 160 meter network and enclosure was actually a duplicate of Fig 10. The correct Fig 7 photo is:





## Upcoming State/Province QSO Parties

Thanks to WA7BNM

<https://contestcalendar.com/stateparties.php>

State/Province	Dates/Times
Vermont	7 Feb 0000Z to 8 Feb 2400Z
Minnesota	7 Feb 1400Z to 2400Z
British Columbia	7 Feb 1600Z to 8 Feb 0359Z 8 Feb 1600Z to 2400Z
So. Carolina	28 Feb 1500Z to 1 Mar 0200Z
No. Carolina	1 Mar 1500Z to 2 Mar 0100Z

## Larger Contests on the Horizon

NA Sprint – CW	8 Feb 0000Z to 0400Z
ARRL International DX	21 Feb 0000Z to 22 Feb 2400Z
CQ 160 – SSB	27 Feb 2200 to 1 Mar 2200Z
NAQP RTTY	28 Feb 1800Z to 1 Mar 0600Z
ARRL DX - SSB	7 Mar 0000Z to 8 Mar 2400Z

## Weekly CW (1 hr) Events

ID	DAY	UTC	EXCH	WPM	SPONSOR
SST	Fri	2000 - 2100	Name+SPC	<20	K1USN
	Mon	0000 - 0100			
MST	Mon	1300 - 1400	Name+QSO#	20-25	ICWC
	Mon	1900 - 2000			
	Tue	0300 - 0400			
CWT	Wed	1300 - 1400	Name+CWO# or Name+SPC	20->∞	CWops
	Wed	1900 - 2000			
	Thu	0300 - 0400			
	Thu	0700 - 0800			



## Thursday FT4 NCCC Sprint

The Northern California Club is again pleased to sponsor our weekly FT4 Sprint, aka FT4NS (NCCC Sprint). This contest is held every Friday UTC between 0100Z and 0130Z (Thursday evening in North America). Non-North American stations are welcome to participate. No logs are necessary; please submit your score to [3830scores.com](http://3830scores.com) using the "NCCC FT4 Sprint" template. FT4 NS Sprint Rules are posted at: <https://www.ncccsprint.com/ns.html> See you on the screen! Frequencies: 1839, 3575, 7047.5 (also 7080), 14080, 21140, 28180, 50318.

## February Meeting Presentation

*Gary Johnson, NA6O*

“This talk is adapted from one that I give to the new hams in a UC Berkeley course “Fun With Ham Radio” taught by our very own Prof. Michael, NT6V. It covers general fabrication tools and techniques, and this version also includes antenna feedpoint boxes.”



## Club Officer and Board Members Duties

*With elections for the new 2026-2027 club year approaching in April, the officers and directors reviewed, updated, and organized the duties of each position into the following list.*

### Board Members:

- An NCCC Board member is expected to attend the monthly Board meetings, which are usually conducted over Zoom, currently on the first Tuesday of each month at 7 PM local time.
- Participate in discussions of policy matters affecting the NCCC as a whole, including:
  - what contests to focus on,
  - whom we should invite to give presentations,
  - the subject matter of these presentations,
  - whom we should nominate for the Contest Hall of Fame,
  - what awards we should give out,
  - where we should have in-person meetings,
  - And so on.
- Stay in touch with the membership by monitoring and participating on the NCCC [groups.io](https://groups.io) reflector and Slack, to try to understand the needs and desires of our members, how to help them grow their stations and grow as contesters, and provide an infrastructure to accomplish these goals.
- Work on making all of our members feel appreciated and a part of the club.
- Promote and participate in the "helping each other" program that we made the baby steps to build with Slack after the survey, and the mentoring we can provide both at the big stations and one-on-one are very important parts of pulling this off.
- Attend the monthly general membership meetings.
- Be active in amateur radio contests, especially designated Focus contests and KB contests.
- Provide ideas, perspective, and wisdom; support officers.
- One extra meeting a year to help choose the award recipients.

### President

- Plan date/time/location of monthly meetings (with help from secretary and the Board).
- Plan the program for each meeting (find speakers, with help from the Board).
- Act as MC for the meetings.
- Attend one zoom Board meeting a month.
- Coordinate with other clubs for joint meetings.
- Coordinate with other organizations for special events and interests.
- Monthly Jug article.



- Welcome New Members and coordinate their introduction and initiation with Secretary
- Groups IO moderation support
- Memberplanet moderation support
- Support special events.
- Support CQP Chairman
- Support all other Board roles as needed. (backup if needed)
- Time required: a few hours a week.

### **Vice President/Contest Chair**

- Support the president.
- Determine club contest strategy/emphasis, focus contests, etc.
- Serve as cheer-leader/motivator.
- Monthly Jug article
- Attend one zoom Board meeting a month.
- Time required: a few hours a week.

### **Secretary**

- Arrange board meetings, take notes (can use AI)
- Publish recorded club meetings to YouTube.
- Help the President with arranging meetings.
- Attend one zoom Board meeting a month.
- Time required: a few hours a week.

