



Publication of the
Northern California
Contest Club



Issue 604

Nov 2022



Jug Editor, Saraj Cory, KU6F, signing off and passing the mic to Fred ["Skip"] K6DGW.

NCCC — 52 years of contesting excellence

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THE JUG'S NEW EDITOR IS Fred ["Skip"] K6DGW who will begin his journey with the December issue. Thanks Fred, de KU6F

NCCC ZOOM MEETING

FOR DETAILS:

<https://nccc.cc/meetings.html>

Date: Tuesday, November 15, 2022
Time: Open chat, 6:00 PM PDST
Meeting: 6:30 PM to 8:30 PM
Open chat after the meeting, too.

Web Meeting Info: For Zoom meeting information, please contact the NCCC Secretary at secretary.nccc@gmail.com

Program:

1. Club Business update by David, WD6T, our President.
2. Contest update and Sweepstakes, with Andy, AE6Y, our VP/CC.
3. Our member guest is Peter Driessen on "Amateur Radio Contesting and University Research Projects".

President's Report - WD6T

28 Famous Flavors of Contesting
Dave WD6T

It was great to see many of you at the picnic, our first in-person convergence since the pandemic forced us into little boxes on the computer screen. The weather was perfect. The food was great and worthy of many days of leftovers. N6RO, K6RC and I had a chance to dust off our musical wits. Many took NA6O up on his offer to tour the antenna farm, even if it meant waking up the next day with a stiff neck from too much skyward gazing. Best of all was rag chewing with fellow testers in 3D.

I had a quick but interesting chat with N6KT. We all know Rich as the guy who migrates south and wins phone contests. But he told me he also has a small station with a dipole, which he uses to have some fun when he's not traveling the world.

There's a lesson there... there are many ways to contest. Once upon a time, the largest restaurant chain in America was Howard Johnson's, with their signature orange roof, fried clams, and an amazing 28 flavors of Ice Cream. There are just about as many ways to contest. Which flavor will you chose?

You may choose to maximize score, either to win the whole contest, win a division, or just to beat your own score from a previous year. When in this mode, all decisions are in service of making as high a score as possible. Is it really worth chasing mults? Even in contests with a high Q-to-mult ratio where mults are



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Thursday Night Sprint

The Northern California Contest Club sponsors a Thursday Night Contesting session of thirty minute duration. Often, on Fridays prior to a major contest weekend, a special practice session is held.

Generally, on 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 America time. The power limit is 100 watts. Occasionally, multi-week ladder competitions are held. See www.ncccsprint.com for details

Thursday Night Contesting Director and Founder
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[W9RE](#), [K4BAI](#), [N3BB](#), [VE3TY](#), and [WO8H](#))



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3. Our member guest is Peter Driessen on "[Amateur Radio Contesting and University Research Projects](#)".

Bio: Peter Driessen, VE7AB / AI7O / ZL1AX is Professor of Electrical Engineering at the University of Victoria, Canada with a cross-appointment in Music. After graduation, he worked for 5 years designing modems for data communications. He spent 10 years part time at AT&T Bell Laboratories working on wireless communications systems and 5 years at Massey University, Wellington, New Zealand.

Peter was first licensed in 1969 and learned about contesting at the University of British Columbia Amateur radio club VE7UBC and the first VE7 multi-tower superstation VE7WJ. He was an elected director of (the precursor of) RAC at which time he created the RAC contests and awards. He participated in the ZL7AAA DXpedition to Chatham Island.

Upcoming meetings:
December 2022 TBD.

For now, we look forward to seeing you all online!

Greg, KK6PXT
NCCC Secretary



(Con't from page 1) most valuable, it is often better to just make a bunch more QSOs.

This can be quite counter-intuitive. For example, there are (if I counted right) 84 multipliers in the upcoming ARRL Sweepstakes. With concerted effort, it is possible for a medium sized station to work 1000 stations. Because each QSO counts as two points, if you work 84 multipliers and 1000 QSOs, that's 168,000 points. BUT... if you work only 83 multipliers and just 13 more QSOs, your score is 168,158! This defies intuition, as there is such a thrill in working that final mult. But you may be better off finding those 13 guys.

But maximizing score is just one way to contest. Your goal may be completely different. You may decide to challenge yourself to get a sweep as fast as possible. Or perhaps you are still working on your Worked All States award. In that case, mults will be your focus. (That can be fun in the ARRL 160m or ARRL 10m contest... I still need a few states on 10m from home... maybe this year!)

