



#634 May 2025



Publication of the  
Northern California  
Contest Club

**NCCC**

**54 years of  
contesting  
excellence**

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#### **NCCC MEETING**

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

**Tue 13 May 2025**

**Tim Shoppa - N3QE**

**“Introducing Tina--N3QE AI op”**

*Contesting Columnist for CQ Magazine,  
Secretary for the Potomac Valley Radio  
Club, and WRTC 2022 competitor.*

## **President's Report**

**David West, KO6M**



Greetings KBBers,

Thank you for the trust you've placed in me to serve as your club President for the coming year. I'm genuinely excited about what lies ahead. We have a number of activities planned, many of which are direct responses to the feedback you provided in our recent surveys. (Yes, I'll keep mentioning those

surveys – you spoke and we're taking action!)

### **Building a More Social Club**

First and foremost, you asked for more social opportunities and we're delivering. We are planning in-person meetings for July and August—details will be shared soon. Of course, we'll also continue our tradition of the October BBQ (pending Ken's go-ahead). Additionally, based on last year's interest, we're exploring the possibility of a holiday dinner in December. Planning for that will begin shortly.



## 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](#)  
Director: Ed Radlo, [AJ6V](#)

### Volunteers

Charter Member: Rusty Epps, [W6OAT](#)  
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 Thursday Night Contesting

NCCC Sprint: Tom Hutton, [N3ZZ](#)  
NS CW Ladder: Bill Haddon, [N6ZFO](#)  
NS RTTY Sprint/Ladder: Ed Radlo, [AJ6V](#)

### Communications

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

### JUG Editor

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

That's a brief overview of our plans for the year. I look forward to an exciting and engaging year ahead for all of us!

Thanks and KB!  
David West, KO6M

## **Celebrating 55 Years On the Air**

In the spirit of both being social and celebrating the club's 55<sup>th</sup> anniversary, we are excited to announce a special on-air event. This concept, originally proposed by K3EST a few years ago, will finally become a reality. We'll be hosting the **NCCC 55th Anniversary On-Air Reunion** [name subject to finalization] – tentatively scheduled for August 9. Mark your calendars! Full details and event guidelines will be announced soon. To add a little extra excitement, we plan to offer prizes to participants.

## **Upcoming Programs and Opportunities**

Before the anniversary event, we have a great lineup of presentations and activities:

**May Meeting:** N3QE will present on his project, "Tina – N3QE AI Op"

**June Meeting:** A sprint workshop led by some well-known sprinters.

## **Future Programs**

We're looking for your suggestions! What topics or speakers would you like to see? Please feel free to reach out with ideas.

## **Call for Volunteers**

We still have an open position on the Board – Vice President/Contest Chair (VP/CC). We're considering restructuring the CC role into a Contest Committee to distribute the workload. This committee will help guide the club's contesting activities. If you're interested in joining, please contact me. I'll also be reaching out to some of you in the coming weeks.



## Upcoming State/Province QSO Parties

**Thanks to WA7BNM**

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

State/Province	Dates/Times
Arkansas	17 May 1400Z to 18 May 0200Z
Atlantic Canada	7 Jun 1200Z to 8 Jun 0200Z
Kentucky	7 Jun 1300Z to 8 Jun 0100Z
West Virginia	21 Jun 1600Z to 22 Jun 0400Z
Alabama	26 Jul 1500Z to 27 Jul 0300Z
Maryland	9 Aug 1400Z to 10 Aug 0400Z
<b>Hawaii</b>	<b>23 Aug 0400Z to 25 Aug 0400Z</b>
Ohio	23 Aug 1600Z to 24 Aug 0400Z
Colorado	30 Aug 1300Z to 31 Aug 0400Z
Kansas	30 Aug 1400Z to 31 Aug 0200Z 31 Aug 1400Z to 2000Z
Tennessee	7 Sep 1700Z to 8 Sep 0300Z
New Jersey	20 Sep 1400Z to 21 Sep 0159Z

## Upcoming Large Contests

Volta WW RTTY	10 May 1200Z to 11 May 1200Z
<b>CQ WW WPX – CW</b>	<b>24 May 0000Z to 25 May 2400Z</b>
ARRL Jun VHF	14 Jun 1800Z to 16 Jun 0259Z
NAQP RTTY	19 Jul 1800Z to 20 Jul 0600Z
NAQP CW	2 Aug 1800Z to 3 Aug 0600Z

**Red entries denote NCCC Focus contest**



## 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](https://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.

## Position Open

The JUG is looking for an author for a series of articles introducing the “Joe Taylor Modes” to those of us who haven't kept up with the advances in technology. The modes have become very popular, DXpeditions are sometimes “FT-only” and often, the FT signals are the only ones on the band. The position carries a measure of fame with it --- sadly no fortune. The JUG editorial staff will take care of all editing, layout, production, and the like. The only software required, except for the WSJT stuff of course, is an email client and the ability to attach any photos, illustrations, diagrams, and graphics to the emails.