### **Treasurer**

- Manage budget.
- Collect dues via Member Planet.
- Collect fees for in-person meetings where food is pre-ordered.
- Attend one zoom Board meeting a month.
- Time required: a few hours a week.
- Manage the club bank account, Paypal account and the investment (currently the last is outsourced to another club member)
- Propose and maintain annual club expense plan. The board of directors will make the decision and adjustment and approve it.
- Monthly finance report (how much money we left, where we spend/collect money)
- Plaques sponsorship (pay the bills)
- Badge ordering



- ARRL annual insurance
- Support special event/activities
- CQP sponsorship
- Collecting money, Like membership dues (majority is done automatically, but need keep an eye on some special cases)
- Annual Tax exemption paperwork (it is pretty straight forward and mainly just follow the previous year template)
- Job requirement
  - No Financial background necessary
  - Excel experience is a plus, as the current club treasurer uses it for club business.
  - Not afraid of learning new things (and asking for help). The first time to file an non-profit tax annual exception can be challenge at beginning (but it is quite easy at end, and rewarding)
- Club treasurer is an interesting position, as it foresees the club money flow. Right now, the club has around \$20K in balance sheet.
- It gives you an insight view on how a 501.c.3 non-profit organization works from a finance view point, and work with other officers (President, VP and Club Admin) as well as Board of directors on all the club decision making.

### **Past President**

- Smooth transition to new president.
- Support new president in coming up to speed.
- Otherwise , same as other board member.



## The N6RO Vertical Dipole Array (VDA)

Gary Johnson, NA6O



A contesting method that has rarely been attempted at N6RO is **in-band operation**. The idea is to have one operator running (calling CQ) with another doing search and pounce, looking for multipliers, with both on the same band. Interlocking of the radios is required to avoid blowing up a receiver, and very close cooperation between operators is required at all times. The antenna side of the equation is also important. In order to listen while another transmitter is active within your band, **isolation** is highly desirable. Geometry is our friend in this case. First, you place the antennas for the two radios as far apart as possible. Luckily, we have 10 acres to work with. Second, you use antennas with different polarization. In a perfect world (most likely in outer space!), that alone would give you complete isolation.

Since our main antennas are stacked Yagis with horizontal polarization, we decided to put up a **vertical dipole array (VDA)** on 15m. The VDA is a clever design (see this article) with four vertical dipoles arranged in a square. One element is driven. The other three are left disconnected, but fed by a piece of coax with a very critical length. That open-circuit coax reflects a particular impedance at the feedpoint of its dipole, effectively lengthening the dipole a bit. The result is that those three elements act as reflectors. With a few relays, the array can be steered in four directions. Its overall gain is similar to a two-element Yagi, but with vertical polarization of course. Our installation was designed by NA6O and uses straight vertical elements to almost entirely eliminate any horizontal component.



On January 20, 2026, we put together a crew consisting of NA6O, K6KM, W6WZZ, and AA6MU on a cold overcast day, thankfully with no wind. Installation went well. We did have to trim the elements a few inches to center the SWR in the middle of the 15m band. The whole thing is supported by a wooden post and three guy ropes. It should have no problem with our mild winds. The grapevines could be a problem though: They tend to grab onto anything nearby. We did have one vineyard-related issue, related to the steel wires that support the vines. They ran very close to our elements and shifted our resonance down by 200 kHz. So we replaced those with ropes. Hopefully the vineyard maintenance guys won't mind too much. They certainly put up with a lot of strange wires and poles as it is!

All that's left is to run a very long piece of coax out to the VDA. Then we'll find out how this thing plays.

[Ed. Note: For those who have never visited N6RO, the antenna field is located in a working vineyard. While likely not operating during the winter months, it had a gas cannon a few years ago that, when the grapes are getting tasty for the birds, goes off with a very loud boom at periodic and unexpected intervals]



**Tube of the Month**  
**Norm Wilson, N6JV**  
Visit the Tube Museum at [n6jv.com](http://n6jv.com)

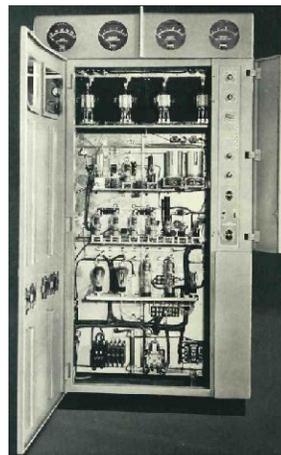
**WE-357A/B**



Western Electric was one of the first makers of vacuum tubes. After World War I, surplus tubes were made available to the public and commercial users. Western Electric also became a manufacturer of tubes for their own products including broadcast transmitters. In 1928, new Western Electric 500-watt transmitters were installed in my area at KMJ and KFBK. I have 212D tubes from the finals of these transmitters. A new tube was introduced in 1939 designed for general use in broadcasting. The [357A](#) is a 350-watt dissipation triode designed for operation at full power up to 100 MHz and up to 150 MHz at reduced power. Filament power is 10 volts at 10 amps and the plate rating is 4000 volts at 500 ma maximum. Class C output was a maximum of 1250 watts. In 1941, the plate coating was changed to Zirconium resulting in a plate dissipation of 400 watts. The new tube was the 357B.

