



#623 – June 2024



JUG

Publication of the
Northern California
Contest Club

NCCC

**NCCC – 53 years
of contesting
excellence**

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NCCC MEETING

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

Next ZOOM Meeting
Tue 11 Jun 2024 1830 PDT

"Updates at J68HZ"

Dr. William J. Schmidt - K9HZ

President's Report

David West, KO6M



Greetings Fellow KBers!

It's June. I hope this newsletter finds you keeping cool! My little article will be short and sweet this month. Just a couple friendly reminders:

1. July 21st we will be having our Sierra Chapter BBQ. Thank you to Rick for opening up his QTH to us all. I hope to see you there! You may RSVP at [Member Planet](#).

[Ed Note: Rick has also provided an RSVP in an email to all members]

2. We are looking to sponsor the California area Tent for WRTC. We are still looking for donations for that. You may donate at the link below or you may send your check, made out to NCCC, to me at my QTH. We will be paying for the tent at the end of this month, donations would be greatly appreciated.

www.memberplanet.com/campaign/ncccckb/wrtc26

3. Lastly, it's almost time for those dues emails to go out. We were able to keep our dues the same this year even with our big plans. Please help keep us on budget this year. Dues are the economic lifeblood of our club. Please remember that with the dues we not only are able to promote contesting within our club by



way of our award system, but we sponsor awards in other contests as well. Adapted from our website since it says it better than I can:

Top 10 Reasons To Join Support NCCC

- 1) Nationally recognized as a top-tier amateur radio contest club. Devoted to the pursuit of operating and technical excellence in amateur radio contesting. Experience the fun, satisfaction, and competitive thrill of radio contesting.
- 2) Opportunity to develop or improve your operating and technical skills to become better testers.
- 3) Email Reflector -- Access to over 300 members. Our membership consists not only of world-class operators, but also some of the most knowledgeable amateur radio practitioners in the country.
- 4) Frequent meetings throughout the greater SF Bay Area, often with top-notch guest speakers.
- 5) The JUG -- our monthly newsletter delivered electronically
- 6) The NCCC website -- Contains some great operating resources. Free logging software. Tutorials and presentations on RFI & noise elimination, SO2R operation, RTTY Contesting, antenna design, understanding propagation, preparing your own QSL cards, a Sweepstakes handbook, radio-computer interfaces, sleep strategy for big contests, etc.
- 7) Opportunity to win both Club and Individual amateur radio contest awards.
- 8) CQP -- The California QSO Party, sponsored by NCCC, is recognized nationally and internationally, as one of the finest US State QSO Parties of the year.
- 9) NS (NCCC Sprint) – high energy CW event every Thursday evening.
- 10) We're Cool! NCCC is one of the finest amateur radio contesting (and friendship) organizations in the world.

73,

David, KO6M



VP/CC Report Chris Tate, N6WM

About NCCC

Officers and Directors, 2023-2024 Contest Season

President: David West, [KO6M](#)
Vice-President/Contest Chairman: Chris Tate, [N6WM](#)
Secretary: Greg Alameda, [KK6PXT](#)
Treasurer: Nian Li, [WU6P](#)
Past President: David Jaffe, WD6T
Director: Jim Brown, [K9YC](#)
Director: John Miller, K6MM
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

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Cell: 530.210.0778

The “In Between Season!”



Greetings KBers. With the completion of the WPX CW contest (followed by the newer ARRL digital contest), we have entered into the “off season” and summer HF conditions..

Seasoned contesters know that summer in the northern hemisphere produce challenging conditions. Regardless, during this transitional season there are several upcoming contests should you want to keep your chops going during this period Including but not limited to All Asia DX contest cw, as well as the IARU HF world championship in July. For those looking for some contesting action, these could be great choices for you.

Congrats NCCC for our ARRL 10m win!

I want to congratulate the club on our Unlimited contest win in the ARRL 10m contest. This was a great example of the NCCC achieving critical mass producing the logs and efforts to put us over the top. We established a nice award program revolving around our 10 meter efforts, and I want to thank Gary NA6O for designing one of the most attractive NCCC effort plaques ever issued. They are truly spectacular. K6MM has posted a nice version of our unlimited club win certificate on the front page of the NCCC website. If you have not seen it yet, and you were a participant, grab it because you were part of it!