Simply send an email to the JUG at [k6dgwnv@gmail.com](mailto:k6dgwnv@gmail.com) or better, send your introductory article. The JUG is normally published on the weekend prior to the NCCC monthly meeting on the 2<sup>nd</sup> Tuesday of each month.



## **2024-2025 Contest Season Awards**

### **Presented at the April 2025 Meeting**

#### **NCCC ARRL 10M Contest – Top Contester (SO):**

Mixed: Bob Wolbert, K6XX with 3094 QSOs

SSB: Bob Cox, K3EST with 3058 QSOS

CW: Ed Muns, W0YK

#### **Annual KB Awards:**

##### **Platinum**

1st Place: David Jaffee, WD6T

2nd Place: Dave Tucker, KA6BIM

3rd Place: Ed Radlo, AJ6V

##### **Gold**

1st Place: Bill Fehring, W9KKN

2nd Place: Rick Tavan, N6XI

3rd Place: Alan Maenchen, AD6E

##### **Silver**

1st Place: Mike Clark, KM9R

2nd Place: Trey Garlough, N5KO

3rd Place: George Overturf, N6GEO

##### **Bronze**

1st Place: Dave Rietz, K6RC

2nd Place: Dave Ritchie, W6DR

3rd Place: Rich Muller, WN6A

#### **Champions of Asia:**

1st Place: Bill Haddon, N6ZFO

2nd Place: Dave Tucker, KA6BIM

3rd Place: David Jaffe, WD6T

#### **Special Awards:**

We've Got our Eye on You: Kevin Kang, K6EY

Iron Butt: Barry Bettman, K6ST

Radio-Active Ham Award: Hank Garretson, W6SX

Maximum Smoke Award: Ken Keeler, N6RO

JUG Editor's Award: Gary Johnson, NA6O

CQWW DX Founder's Award: Bob Wolbert, K6XX

Rookie of the Year: Rich Muller, WN6A

Contesting Outside of the Box: John Owens, NN6U

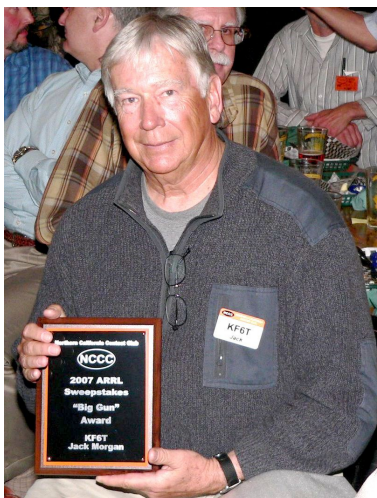
Making the Most of Low Power: Mike Clark, KM9R

Contest Expeditioner - Oliver Sweningsen, W6NV

More Power to You - Frank Letton, W6JTI



## Jack Morgan, KF6T – SK



Former NCCC President and long time NCCC member, Jack Morgan, KF6T, passed away in mid-April in Stockton CA after a battle with cancer. Originally licensed with the call W1FEA, Jack was employed at ARRL Headquarters in Newington CT prior to moving to Auburn CA in the early 1990's. An avid DX'er and even more avid contester, Jack served as NCCC President in 2009-2010.

Jack's Auburn QTH was atop a hill overlooking the airport with a commanding 360° view and sporting a detached shack including a kitchen, several acres with plenty of room for antennas, and a homebrew full-power amplifier built into a file cabinet. He owned and operated a company that specialized in race timing systems.

Jack is survived by his former wife Sandy and two grown children. Services have not been scheduled by JUG press time.