The tube was designed to have the minimum internal length of electrodes. The internal connections were all very thick to allow the tube to be used at high frequency and dissipate heat. The tube has no internal insulators which also improves operation at high frequency. A special 3 pin socket was made just for this type,

The 357A was used in the Western Electric AM transmitters 430B1 (100 watts) up to the 443A1 (1000 watts) that used 4 of these tubes and is shown in this article. The 357A/B was also used in FM transmitters as drivers in the 50 KW transmitters. Continental Electronics incorporated these tubes as drivers in their famous 105 transmitter that had an output of 1,000,000 watts.





## “It's Not Over When The Last Flame Dies”

### K6XX Station Rebuild, 2020-2025

Bob Wolbert, K6XX

*(Part 1 of this saga appeared in the Sep 2020 issue of the JUG right after the flames had gone out. Part 2 appeared in the Jan 2026 issue and described the long, winding road through governmental bureaucracy to re-build the home and get back on the air. This final Part 3 presents Bob's design for his new shack)*



## Part 3 – Rebuilding the Station

### Radio Station Design



**Wide angle view of the operating desk**

By mid October 2024 the rebuilt house was approved for occupancy and new shack construction began. The shack was conceived as a four seat multi/multi, normally configured as two SO2R stations. Each station may access any unused antenna.

The Shed station generated better-than-expected results with it's modest hardware so it was converted into a remote station. The present state-of-the-art for remote station operation suffers from delays as audio fills the sound card buffers—even on a LAN without internet routing delays and jitter. These delays are incompatible with high rate CW contesting. Instead of operating the

Shed as a regular remote, the Shed amplifier is driven from a radio in the shack, controlled via Ethernet plus a hardwired PTT line. All of the proven Shed antennas are thereby available to the shack. The big hurdle is coax loss inherent in the very long run between shack and Shed. That problem is addressed (below).



## Shack Construction

The new shack transformed bare studs to a relatively homey, comfortable suite over the past 15 months, featuring a “lounge”, a workshop, and the operating room itself. The shack is 13’ x 15’, with a C-shaped operating bench with much of its length pulled 18” away from the walls for accessing connectors. A dedicated subpanel provides ample 240 and 120 VAC. Two aluminum ground windows allow for many more coax runs than should ever be necessary. A 12 x 4 coax relay matrix distributes antennas to the four radios, which are anticipated as two SO2R stations, but may be quickly reconfigured into four separate seats.



*Left side of operating desk*



*Right side of operating desk*

The shack has a northern exposure and its windows are tiny, leaving it a bit dark inside, but multiple ceiling lights remedy that. It is unheated. We will see if this is a major problem this winter. While the shack still needs trim and doors, all operations transferred here during the August 2025 NAQP.

The desire for abundant wall space for awards conflicted with an infatuation for monitors displaying the gray line, packet cluster, and NodeRed status updates (showing remote amplifier status, rotator bearings, etc.). Those monitors alternatively display slide shows of appropriate (or otherwise) photos. Four flat screen TVs display useful information while dispelling much of the darkness inherent with the new shack’s siting. One TV is driven by a

tiny PC running *Simon’s World Map*, a flexible GeoChron replacement ([www.sdr-radio.com/world-map](http://www.sdr-radio.com/world-map)). The TVs cover two walls, allowing awards on the others. The bare white walls motivate bigger efforts—especially until they are covered.

## Station Design Details

Multiple AC power outlets, both 120V and 240V are installed along the rear of the benchtop. Multiple circuits are wired so a fault at one station won’t necessarily shut down the others.

Under-desk keyboard shelves are used at each position, but the dim new shack is problematic because the new keyboards are the same color—black—and keys thereby indistinct. A 25” strip of LEDs stuck underneath the benchtop illuminate this issue. The LEDs are too bright when driven from the shack’s 13.6V power supply so a series resistor throttles them back appropriately.



The same week that the solar-electric system was installed, the WWVB clocks all stopped synchronizing (why does it affect the receivers at night?). This presented a new problem: what will provide the official station time? Sure, the internet provides decent time accuracy, but something reliable and completely independent is required. A GPS clock made by Geppetto Electronics of Santa Clara does a fantastic job, exceeding my accuracy requirements by orders of magnitude ( <https://hackaday.io/project/18501-gps-clock> ). This is mounted inside a wall. While the stock LEDs seemed small, they are readable from the operating chair.

Four stations with four amplifiers will eventually connect to an antenna switching relay matrix. As mentioned previously, one of the transceivers may select the Shed amplifier via a long coax cable. The additional attenuation of this long cable—even though it is LMR600, its loss reaches 3 dB at 10m—creates another complexity: transmitter drive power must be doubled when switching between the local and the Shed amp. Otherwise the Shed surrenders half of its strength—obviously unacceptable. There are two straightforward solutions: insert an attenuator in-line with the local amp input or increase the drive when switching to the Shed’s. The input attenuator must be frequency selective, providing 3dB of loss at 10m but nearly none at 80m. Such a circuit could be installed inside the local amps, but that would mean the amps are no longer interchangeable. An external attenuator box would work, but I’d want to switch it out when receiving, resulting in even more complexity.