[Ed Note: See “The Lumber Yard” in this issue]

IT Trouble at ARRL HQ

2 weeks ago, many websites and services at ARRL hq went silent in a shroud of mystery. Over the course of time, they slowly revealed that a major cyber attack was directed toward ARRL IT infrastructure. Amongst the casualties of this attack are systems that we contesters (and DXers) use on a regular basis including the ARRL contest portal (contests.arrl.org) and one of the most heavily used qsl methods for major contesters, Logbook of the world also remains offline. Many contest stations that work thousands every contest use LOTW only to QSL,



so this outage is a big deal (on a number of other fronts as well). Regarding the contest portal, at least the timing was mostly on our side, since we are in a slow contest period. But the LOTW outage is starting to hurt, and I am sure there will be a huge upload jam up once it gets back online. According to press releases, the ARRL has engaged the FBI and Security specialists and are starting to test restored systems. Lets hope our contest portal and LOTW system are brought back online in short order. A 2 plus week outage is far too long.

I also discovered something that I missed last year. The ARRL is no longer providing gavels for unlimited club wins. If one is desired it must be purchased by the club. This is a huge traditional disappointment IMO. Apparently gone are the days where the Pacific Division Director will join us at meetings to present our gavels as was done in years past. So Unlimited Club gavels go the way of qst.. either pay for it or don't get it. I for one plan on writing a note to our Pacific division director expressing my disappointment on this cost cutting?? Measure.

In my opinion, there is a fine line between being frugal... and being cheap and perceptively unsupportive of regional clubs.

I'd love to hear from you about focus contests for the upcoming season!

This is the time of year your VP/CC and Board put our thinking caps on and try and establish some good focus contest for our club to pursue. We did this last year with ARRL 10m and well as you know the results were quite positive. So on that note I wanted to let you all know I would love to hear from you, our contester membership on contests you would like to see us chase collectively as a team! As always, we have the bi-annual NAQPs that have their team registration process. But we do have many ARRL contests, and of course you can expect a much more strong push for WPX this season. So let me know your thoughts and ideas, so we can have a solid plan for the upcoming season.

That's all for this month, I hope you all have a safe and productive summer with station maintenance and family fun. Get your systems and stations ready.. up next, the 2024-2025 contest season!

73 es KB
Chris N6WM VP/CC



Upcoming State/Province QSO Parties

A Quick Reference for those participating in the Intra-Club QSO Party Challenge or just looking for a weekend contest

CONTEST	DATE(S)/TIME(S)
West Virginia	6/15 1600Z – 6/16 0400Z
Alabama	7/27 1500Z – 7/28 0300Z
Maryland/DC	8/10 1400Z – 8/11 0400Z
Hawaii	8/24 0400Z – 8/26 0400Z
Kansas	8/24 1400Z – 8/25 0200Z 8/25 1400-2000Z
Ohio	8/24 1600Z – 8/25 0400Z
Tennessee	9/1 1700Z – 9/2 0300Z
Colorado	Not yet posted
Texas	9/21 1400Z – 9/22 0200Z 9/22 1400Z to 2000Z
Iowa	9/21 1400Z – 9/22 0200Z
New Hampshire	9/21 1600Z to 2200Z 9/22 1400Z to 2000Z
New Jersey	9/21 1600Z – 9/22 0359Z
Washington Salmon Run	9/21 1600Z -- 9/22 0700Z 9/22 1600Z to 2400Z
Maine	9/28 1200Z – 9/29 1200Z
CALIFORNIA QSO PARTY	19/5 1600 – 10/6 2200Z

Planning A CQP County Expedition?

If you're planning a County Expedition for the 2025 CQP, now is the time to get serious. Help is available for just a couple of mouse clicks at [The CQP Website](#) for advice, tips, and anecdotes from those who have been there and are skilled in the art of successful expeditions. County expeditions are a lot of fun, especially with friends, and they set CQP apart from all the rest in that they provide full or nearly full-time operations. Nowadays, nearly all the Worked All California Counties award are for contacts made in the CQP.



THE LUMBER YARD

Awards and Kudos for NCCC Members



Author, Author!

Jim Deloach (WU0I) and Jim Peterson have an article on pp 55-57 of the June issue of QST about Field Day safety.



N6XI Reprises "Truckee Radiogrill!"