One extreme form of this game is to try and work all the mults only once. Obviously, you will not be maximizing your score, but it can be a fun challenge (as long as your club isn't going for a SS win!) As a particularly quirky example, K6XX has been known to see how many stations he can work with a fixed number of CQs. He will get on as fresh-meat near the end of the contest, call one CQ and then work guys who are tail-ending until he hears silence, then throw out another CQ. The extensive use of the Reverse Beacon Network means that as soon as he shows up, the word goes out to the far corners of the globe.

Last weekend was the CQ Worldwide SSB contest. I operated from my small home station. Winning anything at all was certainly not on the table and there's no way I could compete with most of my NCCC colleagues. But I still had fun using it as an opportunity to explore propagation as the day progressed, seeing where/when I could work easily, where/when I could work with a struggle and where/when I couldn't work at all.

I was amused to bust big pileups with stations to the west, while my only chance of working stations to the east was to be the only caller. This is largely due to my being perched on the side of a hill facing southwest. While this is old news both to me and to anyone who has heard me complain about it for years, there were some novel twists. For example, I found I could easily get into Chile, at a bearing of 140 degrees, while getting into Brazil at 110 degrees was an order of magnitude harder, with Argentina somewhere in the middle.

I also found it interesting to see how much easier it became to work the Caribbean on the high bands as the day wore on, partly due to improved propagation, but also because Europe was now in darkness.

Worldwide DX contests never cease to amaze me. I can pump some electrons into a transducer on my roof and someone 10,000 miles away can pull my voice out of thin air. Is that crazy, or what?



Contesting is unique in we need each other and the more people are doing it, the more fun it is. The only bad way to contest is not to do it at all. And even that's ok, because hey, you need a break every now and then. Many of us took multi-year hiatuses from ham radio, only to discover the fun all over again when we had some time to pursue it.

One big difference between now and the old days is the ease of submitting a log. As a youngster, I would not bother to submit a log in a big DX contest. It was far too tedious to prepare the log for submission. Now, with computer logging, it is as simple as pushing a button. Even so, only a small percentage of operators in CQ WW actually submit logs. Many are just out to make some QSOs. And that's fine... as the 3830 cliché goes, "Thanks for the Qs!"

There are so many different ways to contest: Try low power or QRP. Go on an expedition. Remote to somewhere else. Try assistance. Or unassisted. Or a new mode. Mixing it up is a good way to keep the W6SX prime directive in force *and* keep those fried contest clams from going stale. Which reminds me, what *were* the 28 famous flavors of Howard Johnson's anyway? In alphabetical order: Banana, Black Raspberry, Burgundy Cherry, Butter Pecan, Buttercrunch, Butterscotch, Caramel Fudge, Chocolate, Chocolate Chip, Coconut, Coffee, Frozen Pudding, Fruit Salad, Fudge Ripple, Lemon Stick, Macaroon, Maple Walnut, Mocha Chip, Orange-Pineapple, Peach, Peanut Brittle, Pecan Brittle, Peppermint Stick, Pineapple, Pistachio, Strawberry, Strawberry Ripple and Vanilla. I just need Macaroon for Worked All Flavors.



November 2022 AE6Y VP/CC JUG Column

Reflections on some recent contests

Sweepstakes

As I write this, Sweepstakes CW is still in progress, and SSB will be in two weeks. Lots of activity from many club members, including the usual MLDXCC contingent out to win again. Will report next month.

SSB Sprint

I ended up flogging this contest and did participate myself. Of course, SSB Sprint never has the turnout of the CW version, particularly in this club. Nonetheless our Team #1 (WD6T, AE6Y, KA6BIM, K6GHA, W6FB) appears to have finished second only to MRRC and Friends. And they had two DXpedition ringers, V3 and KP2. We had a ringer of our own, in Jack W6FB. Jack beat me out on 40 on a jump ball for a station in KY, so I guess his dipole is actually working well! I also got beat out by WD6T when both of us heard a weak PA station and called – I just can't compete with N6RO, especially on the low bands. Weirdly, that was the only PA station I heard in the entire contest. Even more weirdly, he called my on 40 some time later and gave me contact number 3. Not sure how that could have happened.