**Station Controller – 1 of 4**

If power control was chosen, the loss variation doesn’t really matter, since different power outputs could be commanded using the same mechanism. Better, gain differences between different amplifiers may be accommodated. This was implemented: different power tables, by band. The same Master Controller that selects the antennas sends the rig appropriate drive power depending upon whether the local amplifier or the Shed amplifier is selected. Some readers will note that the K4/KPA1500 combination already has two power tables implemented, depending upon whether the amplifier is in Standby or Operate mode. Unfortunately there are delays when switching between these modes that makes this simple implementation untenable.

## Towers & Antennas

Topography here makes “towers by direction” preferred to the more standard “towers per band”. In other words, place the Europe-facing antennas where the downslope favors Eu, etc. New, more detailed slope data was generated via K6TU’s online service and HFTA determined the antenna height in an inverse Christmas tree—the lowest frequency antennas on top. Few of the replacement antennas moved much, but the updated HFTA evaluations were more comprehensive than the hand-derived ones from 2001 and showed heights where either multiband antennas would play well on each of their frequencies or additional spacing between monobanders was possible. Better, these simulations showed that five towers could equal the eight formerly required. This is helpful on multiple fronts, notwithstanding tower naming issues: my towers were named after my daughters/wife and I had more towers than girls. Now, with some strategic renaming, we are nearly aligned.

One way the reduced number of towers was achieved was by mounting antennas at 90 degrees to others on the same tower. For example, JA/East Asia and Europe are 90 degrees apart in azimuth. Europe and South



America/Caribbean are also 90 degrees apart, at least the way I measure. Slopes falling away from a given tower in directions 90 degrees apart are fortunately different enough that reasonable compromises may be made in mounting height, allowing sufficient separation between antennas. For example, with the different slopes, the two 15m antennas accept mounting at the different heights. Interestingly, I found undesirable coupling even between 90-degree oriented Yagis if they get too close (less than about 10' on 20m).

Phillystran guying was again chosen to minimize interactions. Every fire-related tower failure was caused by trees falling into the guys and pulling down the tower, rather than heat damage. Yes, steel EHS was installed at ground level, converting to Philly higher up. I'm confident in this technology, if not its economy. The 4000 pound stuff was a buck a foot in 2004, rising to \$1.50 five years ago, but it now sets us back \$2/ft. This represents a sizable chunk of change, but these guy lines should be invisible to RF and not disrupt patterns or gain.

While sorting through the complete antennas and assorted aluminum tubing that had been generously donated over the previous five years, new plans came together. Complete or nearly-complete antennas were rebuilt and hoisted into place. Need 20m monobanders? Build them from the tubing parts. Need a large tribander? Piece together parts from several TH6 and TH7 donor antennas (TU KW6S for spending days cleaning old traps). So far, not a single all-new antenna has been required, which is great given their unbelievable price increase.

One or two coax lines connect the towers to the shack, with SixPak-type switches at the tower base multiplexing the desired antenna remotely. Two runs to each tower provides decent flexibility with less clutter than the 50+ individual 75Ω cables employed by the previous K6XX II shack. Everything is now regular-ole 50Ω, so matching gymnastics are unnecessary. While relay-switching decisions now are far more complicated, they are handled by microcontrollers and the Station Master Controller.

## Operating

At each position, the rig automatically tells all of the hardware (logging PC, amplifier, antenna relays) its operating frequency and the desired beam direction is manually selected through a control box. Like the previous station, a rotary knob selects one of six directions important to contesting from NCal: South Pacific, JA/SEA, due North or Rotatable, Europe, North America, and South America/Caribbean. While the old station used a bundle of wires between the station box and the main antenna select relay box, and 74HC-family logic determined conflicts and drove relays, the new station uses serial data communicating with a Raspberry Pi which performs the same functions. The RPi need not be "programmed with a soldering iron", as with the previous system. Antenna configuration changes may be implemented in a few minutes, encouraging experimentation between various harebrained concepts, since reverting to the previous code is quick and reliable. This flexibility also means that in-band operation should be feasible as well as diversity reception using a secondary transmit (not just receive-only) antennas. My prohibition against requiring a PC was conceded for two reasons: the new rigs take approximately the same time to "boot", and the new antenna selection flexibility requires numerous quick decisions—especially when there is more than one station on the air. Crucially, we aren't talking about a windoze confuzer.

In use, the operator finds a frequency and selects a direction. The station control box sends this data to the Station Master Controller. The Controller checks which antennas the other stations are using and determines the correct, safe antenna for this band and direction and drives the appropriate relays. If a conflict exists, the Master Controller looks for an alternate antenna; if there isn't any, an alarm sounds and the antenna relays lock where they were. The alarm blares until a change is made to a safe configuration. When a direction change is made that involves the remote Shed, transceiver drive is saved and the Shed amplifier's drive power is loaded from memory.



Operating frequency is sent to the appropriate amplifier, which recalls any required ATU settings. Finally, the Master Controller broadcasts the selected choices to all of the station controllers. These locally display a great circle map with their station's bearing, show a line of text describing the antenna chosen, and updates the bands used by the other stations. If a non-primary antenna was called, the great circle display changes color as an additional indicator.

Computer logging is supported but is not required for any operation. When N1MM+ runs, it knows the rig frequency, independent from the amplifiers and Station Master Controller. N1MM Rotor control is implemented in parallel with NodeRed remote control to each of the four rotators.