All of you are old enough to have been invited to the late, great "NCCC Sierra Chapter" BBQ at my place in Truckee. Some of you are still young enough to remember it! It was a sort of renegade event, planned without club authorization, and included NCCC, MLDXCC, and Truckee locals (now known as TRASH, the Truckee Radio Amateur Society Hams, a snide acronym for which I will accept responsibility unless it offends you). It used to be in the Fall, too close to the official NCCC BBQ at N6RO, and fell victim to the pandemic. It's high time to bring it back and since we've moved it to July, NCCC is now an enthusiastic promoter.



So come on up to the High Sierra and enjoy some mountain air, views, burgers, and dogs on the deck. No need to bring anything except tall tales of amateur radio exploits (no politics, please). Ann and I will provide the meat items (and a plant-based alternative) and a few salads, sodas, and beers, so please don't bring any meat products. If you want to bring something else, please stick to sides, desserts, or drinks. Optional.

While you're here, do consider the many other mountain recreation possibilities: hiking, biking, fishing, boating, soaring, paddling, photography, birding, flying, POTA/SOTA activating, feeding the bears (just kidding), and more. Some lodging may be available at hams' best price or via recommendations for other possibilities. Ask me.

NCCC members will have received a non-forwardable invitation from the club with a personalized RSVP link. If you reply to that, there is no need to respond to this separate invitation - I will coordinate with NCCC. Otherwise, if you're planning to attend, please let me know who and how many to expect.

We'll gather at 11, fire up the grill around noon, hang out as long as the tall tales persist. The address is 12921 Filly Ln, Truckee. Park closely but carefully in the pull-out at the top of the driveway or anywhere else that looks feasible. Beware some electrical boxes on the ground alongside the long part of the driveway. The pullout continues off the asphalt into the brush, outlined by some stumps. Try to use it efficiently. Carpooling is encouraged to reduce parking pressure.

For those who remain skeptical about VK4 (Virtual K4 remote control app), I should have it running on a laptop to the real K4 in the shack. Or to the one down in Silicon Valley. Or anywhere else where there's an available K4.



Tube of the Month
Norm Wilson, N6JV
Visit the Tube Museum at n6jv.com

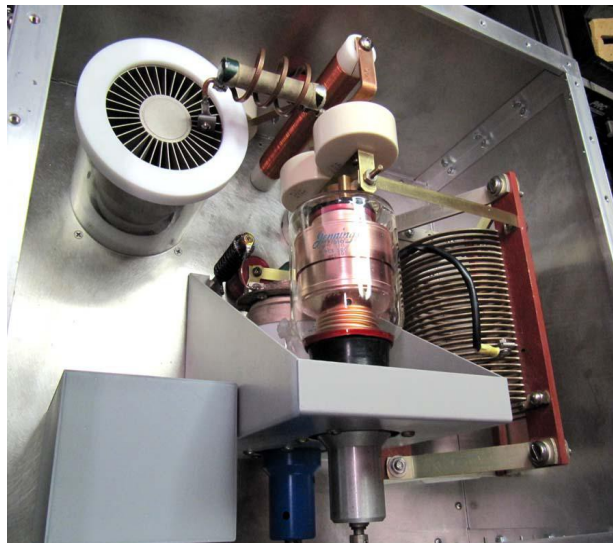
3CX1200D7/YU-121



I have always been interested in amplifier construction as well as the transmitting tubes. I often take the opportunity to look inside new commercially built amplifiers as I like to see if there are different ways to solve the problems all builders run into. Several years ago, I was at the IDXC in Visalia and had a chance to look into a new Henry Radio amplifier. We got into a tube discussion and he said he had a nice tube I could add to my collection. He dug around in a box and came up with a ceramic tube marked [H-800S](#). It was damaged with a bent pin so it couldn't be sold. I was very pleased with the new addition.

I could never find any data on the H-800S. I narrowed it down to the EIMAC [3CX1200D7](#) by appearance alone. I partially bent the pin back just enough to fit into a socket and added it to the collection. A few years later I was going to [ECONCO](#) to have some big tubes tested. I brought along the H-800S and they tested it as a 3CX1200D7/YU-121 and it passed as a new tube. The H-800S must have been a special number just for this buyer. The 3CX1200D7 can be used up to 5.5 kV at 800 ma. The mu is 200 and it can be used up to 110 MHz. The filament uses 6.3 volts with a maximum of 6.6 volts at 25 amps. At less than 4 kV, grounding the grid will not exceed the maximum dissipation.