## NCCC Member News

*"All the member news arriving JUG Central"*

### Matt, WX5S



(via Tom, NW6P): Max (W6BG) and Tom, NW6P went to see Matt (WX5S) at the Acute Rehab Center at Valley Medical Center in San Jose on April 11th 2025 following surgery that involved fixing a major problem whereby his spinal cord was bent with a bulge at C3 in his neck. The surgery was a major fusion involving 5 of the 7 cervical spine vertebrae (C2-C6). The purpose of the surgery was to stabilize the neck so that more damage to the spinal cord would not occur and also hopefully fix some painful nerve problems that were causing problems standing up and walking. His legs hurt, but the problem is actually in the middle of the neck!

We found Matt in a very good mood and in great shape considering what he just went through. They discharged him on April 16 so that he can go home and carry on his rehabilitation therapies. At home, therapy will continue for about 2 months and then he will follow-up with Outpatient Rehab. This is fantastic news. Matt hopes that the therapy will allow him to regain full use of his legs over the next months.

He is unable to drive until he can remove the cervical collar (2-3 months). However, Matt will be able to do important stuff like radio contests!

### Tom, K5RC



Tom, K5RC, reports that he is making slow but steady progress with the health issues from his battle with Long COVID from earlier in the year. He and Midge, K7AFO, are hoping to have their property in Virginia City Highlands on the market by the time you read this.

The Comstock Memorial Station, "Dubya Seven Radio Nevada", has been the scene of some serious contest wins by visiting members of NCCC on CW, SSB, and RTTY, as well as a number of successful single and multi-op efforts using the three remote positions and a remote EME facility as well.

Tom and Midge will be relocating to a senior community in the Houston TX area to be near children and families.

### Garry, NI6T

Garry Shapiro has advanced Parkinson's disease and is living at home with his wife and a helper. He has difficulty speaking and he is doing physical therapy. If you'd like to have more details or leave a note for Garry, contact his wife Yelena at [yelena.kolodji@gmail.com](mailto:yelena.kolodji@gmail.com)



## Antenna of the Month

Gary, NA6O

### Using a 40 m Dipole on 15 m With a Better Match



It's possible to use any dipole on its third harmonic (or even higher, odd harmonics) while obtaining a usable match on both bands. This is very convenient, giving you two bands for the price of one, and is attempted most commonly with 40 and 15 m bands (7 and 21 MHz). However, the desired match does not occur exactly at the third harmonic but rather at a somewhat higher frequency. For instance, a 40 m dipole resonant at 7.0 MHz will also be resonant at 22 MHz, which is way above the top of the 15 m band (Fig. 1). You'll find that the SWR is near 10:1 within the band, and it's quite possible that your antenna tuner can't match it very well, if at all.

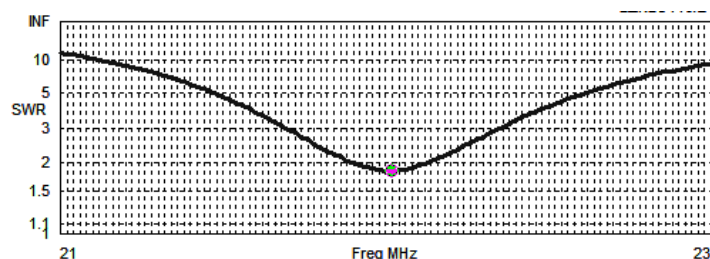


Figure 1. SWR of a basic 40 m dipole up 30 ft on 15 m. Its resonant at 22 MHz with an impedance of about 90 ohms

then it won't spin around all the time.

The exact location of the hats isn't too critical. I put them at 11 ft out from the center. Trim the overall dipole for resonance on 40 m, then check it out on 15. If you want to further refine the resonance on 15 m, you can trim the length of the hats. The tuning rate is about 33 kHz per inch, so trim carefully. Changing the hats will also slightly affect the 40 m resonance at about 12 kHz per inch. In the end, you will easily cover the whole 15 m band with a reasonable SWR. It will be far better than without this trick! Note that this antenna will probably be a better match to 75 ohms, but it's fine with 50 ohm coax for any antenna tuner (Fig. 3).