### **Preliminary Results**

As the hub of activities, the new shack is more comfortable and closer to home; no long hikes up muddy trails to a little shed. The first operation from the new shack was in NAQP in August 2025—NAQP was the final contest entered from the former shack, days before the fire. Between September and CQWW CW 2025, more towers were raised on existing bases and several new Yagis were installed.

Since station “commissioning” in August, four big efforts and a handful of minor contests were entered, all in single operator category. The station achieved high score in CQP '25 and is high claimed score for Zone 3 in both modes of CQWW. Sweepstakes phone was entered in QRP mode, and it presently claims the top score in that category. Most recently was the ARRL 10m contest, where the new station holds top-claimed score for the west coast and second place nationally (behind by less than a percent—fingers crossed during log checking).

Continuing this string of new personal-bests requires improved station capability, both with antennas, controls, and operating technique. SO2R must return, and maybe even attempting the gluttonous 2BSIQ, although I find the concept of a single-op simultaneously occupying two run frequencies reprehensible. Another possibility is operating SO2R in-band, as the new station design accommodates this in both separation and switching logic.

As of this writing, a single K4 may access all antennas via either a local or the Shed amplifier. Remaining work includes adding the other three rigs, automatic bandpass filters, additional station control boxes, and the various other interfaces required when more transceivers are connected. Code is written on rainy days and evenings when antenna work is difficult. While not yet achieving the capability of its predecessor, K6XX III is getting there. Hopefully it won't take another five years!

### **Contributors**

This has been a very long journey and a nearly uncountable number of friends and acquaintances have appeared at a multitude of times in a multitude of ways with assistance and help along the way. I cannot recall every one of you, the number is way too large and is a testament to our ham community. Thank you all. In roughly chronological order:

N6XI, K6KR, K9YC, W6FB, K8JRK, W6TCP, NA6O, N6TA, K6MKF, KW6S, K6GHA, N3ZZ, K6LRN, K6XW, N6SJ, WA6O, N6CM, W6RN, K6GFJ, W6GJB, KG6AO, N6NUL, K6IF, K6VVA, K6HJU, N6CK, W6EB, KE1B, N6FBA, N6SJ, N1WC, WN6A, W6LD, K6MR & K6HNZ estates.

I apologize for forgetting a bunch, it's been a long grind.

Bob, K6XX



## Editor Notes

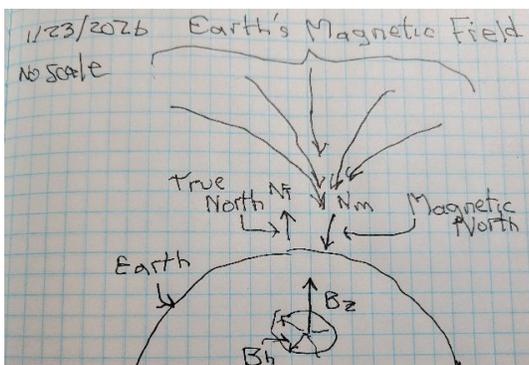
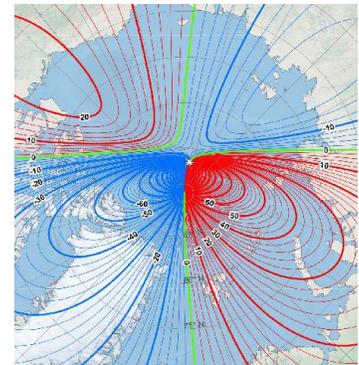


As an OG, I sometimes field a question or two from one of the NG's, about predicting HF propagation. I preface any answer with, "Never place a bet on what 15 meters will do tomorrow morning." Despite having over a dozen satellites, many lounging around at the Earth-Sun Lagrange points, feeding us terabyte doses of data about the Sun and it's antics, predicting tomorrow's propagation remains elusive. A correspondent recently inquired about the "Bz" found in most solar reports. Since the rest of this page would be whitespace:

## Secrets of Bz

The symbol "B" denotes magnetic flux density in the SI units of teslas. The very large magnet in an MRI machine may produce a flux density of around 2-3 teslas. the Earth's magnetic flux density near the poles ranges aroundin 40-50 microteslas [ $\mu\text{T}$ ], and the Interplanetary flux density near the Earth falls in the 10 to 100 nanotesla range [ $\text{nT}$ ]. The Sun essentially creates the Interplanetary magnetic field since it accounts for around 99.9% of the mass in the solar system and the incredible turmoil on the sun causes the interplanetary field to shift, twist, and knot up as it drives outward at multi-hundred kilometers/second, along with the charged particles in the solar wind.

The map at the right shows the Earth's current magnetic north pole which drifts about 50 km/year, currently headed for Siberia. But, it can speed up or slow down or turn around without notice. At the magnetic pole, the field lines point straight downward [diagram below left]. Both interplanetary and the Earth's fields interact and have a strong effect on the trajectories the charged particles in the solar wind will take.