I had built a new [160-meter amplifier](#) with a single 4-1000A in grounded grid. It worked great, but that tube requires more drive than my transceiver can produce for an output of 1500 watts. I decided to try that H-800S. It uses the same socket as the 3-500Z and was easy to swap in.. The filament transformer was 6.9 volts so with a small variac, it was usable for either tube. The thoriated tungsten filament is instant on. The amplifier now has an output of 1500 watts with about 50 watts of drive. The white ring is an air seal made on the lathe from Teflon.





Editor Notes

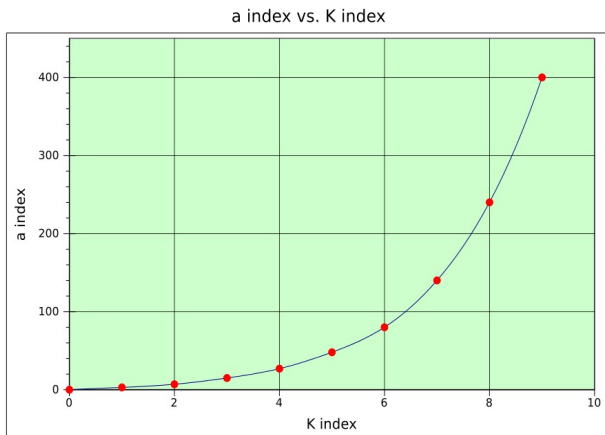


Well, the Sun certainly made May an interesting month! Multiple X-class flares, numerous large CME's producing radio conditions that could be euphemistically termed “Unsettled”, and aurora's down in W6FB's back yard. NW Nevada was disappointingly cloudy, but I've seen the northern lights all over the sky and bright enough to read by thanks to the USAF and its all-expense paid year-long tour at the Arctic Circle. The Sun is still very active, June could be equally interesting.

I received one response to last month's short survey, “Last time you copied a W1AW bulletin.” The response: “W1AW Field Day Bulletin, 2023.” Either very few people get their ham radio news from W1AW, or maybe no one likes to respond to inane surveys.

The Ap and Kp Indices

With a tumultuous May now history, and some whitespace left on the page, a quick review of the Ap and Kp indices might be in order. Both are measures of the variability in strength and direction of the geomagnetic field at nine northern hemisphere stations: Meanook, Glenlea, St. Johns, and Ottawa, Canada; Sitka, Alaska; Newport, Washington; Fredericksburg, Virginia; Boulder, Colorado; and Fresno, California every 3 hrs. These are combined into a “Planetary Kp” index. The K indices are reported in a quasi-logarithmic scale from 0 to 9, similar to the Richter Scale for earthquakes. The K indices are not linear preventing meaningful averaging, so they are converted into an A-index which is linear and unbounded to arrive at the planetary Ap index.



NOAA has established a “G scale” to characterize the effects of the Kp/Ap index magnitudes.

- G0 [Kp=0-4]: No or very low disturbance
- G1 [Kp=5]: Minor, ~900 days/cycle
- G2 [Kp=6]: Moderate, ~360 days/cycle
- G3 [Kp=7]: Strong, ~130 days/cycle
- G4 [Kp=8-9]: Severe, ~60 days/cycle
- G5 [Kp=9]: Extreme, ~4 days/cycle

High Kp indices will affect MF/HF radio communications with the magnitude of the effects “generally” increasing with higher Kp values. However, exactly what those effects are at any given time is pretty much guess-work.

Faraday's Law states that a moving conductor in a magnetic field will create a current. It works the other way as well ... vary the magnetic field around a stationary conductor and the same current will appear. Pipelines, electrical transmission lines, telephone and telegraph cables are all generally very long and the field variations will induce large currents in them at high values of Kp, possibly interrupting service and even damaging equipment. High values of Kp will also spread auroras, normally found at high latitudes, southward. As noted elsewhere in this issue, auroras in May were found as far south as W6FB's QTH by the bayou in Lake Charles, LA.





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

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 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”



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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



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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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

NEW



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 Incl P25, NXDN™, D-STAR • SD Card Slot for Receiver Recorder



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

- Analog FMD-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, UV, 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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Northern California Contest Club

Excellence In Amateur Radio Contesting

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See us at HAMCATION Booth 024-028!



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



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



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



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-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



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-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



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/Host Node with HRI-200



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



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

- All New User Operating Interface-E20-II (Easy to Operate-II) • 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



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