I hope we'll get more participation in this contest in the future. I find it a bit easier than CW Sprint, particularly since high-speed CW skills and instant reflexes are not required. Plus, like other phone contests with your name as part of the exchange, it is inherently friendly, as ops often greet each other by name when acknowledging a call. Mults were relatively plentiful, with the top 10 all having more than 50, but it's always strange why states that are routine in CW, like CT and NH, didn't show up at all, and PA barely. One knock on SSB Sprint has been that its QSY rule tends to create interference and ill will on the bands. This used to particularly be an issue on 80 meters, but with pretty much all activity now below 3800 kHz, that irritant seems to have gone away. It's not much of a problem on 20 or 40, though on the latter, you do have to listen and try to avoid rag chews and nets.

CQWW SSB

Another phone contest, but this one had such great conditions that even N6TV gave it a go and mentioned in his 3830 report that he enjoyed it. There were a number of very good club scores, including the usual K6XX in SO, K3EST (@N6RO, with K6KM KK6PXT N6RO N6WM VA7RR W6DMW) in M/M. Not to mention the return of intrepid travelers to the Caribbean.



In that regard, Rich, N6KT, at his new superstation PJ4K just annihilated the competition in the big dog category of SOABHP. I love to listen to Rich during these contests, and commend his crisp, efficient, but friendly style to any aspiring phone operators who want to hear a master at work. John, W6LD, led a M/2 effort from our P40L/P49Y station with three non-Club sidekicks, coming in third worldwide behind two stations with quite a few more operators, and probably some in-band mult stations.

15 and 10 were really hopping, with activity way above 28500 for example. It's amusing to read the 3830 reports and find an occasional big station complaining about a lack of activity, even as they work 140 or so countries on 10. Do they forget how recently they'd be lucky to work a handful on that band? I guess when you have a great station you just raise your sights and are not necessarily any happier than the guy with a more moderate station and more limited aspirations. Is there some kind of life lesson in that contest observation?

I spent a few hours in the contest primarily to work friends, but did get caught up in the enjoyment, and couldn't resist a brief JA run on 15 in the late afternoon on Saturday. I was using a new KPA 1500 that I had given myself as a birthday present, and love the ability to turn it on for a short time, then turn it off and not worry that I'm shortening tube life by doing so.

It's also a lot of fun, and a useful exercise to practice pileup technique in search and pounce mode. It's interesting to experiment with varying phonetics and timing of calls. Sometimes, you just can't get through no matter what you do, as the time that W6NL beat me out on 80 for a Caribbean station that I just couldn't raise no matter what I did. Is that the subject of another life lesson?

And now for something completely different:

How the Loss of the USS Thresher Improves Our Lives Everyday

I realize this is an unusual title and topic for the column, but it does relate to radio, and tells a story that will be of interest to us as radio enthusiasts, and just deserves to be better known. There may well be some club members who recall these events and may have their own perspective; if so, I'd love to hear from you. This column is being written on an airplane returning from a Celebration of Life for the hero of the story, my cousin Alan Berman, who passed away in Valparaiso, Indiana a few weeks ago at the age of 97. Alan was a remarkable scientist, whose story deserves to be more widely known.

I was a speaker at the Celebration of Life, and had the honor of not only being his first cousin (though he was 20 years older), but since most of his colleagues are obviously of his vintage and no longer around, one of the very few people alive that had the privilege of working with him in the 1960s when he was the Director of Research for Hudson Laboratories and then for the Naval Research Laboratory.



Hudson Labs was then a small research facility located in Dobbs Ferry, NY about 20 miles north of NYC and run by Columbia University. It did research for the Navy and was an outgrowth of the close collaboration of universities with the military during World War II; it's very unlikely that any such facility could exist today.

The Naval Research Laboratory, on the other hand, still does exist. When Alan ran it for about 15 years, it was the largest Department of Defense scientific establishment in the country, employing some 5,000 mostly civilian scientists, engineers and technicians.

The most enduring achievement of NRL under Alan's reign, was the invention of the satellite-based Global Positioning System. In this column, I'm going to explain some of the background, using in part verbiage from the tribute I gave at the Celebration of Life, and in part text from a memoir that Alan wrote a few years ago. And I'll explain what the Thresher had to do with it.

Alan was a real smart kid from Brooklyn, who graduated from Columbia with a degree in physics at the age of 18 in 1944 and was promptly drafted into the Army. Upon his discharge, he started graduate work at Columbia, which at the time was the epicenter of theoretical physics in the United States. His two thesis advisors, Polykarp Kusch and I.I. Rabi, both won Nobel prizes, and he felt a bit cowed by the five Nobel prize winners on the committee judging his thesis defense.