We use an earth-based coordinate system for the interplanetary field. One axis, the infamous  $B_z$ , points outward from the magnetic pole. The other two axes don't affect the incoming solar wind much and the magnetic field density perpendicular to  $B_z$  is termed  $B_h$ . The total interplanetary density is  $B_t$

When  $B_z$  points north or outward, it deflects the solar wind particles out, away from our north pole, and the ionosphere stays somewhat less ionized and somewhat more stable. When  $B_z$  points south [i.e. in the same direction as the Earth's field lines] it literally funnels those solar wind particles into the ionosphere and creates major auroral events, more instability in propagation, but can also create those really great times when QRP can work the world on 10 meters. Find  $B_z$  at [solarham.com](http://solarham.com) in the panel just above the X-ray flare graph. In that display,  $B_t$  represents the total interplanetary field strength. **Takeaway:** If  $B_z$  is southward, expect more than the usual propagation chaos.



## **About NCCC**

### **Officers and Directors, 2023-2024 Contest Season**

President: David West, [KO6M](#)  
Vice-President/Contest Chairman: **VACANT**  
Secretary: Victor Denisov, [N6DVS](#)  
Treasurer: Nian Li, [WU6P](#)  
Past President: David Jaffe, WD6T  
Director: Jim Brown, [K9YC](#)  
Director: Jeff Stai, [WK6I](#)  
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### **Volunteers**

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Awards Chair: Gary Johnson, [NA6O](#)  
California QSO Party Chair: Dean Wood, [N6DE](#)  
QSL Mgr [[K6ZM](#)]: **VACANT**  
QSL Mgr [[K6CQP/N6CQP/W6CQP](#)]: Dean Wood, N6DE  
NAQP Teams: **VACANT**  
NA CW Sprint Teams: Bob Vallio, [W6RGG](#)  
NCCC Email Reflector Admin: Phil Verinsky, [W6PK](#)  
Worked All CA Counties Award: Fred Jensen, [K6DGW](#)  
Photographer: Bob Wilson, N6TV

**NCCC Thur Night Contesting:** [ncccsprint.com](#)

[radiosport.world/ladder](#)

NCCC Sprint: Bill Haddon N6ZFO/4 [n6zfo@arrl.net](#)  
Vic Diccico [vicd@uwaterloo.ca](#)

NS CW Ladder: Bill Haddon, [N6ZFO/4.n6zfo@arrl.net](#)  
Tim Shoppa [tshoppa@gmail.com](#)

FT4/8 Sprint: Dennis W1UE [egan.dennis88@gmail.com](#)

### **Communications**

Webmaster: John Miller, [K6MM](#)  
Webinars: Bill Fehring, [W9KKN](#)  
Membership: Gary Johnson, [NA6O](#)/Ian Parker, [W6TCP](#)

### **JUG Editor**

Fred Jensen, [K6DGW](#): [k6dgwnv@gmail.com](#)  
Home: 775.501.5488  
Cell: 530.210.0778

## **NCCC Membership Information**

If you wish to join NCCC, please fill out an application for membership, which will be read and voted upon at our monthly meeting. To join, you must reside within club territory which is defined as everything in California north of the Tehachapi's up to the Oregon state line, and part of northwestern Nevada (anything within our ARRL 175-mile radius circle centered at 10 miles north of Auburn on Highway 49).

## **Life Memberships**

Life memberships are \$250.00 Contact [secretary.nccc@gmail.com](#). Members who have reached 80 years of age have and been an NCCC member for 20 or more years are eligible for Honorary Life Membership ("80/20 Rule"). Contact [secretary.nccc@gmail.com](#)

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## **JUG Articles Wanted!**

Please consider submitting an article! The preferred format is plain, unformatted ASCII text MS Word (.doc/.docx) are acceptable, Pictures should be as high a resolution as available. Please do not spend time formatting your submittal, the templates will re-format everything. Send your material to [k6dgwnv@gmail.com](#)

## **Northern California Contest Club Reflector—Guidelines**

The NCCC email reflector is devoted to the discussion of contesting. Topics include contests, station building, dxpeditions, technical questions, contesting questions, amateur radio equipment wants/sales, score posting, amateur radio meetings/ conventions, and membership achievements. Postings may not include personal attacks, politics, or off-subject posts. Such postings will be considered a violation of the Guidelines

## **Find NCCC on Social Media**

Facebook: "Northern California Contest Club"



Twitter: "NCCCKB"

## [NCCC Lands' End Store](#)

We are pleased to announce that the new NCCC Land's End store is online! You can choose from an array of shirts, jackets, and hats and apply your choice of custom-embroidered NCCC logos: A plain one, or one that also says Fifty Years. And, you can personalize your item by adding your name and/or call sign. The store is open 24/7 and items are shipped directly to you. No more waiting for everyone else to make up their minds on a group purchase.

<https://business.landsend.com/store/nccc/> or from the NCCC website: <http://nccc.ccc/members/lestore.html>  
Thanks to W6TCP for helping to set this up. Instructions for purchases from Lands' End NCCC Store

1. Go to <https://business.landsend.com/store/nccc/>
2. Click on Men's or Women's link, then choose item(s)
3. Pick color, inter quantity of each size you want to order.
4. Click Apply Logos and Personalizations. This will display the logo choices. Try them out. It will show you what they look like on your chosen fabric color.
5. Select a location for logo (left side, ride side, back, etc)
6. Click Apply Logo.
7. Optionally, click Add Personalization to add your name or call sign (\$8.00, 10 character limit)
8. Click Add to Bag and Continue Shopping or.