Here is a simple solution that I've been using for many years. All you have to do is add small "hats" about 1/3 of the way out on each side of the dipole, which is about 1/4 wavelength on 21 MHz. The diagram in Fig. 2 shows typical dimensions. The "hats" are pieces of wire soldered at their midpoints to the main conductor. I like to use 0.063 inch bronze brazing rod which is available at welding supply stores, but any kind of stiff wire will do. Bend it a little so it forms a bit of an inverted vee,

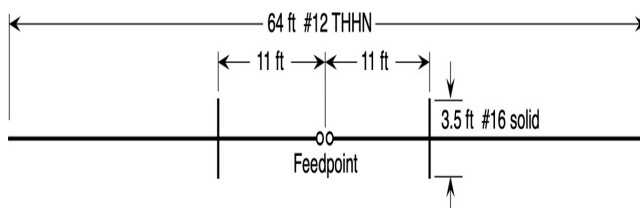


Figure 2. Typical dimensions of the 40/15 m dipole. Remember to leave your wires a bit long for trimming

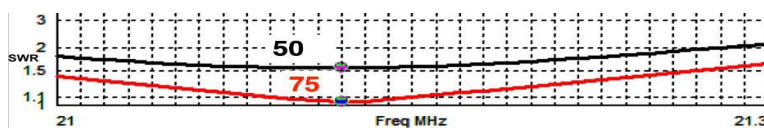


Figure 3. SWR on 15 m with the added hats. It's a better match to 75 ohms, typical of dipoles at this height (30 ft)



I should also mention that the radiation pattern (Fig. 4) on 15 m is quite complex since it's no longer a simple 1/2-wave dipole (the hats have nothing to do with that fact). Peak gain is actually greater than a dipole but there are also many nulls.

Figure 5 shows my original installation on a low-observable 4-band fan dipole (40, 30, 20, and 15 m). I used 18 AWG solid wire for the hats in this case and actually spliced some on because it was a first experiment. The thing has survived for 12 years so far.

Has this been published elsewhere? Yes, in the June 1991 QST it was mentioned in a general article about dipoles by NJ2L. Sadly, it's never made it into the ARRL Antenna Handbook. If you want to try simulation with EZNEC or some other tool, this makes a great exercise.

Speaking of simulation, I wondered if this method would work on an 80 m dipole, making it usable on 30 m. It will, however the hats are about 9 feet long. Perhaps this could be implemented with wires pulled out via insulators and string. Further simulation and experimentation is in order here.