As related to GPS, the story starts with one of the projects Alan worked on in the circa 1950 or so: the development of the first atomic clock. (Incidentally, at about this time the first laser was also invented at Columbia, but that's another story). In his words:

During my first three years in graduate school, the GI Bill supported me. When my funds ran out, I took a job as a technician on one of Professor Rabi's projects. Under his direction, I helped build what would one day become the world's first atomic clock. (The device currently is on display in the Smithsonian.)

At the time, General Dwight Eisenhower was President of Columbia. One morning, hunched over the equipment, I looked up and realized that Dean Peagram, Professor Rabi and General Eisenhower had entered my laboratory. Eisenhower asked me, "What are you working on?" I gave a stumbling explanation. He smiled and asked, "Who is paying for this equipment?" When I replied that I thought that the US Navy was supporting the project, he scowled, "Why? What military value can it possibly have?" Before I could respond, Professor Rabi interjected, "This is pure research. It has no foreseeable military value."

How wrong they both were! Through the next 70 years, the performance, precision and physical size of atomic clocks - time standards - improved immensely. Both military and civilian applications followed -- GPS, satellite communications, high-speed digital computers, lasers, precision-guided munitions, air traffic control systems, cell phones -- the list goes on and on. Modern civilian and military worlds are remarkably different as a result of Rabi's initial concept.



In my simplified way of organizing the drama of scientific discovery that led to GPS, that was Chapter One. Alan was also a lead player in what I am calling Chapter Two (and your truly even was involved as a bit player in Chapter Two), which brings me to the title of this column.

After I graduated from high school, Alan arranged for me to get a summer job as a junior technician at Hudson Labs. At the lab, there was a small number of PhDs who looked scruffier than the rest of us peons, typically walking around in khakis, T-shirts, and sandals with a carefully cultivated air of distraction, or maybe it just came naturally to them. In any event, they were seen as a species apart. That is where Alan perfected his classic academic look – the bald, bearded, sandals-wearing egghead, speaking in oracular tones – that stood him in very good stead when explaining complex scientific matters to civilians and admirals. He tells a story in his memoir of Admiral Rickover, the contentious and strong-willed founder of the nuclear submarine force, throwing Alan out of his office after complaining that he didn't understand why the admirals all listened to Alan and not to him.

Back to Hudson Labs. My first summer was devoted to one of the main areas that Alan mentions in his memoir as being a major effort of the lab – searching for the Thresher, a nuclear submarine that had sunk during test-depth sea trials in April 1963 about 200 miles east of Cape Cod, in water 8,400 feet deep.

Alan was in overall charge of the search effort, which involve a half-dozen ships from various organizations looking all summer. It was a major embarrassment for the Navy and the country that the submarine could not be located with existing technology, even though there was a support vessel overhead at the time of the sinking and thus it was known generally where it had occurred. We spent months in the search area towing various devices just above the sea floor, including cameras and side-looking sonars. It seems clear that this inability to fix positions accurately at sea was instrumental in the ultimate decision to move forward with the satellite-based GPS system.

At the time, the best electronic navigation aid was called Loran C. It used shore stations to transmit radio signals that were decoded and compared by the receiver. It was subject to the vagaries of radio propagation, including nighttime skywave. Loran A, invented during WW II, actually involved a human looked at an oscilloscope trace and matching blips along a time axis. Loran C was much more complex and supposed to work automatically: it required an enormous receiver with score of knobs switches and dials, made by Collins. But it still wasn't very precise or reliable, so the need for something better was apparent. Incidentally, we shared the 160-meter band with Loran, and that was why for many years our use of the band was subject to power limits.

To close the loop on the Thresher, over the winter, under NRL's leadership, better equipment was developed which led to the finding of the submarine the next summer. The Navy was relieved to learn that it had not been sunk by the Russians and also that the nuclear reactor was not polluting the ocean.



In my simplified historical narrative, the loss of the Thresher and the difficulty of finding it, was Chapter Two, in which the need for precision location of objects at sea was highlighted.

As Alan explains, Chapter Three was engendered by the war in Vietnam, which demonstrated the need for precision location of objects on land. In the late 60s, the technology had finally advanced far enough to make GPS worth trying. Again from Alan's memoir:

In the late 1960s, the war in Vietnam was not going well for the U.S. One day in 1968, Johnny Foster, the Assistant Secretary of Defense for Development, Research and Engineering (DDR&E), summoned my boss, myself, and senior Air Force and Army officials who had Research and Development (R&D) responsibility to a meeting in his office.