Start Secure Check out. Account creation and credit card required.



# K4 HIGH-PERFORMANCE DIRECT SAMPLING SDR



### A direct-sampling SDR you'll love to use

Our new K4 transceiver harnesses advanced signal processing while retaining the best aspects of the K3S and P3. It features a 7" touch display, plus a rich set of dedicated controls. Per-VFO transmit metering makes split mode foolproof. Band-stacking registers and per-receiver settings are versatile and intuitive. Control usage information is just one tap away thanks to a built-in help system.

### Modular, hybrid architecture adapts to your needs

The basic K4 covers 160-6 m, with dual receive on the same or different bands. The K4D adds diversity receive, with a full set of band-pass filters for the second receiver. (Thanks to direct RF sampling, there's no need for crystal filters in either the K4 or K4D.) The K4HD adds a dual superhet module for extreme-signal environments. Any K4 model can be upgraded to the next level, and future enhancements—such as a planned internal VHF/UHF module—can be added as needed.

### Single or dual panadapter, plus a high-resolution tuning aid

The main panadapter can be set up as single or dual. Separate from the main panadapter is our per-receiver mini-pan tuning aid, with a resampled bandwidth as narrow as +/- 1 kHz. You can turn it on by tapping either receiver's S-meter or by tapping on a signal of interest, then easily auto-spot or fine tune to the signal.

### Comprehensive I/O, plus full remote control

The K4's rear panel includes all the analog and digital I/O you'll ever need. All K-line accessories are supported, including amps, ATUs, and our K-Pod controller. The Video output can mirror the K4 screen or display a high-res Panadapter only screen. Via Ethernet, the K4 can be 100% remote controlled from a PC, notebook, tablet, or even another K4, with panadapter data included in all remote displays. Work the world from anywhere—in style!

### K4 KEY FEATURES

Optimized for ease of use

Modular, upgradeable design

7" color screen with touch and mouse control

ATU with 10:1+ range, 3 antenna jacks

Up to 5 receive antenna sources

Full remote control via Ethernet



The K4 interfaces seamlessly with the KPAS500 and KPA1500 amplifiers

*'The performance of their products is only eclipsed by their service and support. Truly amazing!'* Joe - W1GO



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- VHF/UHF/1.2GHz • Direct Sampling Now Enters the VHF/UHF Arena • 4.3" Touch Screen Color TFT LCD • Real-Time, High-Speed Spectrum Scope & Waterfall Display • Smooth Satellite Operation



### IC-718 | HF Transceiver

- 160-10M\*\* • 100W • 12V operation • Simple to use • CW Keyer Built-in • One touch band switching • Direct frequency input • VOX Built-in • Band stacking register • IF shift • 101 memories



### IC-V3500 | 144MHz FM Mobile

- 65W of Power for Long Range Communications • 4.5 Watts Loud & Clear Audio • Modern White Display & Simple Operation • Weather Channel Receive & Alert Function



### IC-7851 | HF/50MHz Transceiver

- 1.2kHz "Optimum" roofing filter • New local oscillator design • Improved phase noise • Improved spectrum scope • Dual scope function • Enhanced mouse operation for spectrum scope



### IC-705 | HF/50/144/430 MHz All Mode Transceiver

- RF Direct Sampling • Real-Time Spectrum Scope and Waterfall Display • Large Color Touch Screen • Supports QRP/QRPp • Bluetooth® and Wireless LAN Built-in



### IC-2300H | VHF FM Transceiver

- 65W RF Output Power • 4.5W Audio Output • MIL-STD 810 G Specifications • 207 alphanumeric Memory Channels • Built-in CTCSS/DTCS Encode/Decode • DMS



### IC-7300 | HF/50MHz Transceiver

- RF Direct Sampling System • New "IP+" Function • Class Leading RMDR and Phase Noise Characteristics • 15 Discrete Band-Pass Filters • Built-In Automatic Antenna Tuner



### 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

### IC-V86 | VHF 7W HT

- 7W Output Power Plus New Antenna Provides 1.5 Times More Coverage • More Audio, 1500 mW Audio Output • IP54 & MIL-STD 810G-Rugged Design Against Dust & Water • 19 Hours of Long Lasting Battery Life • 200 Memory Channels, 1 Call Channel & 6 Scan Edges



### IC-7610 | HF/50 MHz All Mode Transceiver

- Large 7-inch color display with high resolution real-time spectrum scope and waterfall • Independent direct sampling receivers capable of receiving two bands/two modes simultaneously



### IC-2730A | VHF/UHF Dual Band Transceiver

- VHF/VHF, UHF/UHF simultaneous receive • 50 watts of output on VHF and UHF • Optional VS-3 Bluetooth® headset • Easy-to-See large white backlight LCD • Controller attachment to the main Unit



### IC-T10 | Rugged 144/430 MHz Dual Band

- Disaster Ready - Excellent Fit for Your Emergency Bag • Loud Audio - New Speaker Design • Long Battery Life - Up to 11 Hours • FM Broadcast & Weather Channels