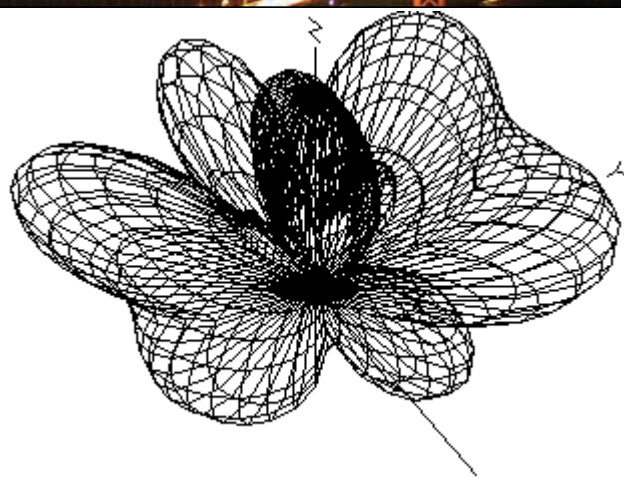


Figure 4. Three-dimensional radiation pattern on 15 m

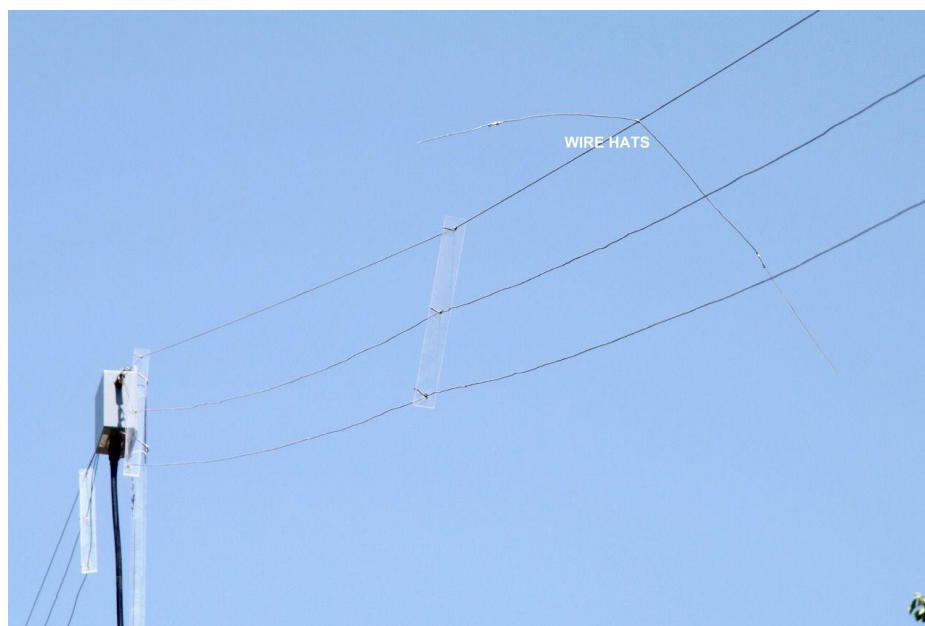


Figure 4. Three-dimensional radiation pattern on 15 m

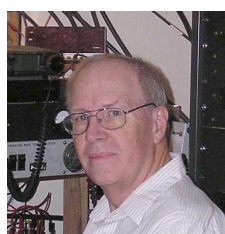


## Tube of theMonth

**Norm Wilson, N6JV**

Visit the Tube Museum at [n6jv.com](http://n6jv.com)

### DET25



In their build up after WWI, the Royal Air Force developed a new triode transmitting tube that was capable of higher power than earlier types. The **DET25** was a developmental tube similar to the “50-watters” being made in the US. In 1925, the RAF was still flying open cockpit biplanes so the DET25 had the L4 base, with its long voltage breakdown paths, for use in wet applications.

I have found two early RAF transmitters that used the DET25. The TR 4 is a single DET25 oscillator that has plug-ins to operate on the range 143 to 500 KHz or 3 to 15 MHz. It uses either CW or interrupted CW (ICW) where the keying lines is fed through a motor driven wheel like a spark transmitter.

The TR 1091 was a MOPA design with the DET25 as the amplifier. It operated at 1.2 to 1.5 MHz and 2 to 3.4 MHz using plug-in capacitors and coils. It used the same CW/ICW keying system, but also had grid voice modulation. This was a larger unit and required a larger aircraft.

The DET25 has a published filament voltage of 7.5 volts but other sources give it as 6 or 8 volts. Filament current is somewhere in the 1-to-2-amp range. Plate voltage has a maximum of 1200 volts and a current given as 36 ma for around 40 watts maximum dissipation. The user needed to know the averageduty cycle of the mode they were using. Fifteen WPM CW has an average duty cycle of about 45% depending on the fist. Hand written notes indicate that in practice about 80 ma was used for a 60-to-70-watt output.

The designation DET25 was changed to VT25 and then CV1025 (Common Valve) when the Inter-Service Technical Valve Committee in 1941 started their version of JAN numbers. The British Army also used the designation AT35 for the VT25.



*Ed. Note: Interrupted CW was an easy way to produce MCW which was needed because many emergency receivers aboard ships and aircraft were simply un-powered “crystal radios” that produced no output from unmodulated keyed CW carriers.*



## 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](mailto: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](mailto: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 plain, unformatted ASCII text, MS Word (.doc/.docx) are acceptable. Indicate the insertion point and title of diagrams and pictures in the text and attach photos/diagrams separately. Pictures should be as high a resolution as available. Please do not spend time formatting your submittal, the publication templates will re-format everything. Send your material to [k6dgwnv@gmail.com](mailto:k6dgwnv@gmail.com) indicating "JUG Submittal" in the subject.

## 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: "NCCCCKB"



**LANDS' END**  
BUSINESS



<https://business.landsend.com/store/nccc/>

MEN WOMEN PROMOTIONAL PRODUCTS

Welcome to the NCCC Land's End store. You can choose many different products and add a custom-embroidered NCCC logo.

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).

If you have questions, contact the NCCC secretary at: [secretary.nccc@gmail.com](mailto:secretary.nccc@gmail.com)



**Northern California Contest Club**

### 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.



## Northern California Contest Club

Excellence In Amateur Radio Contesting

# 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 KPA500 and KPA1500 amplifiers

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



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## Northern California Contest Club

Excellence In Amateur Radio Contesting

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### IC-9700 | All Mode Tri-Band Transceiver

• 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/UHF, 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 Inl 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 V/V, U/U, V/U and DV/DV • Enriched D-STAR® Features Including the Terminal Mode/Access Point Mode • UHF (225-374.995MHz) Air Band Reception



• RETAIL LOCATIONS - Store hours 10:00AM - 5:30PM - Closed Sunday

• PHONE - Toll-free phone hours 9:30AM - 5:30PM

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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/VHF/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 Mode/Mod 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 Xcvr

- 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 Within 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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