He pointed out that the U.S. had dropped more bombs on North Vietnam than had been dropped on Europe during WW II. Few had hit their target and, worse, many had resulted in civilian deaths, which was not only immoral but also fueled worldwide anger.

From Foster's point of view there were a number of issues that contributed to the problem.

- *The aerodynamics of our weapons made them tumble in flight and caused chaotic trajectories.*
- *Our aircraft could not locate themselves or their targets precisely enough.*
- *We could not track, locate and destroy mobile or relocatable targets (e.g. radar controlled anti-aircraft batteries).*

In the discussion that followed, I told Johnny Foster that NRL would take on his last two concerns but that the Air Force and the Navy Weapons Laboratories were better equipped for the first. Foster, my boss and the other attendees agreed. In this section, I will only discuss NRL's efforts. In addition to solving the position location problem, NRL undertook an extremely large and very successful initiative to support the tracking and locating of mobile or relocatable targets. Activities related to that effort are discussed in another section. Unfortunately, almost all of these activities remain classified [55 years later!! – ed.], so the discussion is limited.

On returning from the meeting with DDR&E, I called together all of the people at NRL who I thought could contribute to the job. As described in preceding sections, our effectiveness in Projects Artemis and SOSUS and during the Thresher search was always limited by imprecise navigational capabilities. We had always used some improvised time-difference-of-arrival system that depended on receiving precisely timed signals from three spatially separated transmitters.



Roger Easton began the discussion by pointing out that precision location could be achieved if signals could be received from three geometrically separated precision clocks at known locations. If four separate signals were received, velocity could also be determined. Peter Wilhelm (who eventually built and launched 45 NRL-designed satellites) believed he could design a satellite with an energy system that could power a precision clock and its radiated signal through many years of orbital life.

The people from the Naval Observatory and from the Naval Surface Weapons Laboratory at Dahlgren, Virginia contributed a learned discussion on the stability of artificial satellite orbits and the precision of their ephemeris parameters. In their opinion, satellite stability would not be a problem. In their scholarly way, they also discussed the importance of the Eotvos effect and certain relativistic effects - I learned a lot of new physics that day.

The NRL time standard people were optimistic that they could, in the relatively near future, build a flyable precision clock (a huge change from the first atomic clock I had worked on that caused Eisenhower to turn up his nose at the roomful of equipment). Precision location on earth would be determined by the precision, accuracy and stability of the time signals in space. Even if a flyable cesium, rubidium or hydrogen clock was not then available, quartz crystal clocks could be used for proof of concept. Finally, Peter Wilhelm assured us that he could build and launch three demonstration satellites relatively quickly. We submitted our proposal to the Pentagon. Upon approval, we started what was called the Timation Project.

Based on his background and career accomplishments, Roger Easton was the obvious choice to lead the program. Roger was a remarkable man, who, de facto, invented the system concept that evolved into the modern-day GPS systems. His life story is contained in a write-up in Wikipedia. The Timation Program was so successful that by 1973, the Under-Secretary of Defense declared GPS to be a Major System Acquisition Program and designated the Air Force to serve as the lead service and program manager.

The full deployment of the GPS system was not completed until long after the Vietnam War was over, so it did not help solve the military problems of the 1960s. However, improved aerodynamics and guidance tremendously increased the accuracy of air-to-ground weapons. Unless a target has been misidentified or weapon system guidance malfunctions, modern U.S. weapons hit their intended targets with relatively little collateral damage.

In the years since 1973, the contributions of many organizations have improved the performance of the GPS system markedly and its applications have increased enormously. The clocks in contemporary GPS satellites are about ten million times more



precise and stable than the clocks used in the 1973 version of GPS. As a result, location and timing accuracy has improved commensurately.

The original version of GPS provided high accuracy only to military users. The signal available to non-military users was dithered to hide the system's true location accuracy. Changes in government policy during the late 1990s allowed all users--civilian and military--to use the high accuracy GPS mode. I am proud of NRL's role in producing a system with so many civilian and military applications, reducing to some degree the inhumanity of modern warfare.

There's a lot more of interest to us in Alan's memoir, and I may inflict some more on you in future columns.