### IC-R8600 | Wideband SDR Receiver

- 10 kHz to 3 GHz Super Wideband Coverage • Real-time Spectrum Scope w/Waterfall Function • Remote Control Function through IP Network or USB Cable • Decodes Digital Inct P25, NXDN™, D-STAR • SD Card Slot for Receiver Recorder



### ID-5100A Deluxe 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

### ID-52A | VHF/UHF D-STAR Portable

- Bluetooth® Communication • Simultaneous Reception in VV, UU, VU and DV/DV • Enriched D-STAR® Features Including the Terminal Mode/Access Point Mode • UHF (225-374.995MHz) Air Band Reception



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### FTDX101MP | 200W HF/50MHz Transceiver

- Hybrid SDR Configuration • Unparalleled 70 dB Max. Attenuation VC-Tune • New Generation Scope Display 3DSS • ABI (Active Band Indicator) & MPVD (Multi-Purpose VFO Outer Dial) • PC Remote Control Software to Expand the Operating Range • Includes External Power With Matching Front Speaker



### FTDX10 | HF/50MHz 100 W SDR Transceiver

- Narrow Band and Direct Sampling SDR • Down Conversion, 9MHz IF Roofing Filters Produce Excellent Shape Factor • 5" Full-Color Touch Panel w/3D Spectrum Stream • High Speed Auto Antenna Tuner • Microphone Amplifier w/3-Stage Parametric Equalizer • Remote Operation w/optional LAN Unit (SCU-LAN10)



### FT-991A | HF/HF/UHF All Mode Transceiver

- Real-time Spectrum Scope with Automatic Scope Control • Multi-color waterfall display • State of the art 32-bit Digital Signal Processing System • 3kHz Roofing Filter for enhanced performance • 3.5 inch Full Color TFT USB Capable • Internal Automatic Antenna Tuner • High Accuracy TCXO



### FTDX101D | HF + 6M Transceiver

- Narrow Band SDR & Direct Sampling SDR • Crystal Roofing Filters Phenomenal Multi-Signal Receiving Characteristics • Unparalleled -70dB Maximum Attenuation VC-Tune • 15 Separate (HAM 10 + GEN 5) Powerful Band Pass Filters • New Generation Scope Displays 3-Dimensional Spectrum Stream



### FT-710 Aess | HF/50MHz 100W SDR Transceiver

- Unmatched SDR Receiving Performance • Band Pass Filters Dedicated for the Amateur Bands • High Res 4.3-inch TFT Color Touch Display • AESS: Acoustic Enhanced Speaker System with SP-40 For High-Fidelity Audio • Built-in High Speed Auto Antenna Tuner



### FT-891 | HF+50 MHz All Mode Mobile Transceiver

- Stable 100 Watt Output • 32-Bit IF DSP • Large Dot Matrix LCD Display with Quick Spectrum Scope • USB Port Allows Connection to a PC with a Single Cable • CAT Control, PTT/RTTY Control



### FTM-300DR | C4FM/FM 144/430MHz Dual Band

- 50W Output Power • Real Dual Band Operation • Full Color TFT Display • Band Scope • Built-in Bluetooth • WIRES-X Portable Digital Node/Fixed Node with HRI-200



### FT-2980R | Heavy-Duty 80W 2M FM Transceiver

- 80 watts of RF power • Large 6 digit backlit LCD display for excellent visibility • 200 memory channels for serious users



### FTM-200DR | C4FM/FM 144/430MHz Dual Band

- 1200/9600bps APRS® Data Communications • 2" High-Res Full-Color TFT Display • High-Speed Band Scope • Advanced C4FM Digital Mode • Voice Recording Function for TX/RX



### FTM-400XD | 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

### FT-70DR C4FM/FM 144/430MHz Xcvt

- System Fusion Compatible • Large Front Speaker delivers 700 mW of Loud Audio Output • Automatic Mode Select detects C4FM or Fm Analog and Switches Accordingly • Huge 1,105 Channel Memory Capacity • External DC Jack for DC Supply and Battery Charging



### FT-5DR C4FM/FM 144/430 MHz Dual Band

- High-Res Full-Color Touch Screen TFT LCD Display • Easy Hands-Free Operation w/Built-In Bluetooth® Unit • Built-In High Precision GPS Antenna • 1200/9600bps APRS Data Communications • Supports Simultaneous C4FM Digital • Micro SD Card Slot

### FT-65R | 144/430 MHz Transceiver

- Compact Commercial Grade Rugged Design • Large Front Speaker Delivers 1W of Powerful Clear Audio • 5 Watts of Reliable RF Power With-in a compact Body • 3.5-Hour Rapid Charger Included • Large White LED Flashlight, Alarm and Quick Home Channel Access



### FTM-6000R | 50W VHF/UHF Mobile Transceiver

- All New User Operating Interface-E20-III (Easy to Operate-III) • Robust Speaker Delivers 3W of Clear, Crisp Receive Audio • Detachable Front Panel Can Be Mounted in Multiple Positions • Supports Optional Bluetooth® Wireless Operation Using the SSM-BT10 or a Commercially Available Bluetooth® Headset



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