73, Andy, AE6Y, VP/CC



Tube of the Month

HY75(A)

The Hytron Company was started in 1921 in Salem, Mass. They were making vacuum tubes, but I have found little information on their products until the late 1930's when they started offering tubes of their own design under the name Hytronic Laboratories. In 1951 the company became part of CBS and their tubes were marked accordingly. Prior to WWII, Hytron was making tubes that would operate well into the upper VHF region. 200 MHz was considered UHF. The ARRL featured some of these tubes in their Handbook in the UHF section. One of the last of the UHF tubes developed was the HY75.

The [HY75](#) was a small, graphite anode, 15-watt, triode that they claimed would operate up to 300 MHz. With grid and plate connections on the top of the envelope, the tuned circuits could have very short or no leads at all. The ARRL Handbook of 1942 featured the HY75 in oscillators for 112 and 220 MHz. FCC order No. 87 ended ham radio for the duration of the War, but in June 1942, the War Emergency Radio Service was organized which allowed enrolled hams to operate on the 112 to 116 MHz band. The HY75 had a fast-activating filament so was ideal for portable/mobile use. The photo is of a 112 MHz AM transmitter from the ARRL Handbook of 1942.



In the mid 1940's, Hytron came out with the [HY75A](#) which could use 10 more milliamps of plate current and was about a half inch shorter.

Visit the museum at N6JV.com
Norm N6JV



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 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).

Life Memberships.— \$250.00 Contact secretary.nccc@gmail.com. The 80/20 Rule:

Members who have reached 80 years of age have and been a NCCC Member for 20 years are eligible for Honorary life membership. Contact secretary.nccc@gmail.com

JUG Articles Wanted!

Your help allows us to produce a quality newsletter. Please consider submitting an article!

The editor welcomes any and all relevant articles for inclusion in the JUG.

The preferred format is Mac PAGES or MS Word (.doc or .docx), Arial 11 point. Indicate the insertion point and title of diagrams and pictures in the text and attach photos separately.

Pictures should be full resolution. Avoid PDF files and email text. Please contact us if that's your only format.

Send material to Saraj, KU6F, saraj@sonic.net, ph: 707-888-3906

PLEASE INDICATE "JUG SUBMISSION" IN EMAIL SUBJECT LINE.

Northern California Contest Club Reflector—Guidelines

The NCCC reflector is devoted to the discussion of contesting.

Topics include, for example, contests, station building, dx-peditions, 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.

Go to <https://business.landsend.com/store/nccc/> It's easy to use.

From nccc.cc: <http://nccc.cc/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, enter 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, right 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.
9. Start Secure Check out. Account creation and credit card required.

The screenshot shows the Lands' End Business website interface. At the top left is the "LANDS' END BUSINESS" logo. To the right is a search bar with the word "Search" and a magnifying glass icon. Below the logo is the URL <https://business.landsend.com/store/nccc/>. In the center, there are navigation links for "MEN", "WOMEN", and "PROMOTIONAL PRODUCTS". On the left side, there is a welcome message: "Welcome to the NCCC Land's End store. You can choose many different products and add a custom-embroidered NCCC logo." Below this, it says: "If you would like to add your name and/or call sign, click the Add Personalization button when designing your garment (\$8 charge, 10 character limit)." At the bottom left, it provides contact information: "If you have questions, contact the NCCC secretary at: secretary.nccc@gmail.com". On the right side, there is a large orange oval containing the text "NCCC" in bold black letters, with "Northern California Contest Club" written below it.



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 KPAS00 and KPA1500 amplifiers

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



For complete features and specifications visit elecraft.com • 831-763-4211



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All Mode Tri-Band Transceiver



IC-7300
HF Transceiver



IC-7100
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ID-5100A Deluxe
VHF/UHF Dual Band Digital Transceiver



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

KENWOOD



TS-590SG
HF/50MHz Transceiver



TM-D710G
2M/440 Dualband



TM-V71A
2M/440 DualBand



TM-281A
2 Mtr Mobile



TH-D74A
2M/220/440 HT

YAESU
The radio



FT-991A
HF/VHF/UHF Transceiver



FT-891
HF+50 MHz All Mode Transceiver



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



FTM-400XD
2M/440 Mobile



FT-70DR
C4FM/FM 144/430 Xcvr



- RETAIL LOCATIONS - Store hours 10:00AM - 5:30PM - Closed Sunday
- PHONE - Toll-free phone hours 9:30AM - 5:30PM
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- FAX - All store locations
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Contact HRO for promotion details. Toll Free including KL7, VE and KHE. Call will be routed to nearest store. All 800-HRO-lines can assist you. If Busy, you may call another number. Prices, specifications and descriptions subject to change without notice.